

**THE ROLES OF INSTITUTIONS AND NETWORKS IN THE
MANAGEMENT OF THE NIGER DELTA WETLANDS IN
NIGERIA**

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DEDICATION

In memory of my Dad - Amos Oyegbade Ajagbe Adekola (1927 – 2009) who instilled in me the values necessary to conduct this study.

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ABSTRACT

Despite widespread recognition of the importance of institutions in environmental management and suggestion that networks and institutions mutually shape each other, the theory of how activities of actors in networks generate institutions is underdeveloped. There is no framework for explaining institutional change processes in situations where formal and informal institutions of multiple actors are intertwined. To help fill this gap, a new Network Communication Framework (NCF) was developed to understand how things work in real life and analyse institutional change process in environmental management involving multiple actors.

The NCF was used to predict four institutional outcomes where two networks that vary in direction, autonomy, adaptation and scalar reach communicate. The first is unidirectional non-autonomous non-adaptive communication where a modern state network perfectly imposes communication content on a non-state network. The second is unidirectional autonomous non-adaptive communication, where a traditional network resists such impositions from modern state network. The third is multidirectional adaptive endogenous communication, in which a modern state network has poor scalar reach and a traditional network is able to assert its autonomy and adapt to the virtual absence of the state at local scale by devising its own institutions for sustainable management. The fourth is multidirectional adaptive exogenous communication in which a modern state network has moderate scalar reach and state and non-state networks can vary state institutions for mutual benefit.

In order to test the robustness of the new model, it is applied to wetland management in the Niger Delta region of Nigeria. The results showed that the fourth category of institution predicted by the NCF is widespread, with good awareness of, and support for it across all actors. The informality and multidirectional nature of this outcome ensures flexibility, so it can be modified in response to changes in the preferences of the actors adopting it. The results also showed that the everyday narratives of actors are heterogeneous, which provides further evidence for communication between networks.

Based on these findings it is suggested that future policies for sustainable environmental management in the Niger Delta should be based on how things work rather than on idealistic representations.

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LIST OF ABBREVIATIONS/ACRONYMS

ACA	Academic Network
BP	British Petroleum
Bpd	Barrel Per Day
BUS	Business Network
CDC	Community Development Committee
CNL	Chevron Nigeria Limited
DCF	Discourse Coalition Theory
DCF	Discourse Coalition Framework
FEPA	Federal Environmental Protection Agency
GOV	Governmental Network
IFC	International Finance Corporation
IMF	International Monetary Fund
ITCZ	Inter-Tropical Convergence Zone
IUCN	International Union for Conservation of Nature
LGA	Local Government Area
LGA	Local Government Area
LOC	Local Community Network
MED	Media Network
MEND	Movement for the Emancipation of the Niger Delta
MOSOP	Movement for the Survival of the Ogoni People
MOU	Memorandum of Understanding
MUL	Multilateral Organization Network
NCF	Network Communication Framework
NDVF	Niger Delta Volunteer Force
NESREA	National Environmental Standards and Regulations Enforcement Agency
NGO	Non Governmental Organization
OPEC	Organization of the Petroleum Exporting Countries
RBDA	River Basin Development Authorities
SERAP	Socio-Economic Right Accountability Project
SNA	Social Network Analysis
SNEPC	Shell Nigeria Exploration and Production Company

SPDC	Shell Petroleum Development Company
VAT	Value Added Tax
WTA	Willingness to Accept
WTP	Willingness to Pay
\$	United States of America Dollar
₦	Nigerian Naira: \$1 = ₦ 150

CHAPTER 1

INTRODUCTION

1.1 Introduction to the Study

Wetlands are experiencing unprecedented rates of loss (Day et al., 2000; Finlayson and Rea, 1999; Reid et al., 2004). Estimates put the global wetland loss during the twentieth century at about 50% of the total area of 1,280 million hectares (Barbier, 1994; International Council for Science et al., 2008). In Africa, there is an increasing trend in the severity and extent of wetland degradation (Thiombiano and Tourino-Soto, 2007; Schuyt, 2005). These same ecosystems are increasingly recognized for being hot spots of biodiversity (Renema et al., 2008; Keddy et al., 2009); providing food, water and livelihood security to the mainly poor people living around them (Adams, 1993; Rebelo et al., 2010; Schuyt, 2005; Silvius et al., 2000); and, most recently, for their ability to sequester atmospheric carbon (Ringius, 2002; Loiselle et al., 2006).

The rapid loss of wetlands has led to changes in international and national environmental laws (Shine and De Klemm, 1999), with a general acknowledgement that more effective institutions are a prerequisite for successful wetland management (Dugan, 1992; Hodge and McNally, 2000; Finlayson, 2007; Acheson, 2006; Maconachie et al., 2009). This line of argument, which is reiterated in most major international wetland policy documents (e.g. Millennium Ecosystem Assessment (2005) and Ramsar Convention Secretariat (2010)), has prompted many countries in Africa to adopt international

agreements and develop national wetland laws and policies (see Adekola et al., 2012; Mafabi, 2000; Ntambirweki, 1998). However, formal state institutions and traditional indigenous institutions have also been brought to the fore in efforts to achieve wise use of wetlands (Dixon and Wood, 2007; Maconachie et al., 2009). The Ramsar Convention Secretariat (2010) argues that laws that recognize traditional institutions will ensure effective wetland management.

It has also been suggested that institutional processes governing resource management should bring together multiple institutions, actors, and processes in a manner that cuts across public and private authority, national borders, and policy sectors (Seo and Creed, 2002; World Resources Institute, 2012). Recognizing the multiplicity of actors is especially important when dealing with multi-functional ecosystems, such as wetlands, which provide multiple common pool resources for multiple actors with varying agendas, discourses, preferences, working routines, norms, values, interests and power (Rydin and Falleth, 2006).

Despite these suggestions, little is known of how formal modern state institutions interact with indigenous informal institutions, especially in Africa where the informal dimension of institutions is very important (Teye, 2008). Furthermore, while it has been acknowledged that the discourses of multiple actors are important in the institutionalization process (Scott, 2000b; Yates and Orlikowski, 1992; Schmidt and Radaelli, 2004), their role in shaping institutions has not fully understood (Phillips et al., 2004). This is because few studies have focused on discourses in a detailed and context-sensitive manner. Although the discourses of actors usually differ, as do their institutions (Rydin and Falleth, 2006), few studies on environmental management have focused on differences between the discourses and narratives of individual actors. Adequate effort has not been made to explore how discursive interactions between multiple actors affect environmental management institutions. This has led to inadequate explanations that lack insight into situations where ecosystems are governed by the intertwining formal and informal institutions of multiple actors.

The lack of such explanations explains why formal state institutions are still often regarded in some quarters as supreme, simply because the state ‘holds power in trust for the people’ and this has prompted calls for “strong” national legislation to manage

environments. On the other hand, by virtue of being “authentic and socially embedded” (Crook, 2009), traditional indigenous institutions are also recommended by other authors as alternative forms of social and political authority and private institutions are prescribed by a third group as the answer to conflicting interests (Patterberg, 2005).

One reason for the failure of existing theories may be that research on institutions, and research on the networks that connect multiple actors, have proceeded on largely separate trajectories, so that the mutuality of institutions is not properly recognized (Owen-Smith and Powell, 2007). Any rigorous analysis of institutional change must start from the fact that institutions are neither self-generating nor self-sustaining, and that they are shaped, implemented, undermined or reformed by individuals and their networks (Leftwich and Sen, 2010). A new framework to analyse interactions between institutions and networks is needed to facilitate this, and contribute to our understanding of processes of institutional change where evolution and design are integrated (Kingston and Caballero, 2009).

This thesis aims to make a significant contribution to the literature on institutional analysis, and to advance institutional change theories, many of which fail to acknowledge the place of actors’ discourses in institutional change. This failure is odd, given that linguistic exchanges are not just means of coordinating activities (Clark, 1996), but are also the means by which concepts arise (Baker, 2002). Hajer (2010) has indicated that linguistic utterances cannot be understood outside the practices in which they are uttered. Similarly, discourse should always be conceived of in relation to the practices in which it is produced, reproduced and transformed (Hajer, 2010). Given that the Niger Delta Wetlands provide multiple ecosystem services to multiple actors (Adekola and Mitchell, 2011), an analysis of wetland management in Nigeria provides a good opportunity to fill some of these intellectual gaps.

1.2 Environments of Conflict: The Niger Delta Wetlands

Wetlands are complex multifunctional ecosystems providing diverse interdependent ecosystem services to multiple actors. The shared use of wetland ecosystem services by multiple actors with diverse interests, discourses and institutions, presents a unique

opportunity to investigate how interactions between actors influences the institutionalization process.

There are a number of reasons why the choice of the Niger Delta Wetlands is significant. First, the state of the wetland is so poor that it was declared one of the most endangered ecosystems in the world (Nigerian Conservation Foundation, 2006). It is therefore important to critically analyze the contribution of institutional processes to this. The Niger Delta region have been facing a host of issues including livelihoods challenges, conflict management, governance problems, all having their root causes in the management of wetland resources (Ikelegbe, 2006).

Oil and gas exploration activities which began in the Niger Delta in 1956 have caused severe environmental damage, leading to massive destruction of farmlands, wild area and aquatic systems upon which traditional livelihoods depend. The destruction of the means of livelihood without commensurate development has forced Niger Delta people into an environment-related poverty, deteriorating living conditions, and massive underdevelopment (Odoemene, 2011). The people of the region have felt short-changed and denied benefits accrued from the natural resources found in their environment. This has led to several agitations for self-determination, resource ownership and control and calls to the Federal Government of Nigeria to develop the Niger Delta. The people have generally blamed the Nigerian government for the state of underdevelopment and the oil companies for not meeting their social obligations. This feeling among the people is best captured in the words of Ken Saro Wiwa (an outspoken environmental activist) in his closing statement to the Nigerian Military Tribunal that sentenced him to death:

“We all stand before history Appalled by the denigrating poverty of my people who live on a richly endowed land, distressed by their political marginalization and economic strangulation, angered by the devastation of their land, their ultimate heritage, anxious to preserve their right to life and to a decent living, and determined to usher to this country as a whole a fair and just System which protects everyone and every ethnic group and gives us all a valid claim ...” (Wiwa, 1995).

Since Nigeria returned to democracy in 1999, after almost three decades of military rule, there has been a change of approach among the people, especially the youths who have expressed their frustration and struggle for survival through militancy and gangsterism (kidnapping and hostage taking). The volatility of the Niger Delta peaked around 2006. According to Watts (2007), within the first three months of 2006, \$1 billion in oil revenues was lost and over 29 Nigerian soldiers were killed in the uprising.

In response, the Nigerian government have resorted to repression through the deployment of troops and mobile police units with mortal instructions. Yet, this has only made the region more difficult to govern. Furthermore, the scarcity of revenue has exposed deep rooted inter and/or intra ethnic divisions between oil-bearing communities that struggle for the ownership of resources, usually land. This is responsible for the many violent communal clashes that pervade the Niger Delta. Yet, global demand for crude oil from the Niger Delta is high, with the United States of America the largest importer of Nigerian crude. The interests of local people, the Nigerian people, the Nigerian government, oil multinationals and international community in the resources of the Niger Delta Wetlands have left it one of the most contested environments in the world (Watts, 2003).

Another response has been to establish more formal institutions without any investigation and analysis of why previous formal institutions did not achieve their aims. In such a contested environment, adequate attention need to be paid to how things work on the ground in order to understand institutional processes and how to promote sustainable environments. Failure to do this can only result in the haphazard and reactionary introduction of legislation which may lead to further violence. This study presents a critical analysis of wetland institutions in the Niger Delta, and shows how multidirectional institutions are entrenched in the management of the wetlands. It will therefore be an important addition to literature on wetlands management in Nigeria for which there is a general dearth of critical conceptual and empirical study.

1.3 Aims of the Study

The main aims of this study are to:

1. Design a framework for analyzing institutional change processes in environmental management involving multiple actors.
2. Use this framework to analyse:
 - i. How environmental management in a developing country, Nigeria, depends on communication between national social networks.
 - ii. How this is influenced by communication within national social networks.

1.4 Definitions of Key Terms

1.4.1 Wetland

Wetland is a contested term among scholars, partly because of its highly dynamic character, and because of difficulties in defining its boundaries with any precision (Mitsch and Gosselink, 2007; Turner, 2008). Dugan (1990) points out that there are about 50 definitions of wetlands in use. The Ramsar Convention on Wetlands provide the most widely used, defining wetlands as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”. In addition, they “may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands” (Ramsar Convention Secretariat, 2007).

1.4.2 Environmental Management

Mitchell (2004) defines environmental management as the “actual decisions and actions concerning policy and practice regarding how resources and the environment are appraised, protected, allocated, developed, used, rehabilitated, remediated and restored”.

1.4.3 Discourse

A discourse is "a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer, 1995a).

1.4.4 Practices

Practices are "embedded routines and mutually understood rules and norms that provide coherence to social life" (Hajer, 2010).

1.4.5 Institutions

Institutions are "enduring regularities of human action in situations structured by rules, norms and shared strategies, as well as by the physical world" (Crawford and Ostrom, 2005).

1.4.6 Institutionalization

Institutionalization is the process by which institutions are produced and reproduced (Phillips et al., 2004). This could either be exogenous, e.g. where a government introduces legislation and imposes new institutions on society, or endogenous e.g. where changes are based on internal stimuli such as when a community changes activity in response to a prevailing condition.

1.4.7 Networks

A network is "a set of actors connected by a set of ties" (Borgatti and Foster, 2003)

1.4.8 Actors

Actors are individuals and groups who are actively involved in an activity or whose interests may be positively or negatively affected as a result of the activity (Cleland, 1998).

1.4.9 *Ecosystem Services*

Ecosystem services are the “benefits that people obtain from ecosystems” (Millennium Ecosystem Assessment, 2003). They include provisioning services, such as food and water; regulating services such as flood control; cultural services, such as recreation and supporting services, such as nutrient cycling. The concept of “ecosystem goods and services” (De Groot et al., 2002) is synonymous with the outputs of provisioning services.

1.5 Structure of the Thesis

This thesis is structured in nine chapters.

Chapter 1 (this chapter) set the stage by situating this study in current academic thinking. It outlined the background and significance of the study, presented the rationale for this research, drawing on the current state of research in this field, and listed the principal aims.

Chapter 2 reviews the current literature and presents the emerging themes within this field of research. Its aim is to identify gaps in knowledge and to choose an appropriate methodology for the study, focusing on environmental management institutions. Some of the literatures reviewed in this chapter include new institutionalism, network theories and models of governing.

Chapter 3 outlines the methodology - a new approach to analyzing institutional change - which was adopted in this study. After introducing the main philosophical position that will shape the analytical framework, it presents a new Network Communication Framework and discusses the methodological implications of this approach.

Chapter 4 presents a justification why the Niger Delta is a good place and context to test the NCF. The unique nature of the Niger Delta environment, and an overview of the many pressures exerted on the wetlands, are described. The chapter examines the overarching challenge of sustainable development of the wetlands with reference to the institutional and livelihood burdens faced by society. It goes on to review aspects

related to wetland institutions in Nigeria, with a special emphasis on the Niger Delta Wetlands.

Chapter 5 provides an overview of the research methods used in this thesis. This includes a description of the data collection tools used, and of the ethical challenges and how they were addressed. The chapter also discusses the techniques used in the analysis of the data.

Chapter 6 complements Chapter 4 by evaluating the benefits and costs associated with using the Niger Delta wetlands. It discusses how benefits and costs from use of the wetlands is shared among various networks (local community, government and corporate networks), with particular emphasis on how the local communities have been factored into benefit/cost sharing equation.

Chapter 7 identifies the diverse public narratives of major stakeholder groups concerning the causes of, and possible solutions to, the economic, social, political and environmental problems facing the Niger Delta region. The chapter then analyses respondents' narratives and how this relates to their network structure. The findings in this chapter shed valuable light on the influences of multiple actors on environmental management in the Niger Delta.

Chapter 8 examines institutions in the Niger Delta in the light of the proposed Network Communication Framework. Emphasis is placed on multi-directional institutions that are formed by interactions between different types of institutions. This chapter explores how institutional interactions of this kind are apparent in the management of the Niger Delta Wetlands. The important factors in the institutionalization process are identified, and links between institutional support, network structure and narratives are analyzed.

Chapter 9 summarizes the main research findings, presents the conclusions drawn from these findings, and includes the author's reflections on the study. It also outlines recommendations for future research, and presents policy recommendations for a more sustainable use of wetlands in Nigeria.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In reviewing the relevant literature, this chapter situates the present study within contemporary scholarly research on networks, institutions and institutional change that relates to relevant research on power and models of governing is also discussed. The chapter identifies current gaps in our understanding of these fields and identifies particular methodologies which can be utilized in this study.

2.2 Three Schools of New Institutionalism

It has been suggested that institutions play an important role both in causing and in confronting various types of environmental change (Young, 2008). This approach was previously dominated by what is now referred to as ‘old institutionalism’, which focused on the description and mapping of the formal institutions of government and the modern state (Selznick, 1996). This form of institutionalism has been criticized for its lack of explanatory power and a narrow focus on analyzing the individual rather than the formal and informal institutions that constrain individuals (Peters, 2005). A second concern about old institutionalism is its lack of a theoretical and methodological approach to explicitly constructing empirical theories, which made it generally “atheoretical and descriptive” (Peters, 2005; March and Olsen, 1984).

More recently, ‘new institutionalism’ has gathered force in explaining the actual role that institutions play as determinants of the outcomes of interactive human behaviour (Young, 2002). This approach also focuses on the rules in use and the rules in form (formal constitutional provisions) (Ostrom, 1990), contrary to the old institutionalism, which merely concentrates on describing and mapping the formal institutions of government and the modern state. New institutionalism considers the processes by which schemes, rules, norms, and routines become established as authoritative guidelines for social behaviour (Scott, 2000a; Scott, 1994). Different schools of new institutionalism have attempted to explain how these elements are created, diffused, and adapted over space and time, and how they decline and fall into disuse. Hall and Taylor (1996) have identified three main schools of new institutionalism which have evolved in parallel: historical, rational choice, and sociological institutionalism.

2.2.1 *Historical Institutionalism*

Historical institutionalism emerged in response to the failure of group theories of politics and structural-functionalism prominent in political science prior to the 1970s (Hall and Taylor, 1996; Steinmo, 2008). The approach sought to use real world outcomes and history as an analytic tool to explain the “ways in which institutions structure and shape political behaviour and outcomes” (Steinmo, 2008). Therefore, historical institutionalism emphasizes how institutions emerge from and are embedded in concrete temporal processes. The basic idea behind historical institutionalism is that initial decisions and choices, made when an institution is formed, will have a continuing, and largely determinate influence over the institution far into the future (Skocpol and Pierson, 2002; Pierson, 2000a; Thelen, 1999; Steinmo, 2008).

The concept of ‘punctuated equilibria’ has been used by historical institutionalism to explain institutional change. This relates that, for the most part, an institution will exist in an equilibrium state, functioning in accordance with the decisions made *ab initio*, or perhaps those made at the previous point of equilibrium. Institutions can change through learning and can move between equilibria by responding to new information. The information may come from experience as they move along their own path, or from experience accrued from other institutions. As power is a central concept in historical institutionalism, institutional change translates as the question of how to change ideas,

i.e. where do institutions conflict over ideas? There are four distinctive features of historical institutionalism (Hall and Taylor, 1996)

The first relates to how historical institutionalism tends to conceptualize the relationship between institutions and individual behaviour. Historical institutionalism approaches this from two broad perspectives, which Hall and Taylor (1996) refer to as the ‘calculus approach’ and the ‘cultural approach’. The calculus approach views humans as self-interested rational actors, who make decisions based on strategic calculations, while the cultural approach views humans as both norm-abiding and rule-following. Their behaviour is not fully strategic but bounded by the individual’s worldview (Hall and Taylor, 1996). This is what gives historical institutionalism the semblance of a “stand-between” (Steinmo, 2008) the two other schools of new institutionalism.

The second feature places emphasis on the asymmetries of power. The asymmetries of power refer to the imbalance in societal power relations. Historical institutionalism accepts that conflict over resources is an important phenomenon in institutional relationships, pointing to the privileging of some actors to the detriment of others (Hall and Taylor, 1996). To its credit this approach recognizes that a polity is an overall system of interaction that structures collective behaviour and generates distinctive outcomes, while the state is not viewed as a neutral broker between competing interests. The state, however, whose institutions are capable of structuring the character and outcome of group conflicts, is given a position of primacy (Steinmo, 2008; Pierson, 1996b). This view of power suggests that institutional change comes through the imposition of the ideas of certain powerful actors. Such a conception is, however, blind to the fact that power can be much more diffused (Gaventa, 2003; Foucault, 1995). In this view, power cannot be communicated between different actors. This, however, is far from being a realistic stance, as power *can* be communicated between groups.

