

**Water Marginalised: Findings in
International, British Colonial, and Post-
Colonial Health Discourses
c. 1925-1975**

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Abstract

During the twentieth century a range of administrators and specialists were concerned with the place of water as both the origin of public health problems and a substance essential to human life. Taking a chronological approach between 1925 and 1975 this thesis explores the twists and turns as these actors sought to use such framings to shape British colonial, post-colonial and international health policy. Arguing that water was marginalised within fragmentary structures of imperial and international policy making until the WHO, with UN backing, placed it at the heart of public health in the 1970s, this thesis explains the fluctuating visibility of water within colonial, post-colonial, and international health discourse during this period. It focuses on the role of international health organisations and draws primarily upon WHO engagements with the African continent, in particular Uganda and Sudan, to illustrate the plethora of theoretical and practical interactions with water and health. It investigates how scientists and bureaucrats who were operating in international and British colonial spheres used the art of compromise to overcome constraints shaping final policy decisions.

The role of water in international public health rarely features in the literature from the 1920s until the 1970s when the UN, the WHO, and other international organisations sought to bring water and sanitation as a pair to the forefront of international debates. Where water is present in the scientific scholarship of the times, it is predominantly treated as an interesting by-product rather than a central feature determining public health outcomes. In using the WHO's Global Community Water Supply Programme (est. 1959) as a central point for analysis, this thesis explores how international health programmes before and after sought to encourage governments to prioritise investment in water supplies and sanitation. In doing so, this thesis deepens our understanding of twentieth-century engagements with water and sanitation in British imperial, British colonial, and international settings.

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Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

This thesis draws on material from dissertations from my BA History Degree and my MA History Degree at the University of York. It also draws on material from my 2016 publication (particularly for sections of Chapter 1):

Joanna Lunt. "The League of Nations Health Organization: Water, Health and Development in Colonial Africa, 1925-44." In *The League of Nations' Work on Social Issues: Visions, Endeavours and Experiments*, edited by Magaly Rodríguez García, Davide Rodogno, Liat Kozma, 167-184. Geneva: United Nations Publications, 2016.

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INTRODUCTION

Since the nineteenth century water has been widely known for its ability to produce both favourable and unfavourable health outcomes.¹ Yet there was a major lag before polities in Africa committed to improving water supplies and sanitation for all in the twentieth century. For the first thirty to forty years covered by this study (c. 1925-1955/65) most of the African continent was under one form or another of imperial rule. Thus far, the scholarship on twentieth-century public health and colonial development has not addressed water and sanitation at any great length in this context either from the perspectives of the European colonisers or those colonised. The heart of this thesis lies in how bureaucrats and scientists conceptualised water as a key issue in public health and how this framing shaped British imperial, British colonial, national, and international health policy between 1925 and 1975.

By exploring when and how water became important for policy makers concerned with colonial and post-independence Africa, and in drawing upon material relating to Uganda and Sudan to illustrate its arguments, this thesis contributes to the historical literature by deepening our understanding of how people conceptualised and engaged with water and sanitation in the twentieth century. It primarily focuses on the outside influences on the African continent, such as British colonial and World Health Organisation (WHO) officials, as well as a variety of experts who worked in different sub-fields within imperial, colonial and international policy settings. This thesis is interested in how these individuals and groups conceptualised water and its relation to health and ill-health as well as exploring the various types of negotiation evident through project proposals and policy implementation. It argues that people used the art of compromise to mitigate the tensions between ideologies (systems of ideas and ideals that formed the basis of theory and policy) and pragmatism (approaches that gave greater consideration to practical rather than theoretical constraints).

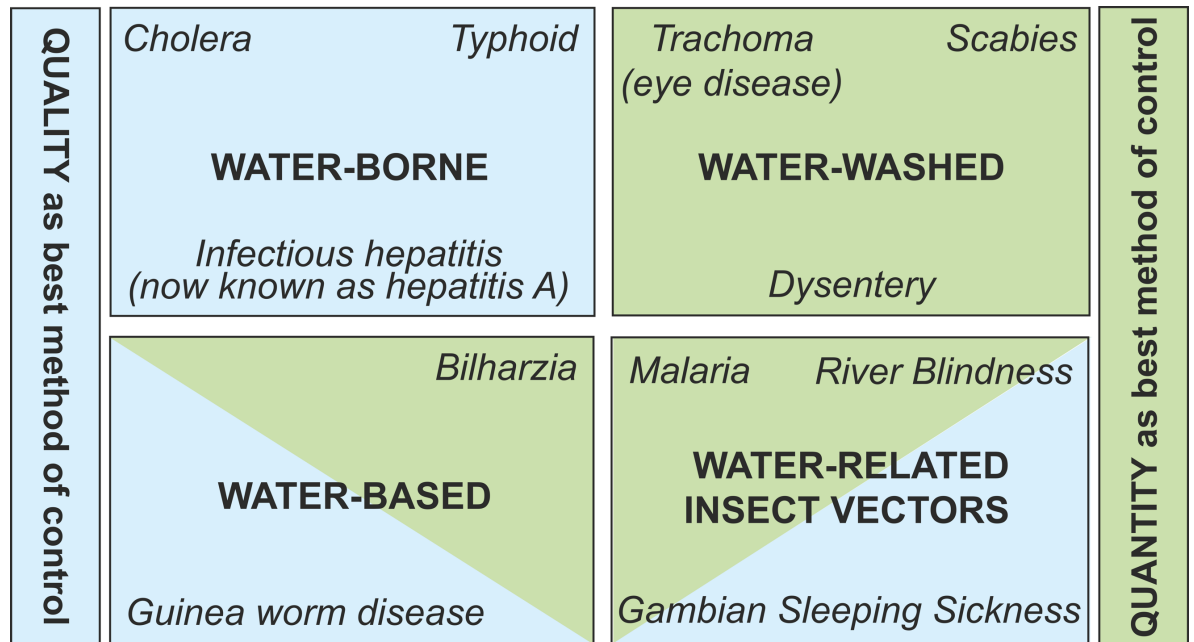
¹ Examples of work discussing the impact of water and sanitation on health see: J. Aagaard-Hansen and C-L. Chaignat, "Neglected tropical diseases: equity and social determinants," in *Equity, Social Determinants and Public Health Programmes*, ed. E. Blas and A. S. Kurup (Geneva: WHO, 2010): 136-157, 139; J. Bartram and S. Cairncross, "Hygiene, Sanitation, and Water: Forgotten Foundations of Health," *Public Library of Science Medical* 7, no. 11 (Nov 9, 2010): e1000367, accessed Aug 12, 2016, <https://doi.org/10.1371/journal.pmed.1000367>.

This thesis looks to understand how water was conceptualised in particular contexts and if, when, and where health figured in the formulation and expression of ideas. It contends that how people understood and engaged with health and development (both in concept and practice) significantly shaped the marginalisation of water supplies and sanitation within health discourse. Water supplies were variously described as an auxiliary to health and development (and in the early years, health was often an auxiliary to development), a problem, a solution, a resource, a medium of disease transmission, and a breeding place. This thesis explores these ideas, what they meant, and how they impacted the ability of administrators and specialists to forward health agendas that prioritised the development of water supplies and sanitation facilities. It explores how colonialism constrained how people thought about and engaged with water in the twentieth century. This thesis considers the lack of consensus over how best to organise water within territories and international organisations; it addresses the challenges in providing accepted proof of water's connections to health and ill-health; and it explores how advocates of water and sanitation fought against stiff competition for resources to effect the implementation of adequate water and sanitation. In doing so, it provides greater insights into what prompted the return of water and sanitation to the forefront of territorial and international health agendas.

So, why is water important in health policy? Using zoologist David Bradley's classification of diseases by their transmission routes as a starting point, we can see that the answer is more complex than you might first think, as water is important in more than one way. Hoping to draw international attention to the significant role water played in addressing health concerns, Bradley formulated and developed a new way to classify tropical diseases in the 1960s and early 1970s.² Published in 1972, Bradley divided diseases into four categories based on their transmission routes, as depicted in Figure A: "water-borne", which were transmitted by consuming water; "water-washed" resulting from insufficient quantities of water for hygiene; "water-based" caused by pathogens requiring aquatic organisms as hosts and transmitted through contact or ingestion; and "water-related insect vectors", which were spread by insects that bred in or

² Gilbert F. White, David J. Bradley and Anne U. White, *Drawers of Water: Domestic Water Use in East Africa* (Chicago and London: The University of Chicago Press, 1972), chap. 6, especially 162-176; Martin Thompson et al., *Drawers of Water II: 30 Years of Change in Domestic Water Use and Environmental Health in East Africa* (London: International Institute for Environment and Development, 2001), 72.

Figure A: David Bradley's Classification of Diseases Related to Water



Source: Drawn by author (2016) using White, Bradley, and White, *Drawers of Water*.

near water. Figure A also shows the control methods that Bradley and colleagues deemed best suited to tackle each group of diseases: improving the quality of water (water-borne), increasing the quantity of water (water-washed), or a combination of both (water-based and water related insect vectors). Though placing water at the forefront of public health in this way reflects a largely contemporary way of thinking about water and health, Bradley's classification of diseases can provide a helpful starting point for finding out about how actors in the past did, or did not, think about water in relation to health.³

As this thesis examines actors operating within and in relation to colonial and international institutions the periodisation of this thesis is not straight forward. Where appropriate, there are varying degrees of cross-over in the time frames of each chapter. To address the changes and continuities over time, this thesis is largely split into colonial and international engagements with water before 1940 (Chapter 1) and those post-1945 (Chapters 2, 3, 4 and 5). Broadly speaking, the period between 1925 and 1945 exhibited the early stages of concerted efforts by European imperial powers and international bodies to work both separately and

³ Jamie Bartram and Paul Hunter, "Bradley Classification of disease transmission routes for water-related hazards" in *Routledge Handbook of Water and Health*, ed. Jamie Bartram et al. (Abingdon: Routledge, 2015), accessed 26 Apr 2019, <https://www.routledgehandbooks.com/doi/10.4324/9781315693606.ch03>; Thompson et al., *Drawers of Water II*.

together to address health concerns across the African continent. The three decades that followed saw a period of consolidation and expansion of international health work through the World Health Organisation alongside other governmental and non-governmental agencies. This occurred in parallel to British attempts to re-establish their position as an imperial power, most notably expressed through development ideologies and practices—which included health—in colonial, post-colonial and international settings. Bearing these contexts in mind, each chapter addresses a few key moments that shaped how people were conceptualising and engaging with water in relation to health.

1. Literature Review

Whether the process of industrialisation elevated or lowered living standards is still contested and historians continue to debate over the main factors responsible for mortality decline in nineteenth-century Europe.⁴ However, there is agreement that the process of industrialisation in Europe and the resultant rapid urbanisation in the nineteenth century led to overcrowded, unhygienic living and working environments.⁵ As the largest city in the western world, London had grown from around 800,000 inhabitants in 1801 to over 7 million by 1901.⁶ The proximity of

⁴ Contesting industrialisation: Szreter's work contests the view that rapid economic growth always produces improved living standards. Szreter emphasises the importance of mitigating the disruptive (the first 'D') impacts that ensue as a result of rapid economic growth in order to avoid deprivation, disease, and death (the other three 'Ds'): Simon Szreter, "Economic Growth, Disruption, Deprivation, Disease, and Death: On the Importance of the Politics of Public Health for Development," *Population and Development Review* 23, no. 4 (Dec 1997): 693-728, 693-694; Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity from Antiquity to the Present* (London: Fontana Press, 1999): 398-399, 400; Robert Millward, *Private and Public Enterprise in Europe: Energy, Telecommunications and Transport, 1830-1990* (Cambridge: Cambridge University Press, 2005), Kindle edition, chap. 3. Also see Robert Millward and Sally Sheard, "The Urban Fiscal Problem, 1870-1914: Government Expenditure and Finance in England and Wales," *The Economic History Review*, New Series 48, no. 3 (Aug 1995): 501-535, 523; J. A. Hassan, "The Growth and Impact of the British Water Industry in the Nineteenth Century," *Economic History Review* 38, 4 (1985): 531-547; Simon Szreter, "The Importance of Social Intervention in Britain's Mortality Decline, c. 1850-1914: A Reinterpretation of the Role of Public Health," *Social History of Medicine* 1, no. 1 (1988): 1-37, 3, 13. Also see 18-33 for critique of Thomas McKeown.

⁵ Porter, *The Greatest Benefit to Mankind*, 398, 399; Millward and Sheard, "The Urban Fiscal Problem, 1870-1914," 501, 526; Frances Bell and Robert Millward, "Public Health Expenditures and Mortality in England and Wales, 1870-1914," *Continuity and Change* 13, no. 2 (1998): 221-249, 247; Simon Szreter, "Rapid Economic Growth and 'the four Ds' of Disruption, Deprivation, Disease and Death: Public Health Lessons from Nineteenth-Century Britain for Twenty-First-Century China?" *Tropical Medicine and International Health* 4, no. 2 (February 1999): 146-152, 147. Szreter preferred to highlight the issues that rapid economic growth could cause in the short term.

⁶ Porter, *The Greatest Benefit to Mankind*, 398.

people in this context, alongside poor factory conditions, exacerbated disease burdens and led to destitution. The social and environmental costs associated with this growth affected the ability of people to work and their quality of life. Therefore, public policy interventions were necessary.⁷

In response to these dire conditions the British state began to prioritise preventive public health measures in the early nineteenth century.⁸ As isolation and quarantine were no longer feasible in crowded urban societies, greater credence was given to alternative ways of curbing the devastating impacts of epidemic cholera, typhoid and influenza.⁹ Before the advent of germ theories of disease in the latter decades of the nineteenth century, miasmatic theories prevailed and were used to justify public health interventions. Those holding to miasmatic perspectives, including social reformer Edwin Chadwick, believed that diseases originated from decomposing organic matter and were transmitted via contaminated water, polluted air, and wretched sanitary conditions. Such contemporary understandings of disease causality and transmission were important in shaping the form of public health policies, including the prime focus given to water supplies and sanitation in the Public Health Act 1848.¹⁰ Regarded as a revolutionary piece of legislation, the Public Health Act 1848 signified a greater commitment to improving the living conditions of the urban poor through preventive public health measures.¹¹ Further reflections on such legislation alongside analysis of local commitment to developing water and sanitary infrastructure have shown that the implementation of such legislature was slow

⁷ Szreter, "Economic Growth, Disruption, Deprivation, Disease, and Death"; Szreter, "Rapid Economic Growth and 'the four Ds'"; For factory conditions causing ill-health see Janet Greenlees on public health in the Lancashire textile industry: Janet Greenlees, "'The dangers attending these conditions are evident': Public Health and the Working Environment of Lancashire Textile Communities, c.1870–1939," *Social History of Medicine Journal* 26, no. 4 (November 2013): 672–694.

⁸ Christopher Hamlin and Sally Sheard, "Revolutions in Public Health: 1848, and 1998?" *British Medical Journal* 317 (29 August 1998): 587-591, 587; Porter, *The Greatest Benefit to Mankind*.

⁹ Hamlin and Sheard, "Revolutions in Public Health," 587; Porter, *The Greatest Benefit to Mankind*.

¹⁰ Bell and Millward, "Public Health Expenditures and Mortality," 238; Porter, *The Greatest Benefit to Mankind*, 411.

¹¹ Hamlin and Sheard, "Revolutions in Public Health," 587; Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800–1854* (Cambridge: Cambridge University Press, 1998); Hamlin and Sheard, 587; William Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge: Cambridge University Press, 1994), 224; Porter, *The Greatest Benefit to Mankind*, 411, 426.

and uneven during the nineteenth century.¹² Nevertheless, historians have been able to show that resultant increases in investment in public health, particularly in the second half of the nineteenth century, did eventually lead to falling mortality from infectious diseases.¹³

Historians have also shown that the expansion of water supplies infrastructure tended to precede concerted efforts to improve sanitary conditions through the development of sewerage works in urban areas.¹⁴ In part, sanitation lagged behind as drains relied on a constant supply of water that was adequately pressurised to function effectively; this was costly. From a practical point of view, therefore, governments gave precedence to the development of water supplies. Yet this prioritisation of water supplies was also firmly grounded in political and economic concerns.¹⁵ In this sense, Robert Millward has aptly described investment in water supply infrastructure as, “a halfway house between on the one hand programmes financed by taxes like public health and education and on the other hand the more commercially orientated services of electricity, gas and tramways.”¹⁶ Millward’s research showed that investment in water supplies came from both private and public sources as businesses and the state sought to profit from the development of such services.¹⁷ Millward and others have shown industrial and commercial interests to be crucial in stimulating the extension of

¹² On differing effectiveness: see Szreter, “The Importance of Social Intervention in Britain’s Mortality Decline”; Millward and Sheard, “The Urban Fiscal Problem, 1870-1914,” 523; Hassan, “The Growth and Impact of the British Water Industry,” 543-44; J. A. Hassan, “The Impact and Development of the Water Supply in Manchester, 1568-1882,” *Transactions of the Historic Society of Lancashire and Cheshire* 133 (1984): 25-35, 32.

¹³ See Bell and Millward, “Public Health Expenditures and Mortality,” 222; Szreter, “Economic Growth, Disruption, Deprivation, Disease, and Death,” 711-712; cf. Thomas McKeown, *The Modern Rise of Population* (New York: Academic Press, 1976). McKeown’s thesis, now widely contested, argued that nutrition and improved living standards—as opposed to sanitary reform and other public health measures—were the primary causes of mortality decline and population growth.

¹⁴ Bell and Millward, “Public Health Expenditures and Mortality”; Millward, *Private and Public Enterprise in Europe*; Hassan, “The Growth and Impact of the British Water Industry”.

¹⁵ Millward, *Private and Public Enterprise in Europe*; Hassan, “The Growth and Impact of the British Water Industry”; Szreter, “Rapid Economic Growth and ‘the four Ds’,” 148-149; C. Cummings et al., “What Drives Political Leaders to Improve Urban Sanitation,” *Local Action with International Cooperation to Improve and Sustain Water, Sanitation and Hygiene Services: Fortieth Water Engineering and Development Centre International Conference, Loughborough, UK, 2017, Paper 2635: 1-7, 1, 2*. Notable advocates of water supplies provision and improved sewage disposal, such as social reformer Edwin Chadwick, were not strictly health professionals.

¹⁶ Millward, *Private and Public Enterprise in Europe*, Chap. 3.

¹⁷ Millward, *Private and Public Enterprise in Europe*, Chap. 3.

urban water supplies between the 1840s and 1870s.¹⁸ As sufficiently pressurised water supply was crucial to the effective operation of a variety of commercial and industrial processes, business owners sought to mitigate their costs. They did this by lobbying municipal governments to prioritise investment in water supplies.¹⁹ Yet while public health was initially of secondary importance, the increasing social costs associated with poor living and working conditions encouraged industrialists to place a higher value on the public health benefits of improved water supplies and sewage disposal as the century progressed.

The establishment of germ theories of disease towards the end of the nineteenth century signified the beginnings of an important shift in how people understood medicine and engaged with it in practice.²⁰ The development of bacteriology as a field of study, which grew from the mid-to-late nineteenth-century advancements in laboratory medicine, helped to definitively confirm that water was a medium for germs that produced cholera and other diseases.²¹ In confirming particular germs as causative agents of disease, the growing authority of the laboratory in turn challenged the older environmental conceptualisations of disease that had inspired preventive public health interventions in Europe.²²

Western medicine and public health progressed rapidly through the nineteenth century. It moved away from Hippocratic methodology in which the body was treated holistically (and in which disease was treated as an imbalance of the four humours) to a targeted, reductionist approach.²³ Following this, germ

¹⁸ Szreter, "Economic Growth, Disruption, Deprivation, Disease, and Death," 708-709; Bell and Millward, "Public Health Expenditures and Mortality," 237-241; Millward, *Private and Public Enterprise in Europe*, Chap. 3; Hassan, "The Growth and Impact of the British Water Industry"; Hassan, "The Impact and Development of the Water Supply in Manchester, 1568-1882"; Szreter addressed this literature in "Rapid Economic Growth and 'the four Ds'," 146-147.

¹⁹ Millward, *Private and Public Enterprise in Europe*, Chap. 3; Szreter on importance of the politics of public health for development: "Economic Growth, Disruption, Deprivation, Disease, and Death," 708; Szreter, "Rapid economic growth and 'the four Ds'".

²⁰ Michael Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000); Charles Rosenberg, *Explaining Epidemics and Other Studies in the History of Medicine* (Cambridge: Cambridge University Press, 1992); Bynum, *Science and the Practice of Medicine*.

²¹ Worboys, *Spreading Germs*; Christopher Hamlin, *Cholera: the Biography* (Oxford: Oxford University Press, 2009); Christoph Gradmann, *Laboratory Disease: Robert Koch's Medical Bacteriology*, trans. Elborg Forster (Baltimore: Johns Hopkins University Press, 2009).

²² Deborah Neill, *Networks in Tropical Medicine: Internationalism, Colonialism, and the Rise of a Medical Speciality* (Stanford: Stanford University Press, 2012), Kindle edition, Chap. 1.

²³ This therapeutic approach emphasised a natural healing process in which disease took its proper course. See George Rosen, *A History of Public Health* (New York: MD

theories of disease began to displace miasmatic theories of disease as Louis Pasteur and Robert Koch's microbiology took precedence.²⁴ Charles Rosenberg and Michael Worboys have spoken in complementary terms of these two ways of understanding disease transmission and how the emphasis on each set of perspectives changed during the nineteenth century.²⁵ Rosenberg spoke of contamination and configuration, Worboys of contagion and anti-contagion.²⁶ Older miasmatic concepts of disease, where illness resulted from environmental factors such as polluted air and water, linked Worboys' anti-contagion and Rosenberg's configuration perspectives. In this sense, for those following a contagion or contamination perspective, water was of lesser importance as it was not a causative agent of disease; rather, it was a medium or habitat for disease-causing microbes to thrive or part of the environment that brought together people and vectors of diseases (flies, mosquitoes).²⁷ Scholarship on bacteriological developments and their impact on the theory and practice of medicine and public health used to be very Eurocentric but this is slowly changing with the work of Pratik Chakrabarti, Anna Greenwood (previously Crozier) and Harshad Topiwala.²⁸ This thesis explores the effect that the acceptance of germ theories of diseases and the discreditation of older environmental conceptualisations in the nineteenth and early twentieth century had on the place of water in health discourse between 1925 and 1975.

Though the much reduced barriers to travel and trade aided European imperial aspirations in the nineteenth and early twentieth centuries, they also

Publications, Inc., 1958); Porter, *The Greatest Benefit to Mankind*. For further reading: Dorothy Porter, "The History of Public Health: Current Themes and Approaches," *Hygeia Internationalis: An Interdisciplinary Journal for the History of Public Health* 1, no. 1 (1999): 9-21; Milton I. Roemer, "A World Perspective on Health Care in the Twentieth Century," *Journal of Public Health Policy* 1, no. 4 (December 1980): 370-378.

²⁴ Miasmatic theory: disease caused by bad air. See John M. Bryan, "The Origin of Miasmatic Disease," *The British Medical Journal* 2, 676 (13 December 1873): 688-689. Germ theory: microorganisms linked with disease causality. See Anon, "The History of the Germ Theory," *The British Medical Journal* 1, no. 1415, (Feb 11, 1888): 312-313; Worboys, *Spreading Germs*.

²⁵ Worboys, *Spreading Germs*, 39; Rosenberg, *Explaining Epidemics*, 295.

²⁶ Rosenberg, *Explaining Epidemics*, 295; Worboys, *Spreading Germs*, 39.

²⁷ Randall M. Packard, *A History of Global Health: Interventions into the Lives of Other People* (Baltimore: Johns Hopkins University Press, 2016), Kindle edition, chap 1. Also see John Ford, *The Role of Trypanosomiases in African Ecology: A study of the Tsetse Fly Problem* (Oxford: Oxford University Press, 1971).

²⁸ Pratik Chakrabarti, *Bacteriology in British India: Laboratory Medicine and the Tropics* (Rochester: University of Rochester Press, 2012); Anna Greenwood and Harshad Topiwala, *Indian Doctors in Kenya: The Forgotten Story, 1895-1940* (Palgrave Macmillan, 2015, paperback 2017).

created favourable conditions for infectious diseases to spread with much greater ease.²⁹ This in turn led to calls for the collective surveillance and control of diseases. If left unchecked, infectious diseases would remain responsible for high morbidity and mortality rates across territorial boundaries.³⁰ One such disease was cholera, responsible for six pandemics that occurred in the nineteenth century: 1817-1824, 1829-1837, 1846-1860, 1863-1875, 1881-1896, and 1899-1923.³¹ The prevalence of this disease and others accelerated the creation of international institutions to curb their spread.³²

It was not until 1851, however, that the first international sanitary conference was held.³³ Boasting representatives from twelve nations, this gathering of physicians and diplomats hoped to formulate a standardised quarantine policy to deal with the scourge of cholera.³⁴ But disagreements surfaced on how best to contain such contagious diseases, and the representatives attending the conference were inclined to prioritise national economic and political self-interest above compromise in this international arena. This hindered the establishment of unanimously agreed upon approaches and legislation to resolve the cholera problem in the nineteenth century.³⁵ Further, the bias of European representatives at these meetings, particularly early on, gave greater weight to this regions' influence in defining and shaping the direction of international medical discourse at this time and into the twentieth century.³⁶ The

²⁹ See Shula Marks, "Presidential Address: What is Colonial about Colonial Medicine? And What has Happened to Imperialism and Health?" *The Society for the Social History of Medicine* 10, no. 2 (1997): 205-219, 209; J. Siddiqi, *World Health and World Politics, the WHO and the UN System* (London: Hurst & Co, 1995), 14; David P. Fidler, "The Globalization of Public Health: the First 100 Years of International Health Diplomacy," *Bulletin of the World Health Organization* 79, no. 9 (2001): 842-849, 845.

³⁰ H. Markel, "Worldly Approaches to Global Health: 1851 to the Present," *Public Health* 128 (2014): 124-128; Fidler, "The Globalization of Public Health," 845.

³¹ Pandemics retrospectively named.

³² Christopher Hamlin, *Cholera*; Dalong Hu et al., "Origins of the Current Seventh Cholera Pandemic," *Proceedings of the National Academy of Sciences of the United States of America* 113, 48 (November 29, 2016) E7730-E7739, published ahead of print November 14, 2016, accessed Oct 29, 2018, <https://doi.org/10.1073/pnas.1608732113>.

³³ Fidler, "The Globalization of Public Health," 843.

³⁴ W. F. Bynum, "Policing the Heart of Darkness: Aspects of the International Sanitary Conferences," *History and Philosophy of the Life Sciences* 15, no. 3 (1993): 421-434, 428; Markel, "Worldly Approaches to Global Health," 125.

³⁵ "The concerns were those of self interest, even if on occasion that self interest might also be called enlightened," See Bynum, "Policing the Heart of Darkness," 434; Markel, "Worldly Approaches to Global Health," 125.

³⁶ "Despite the 'international' in the titles [international sanitary conferences], the meetings were heavily European." Bynum, "Policing the Heart of Darkness," 422, also see 426-427.

1851 conference, and the nine that followed, reflected the growth of international cooperation in the field of medicine (“medical internationalism”) in the second half of the nineteenth century, albeit uneven and prone to fluctuation.³⁷

Before 1925, the importance of controlling disease within and across European imperial borders on the African continent came to the fore at two junctures.³⁸ The first occurred in the aftermath of the Berlin Conference 1885, at which European spheres of influence on the African continent were agreed. In the years that followed territory was contested and new borders were largely confirmed by 1905. During this time, Britain established two schools of tropical medicine in 1898 and 1899, one in Liverpool and one in London.³⁹ Such measures were reactive and signalled British intent to understand and find cures to the plethora of diseases encountered as they sought to extend their imperial influence across the globe. The establishment of formal institutions within colonial territories, albeit small at the start, occurred at contrasting times and took different forms based on immediate needs. In Uganda and Sudan medical departments were established in 1898 and 1904 respectively, but their coverage changed dramatically, particularly in the case of Sudan, in the two decades that followed.⁴⁰ Early priority was given to European soldiers and settlers before services branched out to cover the local population.⁴¹ The second priority was the health of

³⁷ For the phrase and idea of “medical internationalism” see Bynum, “Policing the Heart of Darkness,” 421-422 and Porter, *The Greatest Benefit to Mankind*, 484. Also see, Siddiqi, *World Health and World Politics*, 14; Markel, “Worldly Approaches to Global Health,” 125; Fidler, “The Globalization of Public Health,” 844.

³⁸ Earlier health measures in British-controlled territories occurred in the mid-nineteenth century. For example, in China. MacPherson argued that the transition to ‘modern’ medicine and public health mirrored that of the West in the 1840s and 1850s but, like Britain, was uneven and largely limited to cities. Kerrie MacPherson, *A Wilderness of Marshes: The Origins of Public Health in Shanghai, 1843-1893* (Oxford: Oxford University Press, 1987); Also, Indian Medical Service.

³⁹ Lise Wilkinson and Anne Hardy, *Prevention and Cure: The London School of Hygiene & Tropical Medicine: A 20th Century Quest for Global Public Health* (London: Keegan Paul, 2001); Helen J. Power, *Tropical Medicine in the Twentieth Century: A History of the Liverpool School of Tropical Medicine, 1898-1990* (London: Routledge, 1998 and Oxford: Kegan Paul, 2011).

⁴⁰ Coverage gradually increased, but due to the size of the territory, it took much longer to survey the whole area.

⁴¹ Philip Curtin used data from several military campaigns to show that concerted interest in disease control on the African continent was not a precursor to military offensives but instead occurred in response to the huge death toll amongst soldiers that resulted: Philip Curtin, *Death by Migration: Europe’s Encounter with the Tropical World in the 19th Century* (Cambridge: Cambridge University Press, 1989); Philip Curtin, *Disease and Empire: the Health of European Troops in the Conquest of Africa* (Cambridge: Cambridge University Press, 1998).

workers as they played a vital role in bringing early colonial development projects, such as railway construction, to fruition.

Deborah Neill has shown that between 1890 and 1914, European doctors and scientists also developed informal “transnational” networks in order to share ideas in how to manage the tropical diseases encountered on the African continent.⁴² Self-interest remained a high priority, however, and the willingness to be involved in transnational tropical medicine networks did not preclude the strengthening of nationalism in the first decade of the twentieth century. From this analysis we can see that there was a greater emphasis on controlling disease within imperial borders, albeit with a growing recognition of the need to work together with neighbouring European powers to manage diseases across borders, if only to ensure the safety of one’s own territories.

The second juncture occurred at the end of the First World War. Because of their role in the war, Germany was forced to relinquish its colonies. These were redistributed between the allied powers as mandated territories and, as part of the newly established League of Nations, a Permanent Mandates Commission was set up to supervise how they were managed.⁴³ The enforced cession of German colonial territories led to what Neill has described as, “a legacy of embitterment”, where the transnational networks established before the First World War were reconstituted with German doctors often omitted.⁴⁴ The League of Nations Health Organisation (LNHO), set up in 1920, provided an official forum for European imperial powers to collaborate in controlling particular diseases across imperial—often described as ‘international’—borders.⁴⁵ The increased focus on cross-border disease control was emphasised in the LNHO’s first major initiative regarding Africa: the Sleeping Sickness Commission in 1925. This approach highlighted the blurred lines between colonial and international health interventions in the early

⁴² Neill, *Networks in Tropical Medicine*, Chap. 1-6.

⁴³ Michael D. Callahan, *The League of Nations and Africa, 1914-31* (Brighton: Sussex Academic Press, 1999, 2008); Michael D. Callahan, *The League of Nations and Africa, 1929-1946* (Brighton: Sussex Academic Press, 2004); Susan Pedersen, *The Guardians: The League of Nations and the Crisis of Empire* (Oxford: Oxford University Press, 2015); Stephen Constantine, *The Making of British Colonial Development Policy 1914-1940* (London: Frank Cass, 1984), 231.

⁴⁴ Neill, *Networks in Tropical Medicine*, Chap. 7.

⁴⁵ Joanna Lunt, “The League of Nations Health Organization: Water, Health and Development in Colonial Africa, 1925-44,” in *The League of Nations’ Work on Social Issues: Visions, Endeavours and Experiments*, ed. Magaly Rodríguez García, Davide Rodogno, Liat Kozma (Geneva: United Nations Publications, 2016): 167-184.

twentieth century.⁴⁶ The prioritisation of medicine within British colonies continued, such that by the outbreak of the Second World War the colonial medical services were second only to administrative staff in terms of personnel numbers in British Africa.⁴⁷ In Uganda, medical personnel constituted the largest group.

The period between c.1880 and 1930 has received significant scholarly attention regarding European engagements with medicine in colonial territories. Daniel Headrick's *Tools of Empire* which, in highlighting how medicine was used as a "tool" by imperial powers for social, economic, and political gain, set the tone for future studies.⁴⁸ A swathe of critical accounts followed in reassessing the earlier triumphal accounts of European colonial health interventions in Africa.⁴⁹ John Farley's study of bilharzia revealed how imperialists played their part in causing, as well as curing, disease.⁵⁰ In particular, Farley explored how enforced agricultural policies initially increased, rather than reduced, the prevalence of water-related diseases (bilharzia, malaria) in imperial territories.⁵¹ Yet while Headrick focused on attempts to control disease through curative measures, such as quinine and other prophylactics, Lyons also explored how disease elicited a variety of responses from Belgian authorities and addressed broader interventions: this included Belgian attempts at social engineering by moving populations away from potential sources of the disease.⁵² This thesis adds to these insights to show

⁴⁶ Discussed further in Chapter 1.

⁴⁷ Data for Sudan not included; compared with police and military, judiciary, education, natural resources, public works, railways – 'other' category second overall, but an amalgamation of various services. See Anthony Kirk-Greene, *On Crown Service: A History of HM Colonial and Overseas Civil Services 1837-1997* (New York: St Martin's Press, 1999), 38; Anna Greenwood, ed., *Beyond the State: The Colonial Medical Service in British Africa* (Manchester: Manchester University Press, 2016).

⁴⁸ Daniel Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century*, (USA: Oxford University Press, 1981).

⁴⁹ Maryinez Lyons, *The Colonial Disease: A Social History of Sleeping Sickness in Northern Zaire, 1900-1940* (Cambridge: Cambridge University Press, 1992); Packard, *A History of Global Health*; Randall Packard, "Visions of Postwar Health and Development and their Impact on Public Health Interventions in the Developing World," in *International Development and the Social Sciences: Essays on the History and Politics of Knowledge*, ed. Frederick Cooper and Randall Packard (Berkeley, Los Angeles, London: University of California Press, 1997): 93-115; Megan Vaughan, *Curing Their Ills: Colonial Power and African Illness* (Stanford: Stanford University Press, 1991).

⁵⁰ European and American imperial endeavours to control bilharzia: John Farley, *Bilharzia: A History of Imperial Tropical Medicine* (Cambridge: Cambridge University Press, 1991), 298; also see Lyons, *The Colonial Disease*.

⁵¹ Farley, *Bilharzia*, 298.

⁵² Lyons, *The Colonial Disease*. The administrative decisions based on the attempts to rid the Congo of sleeping sickness shaped demographic patterns and affected local politics, economics, and social life.

how bureaucrats and specialists interacted with and shaped the African environments they worked in during the twentieth century, with a particular focus on the engagements with water supplies and sanitation developments.

There has also been a refreshing move away from histories of colonisers to focus on the colonised and the role that the latter played in both undermining and enabling colonial medical interventions.⁵³ Greater consideration of the important role that missionaries and other non-governmental organisations (NGOs) played in shaping engagements with health in colonial Africa accompanied this shift.⁵⁴ The availability and use of new kinds of source material has thus enabled historians to write more nuanced histories of Africa during the twentieth century. In addition to providing us with alternative perspectives, historians have embraced the idea of pluralism in medicine.⁵⁵ This recognition that people engaged with health and disease in a myriad of ways is important for understanding the complex dynamics that shaped the relationships between colonised and colonisers, between governmental and non-governmental agencies, and between international organisations.⁵⁶

Within these histories there is a greater appreciation for how the variety of understandings and interpretations of health in the twentieth century shaped the management, control, and eradication of particular diseases.⁵⁷ Warwick Anderson

⁵³ Sanjoy Bhattacharya, *Expunging Variola: The Control and Eradication of Smallpox in India, 1947–1977* (New Delhi and London: Orient Longman India and Sangam Books, 2006); Greenwood and Topiwala, *Indian Doctors in Kenya*; Ryan Johnson and Amna Khalid, ed., *Public Health in the British Empire: Intermediaries, Subordinates, and the Practice of Public Health, 1850-1960* (New York and London: Routledge, 2012).

⁵⁴ O. Barrow and M. Jennings, ed., *The Charitable Impulse: NGOs and Development in East and North-East Africa* (Oxford: James Currey, 2001); Yolana Pringle, "Crossing the Divide: Medical Missionaries and Government Service in Uganda, 1897-1940," in *Beyond the State: The Colonial Medical Service in British Africa* ed. Anna Greenwood (Manchester: Manchester University Press, 2015).

⁵⁵ Ernst Waltraud, ed., *Plural Medicine, Tradition and Modernity* (London: Routledge, 2002); Walter Bruchhausen, "Medical Pluralism as a Historical Phenomenon: A Regional and Multi-Level Approach to Health Care in German, British and Independent East Africa," in *Crossing Colonial Historiographies: Histories of Colonial and Indigenous Medicines in Transnational Perspective*, ed. Anne Digby, Waltraud Ernst and Profit B. Mukharji (Newcastle upon Tyne: Cambridge Scholars Publishing, 2010): 99-113

⁵⁶ Bruchhausen, "Medical Pluralism"; John V. Pickstone, *Ways of Knowing: A New History of Science, Technology and Medicine* (Manchester and New York: Manchester University Press, 2000); Pickstone addressed the multiple "ways of knowing", showing how older ideas were not immediately replaced when new ideas came to the fore, but that there was a gradual shift towards acceptance of the new ideas.

⁵⁷ Rohan Deb Roy, "Maladies of Modernity: Malaria and the Making of Burdwan Fever" in *Modern Makeovers: The Oxford Handbook of Modernity in South Asia*, ed. S. Dube (New Delhi: Oxford University Press, 2011): 59-75; Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950* (Chicago:

and Helen Tilley have helpfully shown the continued presence of “ecological interpretations” of disease in the twentieth century within a scientific framework.⁵⁸ A variety of scholars have shown the effects of time and place as well as the methods used to tackle sleeping sickness.⁵⁹ Michael Worboys and Daniel Headrick synthesised the vast historiography on sleeping sickness in Africa. Each examined the contrasting strategies of European colonial powers in their attempts to eliminate the disease in the first half of the twentieth century.⁶⁰ Methods they described varied from measures aimed at trypanosomes (the sleeping sickness causative agent), such as drug prophylaxis, to those focused on environmental management, which prioritised efforts to separate humans from flies through resettlement and bush clearing.⁶¹ Tilley analysed sleeping sickness on the African continent using evidence from the extensive research that scientists and naturalists conducted on the disease to show how new understandings of sleeping sickness were developed between 1900 and 1940.⁶² Tilley crucially argued that sleeping sickness was increasingly conceptualised and tackled through an ecological framework and revealed that early twentieth-century contemporaries

University of Chicago Press, 2011); Helen Tilley, “Ecologies of Complexity: Tropical Environments, African Trypanosomiasis, and the Science of Disease Control in British Colonial Africa, 1900-1940,” *Osiris* 19, no. 1 (2004): 21-38; Lyons, *A Colonial Disease*.⁵⁸ W. Anderson, “Natural Histories of Infectious Disease: Ecological Vision in Twentieth-Century Biomedical Science,” *Osiris* 19, no. 1 (2004): 39-61; Tilley, “Ecologies of Complexity,” 21-38.

⁵⁹ This disease prompted the Medical and Sanitary Department in Uganda to serve the African population in addition to its European contingent. Studies on sleeping sickness include: Ford, *The Role of the Trypanosomiasis in African Ecology*; Michael Worboys, “The Comparative History of Sleeping Sickness in East and Central Africa, 1900-1914,” *History of Science* 32, no. 1 (1994): 89-98; Daniel R. Headrick, “Sleeping Sickness Epidemics and Colonial Responses in East and Central Africa 1900-1940,” *PLoS Neglected Tropical Diseases* 8, no. 4 (April 2014): 1-8; Heather Bell, *Frontiers of Medicine in the Anglo-Egyptian Sudan 1899-1940* (Oxford: Clarendon Press, 1999); Tilley, *Africa as a Living Laboratory*; Luise White, “Tsetse Visions: Narratives of Blood and Bugs in Colonial Northern Rhodesia, 1931-9,” *Journal of African History* 36, no. 2 (1995): 219-45; Lyons, *The Colonial Disease*.

⁶⁰ Worboys, “The Comparative History of Sleeping Sickness”; Headrick, “Sleeping Sickness Epidemics and Colonial Responses”.

⁶¹ Headrick, “Sleeping Sickness Epidemics and Colonial Responses”; Kirk Arden Hoppe, “Lords of the Fly: Colonial Visions and Revisions of African Sleeping-Sickness Environments on Ugandan Lake Victoria 1906-61,” *Africa: Journal of the International African Institute* 67, no. 1 (1997): 86-95. Despite the temporal framework given in the article title, Hoppe’s evidence and analysis focuses primarily on the period between 1906 and 1920.

⁶² Tilley, “Ecologies of Complexity,” 21-38, esp. 21, 32, 38. Examples of those undertaking the research: Kenneth Morris (entomologist), Patrick Manson and Charles L. A. Laveran (Parasitologists), Cuthbert Christy (Zoologist), C. F. M. Swynnerton (Naturalist); Helen Tilley, “Ecologies of Complexity,” 21-38.

recognised the complex nature of disease.⁶³ In effectively demonstrating that diseases in ‘tropical’ environments were not solely perceived through a fly- or parasite-centric lens, Tilley’s analysis reframed historical understandings of tropical medicine.⁶⁴

There is still a gap in our understanding of the preventive public health measures that were suggested, developed, and implemented in colonial territories. Exceptions that focus on the preventive strands are mostly concentrated in the nineteenth century or in the 1930s with the rise of social medicine.⁶⁵ Preventive interventions were often regarded as secondary to curative measures or simply not practical due to the financial burden incurred and the finite access to personnel and materials. Indeed, histories of medicine and public health often employ a disease-by-disease approach, with basic health services receiving more limited attention.

An official turn to ‘colonial development’ from the 1930s accompanied the prioritisation of medicine in the colonies. This produced some reform, including small-scale investment in water supplies and sanitation. During the 1980s and early 1990s several historians set the benchmark for studying the history of British colonial development.⁶⁶ Histories often highlight the dominant understanding of development held in first half of the twentieth century (which persisted to a lessening degree in the second half), which identified European colonists as a forward thinking, modernising, educational force benevolently guiding colonised

⁶³ Tilley, “Ecologies of Complexity”; also see Helen Tilley, *Africa as a Living Laboratory* and Ford, *Role of Trypanosomiasis in African Ecology*.

⁶⁴ White, “Tsetse Visions”; Tilley, “Ecologies of Complexity,” 22.

⁶⁵ Randall Packard, “The History of the Social Determinants of Health in Africa,” in *History of the Social Determinants of Health: Global Histories, Contemporary Debates*, ed. Harold J. Cook, Sanjoy Bhattacharya and Anne Hardy (Hyderabad: Orient BlackSwan, 2009): 42-77, 47. Packard refers to these as the “social determinants of health.”

⁶⁶ Constantine, *The Making of British Colonial Development Policy*; Michael Havinden and David Meredith, *Colonialism and Development: Britain and its Tropical Colonies, 1850-1960* (London and New York: Routledge, 1993); D. J. Morgan, *The Official History of Colonial Development*, vol. 1, *The Origins of Aid Policy 1924.-1945*; Vol. 2, *Developing British Colonial Resources 1945-1951*; Vol. 3, *A Reassessment of British Aid Policy 1951-1965*; Vol. 4, *Changes in British Aid Policy 1951-1970*; Vol. 5, *Guidance Towards Self-Government in British Colonies 1941—1971* (London: Macmillan, 1980); Larry Butler, “The Ambiguities of British Colonial Development Policy, 1938-48,” in *Crisis of Empire: Decolonisation and Europe’s Imperial Status 1918-1975*, ed. Martin Thomas (London: Hodder Education, 2008): 119-140; Larry Butler, “Reconstruction, Development and the Entrepreneurial State: the British Colonial Model, 1939-51,” *Contemporary British History* 13, no. 4 (1999): 29-55. A littler earlier: J. M. Lee, “‘Forward Thinking’ and War: The Colonial Office during the 1940s,” *The Journal of Imperial and Commonwealth History* 6, no. 1 (1977): 64-79.

peoples away from their 'backward' ways of life towards a western-defined enlightenment.⁶⁷ Within this ideological framing, development was to be achieved first through improved agriculture practices (to complement British manufacturing), and later through a movement from agrarian to industrial based economies in colonies. Through the latter process in particular, the anticipated growth in colonial government revenues could then be used to improve living standards.⁶⁸ It was believed that knowledge from Europe's own rise in the nineteenth century, alongside the lessons learned from the health challenges that resulted, could be applied to accelerate development in the colonies.⁶⁹ This crude definition of development as a unifying concept, which was presented through official channels in Britain, belied nuances in the understandings and practice of development over time within the Colonial Office, in the colonies themselves, and elsewhere, as Hodge and others have begun to explore in greater detail.⁷⁰

Historians have thus described development as a "murky and often contentious term" and an "elusive and multivalent" concept.⁷¹ Michael Havinden and David Meredith expressed similar views, stating that while, "many treatise have been written on this subject, social scientists are by no means fully agreed on every aspect."⁷² There is still much work to be done on understanding the concept of development in colonial and post-colonial contexts, but it is beyond the scope of this thesis to fully engage with this growing strand of research. This thesis frames development as both a process and an end point but is largely

⁶⁷ "European colonialism, as Frederick Cooper observes, was constructed around ideologies of difference that justified foreign rule. Non-European native peoples were perceived as 'backward', static, and trapped in their traditional or customary ways," Joseph M. Hodge, Gerald Hödl and Martina Kopf, ed., *Developing Africa: Concepts and Practices in Twentieth-Century Colonialism* (Manchester: Manchester University Press & New York: Palgrave Macmillan, 2014), 5; also see Frederick Cooper, *Africa since 1940: the Past of the Present* (New York and Cambridge: Cambridge University Press, 2002).

⁶⁸ See Packard, *A History of Global Health*, chap. 6, quoting Arturo Escobar, *Encountering Development: The Making and Unmaking of the Third World* (Princeton, NJ: Princeton University Press, 2011), 3–4.

⁶⁹ See discussion of M. P. Cowen and R. W. Shenton, *Doctrines of Development* (London and New York: Routledge, 1996) in Hodge, Hödl and Kopf, *Developing Africa*, 4.

⁷⁰ Hodge, Hödl and Kopf, *Developing Africa*, 23; Frederick Cooper, "Modernizing Bureaucrats, Backward Africans, and the Development Concept," in *International Development and the Social Sciences: Essays on the History and Politics of Knowledge*, ed. Frederick Cooper and Randall Packard (Berkeley, etc.: University of California Press, 1997): 64-92, 81. Cooper brought the failures of development back to this "idea of a single idea of 'development' bringing together the raising of African standards of living and the reconstruction of the British economy, of 'responsible' trade unions and respectable politicians, of 'scientific' ideas applied by knowledgeable experts."

⁷¹ Hodge, Hödl and Kopf, *Developing Africa*, 3; Cooper, *Africa since 1940*, 76;

⁷² Havinden and Meredith, *Colonialism and Development*, 5.

focused on the former.⁷³ It addresses the changing emphases on economic and social aspects within development ideologies during the twentieth century to show how this affected the ways people thought about and engaged with water.

Historians have addressed who colonial development was for, what colonial development looked like in practice, the people who designed and implemented colonial development, and assessments of change over time.⁷⁴ Larry Butler has described the distinction between the two motivations of colonial development—for Britain or for the colonies—as, “blurred”.⁷⁵ In its beginnings, the official reasoning for colonial development through the 1929 Act was to aid Britain’s economy.⁷⁶ Yet unrest in the colonies (West Indies a case in point) plus increasing international distaste for European imperial rule, and how empires were run, challenged these early perceptions and encouraged a turn towards more deliberate consideration of the welfare of colonial citizens.⁷⁷

Havinden and Meredith analysed and tabulated data from Britain’s colonial development papers to assess the type of funds used and their distribution by territory and by class of scheme. They also considered the role of the different people involved in designing and implementing colonial development. Their research showed that after significant investment in transport and communication in the first three decades of the twentieth century, smaller-scale projects were preferred in the 1930s, including water supplies, public health, and sanitation.⁷⁸ Frederick Cooper showed that the “closet paternalists” were more effective in the 1940s as funds were primarily focused on services for urban workers including the provision of water and health care.⁷⁹ Again, in the fifteen years after the Second World War, colonies were keen to emphasise social development, as Meredith and Havinden showed, giving preferential treatment to improvements in education, health, water supplies and sanitation, and housing.⁸⁰ This did not always sit well with the Colonial Office and, as shown in the construction of Uganda’s post-war development plan, original requests from government departments within the

⁷³ For more on this see Hodge, Hödl and Kopf, *Developing Africa*, 3.

⁷⁴ Havinden and Meredith, *Colonialism and Development*; Constantine, *The Making of British Colonial Development Policy*.

⁷⁵ Butler, “Ambiguities,” 119.

⁷⁶ Constantine, *The Making of British Colonial Development Policy*, 188.

⁷⁷ Constantine, *The Making of British Colonial Development Policy*; Butler, “Ambiguities,” 121. Also see Article 22 of the League of Nations Covenant.

⁷⁸ Havinden and Meredith, *Colonialism and Development*, 163.

⁷⁹ Cooper, “Modernizing Bureaucrats,” 67.

⁸⁰ Havinden and Meredith, *Colonialism and Development*, 253.

colonies were reworked to create a plan that showed greater favour to economic development.⁸¹ These texts, and those that followed, have yet to seriously examine engagements with the development and management of water supplies within the context of British colonial development. There is, however, a greater engagement with the role of experts and specialists operating in this field.⁸² Such works have emphasised the importance in considering both well-known and lesser known figures whose involvement shaped understandings of health, disease, and other aspects of colonial development.⁸³ Studies of medical expertise, however, have rarely considered the role of non-medical specialists in shaping understandings of health in the twentieth century.⁸⁴

Historians writing on development have not considered water in much depth and in general do not engage with issues of cost as related to development; nor have they paid much attention to the way that decisions about spending on development programmes could be informed by costs. The British State did not have unlimited funds. In the 1930s, 1940s, and 1950s there were constraints on the spending from funds associated with the Colonial Development and Colonial Development and Welfare Acts. As a result, agriculture was always prioritised. Public health schemes were expensive, did not offer quick financial returns and, as a result, they were often neglected. Historians have acknowledged and calculated the limitations of funds distributed via the Colonial Development Acts, which

⁸¹ Havinden and Meredith, *Colonialism and Development*, 253. Also see chapter 2.

⁸² William Beinhart, "Experts and Expertise in Colonial Africa Reconsidered: Science and the Interpenetration of Knowledge," *African Affairs* 108, no. 432 (2009): 413-433; Sabine Clarke, "Experts, Empire and Development: Fundamental Research for the British Colonies, 1940-1960," (D.Phil dissertation, Centre for the History of Science, Technology and Medicine, Imperial College, 2005); Sabine Clarke, "The Research Council System and the Politics of Medical and Agricultural Research for the British Colonial Empire, 1940-52," *Medical History* 57, no. 3 (2013): 338-358; Joseph Hodge, *Triumph of the Expert: Agrarian Doctrines of Development and the Legacies of British Colonialism* (Athens, OH: Ohio University Press, 2007); Michael Worboys, "Science and British Colonial Imperialism 1895-1940," (D.Phil dissertation, University of Sussex, 1979); Brett M. Bennett and Joseph M. Hodge, ed., *Science and Empire: Knowledge and Networks of Science across the British Empire, 1800-1970* (New York: Palgrave Macmillan, 2011); David Sunderland, *Managing British Colonial and Post-Colonial Development: The Crown Agents 1914-1974* (Woodbridge: The Boydell Press, 2007); Hodge, Hödl and Kopf, *Developing Africa*.

⁸³ Greenwood, *Beyond the State*.

⁸⁴ Example of exception: Shane Doyle's exploration of the collaboration between medical and non-medical people. Shane Doyle, "Social Disease and Social Science: the Intellectual Influence of Non-medical Research on Policy and Practice in the Colonial Medical Service in Tanganyika and Uganda," in *Beyond the State: The Colonial Medical Service in British Africa*, ed. Anna Greenwood (Manchester: Manchester University Press, 2016): 126-152.

constituted between 0.003 and 0.064 percent of GNP between 1918 and 1930.⁸⁵ On the other hand, a detailed understanding of the costs that shaped these limitations, including the unanticipated impact of a variety of obstacles to development, has often been overshadowed by the damning critiques of miserly European attempts to ‘develop’ their colonies.⁸⁶ There is some recognition of the challenges faced, with Butler, Hodge, Hödl and Kopf describing the reactionary nature of colonial development policies. European colonial powers were forced to respond to “pressures from above and below in various ways designed to regain the initiative” and “to react to externally dictated obligations and restrictions, including the force of international opinion and the requirements of other government departments.”⁸⁷ In exploring the costs that affected investment in the provision of water supplies and sanitation, this thesis adds to our understanding of the challenges that colonial officials, experts, and specialists faced in trying to press forward their advocacy of this aspect of development.

Equally, water does not form a large part of the scholarship on international health organisations, such as the League of Nations Health Organisation (LNHO) and the World Health Organisation (WHO). Seeking to draw together colonial and international health histories, Randall Packard contended that their integration is important for understanding why particular approaches were favoured during the nineteenth, twentieth, and into the twenty-first century.⁸⁸ In this way, Packard follows in the footsteps of a select few, such as Helen Tilley and Deborah Neill, who have shown that “colonial medicine and international health shared a long and complex history.”⁸⁹ In linking colonial health interventions in Uganda and Sudan with those occurring within the wider international arena through the

⁸⁵ Constantine, *The Making of British Colonial Development Policy*. For polemical account see R. Palme Dutt, *The Crisis of Britain and the British Empire* (London, Lawrence & Wishart, 1953).

⁸⁶ Dutt, *The Crisis of Britain*. Exceptions addressing the costs of development include Havinden and Meredith, *Colonialism and Development*, 20; Also see Margaret Jones who shows how public health was badly underfunded in Margaret Jones, *Public Health in Jamaica 1850-1940: Neglect, Philanthropy and Development* (Jamaica: University of the West Indies Press, 2013); Butler, “Ambiguities”, 133.

⁸⁷ Hodge, Hödl and Kopf, *Developing Africa*, 14; Butler, “Ambiguities,” 133.

⁸⁸ Packard, *A History of Global Health*, Part I. Packard was looking to understand “why disease-focused interventions were privileged over the development of basic health services and efforts to address the social determinants of health” by drawing colonial and international health histories together.

⁸⁹ Packard, *A History of Global Health*, Part I; Tilley, *Africa as a Living Laboratory*; See E. Barton Worthington, *The Ecological Century: A Personal Appraisal* (Oxford: Clarendon Press, 1983); Deborah J. Neill, *Networks in Tropical Medicine*.

League of Nations Health Organisation (1921-1946) and the World Health Organisation (1947-1975) this thesis contributes to this growing body of literature that seeks to reveal the intricate web of interconnections across imperial, colonial and international boundaries.

While Packard successfully demonstrates some of the “colonial entanglements” shaping the development of international health, mentions of water are mostly confined to the pre-1920s and post-1970s. Water enters Packard’s discussions in relation to William Gorgas’ early methods for yellow fever control and as part of the LNHO’s promotion of rural hygiene and rural reconstruction in the 1920s and 1930s.⁹⁰ Then, bar a few brief mentions, water all but disappears before resurfacing as part of the International Labour Organisation’s (ILO) basic needs framework.⁹¹ Packard is not, however, arguing that water was not important for improving health conditions; quite the opposite. In *A History of Global Health* these examples and later ones are used to show that advocates of a basic health services approach—which included the provision of safe and adequate water supplies—struggled to find favour both within international organisations and with the people these services aimed to help. Further, Packard commented that the problem of the Selective Primary Health Care Programme was that while, “oral rehydration of children with diarrheal diseases would save lives [...] it would not address the causes of the diseases: lack of clean water and sanitation.”⁹²

As the water problem crossed national and colonial boundaries, it was hoped that cooperation with other nations and colonies would accelerate efforts to find solutions and provide impetus and support for their implementation.⁹³ The 1930s signified a movement away from epidemic disease control towards the advancement of social medicine, but this highlighted a widened, not global, scope

⁹⁰ Packard, *A History of Global Health*, chap. 1.

⁹¹ There were a few exceptions: For example, the Bore Committee’s favouring of the BCG campaign, and how smallpox teams “await[ed] nomads at wells and water holes” to improve eradication hopes. Packard, *A History of Global Health*, chap. 5, chap. 6, chap. 8.

⁹² Packard, *A History of Global Health*, chap. 13.

⁹³ Bynum, *Science and the Practice of Medicine*, 152: “the imperial dimension often jostled with the idealism of internationalism”; Also see Bynum for the importance of international organisations, 15-16. Beginning in 1892 and up to 1951, there were 21 international treaties relating to the control of infectious diseases, as listed in Fidler, “The Globalization of Public Health,” 844, 845; Maureen Malowany, “Unfinished Agendas: Writing the History of Medicine of Sub-Saharan Africa,” *African Affairs* 99, no. 395, Centenary Issue: A Hundred Years of Africa (Apr. 2000): 325-349, 336.

of research into areas of socio-economic concern.⁹⁴ The LNHO was an important and unique organisation during the interwar years. In the early twentieth century, the LNHO was one of a growing plethora of health institutions operating in the colonial and international context. It stood alongside, and cooperated to varying degrees with, the Office d'International Hygiène Publique (OIHP, est. 1907), League of Red Cross Societies (est. 1919), Rockefeller Foundation (RF, est. 1913), London School of Hygiene and Tropical Medicine (LSHTM, est. 1899, 1924), and the Liverpool School of Tropical Medicine (LSTM, est. 1898). In the colonial context it worked alongside the Colonial Advisory Medical Committee, the Bureau of Hygiene and Tropical Diseases and other health-related bodies such as the Wellcome Research Laboratory in Khartoum (est. 1902). The LNHO's diversity of engagements with health set it apart from other organisations. Its role in coordinating health activities was important during the interwar years but the LNHO was, however, bound by budgetary constraints. The Rockefeller Foundation, interested in the control of social diseases, gave the LNHO "a degree of financial autonomy" but funds remained limited.⁹⁵ Historians are now examining the plethora of agencies devoted to colonial and international health work in the twentieth century. Definitive histories of LSHTM, LSTM, RF and LNHO structures and priorities have provided scholars with a useful basis for further research.⁹⁶ The multiplicity of opinions, ideas, and methods adopted in the quest to eliminate disease and promote health within and between local, colonial and national contexts are evident through these volumes. Marcos Cueto aptly displays this

⁹⁴ Borowy argued that between 1919 and 1946 "international health work exploded from an unsystematic collection of data on a few diseases in a few countries to a fully-fledged comprehensive global health service," Iris Borowy, *Coming to Terms with World Health: The League of Nations Health Organisation 1921-1946* (Frankfurt am Main: Peter Lang, 2009), 13; Move from epidemic disease control to social medicine: see Paul Weindling "Social medicine at the League of Nations Health Organisation and the International Labour Office Compared," in *International health organisations and movements, 1918-1939*, ed. Paul Weindling (Cambridge: Cambridge University Press, 1995): 134-153; Iris Borowy, "The League of Nations Health Organization: from European to Global health concerns?" in *International and Local Approaches to Health and Health Care*, ed. Astri Andresen, William Hubbard and Teemu Ryymin (Bergen: Novus Forlag, 2010): 11-30.

⁹⁵ Weindling, "Social medicine at the LNHO and ILO compared," 134-153, 141; For a detailed account of the work of the Rockefeller International Health Division see John Farley, *To Cast Out Disease: A History of the International Health Division of the Rockefeller Foundation (1913-1951)* (Oxford: Oxford University Press, 2004).

⁹⁶ Wilkinson and Hardy, *Prevention and Cure; Power, Tropical Medicine in the Twentieth Century*; Farley, *To Cast Out Disease*; Borowy, *Coming to Terms with World Health*; Martin David Dubin, "The League of Nations Health Organisation," in *International Health Organisations and Movements, 1918-1939*, ed. Paul J Weindling (Cambridge: Cambridge University Press, 1995): 56-80.

when unravelling the “continuous reformulation” of eradication as a concept promoted through the Rockefeller Foundation in Latin America 1918-1940.⁹⁷

While Michael Callahan and Susan Pedersen have both addressed the role of the Mandate System established through the League of Nations, historians have not extensively studied the role of the League’s Health Organisation in colonial settings; this is despite the fact that colonial powers had a vested interest in the health and development of their territories, even if primarily for the benefit this would bring to the metropole in terms of trade and security. Michael Callahan’s volumes on Britain and France’s involvement in the League’s Permanent Mandates Commission, contain the most thorough analysis on Africa’s position relative to the League.⁹⁸ Historians have referred to LNHO supported conferences and commissions, but the connection between colonial medicine and the League’s international health has not been addressed in detail.⁹⁹ The role of colonial doctors and administrators in shaping medical policy in this context, except for the mandate system, has been given limited attention.

Iris Borowy and Socrates Litsios have both addressed the LNHO’s role in promoting rural hygiene but differ in their emphasis.¹⁰⁰ Borowy argues that rural hygiene was not promoted across all regions, stating that it, “received relatively little attention despite its obvious relevance for the overwhelmingly rural population in Africa.”¹⁰¹ Socrates Litsios has since gently challenged this notion in referring to the Pan-African Conferences held in South Africa in 1932 and 1935 as rural

⁹⁷ Marcos Cueto, “The Cycles of Eradication: the Rockefeller Foundation and Latin American Public Health” in *International Health Organisations and Movements, 1918-1939*, ed. Paul Weindling (Cambridge: Cambridge University Press, 1995): 222-243, 238.

⁹⁸ See Joanna Lunt, “The League of Nations Health Organization: Water, Health and Development in Colonial Africa, 1925-44,” 167-184; Callahan, *Mandates and Empire*; Callahan, *A Sacred Trust*; Susan Pederson also addresses the relationship with the League of Nations and empire, including discussions of the mandate system with reference to Africa: Susan Pedersen, *The Guardians*.

⁹⁹ Tilley, *Africa as a Living Laboratory*, 176-181; Bell, *Frontiers of Medicine*, esp. 162-197. Bell refers to the LNHO in a footnote: the comparative lack of Sudanese involvement in LNHO-sponsored conferences could explain this, but the impact such discussions may have had on Sudan still requires consideration.

¹⁰⁰ Borowy, *Coming to Terms with World Health*; Borowy, “The League of Nations Health Organization: from European to Global Health Concerns?” 12, 23, 24, 32, 325-360. For rural as key component see also Iris Borowy, “International Social Medicine between the Wars: Positioning a Volatile Concept,” *Hygeia Internationalis* 6, no. 2 (2007): 13-53, 17-21; Socrates Litsios, “Revisiting Bandoeng,” *Social Medicine* 8, no. 3 (Nov 2014): 113-128; Socrates Litsios, “Rural Hygiene in the Early Years of the World Health Organization: Another Casualty of the Cold War?” *Anais Instituto de Higiene e Medicina Tropical* 16 (2016): 125-132.

¹⁰¹ Borowy, “The League of Nations Health Organization: from European to Global Health Concerns,” 18.

hygiene conferences.¹⁰² While this thesis falls more in line with Litsios and argues that the Pan-African Conferences in 1932 and 1935 included important discussions about rural hygiene alongside other health concerns, it does not label them as rural hygiene conferences per se. Packard has aptly described the interconnections between international, imperial and colonial health in this context:

the conference [Pan-African, 1932] thus highlighted the shared concerns of newly established international health organisations and colonial health officials. It revealed the extent to which the interests of the two groups had become entangled.¹⁰³

Drawing upon the above literature, this thesis draws out engagements with water in international, imperial, and colonial health histories.

The significant emphasis placed on social medicine through programmes of rural hygiene and nutrition, Borowy argued, “indicated a—much ignored—path towards improving global well-being.”¹⁰⁴ Keen to stress the LNHO as a “direct predecessor” of the World Health Organisation, Borowy draws direct comparisons between the WHO Working Group on the Social Determinants of Health (2008) and those of the LNHO in the 1920s and 1930s.¹⁰⁵ There was some resemblance between the LNHO and WHO’s programmes to tackle malaria and some parallels between the LNHO’s social medicine and rural hygiene, and the WHO’s environmental sanitation and primary health care programmes. However, Borowy’s work belies the complexities of these transitions and does not fully account for how ideas and attitudes evolved over time.¹⁰⁶

Following its inauguration in 1948, the involvement of the WHO in Uganda, and Africa in general, was limited before 1951/2.¹⁰⁷ The African Regional Office was the penultimate of the six to be set up. The Eastern Mediterranean Office had

¹⁰² Litsios, “Rural Hygiene in the Early Years of the World Health Organization,” 126.

¹⁰³ Packard, *A History of Global Health*, Part 1.

¹⁰⁴ Borowy, “The League of Nations Health Organization: from European to Global Health Concerns?,” 29; For debates about whether the LNHO can be described as truly global, see Lunt, “The League of Nations Health Organization,” 167-184; Paul Farmer describes WHO as “the first truly global health institution”, not the LNHO: Paul Farmer, “Colonial Roots of Global Health,” Sept 19, 2009, accessed Nov 21, 2012, <https://hcghr.wordpress.com/2009/09/19/colonial-roots-of-global-health/>.

¹⁰⁵ Borowy, “The League of Nations Health Organization: from European to Global Health Concerns?,” 11; Borowy, *Coming to Terms with World Health*, 448.

¹⁰⁶ Lunt, “The League of Nations Health Organization,” 167.

¹⁰⁷ Establishment Approved / First meetings of WHO Regional Offices: Eastern Mediterranean (October 1948/February 1949); Africa (May 1951/Autumn 1951).

a head start as it was established in c. October 1948 and held its first meeting in February 1949. The inception of the WHO highlighted the widespread need for improvements in health, providing a forum for constructive debates and a venue where standardised international (later global) health policy could be formulated. However, international health policies were debated in an arena complicated by the relationship between Britain and its territories, by the politics surrounding East African federation and the Nile waters, and by the economics of post-war aid and recovery. In parallel, the rise of international organisations, such as the Food and Agricultural Organisation (FAO) and the United Nations Children's Fund (UNICEF), either aided the process of constructing and implementing colonial health policies or made it more cumbersome. Financial and technical support from the World Bank and United Nations (UN) was welcomed, but the British in Uganda and Sudan wanted it on their own terms. Further, much of the assistance from international organisations was technical rather than financial, particularly in this earlier period. In the aftermath of the Second World War, scarce resources limited the ability of colonial governments, such as those in Uganda and Sudan, to action projects.

There is a general consensus that the WHO prioritised direct attacks on disease, most particularly malaria, in its first two decades of operation.¹⁰⁸ This approach was particularly justified by the bureaucrats and scientists in the United States who believed that the control of malaria would “contribute to agricultural productivity and that the rapid progress achieved would contribute to winning the ‘hearts and minds’ of rural populations threatened by communism.”¹⁰⁹ Given the large-scale impact of the disease, they believed it would be straightforward to

¹⁰⁸ Packard, *A History of Global Health*; Randall M. Packard, *The Making of a Tropical Disease: A Short History of Malaria* (Baltimore: The John Hopkins University Press, 2007); Siddiqi, *World Health and World Politics*; Lee, *The World Health Organisation*; Marcos Cueto, *Cold War, Deadly Fever: Malaria Eradication in Mexico, 1955-1975* (Washington: Woodrow Wilson Center Press, and Baltimore: John Hopkins University Press, 2007); James L. A. Webb, *Humanity's Burden: A Global History of Malaria* (Cambridge: Cambridge University Press, 2009); Elizabeth Fee, Theodore M. Brown, and Marcos Cueto, “WHO at 60: Snapshots From Its First Six Decades,” *American Journal of Public Health* 98, No. 4 (Apr 2008): 630-633; Litsios, “Rural Hygiene in the Early Years of the World Health Organization,” 129-130; Socrates Litsios, “Malaria Control, the Cold War, and the Postwar Reorganization of International Assistance,” *Medical Anthropology* 17 (1997): 255-278; Socrates Litsios, “Re-imagining the Control of Malaria in Tropical Africa during the Early Years of the World Health Organization,” *Malaria Journal* 14 (2015): 1-9.

¹⁰⁸ Litsios, “Rural Hygiene in the Early Years of the World Health Organization,” 130.

¹⁰⁹ Litsios, “Rural Hygiene in the Early Years of the World Health Organization,” 131.

convince people that this was a sound investment.¹¹⁰ As Litsios and Marcos Cueto asserted, Cold War politics had a significant impact on approaches taken to health in the aftermath of the Second World War.¹¹¹ Litsios argued that this was one of the reasons why rural hygiene programmes failed to take off under WHO guidance.¹¹² With some exceptions, such as the growing body of research on primary health care, research on the WHO is still overly concerned with internal politics and eradication schemes. More work is also being done on the operation of the regional offices of the WHO, which builds on the work of Javed Siddiqi, Kelley Lee, and Nitsan Chorev, such as Monica Saavedra's research on the South East Asia Regional Office and Jessica Pearson-Patel's research on the relationship between the African Regional Office and Francophone Africa.¹¹³

Apart from Socrates Litsios, the majority of scholarship on the WHO does not consider the WHO's environmental sanitation programme in any great detail, as its operation was overshadowed by efforts to eradicate malaria and control other troublesome diseases in its first two decades of operation.¹¹⁴ Even then, Litsios' discussion is limited to the first five years of the programme for environmental sanitation.¹¹⁵ As such, this thesis traces the operation of the environmental sanitation committee between 1947 and 1975 to locate and emphasise the importance of the work done by its advocates. The work of public health engineers and sanitarians attached to the Environmental Sanitation Division enabled the WHO to promote a global programme of community water supplies from 1959, which eventually found international support through the United Nations, the World Bank, and other international organisations in the late 1960s and during the 1970s. This added support, alongside the WHO's long-term cooperation with UNICEF, enabled advocates highlighting the importance of the

¹¹⁰ Litsios, "Rural Hygiene in the Early Years of the World Health Organization," 131.

¹¹¹ Cueto, *Cold War, Deadly Fever*; Litsios, "Rural Hygiene in the Early Years of the World Health Organization".

¹¹² Litsios, "Rural Hygiene in the Early Years of the World Health Organization," 125.

¹¹³ Monica Saavedra, "Politics and Health at the WHO Regional Office for South East Asia: The Case of Portuguese India, 1949–61," *Medical History* 61, no. 3 (2017): 380–400; Jessica Pearson-Patel, "Promoting Health, Protecting Empire: Inter-Colonial Medical Cooperation in Postwar Africa," *Mondes* 1, no. 7 (2015): 213-230; Jessica Pearson-Patel, "French Colonialism and the Battle against the WHO Regional Office for Africa," *Hygiea Internationalis* 13, no. 1 (December 2016): 65-80.

¹¹⁴ Packard references environmental sanitation in relation to Primary Health Care, with three other (brief) mentions all relating to the early years of the WHO: Packard, *A History of Global Health*, chap. 12; Litsios, "Rural hygiene in the Early Years of the World Health Organization".

¹¹⁵ Litsios, "Rural hygiene in the Early Years of the World Health Organization," 129-130.

relationship between water and health to put forward their claims and have their voices heard.

In the 1970s and 1980s, the association between water and health became more prominent in discussions. The failures of the Malaria Eradication Programme, the consideration of the environmental impacts of development and health interventions, the organisation of several conferences by the UN, and the development of the primary health care concept, all contributed to a move forward for protagonists advocating for the environmental control of diseases.¹¹⁶ For this, it was argued that water and sanitation as a pair needed to be tackled. This fitted in well with the development of primary health care, which sought to address “the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly”, including “an adequate supply of safe water and basic sanitation.”¹¹⁷ While the thesis concludes in the mid-1970s, some of the developments between 1975 and 1990 form the epilogue to this thesis.

As such, the main body of the thesis does not examine the role of water in Primary Health Care but recognises this as a key area deserving of further study. As with rural hygiene and environmental sanitation, histories of the role of safe water and basic sanitation within the Primary Health Care framework have not been addressed at any length. Indeed, histories of the WHO’s Primary Health Care Programme have only surfaced in more recent years, through the Centre for Global Health Histories at the University of York, and in the writings of Socrates Litsios and Marcos Cueto.¹¹⁸

So, what do we know and not know about water? Does the scholarship talk about public health? Those writing about water as a concept usually refer to public health but, except in reference to nineteenth-century developments of water

¹¹⁶ UN Conferences held on subjects such as the environment, food, water, habitats, and women.

¹¹⁷ WHO/UNICEF, Primary Health Care, *Report of the International Conference on Primary Health Care Alma-Ata, USSR, 6-12 September 1978*, (Geneva: World Health Organisation, 1978), VII, CF/HST/1985-034/Anx.04/07, accessed July 16, 2018, https://www.unicef.org/about/history/files/Alma_Atata_conference_1978_report.pdf.

¹¹⁸ For list of publications, see University of York, Centre for Global Health Histories, “Publications”, 2018, accessed Nov 22, 2018, <https://www.york.ac.uk/history/global-health-histories/publications-outreach/>. For example, Margaret Jones and Chandani Liyanage, “Traditional Medicine and Primary Health Care in Sri Lanka: Policy, Perceptions, and Practice,” *Asian Review of World Histories* 6, no. 1 (2018): 157-184.

supplies and sanitation in response to conditions generated by industrialisation, it does not form a significant part of their analysis.¹¹⁹

A common consideration of scholars is the role of science in influencing how people thought about and engaged with water. Some scholars have strongly asserted that water was “besieged by science and technology” in the nineteenth century, such that by the dawn of the twentieth century water was “regarded as a resource to be exploited and conserved” rather than as a “prime necessity”, a “natural incident” or a “providential blessing”.¹²⁰ Cultural anthropologist Veronica Strang reiterated the significant role of science in structuring engagements with water through an exploration of the vast array of human-environment relations.¹²¹ Strang commented that the, “increasing divergence between ‘rational’ science and faith in the nineteenth and twentieth centuries,” meant that, “beliefs in a beneficent guiding deity segued into secular visions of a hydrological process under the direction of Nature.”¹²² Christopher Hamlin, on the other hand, has favoured more modest interpretations of science in framing how people thought about water, such as those exemplified in the discovery of water as a compound (H₂O) and water’s role in disease transmission.¹²³ In this sense, Hamlin was reluctant to give undue

¹¹⁹ Hamlin, for example, wrote about the history of water from a chemistry and public health perspective in Christopher Hamlin, *A Science of Impurity: Water Analysis in Nineteenth Century Britain* (Bristol: Adam Hilger, 1990); James Linton supported this claim ten years later in James Linton, *What is Water? The History of a Modern Abstraction* (Vancouver: UBC Press, 2010). Linton uses Hamlin’s analysis in Christopher Hamlin, “‘Waters’ or ‘Water’?” as the starting point to explore how scholars have and have not addressed the shift between “waters” and “water”. See Christopher Hamlin, “‘Waters’ or ‘Water’? – Master Narratives in Water History and their Implications for Contemporary Water Policy,” *Water Policy* 2 (2000): 313-325; Also see Ivan Illich, *H₂O and the Waters of Forgetfulness* (London: Marion Boyars Publishers, 1986), iBooks edition. First published 2011; Hamlin notes the importance of the “pre-Snow age” and that it should not be disregarded in relation to historical enquiries into the history of the concept of water: Christopher Hamlin, “‘Waters’ or ‘Water’?”; Goubert, *The Conquest of Water* focused on similar developments in France, arguing that the process in which the industrial world “conquered” water occurred during the nineteenth century was largely completed by the eve of the Second World War. See Jean-Pierre Goubert, *The Conquest of Water: the Advent of Health in the Industrial Age*, trans. Andrew Wilson (Cambridge: Polity Press, 1989), 21, 25.

¹²⁰ Goubert, *The Conquest of Water*, 24; W. J. McGee, “Water as a Resource,” *The Annals of the American Academy of Political and Social Science* 33, no. 3, (May 1909): 37-50, 48, 38-39; Veronica Strang, *Water: Nature and Culture* (London: Reaktion Books Ltd, 2015), iBooks edition, 218: “prior to being tamed by engineering schemes rivers has been seen as uncontrolled fluid spaces, lacking social control”; E. B. Worthington, *Science in Africa: A Review of Scientific Research Relating to Tropical and Southern Africa* (London: Oxford University Press, 1938), 3, 75.

¹²¹ Strang, *Water: Nature and Culture*.

¹²² Strang, *Water: Nature and Culture*, 45-46.

¹²³ Hamlin, “‘Waters’ or ‘Water’?”, 313.

weight to this one factor—science—above the plethora of other changes occurring in the nineteenth century that had impacted the move towards more reductionist views of water.¹²⁴

Notably, several writers who have argued that science was of importance in shaping such conceptualisations of water considered this shift from both economic and health perspectives. Strang, for example, referred not only to the hygienic implications but also remarked how scientific advancements had meant that by the twentieth century “industrialised societies now had the capacity [...] to embark on ambitious programmes of social and material engineering in which water was the most vital ingredient.”¹²⁵ This capacity was epitomised in the construction of large-scale dams, such as the Aswan Dam in Egypt (1899-1902), the Sennar Dam in Sudan (1914-1925), and the Owen Falls Dam in Uganda (1947-1954). Such developments showcased the abilities of British engineers and engineering companies to draw on past and contemporary knowledge to oversee the building of such impressive structures in the twentieth century.¹²⁶ Historians interested in colonial and international relations have attended to these kinds of larger scale projects, but largely in the form of the political economy relating to particular bodies of water, such as the River Nile.¹²⁷

Since Hamlin’s article in 2000, which claimed that studies on the history of water as a concept were largely restricted to public health and chemistry, a much broader literature has developed, and a variety of journals focused on different

¹²⁴ Hamlin, “‘Waters’ or ‘Water’?,” 313.

¹²⁵ Strang, *Water: Nature and Culture*, chap. 5, 234; Goubert, *The Conquest of Water*.

¹²⁶ See Daniel Headrick, *Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1940* (New York and Oxford: Oxford University, 1988), Kindle edition, chap. 6. Headrick analyses irrigation and dam construction in Egypt and India in the nineteenth and early twentieth century, showing how British engineers “took existing irrigation systems as their starting point and, using engineering and scientific practices from the Western industrial world, they developed barrages, perennial canals [etc.]” in order to forward their imperial endeavours.

¹²⁷ Terje Tvedt, *The River Nile in the Age of the British: Political Ecology & the Quest for Economic Power* (London and New York: I. B. Tauris, 2004); Terje Tvedt, ed., *The River Nile in the Post-Colonial Age: Conflict and Cooperation among the Nile Basin Countries* (London and New York: I. B. Tauris, 2010); Terje Tvedt, *Water and Society: Changing Perceptions of Societal and Historical Development* (London: I. B. Tauris, 2016); Matthias Finger, Ludivine Tamiotti, Jeremy Allouche, ed., *The Multi-Governance of Water: Four Case Studies* (New York: State University of New York Press, 2006). This uses cases of Mekong, Danube, Euphrates, Aral Sea; Jeremy Allouche, “Water and State Formation,” in *The Politics of Water: a Survey*, ed. Jeroen Warner and Kai Wegerich (London and New York: Routledge, 2014).

aspects of water have materialised and grown in the last fifteen years.¹²⁸

Alongside these water-specific journals, Terje Tvedt instigated an edited series in 2001, which sought to examine water from a wide range of perspectives. As a result, nine volumes were published in the decade between 2006 and 2016. Each volume focused on a particular theme, such as, water control and river biographies (series 1, vol. 1), the political economy of water (series 1, vol. 2), ideas of water ancient to modern (series 2, vol. 1), geopolitics and the new world order (series 2, vol. 3), water and urbanisation (series 3, vol. 1), and water and food (series 3, vol. 3).¹²⁹ As showcased in these volumes, the relevance of water to a variety of historical disciplines, such as ecology, economics, environment, health, institutions, intellectual histories, science, and more, has resulted in diverse and disparate interpretations of water and people's engagement with it in the past.¹³⁰ In this sense water, because of its unique properties and manifold uses, has not

¹²⁸ The publication of water-specific journals have largely surfaced in the twenty-first century: such as the *Journal of Water and Health* (est. 2006); *Journal of Water, Sanitation and Hygiene for Development* (est. 2013); *Water Policy* (est. 1998): the Official Journal of the World Water Council, which was later transferred to the International Water Association in 2003; *Water Alternatives* (est. 2008); *Water History Journal* (est. 2009); *Water and Environment Journal* (est. 1987).

¹²⁹ Terje Tvedt and E. Jakobsson, ed., *A History of Water: Water Control and River Biographies*, series 1, vol. 1, (London and New York: I. B. Tauris, 2006); Richard Coopey and Terje Tvedt, ed., *A History of Water: The Political Economy of Water*, series 1, vol. 2, (London and New York: I. B. Tauris, 2006); Terje Tvedt and Terje Oestigaard, ed., *A History of Water: The World of Water*, series 1, vol. 3, (London and New York: I. B. Tauris, 2006); Terje Tvedt and T. Oestigaard, ed., *A History of Water: From Ancient Societies to the Modern World*, series 2, vol. 1, (London and New York: I. B. Tauris, 2010); Terje Tvedt and Richard Coopey, ed., *A History of Water: Rivers and Society: From Early Civilizations to Modern Times*, series 2, vol. 2, (London and New York: I. B. Tauris, 2010); Terje Tvedt, Graham Chapman, and Roar Hagen, ed., *A History of Water: Water and Geopolitics in the New World Order*, series 3, vol. 3, (London and New York: I. B. Tauris, 2011); Terje Tvedt and Terje Oestigaard, ed., *A History of Water: Water and Urbanization*, series 3, vol. 1, (London and New York: I. B. Tauris, 2015); Terje Tvedt, Owen McIntyre, and Tadesse Kassa Woldetsadik, ed., *A History of Water: Sovereignty & Development of International Water Law*, series 3, vol. 2, (London and New York: I. B. Tauris, 2015); Terje Tvedt and Terje Oestigaard, ed., *A History of Water: Water and Food: From hunter-gatherers to global production in Africa*, series 3, vol. 3, (London and New York: I. B. Tauris, 2016).

¹³⁰ In Tvedt, *Water and Society*, Tvedt noted that these nine volumes had drawn upon the work of over 220 scholars from almost 100 countries and a variety of disciplines. However, scholarship on water and ecology, and on water and environment, remain limited as noted in Beinart and Carruthers reviews of the fields: William Beinart, "African History and Environmental History," *African Affairs* 99, no. 395, Centenary Issue: A Hundred Years of Africa (Apr 2000): 269-302; Jane Carruthers, "Africa: Histories, Ecologies, and Societies," *Environment and History* 10, no. 4 (2004): 379-406; William Beinart and Joann McGregor, ed., *Social History and African Environments* (Oxford: James Currey Ltd, 2003). Exceptions include: D. S. Moore, "Clear Waters and Muddied Histories in Zimbabwe," *Journal of Southern African Studies* 24, no. 2 (1998): 377-403; N. Jacobs, "The Flowing Eye: Water Management in the Upper Kuruman Valley, South Africa, c.1800–1962," *Journal of African History* 37 (1996): 237–60.

fitted and does not fit neatly into a specific area of historical scholarship, which complicates attempts to review the growing body of secondary literature on the subject. As water crosses various disciplines, this has often resulted in a disconnect between those looking at water and those scholars concerned with health, development, colonialism, and international organisations.

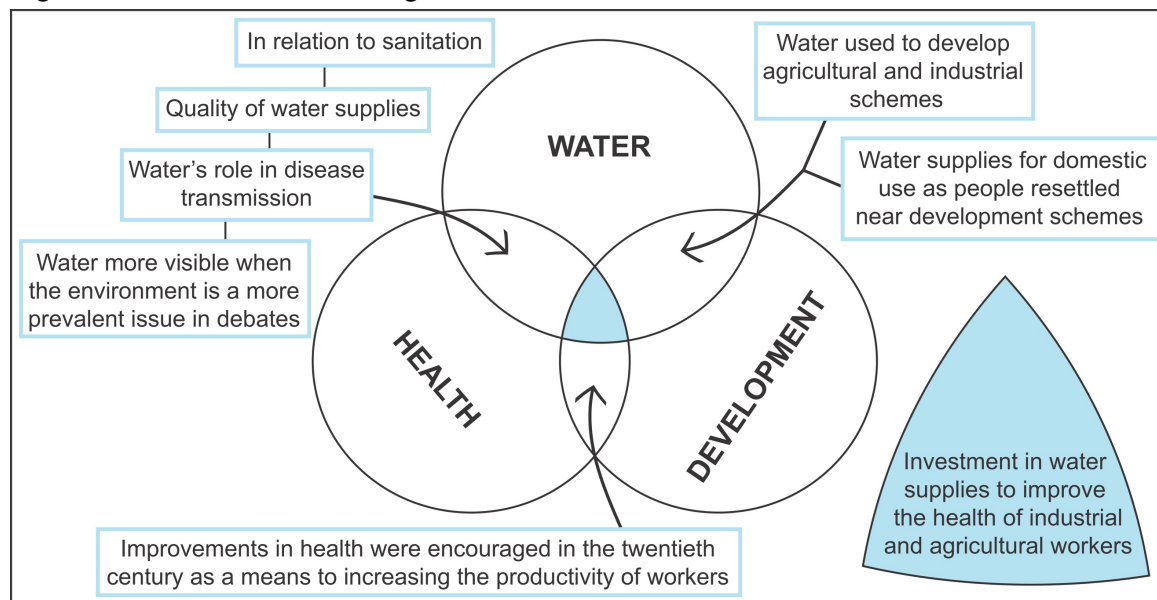
2. Sources and Methodology

This thesis draws upon a variety of archival and published sources and employs mixed methods to further our understanding of how people engaged with water and health in the twentieth century. It takes a chronological approach to assess change and continuity as it looks to provide greater insights into why it took so long to coordinate efforts to prioritise water supplies and sanitation on the African continent. In covering a five-decade period, this thesis is able to show some of the changes and continuities in the visibility of water within this setting as doctors, sanitary engineers, geologists, and the like, articulated their thoughts about water between 1925 and 1975. In doing so, it seeks to show first, the plethora of engagements with water as it was understood as both a problem of, and a solution to, health; and second, to highlight the constraints shaping final policy decisions and how specialists and administrators sought to find solutions to these obstacles, often using the art of compromise.

Due to bureaucratic fragmentation it is difficult to develop a clear picture of how people thought about and engaged with water. The use of mixed methods shows the plethora of engagements with water and health in twentieth-century Africa. Primarily it reconstructs the politics of bureaucratic action to improve water supplies using a diverse range of published and archival sources. To do so, this thesis addresses whether water was considered of prime importance in archival collections and the subsequent implications for historical research on the subject. It then explores the priorities of the published and archival sources that specifically focus on water through an examination of where water is categorised in official reports and how water is mentioned (i.e. clean water, or just water per se). Within this analysis a distinction is made between those who were interested in advocating the various benefits of water and those who had direct responsibility for implementing water supplies and sanitation programmes. Some of the challenges that those promoting and implementing water supplies faced are also addressed. This thesis also traces the transmission of ideas about the link between the quality

of water supplies and health and their entwinement in discourses not related to health (Figure B). To do this, it analyses colonial, post-colonial and international health discourse alongside relevant material from other fields that discuss these

Figure B: Discourse Convergence



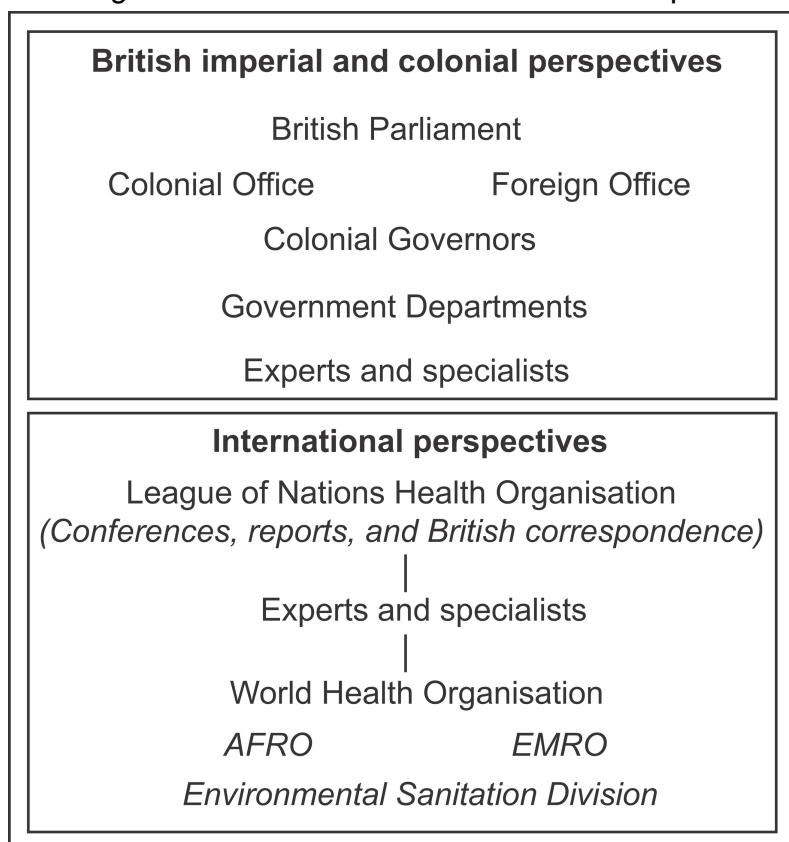
Source: Created by author (2019).

connections. This thesis primarily examines the role of British imperial, British colonial, and international officials and specialists (internal and external), the groups they formed (knowledge communities), and the forums that they gathered in (Figure C). As field work in Uganda and Sudan was not possible, this thesis can only provide glimpses into local involvement during colonial rule and into how people in Uganda and Sudan looked to reinvent their relationships with Britain and international organisations post-independence. Therefore, this thesis cannot provide a full understanding of local perspectives on colonial, post-colonial, and international engagements with the water-health problem, except where it comes to light within the written correspondence held at the British National Archives, the WHO, the Rockefeller Archive Center, University collections held in Cambridge and Oxford, and online resources.

However, if water was regarded as a higher priority for local officials and archivists, it is also possible that information on the water-health problem might be

more accessible and prove to be fruitful in providing alternative perspectives to those held in Britain and within international health organisations.¹³¹

Figure C: Bureaucratic Levels Focused Upon



Source: Created by author (2019).

The purpose here is not to undertake a comparative history between Uganda and Sudan or between the WHO’s EMRO and AFRO, or indeed to provide extensive case studies on the water-health problem in Uganda and Sudan, but rather to show the nuances in conceptualisations of water and the variety of experiences in developing water supplies. As such this thesis uses source material relating to Uganda and Sudan to illustrate the broader arguments of the marginalisation of water in health discourse about the African continent.

¹³¹ Water had a prominent place in folklore, for example in Immaculate Kizza’s study of the oral tradition of the Baganda of Uganda it is interesting to note the number of stories or tales that focus on the fetching of water. See Immaculate N. Kizza, *The Oral Tradition of the Baganda of Uganda: A Study and Anthology of Legends, Myths, Epigrams and Folktales* (North Carolina: McFarland & Co, 2010). In Okot p’Biket *Hare and Hornbill* (a collection of translated Ugandan folktales) water is also a recurring theme. Okot p’Biket, *Hare and Hornbill*, (London: Heinemann, 1978). There is also a tale entitled “Chameleon and Elephant” where drought is central to the story, with the idea of drought repeated several times through different expressive form. These tales highlight a different kind of interaction with water—one where drought was common and where the fetching of water was a central activity.

However, Uganda and Sudan have been purposefully chosen based on their position as bordering territories, their shared use of the River Nile, their subjection to British imperial rule, and their membership as part of the League of Nations Health Organisation and the World Health Organisation (albeit represented by Britain until their independence). These shared connections also represented points of divergence. Their proximity to and joint use of the River Nile meant that Uganda and Sudan had commonalities in the diseases that affected people, such as sleeping sickness, malaria, dysentery, guinea worm disease, river blindness, and schistosomiasis. However, the epidemicity and endemicity of diseases, alongside territorial differences in incidence and prevalence, affected how specialists and administrators engaged with them in each territory, including any connection to water that they might have.

Uganda and Sudan were also subject to different forms of British imperial rule. Uganda was a British Protectorate (1894-1962) ruled indirectly and reliant on cooperation with local elites. Sudan on the other hand was an Anglo-Egyptian condominium (1899-1952/56), legally under the joint rule of Britain and Egypt. However, Britain made all political decisions and the administration of Sudan was mostly carried out by British officials aided by local elites. From the metropole, the Colonial Office handled Uganda's affairs and the Foreign Office administered the Sudan. These different forms of rule shaped Uganda and Sudan's relationship with Britain and its colonial development agendas. The colonial government in Uganda was able to draw from colonial development funds directed under the Colonial Development Act 1929 and the subsequent Colonial Development and Welfare Acts (1940, 1945, and 1955). As a condominium, Sudan was excluded from funds under the above acts. Instead, Sudan was able to apply for financial support from alternative sources in Britain, as shown through the development of the Gezira irrigation scheme.

Uganda and Sudan were both involved with the work of international organisations such as the LNHO and WHO. Britain acted as a representative for Uganda and Sudan during the LNHO's operation between 1924-1939/45. The early years of the LNHO focused on sleeping sickness on the African continent until broader health discussions were undertaken in the 1930s. The connections that people made between water and sleeping sickness in this earlier period (1925-1945) alongside the push for more focused attention on rural sanitation from the 1930s provide some interesting insights into the different ways in which people

conceptualised disease and thought about health in its broader sense. The regional structure of the World Health Organisation saw Sudan placed in the Eastern Mediterranean Regional Office (EMRO) and Uganda in the African Regional Office (AFRO) from the outset and once again represented by Britain until they became full member states in 1956 and 1963 respectively. From the WHO's inception up until 1975 more than twice as many project files were created in relation to Sudan (30) than Uganda (13). During this time, Uganda and Sudan both partnered with the WHO to tackle venereal diseases, malaria, and malnutrition, and both territories sought WHO support in improving hospital administration and statistics, health services training, and nursing education.¹³² Uganda differed from Sudan in its WHO projects aimed at controlling leprosy, improving health education, and supporting the departments of psychiatry and obstetrics.¹³³ Sudan, on the other hand, sought WHO support to tackle cerebro-spinal meningitis, bilharzia and trachoma. In addition, the WHO worked with Sudan on community water supplies, rural water supplies, the training of water works operators, environmental health, a rural health demonstration unit, pharmaceutical quality control and electro-encephalography.¹³⁴

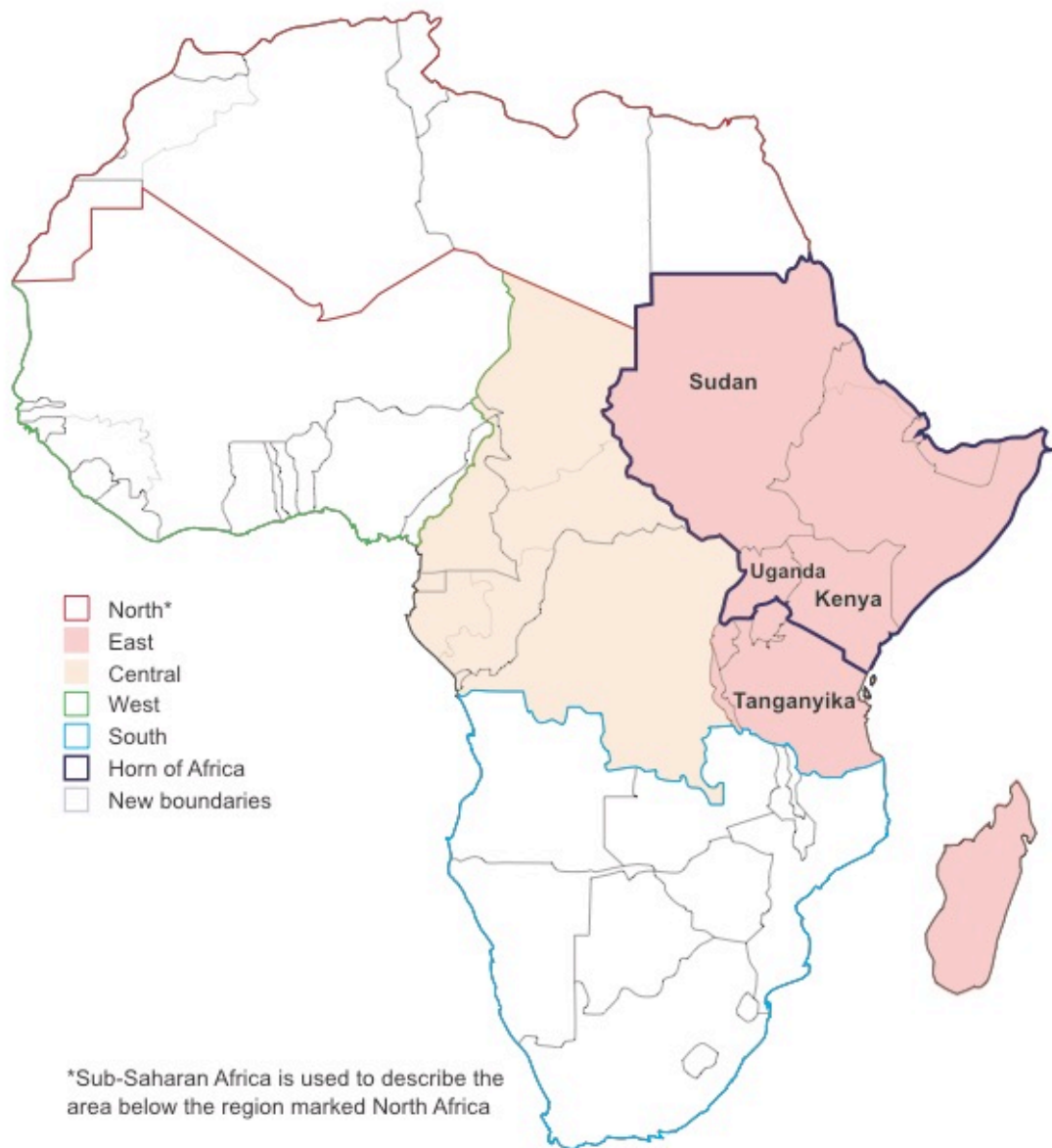
The size, diversity, and variety of imperial influences on the African continent in the twentieth century form an interesting backdrop for this study. Figure D shows some of the regional groupings within the continent. The use of "Sub-Saharan", "North", "East", "West", "Central", and "Horn of" as prefixes to Africa can be extended to include "British", "French", and more. This thesis explores the regional dynamics that affected how people thought about water and how they looked to address the challenges it presented in relation to health. As the brief overview of Uganda and Sudan's engagements with the WHO suggest, there were both shared and differing health priorities. This thesis explores some of the reasons why the WHO undertook certain kinds of projects in some territories and not in others. Recognising the increasing variety of regional groupings associated with imperial, colonial, and international organisations as the twentieth century progressed, this thesis uses experiences in Uganda and Sudan to illustrate some

¹³² Projects files for Uganda date back to 1956 and for Sudan date back to 1952.

¹³³ Excluding destroyed files for Uganda relating onchocerciasis and nutrition; and for Sudan relating to school health, public health administration consultant of Sudan.

¹³⁴ Electro-encephalography potentially linked to work on cerebro-spinal meningitis.

Figure D: Some Regional Groupings on the African Continent



Source: Created by author (2018) using The National Archives, “Maps in Time,” n.d., accessed Oct 26, 2018, <http://www.nationalarchives.gov.uk/cabinetpapers/themes/maps-interactive/maps-in-time.htm>.

of the advantages and disadvantages of their respective regional positionings. It examines how Uganda and Sudan’s positioning with AFRO and EMRO respectively— and their place in other regional groupings such as East Africa, North Africa, and Africa—affected the engagement of each territory with the water-health problem. It also recognises the different experiences across regions within Uganda and Sudan.

This thesis does not, and cannot, provide a complete or fully coherent history of the relationship between water and health. However, it can examine the

role of a variety of bureaucrats and scientists as they looked to understand, and apply what they knew to resolve, the health problems that water presented to people in Uganda and Sudan. In utilising a variety of voices across different specialisms it is able to provide a fuller understanding of the relationship between water and health in the twentieth century and contributes to the expanding literature on the history of the growth in scientific expertise in imperial and colonial histories.¹³⁵

This thesis makes further contributions to the historical literature in its approach as it does not follow the typical medical history focus on specific diseases but instead uses water as a lens to enhance our understanding of twentieth-century health histories. Moreover, it shows the problem that has occurred when historians follow the same divisions and boundaries between responsibilities that were set up by colonial governments and international organisations. As water is found in many different places and is not easily accommodated within territorial categories such as the Department of Health or the Department of Public Works or even in the divisions established within international organisations such as Environmental Sanitation (WHO) a flexible approach is required. By finding moments in history when water supplies advocates were able to make their mark in imperial, colonial, and international forums, we are able to trace their involvement back to both successful and unsuccessful attempts to promote the development of water supplies as a measure to improve public health. As such, this thesis contributes to a broader understanding of British imperial and colonial policy formulation in the twentieth century and its international counterpart. More specifically it explores the increasing specialisation within colonial governments and international organisations, the development of departmental cultures, and the dominance of the medical view that privileged diseases over environment. In doing so this research furthers our understanding of British imperial, British colonial, and international engagements with water and health in the twentieth century.

¹³⁵ William Beinart, "Experts and Expertise in Colonial Africa Reconsidered: Science and the Interpenetration of Knowledge," *African Affairs* 108, no. 432 (2009): 413-433; Clarke, "Experts, Empire and Development"; Sabine Clarke, "The Research Council System"; Joseph Hodge, *Triumph of the Expert*; Michael Worboys, "Science and British Colonial Imperialism 1895-1940"; Brett M. Bennett and Joseph M. Hodge, ed., *Science and Empire*.

This thesis argues that the ways in which people defined the water-health problem set the boundaries for investigation and affected the kinds of solutions explored. It recognises the web of connections across British imperial, British colonial, and international boundaries and explores the challenges in writing international health histories of water where there is cross-over with imperial and colonial regimes. The following paragraphs provide a more detailed analysis of the source material used in this thesis. Firstly, the colonial development and welfare literature (mostly sourced at the British National Archives) alongside other British literature, such as parliamentary discussions and reports, are considered. Secondly, the departmental reports and special reports produced in Uganda and Sudan are addressed. Thirdly, the international health literature, particularly the source material concerning the LNHO and WHO is examined. Fourthly, how these WHO sources revealed connections to other agencies under and outside the UN umbrella, as well as directly to the United Nations (UN) Headquarters, is considered. Fifthly, some of the people involved at different bureaucratic levels are briefly addressed. Within each of these sub-sections the benefits and weaknesses of these sources are assessed, alongside the importance of, and challenges in, utilising negative evidence. Finally, this section concludes by detailing the three key contributions that this thesis makes to add to our current understanding of histories of water and health in the twentieth century.

The Colonial Development (and Welfare post-1940) literature addressing water in British Africa dates between 1929 and 1959. There are some engagements pre-1929, such as proposals for a water supply system in Kampala 1926-1928 and debates over allocation of the Nile Waters during the 1920s.¹³⁶ Britain had limited interest in water for Uganda post-1959. In the case of Sudan, colonial development sources were limited more generally. As noted earlier, the Colonial Development (and Welfare) Acts did not directly apply to Sudan. Development ideologies did not evade Sudan, however, as the Gezira Irrigation Scheme attested. Aside from this, a substantial proportion of the files relating to water were concerned with the division of the Nile waters. Most files 1954-1961 related to the impact of the Owen Falls Dam on Sudan and were particularly concentrated on the two years following its opening in 1954. As shown by

¹³⁶ Kampala water supply: proposals and recommendations regarding introduction of water supply system, September to October, 1926, The National Archives (TNA), UK, CO 536/143/6.

proposals for investment in water supplies in Uganda, such developments were already in the pipeline before the institution of the British Colonial Development Act in 1929.

The files that related specifically to Britain's Colonial Development (and Welfare) Acts can be split broadly into three categories. There were those concerned with overarching colonial policy that was set at the Colonial Office, such as discussions about water legislation in the 1950s. There were files that related to specific colonies and detailed their overall development, specific projects, or both. Finally, there were files that held discussions about obstacles to implementation, such as shortages of machinery and personnel. These files consisted of any combination of correspondence, surveys, project and grant proposals (draft and final), reports on future, current, and past development, and data on expenditure for specific projects and for overall programmes of development.

The combination of these distinct types of source material enable this thesis to provide deep insights into the decision-making processes. For example, correspondence—whether through minutes, letters, telegrams, or annotations—is particularly fruitful in understanding how individuals and groups of individuals were thinking. Combined with surveys and draft proposals they reveal how the art of compromise was employed to obtain funds for development. There are challenges, however, in confirming the prioritisation of water supplies development for health purposes as the colonial development classes of schemes changed and were remodified throughout this period. Moreover, the purposes for developing water supplies were often mixed.

A further challenge in understanding the history of water supplies through these files is the fluctuating interest in water supplies at British parliamentary, Colonial Office, and colonial state levels, as this shaped the creation and availability of source material. Questions asked in the British parliament generated source material, such as Bernard Braine's question about the state of rural water supplies in colonial Africa in the mid-1950s. This resulted in a survey of how, and for what purpose, water was used, as well as details on the departmental organisation of water supplies in African colonies. The Colonial Office itself played a role in defining priorities and asking questions about progress. For example, through debates about water legislation and the initiation of discussions within the colonial states in Uganda and Sudan (such as through debates about the usage of the Nile waters). Governors' concerns were often for the territory they were

assigned to, and though not always evident in the source material, were likely to have stemmed from various places: from challenges in government headquarters, from departments, from provincial and district commissioners, and from the local population. This study focuses on four strands and how they interacted with each other: British parliament, the Colonial and Foreign Offices, Colonial Governors, and those working with specific departments (medical, geological, public works, etc.). Work is still needed to understand the prioritisation of water supplies and sanitation at provincial, district, and village levels; for this a collaborative effort would prove most fruitful.

The second collection of sources this thesis utilises are departmental reports, special reports, and staff lists published in Uganda and Sudan. It focuses primarily on the medical department reports in Uganda and Sudan between 1925 and 1963 and other selected departmental reports accessed at the Wellcome Trust and Cambridge University Library. Analysis of these departmental reports is structural and asks the following questions: were people talking about water and sanitation? If, and when, they were, how were they talking about water and sanitation? Under what headings? This helps us to understand how administrators were categorising water during the twentieth century, which gives us some insights into how people were thinking about water at that time. In addition, this thesis draws upon special reports on water supplies, particularly those written by members of the geological survey departments in Uganda and Sudan during the 1930s, 1940s and 1950s. These reports give a sense of how progress in the development of water supplies was defined, the kinds of technologies and methods used to install and improve water supplies, and the challenges in implementing and maintaining water supplies in Uganda and Sudan. These are useful in giving a broad sense of how specialists and administrators in Uganda and Sudan viewed water and its development. They also convey the sense that while much progress was made in mapping out Britain's colonial territories in the early twentieth century, there was much work still to be done. Analysis of the staff lists shows the number and specialities of staff employed through the colonial service in Uganda and through the Sudan Political Service in Sudan. This thesis is interested in looking at the numbers of staff involved in water (usually engineers, geologists, geographers) and sanitation (public health inspectors, sanitary overseers, 'mosquitomen'). In terms of water, this shows the variety of departments that specialists were in. Regarding sanitation, the lack of evidence is

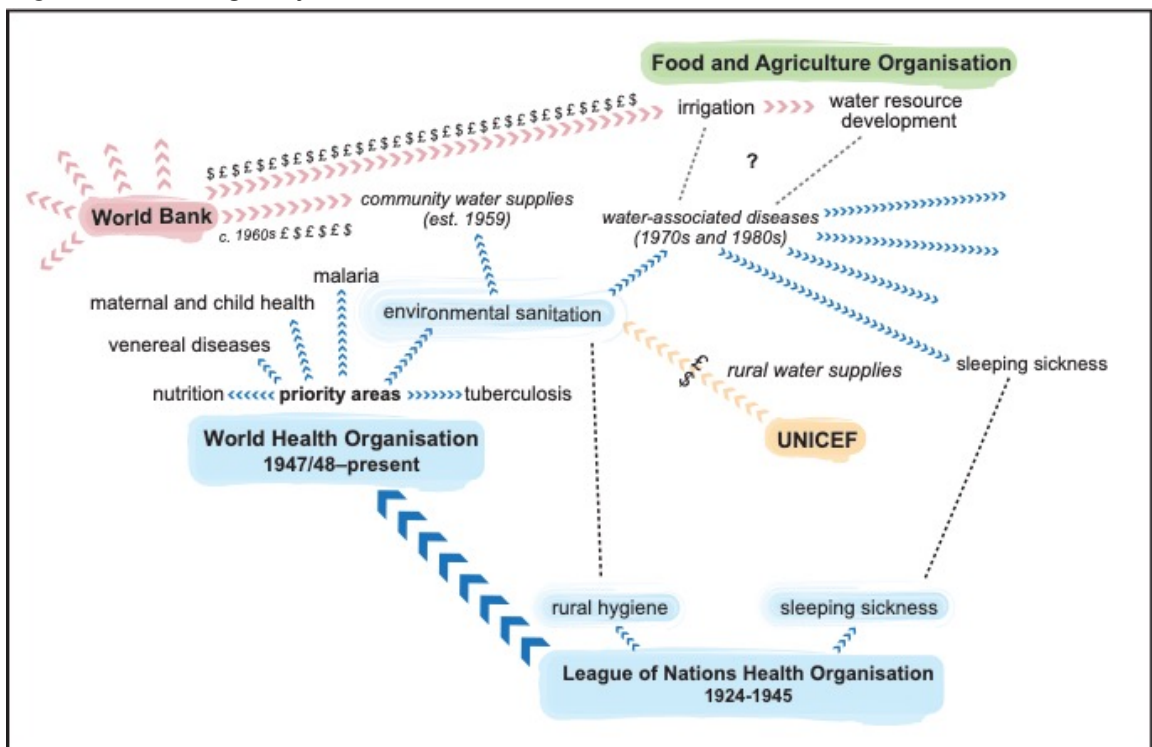
as revealing as its presence. For example, the role of a 'mosquitoman' was a lower position and taken up by local inhabitants or non-Europeans. In the earlier period particularly, these kinds of roles were not always present in the published staff lists. This presents a challenge in understanding the number of people involved in water supplies and sanitation work.

The third collection of sources revolves around the WHO's Global Community Water Supplies Programme. To understand the position of this programme in the context of international health in the twentieth century this thesis contextualises it first in relation to 1930s social medicine—in particular rural hygiene and sanitation programmes—as conceptualised and practiced through the League of Nations Health Organisation during the interwar years. To do this, it utilises sources analysed about British involvement in the LNHO regarding colonial Africa from the British National Archives, the Cambridge University Library (UK), and the Rockefeller Archive Center (US). Secondly, it examines the development of the community water supplies programme within the WHO through several channels, such as the environmental sanitation expert committees (and later through the environmental health division), special editions of the WHO Bulletin dedicated to environmental sanitation, regional office committee meetings and reports, centralised files (originating from the WHO Headquarters), project files, project reports, conferences, special subject reports, and interagency meetings.

The significant role that member states had in shaping WHO involvement in their territories can be problematic for assessing conditions in any given territory. The WHO required governmental approval through signed basic agreements to undertake health projects. This meant that the higher echelons of governments had a considerable say in the type of projects that the WHO were involved in and the regions that were prioritised for funding and technical assistance. In this sense, differentiating between those choices influenced by local politics and those by local needs is not always straightforward. The files that do not deal primarily with the high politics are mostly written by specialists working in the field of health. For example, reports by technical personnel working on WHO-supported projects show less political preference but do not always give a sense of how projects were received on the ground. A further challenge in analysing the WHO involvement in shaping how people understood and engaged with water and sanitation is that a sizeable proportion of files were destroyed. Helpfully the WHO keeps a list of these destroyed files, which shows that a significant collection of files relating to

water supplies and sanitation or to water-related diseases were destroyed. Sadly, this means that there is a part of the history of water supplies and sanitation at the WHO that cannot be written, and this must be borne in mind in the conclusions drawn from the source material available. On a more positive note, analysis of WHO source material still enables a greater understanding of the different ways in which people sought to press forward particular programmes of health at the WHO and of the variety of forums that discussions about water supplies and sanitation

Figure E: Interagency Coordination



Source: Created by author (2019)

were channelled through. The multifaceted nature of water lent itself to interagency discussions as it became clear that resources would be wasted without some degree of coordination. In times of financial stringency this was a matter of great concern.

As such, the fourth group of sources analysed is the work of other agencies and how they cooperated and competed with the WHO to promote water-related policies. Figure E shows some of these connections between organisations operating post-1945 alongside connections back to the work of the League of Nations Health Organisation between 1924 and 1945. While the LNHO's promotion of rural hygiene and its action to deal with the sleeping sickness problem in Africa was not replicated by the WHO, the environmental sanitation

work that began in 1950 and the action taken to tackle water-associated diseases (including sleeping sickness) shared some similarities in conceptualisations of water and its impact on public health. The United Nations Children's Fund (UNICEF), the World Bank, and the Food and Agricultural Organisation (FAO) each developed working relationships with the WHO in the three decades that followed the end of the Second World War to varying degrees. While there is not space to discuss all the interagency connections with the WHO, this thesis draws upon several insights, particularly from UNICEF and the World Bank, to reveal the challenges that the WHO officials and specialists faced in promoting their own agendas. The kinds of sources that are employed here are World Bank and UNICEF reports, correspondence between the WHO, the World Bank, UNICEF, and other organisations about water, and minutes and reports of interagency meetings and discussions (such as Administrative Committee on Coordination meetings on water resources and the UN Economic and Social Council meetings to discuss economic development in under-developed countries). Analysis of this—often disparate—source material gives us a greater insight into the challenges that WHO officials faced in their attempts to promote the health value of water above economic concerns and in promoting the WHO's environmental sanitation programme between 1948 and 1975. The web of connections between these and other organisations show that the WHO did not, and indeed could not, work in isolation. A further challenge with this source material is that much of it is biased towards the WHO's perspectives on water and health. We can glean some insights from published World Bank and UNICEF reports on how officials and experts attached to these organisations viewed the WHO's work, but these are limited. Further research on UNICEF and the World Bank's involvement in water supplies and sanitation work is outside the scope of this research.

Finally, this thesis examines the work and correspondence of a variety of administrators and specialists that showed an interest in water supplies for health purposes in the twentieth century. Those analysed were involved at various levels in the British colonial or international system. Some research was based on shorter visits to territories and on return a report on current conditions was produced (external). Other research consisted of people working as part of government departments or research institutions on the African continent for a longer period (internal).

David Bradley and colleagues Gilbert and Anne White were mentioned earlier. David Bradley undertook research in both the external and internal categories. After studying in Britain, Bradley spent ten years in East Africa undertaking research (internal) but then also paid many shorter visits to various countries (external). Those working for the WHO primarily undertook external research: they paid shorter visits to countries or collated information from a variety of countries to enable a comparison of health conditions across multiple territories. Those in this category include public health engineer J. N. Lanoix, sanitary engineer Bernd H. Dieterich, consulting engineer John M. Henderson, sanitary engineer Herman Baity, consulting engineer C. S. Pineo and sanitary engineer D.V. Subrahmanyam. However, some technical officers spent longer stints in countries to follow up on programmes, such as Subrahmanyam's role in Sudan's environmental health programmes. There are those who were influencers through their written and spoken work, such as intellectual synthesiser Lord Hailey, who wrote about conditions in Africa, natural scientist E. B. Worthington, and sanitary engineer Abel Wolman who advocated for water supplies in health programmes in international forums. Geologist Frank Dixey and geographer Frank Debenham both wrote about the water supply conditions in Africa. Dixey was an influential geologist who promoted water supply work in Britain's colonies from the 1930s. Analysis of published books, journal articles, obituaries, and correspondence allow us to recreate some of the key networks established in the twentieth century to understand and deal with the water problem. The people analysed came from various backgrounds, worked in different fields of research, and they operated at multiple levels.

Using the source material discussed above, this thesis seeks to develop our understanding of the three specific areas. First, British colonial and post-colonial engagements with the development of water supplies for health purposes as shown in the colonial health and the colonial development and welfare literatures. This thesis is interested in how different people and groups of people expressed their understandings of water and sanitation in the twentieth century and the ability of people to influence twentieth-century policy making. Of specific interest is the process of policy formulation (including those that were unsuccessful). This thesis explores the idea that: "improvements in health may come from public action in areas not recognisably medical—education, transport, law, enforcement, and environmental management," as was the case with nineteenth-century

engagements with public health in Britain and elsewhere in Europe.¹³⁷ Added to Hamlin and Sheard's list here are geologists, geographers, intellectual synthesisers, sanitary engineers and hydrological engineers. As such, this thesis expands on the variety of fields interested in questions of health.

Second, it draws upon David Bradley's classification of diseases by their transmission routes as a starting point for finding water within the health discourse. Bradley's classification can be used as a framework to investigate the collective impact of malaria, diarrhoeal diseases, sleeping sickness, schistosomiasis, guinea worm disease, and river blindness, etc., as researchers after Bradley have sought to do.¹³⁸ However, this thesis is not simply interested in highlighting the collective impact of water-related diseases, as others have done. Instead this thesis is interested in how reframing analyses of disease to put water at the forefront, Bradley was able to highlight an area worthy of further research. Where water was not an important factor (or not more important than other modes of classification) then Bradley's classification scheme is important—a knowledge of diseases as we know them to be now, as well as knowledge about how people thought about them in the past are both important for understanding historical engagements with water in health. By exploring the different ways in which people conceptualised diseases such as malaria and schistosomiasis it is possible to show whether water was marginalised in these discussions and what shape it took when it was mentioned within the health discourse. It helps us to understand how the negative associations with the environment pre-1960s influenced how people thought about health. While this thesis goes on to argue that the 1960s environmental agenda gave water advocates a significant boost, it also highlights the crucial role of work undertaken by specialists and administrators in the background during the 1950s and 1960s, such as the collection and analysis of data. This highlighted that the current levels of access to water supplies and sanitation facilities were poor and needed greater attention.

Thirdly, it seeks to develop our understanding of the WHO's Global Community Water Supplies Programme—its origins, how it developed, and the challenges in promoting the importance of water supplies and sanitation within the

¹³⁷ Hamlin and Sheard, "Revolutions in Public Health: 1848, and 1998?" 591.

¹³⁸ Bartram and Cairncross, "Hygiene, Sanitation, and Water: Forgotten Foundations of Health."

WHO as well as on the wider international front in a post-war era searching for quick, technological fixes.

In focusing on contributions to these particular areas, this thesis is able to show the role of science in shaping policies concerning water supplies and sanitation in the twentieth century.¹³⁹ It is also able to emphasise the multiple ways of knowing—the multiplicity of ideas that coexisted about water supplies and sanitation at any given time—and how they changed through the twentieth century.¹⁴⁰

3. Chapter overviews

The first chapter (1925-45) sets the foundations for the rest of the thesis by showing the problems that bureaucratic fragmentation caused in Uganda and Sudan as well as how water was regarded as an auxiliary to health and development (and also how health was an auxiliary to development, particularly in this earlier period pre-1945). It highlights the role of the colonial state, which was primarily to produce agricultural goods in support of the British economy, compared with the role of international health organisations—like the LNHO—which set the foundations for specific bodies focused on tackling particular issues, such as ill-health, within and across territorial boundaries. It explores ideas, such as rural hygiene, social medicine, and sanitation alongside the specific ways in which water was mentioned or noted in colonial medical reports and health discourse. It establishes the position of the LNHO in relation to the League of Nations and sets up the structures relevant to the post-war period.

Chapters 2, 3, 4, and 5 (c. 1945-1975) build upon these foundations to highlight the complexities of colonial and international interactions as people and organisations cooperated and clashed in attempts to improve water supplies and sanitation facilities. These chapters focus on the role of the WHO—its officials and recruited specialists—in shaping water supplies and sanitation agendas in the second half of the twentieth century and how colonial and post-colonial officials worked with and contested the role of this particular international organisation.

Chapters 2 and 3 begin in 1945, which coincided with the end of the Second World War and the establishment of the UN (and later the WHO). They conclude in 1963 following Uganda's independence in October 1962 and the

¹³⁹ Bynum, *Science and the Practice of Medicine in the Nineteenth Century*.

¹⁴⁰ Pickstone, *Ways of Knowing*.

WHO's collection of data for Bernd Dieterich and John Henderson's report on *Urban Water Supplies in Seventy-Five Developing Countries*, published in 1963. These chapters address the costs of development which brought the water problem to the forefront of British colonial planning through parliamentary debates and within the Colonial Office. From an international perspective Chapters 2 and 3 analyse the establishment of WHO priorities, most specifically the focus on environmental sanitation, which is where ideas for a global community water supplies programme originated. Chapter 2 focuses on the conceptualisation of water as a problem of underdevelopment and on the policies established in the British Colonial and Foreign Offices and in the WHO. Chapter 3 focuses on the application of these ideas, or lack thereof, in Uganda and Sudan. It is also interested in how the regional positionings of Uganda and Sudan affected the kinds of policies favoured.

Chapters 4 and 5 explore the concerted efforts to put water supplies and sanitation at the forefront of international health agendas in the 1960s and 1970s. Chapter 4 focuses primarily on how people conceptualised the water problem between 1963 and 1975. Most of the data analysed pertains to the period 1962 to 1970, when data was collected for two WHO surveys. However, as two of the primary documents addressed were published in 1963 and 1975, this time frame is preferred. Chapter 5 then explores the variety of forms that water supplies development took between 1963 and 1972 and how they were affected by the financial, political, and institutional challenges faced. It examines the focus on urban water supplies in Uganda and the large investment in rural water supplies in 1960s Sudan.

There is some overlap in the periodisations of the Chapters. Chapter 1 primarily covers the period 1925 to 1940, when Britain sought to establish bureaucracies within its colonies and when the LNHO was in its prime; this signified the development of international health. The five years between 1940 and 1945 bridge the gap between Chapters 1 and 2. During this half decade the Colonial Development and Welfare Act was established (1940) and then revised (1945). As Britain sought to reframe their imperial intentions, the expansion of the original Colonial Development Act (1929) gave colonial officials more scope to apply for funds for water supplies on health grounds as well as for other development and welfare activities. The LNHO continued to operate between 1940 and 1945 until its duties were transferred to the World Health Organisation's

interim commission. Chapter 3 concludes in 1962/63 and Chapter 4 begins in 1963. While Chapter 4 begins with Dieterich and Henderson's survey, published in 1963, it also reflects on the data collected at the beginning of the 1960s and the implications for future water supplies and sanitation policies.

CHAPTER ONE

The Water Problem: c. 1920-1945

Research shows that there was an established interest in developing water supplies to improve health conditions within colonial and international bureaucracies between c.1920 and 1945. Chapter 1, however, argues that water was marginalised within the fragmentary structures of imperial and international policymaking relating to health during this period. Therefore, this chapter uses material relating to British-colonised Sudan and Uganda to illustrate the role of the bureaucratisation of empire, particularly how this affected British Colonial Development policies regarding water and health. It also explores the unique role that the League of Nations Health Organisation (LNHO) played in connecting colonial and international health agendas.¹ It examines the changes and continuities in how the water problem was portrayed between 1920 and 1945 as bureaucrats and scientists engaged in health and development activities in colonial and international contexts. Further, by using water as a conceptual lens, this chapter shows the multiple ways in which diseases were understood and combated; how some conceptualisations were internationalised in the interwar years; and the contrasts within as well as across territories.

Established in the aftermath of the First World War in 1920, the League of Nations had the expressed aim of ensuring international security and peace through its collective Covenant agreement.² Four main principles drawn from the covenant were that nations should avoid war, respect each other, abide by international law, and prioritise justice in light of “a scrupulous respect” for the League of Nations covenant.³

¹ For useful analysis of the boundaries of colonial medicine see Bell, *Frontiers of Medicine*, 1-21.

² Yale Law School, The Avalon Project: Documents in Law, History and Diplomacy, “The Covenant of the League of Nations (including amendments adopted to December, 1924,” *Yale Law School*, 2008, accessed Sept 7, 2018, http://avalon.law.yale.edu/20th_century/leagcov.asp; UK Government Legislation, “The Colonial Development Act 1929,” 1929, accessed Aug 30, 2018, <http://www.legislation.gov.uk/ukpga/Geo5/20-21/5/enacted>. Signed 28 June 1919, coming into effect 10 January 2020.

³ Yale Law School, “The Covenant of the League of Nations.”

Addressing the practice of colonialism both directly and indirectly, Article 22 sought to reframe engagements between “advanced nations” and those described as:

colonies and territories which as a consequence of the late war have ceased to be under the sovereignty of the States which formerly governed them and which are inhabited by peoples not yet able to stand by themselves under the strenuous conditions of the modern world.⁴

As opposed to colonies or territories under allied rule (such as French or British), Article 22 concentrated on those like the former German colony Tanganyika, which would, under the League of Nations Covenant, become mandated territories.⁵ The idea behind this paternalistic strategy was a form of rule that was explicitly focused on the “well-being and development” of those submitted under the mandate system.⁶

Yet, there were wider implications for European imperialists as the twentieth century progressed and as opposition to empire grew. Six months after the League of Nations Covenant had come into effect this was evident. On the 14 July 1920, British Parliamentary discussions concerning the “status of Indians and native labour” in East Africa were framed in both international and British imperial perspective.⁷ Adherence to the League of Nations’ Article 22 was of great interest to Lord Islington and Viscount Bryce, the latter of whom remarked on imperial labour policy that, “this is a case where we are bound in particular to be on our good behaviour” in view of the Covenant.⁸

⁴ Yale Law School, “The Covenant of the League of Nations,” Article 22.

⁵ For more on the League of Nations and the mandate system: Callahan, *Mandates and Empire: The League of Nations and Africa*; Callahan, *A Sacred Trust: The League of Nations and Africa*.

⁶ “The Covenant of the League of Nations,” Article 22.

⁷ Lord Islington (Sir John Dickson-Poynder), “East Africa: Status of Indians and Native Labour,” *House of Lords Debates*, vol 41 cc118-68, cc129, 14 July 1920, accessed Aug 28, 2018, <https://api.parliament.uk/historic-hansard/lords/1920/jul/14/east-africa-status-of-indians-and-native>; for more on labour in Uganda, see Kenneth Ingram, *The Making of Modern Uganda*, (London: George Allen & Unwin Ltd., 1958), 140-158. For an authoritative comparative history of labour in the French and British empires, see Frederick Cooper, *Decolonization and African Society: the Labor Question* (Cambridge: Cambridge University Press, 1996).

⁸ Viscount Bryce (James Bryce), “East Africa: Status of Indians and Native Labour,” *House of Lords Debates*, vol 41 cc118-68, cc139, 14 July 1920; Lord Islington, “East

The House of Lords debate on labour in the colonies revealed the connected nature of the two spheres—international and imperial—and emphasised a growing concern for how Britain managed their colonial territories. Lord Islington referred to the comment Lord Grey made at the inauguration of the British Institute of National Affairs that: “To think nationally without thinking internationally leads to disaster”.⁹ Believing it to be “apposite to [...] responsibilities in the Empire”, Lord Islington then paraphrased the above remark: “thinking Imperially without thinking inter-Imperially will lead, under our modern conditions, to grave trouble, if not disaster.”¹⁰ The important point here was that Britain should not think of itself in isolation from its international counterparts and nor should individual territories within the British Empire regard themselves as disconnected from the whole.

The variety of views expressed during this debate highlighted the intellectual and practical challenges that British parliamentarians, the British Colonial Office, and those employed in the colonial service faced in reframing how they thought about and practiced colonialism in the aftermath of the First World War.¹¹ The Parliamentary debates, such as those discussed above, which addressed questions about the relationship between international and imperial institutions, had implications for how bureaucrats and specialists engaged with water and health in British imperial, British colonial, and international contexts.

The pivotal debates about the water problem, this thesis argues, were largely intellectual. They were about how the links between water, health, and development were being conceptualised. Water, in this sense, was regarded as an auxiliary to the more pressing concerns of economic development and health.

Africa: Status of Indians and Native Labour,” *House of Lords Debates*, vol 41 cc118-68, cc129, 14 July 1920.

⁹ Lord Islington, “East Africa: Status of Indians and Native Labour,” 14 July 1920.

¹⁰ Lord Islington, “East Africa: Status of Indians and Native Labour,” 14 July 1920. Here, Lord Islington was referring particularly to the British territories as opposed to the relationship between, say, British and French territories.

¹¹ Practical issues were raised such as the necessity of consistent legislation across the empire and the limited capacity of “embryonic” institutions within British territories: Viscount Milner (Alfred Milner), “East Africa: Status of Indians and Native Labour,” cc118-68, cc162, 14 July 1920 and, Lord Islington, “East Africa: Status of Indians and Native Labour,” cc129. Lord Emmott remarked that the Colonial Office was “queering the pitch” in relation to labour policy in light of Article 22 of the Covenant: Alfred Emmott, “East Africa: Status of Indians and Native Labour,” *House of Lords Debates*, vol 41 cc118-68, cc145, 14 July 1920.

This chapter is split into six sections. The first section examines how water was conceptualised in the 1920s, 1930s and early 1940s within these bureaucratic systems, as well as more broadly across Africa from a colonial and international perspective. The second section details the bureaucratisation of empire and what this looked like in the various departments established within colonial government structures in Uganda and Sudan between the 1920s and 1940s. The third section addresses the role of colonial development in Uganda and Sudan, and where it related to water and connected to health. The fourth section looks at the LNHO-sponsored conferences in the interwar years, drawing on experiences and discussions of specific diseases (such as sleeping sickness) and those relating to rural hygiene and nutrition. The fifth section highlights direct and indirect influences that the LNHO had on colonial medical departments, whilst also showing the multiple ideas vying for attention in medical policy during the interwar years.¹² Finally, the sixth section looks at the legacies of the early colonial development and LNHO interventions regarding water and health, and in doing so sets up the post-Second World War context that is addressed in Chapters 2, 3, 4, and 5.

1. Water: An Enigmatic Entity?

Unlike more modern conceptualisations, water was not a “social determinant” of health, as a WHO working group described in 2008, nor was it a globalised commodity between 1920 and 1945.¹³ The definition of potable water for domestic use remained ambiguous in the 1920s, 1930s, and 1940s. Moreover, the management of water raised many questions in domestic, agricultural and

¹² Sections 4 and 5 utilise and develop work published in Lunt, “The League of Nations Health Organization: Water, Health and Development in Colonial Africa, 1925-44,” 167-184.

¹³ WHO, “Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health,” Final Report of the Commission on Social Determinants of Health (Geneva, 2008), accessed June 26, 2014, http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf?ua=1. Water was not a globalised commodity in the sense that national and international management of water denoted relationships between or within nations rather than above national concerns. See Walter Bruchhausen for discussion of the “various and changing” relationship between the concepts of health and development in Tanganyika. Walter Bruchhausen, “From Precondition to Goal of Development: Health and Medicine in the Planning and Politics of British Tanganyika,” in *Developing Africa: Concepts and Practices in Twentieth-Century Colonialism*, ed., Joseph M. Hodge, Gerald Hödl and Martina Kopf (Manchester: Manchester University Press, 2014): 207-221, 207.

industrial circles in the interwar years. Water could be a source of disease, but at the same time it had a crucial role to play in the amelioration of health and economic conditions. Irrigation could increase crop yields, yet the standing water in canals provided a breeding ground for mosquitoes and a hospitable environment for bilharzia.¹⁴ As water often crossed borders, the impossibility of controlling cross-border movements of parasites, bacteria, chemicals, insects and people was another factor that national, colonial and international authorities had to manage.

Drawing from British imperial, British colonial, and international settings, this chapter largely addresses six particular ways that people thought about water. The first three were explicitly referenced: water as a resource, a problem, and a breeding place. As a resource, water was a substance to be utilised, managed, conserved and developed for a variety of purposes, whether done so in support of the British economy or, bearing Article 22 in mind, for the benefit of those subject to colonial rule. A water problem occurred where there was not enough, there was too much, if it was not the right kind (hard, soft, bacteria-ridden), or it had not been properly utilised, managed, conserved or developed. Water was a breeding place for disease-carrying insects, such as mosquitos and flies. The latter three were implicitly referenced: water as a solution, a medium of disease transmission, and an auxiliary to health and development. Water helped to resolve or mitigate particular health and development issues and was thus regarded as a solution to certain problems. For example, the ample and convenient provision of domestic water supplies might reduce contact between people and disease vectors and engineering works might improve the reliability and quality of crops. Water was also a medium for disease transmission as some parasites and bacteria relied on water for their survival. Therefore, when people and water converged—washing, collecting water, tending to crops in irrigated areas—human hosts came into contact with said parasites and bacteria. Finally, water was an auxiliary to health

¹⁴ See Farley, *Bilharzia*; Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), in particular the chapter “Can the Mosquito Speak?,” 19-53; Sandy Sufian, “Re-Imagining Palestine: Scientific Knowledge and Malaria Control in Mandatory Palestine,” *Dynamis: Acta Hispanica ad Medicinam Scientiarumque Historiam Illustrandam* 25 (2005): 351-382. Sufian compares quinine and drainage as techniques used to combat malaria. These two approaches are defined as “anopheles” and “human” factors by Kohei Wakimura, “Anopheles Factor and Human Factor: Malaria Control under the Colonial Rule, India and Taiwan,” in *The Unfinished Agenda: Nation Building in South Asia*, ed., Mushirul Hasan and Nariaki Nakazato (New Delhi: Manohar, 2001): 485-508.

and development, and health an auxiliary to development. In this sense water was not the main focus. Instead, the priority was how to improve agricultural production (which might require improvements in water resources) or how to combat disease or sets of diseases. As water was a common necessity for causative agents of disease and humans (in the sense that it was a basic need, a medium for disease transmission, and it provided a breeding place for vectors of disease), conceptualisations of water included health as either a primary or secondary consideration.

As economic concerns remained central throughout the interwar years this had two, often contrasting, effects. Firstly, that the social importance of access to water and sanitation was promoted because it had positive implications for economic productivity, and secondly, that the health-related discussions about water were overshadowed. Regarding the former, suggestions of improving water and sanitation fitted perfectly within colonial and international aims to ameliorate social and economic conditions. Access to potable water and 'modern' sanitation were regarded as ways to improve health, and thus increase people's capacity to work. Moreover, hygiene and sanitation practices were targeted to highlight the causal link between ill-health and 'native' ignorance in European colonies. These conceptualisations were clearly suggestive of the pre-eminent place of Western understandings as applied to colonial contexts.¹⁵ Regarding the latter, it was more difficult to procure funds for developing water supplies unless the economic or health value of doing so could be measured. It was difficult to quantify the impact that water had as there were different ways in which it added value to economic endeavours and to improving people's health.

As the economic value of water in colonial settings was more explicitly evident than its role in health between 1925 and 1945, water was regarded as an auxiliary to development, and in turn, health to development. In 1925, the Colonial Office published a report following the visit to East Africa of three members of parliament, W. Ormsby-Gore, A. G. Church, and F. C. Linfield, and a Colonial Office official, J. A. Calder.¹⁶ The aim of the trip was to broadly consider the best

¹⁵ Andrew Balfour, "Hygiene as a World Force. Address at the Opening of the New School of Hygiene of the Johns Hopkins University, Baltimore, 22 October, 1926," *The British Medical Journal* 2, no. 3434 (October 1926): 782-784.

¹⁶ William George Arthur Ormsby-Gore, *East Africa. Report of the East Africa Commission*, Cmd. 2387, 1924-25.

courses of action to “accelerate” economic development and to “ameliorate” social conditions, noted in that order.¹⁷ In this vein the report stated that such provision should be “directed to their [East African people] moral and material improvement.”¹⁸ It was clear from this Commission that the broad focus in the British East African Dependencies post-WWI was the prioritisation of largely British-defined economic and social progress. R. C. Pratt referred to this approach in Uganda and commented on the “preoccupation with economic development” in particular as it was deemed to be “a prerequisite of every other advance.”¹⁹ Pratt continued on to state, “this concern for African welfare was, of course, always social and economic, rarely political.”²⁰

Therefore, while the East Africa Commission in 1925 referred to the “continual fight” against waterborne diseases, it was done so in the context of agricultural development, such as the growing of *arabica* coffee.²¹ The report continued on to note the importance of improving water supplies and sanitation in conjunction but was also keen to emphasise the value of harnessing water to develop irrigation schemes.²² References to water were made under headings of “native production”, “scientific research and Amani institute”, “empire development”, and under specific colonial headings (Uganda, Kenya).²³ The main topics addressing water in the report were as follows: combatting disease in agricultural contexts; the importance of scientific and technical experts in water conservation (amongst other fields); the need to improve water supplies and sanitation; and charges relating to irrigation schemes and waterworks.²⁴ Regarding Uganda specifically, William Ormsby-Gore remarked on the “considerable difficulties” that water supply presented in Kampala, and referred to the “most extravagant and wasteful use of labour” as “the greater part of the water [was] carried from the Lake.”²⁵

¹⁷ In addition, the commission personnel were tasked to address the labour question, which included an examination of taxation and service provision for the local population. Ormsby-Gore, *Report of the East Africa Commission*, 3.

¹⁸ Ormsby-Gore, *Report of the East Africa Commission*, 3.

¹⁹ R. C. Pratt, “Administration and Politics in Uganda 1919–1945,” in *History of East Africa*, vol. 2, ed. V. Harlow and E. M. Chilver, 476-541, (Oxford: Oxford University Press, 1965), 483-84.

²⁰ Pratt, “Administration and Politics in Uganda 1919–1945,” 483-84.

²¹ Ormsby-Gore, *Report of the East Africa Commission*, 36.

²² Ormsby-Gore, *Report of the East Africa Commission*, 36.

²³ Ormsby-Gore, *Report of the East Africa Commission*, 36, 81, 88, 91, 189.

²⁴ Ormsby-Gore, *Report of the East Africa Commission*, 36, 81, 88, 91, 189. Quote, 36.

²⁵ Ormsby-Gore, *Report of the East Africa Commission*, 141.

The British Colonial Development Act 1929 provided further impetus for economic arguments relating to water development. When the Colonial Development Act was set up in 1929, aid was allocated to colonial projects that would boost Britain's domestic economy and eradicate unemployment in the staple industries. The economic value of water gave advocates a platform for its development, as the justification of colonial projects in economic terms was vital in shaping allocation decisions and funds issued after the First World War.

During this period of study, water was also articulated as a problem. In 1931, Frank Dixey, a geologist attached to the British Colonial Office, referred to problems in providing water in adequate quantities and of "satisfactory quality."²⁶ While reference to the connection between water and health was intimated, Dixey first and foremost addressed the impact water had on economic development:

the successful and continued development of the agricultural and other resources of large areas within these [African] countries depends upon the satisfactory solution of the more important water supply problems.²⁷

Lord Hailey's *An African Survey* (1938) reiterated this association in dedicating an entire chapter to "the problem of water", which focused on the opportunities for economic development through irrigation in Africa.²⁸ While Lord Hailey concluded that large-scale irrigation had limited value in Africa—instead stressing the importance of small-scale projects that prioritised the provision of drinking-water supplies—the economic imperative of colonial policies remained evident.²⁹ In 1938, E. B. Worthington, then Director of the Freshwater Biological Association of the British Empire and formerly Demonstrator in Zoology at Cambridge University, labelled water as an "all-important factor" and a substance of "prime importance [...] since agriculture and most other branches of human endeavour depend upon it."³⁰

²⁶ Frank Dixey, *A Practical Handbook of Water Supply* (London: T. Murby & Co, 1931), Preface, vii, viii.

²⁷ Dixey, *A Practical Handbook of Water Supply*, 2.

²⁸ Lord Hailey, *An African Survey: A Study of the Problems Arising in Africa South of the Sahara* (London: Oxford University Press, 1938), particularly 927-1055.

²⁹ Hailey, *An African Survey*, 1652-53. See also William Ormsby-Gore, "The Economic Development of Tropical Africa and its Effect on the Native Population," *The Geographical Journal* 68, no. 3 (September 1926): 240-253.

³⁰ E. B. Worthington, *Science in Africa*, 3, 75.

In framing water as a problem in these ways, Dixey, Hailey and Worthington were recognising the value of water as a resource. The League of Nations and its Health Organisation also found merit in addressing water-related issues. For example, a number of irrigation projects were forwarded by the League of Nations to aid the relocation and settlement of Armenian and Bulgarian Refugees.³¹ In addition, water pollution resulting from industrialisation in Europe was addressed and, during the LNHO's early years, there were also a number of discussions about health and disease in relation to waterways.³² The LNHO's promotion of rural hygiene, alongside specific disease programmes, highlighted some connections between water and health. Here, the provision of water supplies was perceived as part of the solution to developing and sustaining rural communities, as well as more broadly in improving agricultural production and health conditions.

In medical reports, health-related aspects of water predominated (in the sense that water was often mentioned in relation to a variety of diseases), yet their relative importance was not always clear.³³ In an article published in the *Kenya Medical Journal* in 1925, Arthur E. Horn, then medical adviser to the Colonial Office, highlighted the ever-presence, yet changing visibility, of medical problems and how epidemic outbreaks of particular diseases masked the visibility of others both individually and collectively.³⁴ This was a major challenge for advocates of water supplies development during much of the twentieth century. Horn stated that:

The problems in preventive and curative medicine which are present in various parts of the tropics are somewhat of the nature of a kaleidoscope [...] Some of the elements may be missing from certain areas but the complex retains the greater number arranged in different patterns so that one or other feature attains a

³¹ Annex 892: Loan for the settlement of Bulgarian Refugees: Letter from the Bulgarian Government to the Secretary General of the League, *League of Nations Official Journal*, 7-12 (July 1926), 1002-1003, Cambridge University Library, Royal Commonwealth Society Collection [hereafter CUL, RCS], OP. 92.08; Annex 883 Work of the Armenian Refugee Settlement Commission: Report of the Commission, *League of Nations Official Journal*, 7-12, 975-76, 980-84, CUL, RCS, OP. 92.08.

³² Borowy, *Coming to Terms with World Health*, 414-419; for example, League of Nations Health Committee Minutes for the First Session, February 11-22, 1924, 12th Meeting, Report of the Mixed Subcommittee of Waterways, 20 February 1924, CUL, RCS, OP. 109.9.13.

³³ This is discussed further in the section on bureaucratic fragmentation.

³⁴ Arthur E. Horn, "Some Aspects of Tropical Medical Work," *Kenya Medical Journal* 2, no. 1 (April 1925): 3-10, especially 3. Latterly this journal became the *Kenya and East African Medical Journal* and finally the *East African Medical Journal*.

predominance, and more urgently demands attention than the remainder. Not only is this the case for different places, but it is equally so for different periods, a turn of the kaleidoscope converting the unobtrusive parts of one view into the insistent features of another, when a smouldering endemic disease lights up into epidemic outbreak.³⁵

Knowingly or unknowingly, Horn's insights highlighted important challenges in understanding the relationship between water and health in the first half of the twentieth century. How problems of curative or preventive medicine were defined and how the visibility of particular issues affected engagements with the wider disease environment, were tied up in a framework that often gave great weight to the cause, impact, and prevention of epidemic outbreaks. This type of framing showed preferences for two related approaches. One tackled disease on an individual basis rather than addressing the collective impact of those that had connections to water. The other dealt directly with either the parasites, viruses, and bacteria that were causing disease or the vectors that transmitted the diseases, such as mosquitoes, rather than the mediums through which they were transmitted. In other words, water was often not the focal point. Historical research on sleeping sickness brings this to light. Although there is a significant body of literature addressing the subject in European colonial contexts, not all have deemed water to be a crucial factor in the sleeping sickness cycle as its impact varied across territories.³⁶ The argument pressed forward in those cases is that only some species of tsetse are riverine, and that the disease is not associated with water on all occasions.

However, Maryinez Lyons' research on sleeping sickness in the Belgian Congo 1900-1940 showed that some tsetse flies—the vector of transmission for sleeping sickness—were known to breed in dense vegetation close to water sources used by local populations.³⁷ Moreover, research into the approaches that British officials used in Uganda and Sudan has revealed the significant attention

³⁵ Arthur E. Horn, "Some Aspects of Tropical Medical Work," 3.

³⁶ This disease prompted the Medical and Sanitary Department in Uganda to serve the African population in addition to its European contingent. Studies on sleeping sickness include: Ford, *The Role of the Trypanosomiases in African Ecology*; Worboys, "The Comparative History of Sleeping Sickness in East and Central Africa, 1900-1914"; Headrick, "Sleeping Sickness Epidemics and Colonial Responses in East and Central Africa 1900-1940"; Bell, *Frontiers of Medicine*; Tilley, *Africa as a Living Laboratory*; White, "Tsetse Visions"; Lyons, *The Colonial Disease*.

³⁷ Lyons, *The Colonial Disease*, 52-53.

given to the clearance of watering places as they attempted to manage the disease between 1925 and 1945. This was then reflected at an international level when an interim report produced in advance of the LNHO conference on sleeping sickness in 1925 complained that the Ugandan people were not respecting cordons aimed to prevent encroachment within one mile of water.³⁸ In Uganda's case, it was believed that the presence of dense vegetation in the vicinity of watering places meant that humans and flies were in regular contact and therefore this needed to be addressed.³⁹

Conceptualisations of water in relation to disease were not limited to sleeping sickness. In 1931, hydrologists H. E. Hurst and P. Phillips noted the broad connections between water and disease vectors in reference to the Nile Basin as a whole. Here, water was regarded as a habitat that acted as a breeding place and a medium for transmission for a variety of diseases:

various harmful insects and other pests live in the Upper Nile basin. In particular mosquitoes abound and in certain districts tsetse and other biting flies are found. These are responsible for disease amongst men and animals.⁴⁰

From January to July 1933, Horn, now promoted to consulting physician to the Colonial Office in 1928, published three papers on the control of tropical diseases in Africa.⁴¹ In the second and third papers "more severe diseases" and "graver infections" were identified alongside the follow up argument that they had "arrested

³⁸ Andrew Balfour, E. van Campenhout, Professor Gustave Martin and A. G. Bagshawe, *Interim Report on Tuberculosis and Sleeping-Sickness in Equatorial Africa, submitted to the Health Committee at sixth session League of Nations Health Organisation*, 26 May 1923, TNA, CO 323/925, 94.

³⁹ Recent articles have been written on current methods for control tsetse flies. Philippa Roxby, "Health Check: Blue is the Colour for Sleeping Sickness Cure," *BBC*, June 28, 2015, accessed July 2, 2015, <https://www.bbc.co.uk/news/health-33268320>; Maryam Abdalla, "Tangled up in Blue: A Sticky End to Sleeping Sickness," *BBC*, June 28, 2015, accessed July 2, 2015, <https://www.bbc.com/news/av/health-33274658/tangled-up-in-blue-a-sticky-end-to-sleeping-sickness>.

⁴⁰ H.E. Hurst and P. Phillips, *General Description of the Basin Meteorology Topography of the White Nile Basin (Ministry of Public Works): Vol. 1* (Cairo: Government Press, 1931), 11. Accessed at Cambridge University Library.

⁴¹ Arthur E. Horn, "The Control of Disease in Tropical Africa: Part I," *Journal of the Royal African Society* 32, 126 (January 1933): 21-30, 24; Arthur E. Horn, "The Control of Disease in Tropical Africa: Part II," *Journal of the Royal African Society* 32, 127 (April 1933): 123-134; Arthur E. Horn, "The Control of Disease in Tropical Africa: Part III," *Journal of the Royal African Society* 32, 128, (July 1933): 252-260.

the progress of civilisation and earned so bad a reputation for this part of the globe.”⁴² Draining and oiling mosquito pools and mosquito-proofing water supplies were referenced as important malaria control methods.⁴³ The breeding habits of the *Aedes aegypti* mosquito, carrier of yellow fever causing parasites, were noted: they bred in “domestic pots and pans [...] in shallow wells and pools, and waste tins and broken vessels containing odd collections of water.”⁴⁴ Preventive measures to deal with sleeping sickness centred on destroying the tsetse fly or clearing breeding grounds, the latter defined as “areas round their village, watering-places, ferries, etc.”⁴⁵ Hookworm disease was also prevalent, with Horn describing defecation practices and poor food preparation as the primary causes.⁴⁶ Horn’s description of diseases represented the scientific backbone defining the now professionalised specialism of tropical medicine—a foundational development of the nineteenth century.⁴⁷ Whilst Horn gave considerable attention to the development of curative measures, references to water and its preventive value in disease management proved a consistent theme throughout these papers. Water was depicted as a watering-place, a breeding place, and something that required managing as part of the solution in dealing with a variety of diseases. It may not have been Horn’s explicit intention to specifically highlight the role of water in disease transmission on the African continent, but nevertheless water formed an important thread across the three papers.

The first paper, focused on public health administration on the continent, also held clear references to water. Describing colonial expenditure on health—medical and sanitary services totalled approximately 10 percent of expenditure in the colonies—Horn highlighted the costs incurred by other departments excluding medical: canalisation and drainage to tackle malaria; afforestation and swamp reclamation; bush clearance to prevent sleeping sickness; and “improved water supplies, and various sanitary public works.”⁴⁸ All had direct or indirect links to the relationship between water and health. Here, Horn acknowledged that preventive aspects of tropical disease control were not the sole purview of physicians and

⁴² Horn, “The Control of Disease in Tropical Africa: Part II,” 123.

⁴³ Horn, “The Control of Disease in Tropical Africa: Part II,” 128. Horn gives more attention to “malaria as a ‘social’ disease”, 129.

⁴⁴ Horn, “The Control of Disease in Tropical Africa: Part II,” 133-34.

⁴⁵ Horn, “The Control of Disease in Tropical Africa: Part III,” 158

⁴⁶ Horn, “The Control of Disease in Tropical Africa: Part III,” 159.

⁴⁷ Bynum, *Science and the Practice of Medicine*, 224-225.

⁴⁸ Horn, “The Control of Disease in Tropical Africa: Part I,” 24, 25.

doctors. This was increasingly the case as the twentieth century unfolded. As William Bynum has emphasised, the growing role and visibility of the “number and variety of groups that were then devoted to prevention, and the administrative structures within which they worked” began in earnest in the late nineteenth century.⁴⁹ The involvement of a variety of occupational groups complicates historical analysis of how administrators and specialists conceptualised water in relation to health as it requires an appreciation of the key occupational groups and their roles at any given time, alongside an analysis of the variety of disciplines involved.

Geologists are a good example of the role that non-medical personnel played in conceptualising water and developing supplies for both health and economic purposes. In 1938, Worthington described the significance of the relationship between geology and the science of water supplies with brief references to the medical emphasis on housing and sanitary conditions.⁵⁰ Following the establishment of a drilling branch within Uganda’s Geological Department in 1921, for example, Worthington wrote, “extensive work has been carried out, especially in Karamoja, where the water problem is most acute in view of the arid nature of the land and the increase in population.”⁵¹ Seven years earlier in 1931, Frank Dixey, a geologist in Nyasaland, noted that “the importance of the water question has received recognition during the last few years.”⁵² The growing interest, particularly in Africa, was demonstrated by the “special assistance” given to Geological Surveys and “other relative Departments.”⁵³ C. B. Bisset, previously first assistant geologist to Dixey, reiterated these sentiments:

most of these proposals long remained on paper mainly on account of lack of staff, funds, and incentive, but during the last decade increasing realisation of the need for rural betterment has brought the matter into the sphere of practical measures.⁵⁴

⁴⁹ Bynum, *Science and the Practice of Medicine*, 224-225.

⁵⁰ Worthington, *Science in Africa*, 75-82, 461.

⁵¹ Worthington, *Science in Africa*, 77.

⁵² Dixey, *A Practical Handbook of Water Supply*, 1931, 1.

⁵³ Dixey, *A Practical Handbook of Water Supply*, 1931, 1.

⁵⁴ C. B. Bisset, *Geological Survey of Uganda. Water Supply Paper No 2: Small Reservoirs in Uganda* (Entebbe: Printed by the Government Printer, 1945), 3, CUL, RCS, OP.33720.556.03 and RCS.L.45.Z97; Colonial Research Committee. First Annual Report, 1943-1944, Cmd. 6535, 5.

The importance of geological expertise was given greater recognition as rural development was prioritised in international and colonial contexts. Described as “the water problem” and “the water question”, geologists addressed the implications for health and economic development in rural areas. For example, during the Great Depression, Dixey was instructed “to concentrate on the provision of improved groundwater supplies for the African population.”⁵⁵ As a result, Dixey wrote *A Practical Handbook of Water Supply*, published in 1931, which was cited by geologists in Uganda and Sudan over the proceeding years.⁵⁶ The importance of Dixey’s work led to the development of “inter-governmental aid” to improve conditions across East Africa. Dixey was transferred to Northern Rhodesia to set up a water department, and was seconded to Kenya, Tanganyika, Sudan and Eritrea. C. B. Bisset, transferred to Uganda in 1934, extended Dixey’s influence into the protectorate. Figure 1.1, which depicts some water supplies publications

Figure 1.1: Water Supplies Papers, Books, and Investigations in Sudan and British Eastern Africa 1923-1945.

1923	Water Supplies, Nyasaland
1926	Lacey, <i>Hydrology and Groundwater</i>
1929	Kenya Water Problems
1929	Northern Rhodesia Paper on Water Supplies
1929	Nyasaland – Population to Water Supplies Compared
1920s & 1930s	Southern Rhodesia Bulletins of Department of Agriculture
1931	Dixey, <i>A Practical Handbook of Water Supplies</i>
1931-40	Nyasaland Colonial Development Water Supply Investigations
1933	Hydrology of Lake Tana
1934	Water Supplies in Sudan
1938	Soil Erosion and Water Supplies in Uganda
1938	Tanganyika Control of Natural Water and Water Law
1940-44	Tanganyika Water Consultant Reports
1941	Water Boring in Uganda 1920-1940
1945	Small Reservoirs in Uganda

Source: Created by author (2015).

⁵⁵ Kingsley Dunham, “Frank Dixey, 7 April 1892-1 November 1982,” *Biographical Memoirs of Fellow of the Royal Society* 29 (November 1983): 158-176, 164.

⁵⁶ Frank Dixey, *A Practical Handbook of Water Supply*, 1931.

between 1923 and 1945, highlights the importance of geologists in shaping conceptualisations of, and engagements with, water supplies. Frank Dixey stressed the importance of the “continuous co-ordination of efforts amongst individuals, departments, and administrations”—something the development of water supplies particularly needed.⁵⁷ Yet the division of responsibilities, discussed in the next section, could easily lead to a disjointed or incomplete understanding of how, why, and who, prioritised water supplies development. The blurred lines in both the spending and responsibility assigned to different government departments, as Horn expressed, is fundamental to understanding how water fitted into interwar colonial health and development programmes.

2. The Bureaucratisation of Empire 1925-1945

This section is split into three parts. The first focuses on the bureaucratisation of empire, particularly regarding the practice of indirect rule. The second part shows where water fitted into these bureaucratic structures in Uganda and Sudan. The third part shows how water was specifically addressed in medical departments in Uganda and Sudan.

In an analysis of colonial chiefs in Uganda, John Tosh referred to the shift towards “a preoccupation with bureaucratic standards of administration” in the aftermath of the First World War as “pacification gave way to ‘improvement’ in the 1920s.”⁵⁸ Here, Tosh was referring to the adjustment from imperial conquest, delineation of territories, and basic administration to the consolidation of empire through more extensive investment in political (legislative), economic (agriculture), and social (medical and education) facilities.⁵⁹ These services were structured centrally within a departmental framework and locally enforced by departmental representatives, district and provincial commissioners, or local elites.

Peter Crooks and Timothy Parsons have encouraged scholars to “think beyond administrative technicalities to how bureaucracy operated as part of the social systems and political cultures of empires.”⁶⁰ Rather than emulate their

⁵⁷ Dixey, *A Practical Handbook of Water Supply*, 1.

⁵⁸ John Tosh, “Colonial Chiefs in a Stateless Society: a Case-study from Northern Uganda,” *The Journal of African History* 3, no. 4 (July 1973): 473-90, 482.

⁵⁹ Tosh, “Colonial Chiefs in a Stateless Society,” 473-90, 482; Pratt, “Administration and Politics in Uganda 1919–1945,” 476-541, esp. 485-486.

⁶⁰ Peter Crooks and Timothy H. Parsons, “Introduction,” in *Empires and Bureaucracy in World History: From Late Antiquity to the Twentieth Century*, ed. Peter Crooks and

valuable synthesis of the current literature on bureaucratic structures, this section seeks to address these administrative technicalities—where water was placed within systems of governance—in order to reveal how definitions of the water problem reflected the wider bureaucratisation of empire in the 1920s and 1930s. It addresses some of the practical out-workings of colonial states as carried out through government departments, whilst recognising the limitations in personnel and the significant role that indirect rule played in shaping priorities.

This bureaucratic system of operation was favoured and explored within the framework of indirect governance—the meaning and practice of which was varied and ill-defined—in Uganda and Sudan.⁶¹ For example, Sir John Maffey, who replaced Sir Geoffrey Archer as Governor-General of Sudan in 1926, was keen to make use of “native administration” to protect the British and Egyptian run administration, believing it would act as “a shield between the agitator [frustrated Sudanese people] and the bureaucracy [British and Egyptian ruling elite].”⁶² In a territory ten times the size of Uganda, the practice of indirect rule was a greater necessity: control could not depend solely on the largely British civil establishment—the Sudan Political Service. The assassination of Governor-General Lee Stack on 19 November 1924 evidenced and catalysed the need to rethink administration within the condominium during the “troubled years of 1924-25.”⁶³ The growth of local government structures accelerated in the 1930s and 1940s. A note on local government policy stated, “in many parts of the country native agencies, tribal and others, were in being and actually performing useful functions.”⁶⁴ The same note commented that the local population “need[ed] supervision and sympathetic guidance.”⁶⁵ In this instance administration via

Timothy H. Parsons (Cambridge: Cambridge University Press, 2016), 8, 3-28: “bureaucracy was an essential component of imperial rule”, 7.

⁶¹ “British conservatism between the wars in Africa meant that ancient kings were now in fashion, and government had become more concerned with management than control”: Shane Doyle, *Crisis & Decline in Bunyoro: Population & Environment in Western Uganda 1860-1955* (London: The British Institute in Eastern Africa, 2006), 165. In Bunyoro, Winyi “fitted the system of indirect rule perfectly”: 166; John Ryle, “People & Cultures of Two Sudans,” in *The Sudan Handbook*, ed. John Ryle, Justin Willis, Suliman Blado and Jok Madut Jok (London: Rift Valley Institute, 2012), 70-87, 81.

⁶² Peter Woodward, *Sudan 1898–1989: The Unstable State* (Boulder: Lynne Rienner Publishers, 1990), 45, 45-57; Peter Woodward, *Condominium and Sudanese Nationalism* (London: Rex Collings, 1979), 9.

⁶³ *Report on the Finances, Administration, and Condition of the Sudan*, 1938, Cmd. 6139, 143. Files in this same set are referred to hereafter as FAC Sudan [year of report].

⁶⁴ FAC Sudan 1938, 143.

⁶⁵ FAC Sudan 1938, 144.

indirect rule was used to consolidate control across the vast territory rather than primarily about giving local people opportunities to make decisions independently from Khartoum and Britain. Despite the varied meanings and practices of indirect rule and its uneven development in Sudan, local cooperation remained key to the maintenance of British authority.⁶⁶

This emphasised the fragility of the British imperial presence in Sudan and reflected experiences elsewhere. In this sense the challenges in imperial bureaucratisation lay in financial and personnel constraints, which necessitated forms of indirect rule to maintain the viability of colonial governments. As Anthony Kirk-Greene remarked:

Their [colonial subjects] social and developmental needs were served by merely 1000 medical officers, 800 officials in natural resources, 700 in public works and fewer than 500 in education. Even when one takes into account that at least 90 percent of the staff of colonial governments were locally employed officials, by post-war standards of staffing and by post-independence sums of manpower budgeting, the Colonial Service between the wars was demonstrably the victim of a policy of 'Empire on the Cheap'.⁶⁷

The outbreak of the Second World War in the aftermath of widespread economic depression exacerbated these conditions further: personnel and finances were redirected towards the war efforts to the detriment of colonial services. Therefore, the involvement of local elites reduced the number of European personnel required for effective operation of the colonial state. Local support and cooperation were necessary for the maintenance of law and order and for the effective implementation of government policy.⁶⁸

⁶⁶ Sharkey, *Living with Colonialism* (California: University of California Press, 2003); Bushra Hamad, "Sudan Notes and Records and Sudanese Nationalism, 1918-1956," *History in Africa* 22 (1995): 239-270, 240.

⁶⁷ Anthony Kirk-Greene, *On Crown Service: A History of HM Colonial and Overseas Civil Services 1837-1997* (New York: St Martin's Press, 1999), 36-37; Ben Jones, *Beyond the State in Rural Uganda* (Edinburgh: Edinburgh University Press, 2011), 41-42; Pratt, "Administration and Politics in Uganda 1919-1945," 476-541, 476. Sudan was not part of the Colonial Office—it was administered through the Foreign Office due to its ties with Egypt. Limited personnel was evident.

⁶⁸ Jones, *Beyond the State in Rural Uganda*, 38; Doyle, *Crisis & Decline in Bunyoro*, 103. Central to Doyle's argument is the that role chiefs played in reinforcing colonial power. For Doyle's argument on why areas like Bunyoro were neglected, see 164.

Before delving into the details of departmental structures it is useful to place them in the context of colonial governments. As Figure 1.2 shows, Uganda was colonised in 1894 and was a British Protectorate until 1962. Sudan was military

Figure 1.2: Colonial Government Structures

		UGANDA (British Protectorate)	SUDAN (Anglo-Egyptian Condominium)		
COLONIAL STATE		METROPOLE	Colonial Office 1894-1962	Foreign Office 1889-1956	METROPOLE
		CENTRAL	Governor Executive & Legislative Councils (est. 1920) Departments	Governor-General Governor-General Council Executive & Legislative Councils (est. 1948) Departments	CENTRAL
COLONIAL STATE		LOCAL	Provincial Commisioners LOCAL ELITE \ / LOCAL ELITE District Commisioners LOCAL ELITE LOCAL ELITE LOCAL ELITE LOCAL ELITE	Provincial Governors LOCAL ELITE \ / LOCAL ELITE District Commisioners LOCAL ELITE LOCAL ELITE LOCAL ELITE LOCAL ELITE	LOCAL

Source: Created by author (2019).

occupied in 1898 and was subject to Anglo-Egyptian Condominium status, with Britain as the dominant power. The Colonial Office administered Uganda and the Foreign Office administered Sudan. Both were administered under unique forms of colonialism but operated within colonial and international health circles.⁶⁹

In Uganda, Executive and Legislative Councils were established in 1920, whereas it was not until 1948 that these bodies were established in Sudan. However, a Governor-General Council was established in Sudan in 1910, which performed a similar role: it consisted of the Legal, Financial and Civil Secretaries,

⁶⁹ The King of Egypt chose the Governor-General to preside over the stipulated territory on recommendation from His Majesty's Government in the United Kingdom.

alongside representatives from the departments of education, health, and agriculture. The Governor-General had veto powers. In each territory these bodies were largely advisory, with a role in rubber-stamping ordinances. Intermediaries in the form of departmental workers, provincial commissioners or governors, district commissioners, and local elite undertook the day-to-day administration.⁷⁰

2.1 Bureaucratic Fragmentation

“I accounted myself fortunate,” remarked Sir Charles Dundas, Governor of Uganda 1940-45, “to have as my last charge a territory which could be truly described as a gem of the Empire.”⁷¹ This depiction was reminiscent of Winston Churchill’s oft quoted and earlier representation of the protectorate, the “Pearl of Africa”, when touring British territories in East Africa as Under Secretary of State for the Colonies in 1907.⁷² Reflecting on experiences in Uganda during the Second World War, Dundas described it as an “ideal land” for the administrator:

There was so much scope, a responsive people and means to hand for development of many sorts. There were no apparent complications, nor brewing troubles nor animosities. The resident Europeans, then numbering some three thousand souls, were engaged in administration, teaching and commerce, the three rôles [Dundas’s inflection] that have always seemed to me proper to White men in Africa.⁷³

The absence of threatening disturbances had meant that “British rule rested to a quite remarkable extent upon the unforced acquiescence of the populace”.⁷⁴ Yet Dundas’s clear belief in the paternal duties of British colonial officials on the continent disguised the difficult task of practical administration within a diverse

⁷⁰ By 1920 “each district in Uganda had its district commissioner and its hierarchy of native authorities”: Pratt, “Administration and Politics in Uganda 1919-1945,” 476; H. B. Thomas and Robert Scott, *Uganda* (Oxford: Oxford University Press and London: Humphrey Milford, 1935), 65-84; Ingram, *The Making of Modern Uganda*, 192-212.

⁷¹ Charles Dundas, *African Crossroads* (University of Michigan: Macmillan, 1955), 216. Churchill described Uganda as the Pearl of Africa. Useful introductions that support research in this section on the administration of Uganda are Thomas and Scott, *Uganda* and H. F. Morris, *Introduction to Annual Departmental Reports Relating to Uganda 1903-1961, Government Publications relating to Africa in microfilm* (Leeds: Solaprint, 1978).

⁷² Dundas’s elder brother was a long-standing friend of Churchill and this connection gave Dundas the opportunities for positions in East Africa.

⁷³ Dundas, *African Crossroads*, 214.

⁷⁴ Pratt, “Administration and Politics in Uganda 1919-1945,” 476.

protectorate and underestimated the impact of two world wars on how people in Uganda viewed themselves and their colonial rulers: unrest in Buganda highlighted these challenges in 1945.⁷⁵

During the 1920s, economic and social activities organised on a departmental basis were more firmly established in the government machinery.⁷⁶ Between 1925 and 1935, the number of European staff serving in Uganda increased across the board.⁷⁷ The Medical and Sanitary Department boasted the largest number of serving officials in 1925, while the Departments of Printing and the Geological Survey were still in nascent form.⁷⁸ From the mid-1930s to mid-1940s, the influx of European personnel stagnated as economic depression and world war took their toll.⁷⁹ The exceptions to this were the fourfold increase in the Geological Survey Department between 1925 and 1945 from 4 to 17 members of staff, while the Medical Department matched its increases from the previous years: both departments had duties to provide and monitor water supplies.⁸⁰

While each department had specific roles, there were some aspects of administration, such as the management and development of water supplies, that crossed departmental boundaries.⁸¹ In Uganda, for example, the main responsibilities for water supplies were split across, but not confined to, four departments: medical, public works, geological survey, and agriculture. Between 1925 and 1945, the Medical Department was in charge of water-related sanitation

⁷⁵ Pratt, "Administration and Politics in Uganda 1919-1945," 469-475, 469: "the second world war did much to disturb this state of unruffled calm"; Ingram, *The Making of Modern Uganda*, 225-228.

⁷⁶ Thomas and Scott, *Uganda*, 71-81.

⁷⁷ Departmental lists did not include numerous Asian and African members of staff. Uganda Protectorate, *Blue Book, For the Year ended December 31st, 1925*, (Uganda: Printed by the Government Printer, Entebbe, 1926), 100-109; Uganda Protectorate, *Blue Book, For the Year ended December 31st, 1935*, (Uganda: Printed and Published by the Government Printer, Entebbe, 1936), 68-75. Blue Books referred to hereafter as UBB plus year of publication.

⁷⁸ UBB 1925, 70-1 (medical and sanitary), 73 (printing), 74 (geological survey).

⁷⁹ UBB 1935, 103-104 (medical), 105-106 (education); medical and education showed exceptional increases within their departments, but for the education department this was short-lived.

⁸⁰ Uganda Protectorate, *Blue Book, For the Year ended December 31st, 1945*, (Uganda: Printed and Published by the Government Printer, Entebbe, 1947), 81-89 (geological survey and medical department). However, the increase in medical department was focused in the 'lower' positions, such as increases in sanitary and health inspectors, whilst the numbers of Medical Officers and Senior Medical Officers remained similar between 1925 and 1945.

⁸¹ G. E. W. Flood, Minute, Water Boring (water supplies), 11 July 1936, TNA, CO 536/188/9.

and water supplies inspections through its sanitary division; and the Public Works Department (PWD) was responsible for water supplies in townships—initially limited to Kampala, Entebbe and Jinja in the early years. Both departments also had responsibilities in laboratory-based water and milk quality testing (medical) and in drainage and canalisation (PWD). By 1945, the Geological Survey Department had appointed three officers specifically tasked with expanding and maintaining rural water supplies; the department as a whole oversaw development in this area.⁸² The Agricultural Department was responsible for water management as it related to increasing and improving methods for agricultural production. The water problem in Uganda was multifaceted and required diverse solutions, as the split responsibilities across departments revealed. Consequently, the bureaucrats and scientists working to resolve coordination issues placed different weight on particular aspects of the water problem and looked to resolve it in relation to their specific expertise. It is not surprising, therefore, that Frank Stockdale remarked, “some change from Departmentalism and the bottle-neck of the present Secretariat system will require consideration.”⁸³ As the government in Uganda looked to structure solutions to economic and social problems on a departmental basis, the definition of the water problem and its overall solutions were restricted. Unless bureaucrats and scientists could find ways to bring together their separate branches of knowledge and deliberate solutions in a cooperative manner, several aspects of the water problem would remain either resolved in part or unresolved.

The separation of duties across departments made it difficult to measure the financial contributions of the government to the management and development of water supplies. While cost break downs were available for the Medical Department, they were limited to the funds set aside for the separate divisions of public health and sanitation: technically, water fitted into both these categories, but was more predominantly discussed within the sanitation division. The multiple headings associated with water supplies added to this problem of delineating funds. It was only when the British Government or other donors made grants and loans available for specific water-related projects that the occasional demarcation of funds occurred: for example, the pipe replacement for the Kampala water

⁸² UBB 1945, 81-89.

⁸³ Frank Stockdale, Minute, Water Boring (water supplies), 14 July 1936, TNA, CO 536/188/9.

supplies in the mid-1930s.⁸⁴ Even so, specific programmes for particular areas did not give a broad sense of whether water supplies were a prioritised investment within the protectorate.

Outside assistance for improving water supplies in the protectorate was also sparing and it was difficult to justify as Uganda's financial position and its access to large bodies of water relative to other colonial territories precluded attention from the Colonial Office and its Development Fund. Once boundaries were established in 1926, Uganda's surface area totalled 243,410 square kilometres, of which 86 percent was land and 14 percent was water.⁸⁵ However, its three largest lakes—Victoria, Albert, and Edward—were shared with bordering territories and the Uganda's "apparent wealth of lakes and waterways" belied the challenges in varied rainfall distribution, the conservation of supplies, and the preferential treatment that Egypt and Sudan received in terms of access to water within the Nile Basin: Lake Victoria, the Victoria Nile, Lake Kioga, Lake Albert and the Albert Nile were all within the Nile River Basin, and from 1929 were subject to the Nile Waters Agreement.⁸⁶

In contrast to Uganda, Sudan had the largest surface area within the African continent and was more than ten times the size of Uganda until South Sudan's independence in 2011. As a territory two and a half million square kilometres in size, Sudan was a territory marked by differences: people, climate, and resources. Within Sudan, there were upwards of 600 ethnic groups speaking 400 languages and dialects, with each differing in culture, religion, and ways of life.⁸⁷ Past and present tribal rivalries fuelled cleavages across Sudan, as did the predominance of Egyptian (Arab) influence in the north and British influence in the south. Its climate varied from the arid north, of which journalist and newspaper publisher Beshir Mohammed Said remarked, "rain is something they only know about from reading the newspapers", to the wetlands in the south where average

⁸⁴ See UBB 1935, 80-81; Development: Drainage Schemes, 1934, TNA, CO 536/182/8.

⁸⁵ Thomas and Scott, *Uganda*, 44.

⁸⁶ Thomas and Scott, *Uganda*, 47-48. For detail on the Nile Waters Agreement 1929 and its impact in East Africa and the Sudan, see Egypt and Great Britain: Nile waters agreement, TNA, FO 141/765/29; Impact of Anglo-Egyptian Nile Waters Agreement on the Sudan, TNA, FO 141/501/3; Water irrigation and storage projects: Upper Nile irrigation projects; proposed construction of dam and reservoir at Lake Albert; possibilities of water storage in Lake Victoria, 1927-1947, TNA, CO 536/217/1.

⁸⁷ Peter K. Bechtold, "The Society and the Environment," in *Sudan: A Country Study*, ed. LaVerle Berry (US: Library of Congress, 2015, fifth edition), 59-140, 76-93; Beshir Mohammed Said, *The Sudan: Crossroads of Africa* (London: Bodley Head, 1965), 12.

rainfall was between 800 and 1000mm per year.⁸⁸ These climatic differentials also influenced access to resources such as food and water; this accounted for the nomadic way of life in regions of scarce supply. This contrasted with British investment in Gezira, an area 100 miles south of Khartoum, which formed a defining feature of Sudan's landscape during this period. This irrigated land, which encouraged the local population to settle in the area, supplied one fifth of the government revenue by 1945 and was hailed as a model development scheme.⁸⁹

Despite the financial devolution and the decentralisation of governmental responsibilities, the departmental set up remained the cornerstone of British efforts to improve economic and social conditions in Sudan—the three largest of which were the Railways and Steamers Department, the Medical Services, and the Agriculture and Forestry Division.⁹⁰ Given the vast distances administrators had to cover, it is not surprising that transport was the highest priority. During this period, the most notable shift was seen in the threefold increase in the Education Department staff between 1935 and 1945.⁹¹ In contrast, the smallest department was, and remained, the Geological Survey, comprising of two staff members throughout the period.⁹² In the 1930s, the Geological Survey transferred its jurisdiction from the Education Department to the Public Works Department, which suggested a move from research to practical application, as well as a focus on water supplies in the territory.

As in Uganda, different departments grappled with the complex task of water supplies management and development during this period. The Geological

⁸⁸ Said, *The Sudan: Crossroads of Africa*, 12; G. W. Grabham, *Water Supplies in the Anglo-Egyptian Sudan, Bulletin No. 2*, (Khartoum: Sudan Government, 1934); the main variables were the amount of rainfall and the length of the dry season: see Bechtold, "The Society and the Environment," 70-71.

⁸⁹ M. O. Beshir, "The Gezira Scheme: An Experiment in Socio-economic Development," *Civilisations* 11, no. 1, (1961): 63-67, 63; See FAC Sudan Reports. For example, Anthony Eden (Secretary of State for Foreign Affairs) in FAC 1936, Cmd. 5575, 134.

⁹⁰ Durham University Special Collection, "Sudan Staff Lists, Quarterly list Sudan government showing appointments and stations for the quarter beginning 1st July, 1925," 1925, accessed May 10, 2016, https://www.dur.ac.uk/library/asc/sudan/staff_lists/; Durham University Special Collection, "Sudan Staff Lists, Quarterly list, Quarterly list of the Sudan government 1st April, 1935," 1935, accessed May 10, 2016, https://www.dur.ac.uk/library/asc/sudan/staff_lists/; Durham University Special Collections, "Sudan Staff Lists, Quarterly Reports Sudan July; Half yearly staff list of the Sudan government 1st March, 1945," 1945, accessed May 10, 2016, https://www.dur.ac.uk/library/asc/sudan/staff_lists/.

⁹¹ *Sudan Staff Lists, 1925; Sudan Staff Lists, 1935; Sudan Staff Lists, 1945.*

⁹² *Sudan Staff Lists, 1925; Sudan Staff Lists, 1935; Sudan Staff Lists, 1945.*

Survey handled rural water supplies and had the financial and practical backing of the Public Works Department (PWD). The PWD was also in charge of township water supplies and swamp and bush clearance. The Medical Department and the affiliated Wellcome Tropical Research Laboratory and Stack Research Laboratories (WTRLK) focused on sanitation, water supplies protection and inspection, and chemical and bacteriological testing. The main contrast between Uganda and Sudan was the separate Irrigation Department in the latter which dealt with the use of water for agricultural purposes; in Uganda this was the remit of the Agricultural Department as only small-scale irrigation works were established during this period. In Sudan, the Irrigation Department was a politically charged arena as it was heavily influenced by Egyptian engineers and the politics surrounding the distribution of the Nile waters.

Estimates of funds spent on water supplies, particularly those for domestic use, were difficult to assess. Aside from external investments in water development schemes primarily for economic purposes, details were scanty; sometimes the PWD specified funds for water supplies, but demarcation of funds was inconsistent. The use of General Reserve Funds, discussed later, reveals the utilisation of surplus revenue to improve water supplies. However, this was only feasible while government surpluses existed and on the proviso that there were no other urgent matters that required attention.⁹³ The primary external assistance relating to water supplies development during this period was a London loan of just under £12 million sterling to support the establishment of the Gezira scheme 1919-1925.⁹⁴

The River Nile at the heart of the territory was a rich resource, but due to the Nile Waters Agreement 1929, its had limited productive value outside of Egypt.

⁹³ General Reserve Funds: FAC Sudan 1925, 83-84; FAC Sudan 1926, 107-108; FAC Sudan 1927, 131-132; FAC Sudan 1928, 146-147; FAC Sudan 1929, 150-151; FAC Sudan 1930, 161; FAC Sudan 1931, 156; FAC Sudan 1932, 168; FAC Sudan 1933, 158; FAC Sudan 1934, 149; FAC Sudan 1935, 145; FAC Sudan 1936, 135; FAC Sudan 1937, 131; FAC Sudan 1938, 139; FAC Sudan 1939-41, 198-199; FAC Sudan 1942-44, 194-195; FAC Sudan 1945, 211.

⁹⁴ FAC Sudan 1925, 86: 1919 - £3,500,000; 1921- £2,880,000; 1923 - £3,250,000; 1924 - £2,013,400 (raised as two separate loans, 1924). The ability to raise loans in London alongside contributions from Egypt towards government revenue during this period, formed the majority of external funds supporting the territory: Egyptian contributions varied from £E500,000 and £E750,000 1925-1938, constituting between 10 and 20 percent of Sudan Government revenue. This drastically reduced in its last two installments of 1939 and 1940, when it dipped to 6 and 1 percent, respectively. See FAC Sudan 1925, 81; FAC Sudan 1928, 142; FAC Sudan 1938, 138; FAC Sudan 1939-41, 196.

Under this agreement, Egypt had exclusive rights to the Nile waters, with small concessions for Sudan which centred around the Gezira area.⁹⁵ Compensation for the environmental impact of the Jebel Aulia Dam, built across the White Nile near Khartoum and completed in 1937, was paid to the Sudan Government from Egypt, but this represented an investment in water supplies for Egypt rather than for the Sudan.⁹⁶ The politicking between British and Egyptian authorities over the Nile Waters and the resulting policies in favour of Egypt and the Gezira irrigation area created and further exacerbated divisions between the northern and southern regions.

This diverse population spread throughout contrasting terrains had a variety of issues to contend with: this presented a complex challenge to the colonial administration. Sudan was, as Said described, “Africa in miniature”.⁹⁷ As such, the management and development of water supplies presented a formidable task, particularly for an administration reliant on local support to retain territorial control.

2.2 Medical Departments and their Engagement with Water

As David Bradley’s classificatory system showed in retrospect, many of the diseases that administrators and specialists were trying to tackle during this period had connections with water. For example, diseases such as dysentery, spread by the ingestion of faeces-contaminated water or food, affected both urban and rural populations; urban areas were particularly susceptible due to the higher population density sharing adulterated resources. Dysentery and other gastro-intestinal diseases disproportionately affected infant mortality, which was important in Uganda and Sudan, where the age distribution of the population favoured the younger end of the spectrum.⁹⁸ Diseases were also contracted by drinking from, washing clothes in, and bathing in, contaminated water (notably bilharzia and

⁹⁵ The Equatorial Nile Project and the Nile Waters Agreement of 1929, 1957: Nile Waters Commission, TNA, CO 822/1412; “The Nile Waters Agreement,” *Bulletin of International News* 5, no. 53 (May 25, 1929): 3-10.

⁹⁶ See Chapter 1, footnote 86.

⁹⁷ Said, *The Sudan: Crossroads of Africa*, 11.

⁹⁸ Wolf-Peter Schmidt, “The Elusive Effect of Water and Sanitation on the Global Burden of Disease,” *Tropical Medicine and International Health* 5, 19 (2014): 522-527; Shane Doyle, “Population Decline and Delayed Recovery in Bunyoro, 1860-1960,” *The Journal of African History* 3, no. 41 (2000): 429-458; On the post-war period, see analysis of infant mortality, Joanna Lunt, “Water, Public Health and Development: The Case of Uganda 1948-1972,” (masters dissertation, University of York, 2012), Part I: Uganda Disease Environment 1948-72, 12-36.

guinea worm disease).⁹⁹ In addition, water shortages had indirect effects on agrarian productivity, which also impacted on nutrition and therefore health.

Part of the challenge that advocates of the relationship between water and health faced was that, as a field, tropical medicine focused on discovering the entities that caused disease and placed greater emphasis on curative rather than preventive medicine. Building drains in Khartoum did not hold the prestige that could be gained through medical breakthroughs in tropical diseases. Hospitals had some symbolic value but, overall, colonial primary healthcare consisted of a series of badly connected and poorly funded Cinderella services afflicted by shortages of skilled staff. In part, this bias explains the lag before colonial agencies committed to investing in sanitation and improving water supplies. Bureaucratic fragmentation led to compartmentalisation. This in turn led to major coordinating problems, making it more difficult to establish a consensus regarding policy priorities with respect to investigating and investing in water and mobilising resources to implement plans.

Between 1925 and 1945, the two main sections of Medical and Sanitary Department reports in Uganda were entitled “Public Health” and “Sanitation”.¹⁰⁰ In the public health section, diseases were categorised in two separate ways: first, their epidemic, endemic or infectious nature and how diseases affected different bodily systems (digestive, eyes, heart etc.). Second, communicable diseases, sub-categorised as (a) mosquito or insect borne (b) infectious or epidemic (c) helminthic. The sanitation section split preventive measures into two categories: epidemic and mosquito or insect borne.¹⁰¹ Such categorisations emphasised the priorities in epidemic disease management and diseases transmitted by insect vectors, *inter alia* mosquitoes. However, if we look beneath these categorisations, we can see a strong emphasis, particularly through the sanitary section, on water-based or water-related solutions and management methods associated with particular diseases, such as sleeping sickness and malaria.

Following an LNHO Conference on sleeping sickness in 1925, Entebbe (situated on the shores of Lake Victoria in Uganda) was chosen to host a sleeping

⁹⁹ John Farley, *Bilharzia*.

¹⁰⁰ Uganda, *General Annual Medical Report*, for the years 1925 to 1945, Wellcome Library, London, WA28.HU4 U26; Uganda, *General Annual Medical Reports*, for the years 1925 to 1945, Tables of Contents. Hereafter, *General Annual Medical Reports* for Uganda and Sudan will be referred to as [territory], *GAMR*, [year].

¹⁰¹ Uganda, *GAMR*, for the years 1925 to 1945.

sickness station.¹⁰² A large concentration of researchers and sanitarians were involved in combating sleeping sickness in Uganda during the 1920s, particularly after this conference, and following a further meeting in 1928.¹⁰³ This was evident from the attention given to the disease in both Medical and Sanitary Department reports and Colonial Office papers related to the Institute established in 1928.¹⁰⁴ From 1926 until 1932, special reports were written about sleeping sickness.¹⁰⁵ These detailed progress in the control and management of sleeping sickness throughout the colony. The 1928 report reiterated the perceived connection between sleeping sickness and watering places:

the view taken in 1924, that the cases found among the recently established population of Bungungu, had been previously infected when they lived near the Waki River, has proved to be correct.¹⁰⁶

In 1926 concern was expressed: “there are watering places on the Nile quite uncleared [and] where several fly-infested streams flow down to Lake Edward [...] clearings were found to be extremely inadequate”.¹⁰⁷ Following an outbreak of sleeping sickness in Murchison Bay, south of Kampala, the 1927 report remarked that:

all persons owning land along the lake shore should be compelled, under No. 6 of the Sleeping Sickness Rules, to clear their own section of the shore for one hundred yards back from the water.¹⁰⁸

It compared the situation in Bunyuli (deemed satisfactory) and Bugweri (deemed unsatisfactory). Regarding the former it noted that, “the natives seem to understand that what is required of them is to keep away from the swamp

¹⁰² Sleeping Sickness in Equatorial Africa: League of Nations proposal for a conference of representatives from governments with territories in Equatorial Africa, 1925, TNA, CO 323/936/1; Uganda, *GAMR*, for the years 1925 to 1945.

¹⁰³ Sleeping Sickness in Equatorial Africa, TNA, CO 323/936/1.

¹⁰⁴ Sleeping Sickness in Equatorial Africa, TNA, CO 323/936/1; For more on sleeping sickness research station see: Sleeping Sickness Research Station, Entebbe, TNA, CO 822/15/10, 1929-30 and Sleeping Sickness Research Institute, Entebbe, 1932-33, TNA, CO 822/45/6; Uganda, *GAMR*, for the years 1925 to 1945.

¹⁰⁵ Uganda, *GAMR*, 1926, 64-71; Uganda, *GAMR*, 1927, 66-74; Uganda, *GAMR*, 1928, 75-83; Uganda, *GAMR*, 1929, 53-59; Uganda, *GAMR*, 1930, 88-93; Uganda, *GAMR*, 1931, 77-80.

¹⁰⁶ Uganda, *GAMR*, 1928, 78. Bunyoro sleeping sickness area.

¹⁰⁷ Uganda, *GAMR*, 1926, 66.

¹⁰⁸ Uganda, *GAMR*, 1927, 69.

altogether or to clear and cultivate to the edge of the water.”¹⁰⁹ Regarding the latter it stated that conditions were “as unsatisfactory and disappointing as they are pleasing in Bunyuli” and that nothing was done for protection: “not even the watering places have been cleared.”¹¹⁰ In the Madi area of Gulu, the steady annual decline in sleeping sickness was attributed, at least in part, to the fact that “the people had already been removed from the vicinity of the dangerous river Omvosso.”¹¹¹ These are only a few examples of the importance placed upon clearing watering places to mitigate sleeping sickness outbreaks.¹¹²

Mosquitos were considered another troublesome insect linked to water. In 1925, anti-malarial measures varied. They consisted of: drainage and swamp reclamation; the clearing, grading and training of channels; filling and draining borrow-pits; bush clearing and cultivation; the use of oil and larvicides in tanks and on collections of water; and personal prophylaxis such as quinine and anti-mosquito protection. There were disadvantages to each of these methods. Drainage and swamp reclamation were time-consuming and required a substantial labour force. Oiling tanks was deemed “unsatisfactory” and “objectionable” because they were principally used as drinking water sources.¹¹³ Regarding prophylaxis, an LNHO report in 1932 warned of limited quinine supplies.¹¹⁴ By 1938, the use of larvicides was popular—Paris Green and “anti-malarial mixture[s]”: these larvicides, alongside filling wells and depressions, “continued as routine measures in most stations.”¹¹⁵ The presence of larvae in water sources used by the population meant that the colonial officials felt it was necessary and most effective to deal with the problem at the larval level.

The Medical Department also engaged with water in other ways. The laboratories attached to the department undertook chemical and bacteriological testing on water supplies and milk. These were confined to a few areas because of personnel limitations and laboratory facilities, but samples were taken from each province—Entebbe; Kampala and Jinja in Buganda; Lake Katwe in the Western

¹⁰⁹ Uganda, *GAMR*, 1927, 70.

¹¹⁰ Uganda, *GAMR*, 1927, 70.

¹¹¹ Uganda, *GAMR*, 1927, 73.

¹¹² Uganda, *GAMR*, 1925, 39.

¹¹³ Uganda, *GAMR*, 1925; Uganda, *GAMR*, 1938, 38.

¹¹⁴ League of Nations Health Organisation, *Enquiry into the Quinine Requirements of Malarial Countries and the World Prevalence of Malaria* (Geneva, LNHO, 1932), Rockefeller Archive Center, Nelson C. Davies Papers, IV2A28, Box 28, 1932.

¹¹⁵ Uganda, *GAMR*, 1938, 38.