Another feature of historical institutionalism is the view that closely associates institutional development with path dependence and unintended consequences. Path dependency explains how the set of decisions an institution faces for any given circumstance is limited by the decisions it has made in the past. If an institution is formed by the acceptance of some norms or value, then a relevant structure must have pre-existed. The historical institutionalism proposition, however, does not provide a

straightforward explanation that would determine when such a structure was formed. Thus, it has been suggested that simply tracing institutional outcomes back to temporally remote causes undermines objective analysis, as there are no criteria for determining the ‘initial’ or ‘starting’ conditions of a sequence (Mahoney, 2000). Historical institutionalism has resorted to choosing relevant dates from which to count present and future development. This still leaves open and, thus, subjectifies, the determination of the defining event that is fundamental to historical institutionalism. The idea of unintended outcomes suggested by historical institutionalism rightly emphasizes the evolutionary aspect of institutional change. This approach, however, does not explain how even immediately successful reforms may bring unintended consequences or what may be done to prevent these (Cortell and Peterson, 2001).

Historical institutionalism is also concerned with integrating institutional analysis factors, such as ideas, and their relationship to political outcomes. According to Steinmo (2008), in order “to explain institutional change ... one needs to bring ‘ideas’ into institutional analysis.” An idea in this context is defined as the “creative solutions to collective action problems”. It is often assumed, however, that these ideas originate from one network, which is defined as the most powerful network. In reality, actual institutions are made up of the ideas of diverse networks of actors. This key concept of ideas, and how they influence institutions comes over very strongly in the historical institutionalism approach. Although historical institutionalists have paid attention to the relationship between institutions and ideas (i.e. information and discourse), they have not explained how these could interact to mediate the institutional process.

Historical institutionalism is surprisingly vague and less explicit when it comes to the definition of what constitutes an institution (Peters, 2005). A definition by Hall (1986), which suggested that institutions are “the formal rules, compliance procedures, and standard operating procedures that structure the relationship between people in various units of the polity and economy” comes closest to a definition of institution in this tradition. However, as will be seen from this definition, the emphasis is placed on formal rules. Although mention is made of ‘procedures’, there is no clarity as to whether this refers also to the informal dimensions of an institution. Generally, historical institutionalism defines institutions as “the formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity

or political economy” (Hall and Taylor, 1996). According to this definition, institutions can range from formal governmental structures (legislatures) through to legal institutions (electoral laws), and social institutions (social class), (Thelen, 1999; Thelen and Steinmo, 1992). Overall, historical institutionalism associates institutions with organizations and the rules or conventions promulgated by formal organizations. It is often common to focus on either of the two. For instance, Streeck and Thelen (2005) focused on formal rules and organizations, while informal rules and norms were addressed by Marcussen (2000). Yet, studies recognizing and focusing on the co-existence of the formal and informal aspects of institutions are scarce in this tradition.

In understanding issues such as why institutions succeed or fail to address environmental crises, historical institutionalism puts forward a useful method of historical analysis with which to examine the ways in which a number of factors have intersected and affected one another over time (Hall and Taylor, 1996). For example, historical institutionalism can yield useful insights for the understanding of the role of institutions (formal and informal, and at different spatial scales) in the historical annexation of environmental resources in developing countries in both the pre- and post-colonial times. How this led to the creation of various (centralized) institutions, and shaped the access of different groups to resources is well addressed by historical institutionalism. Historical institutionalism, however, still does not offer adequate insights into how institutions change. Rather, it focuses on their path following their creation (Peters, 2005; Hall and Taylor, 1996).

2.2.2 *Rational Choice Institutionalism*

Rational choice institutionalism grew out of the observation of American congressional behaviour. It contends that if traditional rational choice postulates are correct, it should be difficult to secure stable majorities for legislation in the U.S. Congress. It was thus suggested that the answer lies in the rules of Congress that structure the choices and information available to its members. Early work explored how institutions influence the range and sequence of the options relating to legislature (Shepsle and Weingast, 1981).

At first glance, rational choice institutionalism might appear as a contradiction, or even an oxymoron, and a departure from the mainstream rational choice approach, which emphasizes utility-maximizing individual behaviour. A closer look, however, reveals that rational choice institutionalism still assumes egoistic behavioural characteristics. It argues that utility maximization is the primary motivation of individuals, but those individuals may realize that their goals can be achieved most effectively through institutional action and consequently find that their behaviour is shaped by those institutions. Even though individuals are interested in maximizing personal utility, they quickly learn that in order to make the most out of institutions they must abide by their rules, norms and values (Shepsle, 2006; Peters, 2005). Rational choice institutionalism suggests that institutions are only vested with powers by individuals. Hence, in order to understand institutions we need first and foremost to understand individual interactions.

This approach by no means forms a coherent school, as internal debates in rational choice institutionalism are commonplace (Peters, 2005; Hall and Taylor, 1996). Hall and Taylor (1996) emphasize four notable features of rational choice institutionalism. The first is the suggestion that actors have a fixed set of preferences and are utility maximizers. The second emphasizes collective action dilemmas and the lack of institutional arrangements that prevents actors from taking collectively superior courses of action. Thirdly, the authors emphasize the role of strategic interaction in the determination of political outcomes. The final feature focuses on the explanation of institutional change.

The idea that actors have a fixed set of preferences and modify their behaviour entirely in order to maximize the attainment of these preferences suggests that humans are passive and that preferences are established exogenously. This is far from what is observable in societies where actors experience societal limitations that might cognitively affect their rationality. Emphasis on rationality does not explain why some individuals are willing to violate their own self-interest in favour of that of their society. It has been frequently suggested that actors are not entirely rational, but rather function under a bounded rationality (Simon, 1991). At the same time the tenet of rational institutionalism that assumes that human preferences and their motives exist *a priori* neglects the fact that actors have the capacity to observe and learn. Such a view of rational actors is also critiqued for being relatively static and ahistorical (Bell, 2002).

The second feature of rational choice institutionalism is the emphasis on ‘collective action dilemmas’, suggesting instances where utility maximizing actors are likely to produce sub-optimal outcomes. Thus, it is suggested that there is a need for institutional arrangements that could create optimal solutions that might resolve scenarios similar to Hardin’s (1968) ‘tragedy of the commons’. Actors are also described as strategic and calculating based on their expectations of others’ behaviour. It is suggested that institutions structure interactions and lead actors to particular calculations that promise potentially better social outcomes. This does not, however, explain why in some cases actors comply with rules and institutions that are successful, while in others they do not and institutions are, by extent, less successful (North, 1998). Unlike historical institutionalism, rational choice institutionalism views individual and institutional interaction as bi-directional.

In explaining institutional change rational choice institutionalism suggests that the creation of institutions is a result of the voluntary agreement by actors who are driven by the benefits they stand to gain. This suggests that institutions are a given and can be easily created. It is argued that if there is a logical need for the existence of a particular institution then this will be created, given that actors are rational. Institutions arise from the desire of individuals, who have the capability to manipulate political structures, to impose their will on others (Sened, 1991). This pattern might comfortably apply to formal institutions, but the creation process of informal institutions is more complex (Chavance, 2008). According to rational choice institutionalism, institutional equilibrium is the norm. A normal state is one in which the rules of the game are stable and actors maximize their utilities (usually self-interest) according to these rules. As actors learn the rules, their strategies adjust and an institutional equilibrium sets in. Though not everyone is necessarily happy with the institutional structure, a significant coalition is built. Otherwise, the structure would not, by definition, be stable. Once stabilized, it becomes very difficult to change the rules because no one can be certain of what the outcomes of new structures would be. This is because institutions shape strategies. New institutional rules prompt new strategies throughout the system. In short, the amount of uncertainty accompanying new institutional structures makes actors unwilling to change the extant structure (Shepsle, 1986). It survives primarily because it provides more benefits to the relevant actors than alternate institutional forms.

One area that rational choice has contributed more than historical institutionalism is in defining what an institution is. The most widely quoted definitions of an institution are those suggested by rational choice institutionalists. According to them, institutions are viewed in terms of rules. It is rules that separate the institutional from the non-institutional (Peters, 2005). One of the earliest definitions of institution states that “institutions are collective action in control, liberation and expansion of individual action” (Commons, 1931). Collective action here can be taken to mean that individuals always act within some framework of 'collectively enforced' social rules (Vanberg, 1989). Obviously, this definition overlooks institutions resulting from the exercise of power, such as coercion and even those emerging out of the unexpected consequences of human actions. More recently, Douglass North proposed his influential definition that “institutions are the rules of the game in society” (North, 1990). North further suggests a restriction of the term ‘rules’ to describe the ‘formal’, while he describes the ‘informal’ with the terms ‘norms’ or ‘constraints’ (North, 1993; Hodgson, 2006). To North, “formal rules are enforced by courts while informal constraints or norms are usually enforced by peers or others who will impose costs.” Although North emphasized “informal constraints” and the “cultural transmission of values” he unnecessarily confines his definition of institutions to rules codified in law (Hodgson, 2006), thereby neglecting the place of “informal constraints” as institutions. Such a conceptualization of institutions does not fit well with many developing societies, especially those in Africa, where the informal dimension of political relationships and institutions is very important (Teye, 2008) .

While the aforementioned are all significant contributions to the understanding of institutional outcomes, the rational choice tradition has emphasized the impact of human behaviour and policy and has generally treated institutional change as not particularly important. This has led, by extent, to an inchoately developed explanation of institutional change (Peters, 2005). Rational choice institutionalism overemphasizes reality and often suggests a static image of political development. Its explanation of institutional processes can be argued to be incomplete, as it neglects beliefs (Weyland, 2002), an aspect important in African societies and one emphasized by sociological institutionalism.

2.2.3 *Sociological Institutionalism*

Sociological institutionalism appeared in the late 1970s as an offshoot of organization theory. The movement challenges the prevailing emphasis on formal institutions to the neglect of 'culture' and argues that institutions should be seen in the light of culturally specific practices. As such, sociological institutionalists see human beings as fundamentally social beings who are not overtly rational or atomistic, acting to maximize their personal utility but, instead, are 'satisficers' who follow a 'logic of appropriateness' (March and Olsen, 1984) by reflecting more closely on the values of the institutions with which they are associated (Peters, 2005).

Sociological institutionalism holds that a "logic of appropriateness" guides the behaviour of actors within an institution. According to this 'logic', human actions are seen as driven by rules of appropriate or exemplary behaviour, organized into institutions. It suggests that institutions derive their norms and rules from the society in which they are formed.

Hall and Taylor (1996) have emphasized three features of sociological institutionalism, which render it relatively distinct from historical and rational choice institutionalism.

The first is that sociological institutionalism defines institutions much more broadly, as it includes not just formal rules but also informal institutions. According to March and Olsen (1989), institutions are not necessarily a formal structure. They are a collection of norms, rules, understandings and, perhaps most importantly, routines and "symbolic and behavioural systems (Scott, 1994) that give meaning and identities to participating actors.

The second feature involves the explanation of the relationship between institutions and individual action. Sociological institutionalism puts an emphasis on norms and values in explaining human behaviour (March and Olsen, 1984). Institutions are conceived as influencing behaviour by providing the cognitive scripts, categories and models that specify what one should do and what one can imagine oneself doing in a given context. This does not, however, suggest that individuals are not purposive, goal-oriented or rational. Rather, it is a suggestion that institutions are equally socially constructed. It assumes bounded rationality, whereby individuals cannot really meet the conditions for

full rationality and, therefore, use a variety of mechanisms to facilitate their decision-making. The relationship between the individual and the institution then, is built on a kind of ‘practical reasoning’, whereby the individual works with and reworks the available institutional templates to devise a course of action. Sociological institutionalists frequently posit a world of individuals seeking to define and express their identity in socially appropriate ways. Many sociological institutionalists emphasize this interactive and mutually-constitutive character of the relationship between institutions and individual action and suggest the idea of a reciprocal relationship at work.

Finally, as regards how institutions change, sociological institutionalism argues that actors have a ‘garbage can’ (a set of re-utilized responses) from which to seek solutions to problems before searching for alternatives that are farther away from their core values. Actors identify and then adapt to changing circumstances in their environment. Sociological institutionalism suggests that new institutions are adopted because they enhance social legitimacy. This suggests that they are widely valued in society. Such an explanation may hold true for many communities in Africa, where formal institutions are not socially popular and, hence not followed, while other informal institutions, which are more popular within society, are much more widely followed even though they may be dysfunctional with regard to achieving formal goals. This is what Campbell (1989) described as a ‘logic of social appropriateness’ in contrast to a ‘logic of instrumentality’. In these circumstances, the legitimacy of the new institution comes from the fact that it is culturally more acceptable.

One key contribution of sociological institutionalism is the idea that institutions are socially constructed and “embody shared cultural understandings” (Thelen, 1999), which give meaning to, and legitimize, certain behaviours. This might explain how individuals from diverse networks can subvert formal institutions. Sociological institutionalism also points to the role of belief systems, ideas, and discourses in shaping institutions, forming policy, and binding actors together (Rosamond, 2000).

Sociological institutionalism is critiqued for not giving adequate consideration to those cases where institutions may behave in ways that may violate their own self-interest. In response to that, it has been suggested that rules are followed because they are seen as

natural, rightful, expected, and legitimate (Peters, 2005). The challenge also arises to rationalize why institutions sometimes appear to have different norms and rules to those of society. Another fundamental criticism of sociological institutionalism is that the criteria for the 'logic of appropriateness' within an institution are sufficiently vague that it would be difficult to ascertain whether they exist and whether they do influence the behaviour of the members of the organization. The approach is also criticized for distancing human agency away from political decision-making, as well as the assumption that behaviour is normative, rather than coercive (and as such, blind to power relations) (Peters, 2005). Sociological institutionalism is also critiqued for its inability to provide a clear distinction between institutions as entities and the process of institutional change (Peters, 2005).

The three schools of new institutionalism have enhanced our understanding of the institutional change process. All three schools emphasize the interaction between actors, as well as between actors and institutions. Historical institutionalism also emphasizes the fact that the state is not neutral, while rational choice institutionalism emphasizes that humans are strategic in their decision-making. Of the three strands of new institutionalism, however, it is sociological institutionalism that fits better with how things actually work in an African context. Institutions should be viewed as both formal and informal. The definition of institutions which captures the strengths of all three schools is that of Crawford and Ostrom (1995): "institutions are enduring regularities of human action in situations structured by rules, norms, and shared strategies, as well as by the physical world". For the purposes of this research, the author finds this description of an institution most helpful. This definition is broader in that it accommodates the informal basis of institutions rather than just their rules (formal institutions). Such a broad definition captures how things actually work in an African context, where both formal and informal dimensions are constantly intertwined. Furthermore, it emphasizes that institutions are repetitive.

Despite the strengths of the three new institutionalism types, however, all fail to advance an understanding of how actors' interactions can change institutions, and are often weak in explaining the fluidity of power.

2.3 Theories of Institutional Change

The three schools of new institutionalism are good at explaining why institutions don't change, but less good at explaining how and why they do change (Hall and Taylor, 1996). The reality in many developing societies does not involve primarily institutional inertia/lock (Pierson, 2000b), but changes that have been implicated in political outcomes. Different theories of institutional change have been suggested by different scholars, but Kingston and Caballero (2009) put all these approaches into three broad categories according to their explanation of causes, processes, and outcomes. These are: collective choice theories, which emphasize the deliberate creation of institutions; evolutionary theories, which emphasize the spontaneous emergence of institutions through evolutionary processes; and theories that combine elements of collective choice and evolution.

2.3.1 *Collective Choice Theories*

Although there are several variants, collective-choice theories generally posit that institutional change is purposefully designed in a centralized way either by a single individual (such as the King) or a collective political entity (such as the community or the state) (Kingston and Caballero, 2009). In collective choice, institutional change emerges through individuals and organizations who are engaged in collective action, conflict, and bargaining in an attempt to change the rules for their own benefit. This group generally involves strategic individuals who calculate the costs and benefits of an institutional change before it can occur. Such a view is reminiscent of the rational choice institutionalism discussed above.

Theories in this group emphasize “hierarchies of rules”, treat institutional change not as a decentralized and spontaneous process, but as a centralized, political process in which the state specifies formal rules and individuals and organizations engage in conflict and bargaining in order to shape the rules according to their benefit. The state and/or elements thereof is given the role of actor with its own objectives, rather than viewing it primarily as a battleground in which groups compete to mould formal rules to their own advantage.

Although they provide numerous insights, theories which view institutional change as the outcome of a deliberate, collective-choice process of rule-creation, also leave several important questions unanswered. In particular, they have difficulty in explaining why, in many cases, formal rules are ignored, or fail to produce their intended outcomes. While exponents of collective-choice acknowledge the importance of informal rules, the approach is ill-equipped to deal with 'informal rules' (i.e. rules that are not deliberately designed), but are nevertheless followed because deviating from the rules (social norms and conventions) is not individually rational if others follow them. These are institutions that do sometimes change over time but generally evolve in a decentralized and spontaneous manner. As such they do not fit into the collective-choice model. In addition, the existence of some 'powerful groups' blocking or imposing institutions only tells one side of the story.

2.3.2 *Evolutionary Theories*

Evolutionary theories perceive institutional change as a random process in which institutions undergo some kind of decentralized selection process, as a consequence of which institutions that survive random selection spread through the population, while unsuccessful institutions die out. Thus, new rules and associated patterns of behaviour emerge from the uncoordinated choices of many individuals rather than a single, collective-choice or political process. Implicitly, if existing institutions are not efficient following such a change, then new, more efficient, institutions will in time emerge. The process of institutional change envisaged is one in which more efficient institutions will drive out less efficient ones through the evolutionary-competitive process. This competitive pressure ensures that bounded rationality will not impede the selection of efficient institutions (Kingston and Caballero, 2009).

Selection is thought to be driven by exogenous parameters that aim to reduce the transaction costs resulting from the bounded rationality and the opportunism of the transacting parties. In evolutionary theories there is no mechanism, such as legislation, that would cause a coordinated shift in the rules perceived by all the players, or in their behaviour or beliefs.

A common conclusion from such an approach is the suggestion that formal rules change or drive out informal rules (McAdams, 1997). These theorists have neglected the role of collective action and political processes and have turned a “blind eye” to bounded rationality (the core of transaction cost theory on which its thesis is based). The possibility of institutions being rendered neutral by actors is ignored. Neither has the possibility of formal and informal rules cooperating and coexisting in harmony been considered.

2.3.3 *Blending Evolution and Design*

Both evolutionary theories and centralized collective-choice processes have their limitations and are only useful in particular settings. In many real-world processes of institutional change, however, both unintentional, evolutionary processes and intentional processes of design are at work, and it is often difficult to clearly separate the two (Kingston and Caballero, 2009). For example, the impetus for attempts at deliberate institutional design may reflect gradual underlying changes in parameters, beliefs, or knowledge, which result from the spontaneous evolution of existing institutions over time. Even when deliberate attempts are made to design and implement new institutions, competition or other evolutionary processes may subsequently play a role in determining which kinds of institutions survive and spread.

Such institutions recognize the fact that while in many societies there are purposefully designed institutions, evolutionary processes outside the hierarchical centralized environment exist, which may interact and give rise to new institutions. While Kingston and Caballero have identified these institutions, they have not developed a framework with which to explain institutional change in such complex environments. Such a framework would not only explain how institutions change, but could provide further insights into the multiplicity of institutions that are widespread, since it is possible for multiple institutions (both designed and evolved) to be at work at the same time.

Although some insights are provided by the above, however, these do not allow a rigorous analysis of institutions found in an African context, where institutions made up of numerous actors belonging to multiple interacting networks influence one another. This is despite the fact that networks have been named as an important governance

mechanism, and the suggestion that institutions are generated through repeated practices within and between networks (Owen-Smith and Powell, 2007; Rodriguez-Pose, 2009; Rydin and Falleth, 2006).

2.4 Theories of Networks

Network models are widely used to represent relational information among interacting units. The term ‘network’ is frequently used to describe a set of actors connected by a set of ties (Borgatti and Foster, 2003) in order to share and exchange resources and allow communication. What follows is a review of relevant network theories.