Province; Arua in the Northern Province; and Tororo in the Eastern Province.¹¹⁶ Milk adulteration was particularly rife in Kampala as local milk was in limited supply. Water was the main contaminant and concern was raised that those selling the milk diluted it using water from any “convenient stream”.¹¹⁷ The 1927 report continued on to argue that as a result there was “every likelihood of spreading dysentery and typhoid throughout the community”.¹¹⁸

In 1932 William Henry Kauntze took over the directorship of the Medical and Sanitary Department and remained in office until 1941. During this period, Kauntze’s primary motive was to promote medical education in the protectorate, believing that this was the missing ingredient to the success of ‘modern’ medicine in Uganda. In 1935 Kauntze oversaw the first Welfare Exhibition in Mbale, which was deemed so successful that a further show was planned in Lango on the north shores of Lake Kioga.¹¹⁹ As part of this emphasis on medical education, Kauntze highlighted the importance of water supplies and their protection, stating in 1939, “there can be no doubt that the African population generally is being educated to prefer clean drinking water.”¹²⁰ Throughout the reports during Kauntze’s directorship there was brief, but constant, reference to the cooperation and interest of the local population in the protection of water supplies.¹²¹ Kauntze went so far to state that protected supplies had “become so popular” that it was hoped that the PWD would “take over the responsibility of training Africans to continue this work.”¹²² Kauntze was also keen to promote rural sanitation, alluding to the 1932 LNHO sponsored conference in the Annual Report in 1933.¹²³

Despite this emphasis on water, rural sanitation, and efforts to tackle malaria, concerns were raised about the limited personnel and lack of funds for improving water supplies and combating malaria effectively.¹²⁴ Regarding malaria, G. R. H. Chell, Deputy Director of Sanitary Services, complained that measures taken were “unsatisfactory”, and that there were “insufficient sums of money” due to:

¹¹⁶ Uganda, *GAMR*, 1931, 47.

¹¹⁷ Uganda, *GAMR*, 1927, 32; Uganda, *GAMR*, 1926, 28.

¹¹⁸ Uganda, *GAMR*, 1927, 32

¹¹⁹ Uganda, *GAMR*, 1935, 43-46.

¹²⁰ Uganda, *GAMR*, 1939, 36.

¹²¹ Uganda, *GAMR*, 1934, 5; Uganda, *GAMR*, 1936, 13; Uganda, *GAMR*, 1938, 43;

Uganda, *GAMR*, 1940, 9. Shelton was temporary director in 1940 in Kauntze’s absence.

¹²² Uganda, *GAMR*, 1936, 13.

¹²³ Uganda, *GAMR*, 1933, 6.

¹²⁴ Uganda, *GAMR*, 1925; Uganda, *GAMR*, 1927, 28.

divided control, since part of these funds is administered by the Township Authorities, and part by the Sanitation Department. While in most cases co-operation is attempted, unity of purpose and effort is not always complete.¹²⁵

Chell believed that, to make improvements, the sanitary section should have control over funds in order to implement the measures they were tasked to undertake. Problems also arose in relation to the dual responsibility for anti-malarial measures in the Public Works Department brickfields between the PWD and the Sanitation Department. This led to “a good deal of misunderstanding” and it was agreed in 1927 that the Sanitation Department would implement necessary measures and the PWD would “merely contribute to the cost.”¹²⁶ The tensions between departments were evident. In this case, PWD expertise on anti-malarial measures was questioned and the Sanitation Department expertise was vindicated.

Between 1900 and 1901, Henry Wellcome, co-founder of the pharmaceutical company Burroughs Wellcome & Co in 1880, visited Sudan. This trip prompted the businessman and philanthropist to establish the Wellcome Tropical Research Laboratories in Khartoum (WTRLK) in 1903: the first British medical institution in the condominium.¹²⁷ The government-run Sudan Medical Service was established the following year, and the Stack Medical Research Laboratories, named in commemoration of Lee Stack, were built 1927-1928. Directed as three separate institutions until 1934, they formed the bedrock of western medical research and practice in Sudan. In 1928, the WTRLK’s bacteriological section was moved to the Stack Laboratories. By 1934, the segmentation of the WTRLK was completed; the Stack Laboratories were subsumed under the Sudan Medical Services, and the chemical and entomological sections fell under the agriculture and forests departments’ jurisdiction.¹²⁸ Once established and reorganised in 1935, the Medical Service consisted of “three main sections—public health, hospitals and laboratories.”¹²⁹ Appendix A details the organisation of services that resulted in

¹²⁵ Uganda, *GAMR*, 1927, 28.

¹²⁶ Uganda, *GAMR*, 1927, 20-21.

¹²⁷ Ahmed Awad Abdel-Hameed, “The Wellcome Tropical Research Laboratories in Khartoum (1903-1934): An Experiment in Development,” *Medical History* 41, 1 (January 1997): 30-58.

¹²⁸ Later the Medical Services also absorbed Wellcome Chemical Laboratory.

¹²⁹ Sudan, *GAMR*, 1937, 93.

1937.¹³⁰ Combining evidence from the Medical Service reports with this restructure, we can see the multiple sections connected either directly or indirectly with water (highlighted in blue); this covers almost two thirds of the headings.

From 1929 the reports began with a map showing sleeping sickness areas in Sudan. These were mostly in the south of the territory on the borderlands of the French Congo, Belgian Congo, Uganda and Kenya.¹³¹ In 1937, a map showing hospitals and dispensaries and their distribution replaced the sleeping sickness map. The Medical Service's health coverage was minimal through the 1920s, focusing heavily on areas of economic value (such as the Gezira), those of political import (such as Khartoum), or border areas where territorial security was of paramount concern. The Gezira was crucial to the Sudanese economy and thus the health of those within the region was considered a high priority. Khartoum was situated upon the divergence of the Nile River as it flowed into the Blue and White Nile tributaries: as the capital it held great political significance. The Southern borders were also given ample attention:

The Sudan, by reason of its geographical position, is especially vulnerable to the introduction of epidemic disease from neighbouring countries.¹³²

This provides an explanation for the importance of the sleeping sickness map at the front of medical reports. Large numbers of staff worked in sleeping sickness infested regions along the southern borders of Sudan, and according to reports, carried out 563,798 medical examinations in 1934 alone.¹³³ The detailed information on this disease highlighted the importance placed on maintaining health in the border regions in order to protect the health of the territory as a whole.¹³⁴

The expansion of services across the territory accelerated under O. F. H. Atkey's Directorship in the 1930s. Posted to Sudan in 1907 and acting as Medical Supervisor in the Blue Nile Province between 1919 and 1922, Atkey had worked up the ranks to promotion as Director. Responsible for the reorganisation of

¹³⁰ See Appendix A, 328.

¹³¹ Sudan, *GAMR*, 1929; Sudan, *GAMR*, 1930; Sudan, *GAMR*, 1931; Sudan, *GAMR*, 1932; Sudan, *GAMR*, 1933; Sudan, *GAMR*, 1934; Sudan, *GAMR*, 1935; Sudan, *GAMR*, 1936; Sudan, *GAMR*, 1937; Sudan, *GAMR*, 1938; Sudan, *GAMR*, 1939; Sudan, *GAMR*, 1940.

¹³² Sudan, *GAMR*, 1937, 26.

¹³³ Sudan *GAMR*, 1934, 27.

¹³⁴ Sudan *GAMR*, 1934, 27.

services in the early 1930s, Atkey laid the foundations for shifting Sudan's reputation from a sleeping sickness haven to a territory with a flourishing medical service. The map of medical centres reflected this shift. This move occurred in parallel with the slowly changing conceptualisations of health and disease in Africa and was expressed through correspondence and meeting reports associated with LNHO sponsored conferences between 1925 and 1935.¹³⁵ British participation on both the colonial and international stage undoubtedly affected the administration of its territories in Africa, and we can surmise that the wider networks in medicine had some influence on the changing approaches within British imperial territories.

Throughout this period, the Medical Services reports began with a list of epidemic and endemic diseases, discussed in alphabetic order. The second section was specifically entitled Public Health (1925-1935; 1945) or Public Health and Hygiene (1935-1945) and contained reports on the status of public health and hygiene as they related to both the territory as a whole and to the provinces specifically. In the late 1920s, provincial reports were limited to important strategic locations: Khartoum and Port Sudan. Located on the border of the Red Sea, Port Sudan was established in 1905 to replace the Suakin port further south and became the primary location for marine traffic.¹³⁶ By 1935, provincial reports were also available for Atbara, Wad Medani, Gebel Aulia and the Blue Nile Provinces. Two years later, reports were available for all the provinces: Khartoum, Northern Province, Blue Nile Province, Kassala, Kordofan, Darfur, Upper Nile, and Equatoria. This reflected the rapid expansion of services during the 1930s, but again highlighted the prioritisation of strategic locations first. For example, a dam was built on the White Nile at Gebel Aulia between 1933 and 1937 and the Blue Nile Province housed the Gezira scheme. In Sudan, the provincial details provided important perspectives on health in the different regions, including the availability of medical and health staff.¹³⁷

Between 1925 and 1945, many of the diseases considered endemic in Sudan remained the same, and some epidemic diseases were continuous issues throughout the period. Appendix B shows the list of epidemic and endemic

¹³⁵ League of Nations Health Organisation, "Report of the Health Organisation Jan 1931 - Sept 1932," *Quarterly Bulletin of the Health Organisation* 1, 3 (September 1932), CUL, RCS, OP. 309.25.01(1); LNHO, *Report of the Pan African Health Conference*, 7 January 1936, TNA, CO 847/6/7.

¹³⁶ Kenneth J. Perkins, *Port Sudan: The Evolution of a Colonial City: State, Culture, and Society in Arab North Africa* (Boulder, Colo.: Westview, 1993).

¹³⁷ These are compared further in Chapter 1, Section 3.2.

diseases mentioned in the Sudan Medical Service reports between 1928 and 1945.¹³⁸ The ten endemic diseases referred to in each year were ancylostomiasis (hookworm), bilharziasis, blackwater fever, dracontasis (also known as guinea worm disease and dracunculiasis), dysentery, leprosy, malaria, rabies, sleeping sickness and tuberculosis.¹³⁹ Epidemic diseases included anthrax, cerebro-spinal meningitis, dengue, diphtheria, influenza, infectious jaundice, measles, relapsing fever, smallpox, typhus, whooping cough and yellow fever, but only four of these were mentioned in each year between 1928 and 1945: cerebro-spinal meningitis, diphtheria, relapsing fever, and smallpox.¹⁴⁰ Within these lists were diseases that had direct and indirect connections with water; some related to the climate, some provided a medium for transmission.

Commenting on twenty years of sleeping sickness studies, the Medical Service report in 1930 described the disease as “extremely chronic” with a 60 percent mortality rate.¹⁴¹ If cases were not detected early, incidence increased rapidly, but there was strong belief that the disease could be “completely eradicated”.¹⁴² This optimism was soon tested with the retrogression of sleeping sickness in 1931. A Senior Medical Officer apportioned blame to chiefs, bush dwellers, and climatic conditions, such as late rains.¹⁴³ It was argued that “heavily infested streams on the other side of the border” caused concern and chiefs neglected their duties: watering places were not cleared and attendance at sleeping sickness inspections was not enforced.¹⁴⁴ The danger expressed in the lack of border security continued to find mention in Medical Service reports. In 1932, it was (apparently) found “that the people were drinking from infected stream heads on the French side of the border”.¹⁴⁵

Like sleeping sickness, malaria was associated with late and irregular rainfall. Lack of access to water during such periods forced the population to use contaminated sources and brought them into contact with mosquitoes and flies. In 1928, the contrast in malaria incidence between 1927 and 1928 was attributed to the difference in climatic conditions. Reports up to the autumn of 1927 attributed

¹³⁸ See Appendix B, 329-330. From 1928, as this was when there was a comparable data set.

¹³⁹ Sudan, *GAMR*, 1928 to 1945, tables of contents.

¹⁴⁰ Sudan, *GAMR*, 1928 to 1945, tables of contents.

¹⁴¹ Sudan, *GAMR*, 1930, 46.

¹⁴² Sudan, *GAMR*, 1931, 46.

¹⁴³ Sudan, *GAMR*, 1931, 27.

¹⁴⁴ Sudan, *GAMR*, 1931, 27.

¹⁴⁵ Sudan, *GAMR*, 1932, 31; Sudan, *GAMR*, 1934, 26.

lower malaria incidence to “the lower rainfall, the better spacing of the rains, and the lower humidity”, whereas the “heavy rains followed by a warm winter” were given as the explanatory factors for the higher number of malaria cases between the autumn of 1927 and the late spring of 1928.¹⁴⁶ In 1936 the Medical Service report once again referred to climate as the main explanation for high rates of malaria: “a late rainy season with badly spaced rains, and an irregular fall in the level of the Nile, combined to create an ideal state of affairs for mosquito breeding.”¹⁴⁷ This resulted in the higher incidence of malaria but the improved health services kept the disease “within bounds.”¹⁴⁸ Similarly, heavy or “badly spaced” rains were associated with mosquito breeding and malaria.¹⁴⁹ In irrigated areas, surface drainage was regarded as the only effective method to reduce epidemic and endemic malaria but “this was not an easy engineering problem” to resolve, particularly in the Gezira area.¹⁵⁰ Impacts varied throughout the territory, which was evident in the differing experiences of malaria incidence in Khartoum, the Northern Province, Kassala, and Darfur in 1938.¹⁵¹ Whether water—in this case rainfall—was the decisive factor we cannot be certain. However, the frequent referral to this issue suggested there was some merit in the attribution of climatic conditions to the incidence of malaria.

The preventive measures taken to combat mosquitoes centred on the management of water. From the late 1930 there were several references about the importance of local involvement: changes in departmental organisation regarding malaria had enabled anti-mosquito measures to be carried out in some rural areas.¹⁵² In 1939 measures were taken to eliminate mosquito breeding in Equatoria and Darfur.¹⁵³ In Equatoria, this was:

effected by the planting of eucalyptus in swamp areas and by careful attention to the smaller breeding places, such as pools in rocks, borrow pits, rain pools, holes in trees etc.¹⁵⁴

¹⁴⁶ Sudan, *GAMR*, 1928, 1.

¹⁴⁷ Sudan, *GAMR*, 1936, 18.

¹⁴⁸ Sudan, *GAMR*, 1936, 18.

¹⁴⁹ Sudan, *GAMR*, 1931, 27; Sudan, *GAMR*, 1936, 18; Sudan, *GAMR*, 1939.

¹⁵⁰ Sudan, *GAMR*, 1930, 59, 59-60; Sudan, *GAMR*, 1929, 55-56; Sudan, *GAMR*, 1935, 18.

¹⁵¹ Sudan, *GAMR*, 1938, 42, 53, 55, 58-59.

¹⁵² Sudan, *GAMR*, 1937, 28, 93.

¹⁵³ Sudan, *GAMR*, 1939, 44, 46.

¹⁵⁴ Sudan, *GAMR*, 1939, 46.

In Darfur there were 44 lectures on mosquito work with “selected mounted police” used as mosquito scouts and tasked with patrolling and reporting “infected pools and other breeding places which were then treated.”¹⁵⁵ It was noted that “near Fasher the villagers showed interest and voluntarily oiled their own pools expressing themselves pleased with the improvement in conditions.”¹⁵⁶

Bilharzia presented a different kind of challenge. By 1939, the impact of the disease was drastically reduced from its peak in the late 1920s and early 1930s.¹⁵⁷ However, it remained endemic and concerns grew over migrant labour as a primary reservoir for the disease:

A large scheme to provide piped water supplies to villages had to be abandoned during the year owing to the difficulty of obtaining materials. This was regrettable as the provision of a good water supply is the chief weapon in prevention. The eradication of bilharzia is a problem that would be better tackled by engineers than by doctors.¹⁵⁸

Not only did this point to water supplies as being crucial for prevention, this comment highlighted the role of non-medical professionals. Further, it reiterated the Medical Service’s comments two years earlier. In a historical survey of the development of the Sudan Medical Service, the report stated:

It is likely that the medical service as a whole is now fully developed in all its branches as is necessary and that the interests of public health in the near future may be better served by spending any additional funds available not directly on medical and public health administration but indirectly on the improvement of urban and rural water supplies, sanitation and drainage, housing and food.¹⁵⁹

Sanitation, particularly through the provision of latrines and clean water supplies, was pressed forward in the late 1930s. Village wells and piped water supplies were “improved as fast as funds permit.”¹⁶⁰ Moreover the “embarrassing number of proposals for sanitary improvements” from provincial authorities, and stimulated by local sanitary staff, were noted.¹⁶¹ Poor sanitary conditions exacerbated the

¹⁵⁵ Sudan, *GAMR*, 1939, 44.

¹⁵⁶ Sudan, *GAMR*, 1939, 45.

¹⁵⁷ Sudan, *GAMR*, 1929, 13; 1931, 2.

¹⁵⁸ Sudan, *GAMR*, 1939, 9, 10.

¹⁵⁹ Sudan, *GAMR*, 1937, 95.

¹⁶⁰ Sudan, *GAMR*, 1938, 92.

¹⁶¹ Sudan, *GAMR*, 1938, 92; *GAMR*, 1937, 26.

incidence of several diseases. For example, in the Equatoria Province, 1939, the report on provincial health described the need for conservancy systems (the provision of latrines), “owing to the almost universal prevalence of hookworm.”¹⁶²

Guinea worm disease (after yaws and ulcers) was deemed “the most common cause of incapacity for work in certain areas of the southern Sudan [Dilling, Bahr-el-Ghazal, Upper Nile Province, Mongalla].”¹⁶³ Labelled “crippling” and “disabling”, the disease was best controlled through the provision of wells and filters.¹⁶⁴ In Equatoria, 1940, “the protection, and in some places, the provision of good water supplies” were deemed “one of the most urgent problems.”¹⁶⁵

Poor village sanitation, particularly lack of latrine provision, was also linked to dysentery and enteric fever. In this regard, the Medical Service report in 1940 stated that “promiscuous defecation in cultivation areas is probably the principal source of infection of both enteric fever and dysentery. The programme of construction of public latrines continues but much remains to be done.”¹⁶⁶ There were also questions earlier in the period over whether dysentery was water borne or fly borne.¹⁶⁷

In addition, the Wellcome Chemical Laboratories and the Stack Medical Research Laboratories carried out research. Water and milk quality were tested in selected areas.¹⁶⁸ In Khartoum and Omdurman water supplies were examined regularly.¹⁶⁹ Frequent testing was also undertaken for the Egyptian Irrigation Service at Gordon’s Tree Dockyard and the water supplies used during the construction of the Jebel Aulia Dam.¹⁷⁰ In Khartoum experiments on the value of chloramine for well water sterilisation concluded that this method “may have considerable practical value in certain cases.”¹⁷¹ Tentative conclusions were also reached on the bacteriological standards for water supplies. The report noted that standard methods of filtration and chlorination could be applied to water supplies,

¹⁶² Sudan, *GAMR*, 1939, 46.

¹⁶³ Sudan, *GAMR*, 1929; Sudan, *GAMR*, 1939, 45, 12.

¹⁶⁴ Sudan, *GAMR*, 1929.

¹⁶⁵ Sudan, *GAMR*, 1940.

¹⁶⁶ Sudan, *GAMR*, 1940, 33; FAC Sudan, 1939-41, 135; Sudan, *GAMR*, 1929, 57; Sudan, *GAMR*, 1932, 7.

¹⁶⁷ Sudan, *GAMR*, 1930, 63.

¹⁶⁸ Sudan *GAMR*, 1931, 36-37, 57-58; Sudan *GAMR*, 1932, 73; Sudan *GAMR*, 1934, 37; Sudan *GAMR*, 1935, 69; Sudan *GAMR*, 1937, 64.

¹⁶⁹ Sudan *GAMR*, 1931, 36-37, 57-58; Sudan *GAMR*, 1932, 73; Sudan *GAMR*, 1934, 37; Sudan *GAMR*, 1935, 69; Sudan *GAMR*, 1937, 64.

¹⁷⁰ Sudan, *GAMR*, 1935, 77.

¹⁷¹ Sudan, *GAMR*, 1935, 77.

but questions of purity remained unresolved. Speaking of untreated river and well waters the report stated that, “the pessimistic admission must be made that neither the accepted home standards nor standards devised to suit local conditions provide any accurate information as to the purity or otherwise of waters.”¹⁷²

Contaminated water was also deemed to be the main cause of milk adulteration. In 1928 one third of samples in Khartoum and Khartoum North were considered below standard, and one fifth in Omdurman. By 1931 the percentages were lower in Khartoum and Khartoum North, 28 percent and 24 percent respectively, but remained at 1928 levels (20 percent) in Omdurman.¹⁷³ It is clear from the laboratory reports that limited resources—financial, equipment, personnel—resulted in a partial picture of water quality in Sudan. Attention remained in the capital and its surrounding area.

This section has provided an overview of the British administrative fabric in Uganda and Sudan, showing how bureaucrats and scientists struggled to place water within the departmental structures of government because its relevance lay across multiple specialisms. It focused particularly on the role of government departments to show where visible responsibility for water lay and the challenges in assessing the extent of the funding marked for the development of water supplies in its various guises.

Bearing in mind the unification of colonial services in the 1930s, the structural analysis of medical department reports revealed clear standardisation such that conditions across British territories could be usefully compared. While Sudan, like India, had its own political service, these two territories were not exempt from the gradual development of standardised approaches to reporting. As such, using material regarding Sudan and Uganda shows the structural similarities of reporting and thus some of the key issues that the Colonial Office and Foreign Office were interested in during this time.

3. Colonial Development in Uganda and Sudan 1929-1945

Though both Uganda and Sudan were situated within the Nile Basin, their experiences of the water problem differed. As shown above, it was difficult to gauge precise interest and investment in water and even more so to differentiate between domestic and agricultural usage. These two illustrations show some

¹⁷² Sudan, *GAMR*, 1935, 77.

¹⁷³ Sudan, *GAMR*, 1928, 65; Sudan, *GAMR*, 1931, 57.

engagements with water within the colonial development framework, and in doing so, connections with health become clear. The establishment of the Colonial Development Act 1929, and its allocation of funds for activities that would support British industry, led to a clearer demarcation of investment in economic and social development in Uganda and other British colonies falling under the Colonial Office's remit. As Sudan was administered through the Foreign Office it did not officially fall under the Colonial Development Act banner. However, the establishment of the Gezira irrigation scheme alongside intense and extensive debates over the use of the Nile waters brought questions about the relationship between water and health to the forefront of the Sudan Government's attention.

Therefore, the Uganda illustration begins with the British Colonial Development Act 1929, which set the two territories apart. The Sudan illustration, on the other hand, begins with the Nile waters, which connected the two territories together.

3.1 The Water Problem

Between 1929 and 1940, 53 percent of the funds under the Colonial Development Act were allocated for the African continent (Table 1.1). The highest percentage of funds overall, 9 percent, went to Tanganyika. Uganda was recommended 3 percent of the overall funds, which amounted to 5 percent of the total funds on the African continent—a small amount; though Uganda fared better than Sierra Leone and Bechuanaland in terms of free grants as compared with loans.¹⁷⁴ Between 1940 and 1946, Uganda's percentage of the overall funds under the new Colonial Development and Welfare Acts 1940 and 1945 remained similar at 5 percent of all funds approved, but £1,551,850 was made available between 1940 and 1946 compared with £260,000 between 1929 and 1940.¹⁷⁵ These funds were allocated for activities under thirteen headings between 1929 and 1940 (Figure 1.3, p.99). These amounts for water and health can be used as a proxy for commitment to deal with the water problem. Almost one third of funds were allocated to internal

¹⁷⁴ Colonial Development Act of 1929 in Overseas Development Institute Publications, *British Aid – 5, Colonial Development*, (Overseas Development Institute: England, 1964).

¹⁷⁵ Colonial Development and Welfare Acts: Return of Schemes made under the Colonial Development and Welfare Acts, by the Secretary of State for the Colonies with the concurrence of the Treasury in the Period from 1st April 1946 to 31st March 1947, 4 July 1947, Parliamentary Paper, no. 127, 46-48.

Table 1.1: Colonial Development Act Recommended Assistance 1929-40

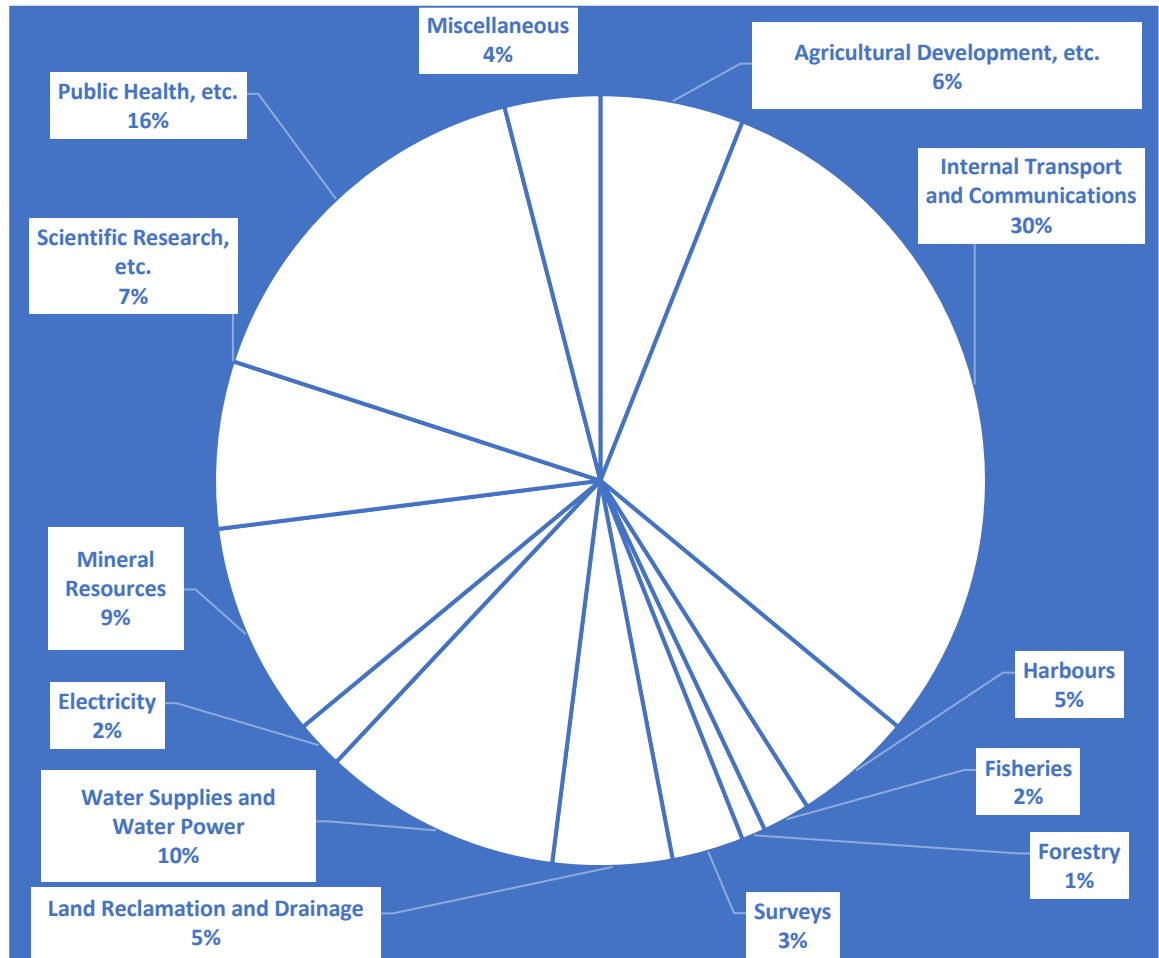
Territory	Assistance loans (£'000)	Assistance grants (£'000)	Assistance total (£'000)	Percentage of total funds
Kenya	154	271	425	4.79
N. Rhodesia	262	275	537	6.05
Nyasaland	-	802	802	9.04
Somaliland	-	63	63	0.71
Tanganyika	96	760	856	9.65
Uganda	-	260	260	2.93
Zanzibar	25	12	37	0.42
Gambia	-	25	25	0.28
Gold Coast	73	88	161	1.81
Nigeria	-	330	330	3.72
Sierra Leone	505	128	633	7.13
Basutoland	158	2	170	1.92
Bechuanaland	239	76	315	3.55
Swaziland	142	33	175	1.97
Other	1537	2547	4088	46.06

Source: Secretary of State for the Colonies: Colonial Development Advisory Committee. Eleventh and final report covering the period 1 April 1939 to 17 July 1940, Cmd. 6298, 1940-41, 12-15.

transport and communications, 16 percent to public health, and 10 percent to water supplies and waterpower; only 6 percent was allocated for agricultural development at this point. Figure 1.4 (p.100) shows the reclassification of schemes and the redistribution of funds 1940-1946.¹⁷⁶ The newly named “water supplies and irrigation” topped the list, gaining 22 percent of the CDWA funds. Agriculture and veterinary schemes (16 percent) overtook communications and transport (14 percent); medical, public health and sanitation received the same percentage of funds as the newly demarcated “education” at 13 percent. This reclassification shows one of the challenges in assessing the interest and investment in water supplies over time. What did the “water supplies and water power” and “water supplies and irrigation” headings mean? Was the priority domestic, agricultural, industrial? It was not always obvious.

¹⁷⁶ This continued interest in water supplies is evidenced in the British National Archives online catalogue using the search terms “water” and “colonial development” 1929-1945. This brings up 206 files on the subject: see The National Archives Catalogue, accessed May 9, 2016, http://discovery.nationalarchives.gov.uk/results/r/9?_st=adv&_aq=water%20colonial%20development&_dss=range&_sd=1929&_ed=1945&_ro=any.

Figure 1.3: Colonial Development Act Fund Category Distribution 1929-40



Source: Overseas Development Institute Publications, *British Aid – 5, Colonial Development*, 29. Data manipulated by author.

At first glance, a map of Uganda shows an abundance of lakes, rivers and swamps, a point highlighted in G. E. W. Flood’s minute in reference to the water situation in Uganda: “no-one looking at an ordinary map of Uganda would even think of it and water shortage together—yet here we are.”¹⁷⁷ Many of these sources did not contain water all year round and were described as “sluggish, vegetation-covered swamps.”¹⁷⁸ In 1933, the Medical and Sanitary Report for Uganda stated that:

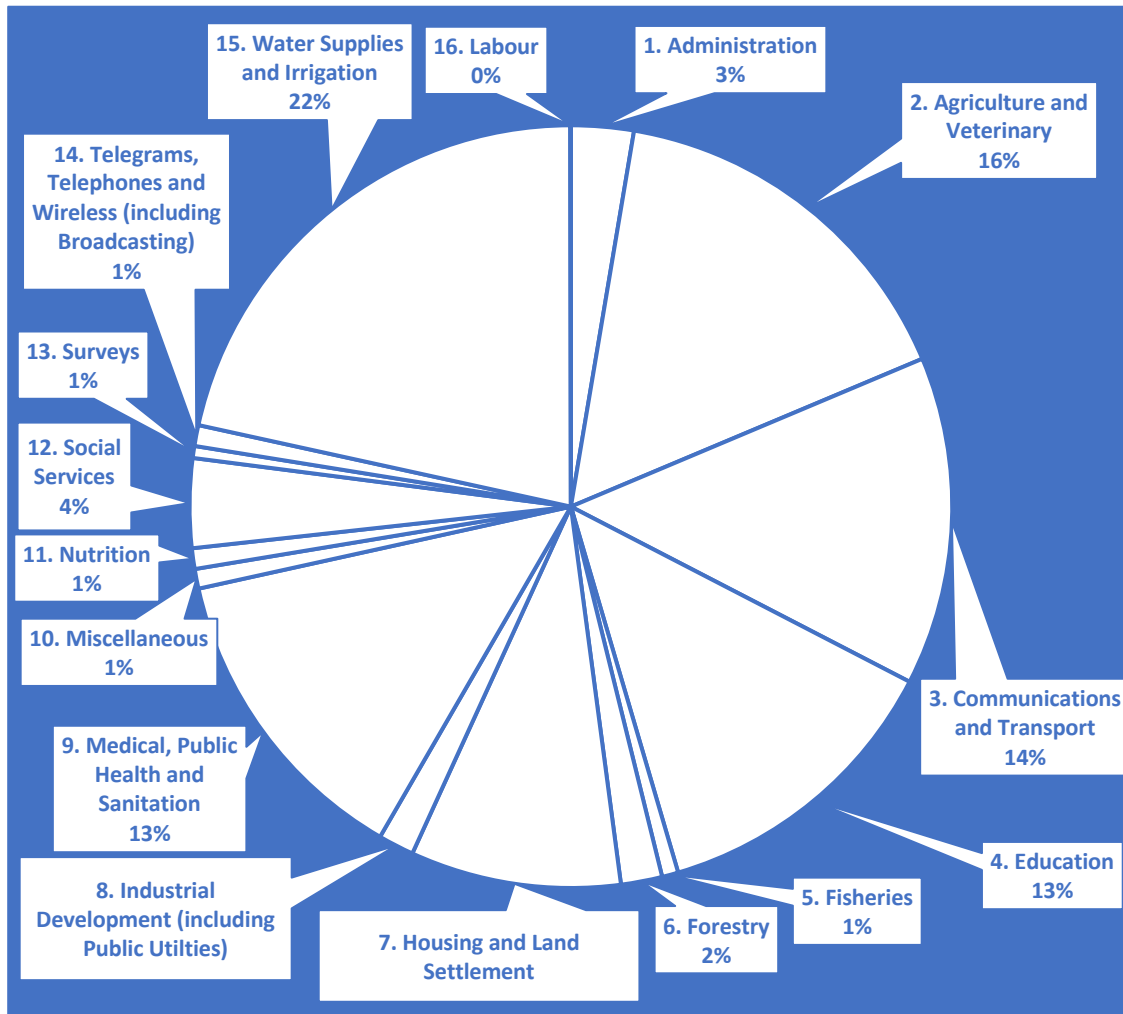
native water supplies everywhere were of a poor type except where lakes or large rivers were available. There can be little doubt that a large proportion of the ill-defined intestinal disturbances encountered could be attributed to polluted water supplies.¹⁷⁹

¹⁷⁷ G. E. W. Flood, Minute, 11 July 1936, Water Boring (water supplies), TNA, CO 536/188/9.

¹⁷⁸ Thomas and Scott, *Uganda*, 47.

¹⁷⁹ Uganda, *GAMR*, 1933, 36.

Figure 1.4: Colonial Development and Welfare: Class of Schemes 1940-46



Source: Colonial Development and Welfare Acts: Return of Schemes, 1946-47, 127. Data manipulated by author.

The use of *could* in the above quote highlighted the lack of definitive proof that intestinal illnesses were caused by poor quality water supplies. Yet, medical officers were nevertheless concerned that inadequate water sources were detrimental to health and that drainage schemes were needed in particular areas.¹⁸⁰ This was reiterated in 1939:

from the public health point of view, it is impossible to over-stress the importance of an adequate supply of water within easy reach of the population, and the attendance at each bore hole testifies to the appreciation of the African for a clean water.¹⁸¹

¹⁸⁰ Mr Cliffe, Minute, 27 July 1934, Development: Drainage Schemes, TNA, CO 536/182/8.

¹⁸¹ Uganda, *GAMR*, 1939, 8; Uganda, *GAMR*, 1940 (Shelton, not Kauntze, retires 1942; De Boer takes over as Director), 9.

While the quantitative evidence was not available to definitively prove that water supplies in adequate quantity and quality could improve health in Uganda there was a definite emphasis on the positive impact of water supplies provision.

Within government departments in Uganda, township water supplies were given considerable explicit attention until the early 1930s. Sanitary Inspectors supplied extensive details on the types of water supplies and their sanitary conditions, as shown in Medical and Sanitary Department reports until 1934. Thereafter, limited statements relating to water supplies and connected sanitary conditions replaced these comprehensive sections.¹⁸² In 1935 the Medical and Sanitary Department was renamed, dropping its “sanitary” label, and was instead referred to as the Medical Department. This seemed to signal the shift away from detailed description of township inspections, which coincided with the financial stringency that accompanied the economic depression during the 1930s and the unification of the colonial services. However, the Medical and Sanitary Department Report in 1934 noted the positive local engagement with government water supplies and sanitary recommendations: “it was pleasing to find how widely the people were adopting the new ideas of ventilation and lighting of native huts, the control and protection of water supplies, and the provision of latrines.”¹⁸³ Internal investigations began before 1939 to explore the possibilities of extending water supplies into rural areas.

In 1934, Governor Bourdillon was keen to prioritise a drainage scheme for Kampala, as concerns were raised over “a risk of a serious epidemic” if something was not done.¹⁸⁴ Howard Humphreys, an engineer with specialist knowledge in drainage, was tasked with reviewing the situation in Kampala and support was found with the local sanitary board for a water borne sewage system.¹⁸⁵ However, concerns were expressed over the monetary implications—“the cost would probably be too heavy”—which reiterated the financial frustrations raised in a press bulletin five months earlier: “it was obviously impracticable to proceed with

¹⁸² See Uganda, *GAMR*, 1925, 58-66; Uganda, *GAMR*, 1926, 32-40; Uganda, *GAMR*, 1927, 27-29; Uganda, *GAMR*, 1928, 110-118; Uganda, *GAMR*, 1929, 109-121; Uganda, *GAMR*, 1930, 101-112.

¹⁸³ Uganda, *GAMR*, 1924, 5.

¹⁸⁴ Mr Cliffe, Minute, 27 July 1934, Development: Drainage Schemes, TNA, CO 536/182/8.

¹⁸⁵ Mr Flood, Minute, 24 September 1934, TNA, CO 536/182/8; Mr Flood, Minute, 29 October 1934, TNA, CO 536/182/8.

projects of this magnitude during a period of serious financial stringency.”¹⁸⁶ The press bulletin continued on to state the difficulties in “obtaining the necessary finance” and remarked that it would add to “the burdens of property owners [...] during a time of unprecedented depression.”¹⁸⁷ Moreover, Humphreys’ survey highlighted another pressing issue in Kampala: the corrosion of water pipes. This extended the list of developments requiring government investment.¹⁸⁸

Both the Medical Department and the Geological Survey Department supported water supplies improvement for health reasons.¹⁸⁹ Favouring the working relationship with the Geological Survey, the 1939 Medical Department report emphasised the pursuance of “showing Africans how easily water supplies from springs can be improved and protected from pollution by man or beast.”¹⁹⁰ Unlike the uneasy relationship between the sanitation section and the Public Works Department regarding malaria control, the Geological Survey was portrayed positively, such that the 1939 Medical Department report described the necessity of geological (and private firms) expertise for the implementation of water supplies development.

A big part of the problem in finding solutions to the water problem was in coordinating those within and across departments. This challenge was noted in 1936:

There is no doubt in my mind that water for man and beast is the crying need of the greater part of East Africa, and that in evolving any schemes for providing this, the Administration and the Medical, Veterinary, Agricultural, Forestry and Engineering Departments are all concerned. To provide for progress some coordinating authority is essential.¹⁹¹

The different kinds of specialist knowledge required for water management were also noted in an application made to the Colonial Development Fund for the

¹⁸⁶ Mr Flood, Minute, 24 September 1934, TNA, CO 536/182/8; Mr Flood, Minute, 29 October 1934, TNA, CO 536/182/8; Press Bulletin, 26 May 1934, Surface and Sewerage Drainage in Kampala, TNA, CO 536/182/8.

¹⁸⁷ Press Bulletin, 26 May 1934, Surface and Sewerage Drainage in Kampala, TNA, CO 536/182/8.

¹⁸⁸ Development: Drainage Schemes, 1934, TNA, CO 536/182/8; Development, Water Supplies Kampala, 1935, TNA, CO 536/184/10.

¹⁸⁹ Mr Cliffe, Minute, 27 July 1934, Development: Drainage Schemes, TNA, CO 536/182/8.

¹⁹⁰ Uganda, *GAMR*, 1939, 8.

¹⁹¹ Frank Stockdale, Minute, 14 July 1936, Water Boring (water supplies), TNA, CO 536/188/9.

improvement of water supplies. Sent in November 1939, it was not acted upon: war had broken out in Europe and the Colonial Development Act was in the process of incorporating 'welfare' explicitly into its remit. In May 1940, it was suggested that this same file should be put before the new Colonial Development and Welfare Advisory Committee. The memorandum to support this application from the agricultural survey emphasised the "water problem" present in Uganda, which "apparent from the early days of the Protectorate, has in recent decades come more and more forcibly to notice."¹⁹² Further concern was raised that the protectorate was drying up and the growing population was placing increasing demands on the already limited water resources.

The supporting memorandum attached to the funding application continued on to state, "it is to be understood that in all the areas work is required on the grounds of shortage, public health and general amelioration."¹⁹³ In spite of impressions that Uganda was well-watered, there were evident shortages. Moreover, there was a keenness to obtain funding for water supplies in relation to health and welfare.

A list of areas requiring attention and their principal needs was then detailed (Figure 1.5). As the attached memorandum suggested, the applications from Uganda were thorough (and eventually passed through). They were supported by the Governor alongside members of the Geological Survey, Agricultural Department, and Medical Department. Despite the more obvious link with mosquitos and the extent of the malaria problem, the information in Figure 1.5 emphasises the importance colonial officials placed on the relationship between watering places and sleeping sickness in Uganda. A second area requiring attention was livestock management, as the provision of finances for a ten-year project to develop rural water supplies in Karamoja (Northern Uganda) showed. This was a region dependent on livestock. Populated by semi-nomadic pastoralists reliant on their stock for subsistence, the limited rainfall affected the movement of the Karamoja people: access to water defined their various places of settlement.¹⁹⁴

¹⁹² Development: Water Supplies in Uganda, Agricultural Survey: Memorandum in Support of the Application, 1939, TNA, CO 536/205/3; E. J. Wayland to Sir Cecil Bottomley, Letter, 25 April 1936, TNA, CO 536/188/9: "eventually we got our answers (as some of us had long realised) that the position is serious."

¹⁹³ Development Programme: Improvement of Water Supplies, 1939-1942, TNA, CO 536/205/3.

¹⁹⁴ Thomas & Scott, *Uganda*, 197.

Figure 1.5: List of Areas Requiring Attention and Their Principal Needs.¹⁹⁵

Area	Principal Needs
West Nile and Madi	Sleeping sickness and guinea worm infection control; stabilisation of native settlements and centres; soil erosion.
Acholi*	Sleeping sickness and guinea worm control; stabilisation of native settlements; redistribution of tribal areas; establishment of trading and administrative centres; cattle control locally.
Karamoja*	To anchor semi-nomadic, cattle-owning tribes; prevention of local overgrazing and to render available new grazing grounds; to avoid incursions into adjacent areas to facilitate conservation of soil and vegetation in a semi-arid area; to arrest the advance of semi-arid conditions into adjacent areas.
Teso* and Lango	Population problems and cattle control; soil erosion; forestation and improved agricultural practice; ordered resettlement.
Bunyoro and Toro	Stabilisation of native settlements.
Bugishu, Bugwere, Budama*, Busoga*	Improvements at trading, minor administrative and other centres.
Mengo	To permit the inculcation of higher standards in what is perhaps the most rapidly advancing part of the Protectorate.
Mubende	To extend settlement and agriculture in a suitable area where domestic supplies are deficient.
West Masaka*, East Ankole	Control of cattle; reduction of cattle disease; utilisation of new grazing areas; prevention of overgrazing.
Kigezi (Bufumbira)	To reduce shortage of supplies in a particularly fertile area.

Source: Recreated by the author using Development Programme: Improvement of water supplies, 1939-1942, TNA, CO 536/205/3

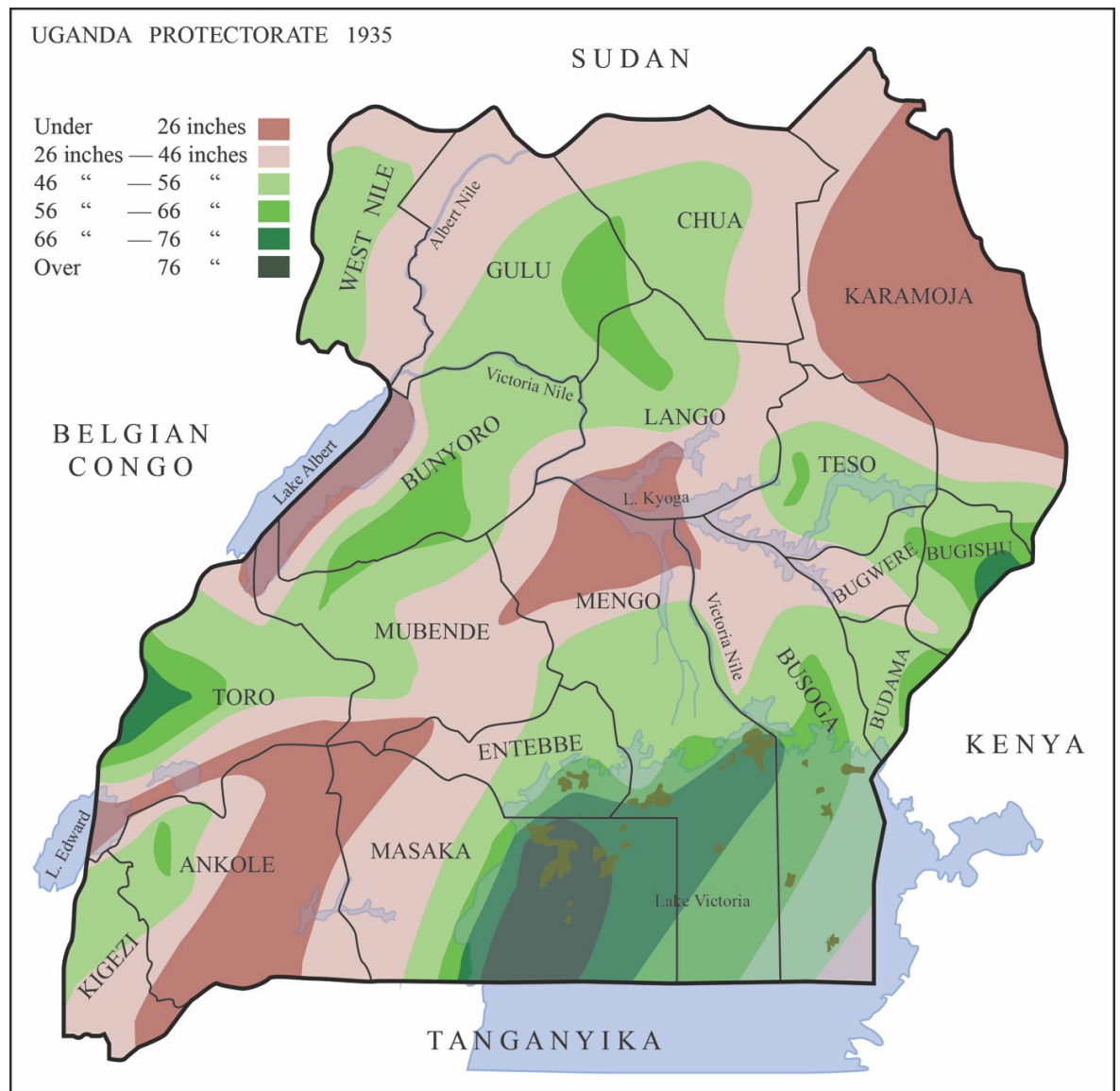
A final ‘need’ centred on the “stabilisation”, extension, or ordering of settlements.¹⁹⁶ This was mentioned in five of the ten areas demarcated in Figure 1.5.¹⁹⁷ Here, there is an implicit sense that colonial officials were keen to use the development of water supplies to organise their colonial subjects; the result of which, people could be more easily controlled and monitored, and development plans could be carried out with greater ease.

¹⁹⁵ *Areas in which improvement has already been undertaken.

¹⁹⁶ Development Programme: Improvement of Water Supplies, 1939-1942, TNA, CO 536/205/3.

¹⁹⁷ Development Programme: Improvement of Water Supplies, 1939-1942, TNA, CO 536/205/3.

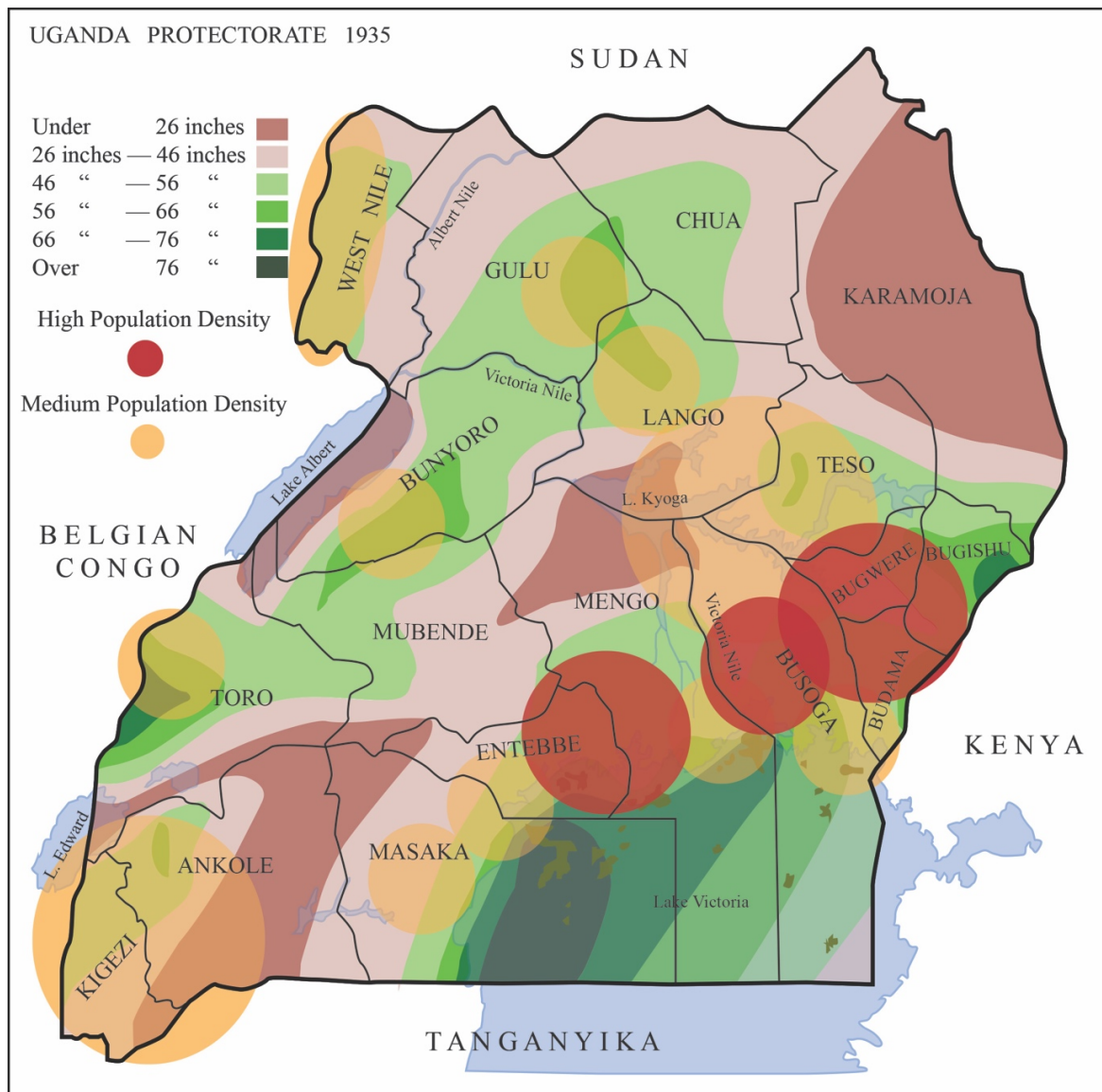
Figure 1.6: Annual Rainfall in Uganda 1935



Source: Recreated by the author using Development Programme: Improvement of water supplies, 1939-1942, TNA, CO 536/205/3.

Three maps were also attached to the application: the first showed average annual rainfall (Figure 1.6), the second, 'native' population density (Figure 1.7), the third, areas of sufficient and insufficient access to water (Figure 1.8). Figure 1.6 shows that areas of low rainfall included the Karamoja in the north east, a large portion of the area surrounding Lake Kyoga, Lake Albert, and in the south west crossing district boundaries between Ankole, Toro, Masaka, Mubende, Entebbe and Kigezi. Based on a map that was attached to the funding application sent to the Colonial Office, Figure 1.7 shows areas of high and medium population density. These areas of high and medium population density largely coincide with the areas of higher rainfall, mostly between 46 and 66 inches. Even in areas with

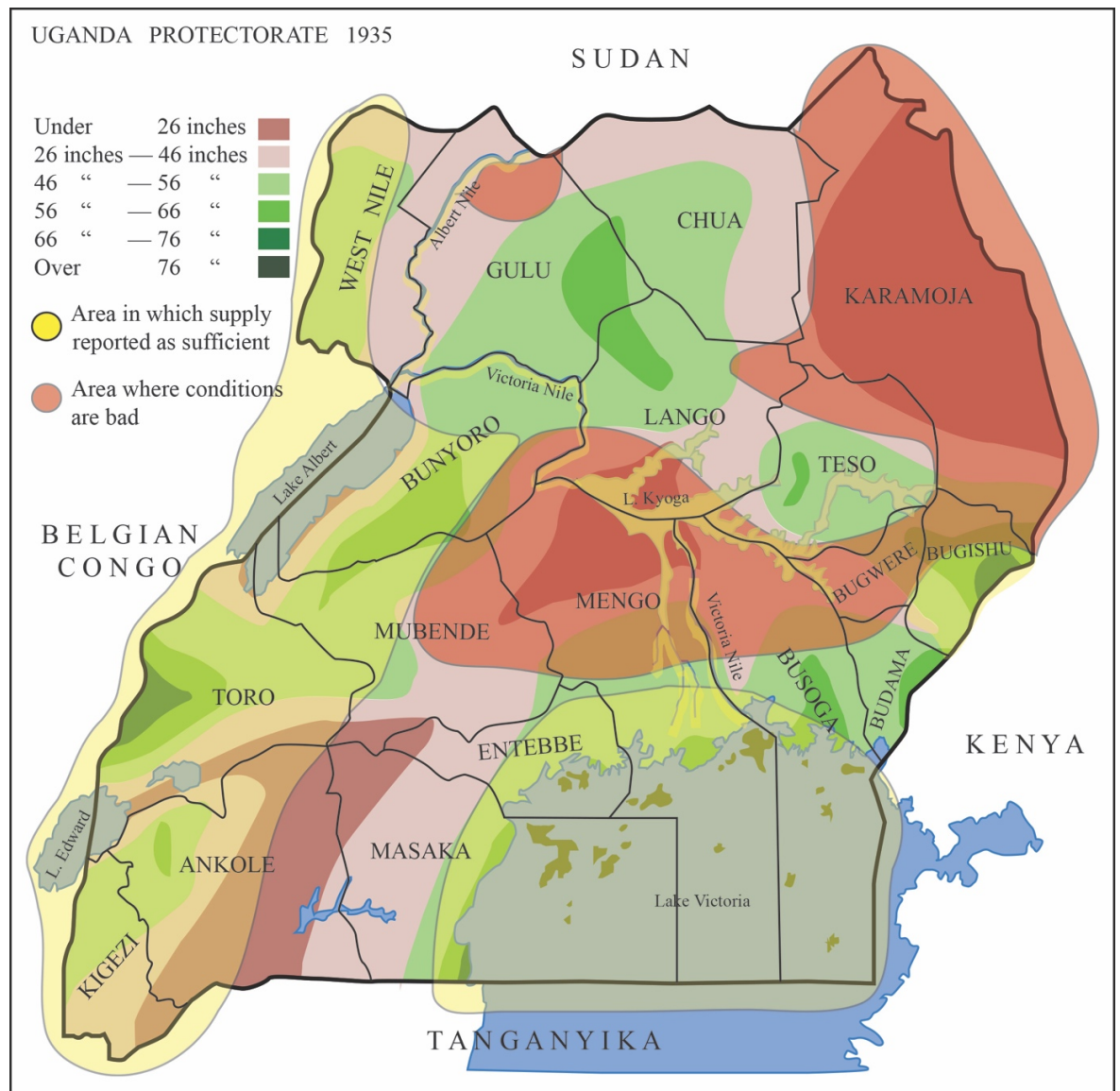
Figure 1.7: Average Rainfall and 'native' Population Density in Uganda 1935



Source: Recreated by the author using Development Programme: Improvement of water supplies, 1939-1942, TNA, CO 536/205/3.

lower rainfall, there was access via lakes or alternative sources. Low population density is not shown but covered much of the protectorate not labelled. Figure 1.8 shows the average rainfall alongside the areas reported to have sufficient (yellow) and insufficient (red) supplies of water. The areas marked as neither yellow nor red were considered to be those with moderate difficulties regarding water supplies. The areas closely surrounding the numerous water bodies in Uganda tended to equate with sufficient supply. The largest area with water supply difficulties was the Karamoja in the north east, where people relied on finding access to water for their livelihood. Water supply was represented as the primary explanation for population distribution in the 1939 memorandum:

Figure 1.8: Average Rainfall and Water Development Need in Uganda 1935



Source: Recreated by the author using Development Programme: Improvement of water supplies, 1939-1942, TNA, CO 536/205/3.

There is in fact a great deal to be said for the suggestion that the distribution of population is primarily related to rainfall and water supplies, and that other factors, tribal, historical, economic and medical are of a modifying or secondary nature.¹⁹⁸

This deterministic description that rainfall and water supplies were the primary factor that shaped population distribution was not a bold statement.¹⁹⁹ Water as a physiological necessity was targeted in this way to give the best chance of procuring finances; supporting statements needed to definitively show why this

¹⁹⁸ Development: Water Supplies in Uganda, Agricultural Survey: Memorandum in Support of the Application 1939, TNA, CO 536/205/3; Worthington, *Science in Africa*, 3.

¹⁹⁹ See Figures 1.6 to 1.8.

project should be prioritised above others that were also competing for funds during the Second World War. The local and metropolitan economic benefits of extended water supply provision, alongside the health benefits, were used to further the case. Local officials forwarded their claims based on local needs stating, “future progress, prosperity and development depend upon improved water supplies” in the protectorate.²⁰⁰ They also demonstrated how this project would support the British economy through the purchase and use of British machinery and parts in its undertaking.²⁰¹ This evidenced the importance of noting the economic value to Britain, despite the absence of British interests referenced as a prerequisite under the reconstituted Colonial Development and Welfare Acts 1940 and 1945.²⁰² Combined with significant stress on “an almost universal and often multiple parasitism much of which is connected in some way with unsatisfactory water conditions”, this provided a convincing case for funding from Britain.²⁰³

The central colonial government in Uganda clearly recognised its responsibility for water supplies provisions following the appointment of Sir Bernard Bourdillon to Governor in 1932. Concerted efforts to extend supplies in rural areas was indicative of the state’s concern for both the social and economic well-being of the local population at this time.²⁰⁴ When money could not be found from local revenue and special funds there was an inclination to raise loans and development funds to this end. The “water problem” pervaded many areas of administration, playing its part in government department agendas and appearing in different forms through various annual reports.²⁰⁵ Different responsibilities lay with different departments and there was further expectation on the part of some local authorities to maintain and extend water supplies.

²⁰⁰ Foreign & Commonwealth Office, Colonial Development and Welfare Acts 1929-70. A Brief Review, 1970-71, Cmnd. 4677, 6. E. R. Wicker, “Colonial Development and Welfare, 1929-1957: the Evolution of a Policy,” *Social and Economic Studies* 7, 4, (1958): 170-192.

²⁰¹ Colonial Development and Welfare Acts 1929-70. A brief review, 1970-71, Cmnd. 4677, 6; Wicker, “Colonial Development and Welfare, 1929-1957,” 170-192.

²⁰² Colonial Development and Welfare Acts 1929-70. A Brief Review, 1970-71, Cmnd. 4677, “any purpose likely to promote the development of the resources of any colony or the welfare of its people,” 7.

²⁰³ Development: Water Supplies in Uganda, Agricultural Survey: Memorandum in Support of the Application 1939, TNA, CO 536/205/3.

²⁰⁴ E. J. Wayland to Sir Cecil Bottomley, Letter, 25 April 1936, TNA, CO 536/188/9.

²⁰⁵ For example, Uganda Protectorate, Annual Report of the Public Works Department (Entebbe: Government Press, 1928; 1929; 1930; 1931; 1932; 1933; 1935): see 1928, 3-4, 9, 11; 1929, 3-4, 8, 11; 1930, 3-4, 10-11; 1931, 3-4, 8-9; 1932, 3-4, 9-10; 1933, 3-4, 7-8; 1935, 3, 8-10, all consulted at CUL, RCS.

The Public Works Department handled the establishment and maintenance of township water supplies in Jinja and Kampala and was also involved in sleeping sickness clearings and mosquito control. Extensions of supply in these areas in 1935 prompted consideration of similar issues in rural areas.²⁰⁶ At the time, Malcolm MacDonald, Secretary of State for the Colonies, was reluctant to support an application for colonial development funds because Uganda was in a good financial position compared to elsewhere in the British Empire.²⁰⁷ Instead, funds were found from within government revenue. The original application showed the intentions of colonial officials working at local levels but emphasised the difficulties in obtaining external support.

The Geological Survey, which was in charge of rural water supplies, produced three papers on Uganda water supplies in 1941, 1945 and 1957.²⁰⁸ The first focused on success rates in water boring 1920-1940, the second on small reservoirs, and the third on domestic rural water supplies. The report on water boring showed the different success rates across the territory and compared this with neighbouring territories.²⁰⁹ These contrasts highlighted the diversity of experiences in attempts to supply water to local populations. The engagement of geologists reflected a growing interest in investigating the supply of water in Uganda in the 1930s. Formed in 1919 following a dispatch sent to Uganda after the Great War ended, the geologist consigned to the territory was directed towards Uganda's mineral resources. Finding mica, which was used to produce military weapons and equipment, was the first task.²¹⁰ In 1925, the department consisted of four members of staff: A director (Edward James Wayland), a chemist/petrologist, a field geologist, and an engineer driller. By 1945, the department was better staffed, with 17 staff members. This included the director, two senior geologists, two geologists, a senior overseer, an overseer, a

²⁰⁶ Development Schemes: Sewerage and Water Supply and Drainage for Kampala and Jinja, 1935, TNA, CO 536/184/10.

²⁰⁷ "I consider that in present circumstance it is inexpedient to approach the Committee" Malcolm MacDonald, 8 October 1935, TNA, CO 536/184/10.

²⁰⁸ C. B. Bisset, *Geological Survey of Uganda. Water Supply Paper No. 1: Water Boring in Uganda, 1920-1940* (Entebbe: Printed by the Government Printer, 1941), CUL, RCS, OP.33720.556.03 and RCS.L.45.Z97; Bisset, *Water Supply Paper No 2: Small Reservoirs in Uganda* (Entebbe: Printed by the Government Printer, 1945), CUL, RCS, OP.33720.556.03 and RCS.L.45.Z97; N. Harris, *Geological Survey of Uganda. Water Supply Paper No. 3: Domestic Rural Water Supplies in Rural Areas* (Entebbe: Printed by the Government Printer, 1957), CUL, RCS, OP.33720.556.03 and RCS.L.45.Z97.

²⁰⁹ Bisset, *Geological Survey of Uganda. Water Supply Paper No. 1*, 1941.

²¹⁰ Thomas and Scott, *Uganda*, 75-6.

chemist/petrologist, a mechanic, a laboratory assistant, and an office assistance.²¹¹ This expansion supported the inclusion of rural water supplies development under the departmental remit. In 1945, there was also a topographer and an overseer specifically working on rural water supplies.²¹²

While departments moved past differences to work towards the common goal of procuring funds, they vied for attention regarding the different kinds, quality, and location of such supplies. The attempts to raise both loans and development grants-in-aid for the improvement of township and rural water supplies attested to the significant attention given to this area, particularly from the 1930s onwards. The fact that significant interest remained in pushing these programmes forward in financially stringent and war-torn times highlighted the importance placed on the development of basic services. Yet, debates regarding water supplies were affected by international agreements regarding the use of the Nile, the subject of this next illustration.

3.2 Navigating the Nile

This section examines how the Nile Waters reflected division rather than unity and emphasises how this shaped the contrasting experiences of health and development within Sudan. The River Nile, over 4000 miles in length and running through Tanganyika, Kenya, Uganda, and Ethiopia, had two main tributaries: the White Nile and the Blue Nile. The Victoria Nile and Albert Nile (flowing through Uganda) converged to form the White Nile, which flows north from the Great Lakes. The Blue Nile begins in Lake Tana, Ethiopia, before joining the White Nile in Sudan near Khartoum. Crossing national and colonial boundaries, human attempts to harness and utilise this river resource affected each territory within the Nile Basin. The 1920s were a pivotal decade in this regard. Until the Nile Waters Agreement 1929, there were no legal institutional constraints limiting the use of the river. However, even in the preparations for this agreement, Egypt adamantly pressed forward what they believed was their divine right to the water.

In the aftermath of World War One, the Sennar Dam was built and completed in 1925. While providing water for crop production in the newly established Gezira irrigation scheme, half the water stored accrued to Egypt. The

²¹¹ Based on Uganda Blue Books 1925 and 1945, which contain listing of European members.

²¹² Though it is not clear from the sources which department these were attached to or whether they formed a department or board of their own.

1929 agreement cemented the prioritisation of Egyptian rights above the other riparian states, stipulating that Egypt had guaranteed access to two thirds of the Nile water. The final third was designated to Sudan. Egypt also had the right to veto any work that threatened the flow of the river and reserved the right to inspect the entire length of the Nile. When this agreement was drawn up, future East African needs regarding irrigation were not considered, and the introduction of said legislation therefore limited riparian states' (excluding Egypt) legal utilisation of the Nile waters.²¹³ Arguably "the most important physical feature of the country [Uganda]", these high level agreements epitomised the problems associated with water control and management across boundaries.²¹⁴ The River Nile, therefore, both unified and divided the territories within its reach.

In Sudan's provinces, the population per square mile was small, entering double figures in the Khartoum Province (44) and Blue Nile Province alone (31).²¹⁵ In the 1930s, a fifth of Sudan's population resided in the Blue Nile Province, drawn towards the Gezira scheme and its offer of work. The allocation of government reserve funds highlighted the Gezira as a focal point of government expenditure. This was unsurprising, since it quickly became a self-funding scheme, a significant proportion of government revenue.²¹⁶ However, the general reserve account also represented the focal points of expenditure at a more general level, particularly between 1925 and 1935. The allocation of funds was voted upon, supporting a variety of developments: water projects such as well boring; hafir building; pumping schemes; famine relief; public works, such as town planning and roads development; reserves against crop losses; and funds relating to the Gezira scheme.²¹⁷ In the late 1930s and 1940s, it notably provided funds for local

²¹³ The Equatorial Nile Project and The Nile Waters Agreement of 1929, 1957, TNA, CO 822/1412.

²¹⁴ Ian Leggett. *Uganda* (Oxford: Fountain Publishers; Oxfam, 2001), 7; For more details on this see: Tvedt, *The River Nile in the Age of the British*.

²¹⁵ For other provinces: Northern (2), Kassala (3), Kordofan (8), Darfur (6), Upper Nile (5), Equatoria (8). Figures from Sudan, *GAMR*, 1937. Population figures probably taken from 1931 census.

²¹⁶ For example, FAC, Sudan 1937, 134.

²¹⁷ General Reserve Funds: FAC Sudan 1925, 83-84; FAC Sudan 1926, 107-108; FAC Sudan 1927, 131-132; FAC Sudan 1928, 146-147; FAC Sudan 1929, 150-151; FAC Sudan 1930, 161; FAC Sudan 1931, 156; FAC Sudan 1932, 168; FAC Sudan 1933, 158; FAC Sudan 1934, 149; FAC Sudan 1935, 145; FAC Sudan 1936, 135; FAC Sudan 1937, 131; FAC Sudan 1938, 139; FAC Sudan 1939-41, 198-199; FAC Sudan 1942-44, 194-195; FAC Sudan 1945, 211.

government reserves as financial responsibility slowly devolved.²¹⁸

The lists of votes suggested that most projects that the account funded were those considered to require urgent attention or those of economic value. In 1927, for example, 9 percent of the general reserve account was allocated to offset the effects of poor rains in 1925 and 1926.²¹⁹ Between 1925 and 1930, the development of water supplies was peppered throughout the funding votes.²²⁰ It can be surmised that further water development was part of famine relief, town planning, and local government budgets, and thus it is difficult to accurately assess the percentage of allocated funds relating to water. From 1925 to 1930 such developments ranged from less than 1 percent to 10 percent of available reserve funds, and between 2 and 25 percent of the funds voted on each year. However, the Gezira and the Sennar Dam remained the priority.

Even before the Gezira development scheme was fully established there were strong intentions to provide a healthy environment for its workers. Most notably, officials were keen to minimise the impact of bilharzia and malaria, employing strict rules to prevent their spread.²²¹ Further, the colonial government set up a quarantine at Wadi Halfa, situated on the northern border between Sudan and Egypt, to reduce the disease threat to the scheme from incoming migrant labourers.²²² A large proportion of the labouring population travelled the 700 miles from the Egyptian borders down to the Gezira. This migrant labour force was considered a significant threat to health in irrigated areas. In this case, Major B. H. H. Spence's main concern was that "the majority of the labouring population is known to be infected with parasitic worm diseases."²²³ It was deemed important to use quarantine "as full economic value could not be obtained from such diseased workmen."²²⁴

British officials were keen to maintain good health within the Gezira scheme and the medical service prioritised the area throughout this period and into the post-WWII era. In the late 1920s, Medical Service reports devoted attention to the

²¹⁸ FAC Sudan 1936, 135; FAC Sudan 1937, 131; FAC Sudan 1938, 139; FAC Sudan 1939-41, 198-199; FAC Sudan 1942-44, 194-195; FAC Sudan 1945, 211.

²¹⁹ FAC Sudan 1927, 131-132.

²²⁰ FAC Sudan 1925, 83-84; FAC Sudan 1926, 107-108; FAC Sudan 1927, 131-132; FAC Sudan 1928, 146-147; FAC Sudan 1929, 150-151; FAC Sudan 1930, 161.

²²¹ In 1919, Atkey was involved in assessing the scheme.

²²² Major B. H. H. Spence, "The Wadi Halfa Quarantine," *Kenya Medical Journal* 2, no. 1 (April 1925): 33-34, 33.

²²³ Spence, "The Wadi Halfa Quarantine," 33.

²²⁴ Spence, "The Wadi Halfa Quarantine," 33.

health of irrigated areas and focused particularly on malaria and waterborne diseases.²²⁵ This emphasised the link made between irrigation development and water borne diseases, or diseases related to water. The influence the Gezira development had within Sudan, and in the British Empire more generally, caused this relatively small province to define views on Sudan as a whole. Whilst it was not until the late 1930s that conditions across the provinces could be valuably compared, if we look at the similarities and contrasts in each area towards the end of this period, it is evident that the Gezira was not necessarily representative of Anglo-Egyptian Sudan's engagements with water, health, and development.

In the 1920s and early 1930s, health coverage in the Sudan was limited. For example, it was not until a relapsing fever epidemic crossed the border in 1926 that Darfur experienced the medical services firsthand.²²⁶ The western district of the Kassala Province was not opened up to medical work until late 1928. More "medical penetration" of the Upper Nile Province in the south was continued throughout 1928.²²⁷ During the late 1920s and early 1930s various medical surveys were undertaken of different tribes within Sudan. In 1928, the Medical Service undertook a survey of the Shilluk Tribe in the south of the territory. According to discussions with the chiefs, the death rate was decreasing but, "many still die during the rains of a disease the natives do not understand."²²⁸ Causing high mortality rates amongst children, this illness was thought to be malaria. The survey concluded that controlling existing disease "with the probable exception of malaria should not present many great difficulties."²²⁹ L. H. Henderson, Medical Inspector, continued: "Malaria still remains the *bête noir* of the tribe and is likely to continue so until accurate investigation is carried out to ascertain the mosquito carriers and their breeding habits."²³⁰ Henderson suggested that "prophylaxis could then be carried out by attacking the breeding grounds in close proximity to the larger villages."²³¹

Once again, the rains were associated with disease. Whilst efforts were made to control malaria in the Gezira, similar attention was not given to outlying regions because of personnel and finance. Attention remained focused on centres

²²⁵ Sudan, *GAMR*, 1929-1930.

²²⁶ Sudan, *GAMR*, 1929, 44: Progress in Certain Provinces

²²⁷ Sudan, *GAMR*, 1929, 44.

²²⁸ Henderson, Medical Inspector, Sudan, *GAMR*, 1928, 35.

²²⁹ Henderson, Medical Inspector, Sudan, *GAMR*, 1928, 42.

²³⁰ Henderson, Medical Inspector, Sudan, *GAMR*, 1928, 43.

²³¹ Henderson, Medical Inspector, Sudan, *GAMR*, 1928, 43.

of population where economic development and productivity could most benefit the growth of revenue within the condominium.²³²

The association of malaria with rainfall in Sudan was keenly felt in 1938. Rains were much heavier than usual, and the comments on province health reflected a rise in malaria cases. Khartoum suffered from the “worst outbreak of malaria for many years”—affecting at least 10 percent of the population—and a “somewhat higher incidence” was described in Kassala.²³³ Heavy rains in Darfur made the control of mosquito breeding difficult.²³⁴ However, in the Northern Province, where rain was usually a rarity, the report commented that “climatic conditions were favourable and the rainfall in the southern area was above average”, with plentiful harvests to follow.²³⁵ The Merowe district suffered “some

Figure 1.9: Staff to Population Ratio by Provinces in Sudan 1945

Province	Staff: Population Ratio
Khartoum	1:796
Northern	1:1404
Blue Nile	1:2344
Kassala	1:2250
Equatoria	1:3590
Upper Nile	1:3878
Kordofan	1:4281
Darfur	1:4340

Source: Sudan, *GAMR*, 1945: 25-41.

loss of property and crops”, but the high river levels were deemed “a hardship not without benefits as several insanitary and overcrowded areas were thereby rendered uninhabitable and the people persuaded to rebuild better houses at a higher level.”²³⁶ The contrasting impact that unusually heavy or late rains had across the territory was clear.

The ratio of British and Sudanese medical and health staff to population also affected disease environments. Figure 1.9 shows the overall staff to population ratio in each province, revealing the gap between services in Khartoum and Darfur. Figures 1.10a, Figure 1.10b, Figure 1.10c and Figure 1.10d show the

²³² FAC, Sudan, 1925 to 1945.

²³³ Sudan, *GAMR*, 1938, 46, 55, 58-59.

²³⁴ Sudan, *GAMR*, 1938, 46, 55, 58-59.

²³⁵ Sudan, *GAMR*, 1938, 53.

²³⁶ Sudan, *GAMR*, 1938, 53.

comparative staff to population ratio (S/P Ratio), delineated to show British (B), Sudanese (S), and overall numbers (T). The key below, numbered 1 to 8, shows which provinces had the best “1” and worst “8” staff to population ratios. In 1945, the Medical Services report listed the number of British and Sudanese medical and health staff in each province. British staff were mainly doctors and nursing sisters, with a few in positions as Public Health Inspectors. Sudanese staff occupied roles in all the labelled positions: doctors, medical assistants, hospital attendants, public health inspectors, public health officers, sanitary overseers, and ‘mosquitomen’. Most Sudanese staff were, however, in posts as hospital attendants or mosquitomen, except in Gezira where many Sudanese staff acted as medical assistants. The data also show that the Sudan was not simply divided along North-South lines. There were also stark contrasts between the north east and Northern Province (Khartoum, Northern Province, Blue Nile and Kassala) and the north west (Kordofan and Darfur). The different numbers and kinds of staff undoubtedly affected the diseases reported and diagnosed. This was highlighted in 1945, when a low incidence of guinea worm disease was recorded in Darfur despite its reputation as “fairly common” in the area.²³⁷ Therefore the extent to

Figure 1.10a: Staff to Population Ratio in Sudan 1945, Khartoum & Northern Provinces²³⁸

	Khartoum				Northern Province			
	B	S	T	S/P Ratio	B	S	T	S/P Ratio
Doctor	9	18	27	1:11,784	2	8	10	1:62,914
Nursing Sister	11	0	11	1:28,949	2	0	2	1:314,568
Medical Assistant	0	15	15	1:21,230	0	22	22	1:28,597
Hospital Attendant	0	212	212	1:1,502	0	180	180	1:3,495
Public Health Inspector	5	0	5	1:63,689	1	0	1	1:629,135
Public Health Officer	0	3	3	1:106,148	0	1	1	1:629,135
Sanitary Overseer	0	13	13	1:24496	0	10	10	1:62,914
Mosquitoman	0	114	114	1:2,793	0	222	222	1:2,834
TOTAL			400				448	

1	2	3	4	5	6	7	8
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Source: Sudan, GAMR, 1945: 25-41.

²³⁷ Sudan, GAMR, 1945, 28-31.

²³⁸ B: British; S: Sudanese; S/P: Staff to population; T: Total.

Figure 1.10b: Staff to Population Ratio in Sudan 1945, Blue Nile and Kassala Provinces.²³⁹

	Blue Nile				Kassala Province			
	B	S	T	S/P Ratio	B	S	T	S/P Ratio
Doctor	5	14	14	1:78,817	3	7	10	1:55,137
Nursing Sister	2	0	2	1:748,769	2	0	1	1:551,369
Medical Assistant	0	105	105	1:14,262	0	29	29	1:19,013
Hospital Attendant	0	259	259	1:5,782	0	155	155	1:3,557
Public Health Inspector	2	0	2	1:748,769	2	0	1	1:551,369
Public Health Officer	0	9	9	1:166,393	0	2	2	1:275,685
Sanitary Overseer	0	19	19	1:78,817	0	7	7	1:78,767
Mosquitoman	0	229	229	1:6,539	0	40	40	1:13,784
TOTAL			639				245	

1	2	3	4	5	6	7	8
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Source: Sudan, GAMR, 1945: 25-41.

Figure 1.10c: Staff to Population Ratio in Sudan 1945, Equatoria and Upper Nile Provinces.²⁴⁰

	Equatoria				Upper Nile Province			
	B	S	T	S/P Ratio	B	S	T	S/P Ratio
Doctor	5	13	18	1:71,801	2	2	4	1:154,143
Nursing Sister	2	0	2	1:646,206	0	0	0	0
Medical Assistant	0	38	38	1:34,011	0	20	20	1:30,829
Hospital Attendant	0	210	210	1:6,154	0	68	68	1:9,067
Public Health Inspector	1	0	1	1:1,292,411	0	0	0	0
Public Health Officer	0	0	0	0	0	1	1	1:616,570
Sanitary Overseer	0	12	12	1:107,700	0	2	2	1:308,285
Mosquitoman	0	79	79	1:16,360	0	64	64	1:9,634

1	2	3	4	5	6	7	8
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Source: Sudan, GAMR, 1945: 25-41.

²³⁹ B: British; S: Sudanese; S/P: Staff to population; T: Total.

²⁴⁰ B: British; S: Sudanese; S/P: Staff to population; T: Total.

Figure 1.10d: Staff to Population Ratio in Sudan 1945, Kordofan and Darfur Provinces.²⁴¹

	Kordofan				Darfur			
	B	S	T	S/P Ratio	B	S	T	S/P Ratio
Doctor	2	9	11	1:121,437	2	3	5	1:158,838
Nursing Sister	0	0	0	0	0	0	0	0
Medical Assistant	0	26	26	1:51,377	0	15	15	1:52,946
Hospital Attendant	0	164	164	1:8,145	0	99	99	1:8,022
Public Health Inspector	0	0	0	0	0	0	0	0
Public Health Officer	0	1	1	1:1,335,807	0	1	1	1:794,190
Sanitary Overseer	0	8	8	1:166,975	0	2	2	1:397,095
Mosquitoman	0	102	102	1:13,096	0	61	61	1:13,019

Source: Sudan, GAMR, 1945: 25-41.

which particular problems affected the population as a whole was not always obvious; it was made visible only by attendance at dispensaries and hospitals, of which there were fewer in Darfur and Kordofan than the other provinces.²⁴²

This illustration has argued that the Gezira was not representative of the Sudan as a whole, highlighting how the British influence spread gradually across the territory. It has shown how the impact of rain was different across Sudan and how the attention given to specific regions affected perceptions of the territory. The dividing nature of the Nile waters continued to raise questions about the health and development of the territories it crossed, epitomising the intricate role water played in shaping the economic, political, and social dynamics of the region.

In addition to British expertise, there were tentative, but important, links with international organisations, such as the LNHO and the Rockefeller Foundation. Two primary factors influenced the nature of international involvement in Uganda and Sudan, namely the conceptualisation of Uganda and Sudan as arenas for the practice of tropical and colonial medicine; and their position as British imperial territories. The Rockefeller Foundation, established in 1913, was heavily involved in international health interventions during this period, and its work in this area was

²⁴¹ B: British; S: Sudanese; S/P: Staff to population; T: Total.

²⁴² Sudan, GAMR, 1945, 25-41.

built on what Elizabeth Fee has described as, “the twin pillars of public health”: bacteriology and sanitary engineering.²⁴³ Fee continued to expound the differences between these two pillars as follows:

Bacteriology represented the achievements of laboratory research; sanitary engineering the practice of providing clean water supplies and treating sewage wastes. Although associated with the older environmental view of public health, sanitary engineering practice had been responsible for much of the improvement in health and the dramatic decline in infectious diseases since the mid-nineteenth century.²⁴⁴

In discussing these pillars, Fee highlighted two, often competing, approaches to improving public health. Yet, despite association with older environmental understandings of public health, the development of water supplies remained an important avenue to explore. However, the only direct connections that Uganda and Sudan had pre-1945 with the Rockefeller Foundation were in relation to yellow fever.²⁴⁵ There were greater connections with the LNHO, as explored in the next section. As several European imperial powers were member states of the League of Nations, the health section of this international organisation became an important forum for working together to combat disease across imperial borders between 1920 and 1945.

4. The LNHO: Disease Control to Social Medicine 1920-1940

As a means of addressing the chronic understaffing in colonial territories, support from external sources was sought from international organisations such as the League of Nations Health Organisation (LNHO). However, certain regions, including South America, were favoured for support over others, such as Africa. The reasons for this were twofold. Firstly, concerns were raised in Britain about international organisations providing services, whether financial, personnel, or through forums and committees, because it opened the door for others to

²⁴³ Elizabeth Fee, *Disease and Discovery: A History of the Johns Hopkins School of Hygiene and Public Health 1916–1939* (Baltimore: Johns Hopkins University Press, 1987, 2016), 60; In 1928, the Rockefeller Foundation’s work was split across five divisions: international health, medical sciences, natural sciences, social sciences, and humanities: Rockefeller Foundation, 2018, accessed Aug 31, 2018, <https://www.rockefellerfoundation.org/about-us/our-history/>.

²⁴⁴ Fee, *Disease and Discovery*, 60.

²⁴⁵ Bell, *Frontiers of Medicine*. Yellow Fever vaccine developed in 1935.

influence British imperial affairs.²⁴⁶ Secondly, at this point in time, the African continent did not have the same political importance as other regions, such as imperial territories in Asia. Yet despite all efforts, British officials were unable to avoid the rhetoric and practice of international organisations. They reluctantly heeded the changing views of empire as anti-imperialist sentiment gained impetus after the Great War. As such, the management of colonial territories gradually changed as the trusteeship ideology took root in the League of Nations.²⁴⁷ The mandate system established by the League encouraged colonial powers to convey a more benevolent attitude towards their colonial subjects. It was within this complex setting that the concept of the water problem, as discussed in this thesis, was articulated and defined; and it was within the bureaucratic structures discussed earlier that methods were devised to deal with the problem.

This section focuses on LNHO sponsored conferences between 1925 and 1935 that related specifically to Africa to show how health work in Africa exemplified the shift from epidemic disease control to an emphasis on the social aspects of disease. Before a detailed examination of these conferences, an overview of the LNHO, its ideas, and its connections to the practice of tropical medicine is provided.

Established in 1921, the League's provisional health committee was made permanent in 1924. The LNHO was composed of three sections to set up to discuss, research, present, and implement their work. The General Advisory Council was the executive body, which comprised medical experts, and consisted of the same membership as the Office International d'Hygiène Publique. The Health Committee handled research and presentation of the various health operations to the council. The Health Bureau implemented decisions, subject to League's approval. Between 1921 and 1926, the Committee consisted of mostly European representatives: France, Great Britain, Italy, Belgium, Portugal, Spain, Denmark, Germany, The Netherlands, Poland and Switzerland. Also represented were the US, Brazil, Peru, Japan and India, alongside the International Labour

²⁴⁶ T. Stanton (Medical Adviser to the Colonial Office) Minute, 15 April 1936, TNA, CO 847/6/7. Stanton suggested that there was no need for an African committee, despite calls from the Director of the League of Nations Health Organisation, Ludwik Rajchman, and representatives from South Africa.

²⁴⁷ League of Nations Covenant, "Treaty Series No. 37 (1924). The Covenant of the League of Nations embodying an amendment of Article 6, in force from August 13, 1924, and amendments of articles 12, 13 and 15, in force from September 26," 1924, Cmd. 2300, 1924-25.

Organisation and the League of Red Cross Societies; further connections were maintained with the Office International d'Hygiène Publique and the Rockefeller Foundation (RF).²⁴⁸

Predicated on international cooperation and the interchange of information and personnel, the expressed aim of the LNHO was to prevent and control disease. Further, the Committee's vision extended to social medicine, which was defined in 1921 as "concerning problems such as tuberculosis, child-welfare, venereal disease, etc."²⁴⁹ The LNHO's work, however, was not accomplished in isolation and its relationship with existing bodies that had similar missions make it difficult to disentangle the influence of one organisation over another. For example, the RF took an interest in disease control (including 'social' diseases, such as tuberculosis) and provided funds to support the work of the LNHO in the 1920s and 1930s.²⁵⁰ The RF's involvement, despite US refusal to formally join the LNHO, also signified its aims in controlling and eradicating specific diseases on a broad geographical scale.²⁵¹ What is clear, however, is that the LNHO's work followed a clear transition from its focus on epidemic disease control in the 1920s towards social conceptions of health during the 1930s.

The challenge in understanding the League's engagement with social medicine lies in the "elusive" and "diffuse" nature of the concept.²⁵² Dorothy Porter

²⁴⁸ Borowy, *Coming to Terms with World Health*, Annex, 470-471.

²⁴⁹ Article 23 of the League of Nations Covenant. Memorandum on the Health Organisation – its functions and activities, November 1921 to May 1922, TNA, FD 1/2453.

²⁵⁰ Paul Weindling, "Social Medicine at the LNHO and ILO Compared," in *International Health Organisations and Movements, 1918-1939*, ed. Paul Weindling (Cambridge: Cambridge University Press, 1995), 134-153, 141. For a detailed account of RF International Health Division work see John Farley, *To Cast out Disease: A History of the International Health Division of the Rockefeller Foundation (1913-1951)* (Oxford and New York: Oxford University Press, 2004). Josep Barona, "The League of Nations and the Rockefeller Foundation: International Activism in Public Health," in *The League of Nations' Work on Social Issues: Visions, Endeavours and Experiments*, ed. Magaly Rodríguez García, Davide Rodogno, Liat Kozma (Geneva: United Nations Publications, 2016), 59-73.

²⁵¹ Marcos Cueto, "The Cycles of Eradication: The Rockefeller Foundation and Latin American Public Health, 1918-1940," in *International Health Organisations and Movements, 1918-1939*, ed. Paul Weindling (Cambridge: Cambridge University Press, 1995), 222-243, 238. See also Rockefeller Foundation Annual Report in 1925 (New York, 1925) for the Foundation's involvement in yellow fever work in West Africa, including references to water supply in 1925. Rockefeller Foundation Annual Report, 1925, available at: <http://www.rockefellerfoundation.org/uploads/files/4b375370-667f-4d77-bc1f-03f0fd498e9e-1925.pdf>; accessed 17 October 2014.

²⁵² Dorothy Porter, "How Did Social Medicine Evolve, and Where Is It Heading?," *Public Library of Science* 3, no. 10 (October 2006), accessed Mar 6, 2015, 10.1371/journal.pmed.0030399, accessed 6 March 2015.

explained the evolution of social medicine from the nineteenth century up to its current trajectory and Marcos Cueto aptly described its development in the early twentieth century as:

a heterodox European current [that] questioned the use of a narrow biomedical perspective in medical education and practice, and emphasised environmental, social and cultural contexts [and] developed against the hegemonic current of most professionals that concentrated on the biological, clinical and technical dimensions of disease.²⁵³

Rudolf Virchow's nineteenth-century vision of social medicine stressed the role of social inequality as a major contributor to ill health. This vision was discernible in the interwar years, as Paul Weindling's description of the LNHO's growing "concern with the socio-economic bases of health" showed.²⁵⁴

Social medicine in the 1920s, 1930s, and early 1940s was therefore both a broad term that covered a variety of interventions as well as referring to specific health programmes and approaches, such as rural hygiene and nutrition. Considering new knowledge and changed circumstances, the variations in approach during this period separate nineteenth-century conceptualisations and practices of social medicine from those between 1925 and 1945. The internationalisation of rural hygiene and nutritional research through the LNHO was supported and shaped by the RF and the international community. It was developed in the context of post-war recovery, economic depression and increased standardisation and information flow.

Several historians allude to conferences and commissions supported or coordinated through the LNHO but there is a lack of literature aimed directly at describing the connections between colonial medicine and the international health

²⁵³ Dorothy Porter, "How Did Social Medicine Evolve, and Where Is It Heading?"; Marcos Cueto, "Social Medicine and 'Leprosy' in the Peruvian Amazon," *The Americas*, 61 (July 2004): 55-80, 56-57; Weindling, "Social Medicine at the LNHO and the ILO Compared," 134-153 (describing social medicine as a "renewed sense of concern with the socio-economic bases of health"), 148. See also Borowy, "International Social Medicine between the Wars," 13-35; Borowy, *Coming to Terms with World Health*, 21; Dorothy Porter and Roy Porter, "What was Social Medicine? An Historiographical Essay," *Journal of Historical Sociology* 1 (March 1988), 90-106.

²⁵⁴ Weindling, "Social Medicine at the LNHO and ILO Compared," 134, 148, 153. This is contrasted with Nazi eugenics programmes branded as 'social hygiene'.

promoted through the League.²⁵⁵ This marginalisation of colonialism in the League's historiography, with the exception of the mandate system, has precluded analysis of how colonial doctors and administrators were able to shape medical policy within an international context.

Like social medicine, colonial medicine varied from place to place and changed over time. Its roots lay in providing hospitable environments for colonists through the research and practice of tropical medicine. In 1898 and 1899 the Liverpool and London Schools of Tropical Medicine (referred to here as the LSTM and LSHTM respectively) were established in Britain.²⁵⁶ These and similar institutions were crucial for the development of tropical medicine as an academic discipline, shaping practice in Britain and its colonies.²⁵⁷ In 1917, an article written for the *British Medical Journal* encapsulated Patrick Manson's particular vision of tropical medicine. Tropical diseases, in Manson's opinion, were those caused by protozoal organisms or helminths requiring either an animal vector "peculiar to warm climates" or a "warm medium" in order to flourish; they were to be distinguished from bacterial diseases.²⁵⁸ Despite the resilience of the parasite-vector disease model (it remained a defining feature of the discipline long after Manson's death in 1922) this was by no means the sole perspective on, or approach to, tropical medicine between 1925 and 1945.²⁵⁹

In 1944 Ellis Herndon Hudson, an American physician with a *Diploma in Tropical Medicine and Hygiene* from the LSHTM, presented a broader conceptualisation.²⁶⁰ Nine specific headings were included in this definition of

²⁵⁵ Tilley, *Africa as a Living Laboratory*, 176-181; Also see Packard, *A History of Global Health*; Bell, *Frontiers of Medicine*, especially 162-197. Bell only refers to the LNHO in a footnote. The comparative lack of Sudanese involvement in LNHO-sponsored conferences could explain this, but the impact such discussions may have had on Sudan is an important question requiring further consideration; Litsios, "Re-imagining the Control of Malaria in Tropical Africa," 1-9. Litsios's analysis includes reference to pre-WWII development in relation to malaria control in tropical Africa.

²⁵⁶ When the London School was established "hygiene" was not in the title; this was a later addition in 1924 following RF funding of the new building. The Liverpool School never had 'Hygiene' in its name.

²⁵⁷ Power, *Tropical Medicine in the Twentieth Century*, 3; Wilkinson and Hardy, *Prevention and Cure*.

²⁵⁸ Patrick Manson, "Tropical Medicine and Hygiene," *The British Medical Journal* 2, no. 2952 (28 July 1917): 103-109, 103.

²⁵⁹ Power, *Tropical Medicine in the Twentieth Century*; Wilkinson and Hardy, *Prevention and Cure*.

²⁶⁰ Ellis Herndon Hudson, "Tropical Medicine: its Scope and Present Status," *The Scientific Monthly* 58, 1, (January 1944): 42-48.

tropical medicine. First, helminthology, such as, hookworms; second, protozoology, which included the trypanosomes that caused sleeping sickness; third, bacteriology: *inter alia* plague, leprosy, cholera, typhus, dengue and yellow fever; fourth, tropical mycology, such as fungal diseases; fifth, entomology, the study of insects and their relationship to the environment and humans, such as mosquitoes responsible for malaria and yellow fever; sixth, nutrition; seventh, neuropsychiatry: “white men and women” suffering from psychic trauma; eighth, other sciences such as meteorology and climatology (how the weather impacted disease); ninth, ethnology and anthropology.²⁶¹ Written 27 years after Manson’s treatise, scientific research had expanded and new fields were continuously added into the tropical medicine framework. While practitioners of tropical medicine held slightly different conceptualisations to Hudson—some broader and some narrower—this expanded exposition of the discipline was akin to Andrew Balfour’s discussion on “imperial diseases” in 1930.²⁶² The line between ‘tropical medicine’ and ‘colonial medicine’ was blurred: just as the definition and practice of tropical medicine changed over time, different aspects found prominence in different places.²⁶³

Andrew Balfour was at the forefront of engagement with hygiene in this tropical or colonial medicine framework. As first director of the Wellcome Tropical Research Laboratories in Khartoum, Balfour focused on the removal of mosquito breeding grounds, developed water and sanitation systems, and consequently reduced the incidence of malaria in Khartoum by 90 percent.²⁶⁴ In 1923 Balfour became the director of the London School of Tropical Medicine, which was renamed a year later as the London School of Hygiene and Tropical Medicine following Rockefeller Foundation supported expansion. Balfour reiterated this renewed emphasis on hygiene when speaking at the opening of the new School of Hygiene at Johns Hopkins University in 1926. England, Balfour argued, was the

²⁶¹ Hudson, “Tropical Medicine: its Scope and Present Status,” 42-48; Alexander Cruikshank, “The Golden Age of Tropical Medicine and its Impact on the Modernization of Sudan,” in *Modernization in the Sudan: Essays in Honor of Richard Hill*, ed. M. W. Daly (New York: Lilian Barber Press Inc., 1985), 85-100.

²⁶² Andrew Balfour, “The Hastings Popular Lecture on Health and Empire,” *The British Medical Journal* 1, 3610 (March 15, 1930): 77-83, 81.

²⁶³ Balfour, “The Hastings Popular Lecture on Health and Empire,” 77-83, 81.

²⁶⁴ Penny Bailey, “Henry Wellcome’s Tropical Medicine Laboratories,” *Wellcome Trust*, Dec 9, 2008, accessed June 21, 2015, <http://www.wellcome.ac.uk/About-us/History/WTX052449.htm>; Cruikshank, “The Golden Age of Tropical Medicine”.

“cradle of modern hygiene.”²⁶⁵ Continuing in the same vein, Balfour stated, “the principles and practice of hygiene were first properly developed and placed on a sound administrative basis” in England.²⁶⁶ Progress that was deemed to be resultant from the transnational networks created by the British Empire was then listed.²⁶⁷ The achievements described were wide-ranging, from yellow fever measures on the west coast of Africa to sewage and water works in Colombo and Singapore. Uganda, Kenya and Tanganyika had apparently done much for syphilis, yaws, and sleeping sickness respectively and the Indian Empire had a “fine record of research in tropical medicine and hygiene.”²⁶⁸ Limitations were noted in applying this research, but Balfour justified it, stating, “its task is a stupendous one.”²⁶⁹ It is clear from this speech that hygiene had many implications and it was believed that Britain had the expertise to tackle the problems at hand.

Developing health work outside Europe was merely hinted at in a 1921 memorandum on the LNHO. Here “tropical diseases” were notably defined in an extra-European category and no definite work was planned for 1921-1922.²⁷⁰ Ludwik Rajchman, appointed director of the LNHO in 1921, wanted to widen the scope of the organisation but this required greater financial backing than the League was able or willing to advance. Support from the RF provided the impetus for the International Sleeping Sickness Commission and enabled action, albeit limited, on agreements made at League conferences that extended into the 1930s.²⁷¹

“The sleeping sickness problem overshadows everything else in my work here,” remarked the Governor of Uganda, Hesketh Bell.²⁷² The disease was transmitted

²⁶⁵ Andrew Balfour, “Hygiene as a World Force,” 782-784, 782.

²⁶⁶ Balfour, “Hygiene as a World Force,” 782.

²⁶⁷ Balfour, “Hygiene as a World Force,” 783.

²⁶⁸ Balfour, “Hygiene as a World Force,” 783.

²⁶⁹ Balfour, “Hygiene as a World Force,” 783.

²⁷⁰ Memorandum on the Health Organisation - its functions and activities, November 1921 to May 1922, TNA, FD 1/2453.

²⁷¹ Memorandum on the Health Organisation, FD 1/2453; See also Rockefeller Foundation Annual Report 1925 (New York, 1925); 1928 (New York, 1928), available at <http://www.rockefellerfoundation.org/about-us/annual-reports/1920-1929>; accessed 18 August 2014.

²⁷² Quoted in Daniel R. Headrick, “Sleeping Sickness Epidemics and Colonial Responses in East and Central Africa, 1900-1940,” *PLOS Neglected Tropical Diseases* 8, no. 4 (April 2014): 1-8, 1.

through the bite of a tsetse fly and caused headaches, fever, and joint pain. Confusion, poor coordination, and sleep disturbance followed. Without treatment, patients were overcome with fatigue, slipped into a coma, and died. Furthermore, there was a link, albeit tenuous, between water and sleeping sickness as discussed earlier. Interwar contemporaries believed this connection was worth further investigation. Between 1901 and 1920 a severe sleeping sickness epidemic reportedly claimed over 200,000 lives in Uganda. This outbreak spread to Sudan, German East Africa (Tanganyika), Northern Rhodesia and Nyasaland. A quarter century later it remained at the heart of health programmes in British Africa: for example, about 50 percent of Colonial Development funds were allocated between 1929 and 1939 to sleeping sickness research and control.²⁷³

In response to the early interest expressed by its Health Committee, the League sponsored its first International Conference on Sleeping Sickness (ICSS) held in London in 1925; the second one in Paris (1928); an International Conference of Representatives of Health Services of African Territories and British India (ICR; 1932); and a Pan-African Health Conference (PAHC; 1935). The final two met in South Africa. In funding these conferences, the League's Health Organisation played a vital role in drawing bureaucrats and scientists across imperial borders together. These gatherings allowed technical officers "to pool information, consider common problems, and share ideas and strategies."²⁷⁴ Whilst conferences on sleeping sickness were held at the turn of the century in response to the epidemic in Uganda, the development of regional coordination on a distinctly 'international' basis in Africa was novel. This built on early twentieth-century connections established between doctors practicing in different imperial spheres.²⁷⁵ The first and the last of these four conferences provide the key comparators here.

In 1922 the League Council passed a resolution on collecting epidemiological and statistical information, exchanging public health personnel, and researching sleeping sickness in Equatorial Africa. Following promises of funding by the RF, a small committee was set up to collect information on the prevalence of sleeping sickness and tuberculosis in local populations in Equatorial

²⁷³ Tilley, *Africa as a Living Laboratory*, 178-79.

²⁷⁴ Tilley, *Africa as a Living Laboratory*, 131. Also see Neill, *Networks in Tropical Medicine*.

²⁷⁵ Neill, *Networks in Tropical Medicine*.

Africa; it was also commissioned to recommend measures “to prevent the extension of these diseases in this region.”²⁷⁶ This engagement reinforced the League’s commitment to the well-being and development of mandated territories as expressed in Article 22 of the Covenant. Eliciting mixed responses, it also extended this ideal to colonies that remained under imperial rule.²⁷⁷ Some colonial officials were very responsive to the involvement of the League and its Health Committee. William Ormsby-Gore, Under Secretary of State for the Colonies, noted that “politically it is essential that Great Britain should support a League interest in this very important question.”²⁷⁸ Others, as correspondence for the PAHC showed, challenged the LNHO in its attempts to coordinate health in Africa and argued that current forums were better suited to the interests of colonial powers.²⁷⁹

The 1925 ICSS was attended by the governments of Great Britain, France, Belgium, Italy, Spain, and Portugal and by Rajchman. It brought to light not only the difficulties of managing water in relation to sleeping sickness, but was also suggestive of a security-based undercurrent that marked colonial and LNHO health policies in Africa.²⁸⁰ Conceptualised as an epidemic disease and an international—implicitly security—concern, LNHO discussions about sleeping sickness epitomised the organisation’s early functions.²⁸¹

The interim report that preceded the 1925 ICSS focused attention on the opportunity that sleeping sickness provided for increased international cooperation:

²⁷⁶ *League of Nations Official Journal* 3, 8, Part 2 (August 1922), 809-814, 827-1022, 812, 934, 936, accessed March 6, 2015,

<http://www.heinonline.org/HOL/Index?index=journals%2Fleagon&collection=intyb>.

²⁷⁷ “Covenant of the League of Nations,” Article 22.

²⁷⁸ William Ormsby-Gore, Minute, 25 February 1925, TNA, CO 323/936/1; see also Ormsby-Gore, “The Economic Development of Tropical Africa,” 240-253.

²⁷⁹ T. Stanton (Medical Adviser to the Colonial Office), Minute, 15 April 1936, TNA, CO 847/6/7.

²⁸⁰ Clavin contrasts the League’s “hard security” based on military intervention with what is labelled “positive security”, in Patricia Clavin *Securing the World Economy: The Reinvention of the League of Nations, 1920-1946* (Oxford: Oxford University Press, 2013), 162-65, 179. By the mid-1940s, colonial officials noted a direct relationship between sleeping sickness and colonial development, and “preventive and social medicine”, but the meetings discussed here did not overly emphasise this. Quoted in Tilley in *Africa as a Living Laboratory*, 178.

²⁸¹ Memorandum on the Health Organisation, FD 1/2453.

At present this disease is being fought independently in French Equatorial Africa, the Belgian Congo, Uganda and in the Sudan [...] the time has now come [...] to cooperate with each other in the attempt to stamp out this disease. Without such international cooperation there is little prospect of the disease being eradicated from the Sudan [...] The committee is of the opinion that these last paragraphs will possess special interest for the health section of the League of Nations.²⁸²

'International' in this context implied cooperation between European authorities in Africa aided by the LNHO. Thus, discussions emphasised what we might now call intra- and inter-colonial (rather than 'international') boundaries. The separation of people from the tsetse fly defined these boundaries, bringing the relationship between water and sleeping sickness to the fore. The Mpologoma area in Uganda was one such boundary emblematic of colonial officials' opinions on local Ugandan habits: "although the country [area] within one mile of the water was forbidden, it proved impossible to prevent natives visiting it for fishing and surreptitiously cultivating in old shambas [gardens or vegetable plots]."²⁸³ Local populations were further accused of defying such enforcement by crossing 'inter-colonial' borders. People and rivers were not defined, or easily constrained, by colonial borders. "This disease has been allowed to spread northward," remarked the interim report, "owing to the fact that the boundary runs across tribes who are half Uganda and half Sudan."²⁸⁴ Here, the movement of people alongside rivers and the resultant interaction with tsetse flies connected water to sleeping sickness. Given that borders, which were dictated by European imperialists, were considered to contribute to sleeping sickness and its 'international' status, it is interesting that colonial officials chose to shift the blame onto colonial subjects.

Rajchman's statement on 19 May during the ICSS's second meeting made the LNHO's specific role in the control of sleeping sickness evident: "It is considered that the duty of the League of Nations was merely to coordinate efforts

²⁸² League of Nations Health Organization Interim Report on Tuberculosis and Sleeping-Sickness in Equatorial Africa (Andrew Balfour, E. van Campenhout, Professor Gustave Martin, A G Bagshawe), submitted to the Health Committee at sixth session, 26 May 1923, 107, TNA, CO 323/925; Sleeping Sickness in Equatorial Africa: League of Nations proposal for a conference, 1925, TNA, CO 323/936/1. For an overview of the independent methods used by different colonial powers see Worboys, "The Comparative History of Sleeping Sickness in East and Central Africa, 1900-1914," *History of Science* vol. 32 (March 1994): 89-98.

²⁸³ Interim report, 94, TNA, CO 323/925.

²⁸⁴ Interim report, 106, TNA, CO 323/925.

of various countries when the time was ripe.”²⁸⁵ The director justified the LNHO’s marginal role at this time saying:

it was felt that the problem was of importance to a very limited number of countries, and it was thought that the Assembly would probably take the view that the general contribution of the League of Nations should not represent too large a proportion of the total cost.²⁸⁶

The localised nature of sleeping sickness compared to malaria, for example, allowed a more targeted approach as well as higher hopes of success. At the same time, it remained an international concern and a complex disease to control. The League provided a forum in which to coordinate sleeping sickness control without direct interference in the inner workings of colonial policy. Far from deterring further discussions about the steps to be taken in managing sleeping sickness, the LNHO’s limited involvement suited colonial governments. It also suited the Health Committee. When the League was unable to undertake or implement specific policies it tended to speak of coordination in order to legitimise its role in international affairs.

Only the British representatives were against an international mission, and this was an easily resolvable terminological contestation. A mission implied a “view to educating the local authorities or improving their arrangements”, which was not within the remit suggested by the Committee or the LNHO.²⁸⁷ Accordingly, the international mission was relabelled a ‘commission’ and the representatives agreed on a location. After much deliberation, the conference chose Entebbe in Uganda over Southern Sudan and a sleeping sickness research station was established.²⁸⁸ Originally representatives had favoured Sudan for its extensive

²⁸⁵ Minutes of the International Conference on Sleeping-Sickness, 19 to 22 May 1925, Rajchman at the second meeting 19 May 1925, TNA, CO 323/936/1.

²⁸⁶ Minutes of the International Conference on Sleeping-Sickness, 19 to 22 May 1925, Rajchman at the second meeting 19 May 1925, TNA, CO 323/936/1.

²⁸⁷ Minutes of the International Conference on Sleeping-Sickness, 19 to 22 May 1925, Andrew Balfour at the fourth meeting 21 May 1925, TNA, CO 323/936/1.

²⁸⁸ For more on the sleeping sickness research station see TNA, CO 822/45/6, 1932-33; TNA, CO 822/15/10, 1929-30.

colonial borders and ‘international’ connections, but the deciding factor to prefer Uganda was that Sudan had poor transport links.²⁸⁹

At the Health Committee’s thirteenth session in 1928, Dr L. Raynaud, Inspector-General of Health Services in Algeria, questioned the attention given to sleeping sickness throughout much of the 1920s. It was asked whether the League could now “extend its activities to other fields?”²⁹⁰ This comment coincided with the rise of broader conceptualisations of health as social medicine emerged as a primary discourse in LNHO circles. It also highlighted the significant role of colonial doctors in LNHO forums, which was in stark contrast to the marginalisation of indigenous knowledge. The Great Depression pushed social issues to a central place in the LNHO and the Colonial Office. Programmes of nutrition, housing, water, and sanitation not only required cooperation, but also formed the perfect arena for the League to justify its position in international health. International interest in so-called ‘modern’ conceptions of hygiene peaked with the LNHO’s Bandoeng Conference on Rural Hygiene in 1937, yet significant questions remained: what did rural hygiene mean for British colonies in Africa? What did it mean in terms of access to water and sanitation facilities?

The widened scope of discussions in the 1930s signified a definite shift away from mere epidemic disease control to an approach considering the social relations of disease. The 1931 League-sponsored European Conference on Rural Hygiene provided a platform for multi-dimensional visions of health. Defined as “the sum total of all the activities which public authorities are called upon to undertake in order to improve the health of economically backward populations”, rural hygiene was “complex and diversified” and shaped by local circumstances and conditions.²⁹¹ This related directly to the tenets of interwar social medicine. Programmes of rural hygiene were not entirely new: they were first mentioned in a 1922 Rockefeller Annual Report in relation to health programmes in

²⁸⁹ This is in contrast to an observation made by H. H. Scott of the Bureau of Tropical Diseases explaining the choice of location: “it was thought that the clinical conditions and therapeutic measures could be well studied in the French and Belgian Congo, the behaviour of the parasite in the insect vector in Uganda”, quoted and discussed by Tilley, *Africa as a Living Laboratory*, 174.

²⁹⁰ L. Raynaud, League of Nations Health Committee, Minutes of the thirteenth session 25-31 October 1928, Fourth Meeting, CUL, RCS, OP.109.0.103, C.3.M.3.1929.III.

²⁹¹ “Report on the work 1938-39,” *Bulletin of the Health Organisation* 8, 1-2 (1939), 1-60, 17, CUL, RCS, OP. 309.25.01(8).

Czechoslovakia.²⁹² Earlier reports refer to rural sanitation as early as 1916.²⁹³ However, the LNHO's main achievement with regard to rural hygiene was to internationalise both the concept and action taken rather than posit new ideas or directly solve health problems. However, not all parties supported discussions on rural hygiene. Edward Newbury Thornton (South Africa) argued that the dialogue during the ICR 1932 had "served very little purpose" and was not averse to dropping the topic entirely for the 1935 conference.²⁹⁴ Thornton did not see it as a matter which the delegates could "compare conditions profitably."²⁹⁵

Borowy argued that the 1930s signified a move away from the "perceived self-evident superiority of western science" to an approach that "emphasised the value of indigenous ways of living and of traditional medicine", and included addressing "hygienic questions like clean water."²⁹⁶ Whilst this was evident in China, the multiplicity of ideas attached to rural hygiene and social medicine lent itself to variable understandings and applications in different contexts.²⁹⁷ Therefore exploring a variety of territories to fully understand the multiplicity of ideas at work is important. The ICR 1932 and PAHC 1935 demonstrated, to a certain degree, the evident shift towards a wider programme of health in 1930s Africa. Whilst lengthy discussions on yellow fever overshadowed this broader outlook, and Western knowledge remained central to LNHO health agendas, this should not detract from the forward thinking that was emerging in social medicine.

The 1930s conferences were held in South Africa, instead of remaining confined to Europe. In contrast to the ICSS, South Africa was heavily involved in the planning and hosting of the 1932 and 1935 conferences, although unlike the ICSS, Sudan's interests were not represented. Albeit predominantly through cooperation of European officials, these later conferences encouraged coordination on a wider intercontinental scale and broached the subject of rural hygiene. The 1935 PAHC extended the dialogue of the ICR 1932, discussing

²⁹² Rockefeller Foundation Annual Report 1922, (New York, 1922), 153, accessed October 17, 2014, <http://www.rockefellerfoundation.org/uploads/files/0ae0ca6f-52ce-46f4-8ef4-928493ca5b20-1922.pdf>.

²⁹³ Rockefeller Foundation Annual Report 1916, (New York, 1916), 83, accessed October 17, 2014, <http://www.rockefellerfoundation.org/uploads/files/24eef728-c7d0-48e2-bda5-79148cde0041-1916.pdf>.

²⁹⁴ Thornton to Stanton, Letter, 17 June 1935, 1, 2, TNA, CO 847/4/7.

²⁹⁵ Thornton to Stanton, Letter, 17 June 1935, 1, 2, TNA, CO 847/4/7.

²⁹⁶ Borowy, *Coming to Terms with World Health*, 449, 454-55.

²⁹⁷ Socrates Litsios, "Revisiting Bandoeng," *Social Medicine* 8, 3 (November 2014):113-127.

progress in the management of yellow fever, plague, malaria, and typhus. It addressed rural hygiene, proposals for better coordination of services, the dangers associated with locust poisoning, and animal diseases communicable to man.²⁹⁸ Following the European rural hygiene conference, one might have expected at least some mention of water, yet the closest reference in the final report was to the role of hygienic education.²⁹⁹ Instead, the committee discussing rural hygiene and the coordination of services (represented by South Africa, Uganda, Basutoland, Angola and Swaziland) furthered the 1932 dialogue on first, the importance of integrated preventive and curative services, second, the need for better coordination between services, third, economic development through better nutrition and housing, and fourth, the utilisation and training of local people.³⁰⁰ The importance of water was implied in mentions of integrating preventive and curative services and potentially hidden under the three other items of dialogue.

The emphasis on coordination was part of a wider movement.³⁰¹ In the Bandoeng discussions water definitively appeared.³⁰² This was in contrast to the resolutions of the 1932 and 1935 conferences, where there was only implied recognition “that there exist problems too numerous to detail here.”³⁰³ Whilst a special conference on rural hygiene was held to discuss this matter in the Far East, there was no comparable conference in Africa aside from the PAHCs where rural hygiene was one topic out of many.

Moreover, it is unsurprising that food and nutrition were prioritised over water in the African context. Proposed by the Yugoslav government in 1925, the Health Committee agreed to a study of food manufacturing and sales regulations

²⁹⁸ “Report of the Pan-African Health Conference,” *Quarterly Bulletin of the Health Organisation* 5, 1 (March 1936), 1-209, CUL, RCS, OP. 309.25.01(5).

²⁹⁹ “Report of the International Conference of Representatives of the Health Services of Certain African Territories and British India, Cape Town, 15-25 November 1932,” *Quarterly Bulletin of the Health Organisation* 2,1 (March 1933), 3-115, especially 104-105, CUL, RCS, OP. 309.25.01(2).

³⁰⁰ “Report of the International Conference of Representatives of the Health Services of Certain African Territories and British India, Cape Town, 15-25 November 1932,” 3-115, 101, 103, 101-102; Also see Worthington, *Science in Africa*, 568-570.

³⁰¹ Litsios, “Revisiting Bandoeng.”

³⁰² Litsios, “Revisiting Bandoeng,” 113; Socrates Litsios, “Selskar Gunn and China: The Rockefeller Foundation’s ‘other’ approach to public health,” *Bulletin of the History of Medicine* 79, no. 2 (Summer 2005): 295-318.

³⁰³ “Report of the Pan-African Health Conference,” *Quarterly Bulletin of the Health Organisation* 5, no. 1 (March 1936), 1-209, particularly 198-208 on rural hygiene, 208-209 on coordination of research, and 200 for the quote, CUL, RCS, OP. 309.25.01(5).

“in the interests of public health.”³⁰⁴ Léon Bernard, Professor of Clinical Tuberculosis and Technical Health Adviser at the French Ministry of Health, followed this up and proposed that the Committee take up the scientific study of nutrition in 1928. The effects of the Great Depression undoubtedly fuelled this interest: two nutrition conferences were convened in 1932 and a detailed study was undertaken to measure the impact that the crisis was having on public health.³⁰⁵ Midway through 1936 the League of Nations published a survey on nutrition and in November questions were asked in the House of Commons.³⁰⁶ As a result full British support for nutrition in the tropics and the Far East was promised. This was followed up by a colony-wide survey of nutrition published in 1939. Grounded in health and economic benefits, nutrition provides another clear example of interwar social medicine.³⁰⁷ However, links between water and nutrition were rarely made explicit.

Despite the dominance of nutrition in this period, water was considered in relation to yellow fever and malaria as mosquitoes needed access to water. At the ICR 1932 the Gold Coast representative, Dr David Duff, noted, “the introduction of a piped water supply has been found to be the most effective single measure

³⁰⁴ League of Nations, “The Problem of Nutrition Volume II: Report on the Physiological Bases of Nutrition,” 1936, accessed March 6, 2015, http://archive.org/stream/problemofnutriti02leaguoft/problemofnutriti02leaguoft_djvu.txt.

³⁰⁵ League of Nations Health Committee, Minutes of the 13th Session, 1928; Fourth Meeting, Nutrition, CUL, RCS, OP.109.9.103, C.3.M.3.1929.III: Proposal of Professor Léon Bernard, 29 October 1928, 32, also Annex 2, 70; “The Most Suitable Methods of Detecting Malnutrition Due to the Economic Depression,” *Quarterly Bulletin of the Health Organisation* 2, no. 1 (March 1933), 116-129, CUL, RCS, OP. 309.25.01(2).

³⁰⁶ Nutrition “will form an important part of the agenda of the conference on Rural Hygiene in the Far East, which will take place in Java next summer under the auspices of the Health Organisation”. Quoted by Viscount Cranborne at Commons Sitting, 30 November 1936, Hansard, accessed March 6, 2015, <http://hansard.millbanksystems.com/sittings/1936/nov/30>. For further work on nutrition see Havinden Meredith, *Colonialism and Development*, 196-198; Josep Barona has written a number of articles on nutrition: Josep Barona, “Nutrition and Health: The International Context during the Inter-war Crisis,” *Social History of Medicine* 21, no. 1 (April 2008): 87-105; Josep Barona, “International Organisations and the Development of a Physiology of Nutrition during the 1930s,” *Food & History* 6, nndo. 1 (2008): 129-162. See also Weindling, “Social Medicine at the LNHO and ILO Compared”.

³⁰⁷ “Nutrition in relation to health is one of the most important aspects of preventive medicine [...] Nutrition is put forward, not only as a physiological problem, but also as an economic [...] problem.” League of Nations, “The Problem of Nutrition, Volume II: Report on the Physiological Bases of Nutrition” drawn up by the Technical Commission of the Health Committee at the meeting held in London (November, 1933), revised and amplified at the meeting held at Geneva (June 4th-8th, 1936), 1936, 4, accessed March 6, 2015, http://archive.org/stream/problemofnutriti02leaguoft/problemofnutriti02leaguoft_djvu.txt.

which can be applied to a town to limit breeding” in combatting yellow fever.³⁰⁸ At the PAHC 1935 the representative for Uganda, Dr Henry De Boer, referred to the “endeavour to deal with these swamps by planting them with trees [...] which will at the same time dispose of a maximum of moisture” and make the area “less suitable for breeding” malarial mosquitoes.³⁰⁹

Like in the discussions on sleeping sickness, water was regarded as both a problem and a solution but it was only one of many factors considered to affect health. No integrated programme for providing access to clean water was advanced in the League of Nations forums in Africa. As priorities for international health lay elsewhere, water had a limited but perpetuating place in colonial and LNHO-promoted international health policies. Yet the connections between the LNHO, the RF, Britain and its colonial territories were suggestive of a wider outlook on health. Coordination was regarded as an important prerequisite of LNHO-sponsored conferences and as such great stress was placed on this factor alone. South African representatives and Rajchman were also keen on developing an African sub-committee of the LNHO; the British, however, were unsupportive, arguing that colonial committees were sufficient.³¹⁰ Why involve an external organisation when you are able to provide similar services entirely on your own terms? As such, the LNHO was significantly hampered throughout the period in its attempts to promote what it believed would improve the coordination of services. The extensive use of the term coordination in relation to its international activities served to highlight its financial restrictions and its limited jurisdiction, alongside a seemingly blind faith in coordination as a method to combat disease and improve general health.³¹¹

Nevertheless, coordination through these conferences allowed the LNHO to connect with questions of international and colonial health and advance ideals such as rural hygiene. How did it do so? How was rural hygiene promoted in

³⁰⁸ “Report of the International Conference of Representatives of the Health Services of Certain African Territories and British India, Cape Town, 15-25 November 1932,” 44, CUL, RCS, OP. 309.25.01(2).

³⁰⁹ “Report of the Pan-African Health Conference,” 138, CUL, RCS, OP. 309.25.01(5).

³¹⁰ E. N. Thornton and A. J. Orenstein, *Coordination of Health Work in Africa*, 1935; T. Stanton, Minute, 15 April 1936. TNA, CO 847/6/7.

³¹¹ See Borowy, *Coming to Terms with World Health*, 468; Carol Miller, “The Social Section and Advisory Committee on Social Questions of the League of Nations,” in *International Health Organisations and Movements, 1918-1939*, ed. Paul Weindling, (Cambridge: Cambridge University Press, 1995), 154-175, 156 for financial details.

Uganda and Sudan? What about other aspects of health? And what did this mean for water-related policy in colonial Africa?

5. Connecting Colonial and International Histories 1920-1945

Following these four conferences, a fifth was planned for 1940 in Nairobi but did not materialise due to the outbreak of war. However, the planning that took place for the Nairobi conference revealed reflections on the previous conferences and the future direction that doctors and administrators wanted to take. Moreover, there appear to be some direct and indirect connections between colonial health and the international health promoted by the LNHO, as shown through analysis of medical department reports in Uganda and Sudan. Representatives at the 1930s conferences were predominantly colonial medical officers of health and thus there was a direct connection between Uganda and LNHO interests. In contrast, any international health contributions by the LNHO had only indirect bearing on Sudan due to its lack of representation. The unification of colonial services in the mid-1930s and the resultant standardisation of reports help make some of these shifts more evident.³¹² This section starts with an examination of the connections between the colonial and international in Uganda, followed by a similar discussion in relation to Sudan.

In 1933, the Director of the Medical and Sanitary Services in Uganda, Dr William Kauntze, wrote a statement that was indicative of rural hygiene:

In the first place, the environment in which the child is to find itself after birth must be rendered healthier by the *provision of better housing*, by improving the *quality of water supplies*, by ensuring *greater cleanliness* in village surroundings, and by introducing *better conservancy arrangements*, so reducing the possibilities of infestation with various parasites [my italics].³¹³

³¹² See Sudan, *GAMR* in 1935, 1936, 1937, 1945, and 1946, CUL, RCS, RCS.L.42.M1; Uganda, *GAMR* in 1935, 1936, 1945, 1946, and 1947, Wellcome Library, WA28.HU4 U26; Kirk-Greene, *On Crown Service*, 35.

³¹³ Uganda, *GAMR*, 1933, 6. Public health was prioritised during the 1930s despite financial constraints, see Mary Bull, "The Medical Service of Uganda 1954-55," Oxford Development Records Project Report 20 (Oxford, 1954), Wellcome Library.

This formed the cornerstone of Kauntze's plans for the medical department in the 1930s. Kauntze's reference to the environmental improvements required corresponded with conceptualisations of rural hygiene expressed at LNHO-sponsored conferences held in South Africa, where attention focused on "the dependence on the improvement of rural sanitary conditions on the economic position of the African peasant."³¹⁴ Kauntze's views, however, contrasted with the international emphasis on nutrition. This underlined, firstly, the prevalence of rural hygiene ideals filtering between colonial and international structures, i.e. the importance of contemporary trends in international health shaping practice on a large scale, and second, the multiple notions of rural hygiene (and other concepts) within this framework. Kauntze's opinions on health clearly expressed deviations from popular fields of research and therefore underlined the ability and inclination of practitioners to promote alternative issues they believed to be of prime importance.

Correspondence regarding the planned conference in Nairobi was indicative of these two points. Following discussions with the Directors of the Medical Services in Kenya and Tanganyika (Albert Rutherford Paterson and Ralph Roylance Scott), the Chief Secretary to the Conference of East Africa Governors, Henry Gurney, argued that focusing on nutrition might increase Africa's visibility in international health circles as well as stress the importance of improving health through this channel:

Paterson and Scott are both keen on making nutrition the keynote or motif of the conference. This is the question of the hour, and the opportunity of bringing its importance home to Governments and the public in this part of the world. Paterson hopes that some person or persons of eminence in the field of nutritional research would be invited [...]³¹⁵

This tactic for elevating the position of African colonies in the wider scientific arena by promoting nutrition as part of health programmes came at a time when nutrition was quickly establishing itself as an important area of medical research.³¹⁶ It was much easier for proponents to raise similar concerns, and therefore funds, in other

³¹⁴ Uganda, *GAMR*, 1935, 1.

³¹⁵ Pan African Health Conference, Nairobi, 1939-1940, Henry Gurney to Leslie B. Freeston (Chief Secretary Tanganyika), Letter, 9 March 1939, TNA, CO 859/14/1.

³¹⁶ Gurney to Freeston, Letter, 9 March 1939, TNA, CO 859/14/1.

geographical contexts. Yet despite the strong pull of nutrition in international health agendas, variations in priorities persisted. Kauntze regarded this strong nutritional focus as too novel to render fruitful discussion and favoured medical education and better organised health services for Africans. Kauntze's East African counterparts believed that such ideas were insufficient to form the basis of the conference and were unlikely to attract "men of eminence."³¹⁷ Malcolm Watson, Director of the Ross Institute in London (which merged with the LSHTM in 1934 and dealt primarily with tropical hygiene), was also uncertain about this concentration on nutrition. Watson regarded knowledge about malaria and its control as a prerequisite to nutritional discussions:

[...] you cannot grow food without water; management of water is the secret of the control of malaria; and at the present so little is known of water management in most parts of Africa that its mere presence is practically synonymous with the presence of malaria. Yet [...] the presence of water need not imply the presence of malaria, and there are reasons for hoping that the solution of the malaria problem will aid in the solution of the nutrition problem.³¹⁸

Watson believed water management required more attention and used connections of water with food and malaria to forward this argument. Watson was also unimpressed with the "depressing influence" of League reports about malaria, which had concluded that there was not enough quinine for worldwide distribution to eradicate the disease.³¹⁹ Watson also demonstrated how particular aspects of health, such as water management, could be attached to popular research in malaria and nutrition to raise its profile in colonial and international health discourses. The views of these three different actors—Kauntze, Watson, and Gurney— represent a small selection of the multiplicity of ideas attached to rural hygiene and nutrition with colonial doctors and administrators alike vying to promote their own visions of health for Africa.

³¹⁷ Gurney to Freeston, Letter, 9 March 1939, TNA, CO 859/14/1.

³¹⁸ Malcolm Watson, "Malaria and Nutrition in Africa," *Journal of the Royal African Society* 36 (October 1937): 405-420, 407-408; a brief history of Ross Institute is available at the London School of Hygiene and Tropical Medicine, accessed June 12, 2015, <http://www.lshtm.ac.uk/library/archives/ross/institute/>.

³¹⁹ Watson, "Malaria and Nutrition in Africa," 413.

Experiences in Sudan showed similarities and contrasts with Uganda and connections between colonial and international health agendas remained visible. As noted earlier, the Sudan Medical Services report renamed its section on public health to public health *and hygiene* in 1935. “A beginning has been made in dealing with the much more difficult problem of village sanitation”, remarked Harold Armstrong Crouch, Assistant Director of Sudan Medical Services and Khartoum Medical Officer of Health.³²⁰ Crouch continued: “Most villages in the Sudan are a muddled mess of houses swarming with flies.”³²¹ This notion of a the start made in improving conditions implied this was a recent addition to the Medical Department’s work. Also addressed was the reorganisation of services, strongly promoting the training of Sudanese sanitary officers, sanitary overseers and dispensary staff.³²² Whether the international health agendas filtered down rather than the other way around is difficult to determine, and it is likely that international and colonial health agendas influenced each other. However, this engagement with these aspects of health in Sudan, as in Uganda, was suggestive of rural hygiene as envisaged by the LNHO. Reference to aspects such as nutrition and water supplies in the years after the conferences emphasised the increasing role of the wider world in defining or shaping models of health.

Colonial development brought the relationship between water management and health to the forefront of analysis in Sudan. New fields of research were clear when irrigation was introduced to early twentieth-century Gezira. In redistributing water from the Blue Nile via canals and water channels, the British aimed to increase agricultural production in the territory. However, by the late 1930s it was clear that both bilharzia and malaria were becoming endemic to the region, seemingly due to standing water in channels. Moreover, it was believed that the presence of malaria was reducing local resistance to bilharzia.³²³ In 1939, Dr Hilmy Bey, Egyptian Under-Secretary of State to the Ministry of Health, brought the spread of bilharzia to the LNHO’s attention. Dr Hilmy Bey felt it was “manifestly essential [...] to organise international collaboration in order to ensure effective preventive action.”³²⁴

³²⁰ Sudan, *GAMR*, 1935, 32.

³²¹ Sudan, *GAMR*, 1935, 32.

³²² Sudan, *GAMR*, 1935, 34.

³²³ Sudan, *GAMR*, 1936, 22.

³²⁴ “Report on the work 1938-39,” *Bulletin of the Health Organisation* 8, no. 1-2 (1939), 1-60, 13-15, CUL, RCS, OP. 309.25.01(8).

Whilst descriptions of bilharzia prevalence in Sudan had shifted from “epidemic” in 1931 to “satisfactory” control in 1937, better management of the disease was still sought.³²⁵ Experts met under the chairmanship of LSHTM Prof. Robert Leiper and agreed that local factors were most important and that further data needed collecting.³²⁶ The most interesting statement made in this regard was the place of bilharzia within the health of the community:

It cannot be considered as though it constitutes an isolated problem [...]. All those factors which come within the scope of rural hygiene have a close bearing upon it: the soil, agriculture, irrigation, housing, water-supply, nutrition and sewage disposal. The study of bilharzia is therefore bound to contribute to the elucidation and solution of the wider problem of rural hygiene.³²⁷

Linking this disease to the rural hygiene agenda brought it into a field the LNHO was known to promote, connecting it directly into the wider health scene. Yet, other than reference to bilharzia alongside malaria, leprosy and other diseases labelled “troublesome”, it did not enter discussions for the Nairobi conference agenda.³²⁸ After much deliberation an agenda was forwarded to include nutrition, rural hygiene, “training of native staff” (subordinate personnel), and yellow fever. This was almost a reversal in the order of priorities for the 1935 conference.³²⁹ Bilharzia proponents could attach the disease to rural hygiene, had the conference gone ahead. We also see the association of rural hygiene with water supply in this example, as the parasites causing bilharzia require water to infect humans.

This connection highlights how doctors were able to attach their personal and professional interests to topics promoted on an international scale, such as the LNHO and RF promotion of rural hygiene. Their main aim was to mobilise financial and intellectual support and to increase the visibility of issues considered important for the international agenda. The above quote, and the lack of subsequent action taken to deal with bilharzia on an international scale, also underlines the difficulties of raising diseases, or ideas related to them, onto

³²⁵ Sudan, *GAMR*, 1931, 2; Sudan, *GAMR*, 1932, 8; Sudan, *GAMR*, 1933, 6, 9; Sudan, *GAMR*, 1934, 8; Sudan, *GAMR*, 1935, 22.

³²⁶ “Report on the work 1938-39,” 14, CUL, RCS, OP. 309.25.01(8).

³²⁷ “Report on the work 1938-39,” 15, CUL, RCS, OP. 309.25.01(8).

³²⁸ Unsigned letter to Dr M. D. Mackenzie (Health Section, League of Nations), Letter, 23 August 1939, TNA, CO 859/14/1.

³²⁹ [illegible name], Minute, 24 July 1939, TNA, CO 859/14/1.

colonial or international research agendas, even if they were attached to contemporary trends. However, this did not stop doctors and health service professionals from trying to forward ideas that they believed were important for improving health in Africa or elsewhere.

Similar attention was not given to rural hygiene, whether in narrow or broad conception as discussed above, within the Colonial Office. Despite separate conferences on the subject in Europe (1931) and Indonesia (1937), rural hygiene met with varied levels of support from administrators and doctors situated in Africa. Experiences in Uganda and Sudan suggested that officials were more inclined to support rural hygiene—often referred to as rural sanitation—within departmental reports. These connections between colonial and international health agendas were expressed in conceptualisations of health and disease, approaches to their management, and research priorities.

6. Concluding Remarks and Legacies

The multiple views that existed in the interwar period on what should be prioritised in health, particularly in Africa, sometimes included water and sometimes did not. The 1930s marked the decade in which British bureaucrats and scientists had more fully formed and articulated their ideas about, and understandings of, the water problem in colonial Africa. Whilst the LNHO was not directly involved in promoting water-related policy in Africa during this period, the indirect impact of its forums should not be understated. As a coordinating body, the LNHO encouraged the re-shaping of discussions, promoting its own ideals, as evident in 1930s attempts to coordinate health in Africa.

This chapter has made a structural argument about the fragmentary responsibilities for investigating and improving clean water supplies and therefore contributes to the literature on experts in the colonies between 1920 and 1945. The first section showed the multiple conceptualisations of water between 1920 and 1945, particularly how at different times and in different places public health concerns relating to water were either overshadowed or brought to light as a result of the prioritisation of economic considerations. Water was shown to be a multifaceted problem requiring a diverse range of expertise and multiple solutions. This was evidenced by the number of departments involved in, or responsible for, the different aspects of water conservation, management, and development.

The second section detailed the administrative structures involved in the development and management of water supplies, demonstrating the conceptualisations of water as defined within a technical framework. It also revealed how scientific experts and civil servants shaped prevailing understanding of the relationship between access to clean water and the prevalence of infectious diseases, with a particular focus on sleeping sickness. This section also highlighted the problems in trying to understand the place of water in colonial and international health policies without reference to the many departments and places in which water was relevant. As Horn noted:

while such expenditure [on water supplies] may prove a source of revenue in the long run, it means a heavy outlay for work which is not always recognised as being peculiarly a sanitary measure—though it is in fact of the greatest importance to the public health.³³⁰

For example, water supplies were provided through the PWD and Geological Survey, they were inspected by the sanitation section of Medical Services, and some supplies were bacteriologically and chemically tested.

This chapter adds to the literature on bureaucratic reform within colonies, revealing how the increasing scale and specialisation of colonial governments affected the recruitment of scientific experts to work beyond metropolitan areas and fed back into research and policy making in the UK. While there were efforts to improve water supplies in this period, these were hampered by the highly fragmentary responsibilities for investing in clean water. This fragmentation, compounded by patchy records, makes it impossible to gain an overview of how much capital was allocated and spent on projects to improve water supplies. There is however indirect evidence that there was growing concern about the link between water and the incidence of infectious diseases and that this intellectual (and political) shift led to commitments by colonial administrations to use local and metropolitan public resources to invest in sanitary schemes post-1945, as explored in the next chapter.

In revealing how colonial officials justified grant proposals in the third section, the popularity of water development projects as part of the Colonial

³³⁰ Horn, "The Control of Disease in Tropical Africa: Part I," 24-25.

Development Act and the Colonial Development and Welfare Acts 1925-1945 is unsurprising. It exposed to view the different mind-sets of colonial officials within the empire compared with those that worked outside of London, as well as within these groups. Such projects served both social and economic ends. This chapter has revealed water to be both an economic menace and an economic necessity. It affected the productivity of labour in Uganda and Sudan but was crucial to the development of large-scale irrigation works in the Gezira region of the Sudan. Each had varied health impacts in Uganda and Sudan. The third section also showed water to be both unifying and divisive, as the politics surrounding the Nile waters shaped the experiences of all those residing on its banks.

The fourth and fifth sections showed how the LNHO directly connected with health concerns in Uganda and supported sleeping sickness studies and pilot schemes. Indirect influences followed as demonstrated by Kauntze's stress on the importance of rural sanitation. Structural changes in medical reports that placed more emphasis on water, housing, and nutrition in both Uganda and Sudan were also suggestive of an indirect connection.

Yet these connections cannot be reduced to the LNHO alone. In the early twentieth century, there was a growing plethora of health institutions operating in, and shaping, colonial and international settings. In the international context, the LNHO operated alongside, and cooperated with, the Office International d'Hygiène Publique, League of Red Cross Societies, the LSHTM, LSTM, and the RF.³³¹ In the colonial context it operated and cooperated with the Colonial Advisory Medical Committee, the Bureau of Hygiene and Tropical Diseases, and other health-related bodies such as the Wellcome Research Laboratory in Khartoum. Discourses of tropical medicine and colonial development, as well as international health trends, shaped priorities within colonial departments.

That Uganda, Sudan, and perhaps other colonies were part of a growing trend towards a wider concept of health was manifest in the shifting focus within medical departments and correspondence relating to international conferences. Moreover, as the LNHO needed to justify and promote its position in the interwar

³³¹ For more on some of these institutions see Wilkinson and Hardy, *Prevention and Cure*; Helen J. Power, *Tropical Medicine in the Twentieth Century*; Farley, *To Cast out Disease*.

international health arena, programmes of rural hygiene, nutrition, and the variable ideas attached to these concepts suited its focus on coordination.

This chapter has shown that the LNHO aimed to be more inclusive than previous health organisations but that this was (unsurprisingly) complicated by colonial powers. Attempts at inclusivity needed reciprocation and the LNHO could only be as 'global' or 'international' as its members understood and allowed. South Africa's increased involvement in African health affairs provided a more independent perspective, but its stake in shaping health agendas was curbed by lack of British support. Nevertheless, there was a definite movement away from a narrow focus on epidemic disease to more social conceptualisations of health in colonial Africa.

Despite an intrinsic link to the social relations of health and disease, water did not always appear to figure prominently in international health agendas during the interwar years. Attached to related concepts of social medicine and rural hygiene, or to specific diseases and their control, early twentieth-century interest in water and sanitation programmes was uneven at best. There was a clear emphasis on the relationship between water and sleeping sickness, which cannot be discounted, but nor can we ignore the important works of Worboys, Headrick, Tilley, and others who have shown the diversity of experiences that shaped control methods. The multiplicity of experiences reflected colonial interests, access to tools and technologies, and the preference that tsetse flies showed to particular environments. Water did not frame health agendas in the 1920s and 1930s as it would in the twenty-first century and lacked a firm place in disease control, social medicine or rural hygiene programmes despite its multiple mentions in departmental reports. Drainage schemes remained instrumental in combatting malaria as shown by Sandy Sufian for Mandatory Palestine, but these programmes battled against proponents of quinine in controlling the disease.³³² More often than not they were used in tandem and it is therefore difficult to differentiate the relative importance of water as a factor affecting malaria control, both in theory and practice. Unlike yellow fever, sleeping sickness, and other

³³² Sufian, "Re-Imagining Palestine".

diseases, malaria did not command central attention in African rural areas, which frustrated some colonial doctors.³³³

This chapter focused on the interwar years due to the lack of evidence available on the war time period. We must assume that within colonies, war time priorities trumped consideration of investing in public goods with repeated long-term gains, and thus there was a declining interest in investigating the link between water and public health in these specific locales. It also seems safe to assume that existing water supplies infrastructures degraded during the war. Doctors were seconded to territories on the front line and shortages across the board reduced reports to statements of “satisfactory” or “unsatisfactory” improvement.³³⁴ Long-term planning in the Colonial Office, which put an emphasis on improving the social infrastructure in the colonies and introducing local representative government, was largely put on hiatus. Work accomplished towards this end before the height of the Second World War was picked up again in the late 1940s.³³⁵

This chapter addressed the place of water in discussions of health and has shown how they were often related to development discourses in the 1920s, 1930s, and early 1940s. Between 1920 and 1945 it was evident that while motives were mixed, Britain prioritised improvements within “under-developed” territories, as specified in the League of Nations covenant.³³⁶ As Powesland stated regarding Uganda, “the trusteeship theory was beginning to impinge more directly on practical economic and labour policy than ever before.”³³⁷ The Colonial Development Act 1929 underscored the relationship between economic development and public health. Of its recommended projects for 1929-40, 17 percent related to public health, 10 percent to water supplies and power, 7 percent

³³³ Letter from C. B. Symes (entomologist in Nairobi) to George Strode (Associate Director of RF International Health Board) dated 10 June 1938, Rockefeller Foundation, Record Group 6.1, Series 1.1, Box 17, Folder 173, Rockefeller Archive Center (New York).

³³⁴ Uganda, *GAMR*, 1940, 9-10; Uganda, *GAMR*, 1941, 4; Uganda, *GAMR*, 1942, 8; Uganda, *GAMR*, 1943, 6; Uganda, *GAMR*, 1944, 8. This report was pessimistic about progress, with supplies improved to a “limited extent” in rural areas; Uganda, *GAMR*, 1945, 6-7. This report was more positive again about progress.

³³⁵ Robert Pearce, “The Colonial Office and Planned Decolonization in Africa,” *African Affairs* 83, no. 330 (Jan 1984): 77-93.

³³⁶ “The Covenant of the League Nations (including amendments adopted to December, 1924)”; UK Government Legislation, “The Colonial Development Act 1929”.

³³⁷ P. G. Powesland, *Economic Policy and Labour: A Study in Uganda's Economic History* (Kampala: East African Institute of Social Research, 1957), 46; “The Colonial Development Act 1929”.

to scientific research, and 5 percent to land reclamation and drainage.³³⁸ Unrest within the colonies during the 1930s and international pressure from America in particular, led to changes in the ideologies and approaches to colonial development, as seen in the 1940 and 1945 Colonial Development and Welfare Acts.³³⁹ As a result, progress towards improving water supplies was undertaken before the 1940s, which was exemplified in a set of government commissioned papers in Uganda.³⁴⁰

Despite its role in promoting water-specific programmes in Europe and the Far East, the LNHO's role in Africa was limited. Though it is easy to equate lack of action with lack of interest, this was not always the case, even if difficult to prove. As the transition was made from the LNHO to the WHO, it was evident the successor agency wanted to impress its new role in coordinating health. The WHO did refer to the LNHO malaria commission, but the novel ways of dealing with the disease in the 1940s (DDT and other pesticides) distinguished from its predecessor. WHO environmental sanitation programmes did allude to LNHO rural hygiene programmes, but the sanitary engineering aspect common to both did not find much support from the WHO executive board. The 1940s and 1950s saw an increase in colonial engagements with water-related policies in health and development. However, this had tenuous links to the LNHO at best. Instead, strong connections were established through colonial development programmes from 1929 and were more fully extended in the post-WWII era.

In light of the current literature on public health and international development, the next four chapters focus on three strands. First, they examine the concept of environmental sanitation (c. 1947 and 1975) within the World Health Organisation and how engagements with water sat primarily under this heading. Apart from Socrates Litsios, academic work has thus far not placed

³³⁸ Overseas Development Institute Publications, British Aid – 5, *Colonial Development*, Overseas Development Institute, (England, 1964), 29, Table 2, accessed March 6, 2015, www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications.../8077.pdf.

³³⁹ See Constantine, *The Making of British Colonial Development Policy 1914-1940*; Havinden and Meredith, *Colonialism and Development*. More on the changing ideology of development is discussed in Chapters 2 and 3 of this thesis.

³⁴⁰ "Water Supply Paper No. 1 is the first of a projected series of descriptions of the way in which water problems are being met in Uganda." Bisset, *Geological Survey of Uganda. Water Supply Paper No. 1: Water Boring in Uganda, 1920-1940*, 1941. The second two papers: Bisset, *Geological Survey of Uganda. Water Supply Paper No 2: Small Reservoirs in Uganda*, 1945; N. Harris, *Geological Survey of Uganda. Water Supply Paper No. 3: Domestic Rural Water Supplies in Rural Areas*.

enough emphasis on the importance of this subject, despite its place as one of the six topics the WHO prioritised. Second, these chapters examine policies within their regional contexts: Uganda in East Africa, Sudan's attachment to a number of different regions, and most particularly the impact of regionalisation in the WHO (Uganda in the African Regional Office, Sudan in the East Mediterranean Regional Office). Thirdly, these next four chapters examine the changing relationship between water and health and between water and development. As such, Chapters 2, 3, 4, and 5 demonstrate how a problem of development—inadequate water supplies—was constructed, and how organisations collaborated and competed to design and implement solutions in the three decades after the Second World War. In this vein, the rest of this thesis will focus on external influences, examining how policies and ideas were adapted and re-conceptualised when officials faced opposition to their ideas about water supplies. Evidence on post war developments strongly suggests that there was a strengthening of political commitment locally and internationally to invest in sanitation, as well as in augmenting water supplies to raise agrarian productivity. The next four chapters investigate the continuities with this interwar and wartime period. They address the long-term effects of fragmentary structures and how coordination problems were, or were not, tackled.

CHAPTER TWO

A Problem of Underdevelopment? 1945-1963

The much-quoted WHO definition of health in 1948 described the ideal as, “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”¹ Yet, as Packard and others have noted, there was a “tendency to view health as the absence of disease” in international health circles.² As a result disease-centric approaches continued to pervade international health interventions and their imperial and colonial counterparts. Kelley Lee argued in similar fashion, “for the WHO, the initial focus of its activities was individual factors while broader environmental or structural factors have been given limited attention.”³ The prioritisation of disease eradication campaigns after the war supports these views. However, as Chapters 2 and 3 show, the apparent disparity between the ideal conceptualisation of health and the WHO action taken reflected, firstly, the realities of worldwide post-war reconstruction and, secondly, the opportunities that technical solutions provided (such as the use of DDT and other pesticides) to vastly improve health in a short period and at minimal expense. This reflected a compromise based on current circumstances and available technologies and did not imply a disagreement with the ideal. These chapters explore how and to what extent these practical factors constrained the implementation of policy to improve public health.

While Packard and others have focused upon the areas of health that received the most attention in the post-war period, such as disease eradication campaigns, Chapters 2 and 3 emphasise the importance of examining areas that have received less attention, such as environmental sanitation. This reveals how protagonists of broader conceptualisations of health continued to promote these ideals and laid important foundations for policies in the 1970s and 1980s. The gap between policy ideals and the practical realities of policymaking was evident in

¹ WHO, “Constitution of the World Health Organization,” 22 July 1946, accessed Nov 24, 2018, https://treaties.un.org/doc/Treaties/1948/04/19480407%2010-51%20PM/Ch_IX_01p.pdf.

² Packard, “Vision of Postwar Health and Development,” 108; John Farley describes South Africa as illustrative of “the switch from a socioeconomic approach to health to a parasite- and disease-oriented approach” in Farley, *Bilharzia*, 233; Lee, *The World Health Organisation*, 17; Litsios, “Rural Hygiene in the Early Years of the World Health Organization”; Siddiqi, *World Health and World Politics*.

³ Lee, *The World Health Organisation*, 71.

discussions about water. The ideal for water was universal access to water supplies of adequate quantity and quality. These chapters show that the prioritisation of supplies to urban areas and the focus on quantity over quality once again highlighted the constraints policymakers were working under during this period. Chapters 2 and 3 argue that, as targeted disease campaigns were favoured over long-term infrastructural investments, water was increasingly marginalised within the fragmentary structures of imperial and international policymaking related to health. The period between 1945 and 1963 represented a time of incremental change that built on pre-war shifts during a period of uncertainty. When an interim health commission was set up, the WHO took over health-related responsibilities from several organisations. Once officially formed the WHO firmly established itself as the prime institution for defining and upholding international standards of health. However, the growth in the variety of organisations, governmental and non-governmental, meant that the WHO operated in an increasingly crowded setting and found itself up against other organisations competing for international funds.

Chapter 2 shows the different ways that water entered health and development discourses between 1945 and 1963 with a particular focus on the United Nations (UN) and the British imperial system. It explores the growing overlap between international, imperial, colonial, and post-colonial officials as British officials shifted their spheres of operation from colonial to international from the early 1960s onwards. This chapter explores both the conceptualisations of water as a problem and a solution to underdevelopment, and the obstacles and challenges policymakers faced in their attempts to provide access to adequate water supplies where it was lacking. It shows the challenges that health advocates faced in trying to promote the importance of water supplies and sanitation as foundational to improvements in health and effective economic development.

Coinciding with British attempts to reinforce their imperial stake, their failure to do so, and the increasing interest of international organisations (notably those attached to the UN) as British formal influence waned, Africa became a crucial testing ground for international and British colonial development ideals. As such, Chapter 3 will move from the wider perspective to examine how international, imperial, and colonial policies were applied to, and reformed or ignored in, Uganda and Sudan.

1. A Problem of Underdevelopment?

To explain how and why organisations collaborated and competed to solve the problem of inadequate water supplies during this period, one first needs to understand the colonial and international background it was constructed against. In 1945, Britain had already endorsed a revised Colonial Development and Welfare Act, which came into full force in April 1946 and doubled the funds set aside under the 1940 Bill for the proceeding decade. This increased commitment was for the same purposes as the 1940 Bill, which was to: “make provision for promoting the development of the resources of colonies, protectorates, protected states and mandated territories and the welfare of their peoples”; this reaffirmed British aims towards its empire.⁴ The first and primary intention—resources development—focused on the exploitation or utilisation of minerals and crops. Improvements suggested to increase the productivity of crops and livestock were thus prioritised. Settlement or resettlement schemes were also included in such colonial development plans and were justified on the basis that “many people have emphasised that African methods of subsistence, either as nomad pastoralists or as small cultivators, are extremely vulnerable to natural disasters.”⁵ In addition, fisheries, mining, secondary industries, and rural water supplies—to support livestock and small scale irrigation works—were explored with renewed vigour. In terms of minerals, crops, and livestock, Africa was regarded as an important part of the empire that possessed underexploited and untapped resources at a time of rising world commodity prices. The second intention—welfare—was centred on the improvement of health and education alongside social welfare.⁶ Development finances to these ends were focused on upgrading infrastructures such as building hospitals and health centres, schools and universities, and welfare centres. Research, predominantly agricultural and medical, was funded using a separate

⁴ Colonial Development and Welfare. A bill to make provision for promoting the development of the resources of colonies, protectorates, protected states and mandated territories and the welfare of their peoples, and for relieving colonial and other governments from liability in respect of certain loans, Parliamentary Paper 40, 1939-40, accessed Nov 22, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1939-036465?accountid=15181>.

⁵ Uganda Original Correspondence, Colonial Development Report, 1946-49, TNA, CO 536/220, 17.

⁶ “Social welfare” included the provision of acceptable standards of African housing plus welfare centres and a welfare department.

pot of money and was informed and supported by specialist surveys alongside the collection of population data and vital statistics.

However, this reform came at a price and Britain's reliance on financial support from the US left space for Americans to express reservations over the nation's capabilities (much to the dismay of Britain and its European counterparts).⁷ In 1945, the US Chief of the Division of Near Eastern Affairs wrote a memorandum to President Truman, which described the Near Eastern peoples as "for the most part ignorant, poverty-stricken and diseased" and that this present state stemmed from British and French failures to "take adequate steps to look after the welfare of the masses."⁸ The chief continued to express concern that, if America did not intervene, the people in the region might look to the USSR for a "cure for their economic and social ills."⁹ American intent to act in the Near East epitomised the growing rivalry with the USSR and the increasing belief that Britain lacked the ability to implement the development plans set for each of its colonial territories—formal and informal—after the war.

The friction between the USSR and US grew in the aftermath of the Second World War as both countries sought to outmanoeuvre Britain, and subsequently each other, to reach the top of the international pyramid of influence.¹⁰ The US spear-headed the UN and led the challenge to the old European imperial order.¹¹ The UN's commitment "to promote social progress and better standards in life" and "to employ international machinery for the promotion of the economic and social advancement of all peoples" differed from British colonial development. The

⁷ Odd Arne Westad, *The Global Cold War* (Cambridge and New York etc.: Cambridge University Press, 2007), 132.

⁸ Office of the Historian, "Memorandum by the Under Secretary of State (Acheson) to the Secretary of State," *Foreign Relations of the United States: Diplomatic Papers, 1945, the Near East and Africa, Vol. 8*, Oct 9, 1945, accessed Nov 23, 2018, <https://history.state.gov/historicaldocuments/frus1945v08/d20>.

⁹ Office of the Historian, "Memorandum by the Under Secretary of State (Acheson) to the Secretary of State".

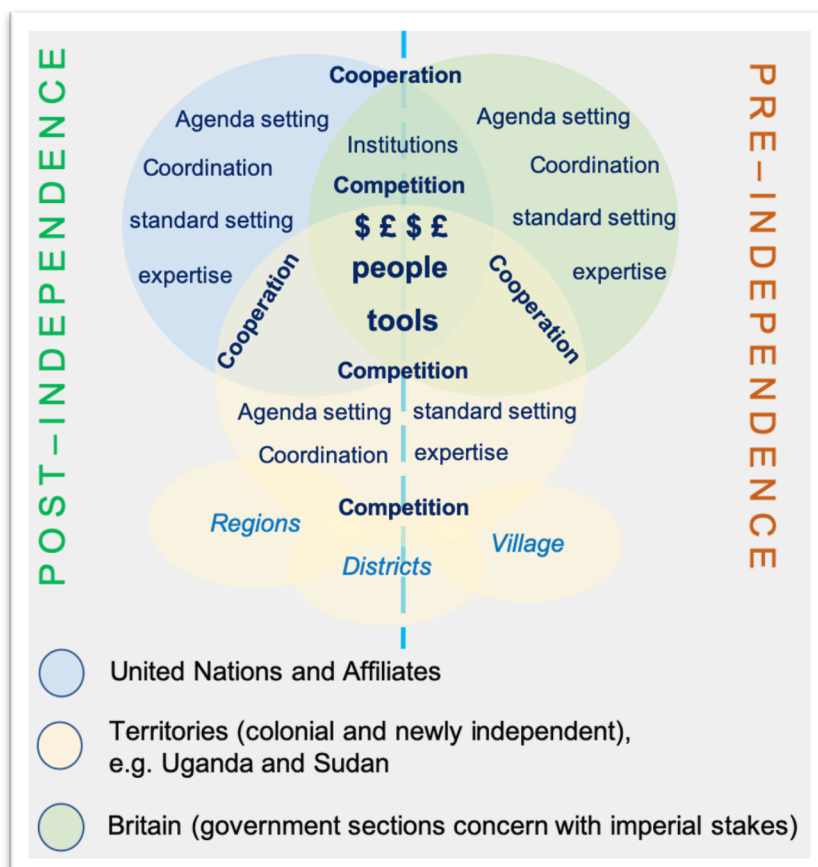
¹⁰ Woodward, *Horn of Africa*, 17; John Darwin, *Britain and Decolonisation: The Retreat from Empire in the Post-War World* (Basingstoke and New York: Palgrave Macmillan, 1988), 69; Frank Heinlein, *British Government Policy and Decolonisation 1945-1963: Scrutinising the Official Mind* (London and New York: Routledge, 2002, 2007). Kindle edition, chap. 2.

¹¹ Heinlein, *British Government Policy and Decolonisation 1945-1963*, chap 2; United Nations, "Charter of the United Nations and Statute of the International Court of Justice," 1945, accessed Nov 23, 2018, <https://treaties.un.org/doc/publication/ctc/uncharter.pdf>; Office of the Historian, "Milestones: 1937-1945: The Atlantic Conference & Charter, 1941," 2016, accessed Apr 20, 2016, <https://history.state.gov/milestones/1937-1945/atlantic-conf>; Liberal economic trade agreements also clashed with Britain's policy of imperial preference.

UN's commitment was inclusive while Britain's commitment was more exclusive having only the metropole and Britain's imperial territories in mind. Both the UN and Britain intended to use their own formulations of development as tools to maintain peace and security but each on a different scale. The UN encompassed all its member states and referred to international peace and security whereas Britain was interested in the peace and security within its empire. Both, however, required adherence to a set of rules and regulations and both reinforced the division between 'developed' and 'under-developed'. In pitching developed against under-developed and autonomous states against those under imperial governance in this way, the UN and Britain built frameworks that both clashed and overlapped.

The roles and responsibilities of organisations and personnel involved in solving the problem of inadequate water supplies (as water was often conceptualised) were set within these overlapping frameworks (Figure 2.1).

Figure 2.1: Roles and Responsibilities



Source: Created by author (2016).

UN officials and their British Colonial Office counterparts cooperated and competed for access to funds, personnel, and tools to advance their own cause, the cause of others, or both. Equally, advocates for colonial interests in Uganda

and Sudan cooperated and competed: development was the expressed end goal. Each organisation and territory had their own agendas and their own standards, but these were not created in isolation. Though it is difficult to assess the direct influence each territory had on international organisations before independence, Britain acted as an intermediary for voices within Sudan and Uganda. The dotted line down the centre of Figure 2.1 represents the pre- and post-independence division. The diagram shows that this was not an impermeable line: UN bodies and agencies got involved at Britain's request, and British personnel at the request of the United Nations, throughout this period. However, in the main, Britain was responsible for developing territories within its empire pre-independence and the United Nations developed formal ties in the lead up to and/or following independence.

One main point of agreement was the division of territories into categories of developed and under-developed. Here, the term 'under-developed' was largely attached to territories on the African continent as well as those in South East Asia and South America; these regional groupings reflected categorisations of underdevelopment. During this period the terminology shifted from 'under-developed' to 'less-developed' and finally to 'developing'.¹² This chapter and those that follow utilise the terms used by post-war contemporaries to reveal the gradual and uneven change from 'under-developed' to 'developing'. This shift stemmed from the power relationships established as territories were categorised as developed or under-developed. It revealed an increasing recognition of those within under-developed territories as active rather than passive participants in framing and actuating development ideologies. This recognition was slow, and as this chapter shows, underdevelopment was largely regarded as a problem requiring solutions provided by developed territories.¹³ This chapter focuses on

¹² United Nations Yearbooks from 1950 to 1960 inclusive refer to "under-developed", UNYB 1961 to 1963 inclusive uses the term "less developed", and UNYB 1964 uses "developing". United Nations, "Yearbooks of the United Nations," 2016, accessed June 1, 2016, <https://unyearbook.un.org/#block-views-timeline-block>. For example, United Nations, *Yearbook of the United Nations 1950*, (New York: United Nations, 1951), accessed June 1, 2016, <https://www.unmultimedia.org/searchers/yearbook/page.jsp?volume=1958&page=1>. These will be referred to herewith as UNYB [yearbook year].

¹³ Similarly seen in relation to health, which led Farley to remark, "medical problems of the tropical worlds and solutions to them were defined and imposed by practitioners of Western-style medicine", see Farley, *Bilharzia*, 293.

understanding how these terms were applied and the implications for the construction of imperial, colonial and international water policies.

Lord Ogmores, the Parliamentary Undersecretary of State for Commonwealth Relations, clearly believed a flexible approach was needed if a resolution were to be found to the problem of underdevelopment. On 13 March 1951, Lord Ogmores concluded a long speech during the *House of Lords Debates* saying:

In conclusion, I should like to reiterate that neither we, nor anyone else, have yet found the answer to the problem of development of under-developed areas, whether in Africa or elsewhere. There may not be a single answer; or the answers may depend upon circumstances. A great deal of trial and error is required, on the organisation side, on the field side, on the research side and on the financial side.¹⁴

This advocacy of trial and error highlighted the difficulties in researching, organising, financing, and applying solutions and thus emphasised the uncertainties that these constraints presented in both planning and implementing effective policies.

Solutions to the development problem were elusive, but this did not deter the British Colonial Office and the UN Organisations, such as the UN, WHO, and UNICEF, in their quest to boost economic and social development in the so-called under-developed areas.¹⁵ How bureaucrats and scientists attached to these organisations addressed problems of underdevelopment, in particular water, forms the basis of this chapter. Each organisation had a role to play in affecting the direction of policies in the years before colonial independence and afterwards.

1.1 The United Nations and the World Health Organisation

The UN Charter, completed and ratified in June 1945, promoted the ideal of peace and security through its six main organs and through its specialised agencies (Figure 2.2).¹⁶ An important facet of the Charter was its concerted emphasis on

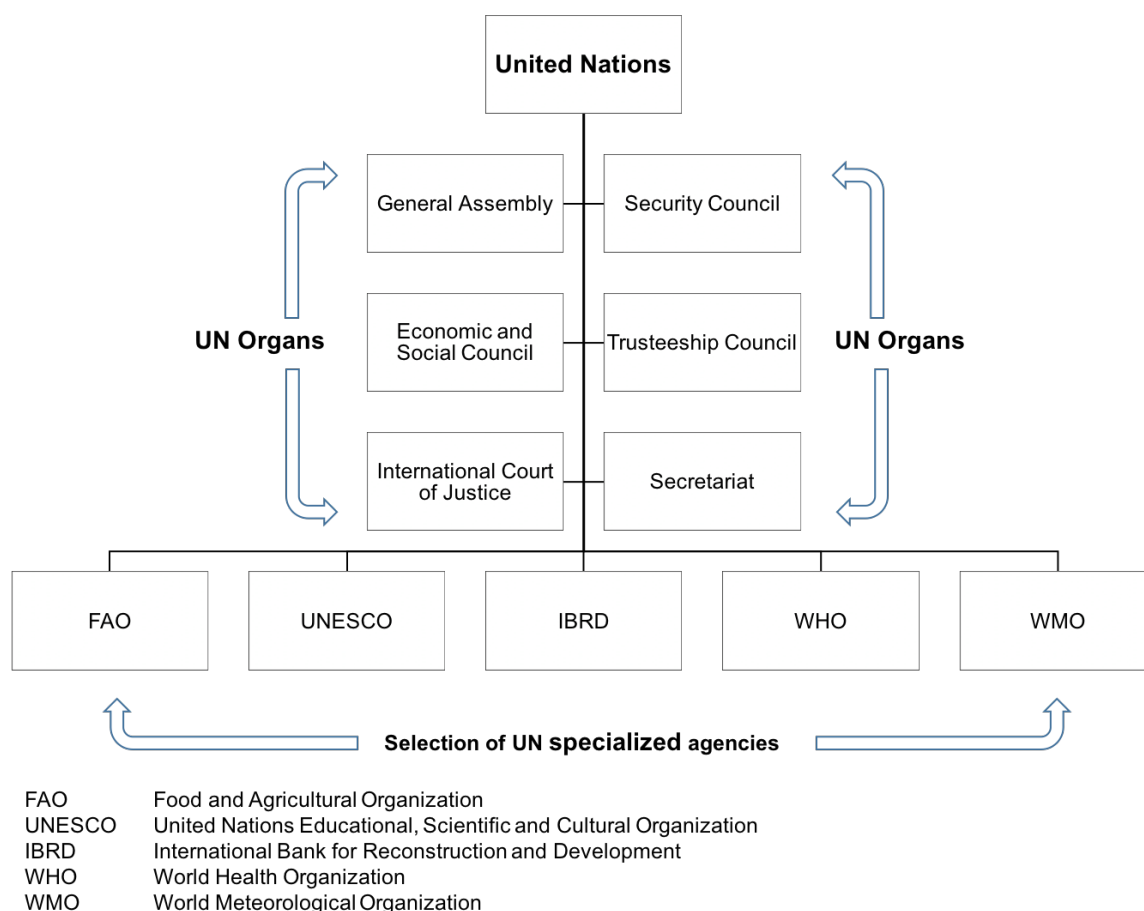
¹⁴ Lord Ogmores, "Overseas Resources Development Bill," *House of Lords Debates*, vol. 170 cc1031-73, March 13, 1951.

¹⁵ Lord Ogmores, "Overseas Resources Development Bill."

¹⁶ United Nations, "Charter of the United Nations and Statute of the International Court of Justice," 1945.

equality, which was to be promoted through the “economic and social advancements of all peoples.”¹⁷ Building on the premise established in the United

Figure 2.2: The United Nations (UN), its Organs, and Specialised Agencies



Source: Created by author (2016), using UN Year Books for 1947-48 and 1952 alongside the UN Charter.

Nations Charter that “stability and well-being”—in the form of higher living standards, full-employment, and socio-economic progress and development—was “necessary for peaceful and friendly relations among nations”, an Economic and Social Council (ECOSOC) was established and charged to support “solutions of international economic, social, health and related problems.”¹⁸ Water resources development did not appear in official discussions until 1952 when the subject was raised in relation to the “economic development of under-developed countries.”¹⁹

¹⁷ United Nations, “Charter of the United Nations and Statute of the International Court of Justice,” 1945, 2 (preamble).

¹⁸ United Nations, “Charter of the United Nations and Statute of the International Court of Justice,” 1945, 11.

¹⁹ UNYB 1952, Part 1: The United Nations. Section 3: Economic and Social Questions. Chapter B: Economic Development of Under-developed Countries: 381-82.

Positioned in this manner, and conceptualised as a resource, water was regarded as an auxiliary to agricultural and industrial productivity. There was little disagreement over the need for water resource development in the under-developed areas, but not all ECOSOC representatives supported its confinement to this forum.

When questions were first raised in 1952, the USSR and Czechoslovakian representatives were keen to point out that certain aspects of water resources development, such as the problem of arid land, were “one of general economic development of any country.”²⁰ In placing water resources development primarily under the remit of ECOSOC’s *Economic Development of Under-Developed Countries* forum, the UN reinforced the conceptualisation of water as a specific problem of underdevelopment. This idea permeated into the water resource development interagency meetings, which were established in response to discussions over several papers related to the subject during ECOSOC’s biennial gatherings in 1952 and 1954.²¹ Set up in recognition of the multifaceted nature of water resources development, the interagency meetings attempted to coordinate the diverse perspectives emanating from different branches of the UN.

After the UN Special Fund was set up (1958), the UN interagency meetings for water resources development outlined its intended role:

The Fund is particularly interested in assisting water resources development through surveys, research, training and demonstration, including the setting up of pilot projects. They will in no case finance capital investment programmes.²²

This comment highlighted the Fund’s interest in water resources development while at the same time tempering any expectations of capital investment. The UN was to continue its supporting role and governments were required to raise funds through local revenue, loans, or both. Further analysis of the UN Special Fund

²⁰ UNYB 1952, Part 1: The United Nations. Section 3: Economic and Social Questions. Chapter B: Economic Development of Under-developed Countries: 381-82.

²¹ Interagency meetings, such as the Fifth Interagency Meeting, 1959, WHO Archives, WHO3, W2/86/2 (5); Sixth Interagency Meeting, 1960, WHO Archives, WHO3, W2/86/2 (6); Seventh Interagency Meeting, 1961, WHO Archives, WHO3, W2/86/2 (7); Eighth Interagency Meeting, 1962, WHO Archives, WHO3, W2/86/2 (8); Ninth Interagency Meeting, 1963, WHO Archives, WHO3, W2/86/2 (9).

²² WHO, Report of the Sixth Inter-agency Meeting on International Co-operation with respect to the Development and Utilization of Water Resources (6-8 July), 21 October 1959, Sixth Interagency Meeting, WHO Archives, WHO3 W2/86/2 (6).

shows, firstly, who provided funds and personnel, secondly, the shift in allocation of funds towards the African region during the wave of independence in the early 1960s, and thirdly, the importance placed upon economic development and the adequate provision of food for the growing world population.

First, as a small number of African colonies gained independence in the 1950s, and the majority proceeded towards it, the UN system paid increasing attention to developments on the African continent. In the first two years of the Special Fund only allocations to the European Region (6 percent in 1959/60 and 1960/61) were lower than those to the African Region (14 percent in 1959/60 and 16 percent in 1960/61); Asia and the Far East received 34 percent and 33 percent of UN Special Funds in 1959/60 and 1960/61 respectively.²³ However, there was a drastic shift in 1961/62 as contributions to the African region spiked from 16 percent to 33 percent of total allocations. Despite the much lower starting point the African region was second only to Asia and the Far East (28 percent and 30 percent respectively) in total allocations across the period (1959/60 to 1963/64).²⁴ This altered course was supported with the establishment of an Economic Commission for Africa 1958/59 and concerted efforts to improve regional conditions were reflected at the interagency meetings for water resources development.²⁵ The first meeting of the Economic Commission for Africa, for example, emphasised the “high priority” of national resources “including water” and noted that “in many parts of Africa, water problems are urgent.”²⁶ However, the UN tended to favour independent, particularly newly independent, countries and trust territories ahead of colonies. This was evident in the level of financial and technical support within Africa.²⁷ It was particularly noticeable when comparing Libya, Sudan, and Ethiopia with the British East African Territories (Uganda, Kenya, Tanganyika) in these first years of the Special Fund.²⁸ The different experiences of Sudan and Uganda within the UN system provide for interesting comparison. Equally, the developmental states (as defined largely by the UN and

²³ See Appendix C, 331.

²⁴ See Appendix C, 331.

²⁵ WHO, Sixth Interagency Meeting, WHO Archives, WHO3 W2/86/2 (6).

²⁶ WHO, Sixth Interagency Meeting, WHO Archives, WHO3 W2/86/2 (6).

²⁷ See UN Year Books for the years 1958 to 1963 inclusive: United Nations, “Yearbooks of the United Nations,” 2016, accessed June 1, 2016, <https://unyearbook.un.org/#block-views-timeline-block>. For example, United Nations, *Yearbook of the United Nations 1958*, (New York: United Nations, 1959), accessed June 1, 2016, <https://www.unmultimedia.org/searchers/yearbook/page.jsp?volume=1958&page=1>.

²⁸ See UNYBs 1958 to 1963. For example, UNYB 1959, 132-33.

imperial powers) of intended targets for funds, such as Asia and the Far East and Africa, shaped agendas. The readjustment of allocations in the early 1960s reinforced the movement of British—and formally British—Africa to the centre of international politics and development.

Second, the policies created also took account of those who contributed to the funds and personnel. The United States was consistently the largest funder of UN programmes, for example, providing the majority of financial backing for UN contributions to the World Food Programme in 1962.²⁹ The US was also the biggest contributor to the Special Fund (\$15 million), providing three times the amount of Britain in second place (\$5 million) in 1959; this pattern continued.³⁰ However, the largest number of experts provided and recruited for the technical assistance programmes were British.³¹ In 1959, 390 out of a total 2561 experts were British, which constituted 27 percent of the overall European expertise and 15 percent of the overall total and thus outnumbered the US participation (310 experts); similar percentages continued into 1960 and beyond.³² The undoubted influence the US and Britain were able to exert based on these contributions cannot be ignored.

Third, analysis of the UN Special Fund shows the prioritisation of food production and economic development alongside significant support given to the Freedom from Hunger campaign. In 1961, for example, almost half the UN Special Fund was allocated to land and water: the Food and Agricultural Organisation (FAO) was set up as the primary operating agency. The emphasis on water grew throughout this period but must be regarded as relative to, not inflated above, economic concerns. As such, the largest proportion of funds for technical assistance associated with the Special Fund were managed through the FAO (25 to 26 percent between 1959 and 1963); one fifth of these funds went through the UN (20 to 22 percent), 17 percent through the WHO, and 15 to 16 percent through the United Nations Education, Scientific, and Cultural Organisation (UNESCO).³³ However, the allocation of funds does not reveal the joint nature of many UN programmes. On the surface, the data analysis seals the FAO as primary receiver

²⁹ UNYB 1962, 237; 71 percent of funds came from US, UK and Federal Republic of Germany combined.

³⁰ UNYB 1959, 113-114; also see UNYB 1960, 239-40.

³¹ UNYB 1959, 132-136; UNYB 1960, 265-268.

³² UNYB 1959, 132-136.

³³ See Appendix D, 332.

of funds but the WHO's expertise on health was foundational to the FAO's and other agencies' development programmes. As shown through interagency meetings, these UN specialised agencies worked together in the field of water resource development and it was agreed in 1959 that "the World Health Organisation should be consulted always in drawing up the Plan of Operation, and also, where necessary, in the framing of the request."³⁴

Regularly attended by representatives from the UN, the FAO, the WHO, UNESCO, and the World Meteorological Organisation (WMO), the early water resource development meetings focused on basic research and defining the functions of each organisation and its specialists.³⁵ Before the division of responsibilities was formally—albeit "tentatively"—agreed, WHO environmental sanitation adviser, John Buxell, enquired about drawing the UN Economic and Social Council's attention to the impact of disease vectors:

There is a very broad and important field of WHO interest, that of water development and utilisation so as to minimise disease vectors [...] such disease vectors as the mosquito vectors of malaria, or encephalitis and of yellow fever and other diseases, and the small vectors of bilharziasis and others spread over wider areas, and increased opportunities for human exposure can occur, through water developments, particularly in irrigation but also in power, flood control and navigational developments. These diseases, if their prevention is not considered adequately, can reduce or negate the economic values of the development by [sic] disabling the human resources involved.³⁶

Buxell was keen to point out that water resources development undertaken without due consideration of the health implications was unlikely to achieve the economic growth its protagonists envisaged.³⁷ Trained as a sanitary engineer, and acting as

³⁴ WHO, Sixth Interagency Meeting, WHO3 W2/86/2 (6).

³⁵ WHO, Sixth Interagency Meeting, WHO3 W2/86/2 (6).

³⁶ John Buxell (Environmental Sanitation Adviser) to Regional Director (Eastern Mediterranean), Letter, 21 April 1955, General Reports on Water Supply from Misc Sources, WHO Archives, W2/418/1(15); E. G. Wagner and J. N Lanoix, *Excreta Disposal for Rural Areas and Small Communities*, (WHO: Geneva, 1958); E. G. Wagner and J. N Lanoix, *Water Supply for Rural Areas and Small Communities*, (WHO: Geneva, 1959); Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee August 1950 to August 1953, WHO Archives, RC4/EM/2.

³⁷ William Jobin, *Dams and Diseases: Ecological Design and Health Impacts of Large Dams, Canals and Irrigation Systems* (London and New York: E & FN SPON, 1999).

WHO regional adviser to the Eastern Mediterranean Office, Buxell was alert to the specific dangers of the aforementioned diseases. Buxell wanted to share this knowledge with the relevant international organisations as they looked to utilise current, and make available new, water resources in under-developed territories. It was often the environmental sanitation protagonists that raised these kinds of concerns and it was through the WHO's environmental sanitation committee—later division—that alternative perspectives on the water problem were expressed.

The environmental sanitation committee was established following member state support for Mexican and American proposals at the Programme Committee of the first World Health Assembly in 1948.³⁸ The Mexican delegation had proposed that the WHO would benefit from the “advice of a group of competent specialists experienced in the several branches of sanitation and prevention of waterborne disease and in various parts of the world.”³⁹ Three days later, the United States delegation presented a paper on environmental sanitation.⁴⁰ The paper put forward a strong argument for a “worldwide attack” upon “waterborne, milk borne and fly borne enteric and respiratory diseases of bacterial, viral and protozoal origin”, which “aside from malaria” were “probably the greatest killers and debilitators.”⁴¹ The paper continued:

The scientific bases for such programmes are not only *long tested* and *scientifically supported*, but they are *universally accepted* [...] these elementary measures, literally the *underpinning* of any sound public-health structure, are *frequently lost in programme-making* or give place in priority to more difficult and more expensive attacks on diseases of less total significance [...] dollar for dollar, the returns will be greater in this area of work than in perhaps any other field of public-health endeavour [my emphasis].⁴²

³⁸ Waterborne Disease – General Correspondence, WHO Archives, WHO First Generation Files, WHO1 450/1/17.

³⁹ First World Health Assembly, Committee on Programme, Draft Resolution on Water Borne Diseases, submitted by the Delegation of Mexico, 3 July 1948, WHO Archives, WHO First Generation Files, WHO1 450/1/17, Waterborne Disease – General Correspondence.

⁴⁰ First World Health Assembly, Committee on Programme: Paper on Environmental Sanitation submitted by the Delegation of the United States of America, 6 July 1948, WHO Archives, WHO First Generation Files, WHO1 652/1/1, Environmental Sanitation. Documents Presented to and Discussed at Sessions of the Assembly.

⁴¹ Delegation of the United States of America, 6 July 1948, WHO Archives, WHO First Generation Files, WHO1 652/1/1.

⁴² Delegation of the United States of America, 6 July 1948, WHO Archives, WHO First Generation Files, WHO1 652/1/1.

This call for the WHO to give due consideration to the role of water supplies and sanitation in international programmes of health raised some interesting points. Firstly, there was an assuredness that science supported the inclusion of environmental sanitation and that there was universal acceptance of its importance. Secondly, it was recognised that these kinds of programmes were often forgotten or marginalised. Thirdly, financially environmental sanitation was regarded as one of the most lucrative health fields to invest in. On the basis of the US and Mexican delegation reports, environmental sanitation was made one of the six WHO “top priority” areas, alongside malaria, maternal and child health, tuberculosis, venereal diseases, and nutrition.⁴³ The second point was most consistently expressed and agreed upon between 1945 and 1963: water and sanitation were marginalised. The first and third points remained open for debate, as this chapter shows. While there was scientific evidence that proved there was a connection between water, sanitation, and a variety of diseases, the quantitative extent of the relationship was hard to prove. Whether or not the US delegation was correct regarding the financial returns of improved water supplies and sanitation, it seemed increasingly difficult to justify investment in these areas as the period progressed.

The environmental sanitation committee met with opposition from the Executive Board almost immediately after its first meeting in 1949.⁴⁴ The Board was pleased with the information gathered but made note that the report “does not necessarily represent the established policy of the World Health Organisation” and that “undue emphasis has been placed on the engineering aspect of the problem rather than on the sanitation viewpoint.”⁴⁵ These comments highlighted a disconnect between the Executive Board, whose primary membership was composed of physicians and directors of national medical services, and the WHO’s expert committee on environmental sanitation, which was exclusively

⁴³ WHO, *The First Ten Years of the World Health Organization*, (Geneva: WHO, 1958), accessed Nov 23, 2018, <http://www.who.int/iris/handle/10665/37089>, 73. Second priority, public health administration; third, parasitic diseases; fourth, virus diseases; fifth, mental health; sixth, “accorded to a somewhat varied group of other activities.”

⁴⁴ Official Records of the WHO, No. 25, Report of the Executive Board, Fifth Session, 16 January to 2 February 1950, Part I (WHO, Geneva), March 1950, Annex 1, 26, accessed December 19, 2019, <https://apps.who.int/iris/handle/10665/85604>; WHO Technical Report Series, No. 10, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” May 1950, 3, WHO Archives.

⁴⁵ WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” May 1950, 3.

represented by those with specialisms in engineering, hygiene, or a combination of both (sanitary engineering).⁴⁶

The WHO expert committee in 1949 highlighted the need for government agencies to take responsibility for improving environmental sanitation. The meeting argued it was necessary “to establish professional sanitary engineering units at a suitably high level in governments to take charge of this function [implementing environmental sanitation programmes] and influence policies.”⁴⁷ In advocating a separate unit for sanitary engineering the committee highlighted that one of the major obstacles to progress was the divided functionality of government departments. Concern was raised that the division of function across multiple departments (public works departments, medical departments, geological survey departments, and labour departments to name a few) would result “not only in loss of emphasis on the health objective, but in lack of co-ordination and sometimes even in unintentional working at cross purposes by the various agencies, as each agency may work in isolation from others.”⁴⁸

Part of the challenge lay in the lack of political weight sanitary engineers had at higher levels of government and in the higher echelons of the WHO. Given the significant attention to the role of sanitary engineering it is perhaps unsurprising that the WHO Executive Board was not fully supportive. There seemed to be a tension between physicians and other professionals, such as sanitary engineers, with expertise from the former prioritised over the latter at the Executive Board level in the early years of the WHO. The fact that similar emphasis on sanitary engineering was not found in the report from the third meeting of the environmental sanitation committee, which met in 1953, is suggestive of this tension.

⁴⁶ Expert Committee members: Professors R. De León (Dean of the Engineering School in Venezuela), G. Macdonald (Director of the Ross Institute of Tropical Hygiene, London), M. Petrik (Public Health Engineering Professor, Yugoslavia), V. Puntoni (Hygiene Professor, Italy), K. Subrahmanyam (Sanitary Engineering Professor), A. Wolman (Sanitary Engineering Professor), and Sol Pincus (Chief of WHO Environmental Sanitation Section): WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” May 1950, 2; Sol Pincus to head the Environmental Sanitation Committee: “News from the Field,” *American Journal of Public Health* 39 (May 1949): 698-712, 702, accessed Nov 24, 2018, http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.39.5_Pt_1.698.

⁴⁷ WHO “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” May 1950, 11.

⁴⁸ WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” 11.

In 1949, the expert committee took its opportunity to establish the broad parameters of environmental sanitation as “the control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health, and survival.”⁴⁹ The eight main lines of work were then expounded: excreta and sewage disposal; safe water supplies; housing; cleanliness; safety of milk and food supplies; “arthropod, rodent, mollusc, or other alternative hosts of human disease”; atmospheric conditions (air pollution); and safety in living areas and workplaces.⁵⁰ In this extensive list, the access to clean water supplies came second only to excreta disposal. Regarding water supplies the committee also felt the WHO had an important role to play in developing international standards for water analysis and quality; this was followed up in the establishment of the first International Drinking Water Standards in 1958 and at interagency meetings regarding water resources development.⁵¹ In addition to defining what environmental sanitation covered the committee also stated exclusions: malaria, tuberculosis or treponematoses, which were all handled by other WHO sections; leprosy, which had “better prospects of eradication by means other than environmental control”; and nutrition, which was handled through the Joint FAO/WHO committee.⁵²

The ambitions of the first expert committee in 1949, particular in its definition of environmental sanitation, were tempered by 1953 when a much more succinct outline of the subject replaced the previous detailed exposition.⁵³ Environmental sanitation was described simply, if no less broadly, as “the control of all those factors in man's physical environment, which exercise or may exercise a deleterious effect on his physical, mental, or social well-being.”⁵⁴ This vague and all-encompassing definition was qualified as the committee “distinguished a few

⁴⁹ WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” 5.

⁵⁰ WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” 5.

⁵¹ WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” 15; Gilcreas' Analysis, “Development of International Standards of Drinking Water Quality and of Approved Methods for the Examinations of Water: A Report by F. Wellington Gilcreas, Consultant to the WHO,” 15 June 1954, WHO Archives, (21 a-d) WHO2 27; also see footnote 21 for interagency meetings.

⁵² WHO, “Expert Committee on Environmental Sanitation Report on the First Session, Geneva, 12-17 September 1949,” 5.

⁵³ Expert Committee on Environmental Sanitation, Third Report, 27-31 July 1953, WHO Archives, WHO/Env.San./62 Rev.1.

⁵⁴ Expert Committee on Environmental Sanitation, Third Report, 27-31 July 1953.

basic sanitation needs.”⁵⁵ These were: “adequate supplies of safe drinking-water”; the “safe disposal of human excreta”; and the control of insect and animal vectors.⁵⁶ These priorities were reiterated by the Director of the Environmental Sanitation Division, Herman Baity, at the Council for Europe on 15 March 1954.⁵⁷ Describing the principal activities of the division, Baity began with the same order as above: water supply, excreta and sewage disposal, insecticides and insect control. Further activities were mentioned, but in less detail: milk and food control, refuse disposal, housing, atmospheric pollution, and industrial hygiene. For water supply the four principal activities of the division were, firstly, technical and administrative support for a governments’ rural and urban water supply programmes; secondly and thirdly, water quality recommendations, including standardised methods of analysis; and fourthly, financial support for training and teaching water works personnel.⁵⁸

The emphasis on water supplies, excreta and sewage disposal, and insect vectors, was formulated most notably within the framework of rural sanitation. In many “underdeveloped” areas, more than 80 percent lived in rural areas and many lacked soil sanitation, adequate sewage disposal methods, and organised health services.⁵⁹ After the environmental sanitation committee meeting in 1953 the WHO Executive Board commented on the need for “fuller consideration” of rural sanitation as it had following the first meeting in 1949.⁶⁰ The Director General reiterated the Board’s sentiments and praised the environmental sanitation committee’s programme. Emphasised through its agenda and discussions the environmental sanitation committee’s focus on rural sanitation gathered support from regional offices. Further attention was given in a special edition of the *Bulletin of the World Health Organisation* in 1954, which highlighted the importance of environmental sanitation and shed light on the various states of water supplies, sewage disposal, general sanitation, and sanitary engineering in Europe (e.g. Yugoslavia, Denmark, Britain), America, Latin America (Colombia, Brazil), India,

⁵⁵ “Environmental Sanitation: Introduction,” *Bulletin of the World Health Organisation* 10, no. 2, (1954): 139–143, 139.

⁵⁶ “Environmental Sanitation: Introduction,” 139.

⁵⁷ H. G. Baity (Director of Division of Environmental Sanitation) to V. A. Sutter (Assistant Director-General Advisory Services), Letter, 15 March 1954, WHO Archives, (25a-b) WHO 2 CC 4-2 Council for Europe.

⁵⁸ Baity to Sutter, 15 March 1954, WHO Archives, (25a-b) WHO 2 CC 4-2 Council for Europe.

⁵⁹ Expert Committee on Environmental Sanitation, Third Report, 27-31 July 1953, 7.

⁶⁰ Expert Committee on Environmental Sanitation, Third Report, 27-31 July 1953.

and Africa.⁶¹ A number of notes and reports were re-issued from papers presented at the newly established seminars for European sanitary engineers; the first of which was held in The Hague, 1950.⁶² Despite the more muted references to sanitary engineering at the environmental sanitation committee meeting in 1953 the expositions provided in the special bulletin suggested that it remained at the forefront of interest.

This focus on water supplies was continued when the WHO sent out questionnaires to its member states asking for feedback on various aspects of water quality in 1954.⁶³ In answers to the survey the principal problems mentioned regarding water development were: water shortages; difficulties in obtaining water free from excessive mineralisation; fresh water unavailability; and pollution.⁶⁴ One notable question posed in the survey concerned the relationship between water quality and enteric disease. Statistics were lacking or incomplete, but F. Wellington Gilcreas stated that:

the data furnished, however, indicate water-borne enteric disease is not considered of paramount importance in most of the countries replying. In several the incidence of enteritis is large, although only a few cases of true enteric disease, such as dysentery, typhoid fever, or cholera, are reported.⁶⁵

⁶¹ See *Bulletin of the World Health Organisation* 10, 2 (1954): 139-314; "Environmental Sanitation: Introduction," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 139-143; Mayhew Derryberry, "Health Education Aspects of Sanitation Programmes in Rural Areas and Small Community," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 145-154, 139; Walter R. Sanches and Edmund G. Wagner, "Experience with Excreta-Disposal Programmes in Rural Areas of Brazil," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 229-249; "Sanitary Engineering Activities and Problems in Yugoslavia," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 282-85; "Problems of Water-supply and Sewage Disposal in Denmark," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 285-287; "Public-health Engineering Activities in the United Kingdom," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 280-82; Mark D. Hollis, "Economic Aspects of Rural Sanitation in the United States of America," *World Health Organization Bulletin* 10, no. 2 (1954): 155-70; Luis Pachón-Rojas, "Water-supply Systems for Rural Areas and Small Communities in Colombia," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 195-206; "Excreta Disposal from Individual Houses in Rural and Semi-rural areas of India," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 290-91; "Water-supply and Sewage Disposal in Africa South of the Sahara," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 285-87; "Progress in the Training of Rural Health Staff in Uganda," *Bulletin of the World Health Organisation* 10, no. 2 (1954): 303-307.

⁶² "Environmental Sanitation: Introduction," 139-143.

⁶³ Gilcreas' Analysis, "Development of International Standards of Drinking Water Quality."

⁶⁴ Gilcreas' Analysis, "Development of International Standards of Drinking Water Quality."

⁶⁵ Gilcreas' Analysis, "Development of International Standards of Drinking Water Quality," 1-2

This statement revealed two important factors that marked the first decade of WHO work: the limited availability of reliable statistics and the development of general policies based on feedback from member states. The latter point brought to light the problem of the generalised views evident in Gilcreas' analysis, particularly regarding the relationship between water and enteric diseases.⁶⁶ Though a strong connection was not found, Gilcreas' conclusion was based on information from the countries that replied to the survey. In this case the only feedback from the African continent came from Sudan, which was attached to the Eastern Mediterranean Regional Office (EMRO). Given the general representation of Africa as plagued by enteric diseases, the data gap regarding the African continent raises questions about the universal value of the International Drinking Water Standards that followed in 1958. Maggie Black wrote in the 1980s that disease campaigns during the two decades following WWII's end swept gastro-enteric and parasitical infections—such as diarrhoeas and intestinal worms—under the carpet.⁶⁷ This is not to imply that Gilcreas, Buxell and others did not consider these diseases important. Malaria and other diseases may have been mentioned based on the greater international coverage they received, thus increasing Buxell's chances of being heard within the ECOSOC and in water resource development interagency meetings. However, the fact remained that “a bout of diarrhoea in a small child—as long as it was not cholera or typhoid—did not appear to pose the same threat to life and health as malaria or tuberculosis”, hence the limited attention.⁶⁸ Yet “appearances deceived”, Black continued:

⁶⁶ Schmidt, “The Elusive Effect of Water and Sanitation on the Global Burden of Diseases.”

⁶⁷ Maggie Black, *The Children and the Nations: the Story of Unicef* (Australia: P. I. C. Pty Ltd, 1986), 290, accessed Nov 24, 2018, https://www.unicef.org/about/history/index_childrenandnations.html; Also see reproduction in Martin Beyer, *The WET History: Water and Sanitation in UNICEF 1948-1986 Part I, Second Revision* (New York: UNICEF, 1986), accessed Jan 5, 2017, <http://www.cf-hst.net/unicef-temp/Doc-Repository/doc/doc334226.PDF>. This was an early version which eventually became the water and sanitation monograph; Martin G. Beyer (author) and John Balcomb (editor) *Water and Sanitation in UNICEF 1946-1986* (New York: UNICEF, 1987), accessed Jan 5, 2017, <https://www.unicef.org/about/history/files/CF-HST-MON-1987-008-water-sanitation-1946-86-mono-VIII.pdf>. These provide an external perspective on the WHO's involvement in water supplies and reveal the working relationship between WHO and UNICEF in this field.

⁶⁸ Black, *The Children and the Nations: the Story of Unicef*, 290. Also see Beyer, *The WET History: Water and Sanitation in UNICEF 1948-1986 Part I, Second Revision*, 50.

statistics from underdeveloped countries which had such statistics showed that gastro-enteric infections, which were especially lethal in association with poor nutrition, were so numerous that they often accounted for more than half the deaths of children under one year. Taken together, the disease rate from all causes associated with bad water and poor sanitation was much higher.⁶⁹

Black had explicitly linked water and underdevelopment. Working for UNICEF in the 1970s and 1980s Black drew on personal and outside experiences, which showed that during this earlier period water—particularly the gastro-enteric and parasitical infections associated with it—was as much a hidden problem of underdevelopment as it was visible.