2.4.1 Policy Network

The concept of a policy network (i.e. interactions between groups involved in policy-making and their influence on the policy process), has a variety of uses among scholars (Rhodes, 1990a; Rhodes, 1990b). A number of concepts are used which sometimes describe very similar or even overlapping phenomena. Such concepts are, for example, ‘policy communities’ (Heclo and Wildavsky, 1974) and ‘issue networks’ (Heclo, 2010; Kenis and Schneider, 1991). The central theme of this approach is that a policy network is a “set of relatively stable relationships which are of a non-hierarchical and interdependent nature linking a variety of actors, who share common interests with regard to a policy and who exchange resources to pursue these shared interests acknowledging that co-operation is the best way to achieve common goals” (Börzel, 1997).

Theoretical debates persist within this approach between the British school, which believes that state actors are equal partners, and the Dutch school, which believes that the state holds a special position in the network (Sibeon, 2000), but the policy network approach captures the complexity of the policy process by pointing attention to the diverse interests, or ‘stakes’, of clusters of actors within the network (Peterson, 2003).

Despite the strengths and contributions of the policy network approach it has been criticized for focusing on characteristics of network components rather than the characteristics of the network itself (Dowding, 1995). Another weakness of this

approach is that it is too descriptive and lacks adequate explanation of how networks change (Dowding, 1995). Furthermore, it neglects the roles of those not in the policy arena and their institutions, and emphasizes cooperation to the detriment of situations where there are power differences and conflicts.

2.4.2 *Actor Network Theory*

Actor network theory (ANT) emerged during the mid-1980s and is associated with the works of Michel Callon, John Law and Bruno Latour (Callon, 1986; Latour, 2005; Law, 1992; Law and Callon, 1988). The theory focuses on networks that are made up of humans, as well as taking seriously into consideration the agency of non-humans (machines, animals, texts, and hybrids, among others). As such, ANT focuses on textual, conceptual, social, and technical actors. It assumes that in order to understand social processes, one has to take into account all human and non-human entities within the network arguing that ‘social relations’ are not independent of the material and natural world (Latour, 2005). The theory which stems from a science and technology point of view, has in recent years come to attract wider application within the social sciences (Nimmo, 2011). This has resulted in a body of studies that uses ANT to understand phenomena as diverse as environmental management (Steins, 2001; van der Duim, 2007; Burgess et al., 2000).

The possibility of combining human and non-human actants in societies makes actor network theory promising for the understanding of environmental institutions, where one needs to take into consideration interactions and exchanges that take place between humans (in terms of language, money etc.). The bringing of the ‘missing masses’ (Latour, 1992) of non-human actors into the frame of analysis is important and timely given the influence of the linguistic turn in organization theory (Whittle and Spicer, 2008). Furthermore, it further brings the focus of attention on the diversity of actors and the interactions between them. Through these interactions it is possible for an actor’s interest to be translated - a situation whereby actors construct common definitions and co-opt in the pursuit of individual and collective goals.

Whilst a novel approach, ANT has certain shortcomings. The first problematic area is the ethical implication of equating humans with inanimate objects and according

inanimate objects, such as machines, the same degree of agency as a person (Whittle and Spicer, 2008). While this attempt to invite non-humans into the policy arena is a worthy gesture, it runs the risk of displacing the defining human characteristics of the policy arena as a space of meaningful, purposeful, self-aware and non-repetitive action (Mutch, 2002).

Also, ANT focuses on stable relationships organized and stabilized to create a durable and robust network (Callon, 1991). For instance, a formal institution functions properly as long as the enforcers employ their technical knowhow and the local communities continue to obey. However, the actor network is only stable as long as all human and non-human actors remain faithful to the network (Whittle and Spicer, 2008). The approach has also been critiqued for not adequately examining power differentials and for presenting an overly rationalistic and cynical understanding of the human actor (Laurier and Philo, 1999). Even more fundamentally, ANT does not provide a framework for forensic evaluation of the merits and demerits of different network as it focuses too much on negotiation where actors pursue collective goals.

This does not completely dismiss ANT as a useful approach for the study of institutional change. It does, however, question the contribution of ANT to the development of a critical theory of institutional change in an African context where the exercise of power is important.

2.4.3 *Social Network Analysis*

Social network analysis is applied across a wide range of discipline including the social and natural sciences, e.g. sociology, psychology, anthropology, biology and medicine (Wasserman and Faust, 1994). The origin of the main developments of social network theory is traced to the work of several groups in different traditional fields working independently in the 1930s (Scott, 1991). Overall, this approach focuses on the interactions between individuals within a group in order to understand the collective behaviour of that group (Martínez-López et al., 2009).

The social network perspective is based on the importance of the relationships among interacting units. The peculiarity of this perspective is that it focuses not on individuals

or other social units, but on relationships between them, recognizing that individuals' behaviour is influenced by those around them (Burkhardt, 1994). Social network analysis seeks to describe networks of relations as fully as possible, tease out the prominent patterns in such networks, trace the flow of information (and other resources) through them, and discover what effects these relations and networks have on people and organizations (Garton et al., 1997). According to Wasserman and Faust (1994), in addition to a focus on relationships, there are four fundamental concepts important to a social network analysis: the actors (the people, organizations or other social entities) in social networks; the sets of social relationships, such as friendship, co-working or information exchange through which they are connected and which serve as channels for the transfer of resources (material or non-material); the structure of the network, which provides opportunities and constraints for individual action; and the lasting patterns of these social structures.

The actors are referred to as the 'egos' or 'nodes' while those they are connected to are referred to as their 'alters'. For instance, if A is connected to B, this will be termed as a network in which A is the ego and B is A's alter. A may not only be connected to B, but also C, D, E etc. At the same time the alters of A (B, C, D, E...) may also be connected to other actors to whom A is not connected, but are also members of A's network. Such indirect links to actors whose alters are connected is also important in social network analysis (Garton et al., 1997). Some network analysts have relied on such single individuals or nodes for explaining the network of A in an ego-centred approach. However, if we consider the fact that in reality A has more than one alters, while the same is true for B and that ties not only give one ego access to their alter, but also indirect access to all those network members to whom their alters are connected. A has its ego network, while B also has its ego network. In principle, every network is linked to the *total network* covering the whole of society. This is much more the case because in reality relations are widespread and it can no longer be considered appropriate to focus on the individual. Instead, one should concentrate on the larger or total network. These two, the ego-centric and total networks, represent the two approaches to social network analysis (Garton et al., 1997).

The defining feature of a social network is the relational link between actors. These links are referred to as ties (Wasserman and Faust, 1994), which can be quite extensive.

Wasserman and Faust (1994) suggest some common examples of ties, but Borgatti et al (2009) were more helpful when they divided the ties that link nodes in a network according to similarities (location, membership and attributes), social relations (affective and cognitive kinship, and other roles), interactions (talking, helping, harming etc.), and flows (information, institutions, personnel, resources and power). Such a division helps in focusing on the type of ties that can be found in any institutional process, and especially in interactions and flows. One other advantage of the social network approach is that it emphasizes informal links, such as friendship, financial exchange, dislike, or relationships based on beliefs, knowledge or prestige among individuals or groups, which are often neglected by the policy network approach.

Another important feature of the social network approach, which makes it attractive, is that it does not only place emphasis on the structure but allows it to be mapped and measured (Smith, 2001) in such a way that the structure of relations between various actors can be understood. The connections (ties) between actors (points) are mapped using a line. The resulting system of points and lines indicates the nature of a structure within the network. In its most simple form, a social network is a map of all the relevant ties between the nodes being studied. These concepts are displayed in a social network diagram, where nodes are the points and ties are the lines. The resulting structure of the network of actors can be measured and is important in understanding societal outcomes. The measurement of a network's structural properties has generated a considerable body of literature (Okuyama and Holland, 2007; Lauber et al., 2008; Janssen et al., 2006).

Social network theory has been criticized for leaving less room for individual agency and the ability of individuals to influence their own success. So much of it rests within the structure of their network. Another critique is that social network analysis focuses attention on the structure and neglects the interaction between structure and content (Stokman, 2004). As such, it explains interactions within the network but places little emphasis on interactions between networks. It may be possible to conceive that any one interaction within the network can mirror interaction between networks. Surely this is a challenge to traditional social network thinking as we know it. Therefore, any model must take this into consideration and employ a more content-driven methodology.

Despite its critics, the power of social network theory stems from its emphasis on linkages among individuals, rather than the attributes of individual actors themselves. This approach has turned out to be useful in explaining many real-world phenomena and there is a call for incorporating social network perspective in environmental governance (Ernstson et al., 2008). A major advantage compared with other analytical approaches is an inherent ability to handle relations that are bi-directional (Martínez-López et al., 2009) and communication contents that are exchanged simultaneously. Social network theory also encompasses indirect links, which are mostly informal and not necessarily visible during the policy processes, as suggested by the policy network approach. Furthermore, the approach can provide a conceptual framework within which to study interaction patterns between actors that are frequently or intensely connected within the network and that result in institutional change.

2.5 Models of Interaction

Given that the network approach involves interaction among actors who differ, it is good to understand the nature of interactions possible in a network. Scharpf (1997) developed a typology of institutional settings based on four models of interaction: unilateral action, negotiated agreement, majority vote and hierarchical direction. These modes of interaction can explain how networks are converted to policy outcomes. Although based on rational choice assumptions (Peters, 2005), these models offer insights into how actors may pattern their interactions within and between networks.

2.5.1 Unilateral Action

This model is applicable to the “anarchic field” (Hermann, 1998) in which actors in the network respond to each other either by mutual adjustment or through non-cooperative strategy where dialogue is almost non-existent. This is possible because actors do not have pre-existing relationships or specific obligations to themselves. Hence, even where they do reach agreements they may still renege. In such a scenario actors can engage in non-cooperative games in which case all they think about is maximizing their own best interest. Although aware of other actors and their interdependence to them, as well as their strategies, the goal is to secure a clear strategic interaction. The other option (mutual adjustment) involves the actor’s knowledge of his own strategy and its

outcome, as well as the ability to predict the strategies of other actors. This enables decision-making geared towards the maximization of their benefits. In reality, however, it is difficult to know the other actors' true intentions. In other words, one cannot know exactly how people will interact and what the final outcome will be (Stacey and Stacey Ralph, 1996). In both instances (non-cooperative and mutual adjustment) there is a lack of any mechanism that could prevent actors from inflicting damage on one another, which may result in significant welfare loss.

Although unilateral strategies may in some cases stimulate a process of interaction (Bruijn, 2005), interaction itself is often not based on them. This renders this model less helpful in studying networked interaction. Further, the model does not foresee a situation where actors cooperate in networks in which decision-making is based on multilateral interaction (Bruijn, 2005). The model also assumes a 'lawless' society where institutions capable of preventing unilateral violations do not exist. While this model is generally not applicable to modern states, where legal institutions to prevent unilateral violations exist, in scenarios where a weak state has little or no autonomy unilateral actions could be observed. Even in this case, however, there are informal institutions in place that may act preventively.

2.5.2 *Negotiated Agreement*

The unilateral action model can lead to welfare loss, which can be avoided in an environment of negotiation (Scharpf, 1997). This model posits that actors can voluntarily negotiate outcomes that can lead to agreement that will realize benefit for all participants, provided that transaction costs are negligible (Dixit and Olson, 2000; Scharpf, 1997). This approach recognizes the fact that actors may engage in negotiations despite them not being fully aware of the other actors' true intentions, because they are able to trust each other (Scharpf, 1997). This world-view relates to social network analysis in which network relations are seen as a form of social capital (Putnam, 1993). The model also recognizes that importance of negotiation in self-organizing networks where decision-making is a joint process. Therefore, apart from bearing similarities to the social network perspective, this model also recognizes the fluidity of power in networks. Even though power may be unequal among negotiating partners, outcomes are voluntarily agreed in non-coercive negotiations (Pfetsch, 1998)

This mode of interaction may result in ‘fair’ outcomes for all participants in terms of other alternatives that may be available to them if they had chosen not to enter negotiations. This mode, however, often does not correct existing inequalities in society. Nevertheless, it does offer an attractive promise, closest to what is actually available.

2.5.3 *Majority Voting*

Majority voting suggests that neither the welfare damaging unilateral interaction nor negotiations, which may run into prohibitive transaction costs is helpful in explaining interaction between actors. A situation whereby decision-making is based on majority rule suggests a model based on a system of ‘democratic majority consensus’, where objections by a dissenting minority can be overruled by the majority.

In practice, decision-making is not a democratic process. There are many instances where the minority dominates the majority (Nafziger, 1988). This is particularly common in many African societies. The other weakness of this model in an African context is the assumption that the ‘majority’ vote always counts. As such, interaction by a majority decision rule is far from realistic. It is also too idealistic and too much of a western conception to correspond to what is practiced in Africa (Adejumobi, 2000).

2.5.4 *Hierarchical Direction*

Hierarchical direction is another mode of network interaction. According to Scharpf (1997), hierarchical direction is a mode of interaction in which egos are able to specify alter choices, or more precisely some alters decisions, which arise out of the egos superior power. As such, this model assumes that decisions can be imposed without the consent of other actors within the network. Based on the fact that power is diffused in networks, hierarchical interaction is not possible in them (Blatter, 2003).

It has been suggested that actors may be forced to act against their own preferences because of the consequences their inaction may bring from the hierarchical head. Scholars do recognize the fact that the *reach* of such hierarchical authority can be constrained by factors within the environment (Scharpf, 1997). In reality, many

governments have realized the need to collaborate with other actors as an effective means of problem-solving.

2.6 Theories of the Politics of the Environment

2.6.1 Political Ecology

Political ecology emerged in response to the deconstruction of dominant apolitical myths that were widespread in the debates on environmental change (Blaikie and Brookfield, 1987). In its broadest sense, political ecology is an outgrowth of ecological and social science research that combines social and political investigation with environmental processes (Bryant, 1992). Political ecology posits that ecological arguments are never socially neutral but are influenced by structural forces that condition the choices available (Watts and Peet, 2004). To its credit, political ecology engages a wider set of influential political and economic structures by emphasizing the role of political and economic obstacles as a force in environmental degradation (Walker, 2005). This implies a shifting of emphasis from biophysical characteristics of human life, analyzed through theories of evolution and adaptation, towards the study of the social and cultural dimensions of human life embedded in political economic contexts (Paulson et al., 2003).

Despite its strengths, political ecology is critiqued for its lack of coherence (Peluso, 1992; Watts, 2000). Political ecology is also critiqued for basing explanations on *a priori* judgments, theories, or biases centring on what tools should be used in order to explain, rather than on what is to be explained (Vayda and Walters, 1999). As a result, it is often accused of dealing with politics and not with ecology (Vayda and Walters, 1999) and is frequently called ‘politics without ecology’. Another shortcoming of political ecology is its emphasis on the idea that some individuals and groups drive changes in society by their exercise of power over how others in society benefit from the environment (Boyce, 2002; Robbins, 2004). This generally ignores the fact that power can be fluid in society and results in local people being portrayed as victims instead of agents (Hummel et al., 2012).

Despite these criticisms, political ecology has become a widely accepted approach, and today there is a considerable diversity of political ecologies, including feminist political ecology, liberation ecology, third world political ecology, first world political ecology, local and regional political ecology, and more recently, critical political ecology (Robbins, 2004; Bryant and Bailey, 1997).

2.6.2 *Advocacy Coalition Framework*

The Advocacy Coalition Framework (ACT) was developed to analyse policy processes (Sabatiwer and Jenkins-Smith, 1993; Sabatier, 1988; Sabatier, 1998). An advocacy coalition, according to Sabatier and Jenkins-Smith, refers to coalitions of “actors from a variety of ... institutions at all levels of government who share a set of basic beliefs ... who seek to manipulate the rules, budgets, and personnel of governmental institutions in order to achieve these goals over time” (Sabatier and Jenkins-Smith, 1993).

Basic to this approach is the importance of sub-systems in policy formulation and implementation. It argues that policy-making entails policy sub-systems that come together to form coalitions. Each sub-system is characterized by coalitions, which differ in belief systems and policy preferences. It is these belief systems that make coalitions hold together and build the basis for their coordination and internal organization. Coalitions can be composed not only of policy actors, parties, lobbies, administrative agencies, but also of journalists and scientific representatives (Sabatier and Jenkins-Smith, 1993). Hence, the Advocacy Coalition Framework emphasizes the importance of even small groups and other actors that may play a direct or indirect role in the policy-making process. The idea is that any advocacy group is potentially important in effecting change on the basis of shared beliefs, irrespective of their formal location or size.

The framework distinguishes between three levels of beliefs in the belief system of a coalition: the deep core, the policy core and secondary aspects. The central ideas of a policy sub-system, namely whether a coalition sticks together or not, depend on the policy core level (Sabatier and Jenkins-Smith, 1993). Learning processes (the so-called policy-oriented learning) and policy change are most likely to concern only secondary aspects of a belief system, leaving the policy core of a coalition intact, and thus able to

bring about only minor policy changes (Sabatier, 1998). Minor policy changes are the result of two processes: learning within and learning across coalitions. The second is more interesting in this case, as it is where policy brokers may intervene. Learning across two coalitions happens when their respective belief systems, as well as their opinions about the specific policy domain, differ. The two coalitions are in conflict and it is difficult to obtain a dialogue between them. Conflicting belief systems of coalitions are mediated by policy brokers whose principal concern is to find some reasonable compromise, which will reduce conflict intensity (Sabatier, 1988). In that sense, policy brokers have to combine two tasks: first, they have to relativize the beliefs and preferences of the competing coalitions in order to facilitate feasible policy solutions, and second, they must be linked to actors from different coalitions and, ideally, directly to the decision makers as well.

While the Advocacy Coalition Framework is novel in pointing to the important role of brokers in the policy process, and is a prominent approach used to analyse broker positions in a political sub-system, the suggestion that brokers do not have strong beliefs, or they abandon their preferences in order to make feasible political solutions possible (Ingold, 2011), does not give room for real life situations where brokers still hold strongly to their own beliefs, instead of readily adopting the beliefs of other coalitions. The approach has, thus, been criticized for downplaying the interests of policy brokers (Kübler 2001; Schlager 1995) and for being weak in integrating power in the policy process (Doolin and Lowe, 2002). Furthermore, it emphasizes the importance of policy sub-systems, which are quiescent in nature, meaning they only get together when there is a need. Once the need is resolved, the sub-systems adjourn (Ike, 2009). The institutional process, however, is continuous and repetitive and there may not be an opportunity to stop or adjourn.

2.6.3 *Discourse Coalition Framework*

The Discourse Coalition Framework has its roots in the work of Maarten Hajer, who criticized the Advocacy Coalition Framework for being analytically too thin to account adequately for the interactive dynamics of policy changes, and hence why and how changes come about (Hajer, 1995b). Therefore, whereas the advocacy Coalition Framework emphasizes policy beliefs, Hajer points to narratives and story lines (Hajer,

1993). It is also a departure from traditional approaches, which hold that interests and institutional constraints are the key determinants of policy formulation and implementation. Hajer contends that language is not neutral and should be recognized as a medium through which actors not simply describe but also create the world (Hajer, 1993). As such, the focus should extend beyond differences of opinion expressed in language and include extra-discursive practices, such as context and structure of language from which social constructs emerge.

The Discourse Coalition Framework suggests that actors from various networks can form coalitions around specific story lines. Story lines are the medium through which actors try to impose their view of reality on others, suggest certain social positions and practices and criticize alternative social arrangements. A storyline simplifies the discursive space and helps to bring about a discursive closure.

The crux of the argument is that hegemonic discourses often hinge on the construction of a particular storyline that provides a short, condensed and often metaphorical expression of how policy discourse defines problems and solutions. Adoption of a particular storyline tends to facilitate mutual learning and compromises formation while serving to exclude competing problem definitions and alternative policy solutions. According to Hajer (1993), a discourse coalition can be said to dominate a given political realm only if it fulfils two conditions: (i) it dominates the discursive space (discourse structuration), that is, “central actors are persuaded by, or forced to accept, the rhetorical power of a new discourse”, and (ii) this is reflected in institutional practices (discourse institutionalization), that is, the actual policy process is conducted according to the ideas of a given discourse.

2.7 The Concept of Power

Power is a key concept when studying interactions between multiple actors who mobilize different institutions. It plays an important role in shaping network interactions, the nature of institutions that are formed, and the direction of institutional change. Despite this, contemporary discussion about networks and institutions ignores the question of power (Pratt, 2003).

In spite of the acknowledged importance of power, there is no clear-cut consensus on how power should be conceptualized (Sharp et al., 2000). An early conceptualization suggests that “power is the production of intended effects” (Russell, 2004) which means that one person can have power over another if they are able to dominate or produce certain effects over them. However, recent conceptualizations have emphasized that power is rather more diffused than suggested above. Hence, it is wrong to portray those with power of domination as the only people with power and consider also weaker forces of resistance as forms of power. This is a departure from early models that generally maintain that power is in the hands of a rich few (Anderson, 1975).