This aside, Gilcreas' document concluded that there was significant interest in the need to promote safe water supplies and sanitation.⁷⁰ The contrasting standards across countries emphasised the necessity of setting accepted minimum limits with the acceptance that “standards of water quality or standard methods for the examination of water are not static.”⁷¹ This, Gilcreas argued, further supported the continued need for study and modification “to meet changing conditions and advances in the science of sanitation and water treatment.”⁷²

The production of the first International Drinking Water Standards in 1958 coincided with a monograph written by E.G. Wagner (Chief Engineer and Associate Chief of Field Party, Division of Health and Sanitation, Institute of Inter-American Affairs, Rio de Janeiro, Brazil) and J. N. Lanoix (Public Health (Sanitary) Engineer, Division of Environmental Sanitation, WHO, Geneva, Switzerland) entitled *Excreta Disposal for Rural Areas and Small Communities*.⁷³ This publication and *Water Supplies in Rural Areas and Small Communities* signalled a further emphasis within the environmental sanitation division on water supplies with particular regard for rural or small communities; this was reiterated in contributions from the UN interagency meetings.⁷⁴

⁶⁹ Black, *The Children and the Nations: the Story of Unicef*, 290.

⁷⁰ Gilcreas' Analysis, “Development of International Standards of Drinking Water Quality,” 29.

⁷¹ WHO, “International Standards for Drinking Water,” 1958, accessed June 1, 2016, <http://apps.who.int/iris/bitstream/10665/43845/1/a91160.pdf>, 38.

⁷² WHO, “International Standards for Drinking Water,” 1958, 38.

⁷³ WHO, “International Standards for Drinking Water,” 1958, 38; Wagner and Lanoix, *Excreta Disposal for Rural Areas and Small Community*.

⁷⁴ Wagner and Lanoix, *Water Supply for Rural Areas and Small Communities*.

At the Twelfth World Health Assembly in 1959 a resolution was made (WHA12.48), which recognised that safe and adequate water supplies were “an important measure for the protection and improvement of health and are indispensable for economic and social development.”⁷⁵ Further, it requested that the WHO provided funds and personnel to support and “to maintain leadership in a co-ordinated global programme of community water supply and to provide the necessary technical and advisory services to governments.”⁷⁶ The development of several community water supply programmes followed.⁷⁷ From 1959 the focus shifted from a broader conceptualisation of environmental sanitation, encompassing a range of factors, to a narrower one centred on the provision of water supplies. The other factors encompassed in the broader definition were still addressed, but water supplies became the flagship programme of the environmental sanitation division. This was further evidenced in the WHO Official History of the first ten years of the organisation, which depicted environmental sanitation through pictures of water supplies installations alone.⁷⁸ Sanitary engineers continued to lobby stoically for the environmental sanitation cause. While the direct funding figures did not reflect huge investments in environmental sanitation, quantitative measures were not necessarily the most useful in gauging its impact. Despite financial limitations and narrow technical approaches, protagonists of environmental sanitation were able to continue working behind the scenes. When the WHO resolved to focus attention on community water supplies this did not surprise environmental sanitation advocates: it reflected the lobbying that occurred within the WHO and more broadly at an international level.

Other challenges remained, as H. G. Baity, Director of the WHO’s Environmental Sanitation Division 1952-1962, echoed the concerns Buxell had raised eight years earlier: economic considerations continued to be placed ahead of health concerns. Baity voiced frustrations with the, “widespread conviction that the pathway for higher economic levels is by the industrial route,” stating that, “good health is the necessary foundation of a sound economy.”⁷⁹ While others,

⁷⁵ WHA, 12, “Environmental Sanitation,” 28 May 1959, accessed Nov 27, 2018, http://apps.who.int/iris/bitstream/handle/10665/110034/WHA12_18_eng.pdf?sequence=1&isAllowed=y. See Appendix E for the full resolution, 333.

⁷⁶ WHA, 12. “Environmental Sanitation,” 28 May 1959; Appendix E, 333.

⁷⁷ Community Water Supplies Programmes ran in at least 88 countries.

⁷⁸ WHO, *The First Ten Years of the World Health Organization*, 1958, plates between 344 and 345.

⁷⁹ H. G. Baity, “Community Water Supply in Developing Countries,” in *Water Development in Less Developed Areas: Transactions of an International Conference held*

such as Hollis argued in 1954 that, “health conditions and economic conditions are obviously interrelated [...] it is not a question of one condition holding priority over another. They live on reciprocity”, the competition between those advocating for health improvements and those advocating for economic improvements created a division between these two fields.⁸⁰ Baity continued on, arguing that, “the first requisite of good health is good and safe water in adequate amounts for all domestic purposes.”⁸¹

Baity’s comments followed three WHO-commissioned papers, produced between 1958 and 1963, which focused on water supplies and sanitation.⁸² The second of these, published during Baity’s directorship of the environmental sanitation division in 1959, remarked along the same lines that, “without water readily available in adequate quantity and free of pathogenic organisms, man’s progress is tremendously hindered.”⁸³ The authors Lanoix and Wagner associated progress with living standards: in particular, they referred to the “economic loss” caused by illness or death from water borne diseases.⁸⁴ The water problem, in this sense, was a contributor to underdevelopment as it provided a favourable environment for a variety of disease vectors. Dieterich and Henderson’s report on *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries* also commented on the “public health importance” of water “in the less developed areas of the world.”⁸⁵

The different conceptualisations of water as an economic problem, a health problem, a visible problem, and an invisible problem show that the United Nations, the WHO, UN-associated organisations, and specialist advisors each had their own perspectives on water resources and how they should be utilised and

in Berlin from 17 to 21 May 1963, ed. H. P. Michael (Berlin: Duncker & Humblot, 1965), 70.

⁸⁰ Hollis, “Economic Aspects of Rural Sanitation in the USA,” 157; Bernd H. Dieterich and John M. Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries* (Geneva: WHO, 1963), accessed Nov 21, 2018, <http://www.who.int/iris/handle/10665/39735>, 17. Dieterich and Henderson also described the reciprocity when they wrote of water as “a basic factor” in economic development.

⁸¹ H. G. Baity, “Community Water Supply in Developing Countries,” 70.

⁸² Wagner and Lanoix, *Excreta Disposal for Rural Areas and Small Communities*, 1958; Wagner and Lanoix, *Water Supplies for Rural Areas and Small Communities*, 1959; Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*, 1963.

⁸³ Wagner and Lanoix, *Water Supply for Rural Areas and Small Communities*, 9.

⁸⁴ Wagner and Lanoix, *Water Supply for Rural Areas and Small Communities*, 9.

⁸⁵ Baity, “Community Water Supply in Developing Countries,” 70; Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*.

managed. One commonality remained, however: they all agreed that water, albeit for different purposes, needed to be developed and used more effectively and this need was most urgent in areas categorised as underdeveloped.

1.2 Britain's Imperial and Colonial Development Strategies

In 1948 geographer Frank Debenham described the difficult decisions facing policymakers:

Do we start at the need for a better distribution of a rapidly increasing population? Then we immediately call upon the doctor to improve the health conditions, who calls upon the agriculturist to find better soil for better crops, who calls upon the water engineers to find water over a wider area, who calls upon the veterinary people to free fresh country from tsetse fly, who call upon education people to convince the natives that keeping cattle mainly for 'bride price' is foolish, and so on down the line. Better health, housing, communications, water supply, education — where all seem fundamental who shall award priority?⁸⁶

The major challenge for policymakers, as this statement highlighted, was that each of the factors Debenham mentioned could be argued as fundamental; so, where should policymakers start? What was deemed foundational to progress? And how would they justify their choices? This section addresses some of the decision-making processes to show how people understood water, how it was valued, and for what purposes. It also explores some of the obstacles to investment in water supplies between 1945 and 1963.

Britain's colonial development strategy, which itself encouraged investment in water supplies, also implied that water was a problem of underdevelopment. In addition to the Colonial Development and Welfare Act 1945 the British Parliament passed the Overseas Resources Bill in 1948, whose purpose was: "to attempt to make good the world shortage of oils and fats by the cultivation of land which has not previously been cultivated, [and] by methods never before adopted on the scale envisaged."⁸⁷ This idea was alluded to during Colonial Office discussions

⁸⁶ Frank Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate, 1948, TNA, CO 927/ 33/3.

⁸⁷ Overseas Resources Development Act, 1948, Parliamentary Paper 162, 1948-49, accessed Nov 24, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1948-040314?accountid=15181>.

about imperial and colonial water legislation the preceding year when an undated (c. 1947) and unsigned note (likely author Frank Dixey) wrote of the, “resort to large-scale mechanised agriculture to overcome the problem of world fat shortage.”⁸⁸ As such, this was likened to the need for “large-scale” water resource development “as an auxiliary to large-scale economic development.”⁸⁹ This was reiterated in the report of the East African Royal Commission:

capital for further economic development is required for agricultural improvement, for the expansion of export production, for industrial and commercial expansion and for railways, roads, water supplies and other public services without which the basic resources of East Africa cannot be fully utilised.⁹⁰

Linking water to economic development in this way, these comments described the position of this resource within the larger context of British imperial and international development strategies: large-scale food production was the primary concern.⁹¹ As implied in the United Nations Yearbooks and through Britain’s Overseas Resources Bill, methods to increase food production, as suggested by Debenham, were primarily applied in countries or colonies defined as underdeveloped, less-developed, or developing. In this sense, water was not simply a problem of underdevelopment but part of the solution to certain problems of underdevelopment, such as sufficient food provision for growing populations.

From the inception of the British Colonial Development and Welfare Act in 1940 there was a clear emphasis on the importance of water supplies for health, as well as economic, improvements.⁹² However, advocates prioritising health over

⁸⁸ *Note on suggested water legislation*, n.d. (c. 1947), TNA, CO 852/1008/2. Frank Dixey[?], Memorandum on Water Policy, TNA CO 852/1008/2; Water was also described as an asset. See Christopher Eastwood, Minute, 23 March 1947, TNA CO 852/1008/2; Also see Frank Dixey, *A Practical Handbook of Water Supply* (London: T. Murby & Co, 1931, second edition 1950).

⁸⁹ *Note on suggested water legislation*, n.d., CO 852/1008/2. Frank Dixey[?], Memorandum on Water Policy, TNA CO 852/1008/2.

⁹⁰ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 1955-56, accessed Nov 23, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1955-045555?accountid=15181>, 78, 136; also see Water Legislation: Survey, 15 October 1947, TNA, CO 852/1008/2.

⁹¹ Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate, 1948, TNA, CO 927/ 33/3, 8; Water Supplies: East Africa, 1950-51, TNA, CO 822/158/1; Water Supplies: East Africa, 1951, TNA, CO 822/158/2; *Note on suggested water legislation*, n.d., CO 852/1008/2.

⁹² Dixey, *A Practical Handbook of Water Supply*, 1950.

economic development had limited success in keeping the importance of water for health ahead of water for economic development; the former was not directly productive, the latter produced more immediate results:

The finance made available by the Colonial Welfare and Development Acts has been drawn on heavily to take advantage of the improvement of water supplies from the point of view of the health and social well-being of colonial peoples. It was of importance that there should be such social investment. But it is of greater importance that there should be improved industrial use of water to establish colonial economic development under the Development Corporation on a sound basis.⁹³

While there were individuals and groups that supported the improvement and development of water supplies for combined economic, health, and social benefits there remained a clear tension between advocates of economic development and those of health and social well-being; one was usually regarded as foundational to the other.

As the development and management of water supplies aroused particular interest from the 1940s onwards through the Colonial Office and its development and welfare fund, as well as through fierce debates over Nile Waters allocations, discussion began over the creation of an imperial water legislation policy to be centralised through governments within the colonies.⁹⁴ In a rambling minute, dated 4 August 1947, one official remarked:

the study of this problem and the issue of a paper would be most valuable [...] our own shortcomings have received a flood of publicity, and there has been much official enquiry by the Ministry of Health and M. of Agriculture, and drafters[?] of legislation [...] A big push in many colonies is called for – conservation of water by simple means, irrigation, sanitation, pure water supplies, its place in health and nutrition and industry (e.g. production in E. Africa – effect on food, fish e.g. dehydration factory and agriculture in Kenya) [...] Also its place in geology and mining. Also its economic value [...]⁹⁵

⁹³ *Note on suggested water legislation*, n.d., CO 852/1008/2.

⁹⁴ Colonial Office, Minute, 4 August 1947, TNA, CO 852/1008/2.

⁹⁵ Colonial Office, Minute, 4 August 1947, TNA, CO 852/1008/2.

The publicity over British shortcomings was expressed through several channels. British colonial development responses to this publicity, alongside questions over food production within the colonial empire, form the focal point of this analysis.

Despite this call for action progress was slow or non-existent. Douglas Smith bemoaned this lack of implementation two months later:

Dr. Raeburn's work apart, I have been struck in my cursory study, by the rather pedestrian approach to the question of water in the Colonies. Everyone admits its fundamental importance, and after that is disposed to forget it and leave its utilisation to rather second class minds. The result has been that little sums are being spent on little schemes, whose benefits may quickly be eaten up by increases in population. I should hope this might be counteracted by perhaps the establishment of a Colonial Water Engineering Service.⁹⁶

Smith continued on to argue, "there is something to be said for concentrating a larger proportion of our investment in the Colonies into a few areas", such as hydro-electricity, large-scale agriculture, and mining.⁹⁷ Smith's arguments for large schemes were not given without reason: if select areas were chosen for attention across the colonies, this would allow expertise and comparable experiences to be shared. At the same time this would effectively deal with concerns over population growth. However, these strident opinions indicated a lack of detailed knowledge about the complexities of water resource development. Environmental variations, differing access to resources, and local needs were not accounted for.

The draft memorandum, developed in response to the Colonial Office discussions, provided an extended commentary on the diversity of conditions and the variety of administrative structures for managing water; it tempered Smith's statements, arguing, "it is well that imaginative study should be stimulated, and it is necessary that we should not boggle at the thought of large-scale projects. But this does not mean that we can neglect the small-scale operations in water-supply, well-boring and drainage."⁹⁸ In this sense, both large and small schemes were deemed important, but their appropriateness differed across time and place. Part of the challenge in procuring investment stemmed from this lack of agreement over what kind of projects to prioritise, when, and where.

⁹⁶ Douglas Smith, Minute, 15 October 1947, TNA, CO 852/1008/2 Water Legislation.

⁹⁷ Smith, Minute, 15 October 1947, TNA, CO 852/1008/2 Water Legislation.

⁹⁸ *Note on suggested water legislation*, n.d., CO 852/1008/2.

These discussions were notably directed toward Britain's African colonies with a succinct version of this memorandum prepared for, and discussed at, the Conference of African Governors. Unanimous support was indicated over developments in water legislation and the improvement of supplies but disquiet was expressed about the response of local populations to centralised policies. Concerns were also voiced over the limited application of irrigation in Uganda (related to Nile Waters allocation) and the problem of schemes held up due to lack of staff.⁹⁹

By 1950 staffing problems were easing but valve supplies for water development projects were unable to match the spike in demand after the Second World War.¹⁰⁰ In a letter dated 7 September 1949 H. G. Savage, Crown Agent for the Colonies, commented on the "flood of post-war orders from water development and sewage authorities both in this country and overseas" received by British manufacturers.¹⁰¹ Delays of twenty-four to thirty months were commonplace, having "serious repercussions in the implementation of several Colonial Development Water Schemes, notably in Malta, Nigeria, Gold Coast and Hong Kong."¹⁰² Another official, M. A. Willis, reiterated these concerns:

these Colonial Water supply schemes have a very important bearing on our Colonial Development, and delay in delivery even of small items can, as the Crown Agents have pointed out in their letter, hold up a complete project.¹⁰³

Still unresolved in the January of 1950, a letter addressed to Lt. Col. J. Mac Ewan-Martin attached a long list detailing a number of such delays to Colonial Development Programmes, including those in Gibraltar, Gold Coast, Nigeria, Northern Rhodesia, Uganda (Kampala), Tanganyika, and Ceylon.¹⁰⁴ The

⁹⁹ For example, problems of recruitment in Tanganyika: Water Development Department: Tanganyika: Recruitment of staff, 1947, TNA, CO 691/199; This is also discussed in Havinden and Meredith, *Colonialism and Development*, 257.

¹⁰⁰ Machinery for Water Supplies, 1949-50, TNA, CO 852/1104/2.

¹⁰¹ H. G. Savage (Crown Agent for the Colonies) to M. A. Willis (Colonial Office), Letter, 7 September 1949, TNA, CO 852/1104/2.

¹⁰² Savage to Willis, Letter, 7 September 1949, TNA, CO 852/1104/2.

¹⁰³ M. A. Willis (Colonial Office) to H. Phillip Levy (Ministry of Labour and National Insurance), Letter, 21 September 1949, TNA, CO 852/1104/2.

¹⁰⁴ M. A. Willis to Lt Col J. Mac Ewan-Martin, Letter, 11 January 1950, TNA, CO 852/1104/2.

seriousness of the situation, affecting both water development in Britain and in its colonies, led to the creation of a working party to resolve the matter.¹⁰⁵

Manufacturers noted that the production of industrial valves had risen significantly between 1946 and 1950 but that demand outstripped supply. In order to manage the shortage it was suggested that exports should be reduced, such as those to the colonies, “until some headway has been made in wiping off the big backlog of orders for home requirements.”¹⁰⁶ However, the chairman, the manufacturing representatives, the Board of Trade, and the Colonial Office were not supportive.¹⁰⁷ These parties were keen to prioritise export earnings unlike the Ministry of Health that believed, “home water supplies and sewage schemes should come first.”¹⁰⁸ A decision was not reached on which should be prioritised—home or abroad—and instead attention focused on how this shortage could be resolved. The main suggestion was to resolve the shortage issue by importing valves from the US or from Belgium, Germany, Austria, and Italy.¹⁰⁹

At the second meeting Mr. Bruce Ball, Chair of British Valve Manufacturers and representative for the manufacturing company Glenfield & Kennedy, highlighted the concerted efforts of manufacturers to accelerate production.¹¹⁰ Shortages of skilled labour and supplies of steel castings remained the biggest obstacles. Estimation of valves needed and the differing costs based on final destination posed further difficulties.¹¹¹ An open, general license to import Italian valves was favoured as time and costs would be lower; this was a popular choice with the Ministry of Health who were keen to take “full advantage” of reduced delivery times and lower costs.¹¹²

¹⁰⁵ Notes from meeting held 12 January at Ministry of Supply. A working party was set up to consider certain recommendations made by Mr Aneurin Bevan, the Minister of Health in a letter 22 November 1949 to Mr Strauss about the supply of valves: Engineering Industries Division, Ministry of Supply, 1949, TNA, CO 852/1104/2; Notes of second meeting, held Tuesday 31 January 1950, Ministry of Supply, by working party set up to consider certain recommendations made by Mr Aneurin Bevan, the Minister of Health in his letter 22 November 1949 to Mr Strauss about the supply of valves: Engineering Industries Division, Ministry of Supply, 9 February, 1950, TNA, CO 852/1104/2.

¹⁰⁶ Notes from meeting held 12 January at Ministry of Supply, TNA, CO 852/1104/2.

¹⁰⁷ Notes from meeting held 12 January at Ministry of Supply, TNA, CO 852/1104/2.

¹⁰⁸ Glenfield & Kennedy to Crown Agents, Letter, 5 December 1949, TNA, CO 852/1104/2.

¹⁰⁹ Notes from meeting held 12 January at Ministry of Supply, TNA, CO 852/1104/2.

¹¹⁰ Notes of second meeting held Tuesday 31 January 1950, TNA, CO 852/1104/2.

¹¹¹ Notes of second meeting held Tuesday 31 January 1950, TNA, CO 852/1104/2.

¹¹² Notes of second meeting held Tuesday 31 January 1950, TNA, CO 852/1104/2.

The shortage of valves, and the solutions suggested, highlighted the problems plaguing British colonial development plans. British industry was unable to effectively support extensive water supplies development in the colonies not only because of labour and supplies shortages but because colonial projects were competing with similar improvements planned within Britain itself. As such, these discussions also revealed the more generalised importance of water supplies development, which was not confined to colonial territories. There was, however, a notable concentration of interest in the African territories. On the two occasions that the problem of shortages was raised at least half the named territories affected were on the African continent.

Interest in water supplies on the African continent continued into the mid-1950s when some of the severe supply-side constraints afflicting the British economy had eased. Mr. Bernard Braine M. P. asked on 9 March 1955 if it could be indicated “what steps have been taken in recent years in each of the African territories to develop rural water supplies.”¹¹³ In response, Alan Lennox-Boyd, Secretary of State for the Colonies, sought information from the colonies directly. On 19 February 1955 an outward telegram was sent to eleven African colonies, including Uganda, asking for a general statement of policy on rural water supplies development and some brief detail regarding specific measures taken in this area since 1950 in relation to domestic use, livestock, and crops (“i.e. irrigation”).¹¹⁴ Alongside this Gerald Sayers requested the following information:

1. expenditure territory by territory on rural water supplies in the last three years
2. in which of the territories there is a separate water supply department
3. the total European staff employed on rural water supplies territory by territory.¹¹⁵

These questionnaires focused on how much money was spent on rural water supplies, how water was organised on a departmental basis, and the human resources employed (European) in each territory.

¹¹³ Mr. Bernard Braine, “Africa (Rural Water Supplies),” *House of Commons Debates*, 9 March 1955 vol 538 c410; Minute, 18 February 1955, TNA, CO 1029/205, Colonial Water Resources and Water Policy.

¹¹⁴ Secretary of State for the Colonies to Kenya, Tanganyika, Uganda, Northern Rhodesia, Nyasaland, Zanzibar, Somaliland Protectorate, Gambia, Gold Coast, Sierra Leone, Northern Region Nigeria, Eastern Region Nigeria, Western Region Nigeria to Colonial Office, Telegram, 19 February 1955, TNA, CO 1029/205.

¹¹⁵ Gerald Sayers to J. B. Johnson, Letter, 4 March 1955, TNA, CO 1029/205.

The responses received were compiled into two documents (Annex A and Annex B). Annex A collated all the information on rural water supplies into one document. This included expenditure, where available, and development in relation to domestic use, stock, and crops.¹¹⁶ Annex B took the form of a more general statement on departmental organisation and this emphasised the complexities of water management within territories.¹¹⁷ Regarding the first point, general estimations were given: responses showed the limited nature of statistics in this field and in the region more generally. Regarding the second point, of the eleven British African territories involved in this correspondence only three possessed separate water departments—the Gold Coast, Tanganyika, and Northern Rhodesia. Each of these independent water departments primarily focused on rural water supplies but meanings attached to the phrase ‘rural water supplies’ were not clearly defined. Due to the remit given to the colonies its meaning was split across domestic, livestock, and irrigation and emphasis varied based on locality. Little attention was paid to the third point in the responses.

In Uganda, as before the war, water supplies were managed “by sections of the appropriate government departments”, as the Governor of Uganda, Sir Andrew Cohen, explained:

The hydrological survey is responsible for investigating water resources and recording hydrological data, the design and construction of irrigation schemes and experiments in and execution of swamp reclamation works. The geological survey is responsible for drilling water and for the construction of small reservoirs and dams for conserving surface flow. The public works department deals with supplies in urban areas provided under the Water Works Ordinance and with sewage disposal. Water rights are registered with the survey lands and mines Department.¹¹⁸

Cohen did not mention medical or agricultural departments but did highlight the role of the new hydrological department, which was established after the Second World War. Though water was clearly considered through the medical and agricultural departments their staff were advisers rather than implementers: the

¹¹⁶ Annex A: Rural Water Supplies in Africa, 1954-55, TNA, CO 1029/205.

¹¹⁷ Annex B: Rural Water Supplies in Africa: Departmental Organisation, 1954-55, TNA, CO 1029/205.

¹¹⁸ Governor of Uganda to the Secretary of State for the Colonies, Savingram, 29 March 1954, TNA, CO 1029/205.

execution of projects required engineering expertise. The medical and agricultural departments advised at the planning and implementation stages and were then more directly involved in maintenance. Therefore, the attention focused on planning and implementation sometimes precluded deeper questions surrounding the relationship between water and disease.

Accounting for these discussions, further suggestions for a centrally coordinated plan for water supplies development and management in Africa were not regarded favourably.¹¹⁹ M. Z. Terry stated, “the general view is that water supply development is essentially a thing for each colonial government to tackle as part of its own development plan according to its individual hydrological circumstances.”¹²⁰ This was reiterated by J. W. Vernon.¹²¹ Water did not lend itself to centralisation or to standardised policy and officials working within the colonies were not keen to have a policy centralised through the Colonial Office. The diverse environments and topographies of Africa epitomised the problem of generalised policies. This was also exacerbated by the lack of available information on the development of water resources at the time. Even the costs involved in improving channels of communication in the water development field were deemed “too excessive compared with the likely advantages.”¹²² G. Lacey, however, took a slightly different approach, regarding the proposal “somewhat vague”.¹²³ Also not convinced a centrally coordinated plan was the answer Lacey instead suggested that “the basic principles” might be agreed on:

If it is considered that action is necessary to stimulate water development activities the best way possibly of doing it would be to stage an inter-colonial conference in Africa to discuss the problem, and put forward recommendations of a general character [...] this would be much better than some central organisation, or some persons, or single person telling the territories what they ought to do. All are allergic, when it comes to advice and sometimes I sympathise.¹²⁴

¹¹⁹ Sayers to J. B. Johnson, Letter, 4 March 1955, TNA, CO 1029/205.

¹²⁰ M. Z. Terry, Minute, 14 March 1955, TNA, CO 1029/205.

¹²¹ J. W. Vernon, Minute, 5 April 1955, TNA, CO 1029/205.

¹²² J. W. Vernon, Minute, 14 April 1955, CO 1029/205.

¹²³ G. Lacey, Minute, 10 June 1955, CO 1029/206.

¹²⁴ Lacey, Minute, 10 June 1955, CO 1029/206.

Attempts to mould water into a rigid framework proved impossible given the nature of varied environments and circumstances and the reticence of colonial officials both in London and the colonies to support centralisation.

2. Solving the Water Problem in Underdeveloped Territories?

On 13 March 1951 Lord Ogmores spoke to the House of Lords about the obstacles, notably financial, hampering the implementation of primary development. These comments followed the failure of the ground nut scheme in Tanganyika and came at a time when Britain's Overseas Resources Bill had reaffirmed the Colonial Development and Welfare Act's practical meaning and application of development as centred on the utilisation of resources, particularly for economic gain. Ogmores's comments provide useful insights into the nuances of the development concept, the challenges in implementing development ideals, and how this took place within and across British Colonial and UN forums.¹²⁵ Ogmores began by highlighting one of the connections between Britain and the UN through the latter's Economic and Social Council. It was clear from Ogmores's remarks that discussions about the problems of, and solutions to, underdevelopment were not isolated within Britain or the UN; ideas were shared. However, there was also a definite sense of competition between Britain and other nations as shown in Lord Ogmores's belief that Britain was "a great way ahead of any other country" in its development mechanisms.¹²⁶ It is within these contexts—Britain and the UN—that ideals were established, obstacles and challenges were accounted for, and solutions for underdevelopment were sought. Their aim was to make development realities sit as close to development ideals as possible, whether this was through greater investment, or through reframing ideals. For example, on 2 October 1952 frustrations were vented in the Colonial Office at the reluctance of the International Bank for Reconstruction and Development (IBRD) to provide loans to East Africa: one official remarked, "the apparent lassitude of the International Bank at this

¹²⁵ Lord Ogmores, "Overseas Resources Development Bill," *House of Lords Debates*, vol 170 cc1031-73.

¹²⁶ Lord Ogmores, "Overseas Resources Development Bill," *House of Lords Debates*, vol 170 cc1031-73.

stage of affairs is very annoying.”¹²⁷ The bank stood its ground and argued that the region had enough money already.¹²⁸

Lord Ogmores introduced development in three ways. Firstly, in a general manner, which emphasised the difficulties in procuring finances in “underdeveloped areas.”¹²⁹ In this sense, Ogmores alluded to the definition ascribed in the Colonial Development and Welfare Act 1945: “the development of the resources of the colonies [etc.]”¹³⁰ After this Lord Ogmores described two different stages of the development process, which were labelled “primary development” and “real development” as shown below:

It has been found a matter of the utmost difficulty to finance unproductive but essential primary development in rural territories. Before there can be any real development someone has to pay for the roads, water supplies, electricity, hospitals, schools and so on. The financing of that primary development, before one can proceed to the development which will have a direct financial return, although it may not be for some years, has been a matter of great difficulty, and it has not yet been solved.¹³¹

Regarding primary development, Lord Ogmores was speaking of the need for basic infrastructures for rural areas. Surmising from these statements in the House of Lords: there was little sense in developing agricultural schemes and improving production if transport links were not in place to provide access to regional, national, and international markets; without access to adequate water supplies and health services, loss of productivity would reduce or negate the advantages of establishing such schemes; without education, the problems of underdevelopment would perpetuate. Ogmores was a staunch believer that training local people was the best method for long term development, rather than relying on British experts. Each of these, according to Lord Ogmores, were prerequisites to “real development”.¹³² This phrase implied the presence of tangible, quantitative results

¹²⁷ H. T. B., Minute, 2 October 1952, TNA, CO 822/299, International Bank Loans to East Africa; A. F. Kirby to Dawson, Letter, 6 August 1953, regarding IBRD loans to East Africa Railways and Harbours.

¹²⁸ H. T. B., Minute, 2 October 1952, TNA, CO 822/299, International Bank Loans to East Africa; A. F. Kirby to Dawson, Letter, 6 August 1953, regarding IBRD loans to East Africa Railways and Harbours.

¹²⁹ Lord Ogmores, “Overseas Resources Development Bill.”

¹³⁰ Colonial Development and Welfare, Paper 40, 1939-40.

¹³¹ Lord Ogmores, “Overseas Resources Development Bill.”

¹³² Lord Ogmores, “Overseas Resources Development Bill.”

that would bring financial benefits, showing the contrast between unproductive (primary) and productive (real) development.¹³³

Ogmore's conceptualisation of development reflected, firstly, its usage to denote both a process (from "primary" to "real" development) and an end-point ("real development"), and secondly, its multifaceted nature—its meanings both broad and narrow.¹³⁴ On the one hand, Ogmore implied that real development was productive development, thus linking it to a narrower, economic conceptualisation of development. On the other hand, Ogmore regarded investment in basic infrastructures, which were connected directly and indirectly with social and economic development, as crucial to the process. Questions remained over what productive, real development looked like in practice.

How the problem of water in underdeveloped territories would therefore be resolved depended on how it was conceptualised. By 1963 the problems with water—its development, utilisation, and management—were better defined, but the application of effective solutions continued to evade protagonists. These difficulties stemmed from the variety of factors that required consideration, alongside the desire to bring them together into a coherent whole. Colonial and international officials were unable to take action despite having a good understanding of the main issues. The reasons, as defined by post-war contemporaries, can be categorised under four interrelated headings: financial, institutional, informational, and population growth.

The first obstacle, labelled as "probably the most significant cause of world-wide deficiencies" was the "inadequate financial support" due to competition within and outside the field of water resources development.¹³⁵ Two particular issues were raised: firstly, because community water supplies "were not often included in national development plans" they received less financial backing.¹³⁶ Therefore, water agencies were forced to "vainly compete with other agencies for limited funds."¹³⁷ Secondly, there was competition within the field of water resources development itself: should water be developed for domestic use, livestock, crops,

¹³³ Lord Ogmore, "Overseas Resources Development Bill."

¹³⁴ Lord Ogmore, "Overseas Resources Development Bill."

¹³⁵ Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*, 11.

¹³⁶ Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*, 11.

¹³⁷ Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*, 11.

or some combination?¹³⁸ These financial limitations were used to explain the focus of community water supplies on urban, rather than rural, areas in the 1960s.¹³⁹ The publication of Lanoix and Wagner's texts on excreta disposal and water supplies, which focused on rural areas and small communities, were thus put to one side to focus on supplying larger urban communities. Another approach suggested to circumvent these financial difficulties was to "give water to as many of the people as possible rather than to give a perfect supply to a few."¹⁴⁰ Here the idea was to focus on quantity rather than quality.

The second obstacle related to the lack of supporting infrastructure and administration. During this period there was little agreement over how water should be organised and categorised. Was it better to coordinate the different specialists working on water supplies (health workers, geologists, geographers, engineers) or to create new specialisms—hybridisations—like the position of sanitary engineers? Was it preferable to have an administrative department focused solely on water development or was it better to have multiple departments each using their own expertise for the different aspects of developing water supplies? What about water laws and advisory councils? While Uganda's Governor stated that their "system of divided responsibility has worked smoothly", the evidence presented suggested that the divisions of responsibility had caused significant cross-department tensions.¹⁴¹ The different kinds of administrative structures utilised to manage water within colonial bureaucracies in British colonial Africa revealed that water needed to be addressed at a local (colonial government) level.

The third obstacle was the lack of knowledge on local situations and the limited availability of people to obtain the required information, which Frank Debenham had highlighted through an assessment of water resources in East Africa in 1948.¹⁴² The Colonial Office bemoaned the continued lack of available

¹³⁸ Secretary of State for the Colonies to Kenya, Tanganyika, Uganda, Northern Rhodesia, Nyasaland, Zanzibar, Somaliland Protectorate, Gambia, Gold Coast, Sierra Leone, Northern Region Nigeria, Eastern Region Nigeria, Western Region Nigeria to Colonial Office, Telegram, 19 February 1955, TNA, CO 1029/205.

¹³⁹ Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*, 7.

¹⁴⁰ Baity, "Community Water Supply in Developing Countries," 58-59.

¹⁴¹ Governor of Uganda to the Secretary of State for the Colonies, Savingram, 29 March 1954, TNA, CO 1029/205.

¹⁴² Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate, 7.

data ten years later when information was collected at the request of Bernard Braine in the mid-1950s. This was indicative of the difficulties in procuring such information.¹⁴³ As a result, a significant proportion of funds allocated to the development of water supplies were used in surveying current conditions in the 1940s, 1950s, and 1960s. There was a bigger push for the collection of data on water supplies in the 1960s, which, once collated, highlighted the nature and significance of the problem to a greater degree. Each of these factors were also impacted by population growth.

The use of already limited finances was also hampered by population growth as the supply of water struggled to keep up with demand. Further, as populations grew so did the scale of the surveys that needed to be undertaken; administrative structures and legislation also needed to account for the growing needs. Although other suggestions were made to solve the water problem, such as rain making experiments and better methods for conservation, these three obstacles continued to temper the progress colonies were able to make during this period.

3. Concluding Remarks

This chapter showed that the terms 'water' and 'underdevelopment' were used in relation to one another and described a set of specific problems in specific geographical locations: the water problems contributed to the problems of underdevelopment, and the problems of underdevelopment contributed to the water problems. Therefore, the formation of, and interactions across, the developed–underdeveloped divide provided the broad framework of analysis within which development ideologies and practices were constructed and reconstructed.

This framework had implications for the construction of imperial, colonial, and international water policies. The diversity of opinions expressed within the overarching development philosophy precipitated a tug between the economic and the social while at the same time drawing them together into a causal

¹⁴³ Colonial Water Resources and Water Policy, TNA, CO 1029/205; Colonial Water Resources and Water Policy, TNA, CO 1029/206; H. P. Michael, ed., *Water Development in Less Developed Areas: Transactions of an International Conference held in Berlin from 17 to 21 May 1963* (Berlin: Duncker & Humblot, 1965).

relationship.¹⁴⁴ Justifications for investment in water supplies have shown economic development took precedence. Protagonists of Britain's colonial development and welfare policy revealed the power of the economic argument as they pressed forward its weight to raise funds for their favoured projects.¹⁴⁵ A similar pattern was seen through UN operations: while 'social' came before 'economic' in the UN Charter—a key contrast between UN and British ideals—the primacy of economic development was clear. The establishment of the UN's Economic and Social Council committee to specifically discuss the economic, and not the social, development of under-developed territories, reinforced the balance of economic power over social.¹⁴⁶ This did not imply, however, that all those involved in imperial, colonial, and international development believed the economy was foundational to all other aspects of progress within the field; social development gained ground towards the end of the period.¹⁴⁷

The contrast between the WHO and British approaches—the former claiming political impartiality and the latter unapologetically serving the interests of Britain and its imperial territories—lay in the local knowledge of British experts. Those attached to the colonial services knew the colonies very well, could speak local languages, and had built up relationships with those they were looking to help. The WHO, on the other hand, had experts who moved around between different places and therefore only got a flavour of local conditions and preferences. That British expertise appeared to be favoured was evident in the sheer number of British experts involved in the UN's development plans.

Though it was increasingly expected that imperial, colonial, international, and national systems of governance should progressively provide affordable

¹⁴⁴ Also see Packard, "Vision of Postwar Health and Development," 103: "tendency to link [post-war international] health interventions with social and economic development"; Hollis, "Economic Aspects of Rural sanitation in the United States of America," 157.

¹⁴⁵ For example, see Minutes, Colonial Water Resources and Water Policy, TNA, CO 1029/205, 1954-55; Minutes, Colonial Water Resources and Water Policy, TNA, CO 1029/206, 1955-56.

¹⁴⁶ UN Yearbooks for "the economic development of under-developed countries": For example: UNYB 1948-49, 432-458; UNYB 1950, 438-466; UNYB 1951, 376-419; UNYB 1952, 353-393; UNYB 1953, 292-315; UNYB 1954, 119-160; UNYB 1955, 91-109; UNYB 1956, 165-182; UNYB 1957, 139-160; UNYB 1958, 131-159; UNYB 1959, 109-164; UNYB 1960, 271-79; Frederick Cooper, "Modernizing Bureaucrats, Backward Africans, and the Development Concept," in *International Development and the Social Sciences: Essays on the History and Politics of Knowledge*, ed. Frederick Cooper and Randall Packard (Berkeley, Los Angeles, London: University of California Press, 1997), 64-92.

¹⁴⁷ Walter Bruchhausen, "From Precondition to Goal of Development: Health and Medicine in the Planning and Politics of British Tanganyika," 207-221.

access to water, health, and education, alongside opportunities for economic advancement, the combined impact of obstacles and challenges tempered the idealistic aims of the UN and the British Colonial Development and Welfare policies. Starting in a time of stringency in terms of finances, personnel, and resources, the growing number of avenues for, and expectations of, development programmes meant that government officials had to make tough decisions to prioritise some areas over others. Moreover, as health improved and mortality rates declined, the resultant population growth further increased the demand for food and basic services and thus placed a greater urgency on investment to match supply with demand. Therefore, compromises were made as ambitious development plans clashed with the resources limitations of colonial governments and their inability to raise external support. As a result attention was focused on surveys, research, technical support (personnel, equipment, training), and pilot projects.

International Organisations were not immune from financial and personnel concerns. Reliant on funds and expertise from their member states, UN organisations also had to decide on their own priority areas. The WHO, as shown in in this chapter, prioritised six main areas during this period—environmental sanitation, malaria, maternal and child health, tuberculosis, venereal diseases, and nutrition. From the mid- to late-1950s the Environmental Sanitation Division of the WHO was able to consolidate its place within its parent organisation as well as on the international stage. Broad in remit at its inauguration, the Environmental Sanitation Committee increasingly focused its attention upon clean and adequate water supplies and excreta disposal facilities. Even though developments were skewed towards urban rather than rural domestic water supplies, and priority was given to areas of potential or guaranteed economic growth, efforts were made in both Uganda and Sudan to improve access as the following chapter shows.

As local contingencies and political configurations affected how universal and imperial frameworks impacted the timing and scope of change, Chapter 3 looks in more detail at the alternative regional dynamics affecting each territory including how the different regions or regional groupings shaped policy decisions.¹⁴⁸ After contrasting experiences of war, and at different points of development, Uganda and Sudan found themselves in unique positions as they

¹⁴⁸ Regional dynamics in the broad sense, to cover East Africa, African Regional Office (AFRO), Eastern Mediterranean Regional Office (EMRO).

operated in both overlapping and different spheres of influence. Each sought to establish their position, particularly after independence, in relation to Britain, the US, the UN, and the plethora of international relations open to them during this period. As such, Chapter 3 uses illustrations from Uganda and Sudan to show the different kinds of engagements with water between 1945 and 1963, how each was affected by its positioning within the same and different regional groupings, and how each engaged with international organisations in their attempts to improve water supplies in their territories.

CHAPTER THREE

Weapons of Water: Sudan and Uganda 1945-1963

Chapter 3 shows that between 1945 and 1963 economic development continued to shape engagements with water supplies and their development for health purposes. This chapter focuses particularly on the different levels of international involvement relating to Sudan and Uganda. The two illustrations addressed in Chapter 3 firstly explore how political tensions over the distribution of the Nile Waters influenced the ability of riparian states to make use of the river for economic purposes; this had knock-on effects for the development of water supplies to improve the health of people in the Nile Basin. Secondly, these illustrations examine the creation of development plans, and where the development of water supplies did or did not figure in draft proposals. Thirdly, these illustrations address the role of the WHO and focus on the role of the regional offices—the Eastern Mediterranean Regional Office (EMRO) for Sudan and the African Regional Office (AFRO) for Uganda. The analysis of experiences in Uganda and Sudan differ in terms of the regional groupings discussed. The Sudan illustration focuses on the role of EMRO in shaping the direction of health work pre- and post-independence.¹ The Uganda illustration focuses on the territory's position within British East Africa. Administered by the Colonial Office, and under colonial rule until 1962, Uganda had stronger ties to British development funds. Moreover, the continued European colonial presence on the African continent, which persisted into the 1960s, hampered AFRO as the WHO was forced to compete with alternative regional organisations: the Commission for Technical Cooperation in Africa South of the Sahara (CCTA) and the East African High Commission (and its associated research groups).

Taking all these factors into account, the role of the WHO and its promotion of environmental sanitation is assessed. Chapter 3 looks at how this concept—environmental sanitation—was adapted and applied in Uganda and Sudan and how it fitted within and around colonial and national ideological frameworks. To understand the place of environmental sanitation in these contexts it is crucial to understand development priorities; restrictions on finances and resources; and the limited personnel available as each colony-cum-nation embarked upon ambitious

¹ Self-government in 1953, independence recognised internationally on 1 January 1956.

development plans. Using water resources and environmental sanitation to draw analyses together, Chapter 3 explores how administrators and specialists working in, or in relation to, Uganda and Sudan conceptualised, planned, and implemented health and development programmes.

After fifteen years of concerted efforts to improve access to water supplies, the WHO's Regional Committee for the Eastern Mediterranean noted frustrations with the "continuous state of struggle" in July 1959:

Man tries to control and use water more and more, and on the other hand it seems that water resists being disturbed in its natural route of the so-called 'water-cycle'. Erosion, floods, diseases, are among the weapons used by water in this struggle. As in every war, the effort required for mastering water is considerable.²

Within this universal war, significant battles were fought as the weapons of water brought fresh challenges: how could swamps be reclaimed without producing arid conditions unsuitable for government planned settlement schemes, irrigated crop schemes, or livestock grazing? How could safe and adequate water supplies be provided without creating an environment where mosquitoes, flies, and other disease carrying organisms could flourish? These questions form the basis of these illustrations as they examine experiences in Sudan, Uganda, and their respective regions between 1945 and 1963.

1. Negotiating the Nile: Sudan 1945-1963

In 1946, the Nile experienced its biggest flood since 1869, putting 2,870 out of 9,000 water wheels out of operation in the Northern Province.³ The excess water provided favourable breeding grounds for mosquitos and flies in the Khartoum region; it also damaged crops and property in the Blue Nile Province further south.⁴ However, in some areas the flood provided favourable conditions for cultivation and "excellent" grazing in most provinces for the first half of 1947.⁵ The contrasting experiences of the Nile flood in the aftermath of the Second World War epitomised the varying conditions across Sudan. At the same time this underlined

² WHO (Eastern Mediterranean Regional Office), *Community Water Supply in Countries of the Eastern Mediterranean Region* (Geneva: WHO, 10 July 1959), 1, accessed Nov 24, 2018, <http://www.who.int/iris/handle/10665/123735>.

³ FAC, Sudan, 1946, 60; FAC, Sudan, 1947, 154.

⁴ FAC, Sudan, 1946, 137, 157.

⁵ FAC, Sudan, 1946, 12; FAC, Sudan 1947, 97.

the widespread importance of the river in shaping engagements with health and development within the territory. Firstly, this illustration highlights the strained Anglo-Egyptian relations, which shaped the colonial and international debates over the Nile Waters. This emphasised the narrowing gap between health and economic development policies in the two decades after the Second World War. Secondly, it examines Sudan's 1951-1956 Development Programme and the budget for 1957/58. It shows the shifts in priorities across the decade including the separate funds marked for different kinds of water resources development.⁶ Thirdly, it examines the promotion of environmental sanitation and community water supplies within colonial and international frameworks, and investigates the approaches of EMRO (WHO) and the Sudan Medical Service.

On 17 November 1945 Hubert Huddleston, Governor-General of the Sudan, wrote a targeted letter to the British representative in Cairo.⁷ Huddleston felt that Sudan had been kept out of the loop on developments between Egypt and Uganda in relation to the construction of a barrage and reservoir at Lake Albert. As "an interested party", Huddleston wanted to be informed with any progress.⁸ Following on from the correspondence between Sudan, Cairo, and the British Foreign Office, the Secretary of State for Foreign Affairs, P. S. Scrivener, wrote to R. J. Bowker in Cairo and commented on the "lack of any form of satisfactory liaison between the technical authorities in Egypt, the Sudan and the East African territories."⁹ The complexities of managing water resources across imperial, colonial, national, and international boundaries was evident throughout these exchanges. This made finding agreement more difficult as any policy changing the natural flow of the Nile would have contrasting impacts on the communities residing, and reliant, on its banks.

The relationship between Britain and Egypt became increasingly fragile in the years following the Second World War, affecting the ability of both parties in their attempts to control access to the river Nile. This was expressed in a variety of forums and included discussions mediated through the UN. There were

⁶ World Bank IBRD, Department of Operations South Asia and Middle East, *The Economy of the Sudan: Main Report*, (Washington: World Bank, 25 February 1958), accessed Nov 24, 2018,

<http://documents.worldbank.org/curated/en/488771468121770513/pdf/multi0page.pdf>.

⁷ Huddleston (Governor General of Sudan) to Cairo, Letter, 17 November 1945, TNA, CO 536/217/1.

⁸ Huddleston to Cairo, Letter, 17 November 1945, TNA, CO 536/217/1.

⁹ R. J. Bowker to P. S. Scrivener, Letter, TNA, CO 536/217/1: this encloses the above notes relating to the Sudan, 4 January 1946.

heightened tensions at the UN Security Council meeting in 1947 as Britain sought to reassess the position of its troops stationed in Egypt and its future role in Sudan.¹⁰ The Egyptian representative argued that the Britain had disregarded “the legitimate rights and interests of Egypt and the Sudan”, and continued on to say, “nature had made the valley of the Nile an entity; it formed a unit physically, economically and racially.”¹¹ Egyptian representatives wanted to integrate the Sudan with Egypt and, in doing so, re-establish their divine claims to the Nile River. In response British representatives took the usual diplomatic stance and promised the removal of troops. They refused to have any consultations regarding Egypt’s claim over the Sudan and commented on the lack of Egyptian “recognition of the right of the Sudanese themselves to choose the future status of their country.”¹² These discussions received significant international coverage and set the tone for the numerous debates over Nile waters allocations that ran through the 1940s, 1950s, and early 1960s.¹³

After a few false starts, negotiations over Owen Falls and the Aswan Dam continued amicably. According to E. A. Chapman (British Ambassador to Egypt) the Prime Minister of the country was keen to emphasise Egypt’s capability in “co-operating in progressive schemes for the benefit of the peoples of Uganda, Sudan and Egypt” and did not want to pass up on “the opportunity to gain considerable prestige for himself and his government by participating in these works.”¹⁴ After the completion of a dam at Owen Falls frustrations resurfaced in the autumn of 1955, which coincided with Sudan’s imminent independence.¹⁵ The lingering

¹⁰ UNYB 1947-48, Part 1: UN. Section 3: The Security Council. Chapter D: Political and security questions, 356.

¹¹ UNYB 1947-48, Part 1: UN. Section 3: The Security Council. Chapter D: Political and security questions, 357; *Daily Mail*, “Stangate to Fly home if — Egyptians reject latest British proposals,” 23 September 1946, TNA, CO 536/217/1.

¹² UNYB 1947-48, Part 1: UN. Section 3: The Security Council. Chapter D: Political and security questions, 358.

¹³ Applications by East African Governments for Share of Nile waters under 1929 Agreement, 1954-55, TNA, CO 822/879; Applications by East African Governments for Share of Nile waters under 1929 Agreement, 1955-56, TNA, CO 822/880; Applications by East African Governments for Share of Nile waters under 1929 Agreement, 1956-57, TNA, CO 822/881; Claim by East African Governments for share of Nile waters under Nile waters Agreement 1929, TNA, CO 822/1411: for continuations of this file see CO 822/1412, CO 822/1413, CO 822/1414; Nile Water Projects, 1949, TNA, FO 371/73614; Nile Water Development Schemes 1949, TNA, FO 957/90.

¹⁴ E. A. Chapman-Andrews to Ernest Bevin, Letter, 9 February 1949, TNA, FO 957/90, Nile Water Development Schemes 1949.

¹⁵ Applications by East African Governments for Share of Nile waters under 1929 agreement, 1955-56, TNA, CO 822/880; See Uganda illustration for more on Owen Falls.

wariness of each party involved in the distribution of the Nile waters expressed itself in pointed correspondence in the mid-1950s. The East African governments were unhappy that permission had to be gained from Egypt in order to utilise the Nile for irrigation. In this regard one Foreign Office official noted, “they find this [the 1929 Nile Agreement] irksome and raged it as unfair that there is no reciprocal obligation on the part of the Egyptian Government to obtain permission from them before they launch any project, however huge.”¹⁶ The Sudan Government also aired its disagreements with Egyptian policies and argued with tempered annoyance that Sudanese engineers were not consulted over the construction of the Aswan Dam.¹⁷ The strained relationship between Egypt and Britain exacerbated these issues and reached its nadir during the Suez Crisis in 1956. British humiliation, as a result, affected not only its status within the international community but also its ability to lobby on behalf of its East African territories while Egypt and Sudan re-negotiated the Nile Waters Agreement.

In September 1958, questions over the allocation of Nile waters for East Africa resurfaced when Egypt and Sudan explored the possibility of building further dams along the river.¹⁸ Both countries had requested financial backing from the International Bank for Reconstruction and Development (IBRD).¹⁹ However, the IBRD was reluctant to provide funds where there was a “lack of international agreement.”²⁰ Head of the Bank, Eugene Black, proposed a conference to discuss rights to the Nile waters and advised the British Government not to forward East African requirements at such a politically volatile time.²¹ This left the British Government in a precarious position: it did not want to upset Egyptian or Sudanese politicians but was understandably reluctant to dismiss East African rights to water. Eventually agreeing to Black’s suggestions, which favoured Egyptian and Sudanese developments, their respective governments were left to negotiate the new agreement. As a number of officials had suspected this left East African territories with no bargaining power: the Nile Waters Agreement in 1959

¹⁶ Foreign Office to Sir Humphrey Trevelyan, Letter, 22 September 1955, TNA, CO 822/880.

¹⁷ Khidr Hamad (Minister of Irrigation & H E P) to Minister of Works, Letter, 20 November 1955, TNA, CO 822/800.

¹⁸ Nile Waters: conference of Riparian states convened by IBRD, 1958-59, TNA, T 236/5821.

¹⁹ Nile Waters: conference of Riparian states convened by IBRD, 1958-59, TNA, T 236/5821.

²⁰ IBRD, Aide Memoire, Washington DC, 15 September 1958, TNA, T 236/5821.

²¹ IBRD, Aide Memoire, Washington DC, 15 September 1958, TNA, T 236/5821.

again paid little heed to Egypt and Sudan's riparian neighbours.²² The involvement of the US and USSR, and their support of Egypt's plans, complicated matters further; as did the influence of the UN and the World Bank.²³ The prioritisation of Egyptian interests reflected the politically charged atmosphere between Egypt, Sudan, Britain, and the other riparian states, which further impacted the Nile's visibility in the press and its development as a resource.²⁴

The multiple parties invested in the development of the Nile waters—Britain and Egypt, the Sudan and the East African territories, and the US and the USSR—complicated both the planning, funding, and operation of schemes. Very much politicised, the Nile waters became an arena in which to: state claims to the resources of river; to make large claims to autonomy; and to press forward the importance of local populations under the colonial authority of, for example, British Governors in Sudan and Uganda.²⁵ Therefore, at the end of WWII the extensive debates over the distribution of the Nile's resources permeated into development planning within Sudan and East Africa: it affected the courses Sudan and Uganda were able to take as they sought to instigate economic development through agricultural production (the Nile Waters Agreement limited the amount of water resources available for this purpose).

Between 1951/52 and 1956/57, the largest outlay of Sudan's development plan was allocated for the improvement of transport and communications.²⁶ Varying from 17 to 43 percent of funds it dominated the development budget during this period.²⁷ Combined, irrigation and agriculture constituted 21 percent of allocations between 1951/52 and 1956/57; social services—health and education—totalled 20 percent; education alone received 13 percent of funds.²⁸ While financial assistance under the agriculture and irrigation administrative headers fluctuated in the 1950s there was definitive intent to pursue development

²² Nile Waters: conference of Riparian states convened by IBRD, 1958-59, TNA, T 236/5821.

²³ Nile Waters: conference of Riparian states convened by IBRD, 1958-59, TNA, T 236/5821.

²⁴ *The Times*, 10 Feb 1956, TNA, CO 822/800.

²⁵ Such as John Hall (Uganda) and Hubert Huddleston (Sudan).

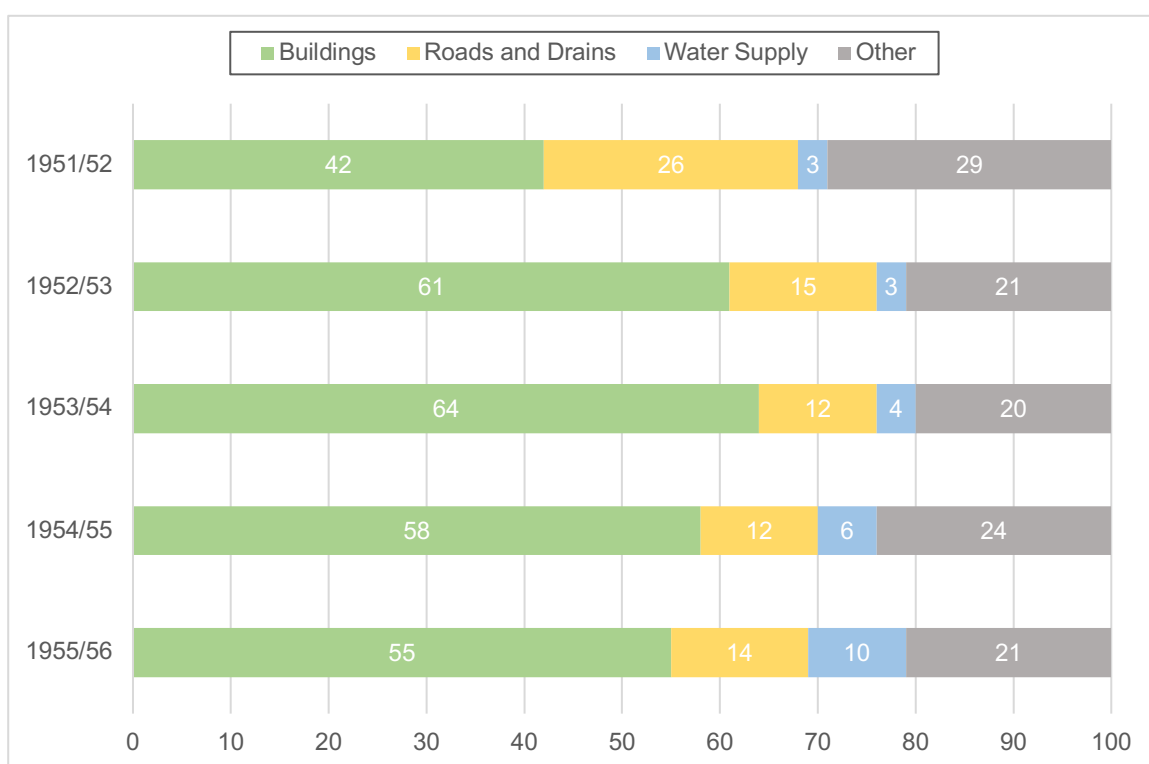
²⁶ Figures calculated using Table 8 in IBRD, *The Economy of the Sudan: Main Report*, 34.

²⁷ IBRD, *The Economy of the Sudan: Main Report*, 34; Ahmad Alawad Sikainga, *“City of Steel and Fire”: A Social History of Atbara: Sudan's Railway Town 1906-1984* (Oxford & Portsmouth, New Hampshire, 2002).

²⁸ Figures calculated using Table 8 in IBRD, *The Economy of the Sudan: Main Report*, 34.

in these areas towards the end of the period. In the budget set for 1957/58, 46 percent of total funds, LS 10 million, was allocated to the Managil Irrigation scheme.²⁹ Within the 1951/56 Sudan Development Programme a number of separate headings indicated significant backing for developing water resources: rural water supply and conservation; hafir excavation (small underground reservoir); drilling (wells); water (public utilities); and a sewage loan to Khartoum.³⁰ The combined percentage across the period totalled 8 percent but did not include the “small advances to Wad Medani Light and Power Co. and some outlays for small combined electricity and water schemes” or the expenditure of municipal and

Figure 3.1: Local Councils’ Investment Expenditure (percentage of total)



Source: Percentages calculated using Table 9 (Local Councils’ Investment Expenditure), IBRD, *The Economy of the Sudan: Main Report*, 35.

²⁹ IBRD, *The Economy of the Sudan: Main Report*, 34. For further details on the budgeting and planning of the Managil Irrigation scheme, see the World Bank, Documents & Reports, accessed Nov 24, 2018, <http://documents.worldbank.org/curated/en/docsearch/projects/P002552>.

For example, World Bank, “Sudan – Managil Irrigation Project,” 30 June 1960, TO244, accessed Nov 24, 2018,

<http://documents.worldbank.org/curated/en/139371468118483975/pdf/multi0page.pdf>.

³⁰ Figures calculated using Table 8 in IBRD, *The Economy of the Sudan: Main Report*, 34.

local government authorities.³¹ Local council expenditure between 1951/52 and 1955/56 was demarcated funding under four headings: buildings; roads and drains; water supply; and other capital expenditure. While buildings dominated the budget—42 to 64 percent of funds 1951/52-1955/56— water supply steadily increased its percentage share of investment from 3 percent in 1951/52 to 10 percent in 1955/56 (Figure 3.1). That water supply was marked separately from “other capital expenditure” emphasised the importance local councils, as well as the central government in Khartoum, placed upon the development of this natural resource.³² In addition the construction of hospitals, dispensaries, and educational facilities demarcated in the Development Programme included the erection and maintenance of, or improved access to, water supplies. Recurrent expenditure through the Ministries of Works, Health and Agriculture also supported the construction, protection, utilisation, and maintenance of water supplies as they had done before the Second World War.

Overall, Sudan’s Development Programme closely reflected the priorities shown within the Central Government’s departmental recurrent expenditure, excepting investment in irrigation, agriculture, and hydro-electric power.³³ Tables 3.1 and 3.2 compare the order of financial priority (funds allocated) in 1951/52 and 1956/57 for recurrent departmental expenditure (Table 3.1) with the order of financial priority for the Development Programme in 1951/52 and 1956/57 (Table 3.2). There was a huge shift in the percentage of Development Programme funds allocated for irrigation and agriculture from 9 percent in 1951/52 to 38 percent in 1956/57.³⁴ External investment in water resources development, evident through the planned large-scale investment in the Managil Irrigation Scheme, emphasised the level of support required to implement development plans; it also highlighted the importance placed on irrigation as a means to catalyse the process. In addition, recurrent government expenditure for General Central Services, the Ministry of Communications, and the Provinces (supported on a local government

³¹ See Table 9 (Local Councils’ Investment Expenditure), IBRD, *The Economy of the Sudan: Main Report*, 35.

³² See Table 9 (Local Councils’ Investment Expenditure), IBRD, *The Economy of the Sudan: Main Report*, 35.

³³ This constituted between 15 and 21 percent of total recurrent government outlay between 1948 and 1956. Percentages calculated using Table 7 in IBRD, *The Economy of the Sudan: Main Report*, 33; Table 5 in IBRD, *The Economy of the Sudan: Main Report*, 31.

³⁴ IBRD, *The Economy of the Sudan: Main Report*. See Tables 3.1 and 3.2.

Table 3.1: Sudan Government Recurrent Departmental Expenditure in Order of Financial Priority 1951/52 and 1956/57

1951/52	1956/57
Provinces	Education
General Central Services	Defence
Health	Works
Agriculture	General Central Services
Communications	Provinces
Works	Agriculture
Defence	Health
Education	Finance
Finance	Communications
Irrigation & Hydro-Electric Power	Irrigation & Hydro-Electric Power

Source: IBRD Report, *The Economy of the Sudan, 1958*. Table Created by author.

*Table 3.2: Sudan Government Development Programme in Order of Financial Priority 1951/52-1956/57.*³⁵

1951/52	1956/57
Transport & Communications	Irrigation and Agriculture
Municipal and Local Government	Transport & Communications
Social Services	Social Services
Public Utilities*	Public Utilities*
Misc.	Misc.
Irrigation and Agriculture	Municipal and Local Government

Source: IBRD Report, *The Economy of the Sudan, 1958*. Table Created by author.

basis) were overtaken by funding for the Ministries of Education, Defence, and Works.³⁶ Social Services received between 14 and 23 percent of Development Programme allocations in the period 1951/52 to 1956/57 and focused on the construction of facilities to support education and health.³⁷ Temporarily in favour of injecting money into the Ministry of Defence, Ministry of Finance, and General Central Services, allocations for education, health—and indeed many other

³⁵ * Public Utilities focused on the Sudan Light Company and water supplies.

³⁶ IBRD, *The Economy of the Sudan: Main Report*. Investment in the Provinces was done in an effort to promote an increased role for local government in the aftermath of the Second World War.

³⁷ IBRD, *The Economy of the Sudan, 1958*.

ministries—decreased in the turbulent lead up to full political independence.³⁸ Apart from this, the share of government recurrent (combined expenditure) for education and health increased steadily during the period from 16 to 21 percent.³⁹ The majority of this increase was due to stronger emphasis on education: the percentage share of funds almost doubled from 7 percent in 1951/52 to 13 percent in 1956/57.⁴⁰ Largely, this indicated Sudan's move towards independence, with education pushed forward as a means to best support the machinery of the newly independent state.⁴¹ A Health Education Programme, supported by the Ministries of Health and Education, fitted within this remit.

On 25 August 1956 the Sudan Ministry of Health submitted to the WHO's Regional Committee for the Eastern Mediterranean the six "major problems" to be tackled: environmental sanitation, maternal and child health, nutrition, adult education, health education in schools, and social diseases.⁴² This move to promote Health Education and environmental sanitation built upon the foundations established within Sudan in the 1930s and 1940s. It blurred departmental boundaries, demanded close cooperation between Health and Education Ministries, and resulted in a greater quantity and quality of local staff, alongside resources, which were crucial to internationally supported programmes, such as environmental sanitation.⁴³

Apart from the urgent request from the Sudan Government to aid in the control of a severe outbreak of Cerebro-Spinal Meningitis, the BCG (Bacillus Calmette-Guérin) vaccination campaign was the only approved WHO programme within the territory between 1948 and 1953. Both of these projects were jointly coordinated by the WHO and UNICEF.⁴⁴ However, it was during these early years

³⁸ IBRD, *The Economy of the Sudan: Main Report*, 31.

³⁹ IBRD, *The Economy of the Sudan: Main Report*, 31.

⁴⁰ IBRD, *The Economy of the Sudan: Main Report*, 31.

⁴¹ See Sudan, *GAMR*, 1954/55, 1.

⁴² WHO (EMRO), *Health Education in the Sudan* (Geneva: WHO, 25 August 1956), accessed Nov 24, 2018, <http://www.who.int/iris/handle/10665/123192>, 2; Ministry of Health to work closely with Ministry of Education "to build machinery similar to the Central Council for Health Education of the United Kingdom"; WHO (EMRO), *Organizations of Health Education in Administration: Coordination of Health Education Programmes* (Geneva: WHO, 6 September 1956), <http://www.who.int/iris/handle/10665/123195>.

⁴³ WHO (EMRO), *Health Education in the Sudan*; WHO (EMRO), *Organizations of Health Education in Administration: Coordination of Health Education Programmes*; WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee August 1950–August 1953* (Geneva: WHO, August 1953), accessed Nov 24, 2018, <http://www.who.int/iris/handle/10665/124546>, 15, 16.

⁴⁴ WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee August 1950–August 1953*, 25; Michel G. Iskander, *UNICEF in*

that foundations and priorities were established within EMRO, such as the firm focus on environmental sanitation, ready to be integrated into territorial health programmes at the appropriate time.⁴⁵ On 2 August 1953 Dr. Aly Tawfik Shousha, the EMRO Regional Director, reported that the period between 1950 and 1953 was in this sense “mainly one of transition from the surveying and planning to the operational phase.”⁴⁶ Shousha referred to each of the WHO’s top priorities—environmental sanitation, malaria, maternal and child health, tuberculosis, venereal diseases, and nutrition—alongside additional priorities for the region. Public Health Administration and Health Education, which were both connected with environmental sanitation, were mentioned, as were specific diseases such as schistosomiasis, trachoma, leishmaniasis, rabies, and leprosy.⁴⁷

When the WHO Environmental Sanitation Committee met for the first time in September 1949, it defined the parameters of the subject (see Chapter 2) and emphasised the responsibility of territorial governments in promoting environmental sanitation. The Sudan Medical Services Report for the same year showed a structural reorganisation.⁴⁸ Previously, public health was separated from endemic and epidemic diseases and split into eight headings: quarantine, antenatal and maternity service, infant and child welfare, school health, rural health, nutrition, legislation, and health in provinces.⁴⁹ In 1949, public health encompassed endemic and epidemics diseases, as well as the newly named

the Middle East and North Africa: A Historical Perspective, UNICEF History Series Monograph XII, United Nations Children’s Fund, March 1989, CF/HST/MON/1989-00/; Sudan *GAMR* 1953/54, 2.

⁴⁵ WHO (EMRO), *Environmental Sanitation in the Countries of the Eastern Mediterranean Region* (Geneva: WHO, 4 August 1954), 1-4, accessed Nov 24, 2018, <http://www.who.int/iris/handle/10665/121224>; WHO (EMRO), *Regional Committee for the Eastern Mediterranean* (Geneva: WHO, 14 July 1955), accessed Nov 24, 2018, <http://www.who.int/iris/handle/10665/122110>: “the promotion and implementation of environmental sanitation programmes”, 3, 7-8.

⁴⁶ WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee August 1950–August 1953*, 5. Dr. Aly Tawfik Shousha was also involved in the establishment of the WHO and was elected Vice-President of the First World Health Assembly and Chairperson of the Executive Board (1948-49) see “Dr Aly Tewfik Shousha (1891 - 1964): Paying tribute to a WHO founding father,” *Al-Ahram Weekly Online* 780, (2-8 February 2006), accessed Nov 24, 2018, <http://weekly.ahram.org.eg/Archive/2006/780/sc121.htm>; Siddiqi, *World Health and World Politics*. EMRO not meeting in 1951, 1952, 1953 was politically motivated in response to Israel becoming a member of EMRO.

⁴⁷ WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee August 1950–August 1953*, 6-9.

⁴⁸ Sudan, *GAMR*, 1949.

⁴⁹ Sudan, *GAMR*, 1945, 16-42; Sudan, *GAMR*, 1946, 17-38; Sudan, *GAMR*, 1947, 18-41 Sudan, *GAMR*, 1948, 21-43.

“Sanitary Circumstances” and a separate section entitled “Social Hygiene.”⁵⁰

Under “Sanitary Circumstances” were a list of subjects akin to the Environmental Sanitation Committee’s definition of work: water supplies, separated into urban and rural for 1949 (thereafter considered jointly); waste disposal; housing; food hygiene; and industrial hygiene.⁵¹ This section covered, if briefly, all the factors mentioned in the WHO Committee’s definition of environmental sanitation except the control of alternative hosts of human diseases, such as rodents; the only difference in ordering lay in discussing water supplies before waste disposal. In the seven years that followed, before Sudan was recognised as an independent nation state on 1 January 1956, the Medical Services were keen to promote rural sanitation on a local basis. While the rural health administrative heading had disappeared in the restructure, reports in the 1950s emphasised its place within departmental policy and included the introduction of sixty-five “specially designed and equipped ambulances distributed to provinces to serve villages.”⁵² This also fitted with the Environmental Sanitation Committee’s prioritisation of rural sanitation during the decade.

Following independence in 1956 the Sudan Medical Services extended its relationship with the WHO such that within four years they were collaborating on a number of fronts. By 1960 BCG and tuberculosis programmes were underway and support was given for nursing, dental assistants, and a blood bank. The Malaria Pilot Project, started in 1956 and deemed a success, was transferred to national hands in 1960/61. A pre-eradication programme was debated in the two years that followed. A WHO/UNICEF Maternal and Child Health project, beginning in 1955, also continued into the early 1960s, with the WHO Diarrhoeal Advisory Team visiting Sudan in 1960/61.⁵³ In addition, a Rural Health Pilot Project in the south in Wau, Bahr-EI-Ghazal, was instigated and an onchocerciasis investigation was mooted for the following year.⁵⁴

⁵⁰ Sudan, *GAMR*, 1949, 19-21 (sanitary circumstances), 21-26 (social hygiene); Sudan, *GAMR*, 1950/51, 26-28 (sanitary circumstances), 28-30 (social hygiene). Social Hygiene covered midwifery, maternity and child welfare, school health, health education, and mental health.

⁵¹ Sudan, *GAMR*, 1949, 19-21.

⁵² Sudan, *GAMR*, 1950/51, 26; Sudan, *GAMR*, 1951/52; Sudan, *GAMR*, 1954/55, 2; Sudan, *GAMR*, 1955/56, 1.

⁵³ Michel G. Iskander, *UNICEF in the Middle East and North Africa: A Historical Perspective*, 23.

⁵⁴ Sudan, *GAMR*, 1960/61, 1-2.

There were no programmes specifically labelled “environmental sanitation” but Dr Aly Tawfik Shousha explained the reasons for this omission in 1956:

environmental sanitation is another subject that is badly represented by figures [...] sanitarians and sanitary engineers were attached to many others and the education and training of this category of health workers figured largely in the sum total of EMRO activities.⁵⁵

Shousha continued on to note that environmental sanitation was implemented within programmes of health education and public health administration, as well as disease control programmes:

WHO-aided projects to control specific diseases usually give appropriate attention to importance of environmental factors in the prevention of that disease. Examples are malaria control and malaria eradication projects, bilharziasis, cholera, trachoma and communicable eye diseases, zoonoses, endemo-epidemic diseases and others. Vector control projects may be predominantly environmental sanitation, and under this heading it is appropriate to mention several projects that involved specific insects or insects in general.⁵⁶

Sudan’s submission to the Regional Committee in 1956 confirmed the connections environmental sanitation had to other aspects of health. The submission described environmental sanitation as the first of six major problems to be tackled in relation to health education in the country.⁵⁷ Sudan’s Rural Health Programme in Bahr-El-Ghazal, its onchocerciasis investigations, and its malaria eradication project also

⁵⁵ WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee, 1955-1956* (Geneva: WHO, 31 July 1956), 5, 57-59, accessed Nov 24, 2018, http://apps.who.int/iris/bitstream/handle/10665/123170/em_rc6_3_en.pdf?sequence=1. Shousha made similar remarks about Health Education. Also see ECOSOC Forty-fifth session, *Problems of the Human Environment*, c. 1968, WHO, Third Generation, N64/86/21 file (45). This file showed the grants awarded by category and the regional distribution of training centres between 1961-67. Limited attention was directed towards environmental sanitation specifically.

⁵⁶ WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee, 1955-1956*, 57; Environmental sanitation discussed in report under cholera, public health administration, and health education: 29, 40, 60-61.

⁵⁷ WHO (EMRO), *Health Education in the Sudan*, 25 August 1956, 2.

promoted aspects of environmental sanitation.⁵⁸ Further, an assessment of UNICEF's involvement in the Middle East and North Africa between 1946 and 1986 reiterated the role of environmental sanitation in disease programmes, such as trachoma and other eye diseases, and bilharzia.⁵⁹ The UNICEF report stated that though:

the fight against bilharziasis continues to this day with new weapons the greatest advance against the disease has been found to result from improvements in public health measures, such as improved water supplies and sanitation, and from the rise in educational levels and standards of living.⁶⁰

The key practitioners in the field of work discussed above were sanitary and public health engineers, sanitary inspectors and health orderlies. Each of these groups played a vital role in the promotion of environmental sanitation.

The shift in favour of community water supplies programmes in 1959 gave environmental sanitation's protagonists a focal point from which to expand and promote their chosen field as a separate entity from other WHO health programmes. Following the environmental sanitation resolution at the Twelfth World Health Assembly that year, the development of community water supplies became the flagship programme of the division. EMRO responded by adding community water supply to its agenda when the Regional Committee met later in 1959.⁶¹ The current state of affairs within the region was reviewed and it was argued that "pure water" was "indispensable" to control the "scourge of the so-called water-borne diseases" and environmental sanitation and water supplies improvements were linked with lowered infant and child death rates.⁶² In essence, EMRO emphasised the importance of prioritising water supplies and related sanitation. However, concern was levelled at the lack of progress in this area.

⁵⁸ Sudan, *GAMR*, 1955/56, 1; Sudan, *GAMR*, 1957/58, 1; Sudan, *GAMR*, 1958/59, 1; Sudan, *GAMR*, 1959/60, 2; Sudan, *GAMR*, 1960-61, 1-2; Sudan, *GAMR*, 1961/62, 2-3; Sudan, *GAMR*, 1962/63, 2-3.

⁵⁹ Iskander, *UNICEF in the Middle East and North Africa: A Historical Perspective*, 23. On Trachoma and other eye diseases: "to be successful, a campaign had to include case finding, treatment, mass health education, control of vector agents (e.g. flies) and environmental sanitation measures", 16-17, 19-20.

⁶⁰ Iskander, *UNICEF in the Middle East and North Africa: A Historical Perspective*, 20.

⁶¹ WHO (EMRO), *Community Water Supply in Countries of the Eastern Mediterranean Region* (Geneva: WHO, 10 July 1959), accessed Nov 24, 2018, http://applications.emro.who.int/docs/em_rc9_7_en.pdf.

⁶² WHO (EMRO), *Community Water Supply in Countries of the Eastern Mediterranean Region* (Geneva: WHO, 10 July 1959), 1, 2.

While financial limitations remained a concern, the regional committee argued that this was not always the primary issue.⁶³ Instead, it turned to the lack of institutions and organisations able to facilitate effective water supplies development and to the diminishing interest of doctors in this field to explain the current unfavourable position:

With the continuous development in the engineering aspect of water and the increase of specialists in this field the interest of medical profession has decreased. Thus Ministries of Health have failed to take militant leadership in developing water supplies and the indispensable collaboration between the two groups has been lacking.⁶⁴

The Ministry of Health in Sudan felt that the improvement of water supplies was important in relation to current and future development plans. However, detailed engagement with the subject was not fully evident: water supplies development was the remit of the sanitary engineers who still struggled to be heard by their medical counterparts.

Four years later not only had these worries failed to abate but concerns about population growth and the pollution of water resources clouded the positive mindsets, which had previously labelled community water supply developments as “encouraging.”⁶⁵ Despite the evidence of the “great health significance” of the hygienic use of water and its relationship to various diseases, the WHO and Ministry of Health found it difficult to procure governmental funds to support the level of development deemed needed.⁶⁶ Ideologies of development often prioritised industrialisation or large-scale irrigation projects as the means to improve economic growth. Health was regarded as secondary to, and a by-product of, economic development. By 1963, many more studies had been undertaken to measure the quality and quantity of water supplies across the world and each revealed the considerable investment required to improve resources to match up

⁶³ WHO (EMRO), *Community Water Supply in Countries of the Eastern Mediterranean Region* (Geneva: WHO, 10 July 1959), 11.

⁶⁴ WHO (EMRO), *Community Water Supply in Countries of the Eastern Mediterranean Region* (Geneva: WHO, 10 July 1959), 12.

⁶⁵ WHO (EMRO), *Drinking Water, People and the Better Life* (Geneva: WHO, 15 April 1963), 2, accessed May 3, 2018, <http://www.who.int/iris/handle/10665/123892>.

⁶⁶ WHO (EMRO), *Drinking Water, People and the Better Life*, 4.

to the WHO's international standards.⁶⁷ As such, the approach to water supplies in developing countries had changed: compromises, specialists in the field argued, had to be made.⁶⁸ Such concessions in these cases called for international organisations and participating governments to prioritise urban over rural supplies and quantity over quality: these debates continued throughout the next few decades.⁶⁹ However, these approaches alone would not solve the problem and a crucial obstacle remained. There was an "almost magical" belief that industrialisation was the only way to high levels of economic development.⁷⁰ It was noted that:

Within certain limits this reasoning is sound and progressive. The trouble comes when planners and purse-string-holders forget about the provision of solid foundations upon which to build their industrial structure. In their zeal for development they sometimes start building from the top downwards. The bed-rock for this foundation is the health of the people who are to be both the participants and the beneficiaries in this industrial venture. The first necessity of good health is for the people to have good water in sufficient amounts for drinking and other domestic purposes.⁷¹

These comments aptly expressed the difficulties that protagonists of investment in domestic water supplies faced during this period and beyond and supported Herman Baity's views that health, through the development of water supplies, was the foundation to economic growth. In Sudan, the central government relied heavily on its ability to export cotton and therefore the development of water resources focused on the irrigation of these crops. In Uganda, a similar focus on economic development as a prerequisite to its social counterpart was also

⁶⁷ Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*; Gilcreas' Analysis, "Development of International Standards of Drinking Water Quality."

⁶⁸ White, Bradley, and White, *Drawers of Water*; Michael, ed., *Water Development in Less Developed Areas*; Dieterich and Henderson, *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*; WHO (EMRO), *Drinking Water, People and the Better Life*; WHO (EMRO), *Report of the Regional Director of the Eastern Mediterranean Region to the Regional Committee, 1955-1956*, 31 July 1956, 5, 57-59.

⁶⁹ White, Bradley, and White, *Drawers of Water*; Michael, ed., *Water Development in Less Developed Areas*.

⁷⁰ WHO (EMRO), *Drinking Water, People and the Better Life*, 5.

⁷¹ WHO (EMRO), *Drinking Water, People and the Better Life*, 5.

experienced and these ideas were left largely unquestioned by the protectorate's colonial government until the late 1950s.

2. Regionalisation and Departmental Reconfiguration: Uganda 1945-1963

This section examines the tug between the prioritisation of social and economic factors in Uganda's post-war development plans. It reveals the general challenges in promoting the health, rather than economic, value of water and the specific challenges in promoting preventive aspects of health, such as water supplies and sanitation. It addresses how imperial, colonial, and international organisations clashed and cooperated as they attempted to carve and consolidate their positions as leaders in their specialist fields.

The construction of a dam at Owen Falls, near Jinja, constituted the largest development undertaking in Uganda in the decade following the Second World War.⁷² The sheer volume of correspondence and debates within the Colonial Office and Foreign Office regarding the design, location, and construction of the dam emphasised the strategic importance of this project not only to Uganda but to Britain, Egypt, Sudan, and the other riparian states in the region.⁷³ Egypt had submitted a plan for a dam at Nimule, where the Northern region of Uganda bordered Sudan. Described by Terje Oestigaard as "an act of intricate diplomacy", a dam along the Nile, situated in Uganda, provided a means of securing Britain's position as a benevolent colonial power as well as an opportunity to appease East African territories as they laid claim to the Nile waters for their own developmental needs.⁷⁴ However, this clashed with Britain's reluctance to support any policies that might place further strain on Anglo-Egyptian relations. Refusing to be bullied for Egyptian benefit the ever-tenacious Governor Hall listed twelve reasons why the Uganda Government opposed this plan, including: loss of land; Egypt gaining

⁷² Costs originally estimated at £7.1 million. By 1953 the cost had risen to £13 million, and the final cost was £16 million. See Terje Oestigaard, *Dammed Divinities: The Water Powers at Bujagali Falls, Uganda* (Nordiska Afrikaninstitutet, Uppsala, 2015), 23; G. Wilson, *Owen Falls. Electricity in a Developing Country*, *East African Studies* 27 (Nairobi: East Africa Publishing House, 1967), 5-7.

⁷³ Applications by East African Governments for Share of Nile waters under 1929 Agreement, 1954-55, TNA, CO 822/879; Applications by East African Governments for Share of Nile waters under 1929 Agreement, 1955-56, TNA, CO 822/880; Claim by East African Governments for share of Nile waters under Nile waters Agreement 1929, TNA, CO 822/1411: for continuations of this file see CO 822/1412, CO 822/1413, CO 822/1414; Nile water projects, 1949, TNA, FO 371/73614; Nile Water Development Schemes 1949, TNA, FO 957/90.

⁷⁴ Oestigaard, *Dammed Divinities*, 22.

control of Lakes Albert and Kioga; the danger of trypanosomiasis; the dispossession of land; and the concern for any unforeseen hydrographic consequences.⁷⁵ This letter was met with exasperation from the Colonial Office and the Foreign Office. Andrew Cohen, Assistant under-Secretary of State for the Colonies, believed it “quite impossible for us to present a flat non-possumus to the Egyptian Government” and this was relayed back to Hall.⁷⁶ A month later, in clarification of the stance taken, the Governor of Uganda stated in a secret and personal note to Sir George Gater, the Permanent Under-Secretary of State for the Colonies, that the letter dated 12 May was “admittedly tactical” and “an attempt to gain time so as to avert the very real danger of Uganda’s interests being once again sacrificed in order to achieve a transient diplomatic advantage in Egypt.”⁷⁷ It was only after extensive deliberations and investigations that the Government in Uganda suggested and agreed upon construction at an alternative site—Owen Falls.⁷⁸ In detailing the contested nature of this project Terje Tvedt argued, “in Uganda, development was seen as identical to hydro-power development.”⁷⁹ Yet discussions between Hall and advisors regarding Uganda’s development plan, which took place in parallel with the Owen Falls debates, suggest a more nuanced perspective.

The Colonial Government in Uganda had agreed upon the services of Sir Douglas Gordon Harris, an experienced engineer and advisor to the Colonial Office, to assess the territory’s post-war development plans. However, the Colonial Office insisted on retaining Harris on special duty until the end of 1946.⁸⁰ In a letter dated 18 February 1946 John Hall, Governor of Uganda, vented frustrations with the British Colonial Office: “This decision has placed me and the Uganda

⁷⁵ John Hall (Governor of Uganda) to the Secretary of State for the Colonies, Savingram, 27 March 1946, TNA, CO 536/217/1; work had already been suggested in a report dated 1935 of the possibilities at Owen Falls.

⁷⁶ Andrew Cohen to P. S. Scrivener, Letter, 30 April 1946, TNA, CO 536/217/1; Scrivener to Hall, Telegram, 4 May 1946, TNA, CO 536/217/1.

⁷⁷ John Hall (Governor of Uganda) to Sir George Gater, Secret and Personal Note, 11 June 1946, TNA, CO 536/217/1.

⁷⁸ Water irrigation and storage projects: Upper Nile irrigation projects; proposed construction of dam and reservoir at Lake Albert; possibilities of water storage in Lake Victoria, 1946-47, TNA, CO 536/217/1 and for continued correspondence see TNA, CO 536/217/2, 1947 and TNA, CO 536/217/3, 1947-48.

⁷⁹ Tvedt, *The River Nile in the Age of the British*, 199; the tenacity of John Hall in all areas concerning development in Uganda was evident.

⁸⁰ John Hathorn Hall (Governor of Uganda) to Sir George Gater (Colonial Office), Letter, 18 February 1946, TNA, CO 536/214/4, Revision of Development and Welfare Schemes.

Government in a very awkward fix.”⁸¹ Hall continued, “Now I imagine that most, if not all, suitable development planners, and there are precious few in the market at any time, have been snapped up by other governments.”⁸² The list of credentials Hall insisted upon meant that few were qualified for the job:

I want someone who, like Harris, has the knowledge and practical experience to plan the optimum use of soil and water, someone who has a generalised and not a narrowly departmental outlook (e.g. I don't [Hall's emphasis] want a retired agriculturalist who, whatever his abilities, would be suspected of departmental bias), someone with a constructive, objective and orderly mind, someone with a good working knowledge of the processes of government, someone who can pick brains and improve the pickings.⁸³

One such rare candidate fitting the bill was Dr. E. B. Worthington, a well-revered natural scientist, but concerns were immediately raised over the Kenya and Tanganyika Governors' responses.⁸⁴ Worthington was already committed to assessing the research and scientific services in East Africa and Hall thought that “the other East African Governors might squeal a bit” at the appointment.⁸⁵ Nevertheless, Worthington's services were acquired on a short-term basis following discussions with the Colonial Office and the East African Governors.

Rapid population growth was envisaged as the primary challenge after the Second World War and significantly shaped Uganda's approach to its development plans. Theories of economic growth based on linear progression—from traditional to industrial to post-industrial economies—and demographic transition ideologies had captured the imaginations of colonial and international officials alike.⁸⁶ In E. B. Worthington, the Governor of Uganda found a like-minded

⁸¹ Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4, 18.

⁸² Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4, 18.

⁸³ Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4, 18.

⁸⁴ Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4, 18; Worthington, *Science in Africa*.

⁸⁵ Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4; George Gater to John Hall, Letter, 8 March 1946, TNA, CO 536/214/4. After reviewing the development plan, Worthington completed Survey of Research and Scientific Services.

⁸⁶ Linear economic growth theories came out of the reconstruction of Europe after the Second World War, and argued that economies followed a logic sequence of growth from traditional and pre-industrial economies to industrial and post-industrial economies (Rostow for 1960s). Also See E. B. Worthington, “A Survey of Research and Scientific Services in East Africa, 1947-56,” Aquatic Commons Online Resources, accessed July 11, 2016,

individual who reiterated Hall's own concerns over the development plan drafted in 1944.⁸⁷ They both believed the original draft placed too much emphasis on social services, with Hall describing the scheme as "far too extravagant" and arguing that "far too little attention was paid in it to the development and preservation of potential sources of wealth which in Uganda can for all practical purposes be reduced to soil and water."⁸⁸ Worthington's first impressions of Uganda reflected these views, reducing planned allocations for welfare from £2,821,000, as stated in the six-year plan (1944-1950), to £1,500,000 over the ten years commencing in 1946; this was equivalent to 30 percent of development funds.⁸⁹ On the other hand, the provisional allocation for production increased from £917,500 to £2,500,000, amounting to 50 percent of development funds. This included: settlement schemes; water supplies in rural areas; the expansion of agricultural, veterinary, forestry, mining and labour departments; the establishment of fisheries and tsetse fly departments; and a development scheme in Karamoja (north-eastern quadrant of the territory).⁹⁰ Worthington directed the most significant sum, £1 million, to settlement schemes aimed at improving cultivation. This was deemed the best method for reducing the vulnerability of the Ugandan population to natural disasters.⁹¹ To justify this position on stabilising settlements Worthington referred to the Gezira scheme in Sudan and praised approaches taken by the

<http://aquaticcommons.org/16911/1/Asurvey%20of%20research%20and%20scientific%20service%20in%20E.A,1947-1958.jan,1947-may,1961..pdf>, 3.

⁸⁷ George Gater, on behalf of the Colonial Office also supported this position: "your [Hall's] view about the importance of paying adequate attention to the development of the country's natural wealth, is fully shared here," Gater to Hall, Letter, 8 March 1946, TNA, CO 536/214/4.

⁸⁸ Sir John Hathorn Hall, Confidential Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4; See TNA, CO 536/214/2, 1943-44 and CO 536/214/3, 1944-45; Hall to Gater, Letter, 18 February 1946, TNA, CO 536/214/4; A. B. Cohen to Sir John Hathorn Hall, Letter, 19 March 1946, TNA, CO 536/214/4; E. B. Worthington, "Development of Uganda: First Impressions," 13 June 1946, CO536/214/4; In 1952, following Worthington's suggestions for development in Uganda water supply was related to "productive services" as opposed to the other developmental headings of "social services" and "common services" see Worthington, *A Survey of Research and Scientific Services in East Africa, 1947-56*, 3.

⁸⁹ Worthington, "Development of Uganda: First Impressions," 13 June 1946, TNA, CO 536/214/4, 6; Worthington, Development of Uganda: Amendments to "First Impressions," 16 September 1946, TNA, CO 536/214/4; Worthington, "Nile Control and Hydro-Electric Development in Uganda," Memorandum, 26 August 1946, TNA, CO 536/214/4; Also see CO 536/220: minutes debating the plans, concerns raised over settlement schemes, and reduced welfare spending.

⁹⁰ Worthington, "Development of Uganda: First Impressions," 13 June 1946, 5.

⁹¹ Worthington, "Development of Uganda: First Impressions," 13 June 1946, 6, 10. This accounted for a fifth of overall development allocations.

Sudan Plantation Syndicate and the Sudan Government.⁹² Worthington believed the Gezira model could be adapted in Uganda for more efficient production and greater output but, like Hall, remained paternalistic in vision for developing settlement schemes.

The huge shift between the development plan in 1944 and Worthington's *First Impressions* in the autumn of 1946 was evidenced in the percentage increase in funds for production from 19 to 50 percent of allocations and the decrease in welfare allocations from 59 percent to 30 percent.⁹³ Far from suggesting that Worthington and Hall, and indeed other colonial officials, had little interest in welfare (the original plan in 1944 clearly suggested otherwise) it instead reflected their views that a strong economy based on greater production, particularly agricultural, was a prerequisite to welfare spending in Uganda.⁹⁴ For this reason, Hall had requested the Medical and Education Departments to "frame revised and more realistic" plans.⁹⁵ They were encouraged to provide "the best service to the greatest number at the lowest possible cost" and, if necessary, to use "slightly unorthodox methods" or accept "a temporary lowering of standards" to do so.⁹⁶ Further, the Governor supported Medical Department efforts to redress the balance between curative and preventive measures for improving health conditions; the former absorbing the majority of finances:

Too much money is being spent today on curing men of diseases which they must inevitably contract again directly they are discharged from hospital. This is of humanitarian but of little economic value. The focus of infection must be eradicated rather than the disease which it causes.⁹⁷

⁹² Worthington, "Development of Uganda: First Impressions," 13 June 1946, 10.

⁹³ Worthington, "Development of Uganda: First Impressions," 13 June 1946, 5, 6.

⁹⁴ Sir John Hathorn Hall, Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4, 11.

⁹⁵ Hall, Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4, 11.

⁹⁶ Hall, Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4, 11.

⁹⁷ Hall, Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4, 11. Hall's analogy: "it is no good starting off on a journey in a Rolls-Royce with only enough petrol for a Ford 'Ten'."

Hall's stance on health, the economy, and the people of Uganda directed immediate government policy towards prioritising the conservation and management of soil and water in the early post-war years.⁹⁸

These conceptualisations of water as a resource to be conserved, managed, developed, and used were augmented within international, colonial, regional, and local frameworks. Professor of Geography at the University of Cambridge, Frank Debenham, echoed Hall's sentiments on the necessity of exploiting Uganda's waters "to provide adequate subsistence in its broadest sense" for present and future generations.⁹⁹ Yet, given the population growth and high infant mortality rate, the colonial government perceived a growing need for better access to protected water supplies and associated sanitary services as well as the adequate provision of water for livestock and crops.¹⁰⁰

Uganda, according to Debenham, was in a better position than its East African neighbours: there were "no very urgent problems [...] nor any real lack of water."¹⁰¹ Despite a population density three times that of its neighbouring territories (Table 3.3), the number of people per square mile of water was lower than Kenya and Tanganyika owing to the much larger percentage of the territory covered by water (14.6 percent).¹⁰² However, these averaged figures disguised local and regional disparities across the colony and did not account for the restrictions within the Nile Basin or the usability of the water. Local differences were particularly evident in the per capita investment in urban water supplies and their rural equivalent. In the 1940s rural water supplies were prioritised: between 1946 and 1949 they topped the percentage of Colonial Development and Welfare (CDW) grants for Uganda, starting at 34 percent of allocated funds in 1946 and

⁹⁸ See Grace Carswell, *Cultivating Success in Uganda: Kigezi Farmers & Colonial Policies* (London: British Institute in East Africa in association with James Currey, Fountain Publishers and Ohio University Press, 2007).

⁹⁹ Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate, 8; Hall, Notes on the Economic Development of Uganda, 18 April 1946, TNA, CO 536/214/4, 1; Hall to Secretary of State for the Colonies, Letter, 24 May 1946, TNA, CO 536/214/4.

¹⁰⁰ In 1948 the infant mortality rate (IMR) was high at 120 per 1000; this was likely an under-estimation.

¹⁰¹ Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate, 76.

¹⁰² Colonial Office. The British Territories in East and Central Africa, Cmd. 7987, 1950, accessed Nov 24, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1950-041299?accountid=15181>, 145.

Table 3.3: Land, Water and Population in East Africa.

Territory	No. of people per square mile of land*	No. of people per square mile of water*	Percentage of territory that is land	Percentage of territory that is water
Kenya	23	997	97.7	2.3
Uganda	61	359	85.4	14.6
Tanganyika	21	367	94.5	5.5

Source: Data manipulated from British Territories in East and Central Africa 1945-1950, Cmd. 7987. Figures rounded down.

reaching up to 85 percent in 1949.¹⁰³ While readjustments to Uganda's post-war development plan reduced "geology and rural water supplies" to 17 percent of CDW grant funds a further 13 percent was allocated for urban water supplies between 1950 and 1952.¹⁰⁴ At £102,000 and £84,000 respectively, "geology and rural water supplies" and "urban water supplies" were the largest beneficiaries of CDW funds after African Housing during these three years.¹⁰⁵ The funds for geology and rural water supplies, approved in January 1949, were allocated solely "to ensure the continuance of the provision of water supplies in rural areas [and] financed entirely from CD&W funds."¹⁰⁶ As a result 250 new watering points were established across 1948 and 1949. Moreover, the success rate of boreholes stood "at the remarkable figure of 90 percent successes."¹⁰⁷ By 1951 there were 1174 successful boreholes. In addition, 41 dams were constructed between 1949 and 1950 and a further 31 tank dams and rock pools were constructed in 1951.¹⁰⁸ It is perhaps not surprising, therefore, that Development Commissioner (1947-50) and Consultant (1950-62), Douglas Harris, stated, "the whole subject of water supplies is a very 'live' one in Uganda."¹⁰⁹ Colonial Officials were very positive about Uganda's prospects following this investment and the subsequent successful—as they deemed it— construction of water supplies.

¹⁰³ Statement of Expenditure 1946-1955, Development and Welfare Schemes Revision of Financial Structure and Proposals for 1953-1956 Uganda, TNA, CO 822/233.