2.7.1 Dimensions of Power

Power is divided into various dimensions in the literature. In the first dimension power is viewed in terms of behaviour in concrete situations. According to Dahl (1957), “A has power over B to the extent that he can get B to do something that B wouldn’t otherwise do”. This concept can easily be determined by observing who participates in a process. It focuses on a decision-making process in a formal setting, to the neglect of many informal unobservable situations in which power is exercised. Dahl’s approach was challenged by Bachrach and Baratz (1970) for neglecting “what does not happen” in decision-making settings, namely, those issues that are unwittingly neglected or consciously excluded from the agenda. In their view, the second dimension of power includes situations where individuals or groups work to limit the scope of public debate and decision-making to those issues that are relatively harmless to themselves, i.e. that do not damage their own interests.

Lukes (1974) proposed that power has three dimensions. He called the two already mentioned above "overt" and "covert", respectively, but argued that they were limited to those forms of power that could be seen. He introduced a third "hidden" dimension, in which power makes existing social, economic and political relations seem natural and therefore shapes the ways that the powerless perceive their wants: “A exercises power over B when A affects B in a manner contrary to B’s interest.”. In this view, power is not always associated with conflict, as people without power may not even know they are under the influence of power. So it is possible for values, interests, and rules adopted by networks to be a product of power influences.

Barnett and Duval (2005) recently extended Lukes' taxonomy to give "four faces of power". In compulsory power, one actor directly controls another, as in Lukes' overt dimension. In institutional power, actors indirectly control others by setting rules, as in Lukes' covert dimension. In productive power, domination is achieved by capturing people's thought processes through language. This interprets Lukes' hidden dimension in a poststructuralist way, drawing on the work of Foucault (1978), who claimed that power "is productive in that it shapes reality". The new fourth face is "structural power", in which actors control others by virtue of their membership of social groups.

2.7.2 *The Place of Power in Network Interaction*

Power is a major factor to be implicated in the process of institutionalization. Although some contemporary discussions about networks and institutions often ignore the question of power, the author believes that the power of actors within the network is an important element. The power effect within networks can explain aspects of institutional outcomes. As actors in the action arena are constantly involved in processes to define and redefine each other's interests, they variously bring power to bear in order to enrol other actors in the pursuit of their own interests.

In the first place, power can play a role in bringing actors into the network. Since networks are not pre-existent, it is possible for some actors to be enrolled in a network without their active knowledge. Privileged actors can create a network by co-opting and coordinating the interests of other actors (Rydin, 2007). Central to this process is the concept of entanglements. Entanglement is based on the idea that interactions may not necessarily arise from direct or physical contact, but that "two (or more) entities, spatially separated and canonically considered causally disconnected, are entangled if an interaction with one of them can influence the other one, without in any way directly interacting with it" (Garton et al., 1997). This can be done by making the actors believe that their interests will be met within the network. Enrolled actors will remain as long as they believe that their interests are being satisfied. If the contrary should happen, however, they might disrupt the *status-quo* by trying to introduce new institutions, which might be met with resistance. This underscores the importance of an actor's interest in the action arena and institutionalization. According to Ostrom (2008), as actors learn more about the outcome of their own and others' actions within a particular

situation, they may change norms and strategies leading to better or worse outcomes for themselves and the relevant environment.

Efforts to enrol other actors' interests may be aided by the use of power (control and resistance), which can be confrontational. According to Fligstein (2001) institution-building moments follow from crises of existing groups, either in their attempts to produce stable interactions or when their current rules no longer serve their purposes. When things are going smoothly and there is cooperation between different actors, institutions appears to be stable, but when the interest of any actor is not met, then there is the possibility for institutional change. Also, power can be used as an instrument of coercion or inducement to embed others into one's interests. While privileged actors may use power in such a way, less privileged actors may continue to adopt resistance or rebellion in order to push their own interests.

Within networks, it is important to view power as relational and not fixed or deposited in one actor. Rather, it depends on the stability of a dominant relation, i.e. A has power because he is related to B. The reason it often seems as though power is located in some central figure or institution (like the government), is because that resource has been stabilized in that relationship over time (Allen, 2003). This can change through ongoing processes of translation. It can be linked to the idea of a "hybrid collective of people and things" (Callon and Law, 1995), which refers to the relations and their heterogeneity as being really important, and not the things in themselves. This shows that in some cases emphasis should be laid on the relations rather than the individuals. In most parts of Africa, power is gradually moving from hierarchies into networks, so that when the top fails, the other members of the network are able to use power to enforce the institutions. Such an arrangement calls into question the process of governing, which is the relationship between the state and the society. In order to understand fully the process we need to examine the concept of the state as it is important in environmental governance.

2.8 Concepts of the State

Agreement among analysts regarding the importance for the state as the focus for the institutionalization process cannot be properly explained without an understanding of

the concept of the state (Pierson, 1996a; Ham et al., 1984). The centrality of the state derives from the assumption that all political societies ought to be united under a determinate rule of law. Since laws emanating from several authorities are likely to come into conflict, it follows that there can be no determinate law of the land unless there is, within that land, a supreme law-making authority whose institutions are final (Alapiki, 2004).

2.8.1 *Definition*

Although it is difficult to provide a meaning of “the state” (Pierson, 1996a), the concept has been used to capture the legitimate sovereign political entity that governs a society. At one end of the definitional spectrum, the state is identified with one or more features, such as organised coercive powers, defined spatial boundaries, and a formal judiciary. At the other end, there are definitions that regard the state as the institutional aspect of political interaction with no concrete structures because the state is assumed to be coterminous with society. Such a view suggests that the state is only one of many networks in the society in which it seeks to rule (Migdal, 1988).

2.8.2 *Types of State*

One can broadly identify two periods of state formation. The first occurred in the Middle Ages (Gorski, 2000) and is referred to here as the traditional state, while the second is what is now widely referred to as the modern state (Duverger, 1966; Pierson, 1996a). The political condition against which the concept of the state emerged was an outgrowth of the Middle Ages. During this period the state was dualistic, having more than one person jointly responsible for governance. This was the case where the Pope and the Emperor were jointly responsible for the governance of Christendom, the former being the final authority in spiritual matters, while the latter in the secular sphere (Alapiki, 2004). A similar form of traditional state was and is still common in many parts of Africa and Asia. The priest is the custodian of spiritual matters, while the chief or king is the secular head of the community. It has been suggested, however, that in these traditional states, conflict and insecurity were endemic (Watkins, 1968). The rise of the modern state is traced to the conquest of territories across Europe in the 14th century (Dalberg and Acton, 1906; Strayer, 1970). In differentiating between the

traditional state and the modern state, (Strayer, 1970) suggested a move from authoritarian to democratic régimes, and used words such as *competent* and *workable* to describe the modern state. Neither of these two, however, captures how things work in Africa. Ake (1995) characterizes the state in Africa somewhat differently from these two. He sums up his views as follows:

“The unique feature of the state in Nigeria, and this is typical of periphery capitalist institutions generally, is that the state has limited autonomy. That is, the state is institutionally constituted in such a way that it enjoys little independence from the social classes, particularly the hegemonic class and so is immersed in the struggle for class ... There may well be a case of talking of political administration or government simply instead of [the] State. It does not matter what we call it as long as we are clear about its objective character and how it differs from the pure ideas of [the] State” (Ake, 1995).

This idea of a Nigerian state is not the same as a modern state, especially owing to its lack of scalar reach which was also emphasised by the Chinua Achebe when he said that:

“In the affairs of the nation there was no owner, the laws of the village became powerless” (Achebe, 1966)

Ake was referring to the modern state as the ideal when he mentioned the “pure ideas of [the] state”. However, it has also been argued that this form of the state does not work in Africa (Callaghy and Ravenhill, 1993; Van Arkadie, 1999). This is not to suggest that states in Africa cannot be ‘developmental’ in both their aspirations and economic performance (Mkandawire, 2001). William Reno has conceived of the African State as a “Shadow State”, with a form of personal rule, where decisions and actions are taken by an individual ruler and do not conform to a set of written laws and procedures, although these might be present (Reno, 1995). A Shadow State can rely on recognition of its legitimacy to undermine formal government institutions for the benefit, interests and powers of its rulers (Funke and Solomon, 2002). This calls into question the interests that are protected by the state.

2.8.3 *Differing Perspectives of the State*

The projection of the state authority as supreme does not mean that the state always acts in the best interests of the society as a whole, although that clearly is the basis upon which the modern state is legitimized. Gill (2003) identified three perspectives of the state:

1. **The State as Partisan.** The ‘partisan’ model sees the state as acting on its own behalf, pursuing its own institutional interests rather than the interests of any other group. This assumes that the state is autonomous from other forces in society. In pursuing its own interests, the state may simply override any opposition to it from within society. The key factor is that the state is a unitary actor that relentlessly pursues its own interests regardless of the interests of other social forces. In practice, it is more likely that the state must work with other forces in society to achieve its aims. This may require negotiation, bargaining and compromise, enabling others to achieve some of their aims in return for being able to gain some of the stakes.

2. **The State as Guardian.** In this guise, the state acts not to advance its own interests but to stabilize the system overall. This conceives of the state as “an autonomous institutional force capable of rebalancing the social pressures upon it”. The state is seen as keeping in view the best interests of the system as a whole and reacting to developments to ensure that the system does not become destabilized. For advocates of this view the state is seen as an arena within which different forces, groups and individuals struggle for supremacy to implement their ideas. In any event, the state is essentially neutral, acting to protect the individual rights of those who constitute the community, seeking to stabilize the system and teaming up with various social forces in order to do so.

3. **The State as Instrument.** In this view, the state is conceived as a pliable instrument, which is controlled by forces outside it in order to achieve their ends. In this light, there is little sense of state autonomy with the state captured and manipulated to meet the ends sought by those who capture it. Such a concept of the state fits with Ake’s (1995) description of the Nigerian state as having “limited autonomy”. Furthermore, it fits with the concept of a shadow state (Reno, 1995)

These contrasting views of the state call into question the structure of governance in a society, or in other words, how the state relates with other social forces. According to Alapiki (2004), there are three main prevailing means through which the state engages other societal actors in governance. The organic approach conceives the state as the critical factor in the public arena, directly influencing institutional processes and affecting outcomes. This approach tends to view the state as a unitary actor, autonomous from society, dominating the societal sphere. It is suggested that the strength of the state in an environment of conflict depends to a large extent on the social control it can exercise (Migdal, 1988). The configurational approach on the other hand suggests that the state is not directional or unitary, but provides a framework for social groups to form and in which certain types of political decisions are made possible, and where other structures of domination are circumscribed. The interactive approach sees the state as engaged in transactions between social groups and state institutions. These views of the state leave open questions, such as what activities the state engages in, according to what guidelines, with what consequences, and what legitimacy does the state have. Therefore, it is of the utmost importance to understand the structure of governance in society further.

2.9 Models of Governing

The fact that the state may have other interests has resulted in an emphasis on the need for coordination between different actors for the governance of ecosystems. According to Pierre and Peters (2000), there are four structural models of governance. These are: governance as hierarchies, governance as markets, governance as communities and governance as networks. The term ‘governance’, however, may be inappropriate here, as it has been used by some authors to refer to a specific form of governing (Rhodes, 1996). The term governing is used instead to emphasize the different types of processes concerned with the relationships between people and institutions in government (Rose, 1973).

2.9.1 Governing by Hierarchies

This form of governing emphasizes the distinction between the state and other organs of society. The state is portrayed as distinct from other entities in society. Bearing the

interests of the entire society at heart the state will govern by law through the use of a traditional command and control mechanism. In practice, however, society is no longer exclusively controlled by a central unit like the state. Instead, controlling devices are dispersed and material resources and information are shared by a multiplicity of divergent actors.

With the advent of globalization and the end of the Cold War came a new vision of social governance, which suggested that the dominance of the direct command and control approach suggested by the traditional hierarchies is not compatible with reality (Giddens, 1998). There have been instances where central command over resources, which are scarce, and certain sectors, has been controlled through coordination between sectors of the society, especially in times of war. Even though central governments still maintain tight hierarchical control over certain resources especially in developing countries Pierre and Peters (2000) hierarchies still yield to the pressures from the civil sector, i.e. from the interests of individuals and their need for personal freedom, choice and initiative.

2.9.2 *Governing by Market*

This approach to governing is based on the belief that unfettered markets would not only lead infallibly towards high growth but also that these markets, which are self-contrived and self-enforcing entities free from politics, will solve problems in an efficient way (Pierre and Peters, 2000). It suggests that just like consumers have power, so does the market approach people in the place of an elected state official who may or may not jeopardise collective interest for self-interest. Thus, instead of electing officials (as in democracy), market forces will dictate the governing process. The market is responsible for optimal resource allocation.

It is suggested that since states on their own are not the appropriate agents for environmental decision-making, there is need for policy reforms, which would ensure market conditions, which leave much more room to self-organization, prevail (Panayotou, 1993). Such a view has been responsible for the promotion of market-based policy instruments for environmental governance (Muradian and Rival, 2012).

However, actual developments in transition economies are in direct contrast to those suggested by this model, as many of these economies have experienced unprecedented economic slump, stagnation and slow growth for many years. Furthermore, market forces can lead to resource depletion and environmental problems, especially in environments of uncertainty, complex interactions and multiple stakeholders (Muradian and Rival, 2012).

2.9.3 *Governing by Communities*

Arguments supporting the idea that ecosystems could not be best governed either by the state alone on behalf of the people, or by private entities, whose property rights facilitate efficient market regulation, have led to a call for alternative governing regimes (Ostrom and Basurto, 2011).

This model of governing argues that the formal state is too big and too bureaucratic to deal with issues, and even generates more problems than it purports to solve. Therefore, a governing structure without the government (Pierre and Peters, 2000) is suggested. It is based on the general idea that communities can, should and are better placed to resolve their common problems without state involvement (Etzioni 1995). As such, authority should be delegated to society.

This model assumes that members of the community act in a humane, concerted and enlightened way. This idea that people are inherently communal, guided by a common set of values is far from realistic and, indeed, over-idealistic. This approach tends to exaggerate the level of consensus possible in a community and neglects heterogeneity and the possible opposition or disagreement within a community, which may lead to conflicts (Varughese and Ostrom, 2001). Also, those who follow this approach do not provide a clear definition of the community for which political governance is to function. This approach fits with the calls for decentralization and community management of natural resources at low levels, but ignores the myriad of problems at the local level that remain unsolved.

2.9.4 *Governing by Network*

The emergence of networks as a model of governing is a reaction to a change in practice, evident in the emergence of organised society, the decentralization and fragmentation of the state, the blurring of boundaries between the public and private spheres and the trans-nationalization of politics (Kenis and Schneider, 1991). Thus, rather than the traditional hierarchical command and control models of governance, which identify the state as 'all powerful', there is a network of public, private, and non-profit organizations working together to deliver the services that the government itself once did in a process of "governing by network" (Goldsmith and Eggers, 2004). Governing by network recognises that power is shared with other entities in the society in a co-governing arrangement. As such, a wide variety of actors (state, communities, non-governmental organizations and market entities) are involved in the governing process (Rhodes, 1996). The model has been described as more realistic, as it adequately captures the reality of governing processes (John, 2000).

This model recognises the government as an active, non-neutral participant in the network. Based on the acknowledgement that power is unequally distributed among actors in a network, some authors have suggested that the state functions as a steering network (Klijn and Koppenjan, 2000; Kickert, 1995). While this is true to an extent, the steering of a network might only be possible in formal and not informal network settings through which the actual "rules in use" are developed. Therefore, understanding the role of state power within networks requires an understanding of the formality and informality of the network itself. By placing other actors on the same footing as the state, this model re-designs the foundations of decision-making in society. While in formal circumstances, the state can have higher scalar reach and be able to steer the network, informal networks are mostly beyond the state's control.

The expansion of stakeholder participation in development planning since the 1970s is symptomatic of the greater involvement of civil society by government in particular, that was fore-runner of the more autonomous activities of civil societies that are apparent in environmental governance.

2.10 Conclusion

The literature reviewed in this chapter has provided rich accounts and several useful insights into the state of knowledge concerning the place of institutions and networks in environmental management. It is clear that networks and institutional processes have important implications for sustainable development. However, considerable progress in conceptualizing and explaining how institutions resist change, no consensus exists on how institutions actually change, especially when taking networks of actors into consideration. This gap exists in part because of a lack of conceptualization of the institutional process and the role of networks within it. Furthermore, existing institutional theories often are inadequate within the African context.

Interesting questions to be asked, therefore, concern: (a) how institutions are established, maintained and changed, and (b) how the many and varied social, economic environmental and political institutions, both formal and informal, interact with each other, both within and between societies, in complementary and conflicting ways, in order to promote or hinder environmental management.

This review has shown that while there are a number of relevant contemporary models, they are missing an elaborate institutional approach for analysing the role of networks and institutions in managing complex socio-ecological systems, especially where relational factors are important.

Existing theories have not paid adequate attention to the interaction between networks and institutions and what this means for the institutional process in environmental management. Institutional change must be analysed not only as a given, but as a component in the networks of actors and in relation to the numerous communication contents that bind these networks together. Of the three schools of new institutionalism, sociological institutionalism allows for that combination of relational factors, as well as power relations that are highly relevant in this thesis. For this approach to be useful, however, there is a need for a framework that incorporates networks. Existing network theories have not adequately analysed the properties of both networks and their relationship to the institutional change process. In response to the literature review, as

mentioned previously, I will combine theories of institutional change with a more sociological network-driven methodology, in order to analyse institutions and networks.

Creating institutions in order to meet the challenge of sustainability is arguably the most important task confronting society. It is also dauntingly complex. The notion that mutuality between institutions and networks should be explicitly addressed as part of the system of social interests is a contribution that this thesis will make to the discourse on environmental decision-making and governance. The next chapter draws on some of the literature reviewed above, in order to develop a new framework for the analysis of institutional change in a networked environment.

There is need to take an entirely new approach for explaining institutional change by applying and extending insights gained from new institutionalism and network theories, which up until now had not been integrated to that end. A framework will be created that will portray how the formal and informal institutions of actors are intertwined. Many developing societies can gain from such an understanding and use the lessons learnt to surmount the challenges that stand in the way of the journey towards sustainable development.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter describes the methodology employed to achieve the research objectives set out in Chapter 1. Knowledge of institutional change is still embryonic, but different approaches have been grouped into 'design' and 'evolution' categories by Kingston and Caballero (2009), who argued that "building theories in which processes of evolution and design are integrated within a broader framework is a priority for current and future research". This chapter aims to fill this gap by describing a new Network Communication Framework which also addresses another neglected area, namely how communication between networks influences institutional change.

3.2 A Network Communication Framework

3.2.1 Rationale

The sustainable management of environments is a major challenge confronting many societies, especially in Africa. The repeated actions that constitute institutions (Ostrom, 2005; Crawford and Ostrom, 2005) play a major role in determining the sustainability of environmental management (Young, 2008). Some institutions lead to sustainable management, while others lead to environmental degradation. How institutions change

to improve sustainability is poorly understood (Phillips et al., 2004; Gatzweiler, 2003). Indeed, current theories of institutions are better at explaining how institutions resist change than explaining how they themselves change (Hall and Taylor, 1996). It is common for laws and other formal institutions to be imposed exogenously, e.g. when a state changes its policy and imposes institutions to implement this. This is what Kingston and Caballero (2009) refer to as "purposeful design". Yet, the complex evolutionary processes in which such institutions are adopted, partially or not at all by state and non-state actors, and resisted by their informal institutions, or everyday practices, are still poorly understood.

Another complication is that the sustainability of management of any environment generally depends on the institutions of numerous actors, who influence one another and in turn are influenced by many more actors (Brock and Carpenter, 2007; Rydin and Falleth, 2006). On a practical level, these actors interact with each other in a number of ways (formally and informally), which present opportunities for environmental management to be influenced. Not surprisingly, the impact of group heterogeneity on the ability to sustain institutions for community-based resource management is an important research area (Adhikari and Lovett, 2006). Explanations of institutional change must inevitably group all these actors, and this leads to simplification. As the theory of policy implementation is still embryonic (Schofield, 2001), a good place to begin conceptualizing institutional change involving multiple actors may well be state-of-the art frameworks for explaining policy change. Thus, the Advocacy Coalition Framework and Discourse Coalition Framework cluster actors competing to formulate policy - and indirectly formal institutions - into coalitions based on shared beliefs and values (Sabatier, 1998) or discourses (Hajer, 1995a), respectively. One limitation of this approach is that it assumes that individual or group actors are discrete entities, whereas many are often members of multiple networks, especially in Africa and other parts of the developing world (Morse and McNamara, 2012). So the next advance in understanding how multiple actors formulate policies and institutions could well depend on new techniques to explain influences from 'actors-in-networks'.