¹⁰⁴ Statement of Expenditure 1946-1955, TNA, CO 822/233.

¹⁰⁵ Statement of Expenditure 1946-1955, TNA, CO 822/233.

¹⁰⁶ Mr Harris, Minute, 30 October 1950, TNA, CO 822/158/1.

¹⁰⁷ Mr Harris, Minute, 30 October 1950, TNA, CO 822/158/1.

¹⁰⁸ Mr Harris, Minute, 1 December 1950, TNA, CO 822/158/1; Dr T. A. Austin (Public Health Officer, Regional Office for Africa), A Survey of Conditions in the Uganda Protectorate, July 1952, WHO Archives, MH/AS/82.55, 136.

¹⁰⁹ Mr Harris, Minute, 30 October 1950, TNA, CO 822/158/1; released from Colonial Office secondment in 1947.

Investment in rural water supplies was reduced in 1950 and overtaken by urban water supplies in the two succeeding years.¹¹⁰ This coincided with difficulties in obtaining personnel and equipment and a renewed interest in education. Emphasis on rural hygiene in the interwar years had led to calls for training local personnel to reduce both the human and financial burden of managing colonial affairs thus supporting Britain's practice of indirect rule within Uganda. This continued across occupational groups after the Second World War. Following the rural health training of Africans based at the Mulago Hospital, Kampala, during the interwar years, the Mbale School of Hygiene in the Eastern Province was re-established in the late 1940s to train local Assistant Health Inspectors and Hygiene Orderlies.¹¹¹ The role of Assistant Health Inspectors was centred on advising and educating the African community in matters pertaining to health; hygiene orderlies were responsible for advising on practicalities, such as housing, domestic hygiene, and rural water supplies.¹¹² This training ideal was reflected in other occupations. In 1953 there were already four African students training to be hydrological inspectors and a group of engineering students were seconded to the Hydrological Survey Department in 1954.¹¹³ Yet despite large investments in education, rural and urban water supplies remained at the forefront of development finances. For the period 1953 to 1955, £330,000 was provisionally

¹¹⁰ Statement of Expenditure 1946-1955, TNA, CO 822/233.

¹¹¹ "Progress in the Training of Rural Health Staff in Uganda," *Bulletin of the World Health Organisation* 10, no. 2 (1954), 304-305; "Editorial," *East African Medical Journal* 25, 11 (November 1948): 413; H.C. Trowell, "The Craft, the Science and the Philosophy of Medicine," *East African Medical Journal* 27, 12 (December 1948): 414-421.

¹¹² "Progress in the Training of Rural Health Staff in Uganda," *Bulletin of the World Health Organisation* 10, no. 2 (1954), 306; East African Bureau of Research in Medicine and Hygiene Annual Report 1949, TNA, CO 927/176/1.

¹¹³ For reports on the Hydrological Survey Department, which became the Water Development Department in 1956, see Uganda Protectorate, see: *Annual Report of the Department of Hydrological Survey for the Period for the Year ended 31 December 1949*, (Entebbe: Government Printer, 1950), CUL, RSC, OP. 33720.551.01(1). These reports will be referred to as Hydrological Survey Department / Water Development Department [year], [record number at CUL]: Hydrological Survey Department 1950, OP. 33720.551.01(2); Hydrological Survey Department 1951, OP. 33720.551.01(3); Hydrological Survey Department 1952, OP. 33720.551.01(4); Hydrological Survey Department 1953, OP. 33720.551.01(5); Hydrological Survey Department 1954, OP. 33720.551.01(6); Hydrological Survey Department 1955, OP. 33720.551.01(7); Water Development Department 1956, OP. 33720.551.01(8), Water Development Department 1957, OP. 33720.551.01(9); Water Development Department 1958, OP. 33720.551.01(10); Water Development Department 1959, OP. 33720.551.01(11), Water Development Department 1960, OP. 33720.551.01(12). For quote, see Hydrological Survey Department, 1953, 3; Hydrological Survey Department, 1954, 1 (Engineering students seconded to the department).

allocated to “geology and rural water supplies” and to “urban water supplies” (£180,000 and 150,000 respectively) and accounted for 27 percent of total development allocations for Uganda.¹¹⁴

The water supplies programmes that followed the financial influx were masked by the unequal distribution of resources catering for urban and rural populations: over 90 percent of the population resided in rural areas; this was not reflected in the issuance of funds.¹¹⁵ Even in the more heavily invested urban areas access was not guaranteed. Dr. T. A. Austin, Public Health Officer for the WHO’s African Regional Office, estimated that 62,351 people, just over 1 percent of Uganda’s population, had access to piped water in 1952.¹¹⁶ Moreover, relative to government revenue these funds were small and amounted to between 9 and 15 percent of overall investment within the protectorate 1950-52; CDW funds only provided 18 and 10 percent of overall capital expenditure on African housing and urban water supplies respectively.¹¹⁷ Further, the demarcation of funds for the different uses of water supplies development—social or economic—was not clear. Development in urban areas tended to imply domestic supplies whereas rural water supplies indicated a combined effort to serve livestock, small-scale irrigation, and domestic needs. However, these lines were blurred as analysis of the engagement of the medical department with environmental hygiene shows.

In 1949, the Uganda Medical Department renamed its “hygiene and sanitation” section to “environmental hygiene” and included under its remit: housing and town planning; water supplies; food supplies; urban sanitation; and rural sanitation.¹¹⁸ Referring to all but industrial hygiene and alternatives hosts of human disease this section reflected the essence of environmental sanitation as conceptualised by the WHO Committee convened to discuss the topic. In the same year the Uganda Medical Department Report described “a successful

¹¹⁴ Statement of Expenditure 1946-1955, Development and Welfare Schemes Revision of Financial Structure and Proposals for 1953-1956 Uganda, TNA, CO 822/233.

¹¹⁵ World Bank Data suggests 96 percent rural and 4 percent urban in 1960: World Bank, Urban Population (% of total), 1960-2017, accessed Nov 24, 2018, <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=UG>; John Innes Clarke *An Advanced Geography of Africa* (Amersham: Hulton, 1975), 270: Clarke estimated that only 2.2 percent lived in urban areas in 1965.

¹¹⁶ Austin, A Survey of Conditions in the Uganda Protectorate. 75 percent of the 62,351 served with water supplies were confined to Kampala and Jinja.

¹¹⁷ Over expenditure of about £900,000; Statement of Expenditure 1946-1955, Development and Welfare Schemes Revision of Financial Structure and Proposals for 1953-1956 Uganda, TNA, CO 822/233.

¹¹⁸ Uganda, *GAMR*, 1949.

campaign to improve primitive rural water supplies” in the Mengo District, which served 20,000 people; this complemented the various developments in the field of water-related environmental sanitation after the war.¹¹⁹ In 1950 local community involvement in rural water supplies continued and was supported by both the colonial government and African local governments.¹²⁰

A year later Dr. T. A. Austin visited, surveyed, and reported upon conditions in the protectorate.¹²¹ Austin praised the “solid achievements” in preventive medicine but raised concerns over the “large proportion” of people suffering from “preventable diseases, either insect-borne or arising from a low standard of environmental hygiene.”¹²² However, intestinal diseases—often caused by polluted water or poor hygiene practices—were described as limited in prevalence based on Austin’s review of hospital returns of disease.¹²³ Dr. N. D. R. Schaafsma, Public Health Engineer for the WHO African Regional Office, held a similar view and described such diseases as “certainly not the most dangerous diseases of Africa.”¹²⁴ On the other hand, schistosomiasis was described as “much more common than it was thought to be.”¹²⁵ Overall, water borne diseases were described as “not uncommon”, but incidence was difficult to determine while facilities were still “rudimentary.”¹²⁶ The restricted knowledge of disease incidence and prevalence was evident from these early post-war reviews and Austin, despite a lack of regard for the threat posed by intestinal or water-borne diseases in Uganda, still believed concerted efforts were needed to improve conditions. The Medical Department agreed that “this criticism must be accepted” but the Director was keen to point out the “increased amount of essential clinical and administrative work.”¹²⁷ The pressure had mounted upon medical department staff after the war and, in spite of calls for improvements in preventive medicine, funds

¹¹⁹ Uganda, *GAMR*, 1949, 37; Uganda, *GAMR*, 1945, 6; Uganda, *GAMR*, 34-35.

¹²⁰ Uganda, *GAMR*, 1950, 24; Uganda, *GAMR*, 1949, 37; Uganda, *GAMR*, 1945, 6.

¹²¹ Austin, *A Survey of Conditions in the Uganda Protectorate*.

¹²² Austin, *A Survey of Conditions in the Uganda Protectorate*, 86, 152.

¹²³ Austin, *A Survey of Conditions in the Uganda Protectorate*, 152; problems with looking at hospital returns.

¹²⁴ Dr. N. D. R. Schaafsma (Public health engineer, WHO Regional Office for Africa), *Problems of Rural Sanitation in Africa South of the Sahara*, 1953, WHO Archives, WHO/Env.San./50, 5.

¹²⁵ Austin, *A Survey of Conditions in the Uganda Protectorate*, 152.

¹²⁶ Austin, *A Survey of Conditions in the Uganda Protectorate*, 152.

¹²⁷ Uganda, *GAMR*, 1952, 35.

were not easily obtained.¹²⁸ As such, Austin's survey had done what many others had: it emphasised the large gap between the knowledge of the improvements required and the ability of medical services to implement such ideals.

In addition, the Medical Department report for 1951 stated that the "removal of the fear of epidemic disease has made it more difficult to interest people in preventive medicine; a special approach is needed when the dangers are insidious rather than dramatic."¹²⁹ Having made good progress during the interwar years the medical department was finding it hard to incentivise local populations to invest in hygiene and preventive measures after the war. This was reiterated in Bull's assessment of the matter: "As diseases came under control, it was inevitable that the enforcement of preventive measures should relax, and new drugs made the threat of diseases less real."¹³⁰ In addition there were still lingering views within colonial circles that chose to place the blame on the "ignorance" of the local population and derided their "superstition and suspicion of alien ideas."¹³¹ This opinion was slowly crowded out as an increasing number of both colonial and international officials were reluctant to accept these opinions and as Medical Departments were pleasantly surprised at the interest of Africans in rural sanitation.¹³² F. Daubenton, Regional Director of the WHO African Regional Office, commented on the positive attitudes of Africans to water and sanitation:

Contrary to the general opinion of the rest of the world, the African is clean when he has water, but obviously cannot wash himself and his surroundings where he has not enough water to drink. Many African men and especially women are more interested in bodily cleanliness than some Europeans are.¹³³

Further, Daubenton discussed the importance of understanding "the religious background of many taboos" and placed great emphasis on the provision of

¹²⁸ In 1951, 5 percent of medical department funds were spent on hygiene and sanitation, 11 percent on refuse collection and disposal, 16 percent on mosquito control: Austin, *A Survey of Conditions in the Uganda Protectorate*, 117; Uganda, *GAMR*, 1951, 3.

¹²⁹ Uganda, *GAMR*, 1951, 36.

¹³⁰ Mary Bull, *The Medical Services of Uganda 1954-5*, 26-27; Uganda, *GAMR*, 1948, 30; Uganda, *GAMR*, 1946, 34.

¹³¹ Uganda, *GAMR*, 1946, 34; Uganda, *GAMR*, 1948, 30.

¹³² Uganda, *GAMR*, 1948, 29; Uganda, *GAMR*, 1956, 28: description of Africans' questions at the Nsamizi Training Centre as revealing "an apparent genuine interest in the ways to achieve an improve rural sanitation."

¹³³ F. Daubenton, Comments on Proposed Agenda, Expert Committee on Environmental Sanitation, 5 May 1953, WHO Archives, WHO/Env.San/29, 3.

policies that accounted for local opinions and beliefs rather than ones that blindly imposed western scientific ideals.¹³⁴ The Regional Director's point recognised that conditions across Europe left much to be desired themselves in the aftermath of the Second World War.

Not all preventive measures were viewed with appreciable caution; most notable was the improvement of urban and rural water supplies.¹³⁵ The 1949 Medical Department report had emphasised the positive community involvement in rural water supplies development:

The work was carried out by the inhabitants themselves under the guidance of health staff and was inspired by the enthusiasm of individual chiefs and councillors; the finished works were used as demonstrations for visiting chiefs and others from neighbouring areas.¹³⁶

These positive attitudes continued into the 1950s and beyond where "considerable interest" was found in the development and protection of water supplies.¹³⁷ As such, Uganda's emphasis on environmental hygiene showed parallels with the WHO's work on the subject as it focused on the improvement of water supplies and waste disposal as its main avenues in this field.

The Geological Survey and Public Works continued in their respective roles of implementing rural and urban water supplies but such water development programmes required a combined effort from government departments within the protectorate.¹³⁸ Commenting on the problems faced in attempts to promote preventive measures, Bull emphasised the difficulties in coordinating efforts across departments. Vector control, for example for malaria, still included bush clearing and water canalisation and thus required cooperation with agriculture, forestry and public works departments:

Further measures became more difficult, as they did not concern the Medical Department only, but also Education, Agriculture, Forestry and Public Works, and

¹³⁴ Daubenton, Comments on Proposed Agenda, Expert Committee on Environmental Sanitation.

¹³⁵ Uganda, *GAMR*, 1950, 24; Uganda, *GAMR*, 1949, 37; Uganda, *GAMR*, 1945, 6; Uganda, *GAMR*, 1935, 34-35.

¹³⁶ Uganda, *GAMR*, 1949, 37; Uganda, *GAMR*, 1945, 6; Uganda *GAMR*, 1935, 34-35.

¹³⁷ Uganda, *GAMR*, 1955; Uganda, *GAMR*, 1956, 28; Uganda, *GAMR*, 1950, 24.

¹³⁸ Austin, A Survey of Conditions in the Uganda Protectorate, 134-36.

finally every department of government; and needed co-operation from local governments, local communities and individuals.¹³⁹

This need for coordinated efforts hampered progress as it required bureaucrats and scientists with different development agendas to define and agree upon their respective roles and methods and then to work together towards a set goal. Yet there were examples of departments working together as shown through the coordination of efforts across the Hydrological Survey Department, the Agricultural Department and Geological Department.¹⁴⁰ Moreover, it shows that the large outlay of funds for the Owen Falls dam belied the broader approach to the development of water and land resources in Uganda.

Due to staff limitations and delays in obtaining equipment the Hydrological Survey Department focused almost solely on data collection and research into swamp reclamation for productive use until 1950/51. Like similar organisations established in the aftermath of war the implementation of projects was limited in the first few years.¹⁴¹ In 1949 the results of an interdepartmental committee concluded that swamps were “a most valuable reserve” and the Hydrological Survey Department described three different kinds of schemes that might be implemented. Firstly, large-scale reclamation for settlement, which would contribute towards resolving issues of high population densities in some areas of Uganda. Secondly, small-scale reclamation for “special purpose”, such as mosquito control, which would reduce the contact between disease carrying organisms and the local population. Thirdly, schemes based on “optimum” food production, which would support both the growing population within the protectorate, as well as contribute towards the world food bank.¹⁴²

Despite the confidence within the Hydrological Survey Department support was not forthcoming from the local population and the first few years of experimentation did not proceed well. In 1951 C. Berg, the department director, stated that there was a “very determined opposition from many Africans.”¹⁴³ While

¹³⁹ Bull, *The Medical Services of Uganda 1954-5*, 26-27; Uganda, *GAMR*, 1948, 30; Uganda, *GAMR*, 1946, 34.

¹⁴⁰ That was, in a way, workable because of Owen Falls and because of the contributions from Egypt to the Hydrological Survey Department revenue.

¹⁴¹ Hydrological Survey Department, 1949, 1, 6, 7-8; Hydrological Survey Department, 1950.

¹⁴² Hydrological Survey Department, 1949, 6, 6-7.

¹⁴³ Hydrological Survey Department, 1951, 8.

support was found in the Kigezi district for swamp reclamation there was still resistance to the methods used. Early experiments resulted in arid, desert-like conditions unsuitable for habitation and cultivation: such was the problem that R. B. Bulman, Executive Engineer of the Hydrological Survey Department, described it as the “Black Death” of swamps.¹⁴⁴ Consequently, studies were commissioned to examine the role of rapid oxidation and its toxic impact on the soil.¹⁴⁵ Combined expertise, which included Dr. Chenery, who was a senior chemist attached to the Agricultural Department, members of the Hydrology Department and advisors from the Rwandan government forced the department to change their approach to swamp reclamation.¹⁴⁶ It was the local population who had raised concerns but the colonial government only responded when they encountered difficulties themselves and when advice was provided from official channels.¹⁴⁷

Between 1950 and 1955 the Kigezi district, situated in the south-west corner of Uganda, became the prime target for experiments in land reclamation. The Mumlawo Swamp in this region was described as “the only one about which local opinion is enthusiastic”, which reflected both the population pressures in Kigezi as well as the importance of village cooperation.¹⁴⁸ In parallel, investigations were also underway in North Bugishu, situated along the Protectorate’s eastern border with Kenya, for irrigation and watering places.¹⁴⁹ A further programme took place in Karamoja, which focused on the development of livestock watering places. The Hydrological Survey Department had started to branch out from the data collection and swamp reclamation in the late 1940s and early 1950s but action remained preliminary.¹⁵⁰

E. B. Worthington, Scientific Secretary to the East African High Commission 1947-51, stressed the importance of scientific research in a survey of the subject,

¹⁴⁴ R. B. Bulman Executive Engineer, Hydrological Survey Department, 1951, 9.

¹⁴⁵ Oxidation occurred when the soil was exposed to the air, creating toxic, acidic sulphates: for example, Hydrological Survey Department, 1952, 11.

¹⁴⁶ Hydrological Survey Department, 1952, 1; Hydrological Survey Department, 1951, 15.

¹⁴⁷ Hydrological Survey Department, 1949, 7-8; Hydrological Survey Department, 1951, 9.

¹⁴⁸ Hydrological Survey Department, 1950, 45; Hydrological Survey Department, 1953, 2; East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 279; J. Steyn, “The Effect on the Anopheline Fauna of Cultivation of Swamps in the Kigezi District, Uganda,” *East African Medical Journal* 23, no. 6 (June 1946): 163-169; J. K. Hunter, “An Epidemic of Bacillary Dysentery in Kigezi District, Uganda,” *East African Medical Journal* 24, no. 2 (February 1947): 98-105.

¹⁴⁹ Hydrological Survey Department, 1953, 6.

¹⁵⁰ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 278-279.

which was published in 1951.¹⁵¹ By this time a number of regional research organisations were established throughout the East African territories. In 1949 the East African Bureau for Research in Medicine and Hygiene (Kenya) was created to coordinate medical research across the region. Under this umbrella at the end of 1951 were the East African Medical Survey (Tanganyika), the East Africa Malaria Unit (Tanganyika), the Filariasis Research Unit, the East Africa Virus Research Institute (Uganda), and the East Africa Leprosy Specialist.¹⁵² In addition further cooperation, formally and informally, was well established in the fields of geology, meteorology, hydrology, agriculture and forestry, animal health, tsetse and trypanosomiasis, locusts, insecticides, and fisheries. The East African High Commission, set up in 1947, administered much of this research. This newly formalised relationship between Uganda, Kenya, and Tanganyika signified the necessity of pooling resources after the Second World War.¹⁵³ Focused on a smaller area than the WHO Regional Office and the Commission for Technical Cooperation in Africa South of the Sahara (CCTA), these divisions were created to provide a more localised research base within British imperial Africa in which costs, expertise, ideas and experiences were shared in order improve the implementation of health interventions in East Africa.¹⁵⁴ These organisations were not autonomous and relied on financial and intellectual support from Britain. Raymond Lewthwaite, Director of Colonial Medical Research at the Colonial Office, annotated Martin's notes on the role of the East African Bureau for Research in Medicine and Hygiene to this end:

¹⁵¹ And latterly Secretary General of the Scientific Council for Africa South of the Sahara; Worthington, *A Survey of Research and Scientific Services in East Africa, 1947-56*: but referring to the period up to the end of 1951.

¹⁵² Visits from various specialists, such as Buxton (trypanosomiasis) and Research Services: Worthington, *A Survey of Research and Scientific Services in East Africa, 1947-56*, 8, 11 "organisations" preferred to "institute" as the latter suggested it was for one place rather than for the region. Also see 13 for list of research institutes up to 1952.

¹⁵³ Worthington lists four reasons for the advantages of regional research: viewing technical problems as a whole; larger staff; attracting the best candidates; pooling resources for financial efficiency. Worthington, *Survey of Research and Scientific Services*, 9. Worthington also mentions the cooperation outside of the British Colonial set up, e.g. with Sudan, Worthington, *A Survey of Research and Scientific Services in East Africa, 1947-56*, 12.

¹⁵⁴ Relations with World Health Organisation, Technical Cooperation in Africa, 1950, CO 936/64/5; Pearson-Patel, "Promoting Health, Protecting Empire: Inter-Colonial Medical Cooperation in Postwar Africa"; Pearson-Patel, "French Colonialism and the Battle against the WHO Regional Office for Africa."

It is expected also that the Bureau will provide a means of encouraging and stimulating medical and health research, will serve as a focus for co-ordinating lines of research, and will have a general responsibility for directing and [Lewthwaite's emphasis] integrating medical research that comes under its aegis.¹⁵⁵

Lewthwaite remarked that the use of "directing" was "encroaching on the functions of the Colonial Medical Research Council (CMRC) and the directors of research units appointed by them."¹⁵⁶ Worthington reiterated this perspective and argued that scientific decisions were not in the hands of Colonial Governments in Africa despite calls for self-determined policy making: such an ideal was "before its time."¹⁵⁷

In 1948 Professor B. A. McSwiney observed the lack of fundamental health data available within the region and argued that the preoccupation with curative medicine had led to insufficient progress in promoting preventive measures.¹⁵⁸ To rectify these inadequacies McSwiney proposed the formation of a regional Bureau of Health, which would undertake "large-scale medical and sanitary surveys in selected populations", follow up with appropriate measures, and then extend these principles across larger areas.¹⁵⁹ In response the East African Bureau for Research in Medicine and Hygiene was established in 1949. Its first annual report underlined McSwiney's concerns, stating that "there was a need for greater interest in preventive medicine."¹⁶⁰ In this effort to advance preventive measures, Kenneth Martin, the Bureau's Director, promoted the importance of environmental hygiene and sanitary engineering, believing there to be "considerable scope for work on such questions as rural and village sanitation and housing."¹⁶¹ Martin

¹⁵⁵ K. A. T. Martin, Note on the East African Bureau of Research and Hygiene, n.d. (1949/50?), TNA, CO 927/176/1.

¹⁵⁶ Lewthwaite, Minute, 2 March 1950, TNA, CO 927/176/1.

¹⁵⁷ Worthington, *A Survey of Research and Scientific Services in East Africa, 1947-56*, 8.

¹⁵⁸ East African Bureau of Research in Medicine and Hygiene Annual Report, 1949, TNA, CO 927/176/1: "owing to enforced preoccupation with the application of curative measures, insufficient progress had been made with preventive medicine; and that in any case fundamental data regarding health conditions were lacking"; Regional Co-ordination of Medical Research: Bureau of Research in Medicine and Hygiene East Africa: Report of Technical Papers, TNA, CO 927/176/4.

¹⁵⁹ East African Bureau of Research in Medicine and Hygiene Annual Report, 1949, TNA, CO 927/176/1.

¹⁶⁰ East African Bureau of Research in Medicine and Hygiene Annual Report, 1949, TNA, CO 927/176/1.

¹⁶¹ East African Bureau of Research in Medicine and Hygiene Annual Report, 1950, TNA, CO 927/176/1.

praised the Medical Department of Uganda as an exemplar of promoting the control of intestinal diseases through effective propaganda.¹⁶² Martin particularly pressed forward “the employment of sanitary engineers conversant with the experience in such work [environmental hygiene]”, arguing that they “would be of the greatest benefit in the fuller implementation of many matters designed towards disease control.”¹⁶³

Having proposed five key areas for research into preventive medicine—health surveys, nutrition, tuberculosis, a yellow fever survey, and parasitological and allied research—Martin also expressed the importance of the complementarity of curative and preventive measures:

It may be as well at this point to interpolate the observation that a rigid and definite insistence upon prevention is, in the usual sense of the word, undesirable. In the light of changing events and new discoveries such an attitude is indefensible. The objective should be a flexible policy to bring about an effective rapprochement between all aspects of medicine and other services that bear upon the promotion of health.¹⁶⁴

Despite the arguments presented for prioritising prevention Martin was clearly reluctant to elevate such measures above their curative counterpart. As a former Medical Officer to the Kenya Medical Services Martin recognised the challenges in promoting preventive measures.¹⁶⁵ While rectifying the gap between curative and preventive medicine was regarded as desirable it was a complicated process, which required cooperation between the Colonial Government in Uganda, its officials (administrators and health staff) on the ground, and the local population.

Support was also required to finance and staff many of the research organisations attached to the East African Bureau for Research in Medicine and Hygiene, such as the East African Malaria Unit. Originally founded and funded by a Colonial Development and Welfare Grant, the East African Malaria Unit ran into

¹⁶² East African Bureau of Research in Medicine and Hygiene Annual Report, 1950, TNA, CO 927/176/1.

¹⁶³ East African Bureau of Research in Medicine and Hygiene Annual Report, 1950, TNA, CO 927/176/1.

¹⁶⁴ East African Bureau of Research in Medicine and Hygiene Annual Report, 1949, TNA, CO 927/176/1.

¹⁶⁵ Curative medicine was taking priority because of its fast impact. See Anna Crozier, *Practising Colonial Medicine: The Colonial Medical Service in British East Africa* (London: I. B. Tauris & New York: St. Martins Press, 2007), 85.

financial difficulties within a few years of operation.¹⁶⁶ In the short-term, the Rockefeller Foundation provided additional staff to improve unit's efficiency but it was understood that the greatest difficulty lay in recurrent expenditure rather than capital investment.¹⁶⁷ Despite the collaborative intentions financial backing from the East African colonies proved challenging. Moreover, the possibilities of capital and technical assistance, and support towards recurrent costs from the WHO, could not be relied upon.¹⁶⁸ J. G. Hibbert, Colonial Office, noted that, without such financial assistance, the East African Governments "might well feel that malaria is attracting a disproportionate amount of money", dismissing the scheme "outright on financial grounds alone."¹⁶⁹ The Acting Governor of Nyasaland, Geoffrey Francis Taylor Colby, was unsupportive for other reasons, believing that malaria should not be prioritised to the detriment of other health initiatives, such as bilharzia control "by the means of protection of water supplies" and hookworm control "by means of improved sanitation."¹⁷⁰ Colby reiterated those sentiments that were insistent on raising the profile of preventive medicine.¹⁷¹ Despite the role of water as a breeding ground for malaria-carrying mosquitoes, many remained convinced that "every effort should be made to develop cheap effective methods of control of larvae and adults in an attempt to cut down expensive engineering problems to a minimum."¹⁷² Attention was focused upon the use of insecticides and larvicides—DDT in particular—with fewer protagonists in medical circles promoting better environmental management and improved supplies of water as an alternative.

¹⁶⁶ Malaria, 1951, TNA, CO 822/147/2; UNICEF Assistance, 1953, TNA, CO 822/510; New Designation of the East African Malaria Unit, 1955, TNA, CO 822/1068; Estimates of the East African Malaria Unit, 1951-52, TNA, CO 822/511; CDW Scheme for the continuation of the East African Malaria Unit from 1/1/54-31/3/56, 1953-1954, TNA, CO 822/512.

¹⁶⁷ [unintelligible name], Minute, 31 January 1950, TNA, CO 822/147/2; Rogers, 31 May 1951, TNA, CO 822/147/2.

¹⁶⁸ J G Hibbert to Knox Johnston, Letter, 10 August 1951, TNA, CO 822/147/2.

¹⁶⁹ Hibbert to Knox Johnston, Letter, 10 August 1951, TNA, CO 822/147/2.

¹⁷⁰ Colby (Acting Governor of Nyasaland) to James Griffiths, Letter, 7 September 1951, TNA, CO 822/510, UNICEF Assistance; Northern Rhodesia did not intend to participate.

¹⁷¹ Colby to Griffiths, Letter, 7 September 1951, TNA, CO 822/510.

¹⁷² Malaria, Rockefeller Archive Center (New York), RG1 S100.I, B48, F462-463, 1945-1960; George W. Pearce, E. L. Gooden and Donald R. Johnson, "Specifications of the International Cooperation Administration for DDT Water-Dispersible Powder for Use in Malaria Control Programmes," *Bulletin of the WHO* 20, (1959): 913-20, 915: preparation of suspension required for DDT water-dispersible powder included: "290 ml of standard hard water (as defined in Specifications for Pesticides, World Health Organisation, 1956, 109)."

As plans materialised, P. J. Kitcatt, Assistant Principal to the Colonial Office, expressed “disquiet” over the possible internationalisation of the unit.¹⁷³ The British Colonial Office was reluctant to hand control to the international organisations involved (WHO and UNICEF). In response to the WHO’s proposal for the extensive staffing of the unit further avenues of funding were explored, including UNICEF and the Colonial Medical Research Committee. Funding was delayed from UNICEF, however, because applications were not prepared in time for the Spring Executive Board Meeting in 1953. As a result financial support was approved through the Colonial Development and Welfare funds in 1954 for the next couple of years.¹⁷⁴ The unit expanded in 1955 and was rebranded as the East African Institute of Malaria and Vector-borne Diseases; its future, however, remained uncertain.¹⁷⁵ The financing and staffing of this Unit provided a glimpse into how the British Colonial Office and the East African colonies established, strengthened, and questioned relationships with UNICEF, the WHO, and the Rockefeller Foundation. Drawing upon the resources of international organisations, the colonial government in Uganda was able to promote its research and development agendas more effectively within the protectorate and the East African region.

Finding it difficult to place water resource research within its bureaucratic framework, the Colonial Office discussed the subject in the late 1940s.¹⁷⁶ One debate centred on whether geological and hydrological research should be deemed as “research” or “development”, which affected applications for funds.¹⁷⁷ A second debate questioned where water fitted: should it be a sub-section within another field, like medical or agricultural research or should it form its own distinct field? This echoed concerns over the position of water supplies within the East

¹⁷³ P. J. Kitcatt, Minute, 18 January 1952, TNA, CO 822/510, UNICEF Assistance; D. W. Newsam, Minute, 26 January 1952, TNA, CO 822/510, UNICEF Assistance.

¹⁷⁴ Secretary of State for the Colonies to Chairman of the East Africa High Commission, Telegram, 8 January 1954, TNA, CO 822/512, CDW Scheme for the Continuation of the East African Malaria Unit.

¹⁷⁵ Further Financing of the Malaria Unit, 1954, TNA, CO 822/987; Future Arrangement for Development Finance. Medical Research Projects, 1954, TNA, CO 822/1000; Scheme for the Extension of the Malaria Unit 1956, TNA, CO 822/1068.

¹⁷⁶ Water Resources Research, 1947/48, TNA, CO927/33/5.

¹⁷⁷ J. G. Hibbert to Robert Scott, Letter, 3 July 1951, TNA, CO 927/176/1; Colonial Office, Colonial research, 1952-1953. Reports of the Colonial Research Council, et al., Cmd. 8971, 1952-53, accessed Nov 24, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1952-043675?accountid=15181>.

African High Commission and within the framework of colonial governments. The East African High Commission was reluctant to occupy a direct leadership role in the field of hydrology and water resources and argued that this was deemed to be a “territorial responsibility.”¹⁷⁸ The High Commission was, however, supportive of “co-ordination and exchange of information” through inter-territorial conferences.¹⁷⁹ In the same vein, efforts were made on both a Colonial Office and regional level to establish connections and share ideas. For example, a Water Pollution Research Laboratory was established within the Department of Scientific and Industrial Research. This laboratory cooperated with East African colonial governments, in particular through the East Africa Scientific and Industrial Research Organisation, to investigate evaporation from reservoirs, industrial processes using water, and chemical and bacteriological imbalances.¹⁸⁰ In addition, explorations into rainmaking, particularly as regards to Kenya and Tanganyika, were undertaken in the early 1950s, following in the footsteps of America’s cloud seeding experiments.¹⁸¹ Hydrological research became increasingly important in the East African region, most notably in Uganda. John Hall’s expressed concern over the availability and use of land and the development of soil and water resources encouraged a number of European-led investigations in the early post-war years: swamp drainage, hydrological data collection, and irrigation within the Nile basin.¹⁸² These systematic studies were undertaken through Uganda’s

¹⁷⁸ C. B. A. Darling (Chairman, East Africa High Commission) to Secretary of State for the Colonies, Letter, 28 December 1949, TNA, CO 822/156/5, Hydrological surveys East Africa, Hydrological Conference; Debenham, Report on the Water Resources of the Bechuanaland Protectorate, Northern Rhodesia, the Nyasaland Protectorate, Tanganyika Territory, Kenya and the Uganda Protectorate.

¹⁷⁹ Darling to Secretary of State for the Colonies, Letter, 28 December 1949, TNA, CO 822/156/5.

¹⁸⁰ Colonial Office, Colonial Research 1949-50. Reports of the Colonial Research Council, et al., Cmd. 8063, 1950, accessed Nov 24, 2018, <https://parlipapers.proquest.com/parlipapers/docview/t70.d75.1950-041373?accountid=15181>.

¹⁸¹ These were undertaken in response to what was later called the “Dust Bowl”—a period in the 1930s when there were a number of sandstorms—which had a long-term impact on agricultural production. Research into rain-making in East Africa and elsewhere, 1952-1954, TNA, CO 927/212; For Water Pollution: Reports of the Colonial Research Council, et al., Cmd. 8971, 1952-53, 21-22; in the same series, see Cmd. 9303, 1953-54; Cmd. 9626, 1954-55, 361; Cmnd. 52, 1955-56, 308-09, 312; Cmd. 321, 1956-57, 319-20 and for Geological surveys and success in developing underground water supplies and mineral success Uganda see 321-22.

¹⁸² Hydrological Survey Department, 1949; Hydrological Survey Department, 1950; Hydrological Survey Department, 1951; Hydrological Survey Department, 1952; Hydrological Survey Department, 1953; Hydrological Survey Department, 1954; Hydrological Survey Department, 1955; Water Development Department, 1956; Water

Hydrological Survey Department, which was established in 1947, and supported through connections with their East African neighbours.

Supported by the Colonial Office and the East African High Commission, Uganda used all available channels to discuss and promote hydrological aspects of development. On 24 March 1950, Christopher G. Eastwood, Assistant Under-Secretary of State for the Colonial Office, wrote to Charles B. A. Darling, East African High Commission, about a proposed inter-territorial hydrological conference, the first meeting of its kind on the African continent.¹⁸³ Eastwood remarked, “we here have been increasingly impressed with the importance of a proper study of water questions.”¹⁸⁴ While Uganda’s Hydrological Survey Department was proud of its foremost position in East Africa, having one of only two meter calibration tanks on the continent, the director of the department placed great emphasis on inter-territorial cooperation through informal meetings and conferences.¹⁸⁵

On a visit to Tanganyika for the Annual Informal Meeting of Hydrologists in 1953, the attendees, including two members of the Uganda Hydrological Survey Department, inspected the Kware Spring that connected to the Kikaletwa [Kikuletwa] River and the Moshi Hydro-electric Power Station, all of which were situated in the north east of the territory just south of the Kilimanjaro mountain range. The construction of a concrete weir, built on the river, fed an irrigation channel supplying the Arusha Chini Sugar Estate. Commenting on this visit, C. L. Berg, Director of the Hydrological Survey in Uganda, remarked that:

it was fascinating to think one had seen the origin of the teaspoonfull [sic] of sugar in one’s cup of tea in the form of a spring of water emerging from out of the ground, and to have before one this practical demonstration of a profitable accomplishment of the work of hydrologists and irrigation engineers.¹⁸⁶

Development Department 1957; Water Development Department 1958; Water Development Department, 1959; Water Development Department, 1960; Bisset, *Geological Survey of Uganda. Water Supply Paper No 2: Small reservoirs in Uganda*, 1945.

¹⁸³ C. G. Eastwood to C. B. A. Darling, Letter, 24 March 1950, TNA, CO 822/156/; Mr. Shipp to C. G. Eastwood, Letter, 26 May 1950, TNA, CO 822/156/5.

¹⁸⁴ Eastwood to C. B. A. Darling, Letter, 24 March 1950.

¹⁸⁵ Meter calibration tank used to check gauges are accurate. Resolutions to be put before the November meeting, May 1950, TNA, CO 822/156/5; Bisset raising the problem of staff and equipment shortages.

¹⁸⁶ Hydrological Survey Department, 1953, 10, 9-10.

This annual gathering epitomised, firstly, the growing importance of hydrologists and their work, particularly within the colonial development framework; secondly, the informal networks used to collect and share knowledge, and in turn, enable more effective research and development given the limited availability of personnel, funds, and equipment.¹⁸⁷

The report of the East Africa Royal Commission, published in 1955, echoed the priorities Hall had set in the early post-war years.¹⁸⁸ It quoted D. W. Malcolm, an agriculturalist and colonial official serving in Tanganyika, who, in 1953, wrote: “if soil fertility is one of the basic assets of the country then water is the catalyst without which it cannot be used.”¹⁸⁹ Thus described as a “catalyst”, conspicuous in its absence or “maldistribution”, water continued to frame development plans in Uganda and the East African region.¹⁹⁰ Investment in water supplies, particularly in Kenya and Tanganyika, was a clear priority. On the other hand, Uganda was described by the IBRD as having “high rainfall and large areas of water.”¹⁹¹ The construction of a dam at Owen Falls was used to bolster this argument and the IBRD set out the important role of the Uganda Electricity Board and the Uganda Development Corporation (both est. 1952) in further promoting the favourable position of the protectorate regarding the potentiality of its water resources.¹⁹² However, the Owen Falls development led the colonial government towards an urban biased policy.¹⁹³ As such, the IBRD failed to take full account of the urban-rural disparities, the unevenness of rainfall across Uganda, and the usability of the water resources available. In this sense several obstacles lay in the way of proposed plans for water supplies development. The East Africa Royal Commission raised four main concerns in this regard, which related to: the collection of data, the organisation of services, the current conditions in Uganda,

¹⁸⁷ Neill, *Networks in Tropical Medicine*.

¹⁸⁸ East Africa Royal Commission 1953-1955 Report, Cmd. 9475.

¹⁸⁹ D. W. Malcolm, *Sukumaland: An African People and their Country* (Oxford: Oxford University Press, 1953), referred to in East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 272. For more on soil conservation in Uganda: see Carswell, *Cultivating Success in Uganda*.

¹⁹⁰ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 258.

¹⁹¹ World Bank, IBRD, *British East Africa – The Economies* (Washington: World Bank, 1955), 7 (Kenya); 40 (Tanganyika), accessed Nov 24, 2018, <http://documents.worldbank.org/curated/en/877881468272957769/British-East-Africa-The-economies>.

¹⁹² World Bank, IBRD, *British East Africa – The Economies*, 22-23, 25.

¹⁹³ World Bank, IBRD, *British East Africa – The Economies*, 25.

Kenya, and Tanganyika, and the relationship between the colonial governments and the local populations.

Firstly, more hydrological data needed to be collected and shared across the territories. According to the Royal Commission the informal networks used in the early post-war years needed to be formalised, ideally through an already established channel, such as the East African Agriculture and Forestry Research Organisation.¹⁹⁴ Secondly, the organisation of government departments for water supplies developments required reassessment. As shown earlier, the Colonial Office debated this matter in 1955 in an attempt to encourage its colonial territories to follow a uniform governmental structure for water supplies.¹⁹⁵ The East Africa Royal Commission report agreed. After detailing the different organisation of the subject through governments in Uganda, Kenya, and Tanganyika, it stated, “it is most important that this dissipation of effort should be rectified and we recommend that there should be a single department in each territory responsible for all aspects of water development with the exception of urban water supplies.”¹⁹⁶ It is no coincidence that the department was reconstituted as the Water Development Department from 1956: this included the transfer of the geological survey’s responsibilities.¹⁹⁷ There were to be three executive branches: irrigation and swamp reclamation, surface water utilisation, and hydrology.¹⁹⁸ This, for the most part, reflected the recommendations of the East Africa Royal Commission, apart from on irrigation, which the Royal Commission suggested was dealt with separately from swamp reclamation.¹⁹⁹ The Public Works Department, in collaboration with the Medical Department, remained responsible for urban water supplies and therefore heeded the mixed concerns of the Royal Commission.²⁰⁰

The third and fourth issues centred on the barriers between colonial government policies and the local population: the threat of the tsetse fly and the limited water availability. These acted as deterrents to development on otherwise

¹⁹⁴ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 137-138: “Many of the problems involved are common to all three territories and it is thus desirable that the work should be under-taken under the aegis of the East African Agriculture and Forestry Research Organisation.”

¹⁹⁵ Water legislation: Survey, 15 October 1947, TNA, CO 852/1008/2.

¹⁹⁶ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 139.

¹⁹⁷ Hydrological Survey Department, 1955, 1.

¹⁹⁸ Hydrological Survey Department, 1955, 1; East Africa Royal Commission 1955, 139.

¹⁹⁹ Hydrological Survey Department, 1955, 1; East Africa Royal Commission 1955, 139.

²⁰⁰ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 139.

good, fertile land.²⁰¹ The tsetse fly barrier stemmed back to the severe epidemics in the early twentieth century and the resurgence of sleeping sickness in the mid-1950s. The limited water barrier reflected the persistent difficulties in providing universal coverage in Uganda during this period. The local opposition to relocation, related to both these issues, emphasised the gap between colonial official ideals and the practicalities of implementing policies on the ground. This did not necessarily imply that colonial officials were always overly paternalistic; rather it often reflected genuine attempts to improve conditions within Uganda. Learning from ten years of experience within the department, the Water Development Department altered its approach in the late 1950s.

Following a separate report, published by Sir Alexander Gibbs & Partners in 1955, which listed suitable areas for irrigation development, the Water Development Department began work on pilot irrigation schemes.²⁰² One such plan centred on the provision of water for domestic, irrigation (cotton), and hydro-electric power purposes.²⁰³ The Director wrote about domestic water supplies for this Pilot Irrigation Project in Nyakatonzi:

Representations have been made for extensions to the supply of water for domestic purposes only, even although [sic] this would mean that less water would be available for irrigation. It was pointed out that because there was no proper domestic water supply, it was not possible to settle permanent cultivators. The domestic water problem is therefore of equal importance to the irrigation problem as without cultivators no land would be put into production.²⁰⁴

This quote emphasised not only the changing attitudes within the Water Development Department but also its keenness to adapt to local conditions and take account of local opinion. Further, it recognised the need to combine improvement in water supplies for domestic and irrigation purposes.²⁰⁵ In the same

²⁰¹ East Africa Royal Commission 1953-1955 Report, Cmd. 9475, 258, 263; World Bank, IBRD, *The Economic Development of Uganda: Report of Mission* (Baltimore: Johns Hopkins Press, 1962).

²⁰² *Water Resources Survey of Uganda, 1955*, TNA, CO 822/886.

²⁰³ *Water Development Department, 1957*, 8.

²⁰⁴ *Water Development Department, 1957*, 11.

²⁰⁵ This idea—the importance of local participation—was emphasised at the Water Conference in Berlin: “Irrigation and drainage projects require the continuous participation of large masses of the rural population.” Michael, ed., *Water Development in Less Developed Areas*, 194.

year the Geological Survey transferred dam construction to the Water Development Department and thus ended twenty-one years of continuous work on the subject.²⁰⁶ This precipitated investigations within the medical department into flood probabilities and the additional requirements in dam design and construction to mitigate the impact of malaria.²⁰⁷ Each of these approaches reflected the close relationship between health and economic development and the cooperation across government departments to achieve the best results. In 1959 the Water Development Department made further changes. After boasting of its access to the latest machinery for reclaiming swamps it adjusted to a more labour-intensive strategy, which improved cooperation with the local populations they were serving.²⁰⁸ In the late 1950s attitudes and approaches were slowly changing and the collaboration which government departments consistently sought since the 1930s was coming to fruition in some places. Attention to domestic water supplies—both urban and rural—was growing and more weight was given to the opinions of the local population.

3. Concluding Remarks

This chapter showed that Uganda and Sudan had differing experiences in their attempts to gain better access to the Nile waters. A new accord in 1959 superseded the Nile Waters Agreement of 1929: Sudan increased its access to the river while Uganda and its East African counterparts were unable to improve on their pre-war position. The development of water resources during this period stemmed from the perception of water as an auxiliary to increase food production across the world. However, there was a noticeable shift in the mid- to late-1950s when the stand-alone necessity of domestic water supplies was more fully recognised: if governments wanted to use water as an auxiliary then they would also have to improve supplies for purposes other than irrigation and livestock.

During this period, the clear emphasis on economic development as a prerequisite to improved standards of living significantly shaped engagements with water in Sudan and Uganda. The government in Sudan, both pre- and post-independence, placed great weight on the development of the Nile Waters to better the territory's economic position. Hall and Worthington focused upon soil

²⁰⁶ Water Development Department 1957, 7.

²⁰⁷ Water Development Department 1957, 8.

²⁰⁸ Water Development Department, 1959, 13, 15.

and water as the resources best placed to forward Uganda's development plans. This continued throughout the period and accelerated in the mid-1950s as the Water Development Department completed surveys in association with outside consultants and began to implement swamp reclamation and irrigation schemes on a larger scale.

This chapter argues for the importance of Uganda and Sudan's respective regional positions, which shaped their engagement with water supplies and associated sanitation during this period. Uganda was heavily influenced by the regional organisation attached to the East African High Commission. This relationship supported and shaped the direction of policy within Uganda in the post-war years. Uganda also developed a good relationship with the World Health Organisation, becoming a full member in 1963. Until the 1960s the WHO's African Regional Office was predominantly made up of colonial states and thus the representatives within the organisation were as much imperial as they were international. Further, the extensive debates over the establishment of AFRO in the early 1950s, which clashed with French and British colonial bodies, meant that many programmes were not fully instigated until the late 1950s or early 1960s. While international trends influenced policies within the territories and while colonial officials were keen to accept financial and technical support from international sources, this chapter has revealed the reluctance to cede organisational control to the United Nations or the United States. In the meantime, many WHO officials visited Uganda and advised the Medical Department. The protectorate implemented WHO ideals, such as environmental sanitation. Sudan, on the other hand, was attached to the WHO's Eastern Mediterranean Regional Office, which benefitted from the sound leadership of Dr. Aly Tewlif Shousa. An early independence date meant that Sudan was a fully operating member of the UN system a full seven years before neighbouring Uganda. Although Sudan had always operated outside of the Colonial Office, and was thus not directly subjected to its Colonial Development and Welfare plans, the contrasts and overlaps between British approaches to colonial development (within and outside the Colonial Office) and those of international development, as well as the cross-over in ideals and intentions, were evident.

While WHO environmental sanitation programmes were limited in the 1950s the Director of EMRO clearly showed that appearances and statistics could be deceiving. Both Uganda and Sudan reconstituted their Medical Department reports

in 1949 after the first meeting of the Environmental Sanitation Committee and both territories gave significant attention to the subject under their own formulations. Environmental sanitation's protagonists were also frequently attached to other programmes of health, such as malaria eradication, bilharziasis control, and health education.

However, as well as supporting single disease programmes, they also had to compete with them for a place in the departmental or organisational budget. Despite the promotion of environmental sanitation at local, regional (both within the territories and outside), colonial, national, and international levels this proved difficult. As the Director of the Uganda Medical Department pointed out, "there is no doubt that a campaign focused on one predominant disease creates greater interest and achieves far more than the general efforts of health education made in the course of dispensary work."²⁰⁹ The constant tug between curative measures (which were often more acceptable to local populations in Uganda and Sudan) and preventive measures (which often clashed with personal and community belief systems) made it difficult for protagonists of environmental sanitation to formulate effective programmes.

The resolution on community water supplies in 1959 signified a turning point for the sanitary engineers and public health workers as water became the flagship programme of the WHO's Environmental Sanitation division. Facing less opposition in the development and protection of water supplies than with attempts to impose improved waste disposal methods, the environmental sanitation programme had found its place in an increasingly crowded arena of public health and development. This small victory was overshadowed in the following four years, however, as surveys revealed the "enormity of the task ahead."²¹⁰ This was evident in Dieterich and Henderson's study of urban water supplies in seventy-five developing countries and a conference on water development in less developed areas in 1963.²¹¹ No longer were "lassitude and inertia" regarded as the "main hindrances" to water supplies development; instead, other obstacles—knowledge, finances, politics, and institutions—were deemed more pressing.²¹² During the

²⁰⁹ Uganda, *GAMR*, 1950, 20.

²¹⁰ WHO (EMRO), *Drinking Water, People and the Better Life*, 15 April 1963.

²¹¹ Dieterich and Henderson, *Urban Water Supplies in Seventy-Five Developing Countries*, 1963; Michael, ed., *Water Development in Less Developed Areas*.

²¹² WHO (EMRO), *Drinking Water, People and the Better Life*, 6.

1960s, due in part to the standardising effects of the WHO, a new but still contested form of development emerged, which gave clean water centrality.

CHAPTER FOUR

Knowledge and Resource Deficiencies 1963-1975

As Sandy Cairncross noted, “the importance of water supply for the promotion of health has been well-known for the last 150 years.”¹ So why did interest spike in the 1970s? Chapters 4 and 5 argue that this spike occurred for the following reasons. Firstly, the production of a more coherent body of empirical research on water. Before the 1960s the true extent of the water problem was not well established in quantitative terms. Secondly, stretching back to the nineteenth century, there was a long standing disconnect between what was known and what had actually been done. There were a variety of factors that limited both people’s belief in the empirical connection between water, health, and development and their ability or inclination to act upon that knowledge. This problem was resolved to some extent in the period as providing resources for clean water became a priority. Thirdly, the rapid growth of population across the world brought issues of basic needs to the forefront of international attention, such as food production, shelter, and water supplies and sanitation facilities; this now included new thinking about the impact that the processes of socio-economic development had on the environment. The focus of these final two chapters will be on the formulation and growing acceptance of ideas about the link between clean water and health, with illustrative examples drawn from Sudan and Uganda. New international forums concerned with food, population, and poverty allowed advocates for better water supplies to promote their concerns to the top of policy agendas.

International Organisations were important in encouraging and supporting governments as they considered investment in water supplies and sanitation. In particular, they encouraged the development of systematic data collection to review progress and provided technical and financial assistance. Chapters 4 and 5 concentrate primarily on how those working in association with the WHO collaborated and competed with others within the organisation itself, with outside organisations, and with nations to promote the development of water supplies and sanitation facilities across the world. The WHO was a prime mover in shaping

¹ Sandy Cairncross, “Domestic Water Supply in Rural Africa,” in *Rural Transformation in Tropical Africa*, ed. Douglas Rimmer (London: Belhaven Press, 1988), 46-63, 46. For online access, see the International Reference Centre, accessed July 14, 2018, <https://www.ircwash.org/sites/default/files/203.1-6138.pdf>.

international health discourse and in collecting and collating data regarding first, water supplies, and later, sanitation during this period. The Community Water Supply Programme of the WHO, which fell under the aegis of the Environmental Sanitation/Health Division, was the primary channel for international investment in water for health during this period and therefore provides the focal point for this analysis.

Chapter 4 focuses primarily on how people conceptualised the water problem between 1963 and 1975. Most of the data analysed here pertained to the period 1962 to 1970, when it was collected for two WHO surveys. As two of the primary documents that collated and analysed this data were published in 1963 and 1975 this time frame is preferred. There were multiple understandings of the water problem during this period but, as in earlier decades, there were those who prioritised water for economic development and those who focused on the relationship between water and health. There was some cross-over, but divisions continued to hamper the ability of people and organisations to work together towards a common goal of improving water supplies. Increasingly during this period governments were encouraged to recognise the value that several funding agencies placed on the importance of investment in water supplies for economic development and to tailor funding applications accordingly. There was a growing recognition of the importance of clean water supplies for health during this period, but it remained difficult to procure financial support without due consideration of economic factors.

Regarding health perspectives, there were those who argued the problem was lack of knowledge (knowledge deficiency) and those who argued the problem was lack of resources (resource deficiency). Chapters 4 and 5 argue that knowledge and resource deficiencies were the primary issues in the global development of community water supplies in the 1960s and 1970s. Chapter 4 also shows how deficiencies in these two areas, knowledge and resources, were interlinked. The first section of Chapter 4 explores the knowledge deficiencies and how the WHO, in collaboration with other international organisations and with nations, sought to address these issues. It analyses the WHO surveys undertaken in 1962/63 and 1970 alongside WHO attempts to collect information on an annual basis from 1971. This will reveal how the construction and results of the surveys shaped the definition of the water (and later sanitation) problems as well as approaches suggested to resolve them between 1963 and 1975. The second

section focuses primarily on the resources deficiencies that came to light as a result of the information collected in the 1960s and early 1970s.

1. **Knowledge Deficiencies: Water Surveyed**

Deficiencies in knowledge about the relationship between water and health took two main forms. Firstly, whilst it was known that there was a deficiency in access to water supplies in many countries across the world, the absence of quantitative data meant that the extent and nature of the issue was still unknown in the early 1960s. International organisations wanted to prioritise the distribution of their resources based on greatest need and based on the capacity of countries to absorb and use resources effectively. This required the collection of basic data, even if estimated, which would then provide a loose baseline for assessing need and capacity. Future progress or regression could then be measured from this point. Yet, how would the parameters agreed upon to define progress and regression affect understandings of, and approaches to, resolving the water and sanitation problem?

Secondly, newly acquired knowledge reinforced or challenged previous understandings: it either provided further evidence to support current understandings of the water problem or highlighted knowledge deficiencies that needed to be addressed. Data collection efforts focused first and foremost on the number and percentage of people served with water supplies, which reinforced target-driven approaches reliant on quantitative evidence. In the 1960s the environmental impacts of health and development interventions were carefully examined at national and international levels. For example, it was well known by the 1960s that the development of irrigation schemes created favourable environments for disease vectors to flourish. Without infrastructural developments, such as the provision of safe water supplies and basic health services, the socio-economic benefits of such schemes would not be realised. Furthermore, the use of DDT and other chemicals, which were deemed cost-effective methods to control malaria and other vector-transmitted diseases in the aftermath of the Second World War, came under scrutiny. Rachel Carson's *Silent Spring* in 1962, for

example, was one such publication that highlighted the environmental impacts of pesticides and challenged WHO approaches to disease control and eradication.²

So, how would these knowledge deficiencies be addressed? During the 1960s the primary action taken was to better understand the water problem through: surveys; the collection, collation and analysis of information; and the wide dissemination of results. The WHO's role in collecting information on water supplies was agreed upon at the ACC sub-committee on water resources in 1957.³ The WHO was established as the primary agency for collecting data on water quality and the human use of water. It was also a collaborating agency for data collection on water flow, geo-physical data, and water drilling.⁴ The WHO utilised lengthy questionnaires sent to national governments often via regional offices.⁵ Other organisations, such as UNICEF and the United Nations Development Programme (UNDP), also gathered data on both countries and sectoral investment in water, as did individual researchers and research groups.⁶ Alongside this, the UN and World Bank gathered extensive statistics relating to

² E. B. Worthington, *The Ecological Century: A Personal Appraisal* (Oxford: Clarendon Press, 1983), 180. Rachel Carson, *Silent Spring* (London: Penguin Books, 2000), first published in America by Houghton Mifflin in 1963.

³ Fourth ACC Interagency Meeting International Cooperation with Respect to Water Resources: *Report of the WHO Representatives at the Fourth ACC Interagency Meeting International Cooperation with Respect to Water Resources, UN Headquarters: 25-27 November 1957*, WHO Archives, W2/86/2 (4).

⁴ See Appendix F, 335; Fourth ACC Interagency: *Report of the WHO Representatives, 25-27 November 1957*, WHO Archives, W2/86/2 (4).

⁵ The results of which can be found in: Dieterich and Henderson, *Urban Water Supplies in Seventy-Five Developing Countries*; C. S. Pineo (Consulting Engineer) and D. V. Subrahmanyam (Sanitary Engineer), *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary* (Geneva: WHO, 1975), accessed July 14, 2018, <https://www.ircwash.org/resources/community-water-supply-and-excreta-disposal-situation-developing-countries-commentary>.

⁶ For example, for UNICEF, see Martin G. Beyer, *Water and Sanitation in Unicef 1946-1986* (New York: UNICEF, 1987), accessed July 14, 2018, <https://www.ircwash.org/sites/default/files/UNICEF-1987-Water.pdf>; Michel G. Iskander, *UNICEF in Africa, South of the Sahara: A Historical Perspective* (New York: UNICEF 1987), accessed July 14, 2018, <https://www.unicef.org/about/history/files/CF-HST-MON-1986-006-africa-south-sahara-mono-VI.pdf>; Michel G. Iskander, *UNICEF in the Middle East and North Africa: A Historical Perspective* (New York: UNICEF, 1989), accessed July 14, 2018, <https://www.unicef.org/about/history/files/CF-HST-MON-1989-001-middle-east-north-africamono-XII.pdf>. For the UN System as a whole: Maggie Black, *Learning What Works: A 20 Year Retrospective View on International Water and Sanitation Cooperation, 1978-1998* (Washington: UNDP/World Bank, 1998), accessed Nov 27, 2018, <http://documents.worldbank.org/curated/en/703661468326369198/pdf/multi-page.pdf>. For research on domestic water use in East Africa see White, Bradley, and White, *Drawers of Water*.

national GNP/GDP, access to education, mortality rates, and more.⁷

Commentators were then able to use water supplies and sanitation data both separately and alongside other social and economic indicators to enhance understandings of the problem.⁸ Questions remained about: the usefulness of the data in raising awareness of the problem; how the data would be used to shape knowledge about the water problem; and whether the data could be used to substantiate the connections between water and health.

Until the publication of Bernd Dieterich and John Henderson's *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries* in 1963 the extent of the water problem was assumed rather than known.⁹ Before this, as intimated earlier, there was a widespread belief that both the absence and presence of water impacted levels of health and development (as an impediment or a facilitator) but data that displayed direct correlations was unavailable, particularly for developing countries. The lack of precision in the use of concepts, and the propensity of organisations to adjust the meanings of, for example, "reasonable" access to water or "urban" water supplies, meant that there was not only an issue in quantifying and resolving the water problem but also in defining what it looked like at any given time or place.¹⁰ Cairncross aptly described this:

the very different definitions of what is 'reasonable' and what is 'safe' were used in different countries. The variation in definition is not the result of bureaucratic whims, but reflects the fact that the standard of adequacy for a water supply depends on the purpose it is intended to serve.¹¹

It also depended on the value placed on the different purposes water served and whether water supplies were serving urban or rural communities. For example, in the 1960s and 1970s national and regional comparisons were complicated due to the lack of consistency over definitions of urban and rural areas.¹² In the 1970

⁷ The World Bank, "IBRD and IDA," accessed July 14, 2018, <https://data.worldbank.org>; *IDA in Retrospect: The First Two Decades of the International Development Association* (Oxford: Oxford University Press, 1982): for detailed statistics see 83-133.

⁸ For example, see Richard Feachem, Michael McGarry and Duncan Mara, ed., *Water, Wastes and Health in Hot Climates* (Chichester, New York, etc.: John Wiley & Sons, 1977).

⁹ Dieterich and Henderson, *Urban Water Supplies*, 1963.

¹⁰ Cairncross, "Domestic Water Supply in Rural Africa," 46.

¹¹ Cairncross, "Domestic Water Supply in Rural Africa," 46.

¹² Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 6.

questionnaire reasonable access to water supplies in urban areas was regarded as “a house located not farther than 200 metres away from a public fountain or standpost.”¹³ The definition of reasonable access was vague for rural areas. It was phrased as ensuring “the housewife or members of the household do not have to spend a disproportionate part of the day in fetching the family's water needs.”¹⁴ No clarity was provided over what constituted a disproportionate length of time. Consequently, measurements of change across time—whether progress or regression—were problematic. In the 1960s and 1970s it was difficult to ascertain how much change was due to progress or regression in people's access to water supplies and sanitation facilities as compared with how much change was due to discrepancies in the definitions of urban and rural areas and reasonable access to water.

Nevertheless, Dieterich and Henderson's “comprehensive analysis”—the first of its kind regarding the comparative condition of water supplies in developing countries—highlighted the immensity of the task at hand in urban areas.¹⁵ Gathering data from seventy-five countries, Dieterich and Henderson revealed the number and percentage of urban populations served with piped water supplies and public standpipes in 1962.¹⁶ In Uganda, for example, 20 percent in urban areas had access to water piped into their homes and 40 percent had access from public standpipes.¹⁷ Overall, 60 per cent of the urban population in Uganda were served with water supplies. In Sudan, 30 percent of the urban population had water piped into their homes and 60 percent had access from public standpipes. This totalled 90 percent of the urban population served, the highest in Sub-Saharan Africa.¹⁸ In the Sub-Saharan Africa region as a whole 51 percent of the urban population were served.

There was a clear emphasis on the urgent need to address the water problem in the countries surveyed particularly in light of population growth. From

¹³ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 6.

¹⁴ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 6.

¹⁵ Dieterich and Henderson, *Urban Water Supplies*, 1963, 7.

¹⁶ Dieterich and Henderson, *Urban Water Supplies*, 1963, Annex 3 and Annex 4, 78-85.

¹⁷ In Uganda, 90,000 people had access to water in urban areas: 30,000 through water piped into homes and 60,000 had access from public standpipes. Dieterich and Henderson, *Urban Water Supplies*, Annex 3, 79.

¹⁸ In Sudan, 950,000 people had access to water in urban areas: 310,000 through water piped into homes and 640,000 from public standpipes. Dieterich and Henderson, *Urban Water Supplies*, Annex 3, 79.

the data, current and future projections of needs were plotted based on estimated population growth between 1962 and 1977; this included the approximated overall costs as well as the GNP annual average percentage cost based on 1960 rates.¹⁹ For Sub-Saharan Africa, the average annual cost as a percentage of 1960 GNP for future (1977) urban water needs was 0.22 percent, the fourth lowest of the regions surveyed.²⁰ This made it possible for international organisations and other donors to better estimate the costs of investing in different regions.

Despite the significant efforts on the part of international organisations and governments to collect the data, Dieterich and Henderson were all too aware of its limitations. Their report had brought the problem to the forefront of international attention, provided greater clarity on the extent of the water problem, and highlighted the gaps in current knowledge. While Dieterich and Henderson's study had more clearly defined the water problem, the survey only covered urban areas in developing countries and excluded mainland China amongst other nations. This left a large proportion of urban water supplies and most rural water supplies in developing countries unsurveyed. Given that the majority of the populations in these resided in rural areas, Dieterich and Henderson's survey represented only the beginning of more concerted efforts to understand and define the water problem (as they were acutely aware).²¹ This was evident in the seven pages they dedicated to consideration for future studies.²² Yet, as chapter 3 concluded, Dieterich and Henderson also noted that the problem was no longer the tendency to do nothing. So, what was holding back investment in water supplies and sanitation? In part the answer lay in the continued belief that more knowledge was needed to effectively address the problem and to enable decision making about where resources should be directed first. There was a keenness, particularly on the part of the WHO and its regional offices, to build upon the foundational knowledge that was collated and analysed by Dieterich and Henderson.²³

¹⁹ Dieterich and Henderson, *Urban Water Supplies*, Annex 3 and Annex 4, 78-85.

²⁰ Dieterich and Henderson, *Urban Water Supplies*, 57. Only Temperate South America (0.11), South-West Asia (0.17), and South-Central Asia (0.20) boasted lower percentage GNP cost.

²¹ WHO, *The First Ten Years of the World Health Organisation*, (Geneva: WHO, 1958), 299, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/37089>.

²² Dieterich and Henderson, *Urban Water Supplies*, Annex 5 and Annex 6, 86-92.

²³ Dieterich and Henderson, *Urban Water Supplies*, Annex 1-3; also, on pages 42 and 43 Dieterich and Henderson diagrammed the additional water service needs due to urban population growth 1962-1977 to show the urgency of addressing this issue.

Following the establishment of the WHO's community water supply programme in 1959, focus was firmly on the water problem. This section shows the shift towards consideration of water and sanitation problems as a pair. The initial problem (water), as it was conceptualised, was exacerbated by the increasing number of people requiring access to water.²⁴ Water, and later sanitation, were issues because of their impact on health and economic development.²⁵ According to the WHO's Director General, the requirements to resolve this problem were: the systematic collection of data; a national policy; effective legislation; a focus on economic development in order to gain political backing; an effective water authority (or better coordination); local involvement; appropriate technology; capital financing; training; and external investment.²⁶ This was no small undertaking, such was the nature of the knowledge deficiencies regarding the water problem at that time.

The rest of this section focuses on how the WHO looked to continue efforts through the creation, analysis, and dissemination of information about water supplies and sanitation. It explores the kinds of knowledge that the WHO was particularly interested in gathering and the challenges faced in the process of collecting and comparing information. To do this, it draws upon discussions about water and health as WHO officials planned for the Seventeenth, Nineteenth, and Twenty-first World Health Assemblies (WHA). For the Seventeenth WHA member states were encouraged to submit information to their regional office's concerning the present water supplies conditions, future needs, progress in the development of community water supplies programmes, and the impact of water supplies on health and economies.²⁷ This section utilises progress reports, written by the WHO's Director-General, Dr. Marcolino Candau, that synthesised the information

²⁴ M. Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 6 December 1963 (corrigendum 24 December 1963), WHO, accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/136814>.

²⁵ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 6 December 1963.

²⁶ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 6 December 1963.

²⁷ WHO (EMRO), *Drinking Water, People and the Better Life*, 15 April 1963; WHO (AFRO), *The Community Water Supply Programme in the African Region: a Report on the Present Situation with regard to Community Water Supplies in Africa, South of the Sahara, with recommendations for the expansion of the programme*, 19 August 1963, WHO Archives, Third Generation, W2-180-6, Community Water Supply: Preparation of Report for 17th World Health Assembly: World Health Organisation Regional Office for Africa.

collected between 1959 and 1972.²⁸ It notes the role of seminars and expert committees and particularly draws from the results of the WHO's first meeting of the expert committee on community water supplies at the end of 1968; this committee marked the first ten years of the WHO's community water supplies programme.²⁹ Finally, it addresses the collection of data for the WHO's second global survey in the early 1970s and for annual surveys thereafter.

Evidence was often stacked up in formulaic fashion as WHO officials sought to improve understandings of the water problem. Firstly, the problem of water was stated and defined: a large proportion of people in developing countries did not have access to adequate water supplies. Then, in varying orders, four further points were discussed: water was recognised as important for economic development and health, with the umbrella term 'socio-economic development' increasingly used to encompass both; the connection between population increases and a growing demand for water were pointed out; the aims and goals of current and future programmes were addressed through discussions of ways in which the water problem could be resolved and when; and reasons were given as to why the problem had not been addressed, such as the obstacles to development, which were often in the form of resource limitations (financial, personnel, materials).

²⁸ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 6 December 1963; M. Candau, *Community Water Supply Programme: report by the Director-General*, World Health Assembly, 17, (Geneva: WHO, 31 January 1964), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/136486>; M. Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 37, (Geneva: WHO, 15 December 1965), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/143612>; M. Candau, *Community Water Supply Programme: report by the Director-General*, World Health Assembly, 19, (Geneva: WHO, 29 April 1966), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/137302>; M. Candau, *Community Water Supply Programme: Progress report by the Director-General*, World Health Assembly, 21, (Geneva: WHO, 25 April 1968), accessed Aug 1, 2018, <http://www.who.int/iris/handle/10665/143496>; M. Candau, *Community Water Supply Programme: Progress report by the Director-General*, World Health Assembly, 23, (Geneva: WHO, 10 April 1970), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/144979>; M. Candau, *Community Water Supply Programme: Progress report by the Director-General*, World Health Assembly, 25, (Geneva: WHO, 25 April 1972), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/145477>.

²⁹ WHO Expert Committee on Community Water Supply and World Health Organisation, *Community Water Supply: Report of a WHO Expert Committee [meeting held in Geneva from 29 October to 4 November 1968]*, WHO Technical Report Series, No. 420, (Geneva: WHO, 1969), accessed Jan 31, 2020, <https://apps.who.int/iris/handle/10665/40740>; Africa – Eastern Mediterranean Seminar on Community Water Supply held in 1961.

For example, following on from Dieterich and Henderson's publication, both the EMRO and AFRO, the regional offices for Sudan and Uganda respectively, recognised water as a problem or problems in 1963. Their experiences highlighted the extent and type of problems that water presented and their responses were later utilised at the Seventeenth World Health Assembly. The EMRO committee referred to "the problems of water" as "manifold" and remarked strongly that "there is no more pressing problem in this entire Region than this one of domestic water supply, and none which has greater impact upon every person within it."³⁰ AFRO echoed these concerns and described the "lack of safe and adequate provision of water supplies to the majority of the 'Africa south of the Sahara' population" as the "main and first problem [...] in the environmental health field." In second place was the "lack of sewerage and sanitary disposal of human waste."³¹

EMRO and AFRO, however, had differing outlooks on the impact of population growth. EMRO commented that "the situation becomes even more dismal when we look toward the future, particularly in light of population growth."³² The percentage population increase (3.5 percent) was compared with the percentage increase in those supplied by clean piped water (0.1 percent) in EMRO's "most populous country" and the following question was posed: "What can be the consequences of population growths 35 times the rate at which they can be provided with clean water to drink?"³³ AFRO discussed the problem but with less apparent urgency.³⁴ Population projections were stated as fact—a population increase of 35 million inhabitants expected by 1970—with no comment on the possible future implications on the provision of water supplies. AFRO's regional director commented on the gravity of the situation, stating that, "in the field of environmental health, there has been a multiplication of problems, because of the exceedingly rapid extension of population and the rapid growth of towns."³⁵

³⁰ WHO (EMRO), *Drinking Water, People and the Better Life*, 1.

³¹ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6, 1.

³² Labelled "alarming" in some countries, and "wild" in general: WHO (EMRO), *Drinking Water, People and the Better Life*, 3.

³³ WHO (EMRO), *Drinking Water, People and the Better Life*, 3.

³⁴ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6; WHO (EMRO), *Drinking Water, People and the Better Life*, 3.

³⁵ Annex 1: Speech by the Regional Director, *Report of the Director-General on the Thirteenth Session of the Regional Committee for Africa*, 5, WHO, Executive Board, 33, 1963, accessed Aug 1, 2018, <http://www.who.int/iris/handle/10665/136811>.

The future was viewed optimistically, however, providing “enough money were available.”³⁶

Both EMRO and AFRO were keen to highlight that without water both economic progress and health improvements were stunted and capped.³⁷ EMRO and AFRO respectively noted “the great waves of urbanisation and industrialisation” and the “very fast process of urbanisation and economic development.”³⁸ Although AFRO emphasised the embarkation “on ambitious development projects aimed at diversifying economies”, greater emphasis was placed on the importance of water in relation to industrialisation than on its influence on other forms of economic development.³⁹ EMRO also remarked on the relationship between water and industrial developments but was keen to question the belief in the “almost magical” benefits of industrialisation.⁴⁰

EMRO and AFRO addressed the relationship between water and health. Their comments suggested that the problem was not knowledge but other constraints. AFRO noted the “wealth of information” that demonstrated the importance of water supplies in preventing a variety of diseases and in working towards the WHO’s goal of “a complete state of physical mental and social well-being.”⁴¹ AFRO was keen to highlight that most governments in Africa “fully recognise[d] the importance of water supplies as a necessary socio-economic development” and noted that the primary constraint to progress was not lack of knowledge but lack of finances.⁴² Moreover, water supplies projects were not as competitive as other industrial development projects.⁴³ EMRO remarked that:

³⁶ Annex 1: Speech by the Regional Director, *Report of the Director-General on the Thirteenth Session of the Regional Committee for Africa*, 5.

³⁷ WHO (EMRO), *Drinking Water, People and the Better Life*, 6; WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6.

³⁸ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6, 2; Appendix A of the same document has two tables of data relating to urban population growth and water supplies.

³⁹ *The Community Water Supply Programme in the African Region*, W2-180-6, 2.

⁴⁰ WHO (EMRO), *Drinking Water, People and the Better Life*, 6.

⁴¹ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6, 3.

⁴² WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6, 3.

⁴³ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6, 3.

One sometimes wonders whether he reaches the point of diminishing returns by recalling the hazards [of the relationship between water and disease]. Deaf ears are turned and people continue to suffer massive sickness and death.⁴⁴

These statements suggested that the relationship between water and disease was known but that the problem was translating this knowledge into action. Despite admirable efforts there still appeared to be a disconnect between the acquisition of knowledge and its effective utilisation in the development of community water supplies programmes in the late 1960s. This disconnect was again emphasised in comments made in 1968, which highlighted the need to act on available knowledge as well as to continue fundamental research into the water and sanitation problems.⁴⁵

On the other hand, as Abel Wolman stated at the Seventeenth World Health Assembly in 1964, the availability of concrete, quantitative, and undeniable evidence was still limited: “unfortunately very little information was available to make a factual evaluation possible.”⁴⁶ So, what was the problem? Lack of knowledge or other resource constraints? H. G. Baity (former director of the WHO’s environmental sanitation division) highlighted that even when the problem was better known the best installation and maintenance methods were still debated.⁴⁷ Candau also supported Wolman’s comments in two progress reports published in 1966 and 1968.⁴⁸ Both reports, almost word for word, referenced the “initial stages” (1959-1963/64) as focused on “the definition of problems and needs on a global scale” or as “defining the problem on a world-wide basis.”⁴⁹ Candau then referred to Dieterich and Henderson’s 1963 study, regarded as the

⁴⁴ WHO (EMRO), *Drinking Water, People and the Better Life*, 15 April 1963, W2-180-6, 3

⁴⁵ WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*, 1969, 16.

⁴⁶ Abel Wolman, *Report on the Technical Discussions at the Seventeenth World Health Assembly on “the influence of community water supply programmes on health and social progress,”* World Health Assembly, 17, 1964, 7.

⁴⁷ Baity, “Community Water Supply in Developing Countries,” 59-66.

⁴⁸ Candau, *Community Water Supply Programme: report by the Director-General*, WHA, 19, 1966; Candau, *Community Water Supply Programme: Progress report by the Director-General*, WHA, 21, 1968.

⁴⁹ Candau, *Community Water Supply Programme: Report by the Director-General*, WHA, 19, 1966, 4; Candau, *Community Water Supply Programme: Progress report by the Director-General*, WHA, 21, 1968, 1.

culmination of these early efforts, as providing “for the first time an indication of the magnitude and complexity of the task confronting developing countries.”⁵⁰

The citation of, and remarks on, Dieterich and Henderson’s survey also reiterated two important points that shaped the nature of the community water supply programme as it proceeded through the 1960s, 1970s, and 1980s. Firstly, the provision of water supplies on a large-scale was a difficult endeavour given the scale of the task and the limited data available. As such, WHO officials and member states resolved to collect further information and discussed how best to proceed as the community water supplies programme entered its second decade. In addition to the systematic collection of data WHO officials argued that further research was required into water technologies, design and maintenance improvements, research into how to best utilise local materials and techniques, improved design guidelines, and a greater understanding of “attitudes, traditions, and taboos.”⁵¹

Secondly, while the Community Water Supply Programme was designated a global venture, the WHO’s early efforts were “‘pinpointed’ rather than universal.”⁵² Candau’s reports in 1966 and 1968 had confirmed that the 1963 publication, alongside discussions between 1962 and 1964, had resulted in a clearer definition of the water problem than at the time of the WHA 12.48 Resolution in 1959.⁵³ However, there were still significant knowledge gaps and concerted action was limited. In admitting to a pinpointed programme Candau was adamant that more information was needed to make better progress.

The final part of this section explores how the form that questionnaires took in the early 1970s shaped perceptions of the water and sanitation problems. As discussed earlier, the first survey in the 1960s focused on urban populations and included data on those served and unserved. In addition, estimates of population growth and construction costs were used to gauge present (1962) and future

⁵⁰ Candau, *Community Water Supply Programme: Progress report by the Director-General*, WHA, 21, 1968, 1.

⁵¹ WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*, 16, 17, 18, 20.

⁵² Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 1963, 20.

⁵³ Candau, *Community Water Supply Programme: report by the Director-General*, WHA, 19, 1966; Candau, *Community Water Supply Programme: Progress report by the Director-General*, WHA, 21, 1968; Dieterich and Henderson, *Urban Water Supplies*, 1963; WHO (EMRO), *Drinking Water, People and the Better Life*; WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6; Wolman, *The Influence of Community Water Supply Programmes on Health and Social Progress*, 1964.

(1977) needs. Dieterich and Henderson also included extensive suggestions for further data collection. These considerations included questions about the general conditions of supplies in urban and rural areas: whether conditions were generally deemed satisfactory and whether enough was being done to close the current gap and to match increasing demands. These early questions were largely subjective. Dieterich and Henderson then suggested that data were collected on: the number of people supplied with piped water; the size of communities being supplied; the per capita water consumption; construction costs; past and proposed investment in waterworks construction, extension and modification; water charges; and sources of revenue from water supplies.⁵⁴ For reporting on community water supplies twelve items of technical data were proposed alongside eight items of economic data and four relating to personnel. Under technical data suggestions included: whether water was used for domestic, industrial, or agricultural purposes (noted in that order); the number of people served and unserved; types of water sources and water treatment methods; and water quality.⁵⁵ Under economic data: the original value of existing works and their annual depreciation; annual costs; investment required; and present debts and interest rates on loans.⁵⁶ Under personnel, suggestions were made to differentiate the types of personnel required: from skilled and semi-skilled labour to management roles.⁵⁷ The collection of such data for many countries was unrealistic. Even with considerable efforts on behalf of the national departments responsible for water and WHO regional offices it would be difficult to gather this extensive information.

While the WHO survey in 1970 comprised a larger data pool and included additional aspects—most importantly the inclusion of data on sanitation and the conditions in rural areas—many of Dieterich and Henderson’s suggestions for further data collection were either not incorporated into the questionnaires or were simplified. Seven aspects were focused upon in the WHO’s Global Survey in 1970.⁵⁸ Firstly, progress between 1962 and 1970 regarding (urban) community water supplies was assessed. Secondly, data was collected on current water supplies and sanitation conditions in both rural and urban areas. Thirdly, targets

⁵⁴ Dieterich and Henderson, *Urban Water Supplies*, 87-90.

⁵⁵ Dieterich and Henderson, *Urban Water Supplies*, 91.

⁵⁶ Dieterich and Henderson, *Urban Water Supplies*, 91-92.

⁵⁷ Dieterich and Henderson, *Urban Water Supplies*, 92.

⁵⁸ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 8, 9, 12, 14, 15, 18, 20, 21, 22, 32, 33, 36-41.

were detailed alongside the estimated costs to reach them (accounting for population growth). It was hoped that the extension of data collection along these first three lines would provide unequivocal proof that there was a great need for investment in water supplies and sanitation facilities. Fourthly, constraints in developing water supplies and sanitation facilities, such as internal and external investment (finances and material), training needs, and further research requirements were addressed. In asking member states to detail the main constraints to their own development of water supplies and sanitation facilities it was hoped that efforts could be directed towards overcoming the biggest obstacles at national, regional, and international levels. Fifthly, information was collected on the agencies responsible for water supplies and sanitation. In understanding how governments handled water and who was responsible for the different aspects of water supplies development it was hoped that institutional issues could be addressed more effectively. Sixthly, data were collected on water quality surveillance, including the impact of pollution by sewage or industrial wastewater. The collection of data on the environmental impacts of poor sewage and wastewater disposal reflected the rising concern for the environment. While environmental data were not analysed in the WHO-commissioned report published in 1975, the WHO followed this up with the establishment of its Human Environment Programme. Seventhly, information was collected on the daily consumption of water. This would enable governments to estimate needs more accurately.

Keen to update Dieterich and Henderson's findings through the dissemination of the information collected for 1970, the WHO commissioned a report to address progress and prospects in the development of water supplies and sanitation facilities.⁵⁹ The WHO wanted to ensure that the report was easily digestible and was relevant to the needs of those countries looking to improve water supplies and sanitation facilities. The first draft, written by consulting engineer Charles Pineo, was heavily critiqued for being "too dry" and "quite

⁵⁹ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*. C. S. Pineo was a consulting engineer in the United States and D. V. Subrahmanyam was a sanitary engineer attached to the WHO's community water supply and sanitation programme (Environmental Health) See B. Dieterich (Director of Environmental Health Division) to Charles S. Pineo, Letter, 6 November 1974, WHO Archives, W2/418/11 (72), JKT 8, Progress Report on CWSS Program to the 25th World Health Assembly 1972, 1972-1975.

inadequate.”⁶⁰ The Regional Director of the South East Asia Regional Office (SEARO) was pleased that Pineo had prepared a “valuable document” but raised concerns that it was far from “comprehensive.”⁶¹ Suggestions were made to incorporate more information on government inputs, which it was argued were “far greater than those provided by international organisations”: this was not followed up at any great length.⁶² A second issue was that the data collected by the WHO for the survey were still insufficient and it was therefore advised that the WHO liaise with the World Bank for information on the ratio of investment in water supplies with total public sector investment in water.⁶³ To improve upon Pineo’s original draft, D. V. Subrahmanyam was called upon to complete the document such that it could be made available for the preparation of the UN Water Conference due to be held in 1977. *Community Water Supply and Excreta Disposal Situation in the Developing Countries: A Commentary* was eventually published in 1975. It was an important document because the data analysed would be used to form the basis of international, regional, and national engagements with water supplies and sanitation in the 1970s and 1980s.

The definition of the water and sanitation problems in the 1970s revolved around the four aspects that Pineo (engineer) and Subrahmanyam (sanitary engineer) focused upon: current conditions, progress, targets, and constraints. Despite the unreliability of much of these data, the focus on the number and percentage of people served and unserved (current conditions, progress made and targets) consolidated target-driven approaches. There was, however, a greater emphasis on understanding the various factors constraining the development of water supplies and sanitation facilities in different regions, which both consolidated and challenged approaches in the 1970s. This is addressed in more detail in the second section.

⁶⁰ Dieterich to Pineo, Letter, 6 November 1974, W2/418/11 (72).

⁶¹ SEARO Regional Director to Chief of Community Water Supply HQ, Memorandum, 1 October 1974, WHO Archives, W2/418/11 (72).

⁶² SEARO Regional Director to Chief of Community Water Supply HQ, Memorandum, 1 October 1974, WHO Archives, W2/418/11 (72).

⁶³ Luis A. Orihuela (Chief of the Community Water Supply Division of Environmental Health) to Harold Shipman (Water Supply Adviser, Public Utilities Department, IBRD), Letter, 18 October 1974, WHO Archives, W2/418/11 (72); Phyllis Peter (Staff Assistant Public Utilities Department) to Luis Orihuela (Chief of the Community Water Supply Division of Environmental Health), Letter, 18 November 1974, WHO Archives, W2/418/11 (72).

An examination of, firstly, the water supplies data collected regarding Uganda and Sudan and, secondly, the regional differences when water supply and sanitation data are compared, highlights some of the data collection challenges. Water supplies data in Uganda and Sudan (Table 4.1) highlighted the different experiences of these two nations. The data suggested that Sudan was struggling to keep up with demand due to population increases, that the information collected was inaccurate, or both. Whilst an added 840,000 were served with water supplies in 1970 than in 1962 the percentage of the urban population served dropped from

Table 4.1: Percentage and Number of People (No. '000) Served Water Supplies in Uganda and Sudan 1962 and 1970

		Sudan	Uganda
Urban Served 1962	%	90	60
	No. '000	310	90
Urban Served 1970	%	72	89
	No. '000	1150	616
Rural Served 1970	%	12	20
	No. '000	1800	1600
Total Served 1970	%	18	25
	No. '000	2950	2216

Source: Pineo and Subrahmanyam, Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary, 36-38, 39-41.

90 percent to 72 percent. Uganda, on the other hand, had improved access to water supplies in urban areas both in the number and percentage of the population served. Sudan was ahead in terms of the number of people served with water supplies in rural area (200,000 more than Uganda). The immensity of the water provision task in Sudan was highlighted, however, in the percentage of people served in rural areas: 12 percent to Uganda's 20 percent.

The inclusion of sanitation within the questionnaire sent out in 1970 represented the WHO's move back towards consideration of water and sanitation as a pair rather than treating them separately.⁶⁴ Sanitation took a back seat when

⁶⁴ WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*, 13. Noting the importance of combined water and sewerage schemes.

the Community Water Supply Programme was established. Addressing the slow progress in environmental sanitation in 1959, Candau proposed a “focus upon a programme to bring to the houses of the people of the world safe drinking water in ample quantities,” which, “may produce a greater reduction in the gastro-intestinal diseases than the past ten years have unfortunately failed to accomplish.”⁶⁵

Candau also pointed out that matters regarding sanitation would still be attended to but that they would be, for a time at least, of secondary concern. Lanoix commented in a similar manner: “the emphasis had shifted to community water supplies” and broader environmental sanitation activities took place in the background.⁶⁶ One of the reasons for this prioritisation was that governments were more inclined to support water supplies developments, which was highlighted by the fact that fewer countries replied to the sanitation sections of the 1970 questionnaire. The unreliability of the sanitation data led Pineo and Subrahmanyam to focus their analysis almost exclusively on water supplies.⁶⁷

It is useful, however, to analyse the data to highlight this unreliability as well as to show the priorities different regions gave to sanitation. There were some stark contrasts within, as well as across, regions. The data reveal that the American Regional Office (AMRO) led the way overall, with high numbers (Figure 4.1) and percentage (Table 4.2) served comparative to the other regional groupings. Though the South-East Asia Regional Office (SEARO) had equally high numbers of people served (Figure 4.1, p. 248), percentage coverage was much lower. Table 4.2 and Figure 4.1 also show that in all but two regions the percentage of population with access to water supplies was higher than that of excreta disposal. A more detailed look at the national figures reveals that the anomalies are explainable based on data from three nations: Uganda and Kenya (AFRO) and Iran (EMRO). In AFRO, Uganda and Kenya’s excreta disposal coverage combined constituted 69 percent of the region’s total. In Uganda 7,591,000 were served, in Kenya 5,559,000 were served, and the rest of the nations in the region combined totalled 5,970,000 served.

⁶⁵ WHO, *The Work and Achievements of WHO in Environmental Sanitation and Proposals for a Future Programme: report of the Director-General*, World Health Assembly, 12, (Geneva: WHO, 1959), 4, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/110777>.

⁶⁶ Joseph Lanoix and WHO, *Action for Environmental Health, WHO says* (Geneva: WHO, 1988), 2, accessed July 16, 2018, <http://www.who.int/iris/handle/10665/62384>.

⁶⁷ Pineo and Subrahmanyam, *Community Water Supplies and Excreta Disposal Situation in Developing Countries: A Commentary*, 5.

*Table 4.2: Regional Percentages with Reasonable Access to Water Supplies and Excreta Disposal Compared.*⁶⁸

Region	Water supplies access (%)	Excreta disposal access (%)
Africa South of the Sahara (AFRO)	21	22
Latin America and the Caribbean (AMRO)	53	46
West Asia and North-East Africa (EMRO)	37	40
Algeria, Morocco and Turkey (EURO)	55	19
South-East Asia (SEARO)	17	16
East Asia and Western Pacific (WPRO)	40	31
Overall Access	29	25

Source: Pineo and Subrahmanyam, Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary, Annex 2: 36-38; Annex 3: 39-41.

Similarly, in EMRO, Iran accounted for 53 percent of the total number of people served with excreta disposal facilities. Moreover, according to the data, 92 percent of those served within Uganda (and 80 percent of those in Kenya) with excreta disposal facilities were situated in rural areas. Surveyed data did not include information on access to sanitation facilities in Sudan.

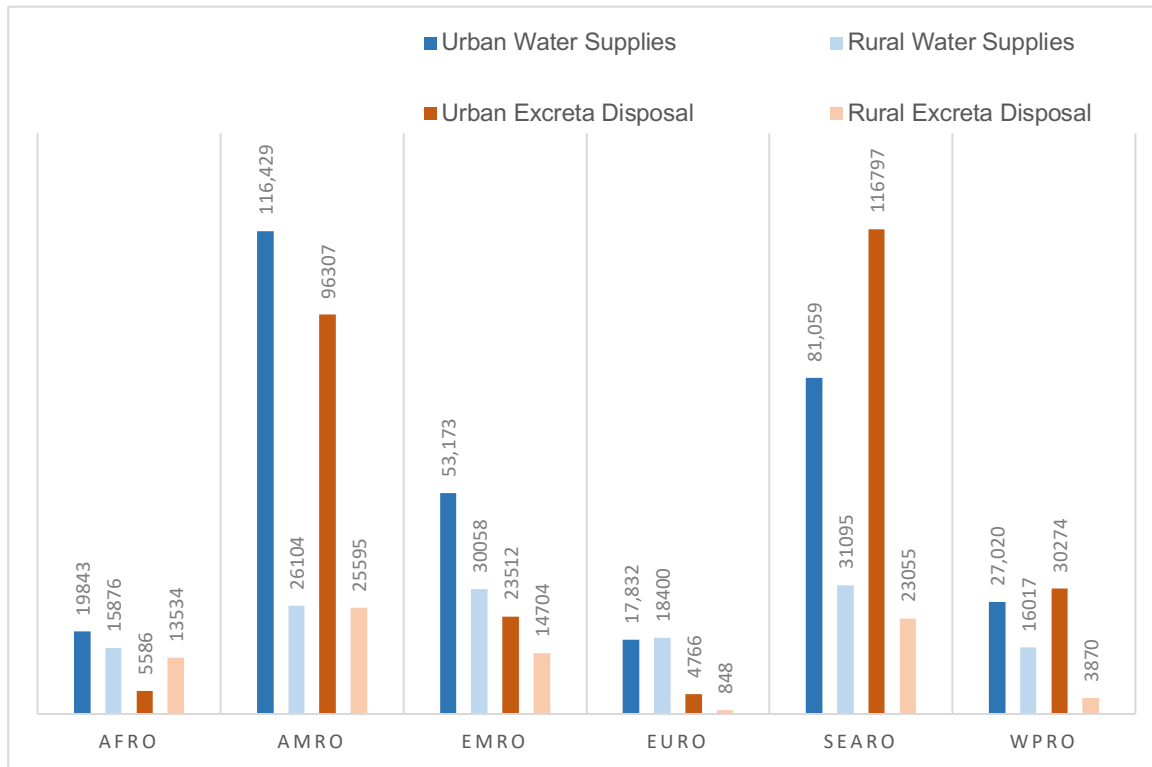
Further to this, Appendix G shows whether the countries in EMRO and AFRO replied to the questionnaire with water supplies data alone, sanitation data alone, or with both water supplies and sanitation data.⁶⁹ Out of AFRO's top eight in terms of numbers served with water supplies, only Uganda replied regarding sanitation. Given that the top eight accounted for 73 percent of the total population served in the region—27,338,000 of 37,514,000—this had a significant impact on the comparison of data across water supplies and sanitation.⁷⁰ In terms of percentage served with water supplies, three of the top eight replied to both

⁶⁸ In charts and texts, the different regions will be primarily referred to by their WHO regional groupings. E.g. "Africa South of the Sahara" is referred to as AFRO (African Regional Office), and so forth. AMRO: American Regional Office; EMRO: Eastern Mediterranean Regional Office; SEARO: South-East Asia Regional Office; and WPRO: Western Pacific Regional Office.

⁶⁹ Appendix G, 336.

⁷⁰ Appendix G, 336.

Figure 4.1: Water Supplies and Excreta Disposal Compared 1970 ('000)



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, Annex 2: 36-38; Annex 3: 39-41.

surveys (Zambia, Ivory Coast, Dahomey). In EMRO three of the top eight (numbers served) replied to the sanitation survey but this did not include the top two which accounted for over 45 million people and 52 percent of total served in the region. In terms of percentage served, none of the top eight replied in relation to sanitation.⁷¹ This highlights the limitations of the sanitation data.

Challenges in data collection were raised in greater detail in correspondence between the WHO’s Environmental Health Division and the WHO’s Regional Directors in 1972.⁷² Following on from the survey in 1970, the WHO was keen to collect data on an annual basis. The simplification of questionnaires proved necessary due to the difficulties that governments experienced in collecting the required information. The basic data for the annual survey focused on the progress achieved in urban and rural areas alongside the internal and external investment in water supplies and sanitation.⁷³ More extensive data collection was planned every five years (mid and end of decade). Yet even

⁷¹ Appendix G, 336.

⁷² Director of Environmental Health to Regional Directors AFRO, AMRO, EMRO, EURO, SEARO, WPRO, Memorandum, 9 May 1972, WHO Archives, W2/418/12.

⁷³ Annual National Data: Community Water Supply and Sewage Disposal, 1971, WHO Archives, W2/418/12.

the simplified survey drew concerns from the WHO's regional offices. It was feared that if too much information was requested on a regular basis that governments would "become annoyed."⁷⁴ Even with compromises, which had placed limits on the information requested, it was clear that water supplies data were still largely based on "estimates or enlightened guesses."⁷⁵ This was due in part to "the existence of many agencies responsible for the construction of water supplies in a country."⁷⁶ It required one ministry to take the lead to gather the "fragmented, partial information."⁷⁷

The capacity of governments to collect data significantly hampered effective evaluation and comparison. On 9 May 1972, the Director of Environmental Health, Bernd Dieterich, commented on the evaluation of the data collected for the year 31 December 1970 to 31 December 1971:

what the DG's [Director General, Candau] report says and also what it does not say are a result of the degree of detail and completeness of a good number of the questionnaire responses.⁷⁸

Four general observations were noted in this regard: questions were left blank, which consequently "made tabulation difficult"; coverage was incomplete (some countries responded with data from one or two provinces or from towns alone); some replies were "patently inaccurate"; and incorrect responses were evident.⁷⁹ Regarding the last observation, four reasons were posited. Firstly, that national governments had not paid sufficient attention to instruction. Secondly, governments had not understood the questions due to language barriers. Thirdly, the "ambiguity or inappropriateness" of the questions. Fourthly, the timing of data collection was an issue: population estimates were often mid-year, country

⁷⁴ Dr. S. Flache (Western Pacific Regional Office) to the WHO Director of Environmental Health, Memorandum, 1 June 1972, WHO Archives, W2/418/12.

⁷⁵ Bernd Dieterich (Director of Environmental Health) to the Regional Directors, "Situation reports on community water supply and sewage disposal," Letter, 1 August 1972, WHO Archives, W2/418/12, Also see further correspondence from this file including: EMRO to the Bernd Dieterich, "Situation reports on community water supply and sewage disposal," Memorandum, 27 June 1972 and AFRO to Bernd Dieterich, "Situation reports on community water supply and sewage disposal," Memorandum, 13 June 1972.

⁷⁶ Dieterich to Regional Directors, Letter, 1 August 1972.