Making this advance involves a further challenge, because the theory of how the activities of actors in networks generate institutions is also underdeveloped, despite calls for research in this field (Nee and Ingram, 1998) and a recognition that networks

and institutions "mutually shape one another" (Owen-Smith and Powell, 2007). Any improved model of institutional change should show how interrelations between institutions and networks influence the dynamics of institutions. The advance will also have wider implications since understanding the dynamics of network processes is said to be the "next frontier" (Barabási, 2009).

A new Network Communication Framework (NCF) is outlined here to help to fill these gaps. Building on concepts developed in social network analysis to describe communication within networks through various 'flows' (Borgatti et al., 2009), such as information and institutions, it assumes that communication between networks involves similar processes, and is affected by communication within networks too. As well as combining different flows that were previously analysed separately (Kosfeld et al., 2006), the NCF also allows for interactions between flows, leading to more complex effects that mirror real-life situations, especially in an African context.

3.2.2 *Actors in Networks*

Taking a network approach allows the analysis of how the numerous actors engaged in managing any environment interact and influence each other. The Network Communication Framework follows the social network analysis (SNA) approach to social network conceptualization (Wasserman and Faust, 1994), in which a *network* is "a set of actors (e.g. persons, teams, organizations, concepts, etc) ... often called nodes ... connected by a set of ties" (Borgatti and Foster, 2003). This definition is typical of SNA's *structuralist* approach, as it does not differentiate between nodes, which are structurally defined, and the actors which fill these nodes. In contrast, in culturally oriented research in the field of relational sociology, networks are "culturally constituted processes of communicative interactions" (Mische, 2003). Here "culture and structure, language and relational ties are fused within a socio-cultural setting" (Mützel, 2009). This second approach is a subset of a *connectionist* stream of research which focuses on flows through ties, rather than on how nodes and ties are configured.

Social networks are generally approached in two ways (Garton et al., 1997). First, by an ego-centred approach, which considers relations reported by a focal node. Second, by a total network approach, based on some specific criterion of population boundaries. In

principle, every network is linked to the *total network* covering the whole of a society, but empirical studies usually focus on *partial networks* with definable boundaries (Mitchell, 1969). In the *ego-centred* approach to boundary definition, a network is centred on a particular actor or node (Scott, 1991) and has members (also referred to as *alters*) defined by their relations with the *ego* (also called the focal node). This approach provides a way of examining communication among nodes (egos and their alters), and is able to show the range and breadth of connectivity for each node (Garton et al., 1997). These positions emerge through analysis of network data which can be mapped and measured (Smith, 2001). In a social network diagram, nodes are the points and ties are the lines: a line between two nodes will suggest that a tie exists between the two actors. The resulting system of points and lines indicates the nature of structure of the total network. Three key measures of centrality in a network are: *degree centrality*, which is the number of ties to a given node; *betweenness centrality*, which is the probability that any node features on the path between two randomly chosen nodes; and *closeness centrality*, which is the sum of distances from one node to all others (Freeman, 1979). An alternative approach is to select *rules of inclusion*, based on particular definitional foci, e.g. attributes shared by actors; transactions between actors; or specific events or activities (Laumann et al., 1983).

3.2.3 *Communication Between and Within Networks*

In social network analysis, a *tie* “establishes a linkage between a pair of actors (or nodes)” (Wasserman and Faust, 1994). The ties that link nodes in a network are commonly divided into four main kinds: (a) *similarities*, such as location, membership and attributes; (b) *social relations*, such as kinship; (c) *interactions*, such as talking, helping, harming etc., and (d) *flows*, such as information, institutions, personnel, resources and power (Borgatti et al., 2009).

Ties (c) and (d) describe *transactions* between nodes in a network (Tichy et al., 1979) or, from a cultural perspective, *communication*. Interactions refer to the *type* of communication, e.g. talking, and flows to the *content* of communication, e.g. information, institutions etc. One or more of these transactions can be observed in any network. For instance a pair of actors talking can also be exchanging resources at the same time. Transactions can serve multiple functions, e.g. mutual understanding;

ensuring that one actor complies with another's wishes; and joint activities. As is discussed in a later section (3.2.6), communication between state and non-state networks is an excellent arena to explore the myriad functions of transactions in the institutional change process.

It is assumed in the new framework that communication between nodes in different networks can be described in a similar way to communication between nodes within the same network. Thus, members of different networks could live in the same village, belong to the same family, and employ the same types and content of communication. A single actor may also belong to many networks. For example, a government official who is a member of the state network may belong to a professional network and also a non-state traditional network by virtue of being a chief in his community.

Communication within a network can even be seen as a special case of communication between networks, since *exogenous* influences linked to ties between pairs of nodes in different networks are influenced by *endogenous* influences linked to ties with other nodes in the same network (Calvo-Armengol et al., 2011). Flows between networks may be *unidirectional* or *multidirectional*, while sustained multidirectional flows are described as *coupled* (following Liu et al., 2007).

Communication between networks may be (a) direct and interpersonal or (b) indirect and impersonal. Direct communication involves a member of one network meeting a member of another. On some occasions the node is common to both networks, and called a 'boundary spanner' or 'broker' node (Allen, 1984; Burt, 2004); on others the networks may communicate via a mediator who is a member of neither network and often a member of another. For instance, in the interaction between a modern state network and a traditional network, a member of a non-governmental organization network could be a mediator. The effectiveness of communication to the entire network naturally depends on the effectiveness of flows to other nodes. Indirect communication involves members of two networks which are spatially separated and causally disconnected and yet influence each other e.g. through the mass media, with varying effectiveness. Members of traditional networks in remote areas of a country with poor access to mass media may not be aware of government policies on the environment or of institutions promulgated to realize these until they meet a member of a state network,

e.g. a forest guard, trying to enforce these institutions. However, where indirect communication lead to ties, they are important as they promote an understanding of communication flows.

3.2.4 *Principal Categories of Communication Content*

Observing communication flows between actors yields empirical data that give important insights into relationships between nodes in a network, the overall behaviour of a network, and the actors involved. Positivist studies restrict their inferences only to such data, whereas post-positivist studies gain insights by looking at what lies behind these data (Fischer, 2003). In the post-positivist Network Communication Framework, each category of communication content is assumed to possess multiple *levels* of attributes, which may be inferred from observations. The four categories of communication content of most importance to this framework are information, institutions, resources and power.

3.2.4.1 Information

The multiple attributes of information include texts, language, narratives and discourse. Information transmitted from one node to another consists of written or spoken texts conveyed in a common language. From the texts of an actor may be extracted, or inferred, the *narrative* of each actor concerning a given phenomenon. A narrative is a set of statements giving a meaningful totality of past and future events (Barton, 2001). Narratives are constructed by each actor within the framework of their *discourse* - "a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer, 1995a). (The term 'discourse' is understood in different ways, e.g. in the 'Q methodology' its meaning is closer to that of a narrative, as defined here (Takshe et al., 2010)).

So even though two actors may exchange information in a common language, such as English, each may understand the same term or text to mean different things, depending on their discourse. In most cases, each network has its own discourse. This underscores the importance of discourse in the process of institutional change (Antoniades, 2010;

Lawrence and Phillips, 2004). Despite this, relatively little conceptual and empirical work has focused on how the discourses of actors are involved in institutional change processes. By identifying and explaining discourse as an important communication content, this framework improves on attempts by much of institutional theory to analyse society as “a society without language” (Breton, 1991).

3.2.4.2 Institutions

Institutions are "enduring regularities of human action in situations structured by rules, norms and shared strategies, as well as by the physical world" (Crawford and Ostrom, 2005). Their attributes include formal and informal rules, norms, levels and meanings. They are also communicated in networks, e.g. as actors attempt, or are asked, to successively reproduce institutions established in nodes at superior scales. Institutions are fundamental to any network, which needs rules of inclusion, and Ostrom (2005) identified six other generic working rules. Nevertheless, links between networks and institutions have received remarkably little study (Beckert, 2010). Ostrom (2005) also proposed a hierarchy of levels of institutions that can affect any scale.

Institutions are conceived differently by three schools of new institutionalism (Hall and Taylor, 1996). The rational choice school focuses on formal institutions, treating them as rules that constrain individual and collective choices. Actors take rational decisions and their preferences are set exogenously (North, 1990). Historical institutionalism also focuses on formal institutions, but people do not follow rules like automatons, and their preferences are not set exogenously but socially constructed (March and Olsen, 1989). Nevertheless, path-dependency can still occur (Thelen, 1999). In sociological institutionalism, institutions include both formal institutions and informal institutions that arise from everyday practices, become rules in use, and can undermine formal institutions. Of the three schools, sociological institutionalism places most stress on a web of informal institutions (Nee and Ingram, 1998). It is also distinctive in providing “frames of meaning” that guide human actions and for emphasizing the emergence of institutional practices in networks (Hall and Taylor, 1996). Institutions form “symbolic and behavioural systems" that create meaning for individuals and shape their discourses and preferences (Scott, 1994). The Network Communication Framework is most influenced by sociological institutionalism, since while informal institutions play an

important role in any social arena, in Africa they are often more important than the formal institutions (Teye, 2008), which may not even be able to function properly without their informal counterparts (Atieno, 2001; Bratton, 2007).

3.2.4.3 Material Resources

The idea that social networks convey material resource flows has received considerable attention in the literature (Wasserman and Faust, 1994). However, environmental management debates tend to revolve around resource inequality between networks, while little attention is paid to how material resources link networks. Various material resources, e.g. money, food and other natural resources, flow within networks, often in multiple directions, e.g. as payments for services and goods. According to Actor Network Theory, the flows of resources consolidate the alignment of networks achieved by other flows (Latour, 2005), but since resources are already included in social network analysis this proposition need not be exclusive to Actor Network Theory. In a structuralist conception, Burt (1992) understood material resources primarily in terms of the pursuit of instrumental objectives (i.e. to influence a target actor). However, in this framework resources also serve relational objectives, in which case they affect both the target and the source (Burlison and MacGeorge, 2011).

3.2.4.4 Power

Power is "the production in and through social relations of effects that shape the capacities of actors to determine their own circumstances and fate" (Barnett and Duval, 2005), and can be exercised through other flows, e.g. by imposing discourses and institutions, and providing resources. According to Barnett and Duval (2005), there are four types of power: compulsory power, in which one actor directly controls another; structural power, in which groups of actors control other groups; institutional power, in which actors indirectly control others by setting rules; and productive power, in which domination is achieved by capturing people's thought processes through language.

Power has been widely conceived as a means of control, whereby it is concentrated in an actor and used to control other actors (Kellert et al., 2000). This leads to the notion that some actors are *powerful* and others are *powerless*. However, it has been suggested

that power is fluid and spreads through society (Foucault, 1980). Here power is not only held by some people to dominate others, but *powerless* actors also have some space to exercise their own form of power, even if only as a form of resistance. This aligns with scholars who have suggested that power is not expressed only as a means of control, but also of resistance (Bryant and Bailey, 1997).

3.2.5 *Dimensions of Communication Between Networks*

All networks in an arena influence each other through the contents of their communication, whether they are aware of it or not. As the basis for a new integrated framework for explaining the contribution of design and evolution to institutional change, in response to the call by Kingston and Caballero (2009), each communication can be considered to have four dimensions: direction, autonomy, adaptation and reach.

3.2.5.1 Direction

The first dimension is direction (Fig. 3.1). Unidirectional communication involves imposition, e.g. when a state network tries to impose its discourse or institutions (communication content) on a non-state network. It can do this through the various mechanisms involved in any power relation, e.g. force, manipulation and persuasion (Wrong, 1995). Force involves the use of threats, e.g. the use of police, prosecution etc., or of symbolic forms of violence (Bourdieu and Passeron, 1977), e.g. stigmatization and degradation. In the case of manipulation one actor will strategically impose upon another without explicitly making him/her aware of their actual intentions (Easton, 1958). Persuasion achieves compliance by the presentation of rational arguments that appeal to the subject (Wrong, 1995).

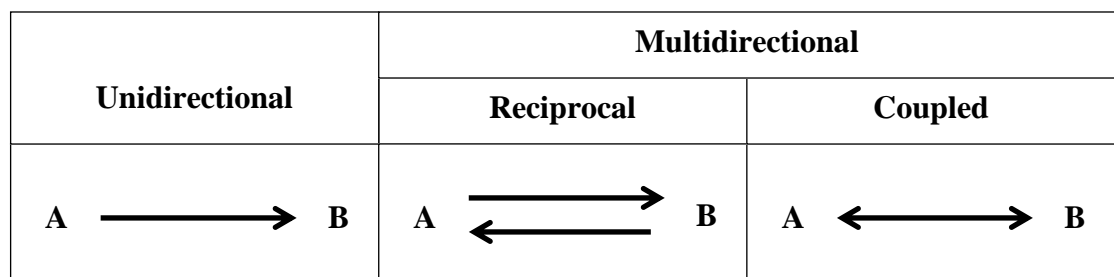


Figure 3.1. A Diagram Depicting Possible Directions of Communication.

Multidirectional communication allows two networks to influence each other. The simplest form of multidirectional communication is reciprocity. In coupled relationships (Liu et al., 2007), there are sustained two way interactions which reinforce network roles and allows mutual learning, leading to improved coordination and decision making, and even to *win-win situations*.

3.2.5.2 Adaptation

Adaptation measures the degree to which one network accepts flows from another without modification. A non-adaptive response (Fig. 3.2) involves full acceptance or rejection without modification, but an adaptive response involves some modification of flows within the network or those from another network. Adaptation may occur in one network or it can occur in both. Adaptation in one network can be seen as a form of *organizational learning*, in which the experiences of some nodes in the network that constitutes an organization lead to changes in the institutions reproduced by all nodes (Crossan et al., 1999). Adaptation in both networks involves *mutual learning*. The adaptation of communication contents of a network by another represents a unique avenue to understand institutional change. Trust and respect towards each other are factors that can influence adaptation.

3.2.5.3 Autonomy

Autonomy measures the degree to which endogenous communication within a network can resist exogenous transactions from another network. Strong and mutually reinforcing (or 'aligning') transactions within a network increase autonomy relative to influences from other networks, and affect the likelihood of changing in response to the latter. A network having weak ties with other networks, coupled with limited boundary spanners, will show high autonomy.

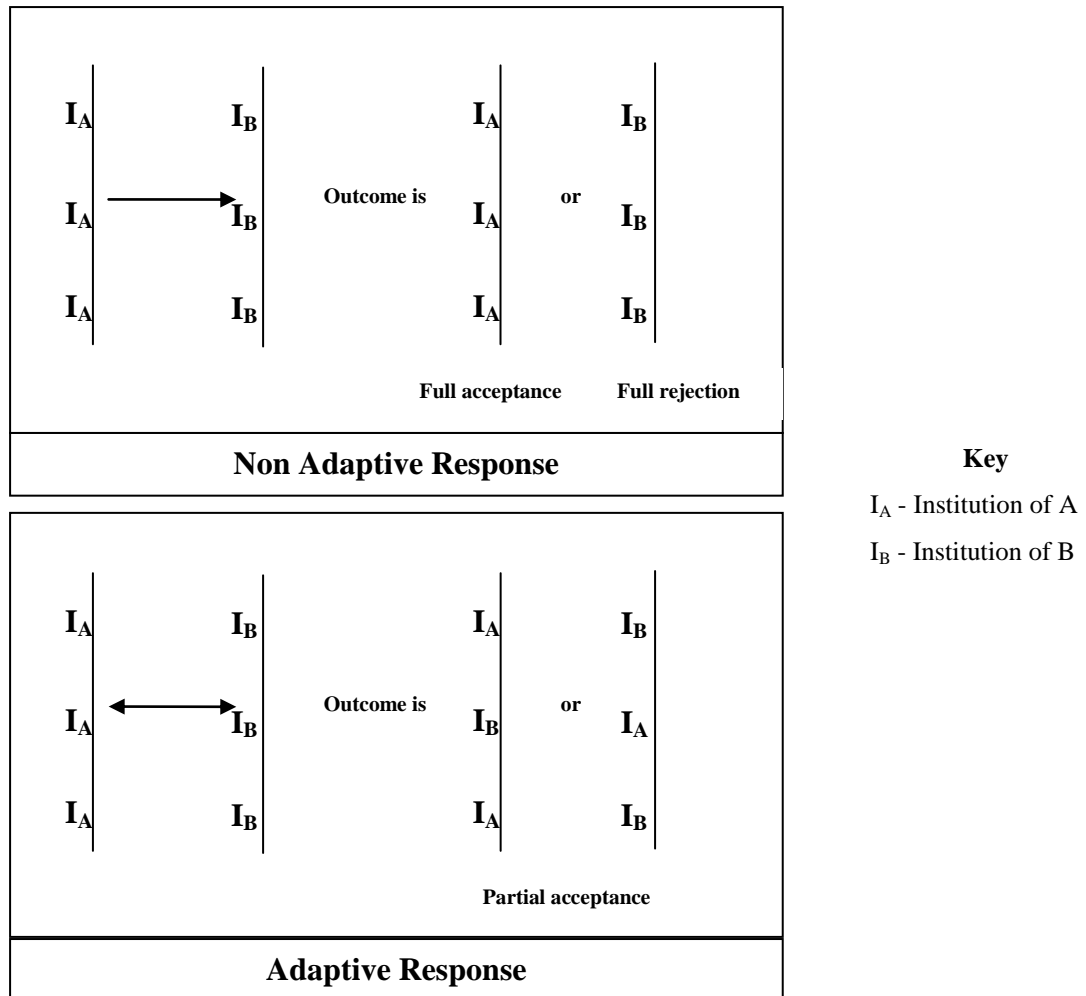


Figure 3.2. An Example of Adaptation in Communication.

3.2.5.4 Reach

Reach measures the extent of an influence from a node or network. A strong state would have high *scalar reach* down a network corresponding to the chain of command of its organizations, e.g. the headquarters of a state forestry department could ensure that its policies are followed perfectly even in the most remote forests in the country (Fig. 3.3). Scalar reach also has influences across the hierarchy of another network i.e. from the ultimate authority to the lowest ranks of the network. Where there is low scalar reach, state influence may be restricted only to a segment of the network e.g. national scale. A strong state would also have a high *networked reach*, so even if it relies on the activities of several intermediate networks to implement its policies, the latter are still realized perfectly.

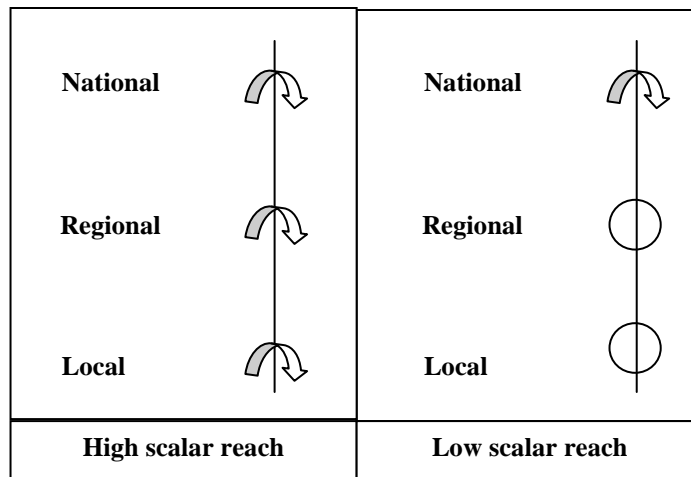


Figure 3.3. High And Low Scalar Reach in Network Communication.

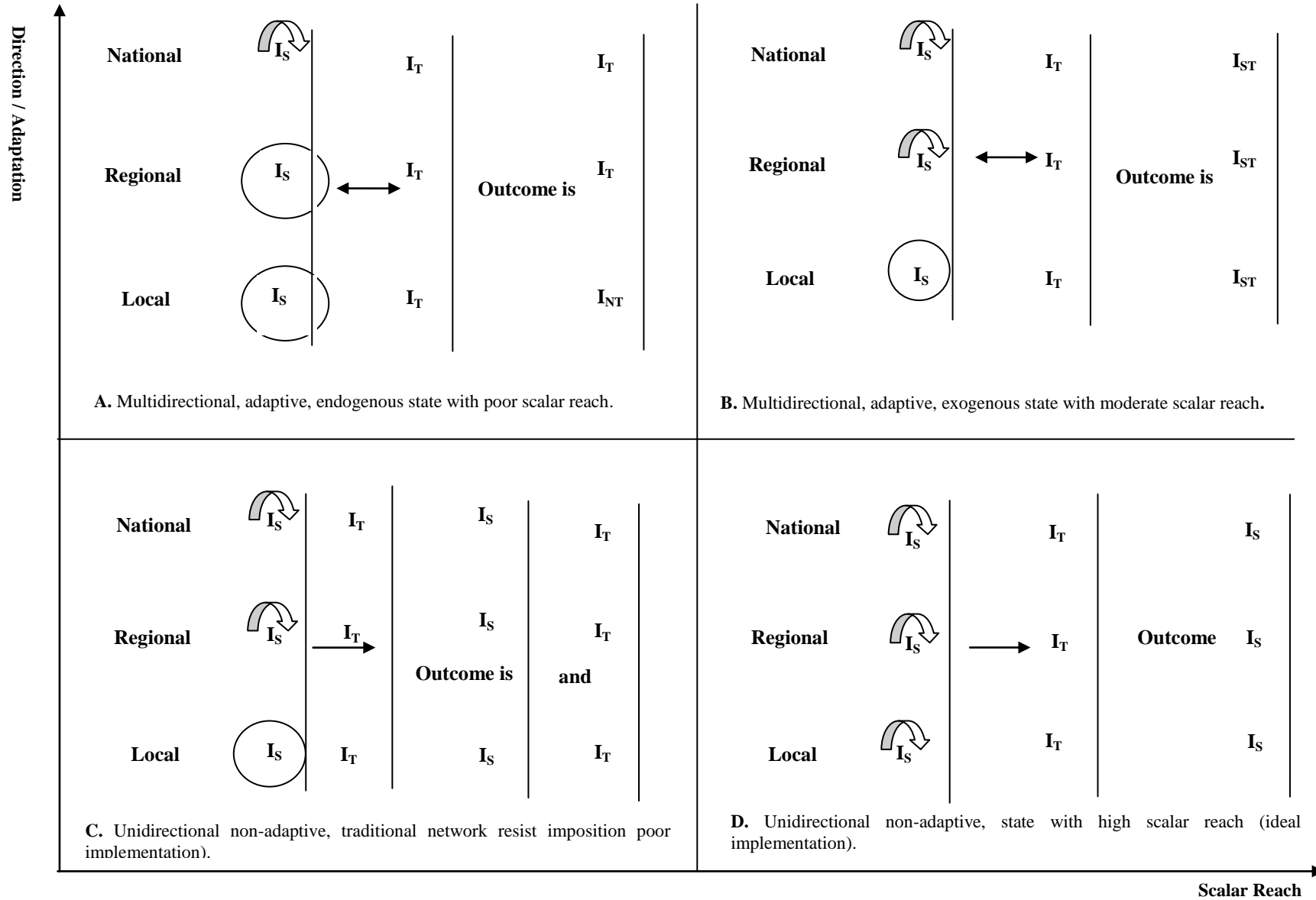
3.2.6 Combinations of Dimensions of Communication

The four dimensions of communication may be combined to predict a range of different outcomes for communications between networks. None of these outcomes are mutually exclusive and in many African societies they exist in various complex combinations.

3.2.6.1 Two Networks

The simplest combinations involve communications between two networks that vary in direction, autonomy, adaptation and scalar reach. For a developing country with a modern state network and a non-state network centred in traditional society (Fig. 3.4 and Fig. 3.5) the combinations include:

1. In unidirectional, non-autonomous and non-adaptive communication, a modern state network with high scalar reach could impose flows of information, institutions etc. on a traditional network. Thus, a state forestry department could ensure that non-state actors at all scales of a country comply with forestry policy and regulations. This describes ideal national policy implementation (Fig. 3.4d and Fig. 3.5d).
2. In unidirectional, autonomous and non-adaptive communication, even if a modern state network has moderate scalar reach the traditional network is not passive, and therefore successfully resists such attempts at impositions. This describes what happens today in many developing countries (Fig. 3.4c and Fig. 3.5c).



Key: I_S = Institution of the state; I_T = Institution of the traditional network; I_{ST} = Institution of state and traditional network; I_{NT} = New traditional institutions

Figure 3.4. Diagram Depicting Communication between Two Networks Based on the Network Communication Framework.

In some cases, the strength of traditional institutions is so great the direction of communication is reversed. Then a modern state network with poor scalar reach could be dominated by a traditional network, as with a neo-patrimonial traditional network headed by the Head of State, which is perfectly aligned and reaches all the way down to local scale. The result is a 'shadow state' (Reno, 1995, 2000) that subverts the stated policy of the modern state (Grainger and Konteh, 2007).

3. In multidirectional and adaptive endogenous communication, in which a modern state network has poor scalar reach, a traditional network can assert its autonomy and adapt to the virtual *absence* of the state at local scale by devising its own institutions for sustainable management (Fig. 3.4a and Fig. 3.5a). This describes the widespread autonomous management of common pool resources by local communities identified by Ostrom (2005).

4. In multidirectional and adaptive exogenous communication in which a modern state network has moderate scalar reach, interactions between state and non-state networks could vary state institutions for mutual benefit (Fig. 3.4b and Fig. 3.5b). This combination is still poorly understood, and therefore is a particular focus of this study.

Direction/Adaptation

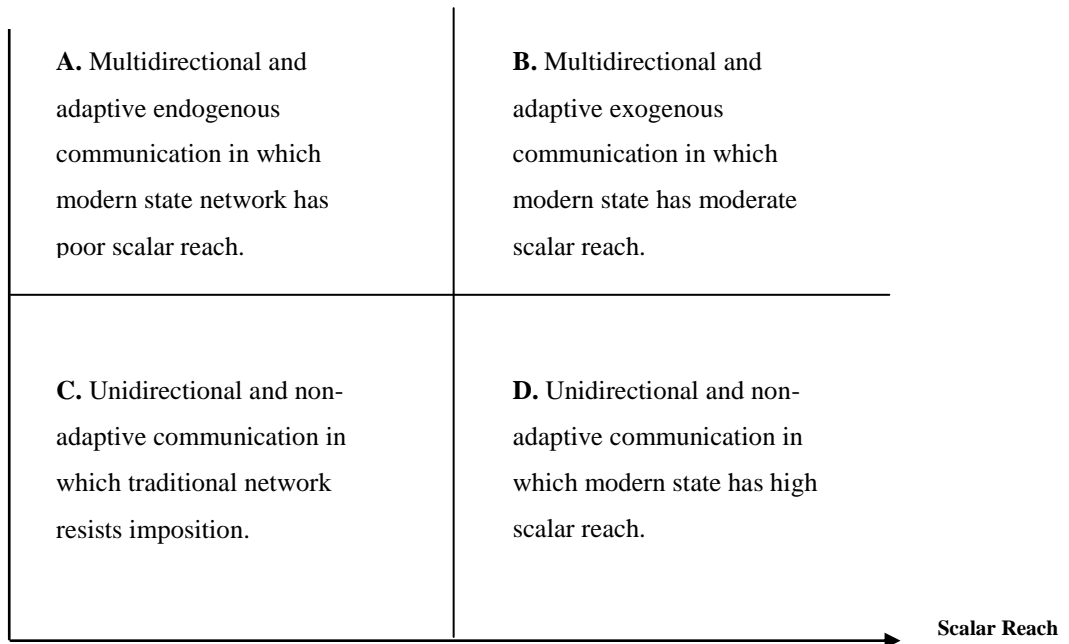


Figure 3.5. Communication between Two Networks Based on the Network Communication Framework.

3.2.6.2 Three Networks

Other combinations are possible when three networks communicate. For example, in multidirectional and adaptive communication a state network with moderate scalar reach and moderate networked reach could vary institutions through interacting with a commercial non-state network, and institutions could be further modified as the commercial network interacts with a non-commercial non-state network. These relationships could be *reciprocal*, i.e. each variation occurs independently of the other, or *coupled*, i.e. change occurs because interactions between the state network, commercial state network and non-commercial state network are all linked together.

3.2.6.3 Mutual Learning and Mediation

Some pairs of networks adapt by communicating with one another directly and undergoing *mutual learning* (see above). Others require *mediation* to adapt, i.e. by communicating with one another through a third party. One form of mediation involves a *boundary spanner* (Allen, 1977) or *broker node* (Burt, 2004) which is common to both networks and speaks both their languages. Thus, a state agricultural organization may employ extension workers who speak its language and that of the farmers (Palacpac, 2009). Other networks may require an intermediate actor that is part of a different network. This would be a special case of the above three network arrangement, in which the intermediate actor merely facilitates the adaptation. In the regular three network arrangement mentioned above, the second network can also facilitate an adaptation of the third network that is in its own interests.

3.2.7 *Overlaps Between Network Flows in Adaptive Communication Outcomes*

When multiple networks, each with at least moderate scalar and networked reach, communicate in an adaptive manner within an 'action arena', to use Ostrom's (2005) term, the Network Communication Framework predicts that flows in each network are modified accordingly (Fig. 3.2).

3.2.7.1 Single Flows

The common flows of institutions, discourses, resources etc. in each network will be modified to be consistent with mutual adaptation by the two networks. Thus:

1. A non-state network will acquire some of the institutions promoted by a modern state network, but not all of them, and the modern state network's institutions will be modified to allow for this.
2. The common discourse of a non-state network will also expand in scope to include some of the terms found in the discourse of the modern state network, and vice versa. In his Discourse Coalition Framework, Hajer (1995a) identified meta-narratives, which he called "story lines", that are consistent with the discourses of all members of a discourse coalition, even though each actor constructs a single narrative within the framework of their discourse. Although story lines are consistent with a range of similar discourses, in an adaptive situation it would be possible for one actor's expanded discourse to be consistent with a much wider range of narratives, and this will be reflected in the texts communicated by that actor.
3. Whereas a modern state will normally pay employees of state organizations regular wages, in an adaptive situation in which flows of resources are multidirectional and multi-featured, state employees may make monetary payments to superiors in the state network, and receive food or other resources from the network as well as wages.

3.2.7.2 Multiple Flows

In practice, changes in flows of different categories of communication content will be synergistic and not independent. Hajer (1995a) has already proposed that discourses and institutions mutually reproduce one another, so it is entirely expected that in adaptive communication changes in institutions and discourses will be interdependent rather than compartmentalized. It would be consistent with this for changes in institutions, discourses and resources to be interdependent too. This has implications for the empirical observation of adaptation, since mutual adaptation of institutions would be

apparent not only in observed changes in practices but also in changes in discourses and resource flows.

3.2.8 *Advances Made by This Methodology*

The Network Communication Framework fills important gaps in explaining institutional change, how multiple networks communicate with each other, and how the dynamics of networks and institutions are interrelated.

The framework is consistent with other phenomena that are already recognized, such as poor implementation of state policies, the existence of shadow states, and the autonomous construction of institutions for common pool management by local communities. This provides support to its prediction of the possibilities for adaptive communication between two networks.

The framework is also interesting for generalizing Hajer's (1995a) claim about the mutual reproduction of discourses and institutions to include other categories of communication content, and for showing that relationships between discourses, narratives and storylines may be more complex than Hajer initially envisaged.

3.2.9 *Testing the Network Communication Framework*

Testing the NCF is an absolutely essential part of its development. Testing will help me ascertain the usefulness of the framework, check for errors, and point towards areas for improvements.

To test the NCF two important factors are essential – appropriate location and data. Since the NCF is a generic framework it could be tested in any location where networks are important, and multiple interacting actors are exchanging within and between networks the various communication contents highlighted in section 3.2.4. The NCF could be applied in any country and in any sector. However, in this thesis it will be tested in a developing country, and in an 'environment of conflict' where continual interactions within and between networks provide a rich source of data. In a developing country conflicts should occur between modern society and traditional society, and the

modern state will exhibit a wide spectrum in the various dimensions of communication, e.g. from poor to high scalar reach.

The Niger Delta region of Nigeria perfectly fits this description. In Africa, networks are central to daily living, and the Niger Delta is an environment that is deeply contested by various networks. The next chapter provides an introduction to the Niger Delta and the people who live there. Chapter 5 describes the methods used to collect the data needed to test the NCF in the Niger Delta.

CHAPTER 4

THE ENVIRONMENT AND PEOPLE OF THE NIGER DELTA

4.1 Introduction

To understand the mechanisms relating to the management of the Niger Delta Wetlands, it is imperative to have a clear understanding of the geographical conditions within Nigeria. This chapter describes the key geographical features of Nigeria (in general) and the Niger Delta (specifically). This is used to illustrate the status of wetland management institutions in Nigeria as it affects the Niger Delta Wetlands. The first part of this chapter presents a compendium of the geography of Nigeria. The trends and status of wetlands management in Nigeria with emphasis on the Niger Delta Wetlands are then described. The third part situates the Niger Delta in the wider Nigerian context by presenting relevant background information describing the regions, the people and their history and culture, physical features, and the socio-economic and political profile. Finally, an overview is presented of wetland institutions in Nigeria.

4.2 Overview of Nigeria

4.2.1 *Location and Land Area*

Nigeria, a country bounded by Cameroon and Chad Republic in the east, Niger Republic in the north, Benin Republic in the west and the Gulf of Guinea to the south

(Fig. 4.1), is Africa's most populous country and the seventh most populous country in the world with a population over 160 million (United Nations, 2011; The Economist, 2011). Nigeria covers a land area of 923,768 km² enclosed within latitude 4° 1' N and 13° 9' N; longitude 3° 2' E and 14° 30' E. The widest distance from east to west is about 900 km and from north to south is about 1,050 km.

4.2.2 *Geology and Relief*

Over the greater part of the country, surface rocks are those of the pre-Cambrian basement complex. The most recent deposits include the sand bars and creeks of the coast, the deposits of the Niger Delta area and the estuarine areas of the Cross River (Buchanan, 1955). The topography of Nigeria rises steadily inland to some 2000 feet. According to Okpoko (1998) there are seven relief regions in Nigeria. These include the creeks and lagoons, the swampy Niger Delta, the coastal plains, the river basin troughs of the valleys created by the Rivers of Niger, Benue, Gongola, Cross, Kaduna, Sokoto and Anambra, the inselberg landscapes of major hills, the Chad basin-areas reaching up to 300 m above sea level, and the eastern highlands, a chain of hills with altitude varying between 600 m and 2,000 m. Nigeria has three distinct drainage systems, including the short swift-flowing coastal rivers (Ogun, Benue, the Imo, Cross and Anambra Rivers), the inland drainage system of the Chad basin (Yobe and its tributaries, Ngadda and Mbuli Rivers) and the long plateau rivers (Niger-Benue system). Nigeria contains about a quarter of the Chad basin and 10% of Lake Chad itself (Akintola, 1982).

4.2.3 *Climate and Vegetation*

Because of its location just north of the Equator, the humid tropical climate in Nigeria is associated with the movement of the Inter-Tropical Convergence Zone (ITCZ) which controls the tropical maritime air mass (moisture-laden south-west winds blowing from the Gulf of Guinea) and the tropical continental air mass (dry and dusty north-east winds from the Sahara Desert) (Odekunle et al., 2005). When the ITCZ (the zone of convergence of the two air masses) is to the south of the Equator, north-east winds prevail over Nigeria, thus producing dry-season conditions. Conversely, with the

movement of the ITCZ into the Northern Hemisphere, the rain-bearing south-west winds prevails far inland to bring rainfall during the wet season.

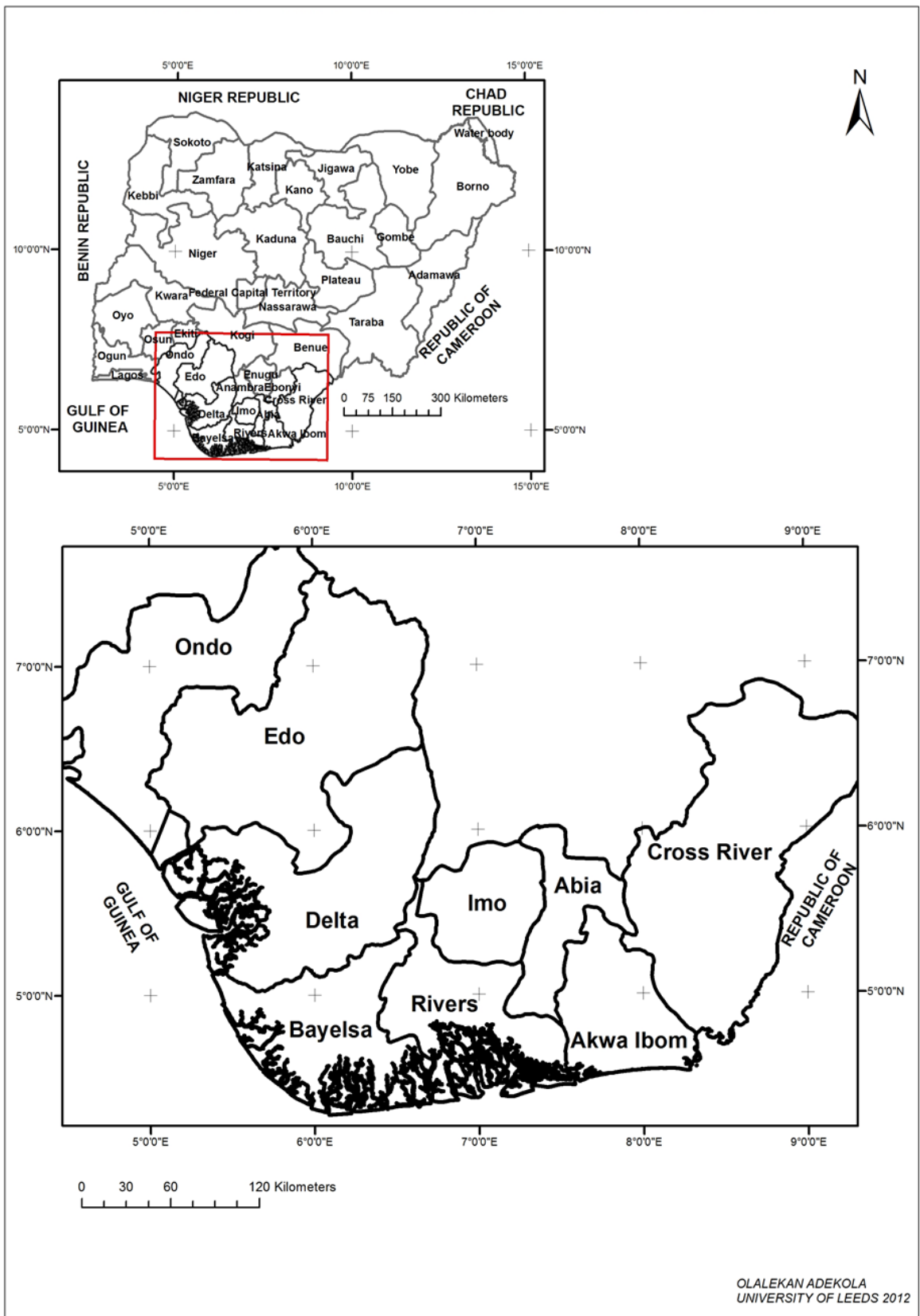


Figure 4.1. Nigeria, Showing the Niger Delta Region.

The result is that there is a prolonged rainy season in the far south, while the far north undergoes long dry periods annually. The climate of Nigeria, therefore, is normally explained in terms of its division into two seasons, the dry season and the wet (or rainy) season, the period, length and severity of which vary from the northern to southern part of the country. In the drier northern half of the country, temperatures often rise above 40°C in the dry season (between October and April) when there is very little or no rainfall with a very low relative humidity. The wet season in Northern Nigeria is between July and September. However, the wetter southern part of Nigeria experiences two rainy seasons with maximum rainfall in May/June and again in October. Two relatively drier periods between December and February and between July and September are experienced in the south. Southern locations in the coastal/delta region experience an almost all year round rainfall with mean annual rainfall ranging from 2,000 mm to 4,000 mm. Three major vegetation types can be recognized in Nigeria, the swamp forests of the coast belt, the high forests of the humid south and the savannahs of the sub-humid belt and the North.