⁷⁷ Dieterich to Regional Directors, Letter, 1 August 1972.

⁷⁸ Bernd Dieterich (Director of Environmental Health) to Regional Directors, "Situation Reports on Community Water Supply and Sewage Disposal," Letter, 9 May 1972, WHO Archives, W2/418/12.

⁷⁹ Dieterich to Regional Directors, Letter, 9 May 1972, WHO Archives, W2/418/12.

achievements were either calendar or financial year, and the water supplies and sanitation statistics were calendar year.

Dieterich was keen to gather thoughts from the regional offices on why there were large inconsistencies in the responses rather than rely on educated assumptions based on the challenges faced previously and on Candau's report: AFRO provided the most extensive feedback. AFRO highlighted difficulties in communication due to language barriers, the lack of qualified staff, and the lack of systematic data collection programmes.⁸⁰ Regarding the first issue, a French version of the questionnaire was requested but in 1972 only an English language version was available.

There were also problems of coordination between external organisations that invested in water supplies and sanitation and therefore it was difficult to collate this information as well as the data on local and national water supplies and sanitation conditions. Six suggestions were made for improvements to the questionnaire by AFRO.⁸¹ Firstly, that the questionnaire ask for national definitions of 'rural' and 'urban'. Secondly, that population growth was added to the survey. Thirdly, that focus should be given to the total number of people benefitting from water and sewerage facilities. The regional offices or WHO headquarters could then calculate additional population figures. Fourthly, AFRO suggested that there was clarification over the demarcation of contributions in cash and kind. Fifthly, that private development was included under a separate heading. Sixthly, that questionnaires should be split into two parts, one on urban and the other on rural, due to the "vast differences in character, approach, investment and magnitude of problems."⁸² Challenges in data collection "except possibly in countries where WHO engineers are assigned" was also noted as a key issue for EMRO and member states in the Western Pacific Regional Office (WPRO).⁸³ All but four of the community water supply questionnaires were reviewed (18 out of 22) by two WHO specialists in EMRO. Regarding sanitation, only six countries replied and all were reviewed. Here, there was a greater consistency in replies regarding water

⁸⁰ Dr. O. Adeniyi-Jones (Director of Services for the Regional Director) to Bernd Dieterich (Director of Environmental Health), Memorandum, 13 June 1972, WHO Archives, W-2-418-12.

⁸¹ G. Conejo (RA/EH for the Regional Director) to Chief of Community Water Supplies, HQ, Memorandum, 2 August 1972, WHO Archives, W2/418/12.

⁸² Conejo to Chief of Community Water Supplies HQ, Memorandum, 2 August 1972.

⁸³ Regional Director (EMRO) to Dr. A. S. Pavlov and for the attention of the Director of Environmental Health, Memorandum, 27 June 1972, WHO Archives, W-2-418-12.

supplies as compared with sanitation. WPRO also emphasised the inappropriateness of the questionnaires for their region as “much of the requested information are just not normally collected by governments.”⁸⁴

The responses from the regional offices confirmed Dieterich’s views on two of the reasons posited for incorrect responses: lack of understanding and the appropriateness of the questionnaires. Yet Dieterich was not eager to make significant changes to the questionnaires on account of the difficulties that governments faced in collecting data. Dieterich firmly believed, as did some of the regional offices, that despite these challenges it was important to continue efforts to collect the best information available, however basic, and to provide greater support to governments and regional offices in developing systematic data collection.

This section has argued that knowledge deficiencies significantly hampered attempts to define water and sanitation problems in the 1960s and 1970s in spite of concerted efforts to address such issues. In addition to challenges in basic data collection on access to water supplies and sanitation facilities, crucial information on the endemicity of water borne and water-related diseases and on water quality was consistently lacking.⁸⁵ Without this information, alongside poor knowledge of construction costs, it was difficult for governments to apply for financial and technical assistance from external agencies.

The forms that questionnaires and surveys took influenced how the water and sanitation problems were defined as did the responses received from governments and WHO regional offices. Dieterich and Henderson’s survey in the early 1960s did not address the constraints, other than financial, as feedback from regional offices about the challenges in developing community water supplies was not requested in detail until after their report was published. The limitations of the data collected in the early 1960s highlighted the need for further information, which was reflected in the more extensive questionnaires sent out in the early 1970s. It was becoming apparent that knowledge deficiencies were affected by resource deficiencies—lack of personnel, finances, and infrastructures. The greater emphasis on understanding the key constraints influenced the kinds of solutions

⁸⁴ S. Flache (WPRO) to Dieterich (Director of Environmental Health), Letter, 1 June 1972, WHO Archives, W2/418/12.

⁸⁵ Candau, *Community Water Supply Programme: Progress report by the Director-General*, World Health Assembly, 23, 10 April 1970, 14.

sought to improve access to water supplies and sanitation in the mid-1960s to early 1970s, as the next section explores.

2. **Resource Deficiencies: Obstacles and Constraints Defined 1963-1975**

Knowledge deficiencies influenced, and were influenced by, practical constraints. Those arguing that the problem was not lack of knowledge but lack of ability to act on available information tended to focus on the variety of constraints and obstacles hampering progress. We saw in Chapters 2 and 3 that between 1945 and 1963 the four factors perceived as hampering progress in the development of water supplies were finances, institutions, knowledge, and the effects of rapid population growth. We saw in the previous section of this chapter that the WHO took concerted action to address knowledge deficiencies, albeit with varying degrees of success. This section argues that resource deficiencies compounded the knowledge deficiencies discussed earlier. It compares the obstacles to water supplies development that EMRO and AFRO described in 1963 with the information gathered in the WHO's second survey in 1970. The 1970 survey collected information on the reasoning given for prioritising water supplies and sanitation as well as on key constraints. It then explores the interrelation of constraints and the difficulties that this presented in deciding which were the main issues.

Member states and WHO regional offices made clear to WHO Headquarters the challenges they faced in implementing water supplies programmes. In 1963 EMRO and AFRO described the “obstacles” or “deterrents” to progress (Table 4.3).⁸⁶ There was a large degree of overlap in factors hampering progress. Both EMRO and AFRO described insufficient finances (internal and external), water rates, personnel, and materials, as well as institutional issues of divided responsibilities across government departments. The main areas of overlap related to internal and external financing, fragmented institutional organisation and coordination problems, lack of trained personnel, and lack of materials. Other obstacles mentioned, such as the problems of scattered populations in rural areas (AFRO) and those specific to arid land (EMRO), revealed the differing experiences across the regions. While there was no overlap in reporting some factors, one can surmise that these issues were not confined to

⁸⁶ WHO (EMRO), *Drinking Water, People and the Better Life*; WHO (AFRO), *The Community Water Supply Programme in the African Region*.

their respective regions. After both regional committees had met and discussed the water supplies predicament, Candau, WHO Director General, evaluated

Table 4.3: Comparison of Obstacles.⁸⁷

EMRO	AFRO
Finances (less of a problem than previous thought)	Limited finances
Lack of effective water authorities: division of responsibilities leading to duplication	Water rates not covering costs of operation and maintenance
Beliefs, e.g. that water should be a free commodity	Lack of technical staff (inefficient management)
Water rates not sufficient	Lack of Long-term planning (no master plans)
Borrowing limitations	Overlapping responsibilities
Competition for finances	Lower priority of water in lending agencies (e.g. World Bank, IDA)
Lacking personnel*	Difficulties importing materials
Lack of Materials plus ability to import them*	Scattered population in rural areas
OTHER: designs**; awareness**; arid areas**	OTHERS: non-specified; competition for finances

Source: WHO (EMRO), *Drinking Water, People and the Better Life*; WHO (AFRO), *The Community Water Supply Programme in the African Region*; WHO (EMRO), *Regional Committee for the Eastern Mediterranean: Report on Thirteenth Session*, Executive Board, 33, (Geneva: WHO, 1963), accessed Aug 1, 2018, <http://www.who.int/iris/handle/10665/136794>. Order taken from the first two sources.

community water supplies in developing countries. Candau emphasised “the need to improve existing conditions.”⁸⁸ The unsatisfactory condition of water supplies, as well as the need for further consideration as to the impact of population growth, were highlighted.⁸⁹ Candau did not address the constraints to progress directly at this time but instead synthesised the difficulties each region faced and drafted a plan of action. In addition to data collection, Candau’s plan included: focused efforts on improving water legislation and institutions; encouraging water supplies and sanitation advocates to highlight the economic benefits of water supplies in

⁸⁷ Blue signifying issues common to both regions. *Also noted in AFRO Regional Committee Meeting. ** in EMRO Regional Committee Meeting only.

⁸⁸ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 1963, 1.

⁸⁹ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 1963, 1, 2.

order to gain political backing; research into appropriate technologies; improving training facilities; and finding creative ways to raise capital and encourage external investment.⁹⁰

Yet frustration was mounting that the water problem still required clear justification as to its value for investors and that progress was not proceeding as quickly as needed or anticipated.⁹¹ As part of the technical discussions on community water supplies at the Seventeenth World Health Assembly in 1964, Professor Abel Wolman made the following remarks:

One may wonder why it is necessary and desirable to rehearse, in the middle of the twentieth century, the virtues and necessities of community water service [...] and yet, today we are still confronted with the task, not only of proving that an adequate supply of safe water is essential to healthful living and economic progress, but that all people, urban and rural, should be provided with this amenity.⁹²

It was evident from Wolman's statement and from the obstacles highlighted in the AFRO and EMRO reports that the problem was unresolved and that advocates for investment in community water supplies were not able to consistently convince governments, international lending agencies, and the like, of the merits in prioritising the development of water supplies.⁹³

Both knowledge and resource deficiencies were addressed four years later during discussions of the "continuing and new problems in water supply" at the first expert committee on community water supply.⁹⁴ Table 4.4 shows how the problems addressed at the expert committee could be classed as both resource and knowledge deficiencies. This highlights the interrelated nature of the obstacles that hampered the development of water supplies facilities in the 1960s.

On the one hand it was hoped that research would help to reduce the effects of resource deficiencies. On the other hand, it was also hoped that better

⁹⁰ Candau, *Community Water Supply Programme: report by the Director-General*, Executive Board, 33, 1963.

⁹¹ WHO (EMRO), *Drinking Water, People and the Better Life*, 15 April 1963, 3.

⁹² Wolman, *The Influence of Community Water Supply Programmes on Health and Social Progress*, 1, 2.

⁹³ Wolman, *The Influence of Community Water Supply Programmes on Health and Social Progress*, 1, 2.

⁹⁴ WHO and Expert Committee, *Community Water Supply: report of a WHO Expert Committee*.

Table 4.4: Knowledge and Resource Deficiencies 1968

Knowledge Problem	THE PROBLEM	Resource Problem	Solution or Compromise
Understanding pollutants and their impact on water supplies	Water Quality	Surveillance and water treatment facilities lacking	Developing standards & compromising where necessary
Impact of water on disease burden; impact of water development on disease burden	Water borne and water-associated diseases	Surveillance and water treatment lacking; poor provision of water supplies	Research and data collection regarding individual disease and disease collectively; monitoring the impact of development schemes
Need to invent / adapt technology Leakage: pollution sucked into systems; water lost	Appropriate technology	Access to materials and professional / technical personnel	Balance of standardisation (design and prefabrication) with appropriateness at local levels; research and training
Centralisation and decentralisation? Centralisation led to "conflict of function"; decentralisation led to fragmentation causing overlap	Institutional Capacity	Lack of public health engineering organisations; lack of coordinated efforts	Capital provision; creation of public health engineering organisation; coordination mechanisms
More research on the kinds of personnel required and the training programmes that would be useful to develop	Trained Personnel	Lack of staff impacted success of funding applications and maintenance of services; lack of educational programmes and institutions	Develop interest through educational programmes and institutions; provisions of educators and funds
Need to understand impact on water supplies and sanitation facilities	Natural disasters	Unsuitable systems due to resource limitations	Research; improved access to materials, personnel and finances
Best ways of justifying investment in water supplies	Competition with other programmes	Finite resources split across many projects	Better justification both from an economic and social standpoint; better education facilities

Source: WHO and Expert Committee, *Community Water Supply: report of a WHO Expert Committee*. Material adapted by author.

Table 4.4: Knowledge and Resource Deficiencies 1968 (continued)

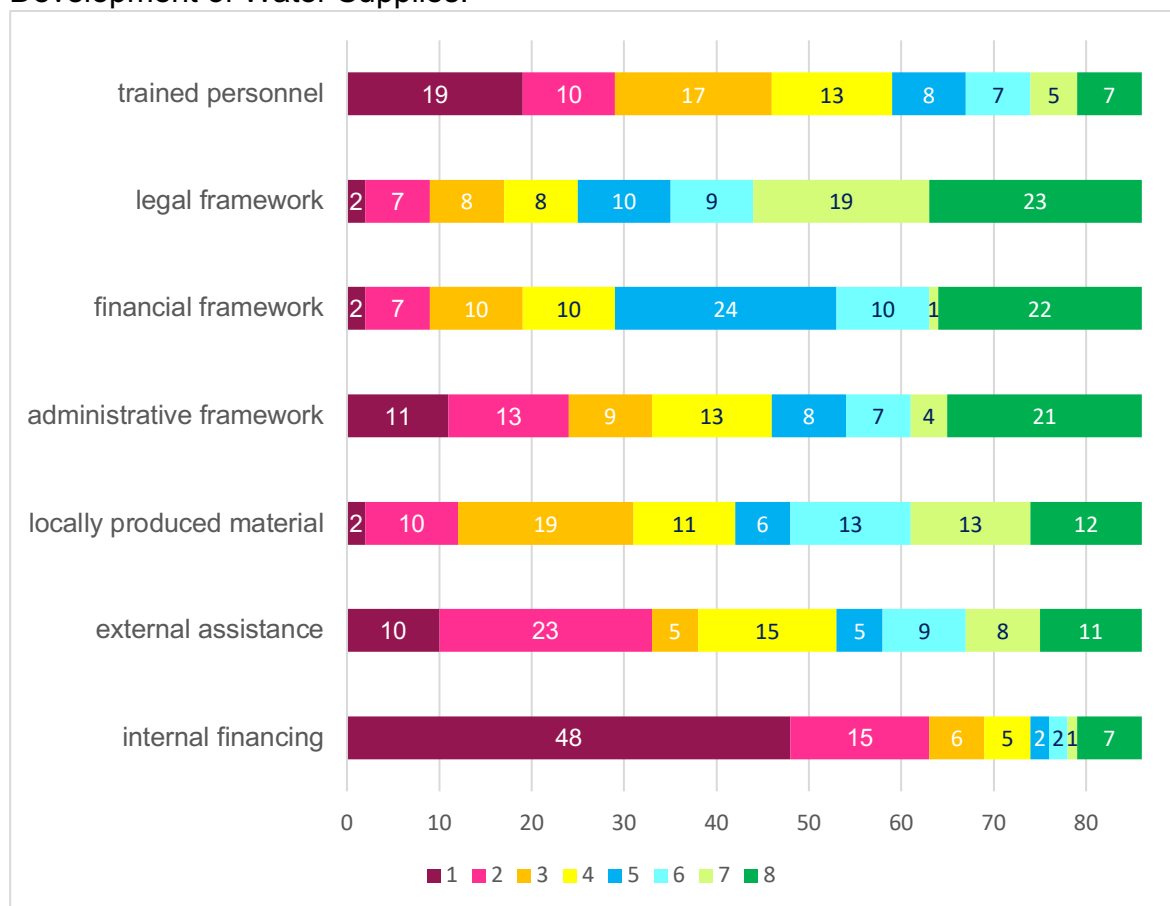
Knowledge Aspects	THE PROBLEM	Resource Aspects	Solution or Compromise
Understanding best ways to finance and value of investment	External Finances	Access to funds	Better justification; better administrative and education institutions
Understanding importance of investment and availability of external support	Internal finances	Access to funds	Better justification; better knowledge dissemination
Understanding what is important to governments	Data collection	Personnel and suitable infrastructures for data collection	Helping governments to develop systematic data collection; better knowledge dissemination

Source: WHO and Expert Committee, *Community Water Supply: report of a WHO Expert Committee*. Material adapted by author (2020).

access to resources, such as finances and personnel, would improve access to knowledge. It was evident from the expert committee’s meeting that a large proportion of the obstacles noted in 1963 continued to hamper development: access to materials, effective institutions, access to personnel, competition with other programmes, and internal and external financing. Water quality and the impact of water borne and water-associated diseases required more research but were also hampered by the lack of suitable personnel, materials and finances.

The information collected and collated over the course of the 1960s was then used to construct the water supplies and sanitation survey in 1970. The need to prioritise limited resources led to a focus on a small handful of constraints, which the WHO asked member states to put in order of importance. Separating these issues out in a simplified format, however, could easily disguise their interrelated nature as shown in Table 4.4. The seven constraints focused upon can be seen in Figure 4.2. Member states were asked to give constraints of high importance a low score and constraints of a low importance a high score. Internal financing, for example, was given a score of “1” by 48 member states, “2” by 15 member states, and so on. As such, the data revealed that for 68 percent of the countries that replied to this section of the survey the biggest obstacle to progress was insufficient internal financing. The constraints in second and third place were lack of trained personnel and external assistance. However, priorities were

Figure 4.2: Distribution of Countries by Score for Each Factor Constraining the Development of Water Supplies.



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 21. Adapted by author (2020).

different across each region. For example, the top three obstacles for AFRO were first, internal financing, second, external financing, and third, lack of trained personnel. For EMRO, the main challenge was lack of trained personnel, followed by insufficient internal finances and inappropriate administrative frameworks.⁹⁵ Once the major obstacles to progress were established in this way, they could then be used as focal points for the international community to provide support in the form of finances, resources, training, and advice (technical and administrative) based on the primary needs of each region. Given the emphasis that international organisations placed on the importance of external assistance in encouraging socio-economic development, the biggest surprise to the WHO and other international organisations was that external assistance was not labelled as the constraint of highest importance.

⁹⁵ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*. Also see Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 9.

In their analysis, Pineo and Subrahmanyam were clear that the “list of constraints suggested in the WHO questionnaire is by no means exhaustive” and that “the listed constraints themselves are interdependent [and] cannot be considered in isolation.”⁹⁶ They drew upon examples of the interdependent nature of the constraints, such as the use of inappropriate technology leading to “high costs and poor maintenance” and the lack of trained personnel which “resulted in departments being unable to utilise the resources allocated”, before continuing on to state that:

it is not even sufficient to consider all the constraints within the community water supply and excreta disposal sectors alone [...] what is required is an integrated analysis of all the constraints affecting the community water supply and excreta disposal sectors vis-à-vis the national health and socio-economic development objectives and plans.⁹⁷

Pineo reflected the growing trend in the 1970s, which prioritised integrated programmes of socio-economic development rather than giving full attention to any one aspect. The WHO’s attempts to isolate the key factors hampering the development of water supplies and sanitation through their survey in 1970 may well have reflected the need to keep the questionnaire simple in order to collect as much data as possible. On the other hand, the approach which separated out and ordered particular constraints may have been influenced by the finite resources at the WHO’s disposal.

Pineo and Subrahmanyam raised one further, and very important, point. They suggested that “some of the constraints that have figured prominently, such as insufficiency of internal financing, could well be symptoms rather than the root causes.”⁹⁸ For example, the lack of personnel affected both the creation and dissemination of knowledge as well as the ability and inclination of nations to act upon what was known. Already several questions come to mind: firstly, was the problem a lack of interest in particular professions and therefore a lack of particular kinds of personnel? The status of engineers, for example, was a long-

⁹⁶ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 23.

⁹⁷ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 23.

⁹⁸ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 23.

standing issue, as discussed in Chapters 2 and 3. In 1968, this was still a problem according to those meeting for the first expert committee on community water supplies:

the status of the engineering profession within the ministry of health should be improved in many countries so that engineers engaged in the solution of problems related to water supplies can work in equal partnership with their colleagues in the medical and other professions.⁹⁹

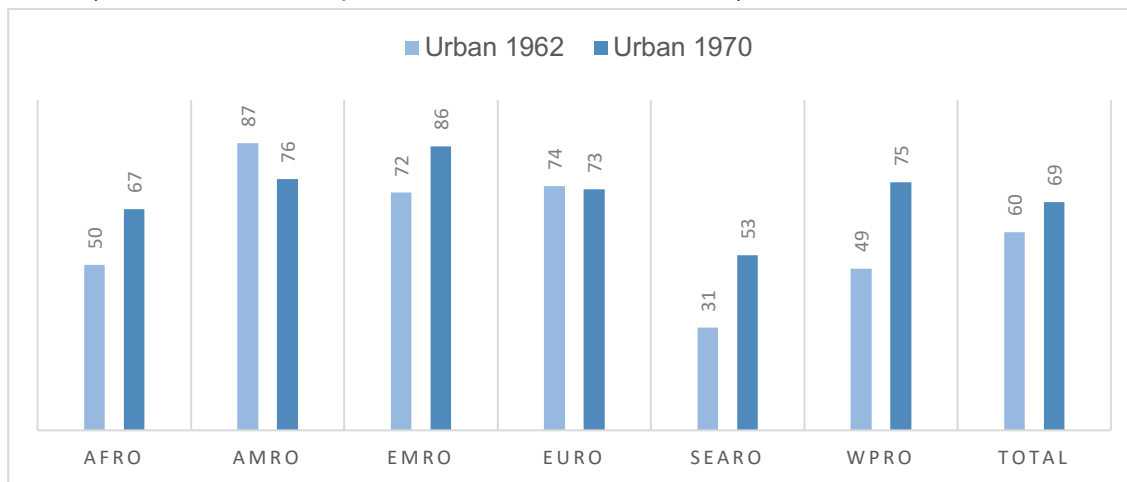
Secondly, did educational institutions and schemes to train personnel exist? The development of colleges and universities required finances, materials, and educators. As training required money and resources, countries may label the major constraint as financial as opposed to lack of trained staff. Thirdly, once people are trained, do they stay in the country? Opportunities abroad may be more forthcoming and more lucrative, so governments may need to develop incentive schemes to encourage people to stay. Alternatively, the lack of relevant expertise could also be related to the low priority often given to water by colonial authorities, which was compounded by the lack of prestige connected with expertise required for developing water supplies and water-based sanitary facilities. Starting from the issues of insufficient personnel, this analysis shows that it was difficult to separate symptoms from root causes.

Population growth was not listed with the factors constraining progress in the WHO survey in 1970. However, it was a significant factor that influenced investment in water supplies. As populations expanded, demand for food, water and health increased, which placed a greater sense of urgency on government investment in basic services and infrastructure.¹⁰⁰ Comparable data between 1962 and 1970 was available for urban water supplies and showed an increase in the percentage of the population with access to water supplies in six regions between 1962 and 1970 with two exceptions: AMRO and EURO (Figure 4.3). This decreased percentage of coverage was not due to a decrease in the number of people served by water services. Rather, it was because investment was unable to

⁹⁹ WHO and Expert Committee, *Community Water Supply: report of a WHO Expert Committee*, 20.

¹⁰⁰ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*.

Figure 4.3: Percentage of Population with Access to Water Supplies in 1962 and 1970 (Countries who replied in both 1962 and 1970).¹⁰¹



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 36-38, 39-41.

match increases in population: the number of people served in urban areas increased in AMRO from 85,370,000 to 116,429,000 and in EURO (Algeria, Morocco and Turkey) from 11,660,000 to 17,832,000.¹⁰² This showed that a major challenge faced in the mid-1960s and in the 1970s was whether socio-economic development could match the rapid population growth in many countries and how this could be done whilst also protecting environment. For Uganda and Sudan this was particularly important as the annual percentage population growth in each country was higher than the average across Sub-Saharan Africa.¹⁰³

Population size, density, and growth were documented as constituting the most frequent answers given to an open-ended question about “the criteria that they [countries] adopted in assigning priorities for the provision of new water supplies.”¹⁰⁴ From the information collected, the WHO was hoping to better understand the motivations of different governments for investing in community water supplies. This could provide valuable information on how best to promote and justify the importance of investing in community water supplies in the future. A

¹⁰¹ For the countries that only replied in 1970: the percentage figures differed by between 0 and 4 percent, but two thirds of the percentages differed by 0-1 percent.

¹⁰² Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 36-38, 39-41.

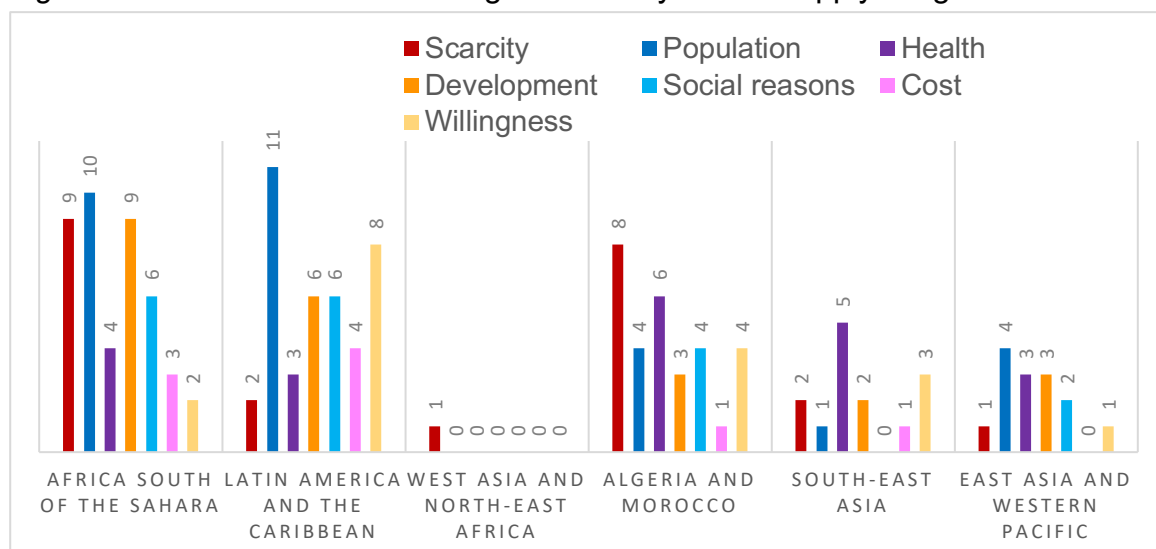
¹⁰³ See Appendix H, 337.

¹⁰⁴ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19.

variety of additional responses were received, which Pineo and Subrahmanyam tabulated under seven headings in their 1975 report.¹⁰⁵

Definitions of each reason given were as follows: ‘Scarcity’ encompassed any mentions of the acute need for water supplies. ‘Population’ included any references to the size of communities, the density of population, and growth rates. ‘Health’ incorporated any mention of water quality, high incidence of water borne diseases and other related factors. ‘Development’ as a reason for investing in water supplies referred to its agricultural, industrial, and other economic uses. ‘Social reasons’ included any reference to uplifting sections of the population or specific areas. ‘Cost’ referred to the unit costs of new projects in one area as

Figure 4.4: Reasons for Prioritising Community Water Supply Programmes



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19-20.

compared with another. One assumes that priority was given to areas where unit costs were lower. Pineo and Subrahmanyam were not clear on this point.

‘Willingness’ referred to community readiness, interest, and demand.

Figure 4.4 depicts how many times each of these seven factors was mentioned. It shows that—after population growth—scarcity and development were tied in second place for the reasoning given to invest in community water supplies; health lagged behind in fourth position out of the seven listed priorities.¹⁰⁶

¹⁰⁵ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19-20.

¹⁰⁶ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19.

While the connection between water and health was perceived to be strong, attempts to quantify this relationship were still very limited. Pineo and Subrahmanyam themselves did not find a correlation between water borne diseases and morbidity and mortality rates, but to their own admission, their datasets were incompatible. Other studies, they stated, showed that “better water and improved sanitation lead to better health.”¹⁰⁷ While development was found in second place, its ambiguous, catch-all meaning made it difficult to assess what was being referred to at any given time or place. These categorisations were subjective and not all factors mentioned by countries were included in the tabulation (Figure 4.4). A notable omission in the tabulated data was political reasoning.¹⁰⁸ “Other criteria such as improvement of existing services, availability of sources, and promotion of tourism were mentioned occasionally” were also not included.¹⁰⁹ It was not clear whether countries gave one or more answers to the question and there was no discussion about how many of these factors were interrelated.

A comparison of the obstacles that EMRO and AFRO noted in 1963 with those in the 1970 survey showed that the main challenges identified as hampering progress during this period were inadequate finances, personnel, and institutions alongside the impact of population growth. As a result of rapid population growth there was a greater demand for water supplies and sanitation facilities and governments were more inclined to prioritise investment in this area. This section also emphasises the interconnected and interdependent nature of resource and knowledge deficiencies.

By the mid-1970s many of these obstacles still influenced the pace and effectiveness of community water supplies programmes and associated sanitary measures (namely waste disposal). These considerations of the interdependence of the constraints highlighted one of the reasons why water supplies and sanitation

¹⁰⁷ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 10. Their data on morbidity and mortality came from hospitals where waterborne diseases and similar were less prevalent in comparison to other diseases. Many diseases that required water as a medium would be treated at a much more local level or would be left unreported.

¹⁰⁸ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19: “it is well known that in many countries political considerations often play a decisive role in the selection of communities for which new water supply systems are provided.”

¹⁰⁹ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 19.

were catapulted to the forefront of international attention in the 1970s and 1980s. The convergence of multiple problems and the need to address each resulted in fresh or reinvented approaches to health and development. Some, such as widespread food provision, was on the agenda from the inception of the United Nations as reflected in the establishment of the Food and Agricultural Organisation in 1945. Others, such as the role of women in development, did not enter the discourse fully until the late 1970s or early 1980s. And as a result of failures in targeted programmes—such as the global malaria eradication campaign and the groundnuts scheme in Tanganyika—there was a gradual shift towards the use of integrated approaches as a means of tackling the various issues that fell under the development umbrella.

3. Concluding Remarks

This chapter showed how knowledge and resource deficiencies affected the development of water supplies and sanitation facilities in the 1960s and early 1970s. In examining the construction of surveys and their results this chapter revealed how the collection and collation of datasets in the 1970s helped to comparatively define the position of developing countries across six regions regarding water and sanitation. With only two regions boasting of over 50 percent of their population served with reasonable access to water supplies in 1970—Latin America and the Caribbean (AMRO) and Algeria, Morocco and Turkey (EURO)—it was quantitatively evident to funding agencies that concerted action needed to be taken. Regional comparisons of water supplies and sanitation combined also showed how the WHO sought to conceptualise water supplies and sanitation as a pair but faced challenges in doing so as its member states did not necessarily have the same priorities. Whether water and sanitation were competing with one another for attention as separate entities or whether they were dealt with together for a double-pronged attack, they formed a crucial dynamic in debates as the 1960s progressed.

As more information became available the gap between what was known and the action taken was highlighted. It was clear that both the resource deficiencies and the disinclination of many international organisations and national governments to invest in water supplies and sanitation was hampering the development of such facilities. To address the constraints affecting action, priorities had to be set and compromises had to be made at both national and

international levels. International organisations wanted to prioritise investment in the countries where they deemed the need was greatest. They also had to find agreement with national governments and their views on where the need was greatest. Compromise was also discussed regarding the development of appropriate technology: it was recognised that the most up-to-date technology may not be suitable in many of the countries that needed to improve their water supplies and sanitation facilities. Even water quality standards were not immune from debates about how best to address needs. Suggestions were made that consideration should be given to providing the best quality of water that could be made available under current circumstances to a greater number of people rather than striving to provide the best quality of water possible for a small number of people. Therefore, policy priorities emerged both within international organisations and within countries due to practical constraints.

This chapter showed the interrelated nature of the knowledge and resource deficiencies affecting the development of water supplies and sanitation facilities in the 1960s and early 1970s. Further evidence of the interlinked nature of constraints is explored in Chapter 5, which first addresses financial and political constraints and then goes on to explore institutional and personnel constraints. Chapter 5 shows that the gap between knowledge and action was narrowed as a result of concerted efforts on the part of both international organisations and national governments to prioritise investment in water supplies and sanitation.

CHAPTER FIVE

Prioritising and Practicalities: Clean Water in the Post-Colonial Period 1963-1972

Between 1963 and 1972 the WHO directed efforts towards overcoming financial and political challenges, alongside addressing the problems caused by divided responsibility for water across government agencies and the lack of suitable personnel to implement community water supplies projects. These priorities lined up with the primary challenges that AFRO and EMRO described in the 1960s and early 1970s.¹ As detailed in the previous chapter the main obstacles to developing water supplies facilities in AFRO in 1963 were access to internal and external financing, the lack of technical staff, and the overlapping responsibilities for water. For EMRO, finances were also a major obstacle internally (due to competition for a limited pot of money) and externally (due to borrowing restrictions), as were problems of divided responsibilities for water and personnel limitations. Chapter 5 builds on how the WHO and national agencies conceptualised the relationship between the supply of clean water and public health to reveal some of the challenges in coordinating action between 1963 and 1972. It supplies some answers to the following three questions: How did international organisations and national governments seek to address these obstacles? How effective were the approaches taken? To what extent did demarcation disputes about responsibilities for water supplies continue to hamper policy making in a post-colonial era?

There was an expectation that the international community had a vital role to play in aiding the process of socio-economic development in Uganda and Sudan.² The specific roles of international organisations, such as the WHO, varied from the coordination of efforts to collect and collate information to the provision of financial support and technical assistance. For Uganda, and to a lesser extent Sudan, there was a more definitive expectation that Britain or British experts would be directly involved in this process (pre-Amin). Before Uganda's independence in

¹ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*. Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 9; WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6; WHO (EMRO), *Drinking Water, People and the Better Life*.

² United Nations, "Joint Declaration of the Developing Countries made at the Eighteenth Session of the General Assembly," 11 November 1963, accessed Nov 25, 2018, [http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/1897\(XVIII\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/1897(XVIII)).

1962, for example, Britain supplied 80 percent of assistance from external sources for the first five-year development plan.³ In addition there were approximately 1700 expatriates working for the Ugandan government including 350 teachers before independence. In 1964 there were still 1100 expatriates, 500 of which were teachers.⁴

As financial challenges were often tied up with international and national politics the first two sections of Chapter 5 examine these factors together. They explore how financial and political challenges affected the types of programmes planned for and implemented at national and international levels. The third section then addresses the divided and overlapping responsibilities for water and, in relation to this, considers personnel limitations. It focuses on attempts to coordinate efforts, which included the growing preference for integrated development.

1. **The WHO: Addressing Financial and Political Challenges**

This section examines the gap between what the WHO wanted to do and what was practical. It explores the financial and political challenges that administrators and specialists attached to the WHO faced in galvanising interest in, and implementing, water supplies and sanitation programmes. The WHO, whose role was mostly to help governments develop pre-investment plans and to provide technical assistance, was hampered by difficulties in procuring financial support from organisations with access to larger pots of money. The WHO was also reliant on (wealthier) member states to take steps to sustain the work of the community water supply programme and counted on governments to express an interest in developing water supplies and sanitation facilities in their territories.

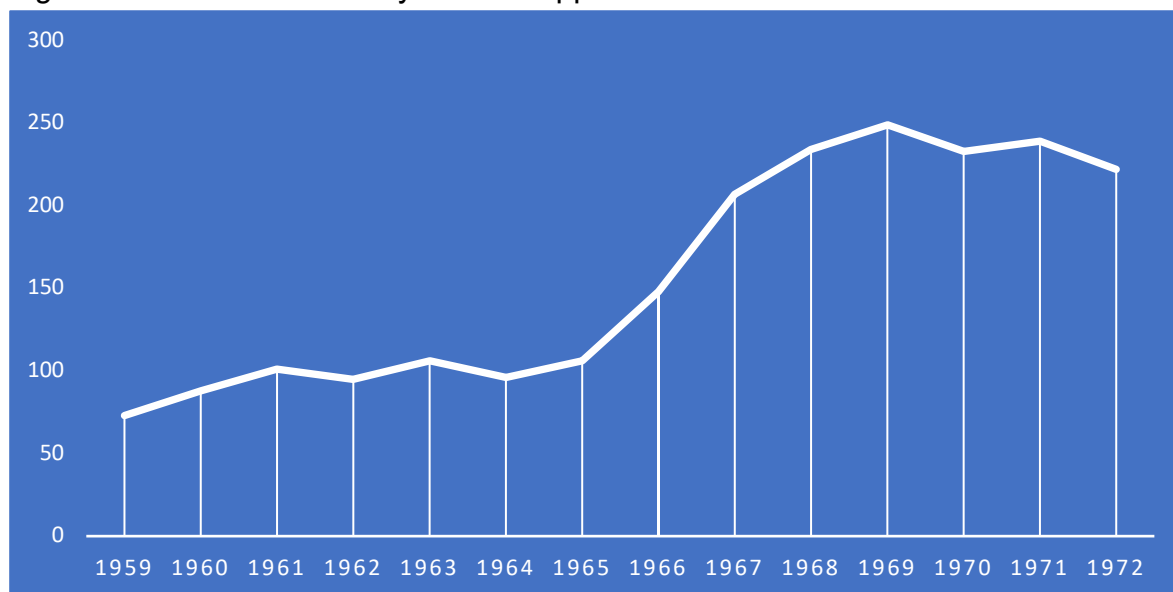
This section explores the regional disparities in both the interest in, and funding of, community water supplies and sanitation. It then goes on to review the disparities in access to water supplies and sanitation facilities in urban and rural areas and addresses the following questions: to what extent did international agencies, such as the WHO, contend with or compound the urban bias of community water supply programmes? And to what extent did deficiencies in internal and external financing affect the urban bias?

³ World Bank, IBRD and IDA, *The Economy of Uganda* (Washington: World Bank, 5 November 1964), 21, accessed Nov 25, 2018, <http://documents.worldbank.org/curated/en/293161468110685500/pdf/multi0page.pdf>.

⁴ World Bank, IBRD and IDA, *The Economy of Uganda*, 3.

In general community water supplies activities were increasing, particularly between 1959 and 1969—the first ten years of the WHO’s Global Community Water Supply Programme (Figure 5.1). There were some fluctuations but this can largely be explained by the different stages of progress: projects expected to be approved, projects approved, projects expected to be in operation / in operation, projects expected to be completed / projects completed in any given year

Figure 5.1: Total Community Water Supplies Activities 1959-72.

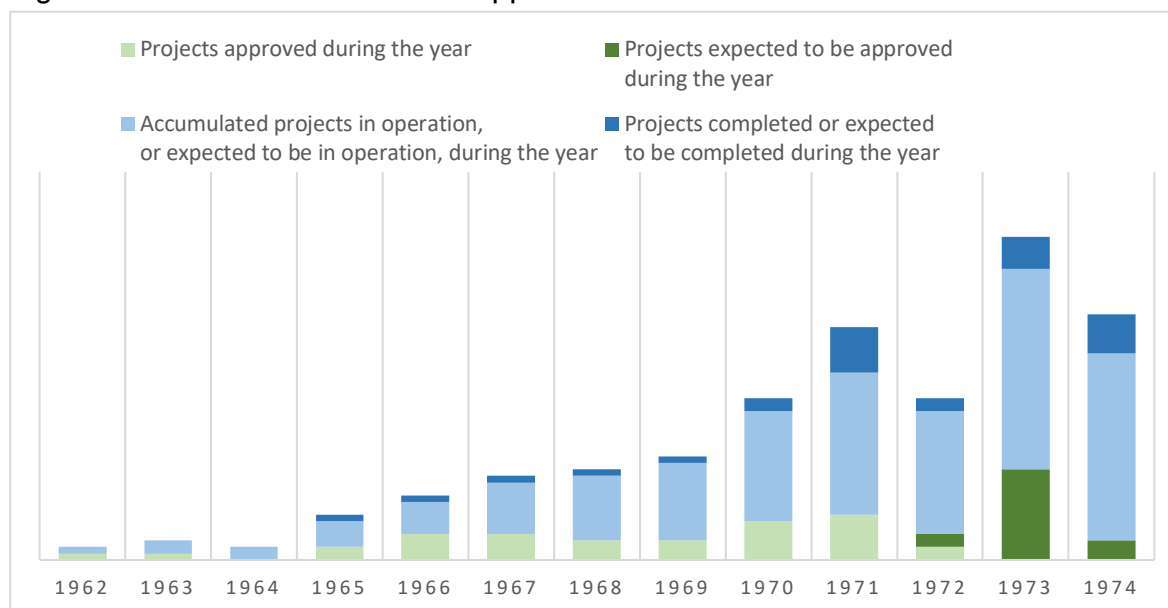


Source: Candau, *Community Water Supply Programme: Progress report by the Director-General*, 1968; Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972.

(see Figure 5.2, p. 268). Projects were often set within three- to five-year time frames and the first two dips reflect this (1962 and 1964). Similarly, the biggest year on year increase in WHO/UNDP projects occurred between 1972 and 1973. Projects expected to be approved or completed, rather than those in operation, account for a substantial proportion of this increase.

Progress during the first five years of the WHO’s Community Water Supply Programme was not particularly impressive, however: community water supplies activities fluctuated between 73 and 106. This section argues that financial and political challenges hampered the growth of community water supplies activities in the 1960s and 1970s. These challenges are shown through an examination of regional, and then rural and urban, disparities.

Figure 5.2: WHO/UNDP Water Supplies and Sanitation Pre-investment 1962-1974



Source: Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 24.

Table 5.1: Regional Needs against External Assistance Provided for Community Water Supply.⁵

Region	Needs		External Assistance
	Percentage of total study population remaining to be served by 1980 to meet DDII* targets	Percentage of total investment required by 1980 to meet DDII* targets	Percentage of total external assistance provided in the 5 years 1966 to 1970
AFRO	9	15	22
AMRO	24	33	49
EMRO	14	11	15
EURO	5	13	0
SEARO	41	23	2
WPRO	7	5	12
Global Figures	100% (1124 million people)	100% (US\$ 1400 million)	100% (US\$ 710 million)

Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 33.

Despite pressing needs in countries attached to both AFRO and EMRO, these two regions were less effective at obtaining external assistance than the American Regional Office. Table 5.1 shows that Latin America and the Caribbean (AMRO) received almost 50 percent of the total external assistance provided between 1966

⁵ *DDII: UN's Second Development Decade.

and 1970. South-East Asia (SEARO), which had the lowest regional levels of access to water supplies and sanitation in 1970, received the lowest percentage of external assistance excepting Algeria, Morocco, and Turkey (EURO). These regional disparities confirmed Candau's comment in 1968 that, "it is disturbing to note that the distribution of loans is diametrically opposite to the indicated needs."⁶

In addition the Pan American Health Organisation's Special Account for Community Water Supplies had nine contributors and was able to raise over double that of the centralised special fund.⁷ Table 5.2 shows that the WHO faced challenges in financing the Community Water Supply Programme between 1963 and 1969. In 1963 and 1969 the shortfall was larger than the available funds: US\$781,675 was earmarked for planned programmes in 1963 but only US\$350,936 was made available. Similarly, in 1969 US\$1,435,753 was earmarked for planned programmes but only US\$658,675 was made available.⁸ The WHO

Table 5.2: Percentage of Funds Available and the Shortfall.

	1963	1964	1965	1966	1967	1968	1969
% Available	45	91	54	60	59	67	46
% Shortfall	55	9	46	40	41	33	54

Source: Candau, Community Water Supply Programme: Progress report by the Director-General, 1968, 31-32. Data manipulated by author.

tried to encourage their member states to invest in the Community Water Supply Programme but this was seemingly ignored. The central Community Water Supply Special Account received contributions from eight member states between 1959 and 1967 (Cambodia, Federal Republic of Germany, Israel, Kuwait, Laos, Morocco, Trinidad and Tobago, and the United States of America). Moreover, 86 percent of the fund came from the United States and 13 percent from the Federal Republic of Germany; together this amounted to 99 percent of the funds for the Community Water Supply Special Account.⁹ Further, the only member states to provide loans for community water supply programmes between 1958 and 1967

⁶ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 1968, 5.

⁷ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 1968, 34.

⁸ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 1968; Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972.

⁹ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 34.

were the United States (US\$120.22 million), the Federal Republic of Germany (US\$33.61 million), and the United Kingdom (US\$9.02 million).

As the WHO gave regional offices a large degree of autonomy, health priorities were often set on a regional basis. Moreover during the 1960s, and more fully expressed in the early 1970s, the least developed countries within each region were prioritised for investment. This corresponded with the UN's Second Development Decade, which called for "special measures in favour of the least developed among the developing countries."¹⁰ It was therefore advantageous for a country like Sudan to be attached to a WHO region in which the majority of countries had better overall water supplies and sanitation coverage. Despite Sudan's attachment to EMRO from the WHO's inception this territory was categorised with Uganda in the Sub-Saharan Africa region in Dieterich and Henderson's study. In the WHO's 1970 Survey Sudan was categorised in the West Asia and North Africa region (corresponding to the WHO's EMRO). This provides an interesting comparison: when Sudan was placed within the Sub-Saharan African region, it fared better than half of the countries in terms of access to water supplies.¹¹ Within EMRO, on the other hand, it had the fifth lowest percentage of those with access to water supplies. This latter categorisation meant those in Sudan trying to procure external investment had a better platform. These regional groupings mattered. Sudan's position compared to the other countries in EMRO meant that it was given preferential treatment, which if Sudan had been attached to AFRO may not have been the case.

Table 5.3 reiterates the gap between AMRO and the rest of the WHO's regional offices in obtaining loans for community water supplies and sanitation programmes. Between 1958 and 1971 almost 60 percent of community water supplies loans made available were for AMRO. Almost 60 percent of these loans for AMRO, however, came from regional agencies. Furthermore, "developing countries in the Americas [...] allocated about twice as much from their internal resources for water supply construction as they have obtained from external

¹⁰ WHO, ECOSOC 54th Session, Memorandum on special measures in favour of the least developed among the developing countries, 25 April 1973, WHO Archives, Third Generation, N64/86/21(54); Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, Annex 2: 36-38; Annex 3: 39-41.

¹¹ Appendix I, 338.

Table 5.3: Community Water Supply Loans** 1958-1971 (millions of US dollars).¹²

AGENCIES	WHO Region						U.D.*	TOTAL
	AFRO	AMRO	EMRO	EURO	SEARO	WPRO		
International	19	183	70	4		38		314
Regional	5	467				29		501
Bilateral								
1958-1969	76	89	52		2	38	12	269
1970							159	159
TOTAL	100	739	122	4	2	105	171	1243

Source: Candau, *Community Water Supply Programme: Progress report by the Director-General, WHA, 25, 25 April 1972, 5.*

sources.”¹³ This highlighted the need to galvanise interest in community water supply at regional and government levels.

In the 1950s and 1960s it was argued that a lack of external assistance was the most crucial factor constraining development in water supplies and sanitation (see Chapters 2 and 3). However, the collection of information from member states in the early 1970s, as shown in Tables 5.1, 5.2 and 5.3, suggested that interest at regional and government levels was equally lacking. While the provision of external assistance could both help overcome the initial problem of insufficient finances, the continued maintenance and operation of water supplies required consistent government support. As water was increasingly viewed as a public good, development was also needed in creating and modifying administrative frameworks and institutions to ensure that progress was sustainable.

Despite the WHO’s desire to support development in water supplies and sanitation for both rural and urban communities there was a clear urban bias between 1959 and 1972. In 1968 Candau reflected on the WHO’s early intention to prioritise development in rural areas and contrasted this with the urban-centric

¹² Regional Offices: AFRO (African), AMRO (American), EMRO (Eastern Mediterranean), EURO (European), SEARO (South-East Asia), WPRO (Western Pacific).

*U.D. = undesignated.

** Excluding loans for sewerage only but including those for water supply and sewerage combined and excluding loans for multi-purposes water resources projects which may include a community water supply component.

¹³ Candau, *Community Water Supply Programme: Progress report by the Director-General, 25 April 1972, 5.*

Table 5.4: Investment in Community Water Supply (1970) against Required Investment to Meet the UN's Second Development Decade Targets.¹⁴

Region	Type of community	Investment (millions of US\$)	
		Actual 1970 investment for construction for community water supplies	Required annual investment in community water supplies to meet DDII targets
AFRO	Urban	72	146
	Rural	20	63
	Total	92	209
AMRO	Urban	263	386
	Rural	46	75
	Total	309	461
EMRO	Urban	198	101
	Rural	37	47
	Total	235	148
EURO	Urban	27	181
	Rural	67	5
	Total	94	186
SEARO	Urban	142	200
	Rural	44	124
	Total	186	324
WPRO	Urban	63	67
	Rural	4	5
	Total	67	72
GLOBAL	Total Urban	765	1081
	Total Rural	218	319
	Total	983	1400

Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 33.

nature of the WHO's Community Water Supply Programme, where "rural and peri-urban areas" became a secondary concern.¹⁵

¹⁴ Regional Offices: AFRO (African), AMRO (American), EMRO (Eastern Mediterranean), EURO (European) SEARO (South-East Asia), WPRO (Western Pacific).

¹⁵ WHO, *The Second Ten Years of the World Health Organisation, 1958-1967* (Geneva: WHO, 1968), accessed Nov 25, 2018, 255, <http://www.who.int/iris/handle/10665/39254>; Joseph Lanoix and WHO, *Action for Environmental Health, WHO says / prepared by J. N. Lanoix* (Geneva: WHO, 1988), 2, accessed July 16, 2018, <http://www.who.int/iris/handle/10665/62384>. In 2003 the WHO referred to the global community water supply programme as "the WHO Programme for Urban Water Supply" in WHO, Water, Sanitation and Health Team, *Looking Back, Looking Ahead: Five Decades of Challenges and Achievements in Environmental Sanitation and Health* (Geneva: WHO, 2003), 9, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/42752>.

The stark contrasts in provision across urban and rural communities became clear in the early 1970s. While 69 percent of people in urban areas had access to water supplies and sanitation facilities only 12 and 8 percent of people in rural areas had access to water supplies and sanitation facilities, respectively. Table 5.4 shows the breakdown of 1970 investment in urban and rural areas alongside the required annual investment to meet the UN's Second Development Decade (DDII) targets. This dataset reemphasised the urban bias: 78 percent of investment in community water supplies was used for urban areas—due to the limited availability of finances and the increased “public health hazards of insanitary conditions” because of “the crowding factor”—and 22 percent allocated for rural areas.¹⁶ This percentage split corresponded with the Development Decade targets: 77 and 23 percent for urban and rural areas respectively. According to these figures an added US\$316 million per year was needed for urban areas to meet Development Decade targets and US\$101 million in rural areas. The higher investment required for urban areas related to the much higher targets for coverage: 60 percent of urban population served by piped supplies and 40 percent by public standpipes, compared with the rural target of ensuring 25 percent had “reasonable access to safe water.”¹⁷

Reflecting on four decades of achievement in 1988 the WHO provided a matter-of-fact assessment of the difficulties in procuring external assistance to support rural water and sanitation programmes:

No matter how high the priority accorded by governments to water and sanitation, the sheer cost of providing the whole population with the proper facilities was an insurmountable obstacle in the poorer countries. International lending agencies did exist 40 years ago, but they considered very few such projects worthy of support. Only urban communities dared apply for funding, and even then, exclusively for water supply projects.¹⁸

Working alongside the WHO, UNICEF was the only UN agency after the Second World War to supply consistent financial support for rural water supplies. Despite

¹⁶ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 7.

¹⁷ Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*, 29.

¹⁸ WHO, *Four Decades of Achievement: Highlights of the Work of WHO*, (Geneva: WHO, 1988), 6, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/40590>.

valiant efforts the investment gap in external assistance for rural and urban projects was huge. Between 1958 and 1971 US\$1,234 million was available from various sources in the form of community water supply loans. These funds were directed towards urban water and sanitation schemes.¹⁹ In contrast, UNICEF investment between 1945 and 1970, plus commitments for 1971, amounted to US\$29,549,000.²⁰ This meant that between 1958 and 1971 at least 97.68 percent of external funds made available for water supply systems were directed towards urban areas and 2.32 percent towards rural areas.

As the WHO's work continued into the 1970s there was a shift back in the direction of serving rural populations. The recognition of the expense, time, and complexity involved in the kind of water supply and sewerage projects the UNDP agreed to finance led to a broader questioning of the value of these larger urban projects; particularly as the majority of people in developing countries still resided in rural areas:

In environmental health [in AFRO], six large-scale urban water supply and sewerage projects, financed by UNDP, proved so complex and time-consuming that they were retarding efforts to reorganise simple programmes in the rural areas where the majority of people lived.²¹

In this sense, the WHO did not want to compound the urban bias but was constrained by the lack of available funds to address the problems in rural areas. The WHO tried to balance the greatest need with the finite resources available and were pragmatic in their approach. It was clear that rural areas were the most underserved but it was also more difficult and more expensive to provide access due to the scattered nature of rural settlements. Yet because rural communities were dispersed out over a wider area there was a smaller chance of serious epidemic outbreaks of disease, which contrasted with the greater likelihood of epidemic outbreaks in urban areas due to high population densities. In urban areas it was cheaper to install water supplies and sanitation facilities because of higher population densities. Moreover, it was easier to encourage lending

¹⁹ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 5.

²⁰ Candau, *Community Water Supply Programme: Progress report by the Director-General*, 25 April 1972, 5.

²¹ WHO, *The Third Ten Years of the World Health Organization: 1968-1977* (Geneva: WHO, 2008), 61, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/43924>.

agencies and governments to invest in urban water supplies as there was a greater likelihood of economic returns.²²

However, internal politics and government interest were also crucial in shaping whether water supplies and sanitation were prioritised within development plans and if so whether attention focused on urban or rural areas. The next section utilises illustrations from the WHO's engagements with community water supplies and environmental health in relation to Uganda and Sudan. These two countries provide an interesting comparison due to their positions within different WHO regional offices, their contrasting levels of engagement with water supplies during this time, and the different prioritisation of rural (Sudan) and urban (Uganda) areas.

2. Prioritisations and Practicalities in Uganda and Sudan

Aside from the difficulties in quantifying the impact of water supplies on health and development, a major problem lay in the fact that social returns on investment exceeded private returns. Such returns lasted across generations but did not provide short-term financial gain. Therefore, capital markets tended not to fund these kinds of programmes. Where loans were supplied for water supplies and sewerage works it was generally done on the basis of expected returns. Private water utility companies, too, tended to focus on places where returns were guaranteed, often middle class and urban areas. They did not aim for comprehensive coverage and certainly not in sparsely populated rural areas. The WHO's call for global investment defined community water supplies as a public good for "all people" and believed that "urban and rural, should be provided with this amenity."²³ However, this required government commitment to mobilise resources, aid, and taxes to ensure social returns (development, leading to higher government revenues); financial returns were gained through water rates.²⁴

Between 1967 and 1972 IBRD statistics on gross domestic fixed investment and governmental public expenditure for Sudan and Uganda showed Uganda's

²² WHO Contribution, "Resolution of the WHA, 20th World WHA, Health and Economic Development," 25 May 1967, WHO Archives, CPD/67.8, Study of Needs of Developing Countries for Pre-Investment and Technical Assistance Through the UNDP in the Years 1968, 1969 and 1970.

²³ Abel Wolman, *The Influence of Community Water Supply Programmes on Health and Social Progress*, World Health Assembly, 17, (Geneva: WHO, 1964), 1, 2, accessed Aug 2, 2018, <http://www.who.int/iris/handle/10665/136575>.

²⁴ Wolman, *The Influence of Community Water Supply Programmes on Health and Social Progress*, 1, 2.

comparative lack of interest in funding water supplies development (Table 5.5).

The only investment recorded in these six years for Uganda was in

Table 5.5: Sudan and Uganda's Investment in Water Supplies 1967-1972

Gross Domestic Fixed Investment in '000 of current (1974) US\$						
	1967	1968	1969	1970	1971	1972
Sudan	202469.8	203618.6	202489.8	275416.4	210224.0	0.0
Uganda	0.0	0.0	156099.1	0.0	0.0	0.0
Public Expenditure of government in '000 of current (1974) US\$						
	1967	1968	1969	1970	1971	1972
Sudan	87593.3	88742.1	116886.8	153647.3	58874.2	0.0
Uganda	0.0	0.0	0.0	0.0	0.0	0.0

Source: Phyllis Peter, Staff Assistant (IBRD, Public Utilities Department), IBRD Statistics, 18 November 1974, WHO Archives, W2/418/11 (72), JKT 8.

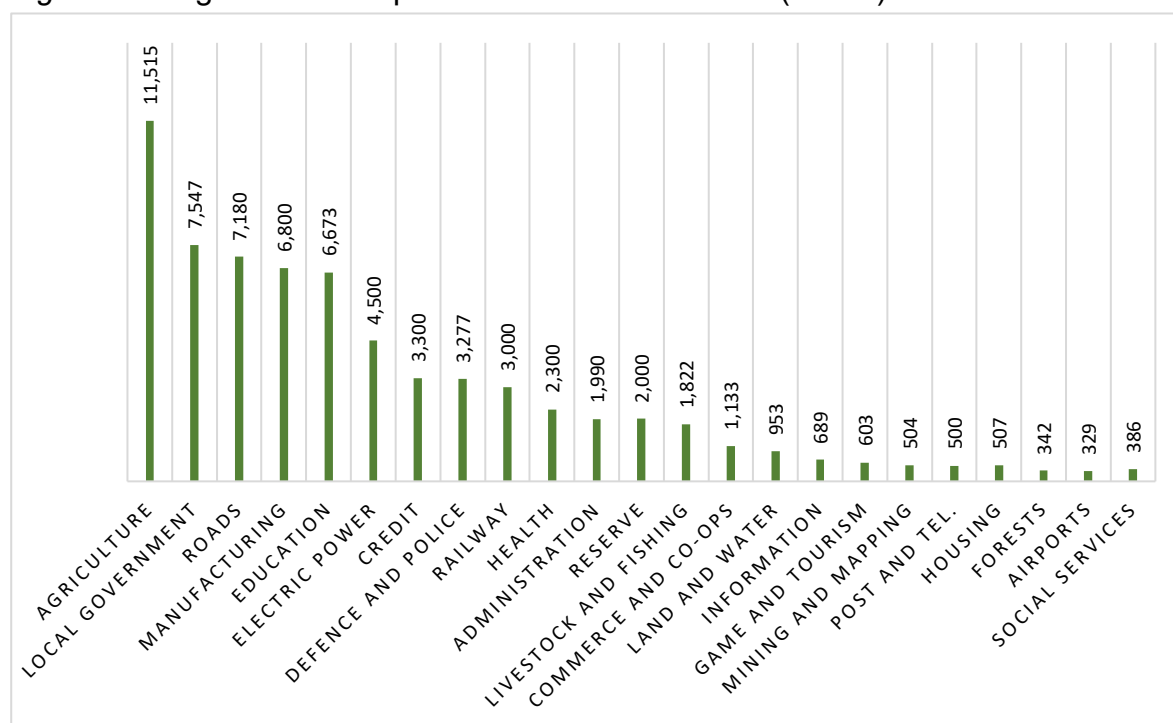
1969. The various levels of internal engagement affected the ability of governments like Uganda to procure external assistance: funding agencies were more reluctant to invest if internal commitment to support water supplies and sanitation development was lacking.

In 1961, *The Economist* provided a commentary on the situation in Uganda, stating that it, "faces difficult economic, as well as political problems. When the bowlers send up as many political googlies [deceptive delivery] as they do in Uganda, it is hard for government batsmen to keep their eyes steadily on the economic ball."²⁵ In the decade following independence, intensified conflict challenged both economic and political stability within and between the newly established parties. This had a significant impact on the government's ability to raise internal and external investment in development. Three notable 'political googlies' were independence (1962), the coalition crisis (1966) and Idi Amin's military coup (1971). Factionalism and regionalism were problems in Uganda and political instability was endemic in the 1960s and 1970s.

²⁵ *The Economist*, 4 August 1961, Arrangements for Development Finance in Uganda, 1961, TNA, CO 822/2555.

By 1963 newly independent Uganda was still in the initial stages of formulating its long-term development plans and officials were in the process of establishing international relations in order to secure the technical and financial support it sought to aid implementation. Figure 5.3 shows that the top five priorities in the Uganda Development Plan 1961/62-1965/66 were: agriculture (16 percent); local government (11 percent); roads (10 percent); manufacturing (10 percent); and education (9 percent).²⁶ Together these accounted for over 50 percent of

Figure 5.3: Uganda Development Plan 1961/62-65/66 (£ '000).



Source: Clark, *Development Planning in East Africa*. Data manipulated by author.

the funds allocated specifically for development. Within the development plan, land and water accounted for a very small percentage. We must consider water's inclusion under other headings, such as agriculture, health, and local government but, compared with other development areas, water was not a high or specified priority. The competition for finances and the overlap in responsibilities were two major obstacles. It is also possible that personnel deficiencies were a problem, which would account for the significant investment in education.²⁷

²⁶ Paul G. Clark, *Development Planning in East Africa*, East African Studies Number Twenty One (Nairobi: East African Publishing House), 1965, 43. Data then manipulated by author. Percentage calculated using published total (71,641).

²⁷ WHO (AFRO), *The Community Water Supply Programme in the African Region*, W2-180-6.

In 1962 Uganda had 60 percent coverage for urban water supplies: only Sudan, Ghana, and Kenya in Sub-Saharan Africa had better urban coverage; Madagascar and Tanganyika were on par with Uganda.²⁸ Labelled by the World Bank as “well-watered” in 1964, Uganda was deemed to be well-endowed with raw resources.²⁹ Moreover, between 1951 and 1968 the population supported through piped supplies had increased from 28,300 to 129,000 in Kampala and from 18,450 to 65,000 in Jinja.³⁰ Yet, while this led to a sharp increase in the percentage of those with access to water in these urban areas—36 percent in Kampala and 59 percent in Jinja—these figures were not impressive. Further, only 17 percent and 33 percent respectively in the Kampala and Jinja areas had access to sewerage systems.³¹ This emphasised the deficiencies in access to safe water and sanitation facilities into the 1970s.

Regarding water supplies and sanitation the key collaboration between the Ugandan government and international organisations (WHO/UNDP) was a pre-investment project to improve water and sewerage in the urban regions of Greater Kampala and Greater Jinja in 1960s.³² This decision to focus on these two communities was at the request of the Ugandan Government in 1963 and supported by WHO Advisers.³³ This project was in line with the WHO’s plans,

²⁸ Dieterich and Henderson, *Urban Water Supplies*, 78-79; Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in Developing Countries: A Commentary*.

²⁹ World Bank, IBRD and IDA, *The Economy of Uganda*; World Bank, Robert McNamara, *Report and Recommendation of the President of the International Development Association to the Executive Directors on a Proposed Credit to the Republic of Uganda for a Water Supply Engineering Project*, 11 February 1981 (Washington: World Bank, 1981), Annex I, 1, accessed Nov 27, 2018, <http://documents.worldbank.org/curated/en/352911468349440024/Uganda-Water-Supply-Engineering-Project>.

³⁰ Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja areas: project results, conclusions and recommendations. Report prepared for the Government of Uganda by the World Health Organisation, acting as Executive Agency for the United Nations Development Programme, July 1972, WHO Archives, CO/72.2.

³¹ Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja areas, July 1972, WHO Archives, CO/72.2.

³² Study of Needs of Developing Countries for Pre-Investment and Technical Assistance Through the UNDP in the Years 1968, 1969 and 1970: WHO Contribution, 25 May 1967, WHO Archives, CPD/67.8; WHO, Plan of Operation: Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja Areas (Government of Uganda, United Nations Development Programme, World Health Organization), 15 July 1968, WHO Archives, CWS/68.1; Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja areas, July 1972, WHO Archives, D72.1339; McNamara, *Report and Recommendation of the President of the International Development Association*, 1981.

³³ Master Plans – Project Results, Conclusions and Recommendations – prepared by WHO acting as Executive Agency for UNDP, 1972, WHO Archives, CO/72.2,

which sought to prioritise urban water supplies.³⁴ The development of plans to improve urban water supplies shows how WHO priorities, which were based on economic factors, could mesh with the specific political priorities in Uganda. The UN argued that this project would enable international agencies to effectively utilise national resources “for the greatest benefit to the greatest number of people”, with Kampala and Jinja forming the largest urban areas in Uganda.³⁵ This complemented the Ugandan Government’s agenda to prioritise investment in areas of political and economic importance: Kampala was the capital of Buganda and held great importance to the Kabaka and the Kabaka Yekka party, which had formed a coalition with Obote and the Uganda People’s Congress; the same could be said of the Mengo area.³⁶ In addition both Kampala and Jinja were situated close to Lake Victoria, with Jinja directly adjacent to the White Nile, and this held a variety of economic potentialities. This reveals that in rural areas the lack of coverage was due to a combination of economic and political reasons: cost was a consideration but so was the political value of any given area.

In addition the lack of data for rural water supplies coverage at this point masked the extent of the overall problem in the country, as the WHO survey in 1970 later revealed. The prioritisation of alternative health and development agendas, accompanied by the lack of accurate data on the extent and the nature of the water problem, meant that water did not figure prominently. Even with shifting international agendas towards investment in rural populations, Uganda was not involved with, nor did it gain direct support for Community Water Supply Programmes outside of the UNDP pre-investment survey. Uganda did not feature directly with the UNICEF programme for environmental sanitation and water supplies either.³⁷

³⁴ Dieterich and Henderson, *Urban Water Supplies*.

³⁵ Seventeenth Inter-Agency Meeting—ACC Sub-Committee on Water Resources Development, WHO Archives, WHO1, W2/86/2 (17); World Bank, IBRD and IDA, *The Economy of Uganda*, 5 November 1964; McNamara, *Report and Recommendation of the President of the International Development Association*, 1981: map showing higher population density around Kampala and around Jinja and its surrounding areas.

³⁶ An agreement was reached prior to independence between the central government and Buganda; the latter was given federal status, whilst the other kingdoms were given semi-federal status. Under this regime, the Kabaka (Kabaka Yekka Party) was President of the country and Milton Obote (Uganda People Congress) was Prime Minister.

³⁷ Coordination with UNICEF, Assessment of UNICEF Programme: Environmental Sanitation and Water Supplies, 1971-72, WHO Archives, E 5/372/2 (A), JKT 2; Coordination with UNICEF, Assessment of UNICEF Programme: Environmental Sanitation and Water Supplies, 1971-72, WHO Archives, E 5/372/2 (A), JKT 3.

It was also difficult to encourage government departments responsible for water supplies—the Ministry of Health in particular—to fund improvements. One of the primary aims of the master plan for water supplies and sanitation in Greater Kampala and Jinja was to make “good water available, within a reasonable distance and in sufficient quantities, to all members of the communities served.”³⁸ To do this, the WHO suggested that the Ministry of Health pay for the:

significant increase in the number of standpipes [...] bearing in mind that the expenditure by the ministry would undoubtedly be more than compensated by savings in hospital and health costs. The water may then be furnished ‘free’.³⁹

The medical officer of health in Kampala was sceptical of this approach and “indicated that people are [...] willing to pay for the modest amounts of water they use at present.”⁴⁰ An alternative option was to sell water through local vendors.⁴¹ It was likely that the Ministry of Health was reluctant to pay for the increase in standpipes due to its own departmental funding limitations. The short to medium term benefits of other health interventions were favoured over the long-term benefits of such an investment.

Though political troubles had surfaced much earlier, the military coup of Idi Amin in 1971 and its aftermath complicated, and ultimately halted, international investment; the WHO/UNDP project was discontinued until the early 1980s.⁴² Problems were already brewing at independence, with the coalition between the Uganda People’s Congress (UPC) and Kabaka Yekka (KY), as the Kabaka wanted to retain powers whereas Obote and the UPC aspired to create a unified Uganda. These opposing agendas led to a political crisis that began in February 1966 and ended with the exile of the Kabaka, the abolishment of the kingdoms, and a new constitution that appointed Obote the new President of the Republic of

³⁸ John Hale, John A. Logan and Robert Miller (WHO Consultants), Master Plan – Report of Advisory Panel 22-31 August 1969, WHO Archives, S.11 (70), 1969; Report of WHO Advisory Panel, WHO Archives, S.138 (71), 5; Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja areas, July 1972, WHO Archives, CO/72.2.

³⁹ Hale, Logan and Miller, 1970 Master Plan for Water Supplies (Uganda): Report of WHO Advisory Panel, 5.

⁴⁰ Hale, Logan and Miller, 1970 Master Plan for Water Supplies (Uganda): Report of WHO Advisory Panel, 11.

⁴¹ Hale, Logan and Miller, 1970 Master Plan for Water Supplies (Uganda): Report of WHO Advisory Panel, 11.

⁴² McNamara, *Report and Recommendation of the President of the International Development Association*, 1981.

Uganda. Political instability worsened, and was exacerbated by, economic difficulties. Despite steady increases in GDP following independence this was offset by population growth. Thus, while the World Bank observed improvements in standards of living for rural inhabitants—re-marking on the “enhanced prospects” of economic development because of “internal political stability” within the country as of 1964—it also noted significant regional disparities.⁴³ Buganda, regarded as the most affluent kingdom, constituted 29 percent of the population but contributed 50 percent towards the country’s production.⁴⁴ This emphasised the greater investment in Buganda, which was reaping the rewards comparative to the other regions. Alongside this, diversification of the Ugandan economy remained limited with agricultural production accounting for over 50 percent of the GDP in 1964.⁴⁵

Water was also a political issue in Sudan. The refusal of the Arab-led government in Khartoum to make political concessions for the southern regions, for example, was reflected in the northern bias of WHO sponsored environmental health projects in the early 1960s and early 1970s: most WHO projects were centred around Khartoum and its outlying districts.⁴⁶ Although the WHO projects represented a microcosm rather than a fullness of work underway, it is a fair reflection of the general bias towards the northern and central regions, which held political favour at this time.

While the Republic of Sudan was more heavily involved in a variety of water and environmental health activities in the mid-1960s, it entered a dip between

⁴³ World Bank, IBRD and IDA, *The Economy of Uganda*, i.

⁴⁴ World Bank, IBRD and IDA *The Economy of Uganda*, 5.

⁴⁵ World Bank, IBRD and IDA, *The Economy of Uganda*, introduction; 28.3 percent on money economy agriculture and 27.5 percent subsistence agriculture.

⁴⁶ D. J. Speares, Minute, 9 February 1966, TNA, FO 371/190415, Annual Report Sudan 1965; J. B. Richmond to Michael Steward (Foreign Office), Confidential Despatch, 3 January 1966, TNA, FO 371/190415, Annual Report Sudan 1965; D. V. Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, July 1968, WHO Archives, EMRO, EM/ES/116, SUDAN 0036/R: though dated from Jan 1965, reference was made to the origins of WHO and Sudan Government coordination to improve the environmental health services from 1961; Sanitary Engineering Course, University of Khartoum, 1964-73, WHO Archives, Project Files, SUD-SES-001, EHE, 1964-73; Community Water Supply 1960s, WHO Archives, Project Files, Sudan-42; Training of Water Works Operators, 1966-68, WHO Archives, Project Files, Sudan-46; Evaluation of Health Services and Training Programmes, 1967-68, WHO Archives, Project Files, Sudan-47; Environmental Health 1965-69, WHO Archives, Project Files, Sudan-3002 JKT 1 & 2; Environmental Health 1970-72, WHO Archives, Project Files, Sudan-3002 JKT 3; Community Water Supply in Rural Areas, 1961-1970, WHO Archives, Sudan-3201; Rural Health Demonstration Unit (in Sudan-3201), WHO Archives, Project Files, Sudan 4001; Health Services and Training, 1956-71, WHO Archives, SUDAN-UNICEF-1.

1971 and 1974 before revitalisation in the mid to late 1970s.⁴⁷ Following the Addis Ababa Agreement between the North and the South in 1972, WHO investment crossed the North-South divide; projects were then undertaken in both the Northern regions (Gezira especially) and the Southern regions.⁴⁸ This resulting change showed how internal politics significantly impacted the ability of international organisations to support nations, and specific regions, with less political favour. However, there was ample support for community water supplies projects in the Republic of Sudan in the 1960s and early 1970s, particular for rural areas.⁴⁹ The most notable difference between Sudan and Uganda's engagement with water supplies was the rural emphasis, as evidenced in a Rural Health Demonstration Project (Sudan-19) in El Huda, south-east of Khartoum, and a community water supplies project for rural areas (Sudan-45).⁵⁰ The prioritisation of investment in rural areas is depicted in Figures 5.4 and 5.5. Between 1960 and 1965, 83 percent of the investment in community water supplies accrued to rural areas and 85 percent between 1965 and 1970. Moreover, while investment in urban areas increased threefold for the latter period from US\$3 million to US\$6 million, the jump from US\$15 million to US\$ 51 million for investment in rural areas highlighted the greater intent to prioritise rural water supplies; this also explains the sharper increase in percentage coverage and numbers served in Sudan between 1960 and 1970.

The focus on rural areas corresponded with EMRO's interest in four aspects relating to water in the region in 1963—people, disease, rural areas, and

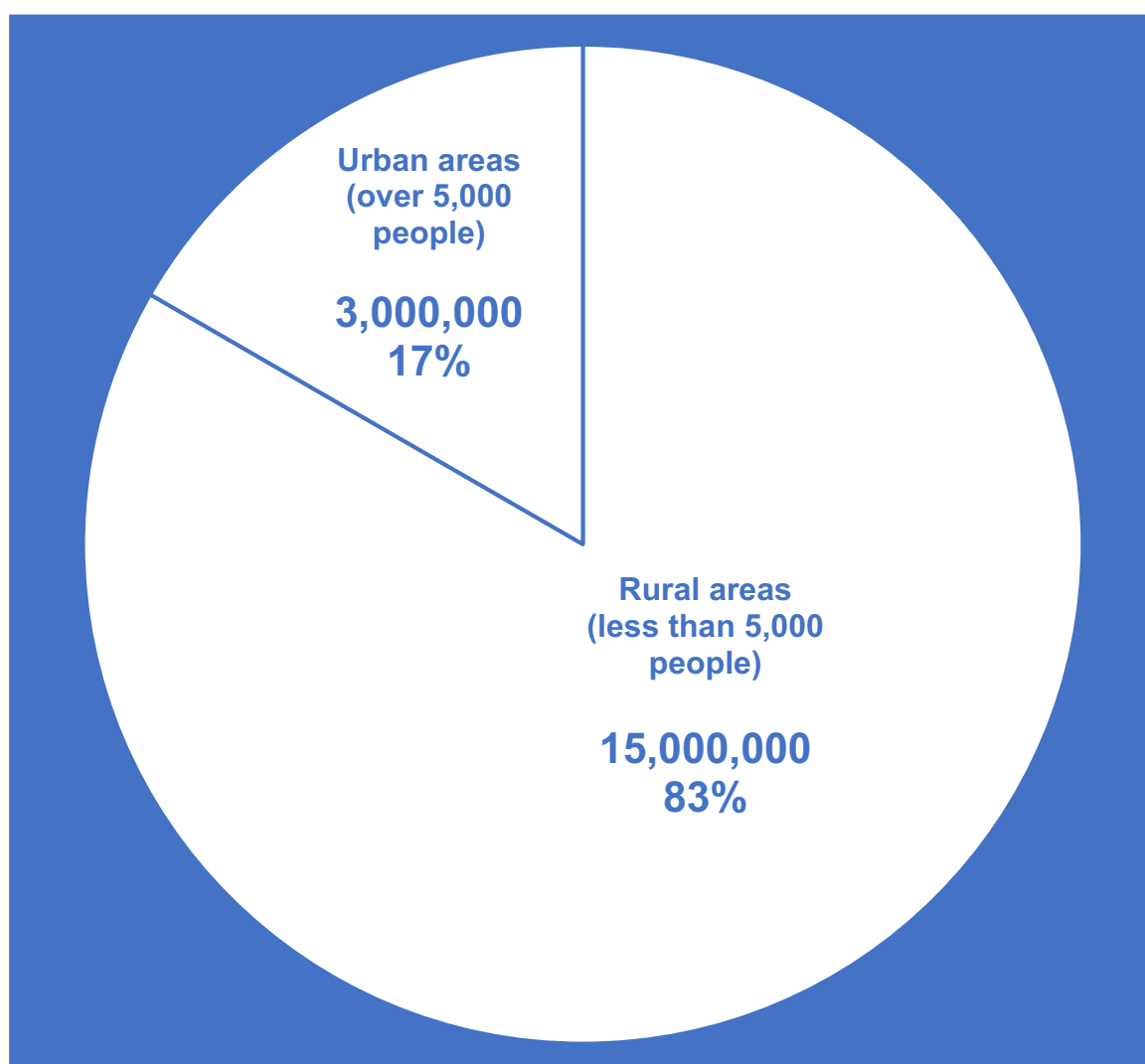
⁴⁷ Rural Water Supply Programme Southern Sudan 1974-1976, WHO Archives, Project Files, SUD-PIP-001 JKT 1; Rural Water Supply Programme Southern Sudan 1976-1977, WHO Archives, Project Files, SUD-PIP-001 JKT 2; Rural Water Supply Programme Southern Sudan 1977-1981, WHO Archives, Project Files, SUD-PIP-001 JKT 3; Rural Water Supply Programme Southern Sudan 1981-86, WHO Archives, Project Files, SUD-PIP-001 JKT 4.

⁴⁸ Comprehensive approach to the prevention and control of water-associated diseases in irrigated schemes, Gezira province, Sudan, 1978-1979, WHO Archives, Project Files, SUD-VBC-001 JKT 1; for 1979-1980, SUD-VBC-001 JKT 2; for 1980, SUD-VBC-001 JKT 3, JKT 4 and JKT 5; for 1980-82, SUD-VBC-001 JKT 6; for 1982-88, SUD-VBC-001 JKT 7; Domestic Water Supply Programme in the Southern Sudan (supported by NORAD), WHO Archives, Project Files, SUDAN-0003.

⁴⁹ Gaafer M. Nimeiry (Major General, Sudan) to U. Thant (Secretary General, UN), Letter, 26 February 1970, accessed Nov 26, 2018, <https://search.archives.un.org/uploads/r/united-nations-archives/7/1/d/71d7e4dfacda5845a5cebaaf5fb7d92aff0d67a5d32c044f75888951eef6cc86/S-0882-0002-30-00001.pdf>.

⁵⁰ Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, July 1968, WHO Archives, EMRO, EM/ES/116, SUDAN 0036/R, and see Annex II: Chronological Listing of Activities of Environmental Health Projects.

Figure 5.4: Investment (US\$) in Community Water Supplies (Sudan) 1960-1965



Source: Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, WHO Archives, EMRO, EM/ES/116, SUDAN 0036/R.

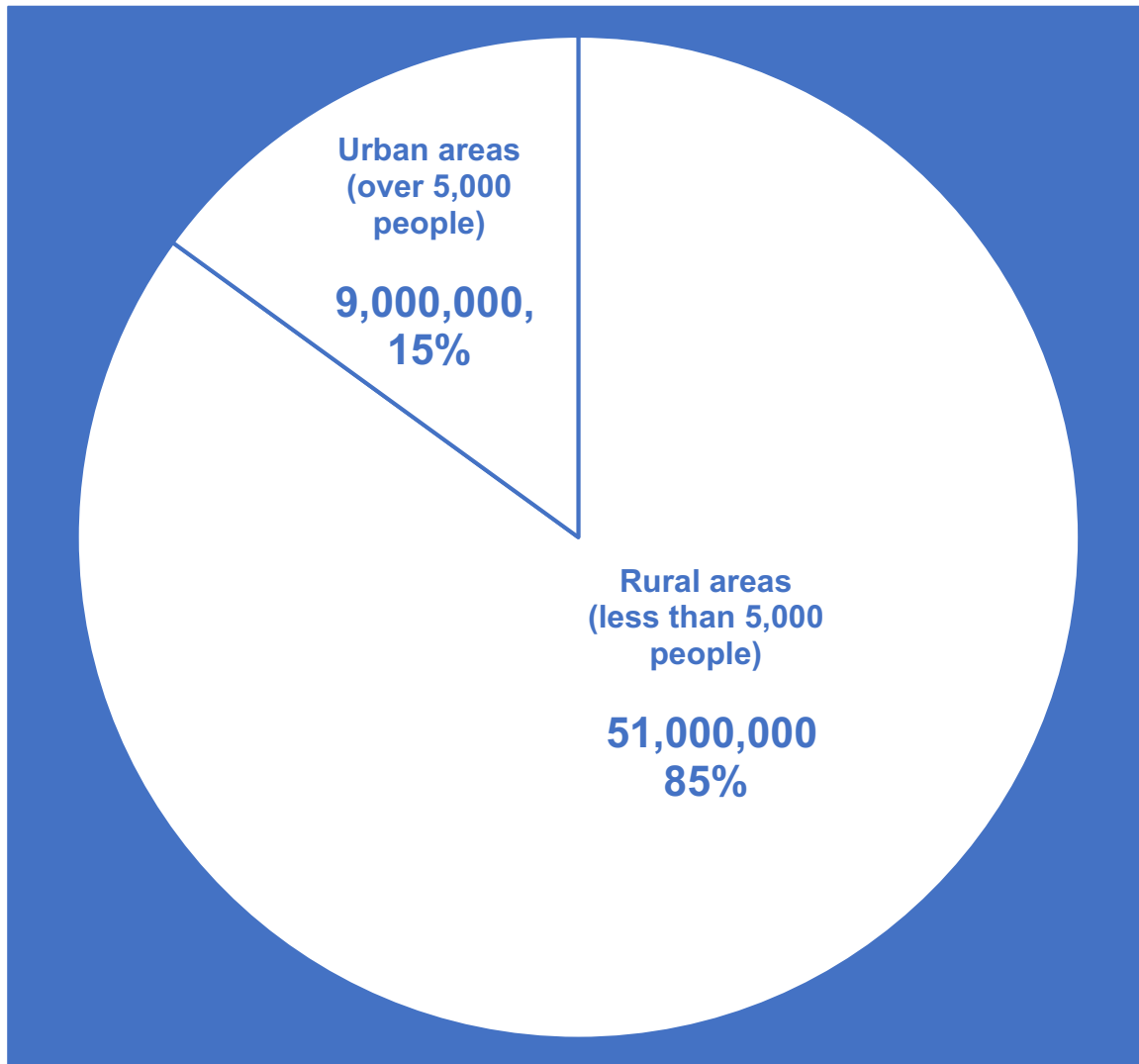
economy.⁵¹ In addition, “considerable interest was shown in Community water supply and many suggestions were put forward to improve the organisation of these services” within Sudan itself.⁵² Within two years, LS15 million was earmarked for the promotion of a “three-year intensive programme” for rural water development.⁵³ Of the LS15 million, it was hoped LS8 million would be found from external sources and LS7 million from internal revenue: LS1 million in hard currency from the development budget of the Central Government and LS6 million in local currency from the Province Council Budget. The Programme would be implemented through the Land Use and Rural Water Development Department of

⁵¹ WHO (EMRO), *Drinking Water, People and the Better Life*.

⁵² Subrahmanyam, Quarterly Field Report, Third Quarter, 1965, Sudan-3002.

⁵³ Subrahmanyam, Quarterly Field Report, Third Quarter, 1965, Sudan-3002.

Figure 5.5: Investment (US\$) in Community Water Supplies (Sudan) 1965-1970.



Source: Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, WHO Archives, EMRO, EM/ES/116, SUDAN 0036/R.

the Ministry of Agriculture, which would seek to address 850 of 1168—75 percent—of the proposals “emanating from provincial & local authorities over three years.”⁵⁴

The rural water development programme agreed on four resolutions, which focused on key roles and responsibilities. The first resolution was that the Ministry of Health had to approve all water supplies schemes.⁵⁵ This ensured that health considerations were accounted for in the implementation of any rural water supplies developments. Secondly, current legislation would be reviewed to ensure that it was appropriate for current and future developments. Thirdly, there was an intent to both improve communications across disciplines and agencies and to

⁵⁴ Subrahmanyam, Quarterly Field Report, Third Quarter, 1965, Annex 1, September 1965, Sudan-3002.

⁵⁵ Subrahmanyam, Quarterly Field Report, Third Quarter, 1965, Sudan-3002.

give sanitary engineers precedence in their specialist area: the Ministry of Health was encouraged to dialogue with the Sanitary Engineering Unit/Division. Fourthly, they agreed that a central water board should be set up. This would act as a legislative and coordinating mechanism to minimise overlap and deal with any tensions surrounding the planning and implementation of programmes.

In looking to improve current institutions and to develop communication between the different agencies responsible for water, it was clear that efforts were being made to overcome some of the obstacles to developing water supplies in the country. While highlighting the gap between development in the north and the south of the country, J. B. Richmond was keen to stress the positive progress to be made "if the measures planned with foreign aid for the development of water supplies in the rural areas come to fruition."⁵⁶

However, in the second half of the 1960s there were difficulties in procuring external and internal finances for the continued development of water supplies. By the Second Quarter of 1966 it was evident that the development of community water supplies in the Gezira (Sudan-42), which had been struggling from inception, would not "materialise for sometime" as neither the UN nor the rural councils in Sudan were able or willing to provide the funding required.⁵⁷ In addition, the Training of Waterworks Personnel (Sudan-46) hit a financial hurdle as the UNDP took six months to reply to a request for funding before eventually stating that it was unable to financially support the project's operation. The WHO agreed to finance the training of waterworks personnel using its own funds before the end of 1966 but this was far from ideal.⁵⁸

Due to the challenges in project operation W. R. W. Ferguson's (WHO Regional Adviser on Environmental Health) visits in February and December 1967 were very welcome.⁵⁹ In February, the main purpose of the visit was to discuss

⁵⁶ Richmond to Steward, Confidential Despatch, 3 January 1966, TNA, FO 371/190415, Annual Report Sudan 1965; Also see WHO Archives, WHO Centralized Files, N79-372-2SUD, World Food Programme, Jackets 1 to 8, 1963-1986.

⁵⁷ Subrahmanyam, Quarterly Field Report, Second Quarter, 1966, Sudan-3002; Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, July 1968, Annex II: Chronological Listing of Activities of Environmental Health Projects, xiii.

⁵⁸ Subrahmanyam, Quarterly Field Report, Second Quarter, 1966, Sudan-3002; Subrahmanyam, Assignment Report: Environmental Health Project January 1965-May 1968, July 1968, Annex II: Chronological Listing of Activities of Environmental Health Projects, xv.

⁵⁹ W. R. W. Ferguson, Report on the Visit to the Sudan, 21-28 February 1967, WHO Archives, Sudan-42, Community Water Supply 1960s; WHO Archives, Sudan-3002.

environmental health and community water supplies with government departments, including the Ministry of Health.⁶⁰ The visit as a whole was positive and emphasis was placed on the good progress made: Sudan-36 (environmental health) was deemed “a very successful project”, the results of Sudan-42 (community water supplies in the Gezira) were deemed to “have been of great value”, and Sudan-46 (training waterworks personnel) was labelled “a great success in spite of recruiting difficulties.”⁶¹ Despite the challenges faced in procuring finances it was evident from Ferguson’s visit that there was support for investment in environmental health in general and water supplies in particular within the higher rungs of government—the Prime Minister was chairman of the new Rural Water Development Corporation.⁶²

However, plans to improve urban and rural water supplies in Sudan had varying success rates. While the cooperation among the Rural Water Corporation, the Ministry of Health, and the WHO was labelled as “noteworthy”, and while some schemes were progressing well, others, such as urban supplies for 24-Qorashi, struggled to find financial backing.⁶³ According to Subrahmanyam this was owing to the fact that the Managil Extension, of which 24-Qorashi was attached, had been “removed from the ‘Development’ status.”⁶⁴ This strongly suggested that without the development tag potential investors were less inclined to lend financial support and consequently reinforced the long-standing bond between water and development.

President Numeiry’s Freedom from Thirst Campaign (also known or referred to as the Thirst Campaign or the Anti-Thirst Campaign) instigated in 1970 boosted investment in the environmental health infrastructure in the Republic of Sudan initially, but priorities were already shifting by the end of 1971.⁶⁵ Thus,

⁶⁰ Ferguson, Report on the Visit to the Sudan, 21-28 February 1967.

⁶¹ Ferguson, Report on the Visit to the Sudan, 21-28 February 1967; Sudan-3002, 3-4.

⁶² Ferguson, Report on the Visit to the Sudan, 21-28 February 1967; Sudan-3002.

⁶³ Subrahmanyam, Assignment Report: Environmental Health Project January 1965 – May 1968, July 1968, WHO Archives, Sudan-3002, WHO, EMRO, 10, 9.

⁶⁴ Subrahmanyam, Assignment Report: Environmental Health Project January 1965 – May 1968, July 1968, WHO Archives, Sudan-3002, WHO, EMRO, 10, 9.

⁶⁵ Ferguson, Report on a Visit to the Sudan 4-12 March 1968, Sudan 3201; Asim I El Moghraby, “State of the environment in Sudan,” accessed July 26, 2018, [https://unep.ch/etu/publications/11\)%2027%20to%2036.pdf](https://unep.ch/etu/publications/11)%2027%20to%2036.pdf); Mahmoud El Zain, “Environmental Scarcity, Hydropolitics, and the Nile: Population Concentration, Water Scarcity and the Changing Domestic and Foreign Politics of the Sudan,” (D.Phil dissertation, Institute of Social Studies, The Hague, The Netherlands, 2007), accessed Nov 26, 2018, <https://core.ac.uk/download/pdf/18507904.pdf>, 119-125.

despite intentions to take this programme forward in the late 1960s, budgetary constraints and the prioritisation of “more specialised training at the Faculty of Medicine” left Sudan-36 (Environmental Health) and Sudan-45 (rural community water supplies) on hiatus at the end of 1971.⁶⁶

3. **Cooperation and Coordination: Addressing Divided Responsibilities**

As well as addressing the knowledge and resource limitations the WHO and its experts were interested in tackling issues regarding the fragmentation both of knowledge and of efforts to resolve the water problem.⁶⁷ This was demonstrated by the establishment of the WHO International Reference Centre (IRC) on Community Water Supply to create, collate, coordinate, and disseminate knowledge in 1968. In particular, work needed to be done to improve channels of communication and the effective dissemination of knowledge. WHO efforts to address fragmentation were also demonstrated in the composition of the first expert committee on community water supplies held between 29 October and 4 November 1968: there were a “wide variety of disciplines and experiences” compared with earlier expert committees on environmental sanitation.⁶⁸ While these inhouse efforts were important the WHO also needed to coordinate more deliberately with other organisations.

In the 1960s and early 1970s attempts were made, albeit slowly, to address the division of responsibilities across international organisations, primarily through the coordination of efforts. Coordination was often developed through joint endeavours, such as the WHO/UNICEF and the WHO/UNDP partnerships for rural and urban water supplies, respectively. International organisations sought to enhance the coordination of efforts through forums, conferences, and seminars, where specialists from various organisations and disciplines gathered to discuss the best way forward for developing community water supplies and sanitation facilities. With the variety of agencies and the number of countries involved in many of these discussions, as this section shows, coordination problems were likely to be inevitable. Therefore, the first part of this section addresses to what

⁶⁶ Community Water Supply in Rural Areas, Sudan-3201, 1967-69.

⁶⁷ WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*.

⁶⁸ WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*, 4, 5, 17: “the establishment of an international reference centre and a chain of collaborating institutions appears to be a very good way of overcoming this [flow of information] deficiency and of making assistance continuously available,” 17.

extent poor coordination constrained action and how these issues were (and were not) overcome. It does this through analysis of several attempts to improve coordination and overcome challenges in resource limitations.

This section also explores the gradual move towards integrated development and how this affected interest in the development of community water supplies. Approaches to both development and health were changing in the late 1960s. Integrated development was increasingly favoured, thus giving precedence to coordinated efforts as opposed to treating individual aspects in isolation from one other. The abandonment of the global malaria eradication programme in 1969 due to its lack of success, particularly in Sub-Saharan Africa, was a good example. Backing was instead given to broader approaches to health and the concept of Primary Health Care was born alongside efforts to prioritise environmental health.⁶⁹ Therefore, this section also addresses the beginnings of integrated development as one of the methods utilised to encourage coordinated efforts.

The WHO made concerted efforts to cooperate and coordinate efforts with other organisations, such as UNICEF, the United Nations Development Programme (UNDP), the International Bank for Reconstruction and Development (IBRD), and the World Bank. The WHO hoped that resources could be pooled to aid a multi-pronged attack on the problems that poor access to water supplies presented.⁷⁰ As agreed in the Administrative Committee on Coordination's (ACC) interagency meetings on international cooperation concerning water resources, the WHO was responsible for water quality and the human use of water but did not have the finances available to implement water supplies projects without external support. UNICEF played an important role in promoting and financially supporting programmes in rural areas: 73 joint UNICEF/WHO projects on environmental sanitation and rural water supplies were underway in 1969, with "about 60 WHO sanitary engineers" involved in field work and roles within regional offices and

⁶⁹ WHO/UNICEF, *Primary Health Care, Report of the International Conference on Primary Health Care Alma-Ata, USSR, 6-12 September 1978* (Geneva/New York: WHO/UNICEF, 1978), accessed July 16, 2018, https://www.unicef.org/about/history/files/Alma_Atata_conference_1978_report.pdf.

⁷⁰ WHO, *The Second Ten Years of the World Health Organisation*; WHO, *The Third Ten Years of the World Health Organisation*; WHO, *The Fourth Ten Years of the World Health Organisation: 1978-1987* (Geneva: WHO, 2011), accessed Nov 25, 2018, <http://apps.who.int/iris/handle/10665/4464>.

headquarters.⁷¹ Further cooperation with prestigious and respected lending agencies also enabled the WHO to encourage member states to invest in water supplies, such as the UNDP assistance in AFRO for pre-investment surveys (UNDP) and government studies (IBRD).⁷² WHO officials were particularly keen to develop good relationships with each of these organisations as this would enable the WHO to undertake work that would otherwise prove financially unviable.

Conflict within and between organisations was a key feature in the 1960s and early 1970s. Problems afflicted cross-organisation and cross-discipline coordination as people tried to work together towards development objectives. Organisations had their own philosophies and agendas, which in turn affected the kinds of projects they would naturally prioritise. Water supplies development had an advantage over alternative health programmes because of its long history of connections to economic development, particularly in countries reliant on agriculture as their main source of income. Water was also important for industrial processes. The economic return of water supplies developments, particularly in urban areas, drew interest from funding bodies like the World Bank, the IBRD, and the UNDP. For UNICEF, which was particularly interested in maternal and child welfare, the development of rural water supplies was of greater interest. It was common for the men of the household to migrate to urban areas for work and for the women and children to remain in rural communities. For UNICEF's work, therefore, the need was greatest in rural areas.

The WHO faced significant challenges in their attempts to find technical and financial support from other governments and international organisations to support their work. In the case of WHO and UNICEF cooperation was complicated by different agendas and personality clashes as they tried to work together towards the goal of integrating economic, social, and health aspects. Tension arose between the two organisations and was noted at the UNICEF staff meetings in 1967 and 1968 for the African region. In addition to "personality differences", Dr. L. J. Charles commented in 1967 on the different approaches to regional work.⁷³

⁷¹ WHO, *The Third Ten Years of the World Health Organisation*, 256; WHO and Expert Committee, *Community Water Supply: Report of a WHO Expert Committee*; Also on cooperation with UNICEF see Lanoix and WHO, *Action for Environmental Health, WHO says*, 2; WHO, *The Second Ten Years of the World Health Organisation*, 257, 40.

⁷² WHO, *The Second Ten Years of the World Health Organisation*, 256; WHO, *The Third Ten Years of the World Health Organisation*, 61.

⁷³ Dr. L. J. Charles, Report at the UNICEF 1967 Staff Conference, Abidjan, 13-17 November, WHO Archives, N69/372/2, AFRO, Programme Co-ordination with UNICEF, AFRO.

UNICEF criticised the “over-centralisation” of the WHO and the WHO criticised the “over-decentralisation” of UNICEF.⁷⁴ Though a “better turn recently taken in relations between the two organisations” was noted, it was also remarked that, “the acme had not yet been reached.”⁷⁵ The continued difficulties were reiterated in discussions with UNICEF in Brazzaville on 30 September 1968.⁷⁶ Concern was expressed that the WHO was not keeping up with developments at the “same pace” as UNICEF, with the suggestion that UNICEF may choose alternative fields of work if the issue was not soon rectified.⁷⁷ The WHO found it difficult to keep up with developments in other organisations because of their own limited resources and because they faced competition for funds from other socio-economic activities. The WHO’s responded in a measured fashion to UNICEF’s concern:

While his [probably referring to Dr. C. A. Eggar] threat to ‘turn to fields other than health’ cannot be expected to influence AFRO policy in that regard due note must nevertheless be taken of it, especially as the impression was gained that the statement was not made lightly.⁷⁸

It is clear from this remark that the WHO representative wanted to continue with caution. This was understandable as UNICEF was one of the few organisations with financial influence that was willing to support the WHO’s Community Water Supply Programme. Moreover, it was the only organisation that consistently supported the development of rural water supplies in the 1950s and 1960s. The WHO found itself in a difficult position on account of its reliance on other organisations that had different philosophies, priorities, and methodologies.

The WHO increasingly encouraged the representatives of member states to emphasise the economic advantages of investing in health as this connection was valued by many lending agencies and by higher levels of governments: this was particularly noticeable in relation to the development of water supplies. The WHO

⁷⁴ Charles, Report at the UNICEF 1967 Staff Conference, Abidjan, 13-17 November.

⁷⁵ Dr L. J. Charles, Note for the record: visit to AFRO of UNICEF Director for Africa, 29 March 1968, WHO Archives, N69-372-2-AF, Programme Coordination with UNICEF – AFRO.

⁷⁶ WHO, Notes on discussion with UNICEF, Brazzaville, 30 September 1968, WHO Archives, N69-372-2-AF – Programme Coordination with UNICEF, AFRO.

⁷⁷ WHO, Notes on discussion with UNICEF, Brazzaville, 30 September 1968, WHO Archives, N69-372-2-AF.

⁷⁸ WHO, Notes on discussion with UNICEF, Brazzaville, 30 September 1968, WHO Archives, N69-372-2-AF.

recognised the difficulties that its officials and health representatives from its member states were having in encouraging governments to raise finances for the development of water supplies. As a result, the WHO chose to focus on how to effectively justify investments in this field.

Meetings during 1967 and 1968 highlighted the different approaches to the development of rural areas. Paul Hoffmann of the UNDP convened these meetings, which discussed new fields of interest. These conversations highlighted the growing attention given to developing integrated programmes to improve the living standards and welfare of people in rural areas.⁷⁹ There was a clear intent to encourage collaboration amongst the representative organisations: the UN, the International Labour Organisation (ILO), FAO, UNESCO, WHO, UNICEF, IBRD, and the World Food Programme (WFP).⁸⁰ Moreover, credence was given to rural development and the aspects of health, such as water supplies, that fell under this remit.

The ACC Working Group of Rural and Community Development and the WHO were concerned that approaches to rural development would be unhelpfully standardised and not take account of local conditions.⁸¹ The ACC Working Group of Rural and Community Development emphasised two points. Firstly, they argued that local conditions needed to be assessed in order to enable discrete programme formulation. The second suggestion, in which they encouraged international organisations to take account of the availability of resources as well as “social and institutional prerequisites”, reiterated the first.⁸² The Working Group of Rural and Community Development was clearly concerned that pilot projects would be standardised to the extent that they did not account for key differences across regions, which in turn would influence the effectiveness of any rural development. The WHO echoed these concerns and noted that nations needed to have the capacity and ability to absorb available assistance. The extent to which

⁷⁹ This was continued into the 1970s: WHO/IBRD Cooperative Programme: African Region, WHO Archives, Centralized Files, P20-372-2AF JKTS 1 to 4, 1971-1973. See Dr. A. S. Pavlov, Letter concerning the proposed visit of Dr Dieterich to AFRO, 5 December 1972, P20-372-2AF JKTS 1 to 4.

⁸⁰ WHO/UNDP Agency Review Meeting 4-5 December 1967, New Fields of Interest, 30 November 1967, WHO Archives, CPD/67.11.

⁸¹ WHO/UNDP Agency Review Meeting 4-5 December 1967, New Fields of Interest, 30 November 1967.

⁸² WHO/UNDP Agency Review Meeting 4-5 December 1967, New Fields of Interest, 30 November 1967.

these concerns were heeded in the development of rural programmes remained to be seen.

P. Bierstein, Chief for Community Water Supply (WHO), emphasised the continued difficulties in coordinating efforts in a letter to A. Alagappan, Chief of Water Resources Section (UN), on 13 April 1970. Bierstein was keen to highlight how disagreements across UN organisations were negatively affecting the countries they were trying to support:

experts from various of the UN Organisations had presented conflicting recommendations to individual governments on suggested national water policy [...] such conflicting advice was not in the best interests of the whole UN system and that some steps should be taken to avoid such situations in the future.⁸³

While Bierstein also noted that the WHO acted as a mediator and “was not directly involved in this matter of conflicting advice”, this situation highlighted the confusion caused by the divided responsibilities for water as national governments looked to develop effective water supplies policies.⁸⁴ Bierstein did not expand on the nature of these conflicting recommendations but more concerted efforts towards coordination and cooperation were evident in the following years.

Keen to avoid unnecessary overlap and tensions between and within organisations, the ACC Sub-Committee on Water Resources Development looked to provide some basic guidelines. Five policy suggestions for all UN organisations, and their affiliates, to consider in this vein were listed as follows: firstly, the importance of utilisation “for the greatest benefit to the greatest number of people”; secondly, institutional arrangements for water policies should have access to “the highest level of government”; thirdly, different usages of water should be acknowledged; fourthly, policy decisions “should be supported by factual information gained by the technically sound system of data collection, storage, retrieval and analysis”; fifthly, that account be taken of the “economic and technical potentialities” and policies adjusted accordingly in each country.⁸⁵

⁸³ P. Bierstein to Mr A. Alagappan, Letter, 13 April 1970, WHO Archives, WHO1, W2/86/2 (17), Seventeenth Inter-Agency Meeting—ACC Sub-Committee on Water Resources Development.

⁸⁴ Bierstein to Mr A. Alagappan, Letter, 13 April 1970.

⁸⁵ Bierstein to Mr A. Alagappan, Letter, 13 April 1970.

There are some important conclusions to draw from these recommendations. Firstly, there was no specification as to whether benefit to the greatest number referred to rural or urban populations. Urban communities were growing rapidly and the proximity of people made it easier to serve them. On the other hand, rural communities still predominated in the nations that water supplies projects were looking to reach. Therefore, investment in rural areas could also be argued as helping more people. Different organisations, depending on their preference, could justify prioritising either rural or urban areas. Secondly, it was clear that water institutions still required much attention and that without government backing it was difficult to get water supplies and sanitation programmes up and running. Thirdly, quantitative evidence and analysis was considered crucial to the process of planning and implementing health and development projects. The WHO was collecting data on water supplies and sanitation at this point, as discussed in Chapter 4. Fourthly, local context was given greater consideration and, as a result, standardised policies were no longer considered favourable. This suggested that the UNDP and other organisations had accounted for the concerns that the WHO, and others, had expressed about the problems with standardised methodologies. Despite the existence of multiple, often conflicting, agendas attempts were still made to coordinate efforts.

WHO/UNDP efforts to improve water supplies in Uganda highlighted some of the challenges in cross-agency coordination; significant tensions persisted and compromise was needed. As water was a lower priority to prominent lending agencies, such as the World Bank, the time between planning and implementation of projects was often lengthy. In 1966 the WHO highlighted its frustration with the lack of response from the UNDP—an issue the Republic of Sudan had also encountered—to the request for assistance in the preparation of master plans for Kampala and Jinja water development:

WHO expressed concern at UNDP's silence on this request which had been submitted in November 1965. UNDP would attempt to fit the request into the agenda of the June 1967 Governing Council Session.⁸⁶

⁸⁶ Record of Discussions, WHO/UNDP (SF) Agency Review Meeting 6-7 December 1966, WHO Archives, CPD/67.1.

Only set up at the beginning of 1966, the UNDP might be forgiven for its slow responses. Amalgamating the UN Special Fund, which had focused on furthering UN technical assistance, with the Expanded Programme of Technical Assistance, which had guided underdeveloped countries on economic and political matters, the UNDP was created with the expressed aim of coordinating development programmes and to thus “avoid duplication within the UN System.”⁸⁷

However, the frustrations were also understandable. The UNDP provided a holding answer and no promise that the project would even make the agenda for discussion in June 1967. A pre-investment survey was carried out eventually and included the investment expected from the special fund (US \$616,800) and the Ugandan government (US \$48,400), but this did not occur until 1968.⁸⁸

Finally, in 1969, the IBRD confirmed World Bank interest in the possibility of an International Development Association (IDA) loan for the Kampala and Jinja projects at very low interest rates; the Resources Group of London was chosen as the subcontractor to undertake the development.⁸⁹ Still very much tied to its colonial past, Britain played a significant role in technical and financial assistance in Uganda. This multilateral venture—combining WHO, IDA, UNDP, and British assistance with Uganda’s internal investment—highlighted Britain’s continued involvement in Uganda’s development plans in the years that followed independence; this also emphasised the increased awareness of the importance of water development within the wider UN system and within the larger funding agencies.⁹⁰ In addition, it highlighted the growing interest in multilateral—as opposed to bilateral—work. This was valuable in the field of water supplies development as a variety of expertise was required in the planning, implementation, operation, and maintenance of water supplies and associated sanitation systems.

⁸⁷ For further detail on the United Nations and the UNDP see: O. Stokke, *The UN and Development: From Aid to Cooperation* (Bloomington and Indianapolis: Indiana University Press, 2009); C. N. Murphy, *The United Nations Development Programme: A Better Way?* (Cambridge: Cambridge University Press, 2006): notably, 51-66; WHO, *The Third Ten Years*.

⁸⁸ Plan of Operation: Master Plans for Water Supply and Sewerage for the Greater Kampala and Jinja Areas, WHO Archives, CWS/68.1, 1968.

⁸⁹ Hale, Logan and Miller (WHO Consultants), Master Plan – Report of Advisory Panel 22-31 August 1969, WHO Archives, S.11 (70), 1969; Report of WHO Advisory Panel, WHO Archives, S.138 (71).

⁹⁰ World Bank, IBRD and IDA, *The Economy of Uganda*; McNamara, *Report and Recommendation of the President of the International Development Association*, 1981.

Efforts to improve water supplies in Sudan highlighted the varied nature of projects in this field. While there was a particular drive towards improving not only the quantity but also the quality of water supplies within communities, the distinct outworking of projects differed from place to place.⁹¹ Some projects focused on one factor, such as the training of waterworks personnel, and others addressed a combination of factors, such as the project aimed at improving environmental health services. There was a distinct emphasis on the “provision of safe community water supplies, provision of healthy housing, removal and disposal of human excreta and other wastes, and industrial sanitation.”⁹² In addition, priority was given to understanding personnel deficiencies and exploring ways to resolve this issue.

The use of a WHO Short-term Consultant in Community Water Supplies (Sudan-42) in Gezira was a project with a specific focus: it was funded by the WHO and the Sudan Gezira Board for the “collection and analysis of water samples” and included research into better filtration systems.⁹³ While work on this project fell behind schedule in 1965 the Gezira Board was keen to “take up this matter vigorously.”⁹⁴ Between August and October 1965, therefore, H. E. Grombach, Civil Engineer and WHO Short-term Consultant, studied the rural water treatment plants in the Gezira and recommendations were made for improvements, particularly regarding water quality.⁹⁵

Other projects, such as the joint WHO/Sudan Government Environmental Health Services Programme, addressed a variety of factors. In addition to data collection on the training of sanitary engineers, this project was focused on the “breakdown” of existing waste disposal services (Wad Medani) and research was

⁹¹ Regional Director (EMRO) to M. P. Siegel (ADG, HQ), Letter, 18 April 1966, WHO Archives, Sudan-3002, EMRO, Memorandum on the Plan of Operation — SUDAN-36, Environmental Health Project; Plan of Operation for An Environmental Health Project, WHO Archives, Sudan-3002, 1.

⁹² Regional Director (EMRO) to M. P. Siegel (ADG, HQ), Letter, 18 April 1966, 1.

⁹³ Subrahmanyam, Quarterly Field Report, 16 September 1964; Subrahmanyam, Monthly Progress Report, November 1964; Community Water Supply 1960s, WHO Archives, Project Files, Sudan-42.

⁹⁴ Subrahmanyam, Progress Report: Quarterly Field Report, First Quarter, 1965, 6 April 1965. For Sudan-36 funds were reframed as WHO Technical Assistance. The Sudan Government and UNICEF and for Sudan-19 funds: reframed as WHO Regular Budget and the Sudan Government.

⁹⁵ H. E. Grombach, Study of Rural Water Treatment Plants in the Sudan Gezira Part I, August – October 1965, September 1965, WHO Archives, Sudan-42, Community Water Supplies 1960s; also see Part II, November 1965, and Part III, May – July 1966, September 1966.

planned to avoid problems in the construction of a new system at the proposed hospital in New Halfa.⁹⁶ Concern was also raised about the low-cost housing scheme that was part of the project and health education was deemed paramount to its success: “intense health education must be given to the householders when the houses are let. These houses have a house connection for water in the house but not in the latrine.”⁹⁷ In 1966 activities within the Environmental Health Project included: filtration systems for hafirs and small dams; pumping schemes for two factories; a committee to be set up to review afforestation in the Khartoum Greenbelt; latrines; oxidation ponds; training; rural hospital design; the acquirement of a sanitarian; and preventive cholera measures.⁹⁸ A large proportion of the work suggested and planned—following visits to hafirs, waterworks, and the low cost housing project—also concerned research for water treatment.⁹⁹ In order to ensure work was carried out effectively, the Sanitary Engineering Unit was tasked with: coordinating between all agencies dealing with environmental health; advising the government; initiating and assisting surveys; acting as Ministry of Health representatives; aiding education and training programmes; and evaluating activities.¹⁰⁰ The utilisation of the Sanitary Engineering Unit highlighted the prioritisation of community water supplies within this project, with the formative role to be played by sanitary engineers in its implementation.¹⁰¹ Furthermore, the role that the Sanitary Engineering Unit played as a coordinating body also emphasised intent to overcome issues of fragmented responsibilities regarding environmental sanitation in general and community water supplies in particular.

⁹⁶ Subrahmanyam, Monthly Progress Report, November 1964; Subrahmanyam, Quarterly Field Report, 16 September 1964.

⁹⁷ Subrahmanyam, Quarterly Field Report, Fourth Quarter, 1964.

⁹⁸ Subrahmanyam, Quarterly Field Report for the Environmental Health Project, First Quarter, 1966, Sudan-3002.

⁹⁹ Subrahmanyam, Progress Report: Quarterly Field Report, First Quarter, 1965, 6 April 1965; Subrahmanyam, Report on a visit to Kosti Town and Rabak, 15 and 16 February 1965, 3, Sudan-3002; Subrahmanyam, Quarterly Field Report, Second Quarter 1965; Subrahmanyam, Fourth Quarterly Progress Report, 1965, 3 January 1966.

¹⁰⁰ Plan of Operation for An Environmental Health Project, WHO Archives, Sudan-3002, 1, 2.

¹⁰¹ In 1969, the Ministry of Health had established a Sanitary Engineering Division to support Environmental Health work in the country: The Scope of Work of the Sanitary Engineering Division of the Ministry of Health, 2 February 1969 (Circular concerning the Establishment of a Sanitary Engineering Division in the Ministry of Health, Mohammed Osman Abdel Nebi, Under Secretary, Ministry of Health, 2 February 1969), WHO Archives, Sudan-3002.

Administrators and specialists in Sudan recognised the need to overcome coordination issues with agencies in Sudan that were involved in the environmental sanitation field and the development of water supplies. The significant push towards the cooperation of agencies dealing with water and health, and the coordination between them, was most notably evidenced through the Community Water Supplies Seminar held in 1967, as was the role of sanitary engineers in bridging the gap across these agencies. As in the earlier periods studied, there were multiple agencies concerned with water supplies and a similar pattern emerged in the broader field of environmental health.¹⁰² During the 1960s and early 1970s, therefore, concerted efforts were made to ensure effective cooperation and coordination to tackle the water problem within government departments in the Republic of Sudan.

W. R. W. Ferguson, WHO Regional Adviser on Environmental Health, visited Sudan again in December 1967. Ferguson's second visit was primarily to attend a University of Khartoum sponsored Seminar on Community Water Supply, which was "supported by every organisation in the Sudan who had any direct or indirect responsibility for community water supplies."¹⁰³ This showed that the Sudan Government at various levels supported engagement with community water supplies and its corollaries. Before seminar discussions, Ferguson also noted the satisfactory progress in the Environmental Health Project under Subrahmanyam's supervision as well as the positive cooperation across government organisations "who have any interest or responsibility for community water supplies."¹⁰⁴

The Community Water Supply seminar itself, "far surpassed expectations and it was one of the most interesting and instructive seminars he [Ferguson] had ever attended."¹⁰⁵ Ferguson explained why:

It was a meeting of a large number of people each of whom was an expert in his own field [...] Participants who attended included not only engineers but doctors, geologists, chemists, biologists and University professors. Papers were submitted

¹⁰² D. V. Subrahmanyam to the Regional Director of the World Health Organization (Eastern Mediterranean Regional Office), Letter, 17 September 1964, WHO Archives, SUD-SES-001, EHE, 1964-73, Sanitary Engineering Course, University of Khartoum, 1964-73.

¹⁰³ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, Sudan-3002, WHO, EMRO, 1.

¹⁰⁴ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, 1.

¹⁰⁵ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, 3.

on all subjects concerned with water from the investigations needed to find it to the quality at the tap.¹⁰⁶

Given Ferguson's high praise, the ability of the various government organisations working on community water supplies to come together for a meeting of this kind was clearly a rarity.¹⁰⁷ This differed from the difficulties experienced in trying to organise coordinated efforts between international organisations during the 1960s.¹⁰⁸ Those gathered thus deserved recognition for their accomplishments—something that international organisations and many other territories had struggled to achieve.

There was, however, a sense of over-optimism on behalf of the Sudanese experts. For example, experts discussed the problem of well-sinking in rural areas at great length, with the Rural Water Development Corporation optimistically proposing to sink 500 wells in 1968. On this front, Ferguson felt it necessary to draw attention to the "problem in logistics."¹⁰⁹ Ferguson suggested that a Sudanese engineer visit Nigeria, where 10,000 wells had been sunk over a ten-year period: they might be able to glean some useful advice and ideas of how to go about implementing these ambitious plans.¹¹⁰ In the early 1970s the Sudan government sought to continue its enthusiasm for investment in water supplies but this time in the south. Within a rural development programme that would cost the World Food Programme \$11,427,000, plans were made for significant developments in water resources to tackle the "scarcity of drinking water."¹¹¹ This included the construction of surface wells, deep bore wells, and reservoirs at 192,

¹⁰⁶ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, 3.

¹⁰⁷ Subrahmanyam reiterated this in Sudan-3002: Assignment Report: Environmental Health Project January 1965 – May 1968, July 1968, WHO Archives, EMRO, 12.

¹⁰⁸ Seventh Interagency Meeting, 1960, WHO Archives, Centralized Files, WHO3, W2/86/2 (7); Eighth Interagency Meeting, 1961, WHO Archives, Centralized Files, WHO3, W2/86/2 (8); Ninth Interagency Meeting, 1962, WHO Archives, Centralized Files, WHO3, W2/86/2 (9); Tenth Interagency Meeting, 1963, WHO Archives, Centralized Files, WHO3, W2/86/2 (10); Sixteenth Interagency Meeting, 1969, WHO Archives, Centralized Files, WHO3, W2/86/2 (16).

¹⁰⁹ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, Sudan-3002, WHO, EMRO, 3.

¹¹⁰ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, Sudan-3002, WHO, EMRO, 3.

¹¹¹ World Food Programme, WHO Archives, WHO Centralized Files, N79-372-2SUD, Jackets 1 to 8, 1963-1986. See World Food Programme, Project Summary, 7 January 1970, WHO Archives, WHO Centralized Files, N79-372-2SUD, Jacket 3, 1970-1971.

160, and 60 sites respectively across the provinces of Bahr El Ghazal, Upper Nile and Equatoria.¹¹²

Based on the need to address the “acute shortage of water, lack of technical data on water supply and paucity of trained personnel, and insufficient coordination between water-supply agencies”, taking into consideration the importance of water from economic and humanitarian perspectives, and being mindful of “the existing limitation of finance, and the potential for further development of water resources”, the seminar made fourteen recommendations:

1. Better coordination and cooperation between agencies
2. Better data collected and dissemination
3. Better conservation
4. Need to establish water quality standards
5. Need for Postgraduate training for Sanitary Engineers
6. Need for trained auxiliary water supply personnel
7. Water Supply agencies to coordinate and cooperate across disciplines
8. Need for technical and sanitary supervision of water supplies works
9. Need for regular medical examination of water supply personnel
10. That water producing agencies would be responsible for the quality of the water
11. Safe supplies of water in rural communities
12. More efforts to improve supplies for rural communities
13. Regulations for water pollution
14. Seminars to be held on Community water supply.¹¹³

Each of these recommendations were followed up separately or in conjunction with each other. A Sanitary Engineering Division within the Ministry of Health was set up to help in coordination and cooperating across agencies and disciplines (Points 1 and 7).¹¹⁴ Data were collected for the WHO survey in 1970 (Point 2). Conservation was addressed through afforestation and research into the problem of arid lands (Point 3). The quality of water was noted in Points 4, 10, 11, and 13, and was in the process of being addressed in several locations.¹¹⁵ It was evident that there was a strong emphasis between 1964 and 1969 on not only improving

¹¹² See World Food Programme, Project Summary, 7 January 1970, WHO Archives, WHO Centralized Files, N79-372-2SUD, World Food Programme, Jacket 3, 1970-1971.

¹¹³ Ferguson, Report on a Visit to the Sudan, 14-21 December 1967, January 1968, i, Sudan-3002, WHO, EMRO, Appendix II: Seminar on Community Water Supply.

¹¹⁴ The Scope of Work of the Sanitary Engineering Division of the Ministry of Health, 2 February 1969 (Circular concerning the Establishment of a Sanitary Engineering Division in the Ministry of Health, Mohammed Osman Abdel Nebi, Under Secretary, Ministry of Health, 2 February 1969), WHO Archives, Sudan-3002.

¹¹⁵ See Community Water Supply, 1960s Sudan-42; Community Water Supply in Rural Areas, Sudan-3201; Sanitary Engineering Course, University of Khartoum, 1964-73, Project Files, SUD-SES-001, EHE.

access to water supplies—quantity—but also to making sure the quality was fit for purpose. Time and resources were poured into research on filtration systems and how best to dispose of waste.¹¹⁶ This was emphasised on 4 October 1969 at an inauguration day of a short course on water quality.¹¹⁷ Dr. Hassan Zaghoul was keen to reiterate the importance of water in the sanitary engineering—read also environmental health—field:

The field of sanitary engineering is quite a comprehensive field that includes drinking water, sewerage, solid waste disposal, insect control, and many other branches. Most of the efforts made so far were dedicated to the field of drinking water. The reason is quite evident because water is the source of all life as it was stated in the holly Qoraan [holy Qur'an] It is needless to speak to a group of health officers about the importance of controlling drinking water.¹¹⁸

Training and check-ups on personnel (Points 5, 6, 8 and 9) were addressed through the training of water works operators, as well as developments in training courses for sanitary engineers.¹¹⁹ Further advancements were made through Primary Health Care Programmes in the late 1970s and early 1980s regarding the training of Community Health Workers. There were clear intentions to place increased emphasis on rural water supplies and this was evidenced in the investment in this area in the 1960s and 1970s.¹²⁰ By the end of 1968, therefore, there was a clear indication that community water supply was “the highest priority” of the Sudanese Government as regards environmental health.¹²¹ Moreover, there were concerted efforts to address personnel deficiencies throughout this period, which then enabled government departments to address the water problem more effectively.

As already indicated, there was a growing interest in integrated development programmes. M. G. Candau, Director General of the WHO, sought to highlight

¹¹⁶ See Sudan-3002.

¹¹⁷ Dr. Hassan F. Zaghoul, Statement in the inauguration day of the short course in Water Quality Control & the Use of Sebro M. F. Portable Kits in the Bacteriological Examination of Water, 4 October 1969, Sudan-3002.

¹¹⁸ Zaghoul, 4 October 1969, Sudan-3002.

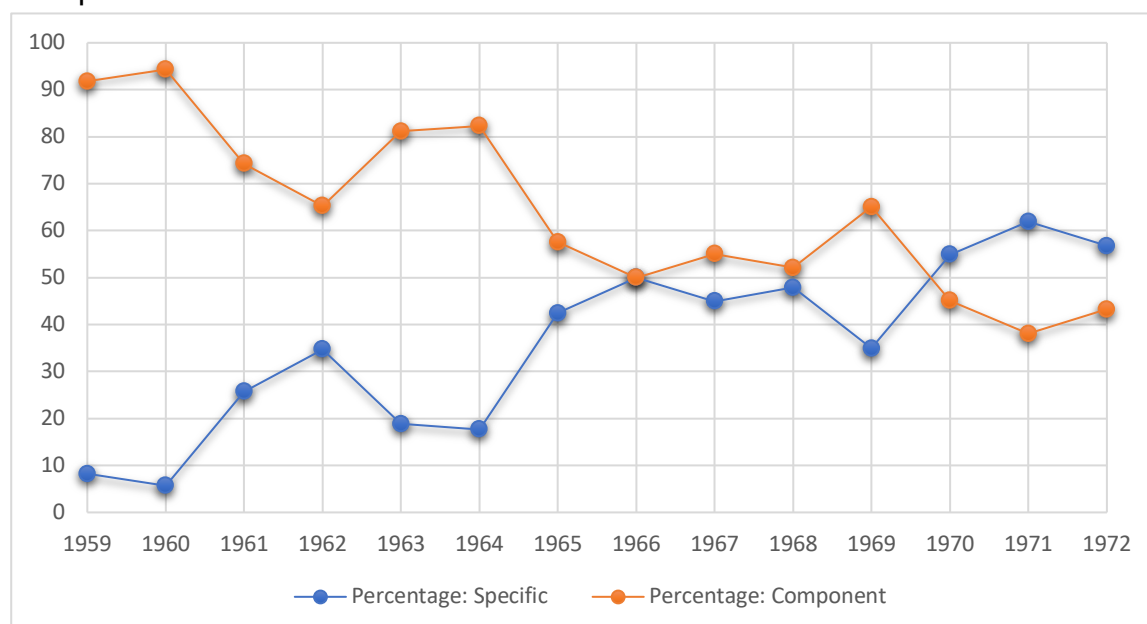
¹¹⁹ Training of Water Works Operators, Sudan-46; Sanitary Engineering Course, University of Khartoum, 1964-73, Project Files, SUD-SES-001, EHE.

¹²⁰ Community Water Supply in Rural Areas, Sudan-3201.

¹²¹ D. V. Subrahmanyam, Assignment Report: Environmental Health Project January 1965 – May 1968, July 1968, WHO Archives, Sudan-3002, WHO, EMRO, 10, 9.

that, just as various health issues connected with each other, health and socio-economic development, too, were inextricably linked.¹²² In offering to provide significant funds the World Bank recognised the importance of water supplies and sanitation to social and economic development agendas.¹²³ As the World Bank and the UNDP provided larger and more consistent financial backing for water supplies and sewerage projects from the late 1960s, developments became more feasible. Figure 5.6 compares the number of programmes solely addressing community water supplies with those that had a community water supply component. It shows that investment in community water supplies was often made in relation to other development activities: there were a sizeable proportion of

Figure 5.6: Percentage of Community Water Supplies Activities as Specific and Component.



Source: Candau, Community Water Supply Programme: Progress report by the Director-General, 1968, 3; Candau, Community Water Supply Programme: Progress report by the Director-General, 25 April 1972, 12.

component activities as compared with sole activities in the first decade of the Community Water Supply Programme. Between 1959 and 1969 there were more component activities undertaken each year except in 1966 when the number of

¹²² WHO, *The Second Ten Years of the World Health Organization, 1958-1967*.

¹²³ For example, see IBRD/WHO meetings on water supply and sewerage activities, 1970-71 (including "A Memorandum on policies and practices of the International Bank for Reconstruction and Development" by Abel Wolman dated 14 April 1969), WHO Archives, Centralized Files, W2-87-7; Community Water Supply: Coordination with UNICEF, 1981-86, WHO Archives, Centralized Files, W2-372-9 JKT 6; Lanoix and WHO, *Action for Environmental Health, WHO says*.

specific and component activities were equal. This supports Richard Feachem's analysis of engagements with water supplies and sanitation in the twentieth century: "For 20 years after the Second World War these [measures to improve water supplies and sanitation] were unfashionable and were eclipsed by advances in vector control, therapy and immunology."¹²⁴ Between 1970 and 1972 this shifted in favour of specific community water supplies programmes. The fact that investment in community water supplies in the early days of the programme tended to favour association with other activities reemphasises the continued difficulties that advocates faced in promoting the stand-alone value of water supplies at a time when targeted disease programmes were favoured.

The shift towards sole community water supply programmes in the early 1970s adds further weight to the importance of data collection in making the water supplies and sanitation problem more prominent, as well as highlighting the challenges faced in controlling various diseases after the Second World War. Richard Feachem described the twists and turns in people's engagement with the role of water supplies and sanitation in health and argued that the difficulties faced in attempts to control diseases through technological means, such as malaria, gave impetus to the advocates of alternative approaches, such as environmental and water-related.¹²⁵ This combined with the convergence of compatible ideas where water was a shared component—such as environmental health, food production, and primary health care—shaped engagement with water's role in the fields of health and development. Heightened awareness was thus due to cumulative processes: it was the result of changes first occurring in the 1960s as the then newly independent nations called for international investment in health and development programmes and as new agendas emerged within international organisations.¹²⁶

Integrated approaches were evidenced by Sudan's Rural Health Demonstration Project (Sudan-19) in El Huda. Funded by WHO, the Sudan Government, UNICEF, and the Sudan Gezira Board, this project was unique when it first began in that it had environmental health components rather than being

¹²⁴ R. G. Feachem, "Community Participation in Appropriate Water Supply and Sanitation Technologies: The Mythology for the Decade," *Proceedings of the Royal Society of London. Series B, Biological Sciences* 209, no. 1174 (1980): 15-29.

¹²⁵ Feachem, "Community Participation in Appropriate Water Supply and Sanitation Technologies: The Mythology for the Decade," 15-29.

¹²⁶ United Nations, "Joint Declaration of the Developing Countries made at the Eighteenth Session of the General Assembly," 11 November 1963.

targeted solely to environmental health improvements. This provides a good example of where investment in environmental health was actioned as part of a wider development project. Between 1961 and 1962 the focus was on planning and preparation: the first environmental health activities undertaken were the training of village workers and the extension of the El Huda Water Supply distribution system. During 1963 the designs for rural latrines were actioned and surveys undertaken to ascertain population numbers and access to sanitation; it was not until 1964 that four prototype houses were completed.¹²⁷ Once established, the environmental health aspect was focused on the “construction of rural homes” and “experimental latrines” and was directly aimed at dealing with the problem of damage caused during the rainy season.¹²⁸ In this context, the supervision of a sanitary engineer was deemed mandatory for building houses. Further, construction was not undertaken in isolation but drew upon aid from the World Food Programme and financial contributions from the Central Government.¹²⁹

There were also signs of integrated approaches for Uganda. The UNICEF/WHO partnership was examining further possibilities for coordination in the African Region in the 1960s, including programmes designed to integrate health services, such as the approval of an allocation of US\$120,000 for Basic Health Services in 1964. This project was instigated in 1967 as Uganda-35.¹³⁰ Possibilities of Community Development and Primary Education, alongside the continued investment in Health Services in 1966, were also discussed.¹³¹ In addition, efforts were directed towards the development of training facilities, health education, and the control of endemic diseases to support the Ugandan

¹²⁷ Subrahmanyam, Quarterly Field Report, 16 September 1964, WHO Archives, Sudan-3002, JKT 1&2; Quarterly Field Report, Fourth Quarter, 1964, Sudan-3002, JKT 1&2.

¹²⁸ Subrahmanyam, Quarterly Field Report, 16 September 1964, WHO Archives, Sudan-3002, JKT 1&2; Quarterly Field Report, Fourth Quarter, 1964, Sudan-3002, JKT 1&2; Rural Health Demonstration Unit (in Sudan-3201), Sudan 4001; Subrahmanyam, Quarterly Field Report, 16 September 1964, Sudan-3002, JKT 1&2; Subrahmanyam, Quarterly Field Report, Fourth Quarter, 1964, Sudan-3002, JKT 1&2; Subrahmanyam, Quarterly Field Report, Third Quarter, 1965, Sudan-3002.

¹²⁹ Subrahmanyam, Monthly Progress Report, November 1964, Sudan-3002.

¹³⁰ S. Flache (WHO Chief Adviser to UNICEF) to Dr. L. Bernard (Personal Representative of the Director General of WHO African Regional Office), Letter re: Recommendations Approved by UNICEF Executive Board June 1964, 25 June 1964, WHO Archives, N69/372/2, AFRO, Programme Co-ordination with UNICEF.

¹³¹ UNICEF Project Review Summaries, Africa South of the Sahara, June 1966, WHO Archives, N69/372/2, AFRO, Programme Co-ordination with UNICEF.

government's investment in rural areas.¹³² Mention was also made of "possible new features" such as "the initiation of rural environmental sanitation and water supplies activities."¹³³

In addition to these developments, F. J. C. Cambournac, WHO Regional Director for Africa, wrote to Stewart Sutton, UNICEF Director for Africa, on 29 January 1963 concerning AFRO's approaches to health.¹³⁴ Cambournac wanted the African region to take better account of the relationship between social, economic, and health factors, such that health was not unnecessarily relegated but rather addressed in conjunction with economic and social aspects of development. Cambournac noted the WHO's "consistent emphasis" on the "great need" to expand the "narrow technical concepts of health, illness and disease to take cognizance of interrelated social factors having a bearing on individual and community welfare."¹³⁵ This, Cambournac stated, was the primary reason for WHO's interest in working jointly with UNICEF on projects that incorporated health activities into other programmes such as community development or social work. Moreover, Cambournac was keen to highlight the WHO Executive Board's comments on the "inseparability of social, economic and health factors" at this point:

public health activities, in developing areas particularly, must impinge more and more on social and economic endeavour. This concept seems specially relevant in relation to plans in respect of the U.N. Development Decade, the World Food Programme and the general co-ordination of international assistance being given for the promotion of social and economic development.¹³⁶

Cambournac's letter thus reflected the path the WHO aspired to during the UN Development Decade and beyond: health must have, and be seen to have, an increasingly positive impact on social and economic development. Moreover, addressing each aspect individually—social, economic, or health—was no longer regarded as advisable or sought after. As water crossed the health, social, and

¹³² UNICEF Project Review Summaries, Africa South of the Sahara, June 1966.

¹³³ UNICEF Project Review Summaries, Africa South of the Sahara, June 1966.

¹³⁴ F. J. C. Cambournac (WHO Regional Director for Africa) to Stewart Sutton (UNICEF Director for Africa), Letter, 29 January 1963, WHO Archives, N69/372/2, AFRO, Programme Co-ordination with UNICEF.

¹³⁵ Cambournac to Sutton, Letter, 29 January 1963.

¹³⁶ Quoting the WHO Executive Board: Cambournac to Sutton, Letter, 29 January 1963; Cambournac to Sutton, Letter, 29 January 1963.

economic divides, the convergence of ideas, such as calls for development, environmental consideration, better food provision, and good health provided a niche for water supplies projects.

Yet as shown in expenditure on community services in Table 5.6 estimations for education and health far surpassed that of water supplies and sanitation in 1960s Uganda. This balance in favour of these two areas, particularly education, reduced the funds available for rural development projects and for investment in water supplies and sanitation within these types of projects; the time

Table 5.6: Expenditure on Selected Social and Community Services in Uganda (Sh million).¹³⁷

	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68*
Education	78.5	98.7	138.5	128.7	133.1	146.0
Health	47.5	52.6	63.2	71.9	84.8	85.0
Fire protection, water supply and sanitation	4.2	5.3	5.7	5.6	9.5	7.7
TOTAL	130.2	156.6	212.9	206.2	227.4	238.7

Source: World Bank, IBRD and IDA, Current Economic Position and Prospects of Uganda (in two volumes), Volume 1, 9 June 1969, Appendix 1, accessed February 6, 2020, <http://documents.worldbank.org/curated/en/966241468176662693/Main-report>.

and resources invested in Kampala and Jinja also exacerbated limitations. Consequently, urban-rural disparities were significant in terms of access to water supplies.¹³⁸

Thus while the WHO emphasised its role in reviewing current rural health development programmes and in encouraging further investment in this field, a country's "readiness and ability to absorb the added external technical assistance" was highlighted as crucial for success.¹³⁹ On this front, the Ugandan Government had not expressed particular enthusiasm for such projects, except in rural health services, and nor was it guaranteed they could absorb the resources needed for developments in rural water supplies. Despite Hoffman's (UNDP Administrator) statement that governments should be encouraged, "to request assistance in this

¹³⁷ *Approved estimates.

¹³⁸ Robert McNamara, *Report and Recommendation of the President of the International Development Association*, Annex 1.

¹³⁹ WHO/UNDP Agency Review Meeting 4-5 December 1967, New Fields of Interest, 30 November 1967, WHO Archives, CPD/67.11.

field”, Uganda had not requested such assistance before 1972.¹⁴⁰ There was, however, a movement towards addressing the imbalance across urban and rural areas. Initiatives, such as the Development Planning seminar held in Uganda in 1969 emphasised the need to study rural aspects of development alongside their urban counterparts.¹⁴¹

Potential for investment in rural water supplies was not realised as WHO/UNICEF had envisaged but steps were taken between 1966 and 1969 to establish integrated approaches to health and development in Uganda. The following paragraphs show there was clear intent to consider the implications of irrigation schemes in Uganda as disease and development were inextricably linked. Moreover, in taking account of the potential issues it was hoped that integrated projects would have a higher success rate than if each factor were considered separately.

In February and March 1967, Dr Marek J. Sanecki, WHO Regional Adviser for Communicable Diseases, and B. Z. Diamant, WHO Consultant and Sanitary Engineer, explored health within an irrigation and pilot demonstration project in Mubuku, situated in the South-West quadrant just north of Lake Edward.¹⁴² The purpose of the project as a whole was to implement an irrigation pilot project to “assess the technical feasibility of economic returns.”¹⁴³ Within this project, health considerations were deemed paramount:

in view of the great variety of communicable disease which prevail (bilharziasis, onchocerciasis, malaria, ancylostomiasis, plague, yellow fever and other arthropod viruses, typhus, relapsing fever, typhoid, tuberculosis, etc.) the project area affords an excellent opportunity for longitudinal epidemiological and control studies.¹⁴⁴

The development of water supplies affected at least half of the ten diseases mentioned in this list. Some of these connections were addressed. For example,

¹⁴⁰ WHO/UNDP Agency Review Meeting 4-5 December 1967, New Fields of Interest, 30 November 1967, WHO Archives, CPD/67.11.

¹⁴¹ General Review of Planning Activities by Regions, WHO Archives, CHS/71/1.

¹⁴² Marek J. Sanecki and B. Z. Diamant, *Report on the Health Aspects of the UNDP(SF)/FAO Irrigation and Pilot Demonstration Project, Mubuku, Uganda*, February – March 1967, WHO Archives, Library, CPD/67.9. For projects files: Uganda-32, Irrigation and Pilot Demonstration Project, Uganda-4, Irrigation and Pilot Demonstration Project and Uganda-1, Irrigation and Pilot Demonstration Project.

¹⁴³ Sanecki and Diamant, *Report on the Health Aspects of the UNDP(SF)/FAO Irrigation and Pilot Demonstration Project, Mubuku, Uganda*, February – March 1967, 5.

¹⁴⁴ Sanecki and Diamant, *Report on the Health Aspects*, 3.

discussions on bilharzia emphasised the importance of “a safe water supply”, which would discourage settlers from using “potential transmission sites” to collect water.¹⁴⁵ Onchocerciasis was labelled “a serious hazard to health” because people and flies, particularly the *S. damnosum*, congregated alongside rivers; the former for access to water for drinking and washing and the latter for breeding sites.¹⁴⁶ Malaria was regarded as a lesser issue initially due to “the combination of good natural drainage and shaded streams” but it was recognised that any irrigation scheme would have the potential to disturb this balance.¹⁴⁷ Ancylostomiasis (hookworm) was a problem where “provision of proper and practical sanitation” was not available.¹⁴⁸ Sleeping sickness, though not mentioned in the list, was also impacted by changes to the water environment. Yellow fever and other arthropod-borne viruses—Bunyamwera, Chikungunya, O’Nyong-Nyong, Rift Valley Fever, and Semliki Forest Fever—were mentioned and preventive drainage measures were suggested to minimise the impact of these vectors on the health of the population.¹⁴⁹ Further, safe water was regarded as the “primary measure” to prevent outbreaks of typhoid, paratyphoid, and dysentery.¹⁵⁰ Given these water-related problems, alongside others, the main suggestion for this project was the establishment of a “multi-purpose” rural health centre to ensure “total health protection and integrated preventive and curative medicine.”¹⁵¹

In a similar vein, Uganda’s Malaria Eradication efforts (Uganda-12) were terminated at the end of 1967 and were replaced by endeavours to improve basic health services (Uganda-35) across the country.¹⁵² Followed up with keenness on the part of the Ugandan Government and supporting international agencies, the project to improve basic health services made use of both WHO and UNICEF contributions.¹⁵³ Once again, however, comment was made that “the availability of

¹⁴⁵ Sanecki and Diamant, *Report on the Health Aspects*, 8.

¹⁴⁶ Sanecki and Diamant, *Report on the Health Aspects*, 9.

¹⁴⁷ Sanecki and Diamant, *Report on the Health Aspects*, 11.

¹⁴⁸ Sanecki and Diamant, *Report on the Health Aspects*, 13.

¹⁴⁹ Sanecki and Diamant, *Report on the Health Aspects*, 16.

¹⁵⁰ Sanecki and Diamant, *Report on the Health Aspects*, 17.

¹⁵¹ Sanecki and Diamant, *Report on the Health Aspects*, 19-20.

¹⁵² J. Galea, *Assignment Report: Development of Basic Health Services*, Uganda, March 1966-68, WHO Archives, Library, Uganda-35, 1; P. M. Kaul (WHO Short-term Consultant, Public Health Administration, Geneva), *Study of Basic Health Services in Uganda*, November/December 1969, WHO Archives, Library, CHS/70.1.

¹⁵³ Kaul, *Study of Basic Health Services in Uganda*, November/December 1969, 2; Galea, *Assignment Report: Development of Basic Health Services*, Uganda, March 1966-68, 4; UNICEF Project Review Summaries, Africa South of the Sahara, June 1966.

water is not too great a problem.”¹⁵⁴ Further to this, the UNDP/WHO master plan for water supply and sewerage in the Greater Kampala and Jinja areas highlighted that “the towns have a good standard of domestic water supply.”¹⁵⁵ P. M. Kaul even suggested that “outlying rural areas” were not cause for great concerns as “rainwater is collected from roof tops and into tanks and boiled for use.”¹⁵⁶ This followed on from Galea’s remarks on the extensive provision of boreholes in rural areas in addition to “plenty of protected springs.”¹⁵⁷ The fact that water was not deemed to be a pressing issue, particularly in politically important areas, likely affected the Ugandan Government’s engagement with the development of water supplies. The positive reports emanating from international organisations compounded the issue. As this chapter has revealed, there was a clear need for better access to water supplies and sanitation facilities in many parts of Uganda but, in comparison to countries like Sudan, the need was smaller. Uganda’s limited engagements in the development of water supplies programmes supported by international organisations, bilateral agreements, and multilateral agreements reflected this.

4. Concluding Remarks

Self-proclaimed as “one of the prime movers at various international meetings”, the WHO played a crucial role in galvanising widespread and concerted engagement with water supplies and sanitation as the 1970s proceeded.¹⁵⁸ The WHO’s limited access to funds meant that coordination with other organisations was particularly important. Coordination enabled the WHO to provide financial and technical assistance to assess current conditions and support government-led water supplies development. If the WHO was unable to obtain backing from funding bodies such as the World Bank or UNICEF then action to improve community water supplies was severely hampered. To secure funds for suggested projects and programmes the WHO partnered with other organisations, such as

¹⁵⁴ Kaul, *Study of Basic Health Services in Uganda*, November/December 1969, 7; Galea, *Assignment Report: Development of Basic Health Services*, Uganda, March 1966-68, 13.

¹⁵⁵ Kaul, *Study of Basic Health Services in Uganda*, November/December 1969.

¹⁵⁶ Kaul, *Study of Basic Health Services in Uganda*, November/December 1969. For note on division of responsibility, see 13.

¹⁵⁷ Kaul, *Study of Basic Health Services in Uganda*, November/December 1969.

¹⁵⁸ WHO, Water, Sanitation and Health Team, *Looking Back, Looking Ahead: Five Decades of Challenges and Achievements in Environmental Sanitation and Health* (Geneva: WHO, 2003), 9, accessed Nov 25, 2018, <http://www.who.int/iris/handle/10665/42752>.

UNICEF and the UNDP, and encouraged bilateral and multilateral investment in water.

During this period the WHO had two main roles. Firstly, the WHO shaped health discourse to reflect the importance of water's relationship to human health. To do so, the WHO competed and collaborated with protagonists of water's relationship to economic development. This was highlighted when the WHO encouraged governments to justify improvements to community water supplies on economic grounds. Secondly, the WHO was responsible for collecting and collating data regarding the water problem, thus having a direct involvement in defining the extent and type of water problem that developing countries would face in the short, medium, and long term if obstacles to the development of water supplies were not overcome (Chapter 4).

Using analysis of WHO project reports, forums, and correspondence, this chapter stressed once again the practical difficulties in developing environmental health and community water supplies programmes. For example, the engagements with environmental health and community water supplies in Sudan highlighted some of the practical constraints as attempts were made to improve urban and rural water supplies in this vast country. Despite the ambitious plans that the Sudanese government sought to bring to fruition in the late 1960s and into the 1970s, issues of finances, coordination, and shortage of skills significantly shaped the outworking of community water supplies development. This chapter also revealed the problems of bureaucratic coordination, which were compounded by inadequate and multi-agency funding. While there was a common belief that water should be a public good by 1970 there was little agreement on how to mobilise international and national agencies to ensure it became one.

The first two sections explored some of the financial and political challenges that hampered the development of the WHO's Global Community Water Supply Programme and the development of water supplies and sanitation facilities in Uganda and Sudan. It was clear that interest within the higher rungs of government was crucial to the development of community water supplies. While Sudan's engagements with water supplies and environmental health were largely confined to the north between 1963 and 1972, there was a clear governmental interest in improving access to water supplies and sanitation.

In Uganda, the development of water supplies was a lower priority but areas of political importance were considered for improvements to services. The

contrasting urban and rural foci, as shown in section two, also highlighted the importance of government interest, as well as the role of the WHO's regional offices in encouraging the development of community water supplies in specific areas. After six large-scale urban water supplies and sanitation projects in AFRO were attempted there was a shift towards rural areas but between 1963 and 1972 WHO/UNDP projects were favoured. In EMRO there was a strong emphasis on improvements in rural water supplies and sanitation, which fitted with the WHO's philosophy (if not its actions) and was supported by UNICEF officials.¹⁵⁹

However, as the first section showed, despite the WHO's long-standing interest in the development of rural areas, financial limitations forced the WHO to prioritise urban areas. WHO officials found it difficult to encourage member states, particularly those where water supplies and sanitation was not a pressing issue in their own country, to supply financial support to the community water supply special fund. Political support and interest were also insufficient in Uganda and Sudan: access to internal and external finances hampered the development of water and sanitation facilities.

The third section revealed some of the challenges in coordinating efforts to improve water supplies and sanitation facilities and argued that poor coordination continued to constrain action throughout the 1960s. It showed how government departments in Sudan were more effective in coordinating water supplies developments as compared with Uganda, thus reemphasising the importance of government interest in addressing issues of fragmented responsibilities. International organisations proved both a help and a hindrance to the development of water supplies and sanitation facilities. Demarcation disputes continued to hamper policymaking in the post-colonial era. When the WHO, UNICEF, the World Bank, and others were able to put differences in philosophies, priorities, and methodologies aside, there were positive steps made in encouraging governments to invest in water supplies. However, this chapter has shown that international organisations were often reluctant to compromise and make concessions (UNICEF and WHO discussions in the late 1960s). The WHO was more likely to make concessions due to its relative lack of finances compared with UNICEF and the World Bank.

¹⁵⁹ WHO (EMRO), *Drinking Water, People and the Better Life*, 4-5.

U. Thant, UN Secretary General, drew together health, development and environment agendas in 1971.¹⁶⁰ Describing development as a cure rather than a cause of environmental problems, Thant emphasised the international reliance on the process of development as the solution to the current state of affairs in the developing world.¹⁶¹ It was hoped that the environmental concerns voiced would “provide new dimensions to the development concept itself.”¹⁶² Thant thus addressed the convergence of development and environment, noted population pressure concerns, and revealed the complexity of environmental problems including unsafe water and ill-health. Environmental agendas, in this sense, were beginning to impinge on health and development programmes in the 1960s but did not gain significant traction until the 1970s.

¹⁶⁰ UN, U. Thant, “Development and Environment,” 22 December 1971, accessed Nov 25, 2018, http://www.un.org/en/ga/search/view_doc.asp?symbol=a/CONF.48/10, 4.

¹⁶¹ Thant, “Development and Environment,” 22 December 1971, 4.

¹⁶² Thant, “Development and Environment,” 22 December 1971, Annex I, 5.

CONCLUSION

Water Marginalised

This thesis sought to develop our understanding of the reasons why water was marginalised during much of the twentieth century and to highlight some attempts at galvanising interest in British imperial, British colonial, national, and international contexts. This thesis argued that coordinated efforts to prioritise the development of adequate water supplies and sanitation did not occur until the 1970s for four main reasons.

Firstly, there was little consensus over how best to organise plans to improve water supplies within territories or international organisations. Should it be dealt with by a discrete department which focused solely on water? Should water be split across departments based on its usage—domestic, agricultural, industrial—or split based on the expertise required for its development, management, and utilisation (e.g. engineering, geology, hygiene)? Should central or local government be held accountable for developing and managing water? To what standards? What role should international organisations play? This thesis showed that water was often fragmented within territorial governments (colonial and post-colonial) and international organisations; these challenges in positioning water resulted in confusion over who was responsible for its development, management, and utilisation. In turn, this affected action taken to develop water supplies and sanitation in the twentieth century.

To better understand these issues of institutional capacity and governance, this thesis explored how water supplies were managed within several settings: territorial government departments in Uganda and Sudan, British colonial development initiatives, and forums and programmes established within and between international organisations (LNHO, WHO, UN, UNICEF, World Bank). This thesis demonstrated that there was not an obvious place to situate debates about health and water supplies within colonial and international bureaucracies, and therefore responsibilities were often divided by either the purposes for which water was being developed or by the expertise and knowledge required for implementation. For example, the responsibility for water was split across departments in Uganda and Sudan in the period under study. In 1925, responsibilities for water were divided primarily across the Medical Department,

the Public Works Department, and the Geological Survey in Uganda. From 1947, the Hydrological Survey Department in Uganda was given particular responsibilities for water and further changes took place when this department was reconstituted as the Water Development Department in 1956. Accompanying the shift in 1956, the responsibilities previously held by the Geological Survey were transferred to the newly formed Water Development Department. Before the Second World War, Sudan's Irrigation Department had key responsibilities alongside the Medical, Geological, and Public Works Departments. In addition, a Rural Water Supplies and Soil Conservation Board was established in 1945, and further revisions to responsibilities continued into the second half of the twentieth century in Sudan.

The division of responsibilities was problematic for those trying to encourage investment in water for health purposes, as decisions could not be made by the Medical Department alone but had to be made in cooperation with other departments. It is also difficult, therefore, to compose a coherent history of the relationship between water and health in twentieth-century Uganda and Sudan. Discussions took place in multiple forums. Between 1925 and 1945, the main problems of coordination related to the different responsibilities for water across colonial government departments in Uganda and Sudan. Attempts to work across departments, such as Public Works and Medical, were hampered by the different priorities and agendas of each (Chapter 1). In the two decades after the Second World War, these problems persisted. Between 1963 and 1972, there was an increasing plethora of organisations and international forums attempting to coordinate efforts to improve water supplies, such as the WHO/UNICEF work on rural water supplies, the WHO/UNDP Cooperative Programme to address water and sanitation in urban areas, and the ACC Sub-Committee on Water Resources Development. Difficulties were encountered. Philosophies varied. Priorities were uncertain. Personalities clashed. These difficulties were shown in discussions between UNICEF and the WHO and in the meetings of the water resources development sub-committee (Chapter 5).

As the twentieth century progressed, however, there was an increasing willingness of those with different occupations working in different departments and across organisations to promote in unison the importance of access to safe and adequate water supplies and sanitation. A good example of this was the community water supply seminar held in Sudan in 1967, which represented an

important step forward in coordinated efforts to improve community water supplies across the country.

The second reason for the marginalisation of water was that administrators and specialists could not provide unequivocal proof of water's social value. In researching this thesis, it was not easy to locate statistics concerning investment in water. It was even more difficult to find out how much money was spent on improving water supplies primarily for health purposes, as shown in the demarcation of funds for colonial development in the 1930s and 1940s (Chapter 1). It was not until the WHO embarked on its Global Community Water Supplies Programme in 1959 that coordinated efforts to gather water supplies data began in earnest. Before this, the limited availability of quantitative evidence hampered the efforts of those advocating the provision of adequate water supplies as a foundational public health intervention.

Yet, despite the lack of coordinated efforts between 1925 and 1959 to promote the importance of developing water supplies, this thesis has shown that there were specialists and administrators attached to the British Colonial and Foreign Office's and the WHO and LNHO who sought to press forward their claims: they believed that water and health were intricately linked despite the limited availability of quantitative data to support their assertions.

The gaps in knowledge reflected the lack of personnel available to collect and collate data, the fragmentation of responsibilities for water supplies, and the difficulties in differentiating the impact of water supplies provision from other factors that contributed to improvements in health such as nutrition, health education, pesticides, and prophylactics (drugs and vaccines). Despite improvements, personnel limitations significantly impacted data collection. Chapters 1, 2, and 3 showed that the British presence in Uganda and Sudan was limited. This affected the collection of data and the ability of colonial governments to encourage the development of water supplies and sanitation on a large-scale within the territories under their supervision. As Uganda, Sudan, and other nations gained independence, imperfect colonial structures for the systematic collection of data were inherited but often personnel limitations affected the ability of government departments to continue earlier colonial efforts. Moreover, as independent nations, Uganda and Sudan had different priorities. They needed to find their own way of adapting and developing their bureaucracies in the 1950s, 1960s and 1970s to suit.

The WHO's surveys in the 1960s and early 1970s meant that the extent and kind of water problem that existed was better defined both qualitatively, and perhaps more crucially, quantitatively by the early 1970s (Chapters 4 and 5). Advocates of investment in water supplies for the improvement of health could now point to sets of figures to show the levels of access to water supplies in particular countries, and whether there had been improvements since concerted efforts to collect data on water supplies conditions began in the late 1950s and early 1960s. The groundwork accomplished in the 1950s to push for the collection of data on a wider scale, and the subsequent collection, collation, and analysis of said data, needs a fuller appreciation when writing national, colonial, and international histories of water in the twentieth century. As borne out in the 1970s and 1980s, this groundwork meant that bureaucrats and scientists were more effectively able to use the connections that water and health had with food, population, and economic development to raise awareness and interest in the all-important water-health dynamic. This led to a more prominent place for improved water infrastructures within integrated programmes of health and development from the mid-1960s onwards, in addition to separate programmes established solely to resolve the water problem.

The work of individuals and groups of researchers also helped to better quantify and qualify the relationship between water and health. David Bradley's re-classification of tropical diseases in the 1960s and early 1970s did not provide indisputable evidence that improving the quality and quantity of water supplies was the *key factor* in reducing the impact of each individual disease. However, Bradley, White, and White were able to highlight the plethora of ways in which water affected tropical disease environments.¹

The ability and the inclination of international organisations, colonial states, and national governments to act towards improving water supplies and sanitation was the third reason for its marginalisation within health discourse. Much of the work accomplished regarding water supplies until the mid-1960s was in the form of surveys and the collection of information. Attempts to implement the development of water supplies on a large-scale were still hampered by the lack of knowledge about the kind and extent of the water problem; the limited finances available and competition for funds; the difficulties in organising water within bureaucratic

¹ White, Bradley, and White, *Drawers of Water*.

structures and deciding on departmental responsibilities; and the impact of population growth, which made estimating demand for clean water prone to error.

Historians have not fully considered how decisions regarding the allocation of resources to improve water supplies were informed by wider economic and political concerns, such as the Great Depression of the 1930s, the aftermath of two world wars, and the political upheaval and economic challenges newly independent nations faced in the 1950s and 1960s. Certainly post-1945, if not before, the issue was not awareness of the problem but rather whether international organisations and colonial and post-colonial territories had the resources available to address the water problem.²

As shown in the first three chapters, the British government did not have unlimited funds at its disposal in the 1930s, 1940s and 1950s, and as a result there were constraints on spending from the Colonial Development and Colonial Development and Welfare Funds. Similarly, colonial territories had limited resources in terms of finances and personnel during this earlier period, which meant that priorities were set, and compromises were inevitable. The League of Nations Health Organisation (Chapter 1) and the World Health Organisation (Chapter 2-5) also struggled to maintain strong financial support, particularly regarding rural hygiene and environmental sanitation. The LNHO was able to draw on Rockefeller Foundation support, but this in turn shaped the priorities set in developing international health interventions. The WHO cooperated with a variety of organisations in their attempts to galvanise government interest in the development of water supplies and sanitation, such as UNICEF, the World Bank, and the UNDP. However, the WHO was forced to compromise on its ideals in order to gain the financial backing needed to make its Global Community Water Supply Programme a success (Chapters 4 and 5).

One of the biggest obstacles that administrators and specialists faced as they attempted to justify funding applications for water supplies development was the competition with other health and development agendas. This competition for resources and funds was heightened as debates about food, population, and economy took priority, which relegated the impact of water on health to secondary importance for a significant portion of the twentieth century (Chapters 1-5). The

² United Nations, "Joint Declaration of the Developing Countries made at the Eighteenth Session of the General Assembly," 11 November 1963, accessed Nov 25, 2018, [http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/1897\(XVIII\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/1897(XVIII)).

development of water supplies was largely perceived as a long-term infrastructural investment with significant capital required both upfront and recurrently for the maintenance and operation of supplies. The limited availability of finances from either internal or external sources meant that advocates were constantly competing against alternative programmes of health and development. If other programmes were more easily measured and their positive impact proven, they were deemed as more viable and lucrative ventures. To mitigate the impact of this issue, a key approach taken, particular post-1945, was to connect water with economic development agendas and highlight its potential contributions in this area. This led to an urban bias in the development of water supplies as recuperation of investment through water tariffs was much more viable in urban settlements than in rural ones (Chapter 2-5). In the earlier period, the economic benefits of developing water supplies were more explicitly evident in colonial Africa, which had two contrasting impacts: the relationship between water and health was overlooked or it was considered with greater vigour. The general prioritisation of the economic value of water did not mean, however, that all bureaucrats and scientists working in Uganda and Sudan gave precedence to water's economic value, as examinations of geologists and medical officers in Uganda and Sudan revealed. Development activities, such as the establishment of the Gezira Irrigation Scheme in Sudan and the construction of a rural water supplies scheme in the northern region of Uganda, highlighted the economic value placed on water. Equally, the development of health services in Uganda and Sudan also revealed interest in water supplies for health purposes, particularly under rural sanitation or rural hygiene headings.

The difficulties in classifying and categorising water within colonial and international bureaucracies compounded problems faced in terms of resource deficiencies and competition for funds. Given the difficulties that administrators and specialists found in obtaining consistent support within the international arena—particularly on the African continent—these individuals and groups of individuals had to be creative in how they promoted and justified the importance of investment in water supplies and sanitation in the twentieth century.³ The fragmented responsibilities for water and the lack of hard evidence to prove the

³ Packard, *A History of Global Health*; Litsios, "Rural Hygiene in the Early Years of the World Health Organization"; J. Bartram and S. Cairncross, "Hygiene, Sanitation, and Water: Forgotten Foundations of Health," *PLoS Medical* 7, no.11 (Nov 9, 2010): e1000367, accessed Aug 12, 2016, <https://doi.org/10.1371/journal.pmed.1000367>.

connection between water and health tempered any incentives for governments and international organisations to back programmes that sought to improve access to water supplies; particularly if funds were requested first and foremost on the basis of improving health.

The final reason for the marginalisation of water in discourses related to public health was the preference for particular kinds of knowledge. This has been revealed in two ways in this thesis: the focus on curative over preventive measures between 1925 and 1975 and the position of non-medical or partially medical professionals. This thesis argued that the wide acceptance of germ theories of diseases and the discreditation of older environmental conceptualisations of diseases between 1925 and 1975 had a detrimental effect on the place of water in health discourse. Until the 1960s, water supplies advocates not only found it difficult to break free from the negative associations with older environmental conceptualisations of disease but also suffered from the 1920s and 1930s attachment of water to social medicine. The tensions that followed in the aftermath of the Second World War between the US, Britain and communist Russia and China, which continued into the 1950s, meant that 'social' became a pejorative term associated with socialism. It was not until the 1960s that criticism of health and development interventions—such as the harmful impacts of DDT and the detrimental effects of large-scale water development projects (dams, irrigation works)—opened doors for water advocates to press forward their ideas and get their voices heard. In the late 1960s and the 1970s, the adverse environmental impacts of development activities in the 1940s, 1950s, and 1960s as well as the failures in other health measures directed towards specific diseases, encouraged bureaucrats and scientists to revisit the importance of environmental considerations in the early 1970s. For the 1960s and 1970s at least, water advocates were able to take advantages of these developments and to build upon the platform that environmental activists established in the 1960s. Because of this, the older environmental conceptualisations, albeit revised and reworked, became more fashionable in the 1970s.

During the colonial period, agencies were rarely concerned directly with environmental improvement and so water was only important indirectly: it was addressed because of other problems, such as poor health or the need to improve agricultural productivity by building irrigation works. In this sense, water was not a primary category of analysis for colonial governments, whereas health and

agriculture were. Disease was understood as having a specific, usually infectious cause and focus thus remained on aetiology. Under the late colonial period and into the early post-colonial period, international agencies, centred on the WHO, wanted to broaden approaches to health and disease, which included addressing a range of environmental determinants of health.

The preference for particular kinds of knowledge was evidenced in the relative position of sanitary engineers and geologists (non-medical or partially medical occupations) compared with doctors. This thesis has explored some of these voices, which were marginalised at the time, such as geologists and sanitary engineers. This provides a fuller understanding of the policy making process and reveals the diversity of pragmatic methods employed to encourage governments and international organisations to invest in water supplies and sanitation. This thesis showed that, much like nineteenth-century engagements with water supplies and sanitation in Britain, public health discourse was not solely the remit of doctors and sanitary experts. For example, geologists played a crucial role in developing understandings of water supplies and considering both their health and economic value combined (Chapter 1). Sanitary (or public health) engineers, a hybridisation of health and engineering expertise, were crucial in promoting the importance of water supplies and sanitation in the twentieth century (Chapter 2-5). While they often struggled to get their voices heard in medical circles, they continued to articulate their ideas in imperial, colonial, national, and international forums.

EPILOGUE

When the International Drinking Water Supply and Sanitation Decade (IDWSSD) ended in 1990, 75 percent of people in developing countries had access to water supplies and 56 percent had access to sanitation facilities.¹ This compared with 43 and 46 percent in 1980 for water and sanitation respectively. Though there was still much to be achieved, particularly regarding sanitation, these figures suggested an encouraging move towards the provision of safe and adequate water supplies and sanitation facilities for all.

However, the figures masked the difficulties the WHO encountered during the second half of the decade in the continued mobilisation of international resources and in the reduced presence of WHO sanitary engineers and sanitarians in member states.² Misconceptions of the IDWSSD programmes, such as three highlighted mid-way through the decade in EMRO, added to the challenges in fulfilling the aims and approaches set in the late 1970s and early 1980s. The first of these misconceptions was that the IDWSSD was regarded as an international and not a national programme. Second, there was a belief that the purpose of the decade was solely to increase coverage. Third, there was an expectation that each country would have 100 percent coverage by 1990. This latter assumption was labelled as “an impossible task to achieve and quite discouraging.”³ Such misconceptions made it difficult to monitor the health impact of improved water supplies and sanitation coverage and to address any underlying issues in the fragmentation of services within nations.

During the 1970s, the opportunities for enhanced coordination across international agencies, NGOs, and governments had looked promising. Following the publications of *Drawers of Water* in 1972, the first international Ad-Hoc Working Group on Rural Potable Water Supply and Sanitation met in 1974. Initially

¹ Including data from China. Data pre-1985 did not include China (such as the data collected for the WHO Surveys in 1963 and 1970). Director-General (WHO), “Evaluation of the International Drinking Water Supply and Sanitation Decade, 1981-1990,” 21 November 1991, EB89/24, Executive Board, Eighty-Ninth Session, Provisional Agenda item 9.2, 4, accessed Feb 6, 2020, https://apps.who.int/iris/bitstream/handle/10665/170492/EB89_24_eng.pdf?sequence=1&isAllowed=y.

² Director-General (WHO), “Evaluation of the International Drinking Water Supply and Sanitation Decade, 1981-1990,” 21 November 1991, 12.

³ WHO (EMRO), IDWSSD Mid-Decade Progress Review Meeting, Cyprus 1-6 July 1985, WHO, WHO-EM/ES/362, October 1985, 4, accessed Feb 6, 2020, <https://apps.who.int/iris/handle/10665/116074>.

this ad hoc group was composed of the WHO, UNDP, the World Bank, UNICEF, United Nations Environmental Programme (UNEP), the Organisation for Economic Cooperation and Development (OECD), and the International Development Research Centre (IDRC). For the second meeting in 1975, invitations were sent to nine industrialised countries, twelve developing countries, and six further international or intercountry agencies/banks to encourage their participation in the group. In the meantime, the ACC Subcommittee on Water Resources Development, established in the 1950s, continued operation until it was replaced by the ACC Intersecretariat Group for Water Resources in 1979. Approved by the UN Committee on Natural Resources, it was hoped that this newly formed group would move past discussions “characterised by statements as to who was doing what, and who was stepping on whose toes” and build upon the interagency work accomplished in preparation for UN Water Conference (1977).⁴ A year earlier, the Steering Committee for Co-operative Action for IDWSSD was also established “outside the ACC umbrella.”⁵

However, the end of the WHO/World Bank cooperative programme in community water supply and sanitation in 1984 and the UNDP’s decision to implement programmes either independently or in association with the World Bank proved detrimental to the WHO’s own water and sanitation programme. The difficulties the WHO encountered in their attempts to find international support for their water and sanitation programmes, coupled with misconceptions of the decade’s aims and approaches, emphasised that enhanced coordination mechanisms were no substitute for the strengthening of national institutions.

Reviews and critiques of approaches taken towards increasing water supply and sanitation coverage between 1975 and 1990 often noted the challenges that fragmentation presented.⁶ Following the IDWSSD, E. O’Rourke critiqued decade

⁴ Meetings of ACC Intersecretariat Group for Water Resources, WHO Archives, W2-86-38 JKT 4, 1987-1988; For comments on poor coordination pre-UN Water Conference see D. V. Subrahmanyam, “Community Water Supply and Excreta Disposal in the Developing Countries.” *Ambio* 6, No. 1, Water: A Special Issue (1977): 51-54, 54.

⁵ Meetings of ACC Intersecretariat Group for Water Resources, WHO Archives, W2-86-38 JKT 4, 1987-1988.

⁶ D. V. Subrahmanyam questioned the “creation of additional UN agency bureaucracies” and “the staging of costly mammoth shows that international conferences represent”: Subrahmanyam, “Community Water Supply and Excreta Disposal in the Developing Countries,” 54; E. O’Rourke, “The International Drinking Water and Sanitation Decade: Dogmatic Means to a Debatable End,” *Water Science and Technology* 26, no. 78 (1992): 1929-1939; IDWSSD Mid-Decade Progress Review Meeting, Cyprus 1-6 July 1985, WHO-EM/ES/362, October 1985, 4.

approaches to target setting, community participation, community management and community financing, amongst other things.⁷ Target setting was done to raise political awareness, but this approach disguised the structural and institutional challenges that needed to be overcome. The community focus was important in giving agency to local people, but government support from the top and from agencies responsible for water and sanitation was needed (in the short term at least) to help plug gaps in finances, personnel, and materials.

Yet, O'Rourke's argument for institutional development was remarkably similar to the WHO's own evaluations of the decade.⁸ Before the IDWSSD decade began, the issue of fragmentation and the complexity of endeavours to resolve it, were highlighted:

the multitude of agencies in the sector with their respective preferences and priorities make it unrealistic to assume that the various plans and adjacent activities are fully compatible and do not waste money and manpower. On the other hand, it may be too heroic or simply naive to expect as the only viable solution, the removal of all fragmentation and the establishment of a uniform sector organisation.⁹

WHO officials recognised that any institutional changes required patience as these were medium-term or long-term investments: this did not clash with the aims and approaches of the decade but the impact of any strengthening in sector planning and institutional capacity would be difficult to measure during and soon after the decade's completion. Midway through the IDWSSD inappropriate institutional frameworks were second only behind the inadequacy of water resources on the list of the main constraining factors. At the end of the IDWSSD, progress was noted in the strengthening of institutional capacity, but shortcomings in this area

⁷ O'Rourke, "The International Drinking Water and Sanitation Decade: Dogmatic Means to a Debatable End": 1930-1935.

⁸ O'Rourke, "The International Drinking Water and Sanitation Decade: Dogmatic Means to a Debatable End": 1936.

⁹ Progress Report on Drinking Water Supply and Sanitation for the Committee on Natural Resources, Draft 11 Aug 1978, Annex I, WHO Archives, N64/80/10, UN Committee on Natural Resources; also see Executive Board, 89, Evaluation of the International Drinking Water Supply and Sanitation Decade, 1981-1990: report by the Director-General, (World Health Organisation: Geneva, 1991), accessed Feb 6, 2020, <https://apps.who.int/iris/handle/10665/170492>.

remained one of the key constraints in project sustainability.¹⁰ While O'Rourke's critique of the progress made in institutional development was understandable, it underplayed the WHO's efforts to improve institutions and the variety of practical challenges faced in attempts to do so.

This thesis has shown something of the varied perspectives on, and approaches to, the development of safe and adequate water supplies and sanitation. Yet we have only glimpsed the role of organisations such as UNICEF, the World Bank, and the UNDP in shaping water supplies and sanitation agendas after the Second World War. UNICEF, for example, had given significant attention to rural water supply development after the Second World War: Between 1966 and 1978 they allocated 9 percent of their funds to the sector on average.¹¹ Moreover, we have not seen how NGOs, such as Oxfam, influenced how people thought about water and sanitation and, as a result, how that affected attempts to improve facilities across the world. Given the fluctuating support for WHO programmes in the twentieth century, research into how other organisations addressed the water problem separately, alongside how they each interpreted their cooperation, coordination and clashes with other organisations, may prove fruitful in further understanding the nuances in the development of water supplies and sanitation.

From the mid-1970s the growth in community centred approaches, such as those advanced through the WHO's Primary Health Care initiative and through the IDWSSD, also provide an important avenue for further research. There is a growing historical literature on primary health care, but the role of developing water supplies and sanitation facilities within and in relation to this programme has not been addressed at any great length. Furthermore, we need to better understand the meanings attached by external influences (e.g. WHO) and internal influences (e.g. central and local government) to the well-used phrases 'community participation', 'community management' and 'community financing' in the 1970s and 1980s, and how experiences in the 1950s and 1960s shaped these conceptualisations. We also need to better understand how this affected local communities and whether local communities were able to influence and shape policies from the ground up.

¹⁰ Executive Board, 89, Evaluation of the International Drinking Water Supply and Sanitation Decade, 1981-1990: report by the Director-General; O'Rourke, "The International Drinking Water and Sanitation Decade: Dogmatic Means to a Debatable End": 1935-1936

¹¹ Progress Report on Drinking Water Supply and Sanitation for the Committee on Natural Resources, Draft 11 Aug 1978.

Alongside this, it is important to understand how national governments sought to address water and who was responsible for the various aspects of its development. A greater understanding of the challenges faced, and the approaches taken, throughout the twentieth century may provide some useful insights into why access to safe and adequate water supplies and sanitation remains a problem for many countries today as well as provide some ideas—old and new—for how the situation can be improved going forward.

LIST OF ABBREVIATIONS

Main Text

ACC	Administrative Committee on Coordination
AFRO	African Regional Office (WHO)
AMRO	American Regional Office (WHO)
BCG	Bacillus Calmette-Guérin
CCTA	Commission for Technical Cooperation in Africa South of the Sahara
CD	Colonial Development
CDW	Colonial Development and Welfare
DDII	UN Second Development Decade
DDT	Dichlorodiphenyltrichloroethane
ECOSOC	United Nations Economic and Social Council
EMRO	Eastern Mediterranean Regional Office (WHO)
EURO	European Regional Office (WHO)
FAO	Food and Agricultural Organisation
IBRD	International Bank for Reconstruction and Development
ICR	International Conference of Representatives of Health Services of African Territories and British India
ICSS	International Conference on Sleeping Sickness
IDA	International Development Association
IDRC	International Development Research Centre
IDWSSD	International Drinking Water Supply and Sanitation Decade
OECD	Organisation for Economic Cooperation and Development
ILO	International Labour Organisation
IO	International Organisation
IRC	International Research Centre
KY	Kabaka Yekka
LNHO	League of Nations Health Organisation
LSHTM	London School of Hygiene and Tropical Medicine
LSTM	London School of Tropical Medicine
NGO	Non-Governmental Organisation
PAHC	Pan-African Health Conference
PWD	Public Works Department
SEARO	South East Asia Regional Office (WHO)
RF	Rockefeller Foundation
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	The United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UPC	Uganda People's Congress
WFP	World Food Programme

WHA	World Health Assembly
WHO	World Health Organisation
WPRO	Western Pacific Regional Office (WHO)
WTRLK	Wellcome Tropical Research Laboratories in Khartoum
WWI	First World War
WWII	Second World War

LIST OF ABBREVIATIONS

Footnotes

CUL	Cambridge University Library
CWS	Community Water Supply
FAC	Report on the finances, administration, and condition of the Sudan
GAMR	General Annual Medical Report
RCS	Royal Commonwealth Society
TNA	The National Archives (UK)
UBB	Uganda Blue Books
UNYB	United Nations Yearbook
WHA	World Health Assembly

APPENDICES

Appendix B: Epidemic and Endemic Diseases in Sudan 1928-1945

Epidemic	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Anthrax								X										
CSM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dengue	X																	
Diphtheria	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Infectious Jaundice	X																	
Influenza	X	X	X	X	X	X	X	X	X	X	X							
Measles		X	X									X						
Relapsing Fever	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Smallpox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Typhus														X	X	X	X	
Whooping Cough	X																	
Yellow Fever													X	X	X	X	X	

Endemic	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Ancylostomiasis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Anthrax	X	X	X															
Bilharziasis**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black water Fever	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dracontiasis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dysentery	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Enteric Fever									X	X	X	X	X	X	X	X	X	X
Hydatid Disease			X	X	X	X	X	X	X	X	X	X	X					X
Kala azar	X	X	X	X	X	X	X	X	X	X			X	X	X	X		

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
Leishmaniasis																		
Endemic Continued	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Leprosy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Malaria	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Malta Fever	X	X	X	X														
New growths			X															
Pellagra						X												
Rabies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rheumatism*			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Scurvy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Sleeping Sickness^	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Snake bite				X														
Trachoma		X																
Tuberculosis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tumours				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Typhoid	X	X	X	X	X	X	X	X										
Undulant Fever					X	X	X	X	X	X	X	X	X	X	X	X	X	X
Veneral Diseases#	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yaws	X	X		X	X	X	X	X	X	X	X	X	X	X				

Source: Sudan, GAMR, 1928-1945.

*Fluctuates between acute rheumatism and rheumatism

**schistosomiasis from 1944 (name fluctuates)

^ changed to trypanosomiasis 1945

Veneral diseases are not demarcated for the purposes of this study

Endemic / Epidemic Throughout	
Mentioned	X
Not Mentioned	

Appendix C: Technical Assistance Funds: Regional Distribution 1959-1963

Tech Assistance Funds (Regions)	Africa	Asia and Far East	Europe	Americas	Middle East	Inter-regional	TOTAL
1959 (\$)	4049158	9836622	1793812	7575517	5046188	--	28670619
1959 (%)	14	34	6	26	18	1	99
1960 (\$)	4377583	9267572	1660240	7222972	4977048	421225	27926640
1960 (%)	16	33	6	26	18	2	
1961 (\$)	11511500	9935200	-	9727700	3469200	-	34643600
1961 (%)	33	29	0	29	10	0	101
1962 (\$)	25835500	19066100	1961100	21451200	11403000	-	79716900
1962 (%)	32	24	3	27	14	0	100
1963 (\$)	24566700	23591800	2565000	20482500	4487800	-	75693800
1963 (%)	32	31	3	27	6	0	99
TOTAL 1959-63 (\$)	78564900	85882200	14843500	78012600	21476900	3866100	282646100
TOTAL 1959-63 (%)	28	30	5	28	8	1	100

Source: United Nations Yearbooks for the years 1959 to 1963.

Appendix D: United Nations Special Fund Technical Assistance through Specialised Agencies 1959-1963

Special Fund Technical Assistance Allocations* (US\$)	UN	ILO	FAO	UNESCO	ICAO	WHO	ITU	WMO	IAEA	UPU	TOTAL
1959 (\$)	7160753	3393374	8526339	4860645	1370544	5494936	384082	411646	638760		32241079
1959 (% of total)	22	11	26	15	4	17	1	1	2		99
1960 (\$)	8806838	4274019	10569053	6593104	1534750	6912445	804465	636622	768704		40900000
1960 (%)	22	10	26	16	4	17	2	2	2		101
1961 (\$)	8092082	3947229	9557874	6161880	1441354	6345048	777985	598896	732065		37744413
1961 (%)	21	10	25	16	4	17	2	2	2	0	99
1962 (\$)	9732488	4879276	11896562	7773733	2084225	8196040	948752	1019470	970123	67359	47568028
1962 (%)	20	10	25	16	4	17	2	2	2	0.1	98.1
1963 (\$)	9464119	4749187	11535277	7589363	2034424	7988760	929823	1028020	944824	83841	46437638
1963 (%)	20	10	25	16	4	17	2	2	2	0.2	98.2

Source: United Nations Yearbooks for the years 1959 to 1963.

* 1959 refers to funds made available for 1960.

Appendix E: World Health Assembly Community Water Supplies Resolution

WHA12.48 Environmental Sanitation

The twelfth WHA,

Having considered the report of the Director-General on the work and achievements of the Organization in assisting governments in the field of environmental sanitation, together with his proposals for a future programme;

Recognizing that safe and adequate supplies of water to inhabitants of communities constitute an important measure for the protection and improvement of health and are indispensable for economic and social development;

Recognizing that the provision of community water supplies depends upon the closely co-ordinated efforts of engineering, financial and administrative personnel;

Considering that a primary deterrent to the early construction of community water supplies on an adequate scale is the difficulty in financing, and that ministries of health are not generally in a position independently to develop schemes for financing such works; and

Considering that some governments may wish to make funds available to the World Health Organization to provide advisory services to governments in community water supply programmes in addition to the work financed from the regular budget of the World Health Organization,

I

1. Endorses the principles and programmes as set forth in general terms in the report of the Director-General; and
2. Requests the Director-General to co-operate with Member States in projects to provide adequate and safe supplies of water to inhabitants for their communities, and, furthermore, to continue his study of ways and means of rendering assistance including an investigation of existing international loan or other funds which might be available for investment in such facilities;

II

Recommends to Member states:

- (a) That priority be given in national programmes to the provision of safe and adequate water supplies for communities;
- (b) That, wherever necessary, national or provincial water boards be established and given authority to deal with the various legal, administrative and fiscal responsibilities involved in such a programme;
- (c) That all available national and local resources of money, materials and services contributory to such a programme be mobilized;
- (d) That within each country requiring such a facility a revolving fund be established to provide loans for water supply development to local agencies of governments; and
- (e) That full advantage be taken of existing international loan funds;

III

1. Authorizes the Executive Board to accept any contributions which may be offered for the purpose of providing assistance to governments in planning, preparing for and providing other technical assistance in the development of community water supply; the Executive Board may delegate this authority to the Chairman of the Board;
2. Requests the Director-General to establish under Financial Regulations 6.6 and 6.7 a special account for the purposes set forth in paragraph III.1 above;
3. Decides that the funds in the special account shall be available for incurring obligations for the purposes set out in paragraph III.1 of this resolution and that notwithstanding Financial Regulation 4.3, the unexpended balance of the account shall be carried forward from one financial year to the next; and
4. Requests the Director-General to present the operations financed, or planned to be financed, from the special account separately in the annual financial report;

IV

Requests the Director-General to make adequate provision in future programmes and budgets to allow the Organization to maintain leadership in a co-ordinated global programme of community water supply and to provide the necessary technical and advisory services to governments;

V

Invites all multilateral and bilateral agencies having an interest in this field to co-operate with the World Health Organization in carrying out a global community water supply programme.

28 May 1959.

Source: WHA, 12. "Environmental Sanitation," 28 May 1959, Accessed Nov 27, 2018, http://apps.who.int/iris/bitstream/handle/10665/110034/WHA12_18_eng.pdf?sequence=1&isAllowed=y

Appendix F: Agencies Responsible for the Different Aspects of Water Resource Development

Subject	Agency: Primary	Agency: Collaborating
Water Resources	No details	No details
Surface Water	No details	No details
Water Flow	FAO	WHO, WMO, UNESCO
Quality	WHO	FAO, UNESCO
Hydropower potential	UN	Regional Office
Underground water	No details	No details
Geophysical data	FAO	WHO, UNESCO
Water Drilling	FAO	WHO, UNESCO
Quality	WHO	FAO, others
Water Requirements	No details	No details
Agriculture	FAO	
Industrial	UN	
Human Use	WHO	

Source: Fourth ACC Interagency Meeting International Cooperation with Respect to Water Resources: Report of the WHO Representatives at the Fourth ACC Interagency Meeting International Cooperation with Respect to Water Resources, UN Headquarters: 25-27 November 1957, WHO Archives, W2/86/2 (4).

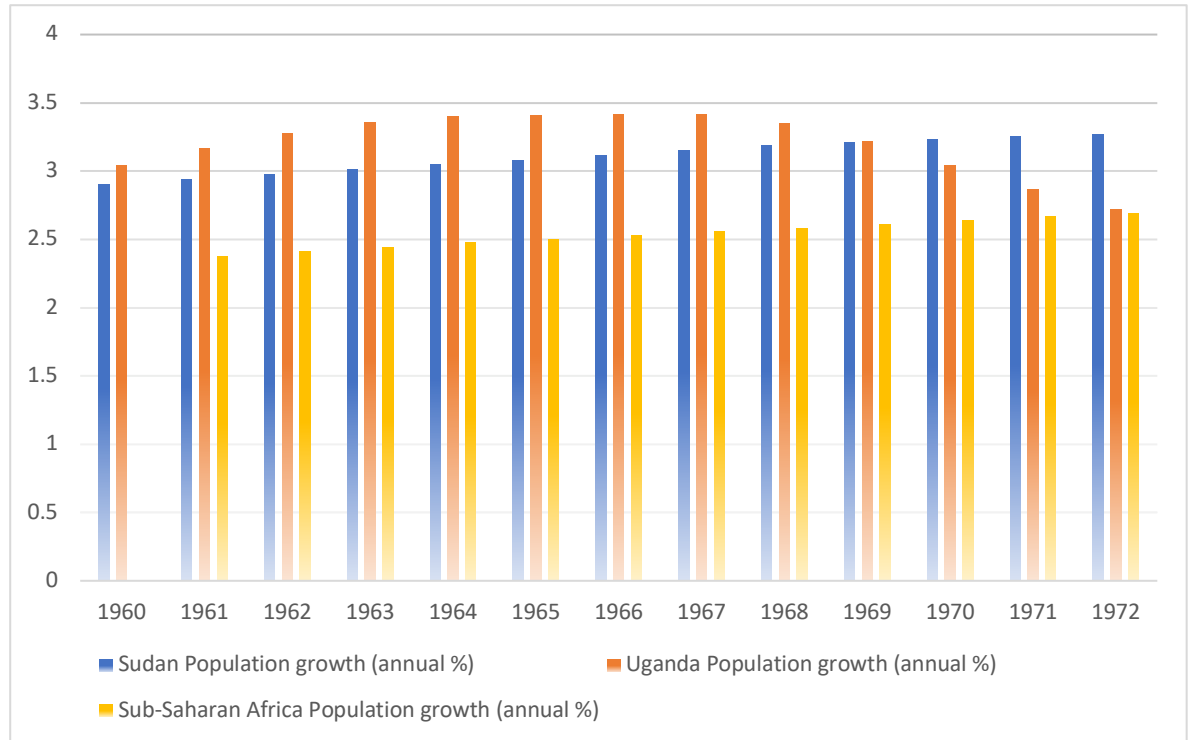
Appendix G: WHO Survey Responses 1970

Africa South of the Sahara	Water Supplies Only Y/N	Excreta Disposal Only Y/N	Both Y/N	Africa South of the Sahara	Water Supplies Only Y/N	Excreta Disposal Only Y/N	Both Y/N
Burundi	N	N	Y	Zaire	N	N	Y
Central African Republic	N	N	Y	Zambia	N	N	Y
Chad	N	N	Y	Botswana	Y	N	N
Dahomey	N	N	Y	Cameroon	Y	N	N
Guinea	N	N	Y	Congo	Y	N	N
Ivory Coast	N	N	Y	Gabon	Y	N	N
Kenya	N	N	Y	Gambia	Y	N	N
Liberia	N	N	Y	Ghana	Y	N	N
Madagascar	N	N	Y	Lesotho	Y	N	N
Mali	N	N	Y	Nigeria	Y	N	N
Mauritania	N	N	Y	Senegal	Y	N	N
Mauritius	N	Y	N	Sierra Leone	Y	N	N
Niger	N	N	Y	Togo	Y	N	N
Uganda	N	N	Y	United Republic of Tanzania	Y	N	N
Upper Volta	N	N	Y				
West Asia and North-East Africa	Water Supplies Only Y/N	Excreta Disposal Only Y/N	Both Y/N	West Asia and North-East Africa	Water Supplies Only Y/N	Excreta Disposal Only Y/N	Both Y/N
Afghanistan	N	N	Y	Egypt	Y	N	N
Ethiopia	N	N	Y	Jordan	Y	N	N
Iran	N	N	Y	Kuwait	Y	N	N
Iraq	N	N	Y	Lebanon	Y	N	N
Libyan Arab Republic	N	N	Y	Pakistan	Y	N	N
Saudi Arabia	N	N	Y	Qatar	Y	N	N
Tunisia	N	N	Y	Somalia	Y	N	N
Bahrain	Y	N	N	Sudan	Y	N	N
Cyprus	Y	N	N	Syrian Arab Republic	Y	N	N
Democratic Yemen	Y	N	N	Yemen	Y	N	N

Source: Created by author using data from *Community Water Supply and Excreta Disposal Situation in the Developing Countries: A Commentary*.

Appendix H: Population Growth in Sudan and Uganda 1960-1972

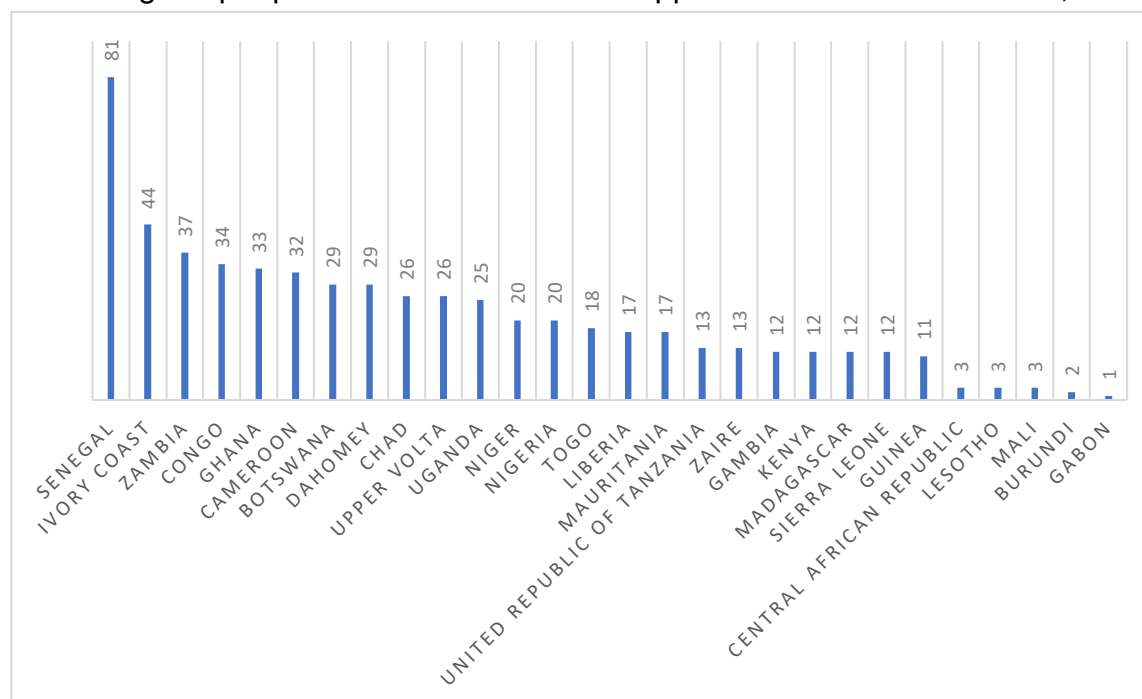
Population Growth (annual percentage) in Sudan and Uganda with Sub-Saharan Africa comparator 1960-1972.



Source: World Bank, "Population Growth (annual %)," 1960-1972, accessed Nov 25, 2018, <https://data.worldbank.org/indicator/SP.POP.GROW?end=1972&locations=SD-UG&start=1960>.

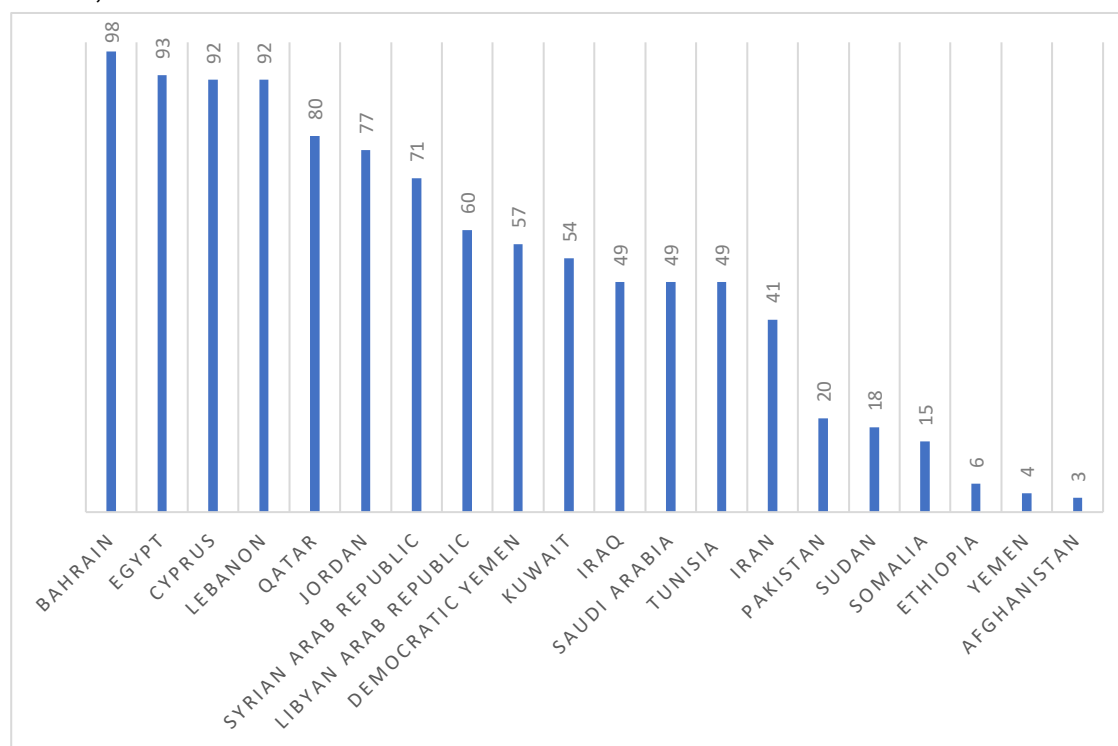
Appendix I: Percentage Access to Water in AFRO and EMRO 1970

Percentage of people with access to water supplies in Sub-Saharan Africa, 1970.



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in the Developing Countries: A Commentary*, Annex 2: 36-38; Annex 3: 39-41.

Percentage with access to water supplies in the Eastern Mediterranean Regional Office, 1970.



Source: Pineo and Subrahmanyam, *Community Water Supply and Excreta Disposal Situation in the Developing Countries: A Commentary*, Annex 2: 36-38; Annex 3: 39-41.

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