4.2.4 *Land and People of Nigeria*

Nigeria was formed in 1914 through the amalgamation of two British colonies - the Colony and Protectorate of Southern Nigeria and the Northern Nigeria Protectorate. However, the history of the people who constitute the present day Nigeria dates back about 8,000 years (Breunig, 1996; Falola and Heaton, 2008). Although often portrayed as a country with racial and cultural uniformity, Nigeria has an incredible diversity of communities and cultures because of the many ethnic, linguistic, and religious groups that live within its borders. The country is made up of over 250 ethnic groups speaking over 500 languages and thousands of dialects (Akinyele, 2001; Oginni et al., 2010; Attah, 1987). The British conquest did not only put ethnic groups with separate and independent histories together, it split the country in such a way that one ethnic group was dominant in each region. For political and administrative exigencies, these people with diverse cultural and religious backgrounds were put into three major nuclei: the Hausa-Fulani dominated in the North, the Ibos in the East and the Yorubas in the West. Groups which had conflicts long before the arrival of the British were grouped together and one made the lord over the other.

This regional division subsequently became the basis for revenue allocation and administration which has become one of the most contentious issues in Nigeria, often taking ethnic dimensions because wide developmental contrasts exist within and between the areas. Numerous authors have argued that these various ethnic groups never considered themselves part of the same culture (Chandra, 2006; Suberu, 2001) and that this general lack of Nigerian nationalism, coupled with an ever-changing and often ethnically biased national leadership, have led to a civil war and several internal ethnic confrontations between or among members of different ethnic groups (Curry, 2001). The Nigerian Civil War, also known as the Nigerian-Biafran war, broke out as a result of the economic, ethnic, cultural and religious tensions that led the south-eastern province of Nigeria to unilaterally declare itself as the independent Republic of Biafra. Over the two-and-a-half years (6 July 1967–15 January 1970) that the conflict lasted, 1 million civilians died in fighting and from famine. Although the Niger Delta region geographically fell under the jurisdiction of the secessionists, its people fought on the side of the Nigerian Government (Boro, 1982).

Diversity of religious beliefs adds a further element to the cultural pattern of Nigeria. Nigeria comprises a number of religions, mainly Christianity, Islam and the traditional beliefs (such as Igbe religion in the Niger Delta). Before the foray of missionaries, different ethnic groups of Nigeria practised different religions, which were finally overpowered by Islam and Christianity. Islam mainly dominated the northern part of Nigeria among the Hausa-Fulanis, while Christianity is prevalent in the southern part of Nigeria, among the Yoruba and the Igbo ethnic groups. However, it is not uncommon to find people practising dual religions, a situation where either Christianity or Islam is practised alongside traditional religion.

4.2.5 *Political and Economic Structure*

Nigeria became an independent nation on 1st October 1960 and a republic (with an indigenous President) three years later (on 1st October 1963). A series of “back to back” military dictators who seized power in coups d'état was ended in 1999 when Nigeria regained democracy, ending almost 33 years of military rule. Nigeria is a federation of thirty six States and a Federal Capital Territory (Abuja) (Fig. 4.1) that are further divided into 774 Local Government Areas (LGAs). The federal, state and local

governments have powers to make laws. Whereas federal laws apply throughout the country, the state laws are limited only to the territorial jurisdiction of the state. Where there is conflict between any of these levels, the law of higher territorial jurisdiction overrides everything else. For instance, federal laws override state laws, while state laws override laws made at the local government level. Nigeria's Federal Bicameral Legislature (Senate and House of Representatives) is responsible for making federal laws. States and local government areas equally have similar law making institutions.

The varied geographical features influence the types of activities carried out by the people. The rainy and forested south has given rise to human activities as fishing, hunting and farming (especially root crops) while the dry north supports animal husbandry and farming (especially of grains). Up until 1970, agriculture was the main source of Nigeria's foreign exchange, exporting major produce such as cocoa, groundnuts, oil palm and timber. Today, with the predominance of the oil sector as the major contributor to the nation's economy, the influence of agriculture has been drastically reduced. Nigeria's economy is heavily dependent on foreign earnings generated from the sale of crude oil which was discovered in the Niger Delta in 1956. The oil industry contributes about 90% of foreign earnings and 40% of Gross Domestic Product (GDP). Nigeria is the 5th largest OPEC producer and 11th largest oil producer in the world (Amaeshi and Amao, 2009). Nevertheless, the vast majority of the people are poor and live in abject poverty. The country has a poor reputation in managing its oil resources effectively and efficiently. In a 2010 measurement of degree of corruption, Nigeria scored 2.4 on a scale of 0 (highly corrupt) to 10 (highly clean), making Nigeria one of the most corrupt nations in the world (Transparency International, 1999). Other natural resources in Nigeria include enormous quantities of tin, coal, iron ore and limestone.

4.3 Wetlands in Nigeria

4.3.1 Overview

Oyebande et al (2003) identified fourteen major wetland belts in Nigeria. These include the Hadejia-Nguru wetland and the Niger Delta Wetland. In Nigeria, wetlands are estimated to cover about 28,000 km² or about 3% of the land surface area of the country

(Garnier, 1967; Uluocha and Okeke, 2004). Hughes and Hughes (1999) divide Nigerian wetlands into five categories. The most extensive are the coastal wetlands found in the southern region bordering the Atlantic Ocean. These include the Lagos and Lekki lagoons and wetlands, the Niger Delta Wetlands, and wetlands of the Cross Rivers. These coastal wetlands support large areas of mangrove which are essential for stabilizing the shorelines, provide a unique habitat for biodiversity, and serve as carbon sinks. Further inland and scattered across the country are the riverine wetlands. These include the floodplains of the Niger/Benue, Ogun/Osun, Anambra/Imo, Soko/Rima, Komadugu Yobe, Ngadda, Yedseram, and ElBeid Rivers, which are extensively used for livestock grazing, farming, and fishing. In addition, riverine wetlands serve as important sites for cultural festivals, e.g., the Argungu fishing festival takes place on the Sokoto/Rima river system. The portions of Lake Chad located in Northeastern Nigeria are another category of wetland. The importance of The Lake Chad Wetlands stems from their proximity to the edge of the Sahara Desert where they provide water for more than 20 million people living in Nigeria, Chad, Cameroon, and Niger (Gophen, 2008). Lake Chad Wetlands are also important for fisheries (Béné et al., 2003). The third category from Hughes and Hughes (1999) was interior wetlands not associated with any major river system. Most of these wetlands, not associated with river systems although seasonal, support a wide variety of livelihood activities including material collection, fishing and farming. These include the Clay-Pan Wetlands in northwest Nigeria (Kano State). The final category of wetlands in Nigeria is artificial impoundments, including Lake Kainji, which are important for electricity generation.

4.3.2 *Status of Nigerian Wetlands*

In 2000, the Nigerian government indicated support for the statutes developed by the Ramsar Convention. This is an intergovernmental treaty with a mission to ensure “the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world” (Ramsar Convention Secretariat, 2012). It is named after the Iranian City of Ramsar where the treaty was signed. The Nguru Marma Channel Complex in the Hadejia Nguru Wetlands was designated the first Ramsar site in Nigeria. Over the next eight years, 10 other sites were designated as Ramsar sites. Nigeria’s 11 Ramsar sites (Fig. 4.2) have a total surface area of about 10,700 km²

comprising about 38% of total wetland area in the country. Other African countries, such as Uganda and South Africa, have only designated about 14% of their total wetlands area as Ramsar sites. However, it is important to note that designation on the Ramsar list does not necessarily translate to actual wise use of the wetlands. Some governments sign up to treaties only in return for bilateral or multilateral donor grants (Agrawal, 2007). However, it would probably be beneficial to designate more Nigerian wetlands, especially in the Niger Delta, to the Ramsar list. This could serve as impetus for environmentalists to push for better wetland policies and laws.

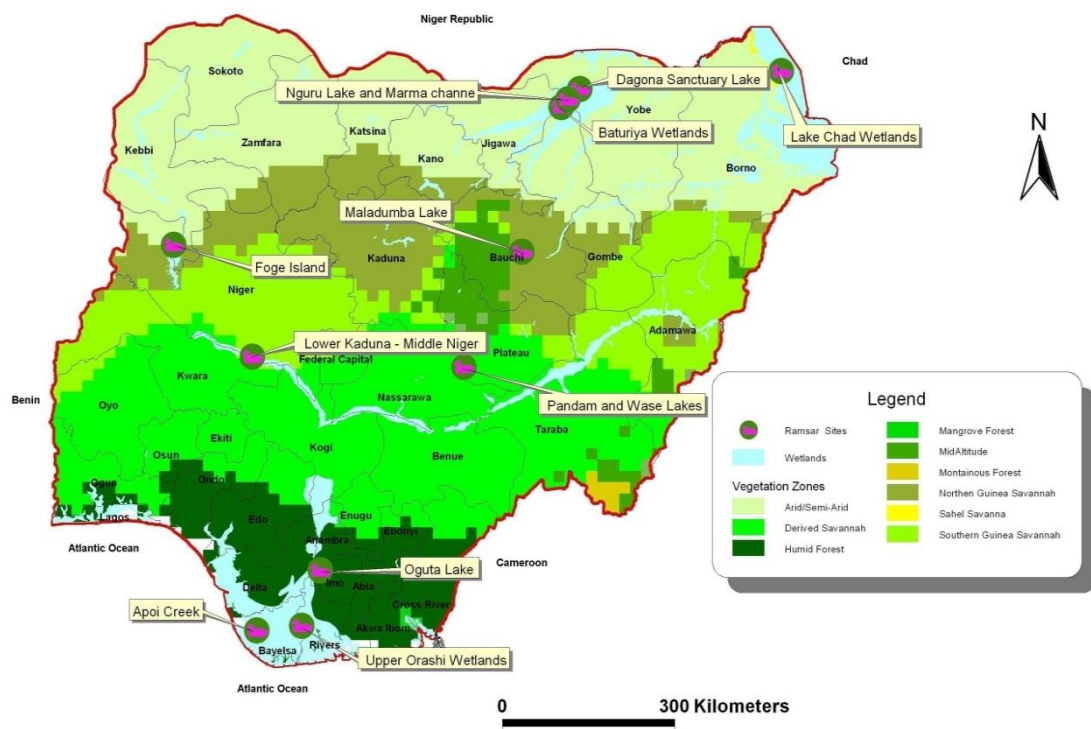


Figure 4.2. Nigeria Showing the Ramsar Sites (Source: Adedamola Ogunesan).

Of the 10,700 km² of Ramsar designated wetlands in Nigeria, only about 5% (Apoi creek and Upper Orashi) are located in the Niger Delta, which is Nigeria's largest wetland area (Ogon, 2006). The Mangroves of the Niger Delta Wetlands, which support high biological diversity and are currently threatened (Nigerian Conservation Foundation, 2006), would clearly benefit by designation to the Ramsar list. Potential Ramsar sites here include the Akassa coastal wetlands, Stubbs Creek, and the wetlands in the Asamabiri and Kalama areas where several IUCN Red List species occur (Global Environment Facility, 2011). Other potential Ramsar sites in Nigeria include Cross

River Estuary, Chingurim-Duguma Wetlands, Pepe Ruwa, Wawa Deji, Ologie, Kalmalo Lake, Uturu Afikpo, Anam flat, and Yaboro.

Although wetlands have played important roles in the development of Nigeria (Eaton and Sarch, 1997; Olomukoro and Ezemonye, 2007), they remain under recognized and undervalued (Adekola and Mitchell, 2011). Human settlements concentrate in wetland areas in Lagos, Warri, Port Harcourt, and Nguru. Wetlands are also the basis of popular Fadama projects, which are designed to increase the incomes of people using rural land and water resources on a sustainable basis (Agwu and Abah, 2010; Nwachukwu et al., 2008). These projects support agricultural production, fisheries, livestock grazing, and forestry. Some Nigerian wetlands are culturally significant, containing sacred sites and places of historical importance (Anwana et al., 2010). Nigerian wetlands also regulate and support services such as carbon sequestration, climate regulation, nutrient cycling, oxygen production, and soil formation (Acharya, 2000; Uluocha and Okeke, 2004). The Hadejia-Nguru Wetland constitutes an important feeding ground for various migratory bird species, and almost 1.5 million farmers, herders, and fishermen depend on the wetlands for their livelihoods (BirdLife International, 2008). The Niger Delta is home to several endemic or near-endemic mammals, e.g., *Kinixys homeana* i.e. hinge-backed tortoises (Luiselli et al., 2006; Obot, 2007), and a large human population here engages in fishing, farming, and collection of various food materials such as Bush Mango (*Irvingia gabonensis*), snails (*Archachatina marginata*), and periwinkles (*Tympanotonus fuscatus*) (World Bank, 1995). Orimoogunje et al. (2009) reported that wetlands in Ilesha, south-western Nigeria, are important for commercial and subsistence cropping.

Threats to Nigerian wetlands, as identified by Uluocha and Okeke (2004), are both anthropocentric and natural. The human factors threatening Nigerian wetlands include increasing population pressure, rapid urbanization, mining, oil and industrial waste pollution, uncontrolled tilling for crop production, overgrazing, logging, land reclamation, and construction of dams, roads, and other infrastructure. Other threats include climate change, marine and coastal erosion, subsidence, ocean water intrusion, invasion by non-native biota, and desertification and droughts.

Increases in waterfront residences, together with an increasing population and land shortages, have induced unprecedented wetland reclamation projects in the southern areas of Lagos and the Niger Delta (Fig. 4.3a and 4.3b). In northern Nigeria, water flows to the Hadejia-Nguru wetlands have been significantly reduced from the construction of the Tiga and Challawa dams, built upstream of the Hadejia and Yobe rivers (Barbier, 2003; Thomas and Adams, 1999). In addition, the Lake Chad Wetlands, located in the north-eastern region of Nigeria (and shared with the Chad republic and Cameroon, was one of the largest in the world but has shrunk considerably due to agriculture (Coe and Foley, 2001). The Niger Delta Wetlands, which are the third largest wetland in the world (Uluocha and Okeke, 2004; Umoh, 2008) and the largest river delta and mangrove ecosystem in Africa (Awosika, 1995), have been degraded due to oil and gas exploration, dredging, invasive plant (*Nypa palm*) infestation, logging and reclamation for residential, industrial, and other developments (Adekola and Mitchell, 2011).



A. Wetland area reclaimed for residential purposes



B. A sign post indicating a government sponsored wetland reclamation and dredging project



C. A government approved dumpsite in the wetland



D. A part of wetland converted to a dump site by traders and nearby residents

Figure 4.3. An Example of Threats to Wetlands in Nigeria.

Past government policies have also encouraged wetland drainage for agriculture and infrastructural development, directly impacting wetlands. Agricultural policies such as ‘Operation Feed the Nation’, or ‘Back to Land’, have led to massive reclamation of wetlands for agriculture without recognizing how agricultural production goals may impact wetlands and the communities that rely on them. The government also supports reclamation of wetlands for residential, industrial, and urban development – the Lagos State government actively supported reclamation of wetlands for high-income residential areas of Lekki and Aja. When a former president of Nigeria was asked how to create space in the Niger Delta, he said “drain the swampy areas” (Oyatomi and Umoru, 2009). Thus, one can understand why massive areas of wetland were reclaimed for residential purposes during his administration. At a community level, many people still view wetlands as wastelands, and convert them to dumpsites (Fig. 4.3c and 4.3d). It is, therefore, important that appropriate policies and laws are instituted to address these threats, and preserve the ecological health of wetlands so that their ability to perform ecosystem functions that provide essential goods and services important to humans is maintained (De Groot et al., 2002).

4.4 The Niger Delta Region

Some authors have argued that the Niger Delta is wrongly termed, as the river draining into the Atlantic Ocean off the coast of Nigeria is not on the River Niger alone (Preboye, 2005). They maintain that there are many rivers from different sources that empty their waters into the basin of the Delta. However, for general usage and wide acceptance, the term “Niger Delta” is used in this thesis.

4.4.1 The Niger Delta Environment

The Niger Delta is located in southern Nigeria, in the lower reaches of the Niger/Benue River (Fig. 4.1), and extends between latitudes $4^{\circ}2^1$ and $6^{\circ}2^1$ north of the equator and is $5^{\circ}2^1$ east of the Greenwich meridian (Davies et al., 2009). Geologically, the Niger Delta is regarded as a modern delta (under 100 million years old in the Mesozoic era, Cretaceous period) (Galloway, 1975; Okonny, 2002). According to Short and Staeuble (1967) there are three depositional cycles in the Niger Delta. The first began with a marine incursion in the middle Cretaceous and was terminated by a mild folding phase

in Santonian time. The second included the growth of a proto-Niger Delta during the late Cretaceous and ended in a major Paleocene marine transgression. The third cycle, from Eocene to Recent, marked the continuous growth of the main Niger Delta. The main geologic formations extending across the whole of the Niger Delta are the sandy Benin formation (including the Afam clay), an intervening unit of alternating sandstone and shale named the Agbada formation, and a lower shaly Akata formation (Short and Staeuble, 1967). The accumulation of sedimentary deposits transported by the rivers Niger and Benue (World Bank, 1995), which discharge water, sediment and other loads across southern Nigeria and beyond into the Gulf of Guinea, resulted in the formation of this complex and fragile delta with a rich biodiversity (Abam, 2001). The Niger Delta is regarded as the third largest wetland in the world (Uluocha and Okeke, 2004; Umoh, 2008), and the largest river delta and mangrove ecosystem with the greatest extension of freshwater swamps in Africa (Ajonina et al., 2008; Dupont et al., 2000; Ogon, 2006).

There are over twenty-eight soil types from various soil zones of the Niger Delta (Osuji and Nwoye, 2007; Okonny, 2002). The soils vary from sandy in the coastal beach zones through alluvial deposits in the freshwater zones to clay further inland (Okonny et al., 1999). Because of their fertility, these soils are utilized extensively for agriculture. In the Niger Delta, the wet season is between March and November, and the dry season from December to February. The mean annual rainfall ranges from 2,000 mm to 4,500 mm and spreads over 8 to 10 months (Oyegun, 1999). The average monthly temperature is 27°C (World Bank, 1995). The topographic configuration of the Niger Delta is generally flat with a gentle westward inclined geomorphic structure broken in many places into hogback ridges and shallow basins (Oyegun, 1999).

The Niger Delta forms an integrated mosaic of aquatic, semi-terrestrial (mangrove and freshwater swamps) and terrestrial habitats (Bisina, 2006), which is highly diverse and supportive of numerous species of terrestrial and aquatic flora and fauna (Uyigüe and Agbo, 2007). The three major vegetation formations in the Niger Delta are brackish water swamps (comprising mangrove forest and coastal vegetation), fresh water swamp forests and riparian forests (Nyananyo, 1999; Nyananyo, 2002). The brackish water swamps are dominated by white and red mangroves. Further inland from the coast into the fresh water swamp forests floating plants such as *vossia cuspidata* (hippo grass), *nymphaea lotus*, grasses and sedges begin to dominate. In the riparian forests no species

can be said to be dominant, but, the region is home to some rare and endangered animal and plant species. Nyananyo (2006) identified 225 plant species in the Niger Delta, many of which are important as cultural, food, timber, medicine and industrial materials. Apart from its rich flora, the delta is rich in fauna that enhance the biodiversity status. The Delta has the richest biodiversity in Nigeria (Ebeku, 2004), and is an area of international importance for its ecological riches which include several IUCN 'Red List' species including some endemic or near endemic mammals (such as *Kinixys homeana*, Home's hinge-back tortoise) (Luiselli et al., 2006; Obot, 2007). Blench and Dendo (2007) identified about 60 large mammals in the delta. Some of these, such as the African elephant (*Loxodonta africana*), chimpanzee (*Pan troglodytes*), Sclater's guenon, white-throated guenon, and crested genet (*Genetta cristata*) are classified as endangered (Hilton-Taylor, 2000). The Delta is home to the Niger Delta Red Colobus (*Procolobus pennantii ssp. epieni*) listed as critically endangered (Oates and Struhsaker, 2008). Many of these animals have decline due to habitat degradation and hunting them for bush meat.

Over 50% of the Delta area is water, with thousands of creeks (Erhabor et al., 2007), and over twenty rivers. Collectively, the Delta accounts for 55% of all fresh water swamps in Nigeria (Umoh, 2008). The numerous water bodies of the Niger Delta are one of the richest in aquatic diversity in West Africa (Idodo-Umeh, 2003; Abowei et al., 2006). However, the complex systems of rivers and creeks have shallow entrances, rendering them limited for big vessels (hence wide scale dredging and channelization in the delta).

4.4.2 *People, History and Culture of Niger Delta*

4.4.2.1 Definition

When defined based on human geography and hydrology, the Delta Region consists of present-day Bayelsa, Delta and Rivers States and covers an area about 20,000 km² (Uyigue and Agbo, 2007; World Bank, 1995). When defined for administrative convenience, political expedience and development objectives, the Delta Region includes all the oil producing States and extends the land area to 110,000 km²

(Ighodaro, 2005). Defined in this way, the Niger Delta consists of nine states (Fig. 4.1), with over 37 million inhabitants, or 22% of Nigeria's population (Table 4.1).

The nine Niger Delta states contain 185 Local Government Areas. Within these are over 1,500 communities that act as host to the oil industry (Forest and Sousa, 2006). The region is ethnically very varied, typifying the diversity and plurality that gives Nigeria its socio-political strength. Ethnic groups include Bini, Efik, Ibibio, Ijo, Isoko/Ukwani, Itsekiri and Urhobo. In Bayelsa state alone there are five linguistic groups speaking over forty different dialects (Alogoa, 1999). The Niger Delta is generally rural, but includes some important Nigerian towns such as Port Harcourt, Warri and Asaba. The population is predominantly animist, attaching cultural values to the fauna and flora species in the area (Anwana et al., 2010; Adekola, 2011).

Table 4.1. Niger Delta States – Population, Area and Revenue.

State	Population ¹	Area ² (km ²)	Population Density (Person/km ²)	Revenue 1999-2010 ³ (\$)
Abia	3,367,507	5,420	621	239,676,067,250
Akwa-Ibom	4,618,077	6,187	746	917,527,162,761
Bayelsa	2,017,294	10,773	187	746,742,034,056
Cross-Rivers	3,423,851	21,050	163	254,040,592,464
Delta	4,867,079	18,050	270	875,924,558,883
Edo	3,826,689	17,450	219	245,221,636,192
Imo	4,648,271	5,430	856	275,811,650,027
Ondo	4,095,948	14,606	280	381,986,908,749
Rivers	6,152,680	11,077	555	1,162,964,830,783
Total Niger Delta (3 states)	13,037,053	39,900	327	2,785,631,423,721
Total Niger Delta (9 states)	37,017,396	110,043	336	5,099,895,441,165
Nigeria	166,201,023	923,768	180	11,510,806,680,296

1- Projected at a growth rate of 3.4% based on 2006 census data by National Population Commission (2006)

2-Source: MACOS Urban Management Consultants (2010)

3- Computed based on data published by Federal Ministry of Finance (2011)

The current challenges confronting the Niger Delta have historical roots (Preboye, 2005) and can only be meaningfully understood within this context. It has been suggested that historical accounts can also provide a frame for the analysis of institutional structure (Thelen, 1999; Boettke et al., 2010). Four periods can be identified in the history of the people of the Niger Delta. First, the early pre-colonial period before 1472. Second from 1472-1842, when trade with European merchants flourished. The third period, from 1843-1959, was the period when the slave trade was

abolished and there was the foray of missionaries and the formalization of British domination of the Niger Delta. The last period is from 1960 to the present, during which Nigeria has been independent.

4.4.2.2 Pre-Colonial Period

The exact origin of the people of the Niger Delta is highly contested. According to Dike (1956), the Niger Delta was practically uninhabited prior to the Portuguese arrival in the fifteenth century. However, palynological and archeological evidence suggests concrete dates for early settlement in the Niger Delta. Evidence from farming obtained from cores taken out of sites near Nembe (present day Bayelsa State) showed that the Niger Delta was probably occupied by 2,800 BC (Sowunmi, 1999). Archaeological excavations also show dates as early as 800 AD (Alogoa, 1999) which supersede the very recent dates suggested by Dike (1956). It is believed that as the first settlers migrated from the freshwater environment to the coastal salt water swamp they took to fishing because of the unsuitable environmental conditions for agriculture. The need to supplement feeding with food crops resulted in trade with the hinterland (mainly with the surrounding tribes of Ibos, Yoruba's and Igala's) where they exchanged their fish and salt for agricultural produce (Princewill, 2000; Fentiman, 1996; Alagoa, 1970). This led to the building of basic internal structures for trade. These included institutions guiding trade routes, markets, networks of relations with producing communities and even oath taking as a form of trade treaties.

4.4.2.3 Trade with Europe

The European capitalist revolution of the mid-fifteenth century brought Portuguese traders to Bonny and Brass (coastal communities in the Niger Delta). The Portuguese were followed by the Dutch, the French and later the English. Delta middlemen distributed manufactured goods from European traders in the hinterland and exported slaves and palm oil for them to take to Europe. The Atlantic trade transformed the Delta into a distribution centre, since the Delta was not suitable for agriculture and with its sparse population it could not satisfy European slave demands. Trade contacts enhanced the position of community leaders who, being the direct contact with the Europeans, were paid fees for rights to trade. These trading elites, who were also rulers of society,

were able to readily translate material gains into greater political power. The increased volume of material trade occasioned the transformation of fishing villages to trading villages.

While this institutionalized form of trade flourished, the Delta was generally peaceful. However, skirmishes began with the abolition of the slave trade and British policy to “bypass the coastal middlemen and to penetrate to the hinterlands tribes directly” (Gallagher, 1950). According to Lord John Russell, the Lord’s Commissioner of Her Majesty's Treasury:

“... to this end the Queen has directed Her Ministers to negotiate Conventions or Agreements with those Chiefs and Powers, the basis of which conventions would be, first, the abandonment and absolute prohibition of the Slave Trade; and, secondly, the admission for consumption in this country” (Russell, 1839).

This effort to bypass the Delta middlemen was resisted by the people and chiefs. However, resistance was crushed through might, dethronement or banishment. On the other hand gifts, such as providing children of community leaders the privilege of attending mission boarding schools, were offered to persuade others and as rewards for good behaviour. Courting the British also became a source of authority and such leaders needing colonial backing became compliant to the colonial administration. The ensuing rivalry and disagreements between Delta chiefs eventually polarized leaders making it easy for the British to dominate the area.

The abandonment of the Delta also led to an economic downturn for the communities that had jettisoned trade in fish to serve as middlemen in the slave trade. In a bid to improve the dwindling wealth, leaders pleaded for the Europeans’ presence. However, the call for economic development was misunderstood, and missionaries were sent to the Delta. Many radical institutions were introduced by the missionaries who introduced laws that declared long-standing traditions null and void.

By 1884, the trade had become so important in the international political economy that the British began to take active steps to seize control of the area. In 1885, they declared

a protectorate of the Niger Delta following their successful treaty making with the chiefs of the area. This brought with it intensification of resource exploitation. Control of land and other natural resources was vested in the colonial authority. Both the act and the content of the new rules were departures from existing institutions whereby land and resources were controlled by communities through the lineage.

Oil exploration in Nigeria began in 1937, when Shell D'Arcy (later SPDC) was commissioned to carry out a mineralogical survey of Nigeria. The initial effort was in the eastern part of the country. This search was truncated by the Second World War and restarted in the 1950s, this time in the Niger Delta as previous searches in the Eastern region had not yielded any substantial commercial quantity. The first oil well was then dug in Otabagi near Oloibiri in the Ogbia area of Bayelsa State. Exploration has increased since then (Appendix 4.1).

4.4.2.4 Independence

At Independence, the people of the Niger Delta were part of the Eastern Region dominated by the Igbo ethnic group who were the majority in the government of the Eastern Region. In 1967, Rivers State (present day Rivers and Bayelsa State) was created as the first administrative unit in the Niger Delta. In 1991, Delta State was carved out of the former Bendel State and in 1996 Bayelsa State was created out of Rivers State.

The Niger Delta is the source of Nigeria's crude oil, which represents about 80% of national government revenues. Nigeria's crude from the Niger Delta is "sweet crude" that is less corrosive and has lower sulphur content than the "sour crudes" that predominate Latin American and Middle Eastern crude. The general rule of thumb is that, the "lighter" and "sweeter" the oil, the more valuable it is. However, despite the region's vast oil resources, regarded as the best quality crude oils in the world, the region remains poor, with high levels of unemployment (Agbogidi and Ofuoku, 2006; Idemudia, 2009). Unemployment and underemployment – at 8.8% and 26.2%, respectively – are higher in the Niger Delta than in other regions of Nigeria (Ukiwo, 2009). Only 27% of the Delta's population have potable water, 30% have electricity and one in three people is illiterate (Forest and Sousa, 2006; Human Rights Watch, 2005).

This has been described as “a profound paradox of oil wealth and poverty” (Ali-Akpajiak and Pyke, 2003). Revenue allocation to the Niger Delta states have risen to almost four times the annual values at the return to democracy in 1999 with over 44% of revenue allocated to the region (Table 4.1; Appendix 4.2). The key question to ask is “What have the successive governments in the Niger Delta done with these robust allocations?” Some analysts have pointed to the corrupt tendencies of governors of Niger Delta states as being responsible for the poor state of affairs in the region, considering that under Nigeria's federal system, state governors enjoy wide powers. Those running Niger Delta oil rich states preside over monies larger than those of some African countries. These monies have either gone into the pockets of the ruling class and their cronies, or have been scandalously misappropriated. There have been numerous cases of corruption and mismanagement in the region. Recently, a Delta state governor was jailed for 13 years for embezzling state funds totalling nearly £50 million (Ibiam, 2012). This has led to the suggestion that the problem with the Niger Delta is not of revenue allocation, but management. The availability of revenue is one thing, but effective utilization of the resources is more important. Despite this, the people of the Delta have always felt surcharged by the various revenue allocation formulas in Nigeria.

4.4.2.5 Conflicts in the Niger Delta

The consequence has been conflicts between local communities and private and public developers over resource ownership and use, particularly those related to oil activities. This began with Issac Jasper Adaka Boro, who dropped out of University in 1966 to form the Niger Delta Volunteer Force (NDVF). His agitation was for the people to take control of the exploitation of oil and gas resources in the Niger Delta areas which, he argued, benefited mainly the federal government of Nigeria and a remote Eastern Nigeria regional government. He was killed under mysterious circumstances in 1968. Not much happened until Ken Saro Wiwa's non-violent agitation focused on unremediated environmental damage from decades of indiscriminate petroleum waste dumping in the Niger Delta. However, under controversial circumstances, Ken Saro Wiwa was arbitrary executed in 1995, along with eight other activists of Movement for the Survival of the Ogoni People (MOSOP). MOSOP is an organization of the Ogoni ethnic minority people of Niger Delta, initiated by Ken Saro Wiwa in 1990 with a

mandate to campaign non-violently to seek protection and development of Ogoni land (Movement for the Survival of the Ogoni People, 2010).

The first major conflict occurred in October 1990 at Umuecechem, an oil-producing community ten miles east of Ogoni land. The same month MOSOP was established by Ken-Wiwa to lead his kinsmen to confront the oil companies and the Nigerian state. Since 1995, agitations have increased in scale and taken a violent turn. Violence then followed the 1998 Kaima Declaration by Niger Delta youths and the Odi crisis. The Kaima Declaration is the communiqué issued at the end of the all Ijaw Youths Conference comprising youths drawn from over five hundred communities from over 40 clans that make up the Ijaw nation and representing 25 representative organizations. Following the declaration government sent policemen to several communities in the Niger Delta to forestall disruption of oil extraction activities and break down of law and order. It was then alleged that Odi youths, protesting the presence of the policemen in the village, had killed seven of them. Subsequently, a military operation destroyed the community. A list of some of the recent crises in the Niger Delta is presented in Appendix 4.3.

Like Boro and Saro Wiwa, many of the notable leaders of Niger Delta agitation are accomplished and educated. For example, Henry Okah, leader of the Movement for Emancipation of Niger Delta (MEND), is the son of a naval officer, grew up in rarified Lagos society, and was educated in the best private school in Nigeria. However, he was upset by the contrast of living conditions in the Niger Delta with those his family enjoyed in Lagos and subsequently took up arms against the government and the Multinational Oil Companies (MNOCs) (Walker, 2008). MEND is one of the largest militant youth groups in the Niger Delta. Alhaji Asari Dokubo, the leader of the Niger Delta People's Volunteer Force (NDVF), also had a middle-class upbringing and latter abandoned his law studies to form the group (De Montclos, 2008) .

The oil companies are seen by the local residents to have failed to give back anything for what they have taken out, and to be complicit in human rights abuses carried out by government security forces that are deployed to protect their facilities. According to Human Rights Watch (1999a), any time there was a protest, the oil companies ran to the government for military assistance and it unleashed terror (indiscriminate killings and

beatings, arbitrary detentions and extortions, rapes and destruction of properties) on the local populace. Violence in the region was exacerbated with the return to democratic rule in May 1999. Various politicians capitalized on the weak structures of numerous ethnic militias, which were paid and armed for protection with guns which were later turned around for criminal acts. Some of the politicians were the same people who were complicit in criminal activities in the Delta and often supported some of the abductions (Human Rights Watch, 2002).

The conflicts are estimated to cost Nigeria US\$ 1 billion a year in revenue, since the Niger Delta insurgency has been able to disrupt 60% of oil drilling (and output) by blasting pipelines and other oil installations (Forest and Sousa, 2006). Social issues presently confronting this region include cases of hostage taking, kidnappings and pipeline vandalization (Peterside, 2007; Watts, 2008). These are viewed as a response of the local people to the perceived injustice in the distribution of costs and benefits of oil exploration. They believe that other regions of the country enjoy the economic benefits of the oil development, while local communities directly bear the environmental consequences, such as loss of biodiversity (James et al., 2007; Phil-Eze and Okoro, 2009; Uluocha and Okeke, 2004) and pollution of the water supply (Ekundayo and Fodeke, 2000; Okoh et al., 1996). Crude oil theft is another issue confronting the Niger Delta. According to the Nigerian Economic Summit Group, there is daily theft of about 100,000 barrels of oil valued at about US\$2.8 million (Ikelegbe, 2006).

4.4.3 Human Impacts on the Niger Delta Wetlands

The Niger Delta environment, including the wetlands, is being impacted by various threats (Fig. 4.3; Appendix 4.4). Four of these - oil and gas exploration, dredging, invasive plant infestation and wetland reclamation - are identified as the main threats eroding the Niger Delta ecosystem (Adekola and Mitchell, 2011).

4.4.3.1 Oil and Gas Exploration and Development

The scale of the operation in the Niger Delta is large, with over 1,500 oil wells drilled in 159 oil fields and more than 7,000 km of pipelines over the Niger Delta region (Ene-Ita, 2009). Shell Petroleum Development Company alone operates over 31,000 km²

(Amnesty International Publication, 2009). The Niger Delta's fragile environment has been highly stressed through these activities. The consequence of the exploitation of oil and gas exploration in the Niger Delta has been widely blamed as a main threat to the integrity of the wetland (Obot, 2007; Uluocha and Okeke, 2004; Zabbey, 2004). The process involved in oil and gas exploration in the Delta involves sophisticated technology to detect and determine the extent of deposits. This involves clearing seismic lines of any patch of wetland and dynamiting for geological excavation. The detonation of dynamite in an aquatic environment stuns fish and other faunal organisms. Destabilization of sedimentary materials associated with dynamite shooting causes water turbidity, blockage of filter feeding apparatus in benthic fauna and reduction of photosynthetic activity due to reduced light penetration (Zabbey, 2004).

Oil spill incidents have occurred in various areas and at different times in the Niger Delta region. Available records indicate that approximately 6%, 25%, and 69%, respectively, of total oil spilled in the Niger Delta area, were in land, swamp and offshore environments (Nwilo and Badejo, 2006). Some major spills are the GOCON's Escravos spill in 1978 of about 300,000 barrels, SPDC's Forcados Terminal tank failure in 1978 of about 580,000; barrels and the Texaco Funiwa-5 blow out in 1980 of about 400,000 barrels (Nwilo and Badejo, 2006). According to Obot (2007), recent estimates are that between 9 million and 13 million barrels (1.5 million tons) of oil has spilled in the Niger Delta ecosystem over the past 50 years. Two states in the Delta, Rivers and Delta, suffer about 300 major oil spills per year (O'Hara, 2001). Between 1976 and 1997, there were 5,334 reported cases of crude oil spillages releasing about 2.8 million barrels of oil into the land, swamp, estuaries and coastal waters of Nigeria (Dublin-Green et al., 1998). The sources of these spills include pipeline leakage and rupturing, accidental discharges, discharges from refineries and sabotage (illegal bunkering). According to Nwilo and Badejo (2006) 50% of oil spills is due to corrosion, 28% to sabotage and 21% to oil production operations. One percent (1%) of oil spills is due to engineering drills, inability to effectively control oil wells, failure of machines, and inadequate care in loading and unloading oil vessels. When it comes into contact with water, oil forms a layer which prevents oxygen dissolving in water and so interferes with the healthy functioning of the ecosystem. Crude oil also contains toxic components, which can cause outright mortality of plants and animals as well as other sub-lethal impacts (Zabbey, 2004).

Like oil spillage, gas flaring associated with oil production has continued unabated in the Niger Delta. Gas flares contain over 250 toxins such as benzene (Zabbey, 2004) which are responsible for loss of vegetation and total burning of the Delta's mangrove vegetation that includes a population of endangered and endemic species (Obot, 2007). Flaring natural gas from oil fields as a by-product of crude oil production is also a common sight that dominates the skyline in the Niger Delta. Local people have complained of respiratory problems such as asthma and bronchitis – health conditions caused by physical or chemical agents associated with crude oil production. The flares also contribute to acid rain and are said to have contributed more greenhouse gases than all of Sub-Saharan Africa combined (Friends of the Earth International, 2004). However, community efforts to halt or reduce gas flaring in the delta have proved unsuccessful (Bienen, 2005).

4.4.3.2 Wetland Reclamation

Population increase, industrialization and urbanization have resulted in an increased demand for space for housing and other infrastructure. Consequently, the government has been forced to reclaim marginal lands in the swamps of the Niger Delta (Abam and Okogbue, 1993). Wetland reclamation remains one of the top developmental priorities for states in this region (Wolf et al., 2002). Central government support for reclamation is also strong (see Fig. 4.3b). Multinational companies, particularly those in the oil and gas industry, also reclaim wetlands for their use (Etuonovbe, 2007). Reclamation activities change the area from its natural state, radically affecting the provision of ecosystem services and impacting upon the flora and fauna in the delta. Extensive pressure is also exerted on the wetland from road building and forest clearing for agriculture. For example, there is a plan to develop about 30,000 hectares of wetland for mechanized farming for large-scale commercial rice, cassava and other associated crop production and processing (UK Trade and Investment, 2011). Information on the exact extent of wetland reclaimed is scarce.

4.4.3.3 Dredging

Dredging involves the relocation of underwater sediments and soils. In the Delta it is carried out for various social and economic development reasons such as construction

and maintenance of waterways, transportation infrastructures and for reclamation and soil improvements. Some of these activities are very large scale. The impending dredging of the river Niger from Baro in Niger State to Warri in Delta State would see over 570 km of channel dredged (Ogah and Odita, 2009). During dredging, sediment, soil, creek banks and vegetation along the way are removed and deposited as dredge spoils. Government and oil companies are mainly responsible for dredging (Ohimain et al., 2004), some local businesses are also involved (Etuonovbe, 2007). Although dredging is variously regarded as a major problem confronting the Delta (James et al., 2007; Ohimain et al., 2004) little information is available on the exact extent of the problem. Ohimain et al. (2007) indicated that a major oil-producing company generated approximately 20 million m³ of spoil between 1990 and 1996. Dredging significantly degrades water quality and can harm fisheries. Rim-Rukeh et al. (2007) and Ohimain et al. (2008) showed that dredging is responsible for physiochemical changes in the water of the delta, particularly in the pH, the total dissolved and suspended solids, conductivity, turbidity, sulphate content, dissolved oxygen, oxygen demand (as biological oxygen demand) and chemical oxygen demand. These activities can cause the removal of sub-tidal benthic species and communities (such as reduction in the population density and taxa of zooplankton), the release of organic matter, nutrients and/or contaminants on aquatic organisms, and disrupt the ambient chemical/physical conditions (such as reduction in light penetration and primary production) (Nayar et al., 2007).

4.4.3.4 Invasive Species

Nypa palm, introduced from Singapore into the Niger Delta as part of a trial plantation in 1906 has become an invasive species (Enemugwem, 2009; King and Udo, 1997). The plant outcompetes and displaces a number of indigenous species (Laë et al., 2004) reducing their growth and survival rate and causing decline and extinction of indigenous plant populations in large areas of the mangrove ecosystem. *Nypa palm* has led to a decrease in genetic diversity through the loss of genetically distinct populations and hybridization with native species. It has assumed a dominant status in the creeks, especially in such areas as the basin of Idua, Assang (Oron Bar), Jaja Creek, Ikineto Creek, Parrot Island, Alligator Island, Strong Face Creek, Uya Oro Creek, Ikot Abasi, Andoni and Bonny Rivers (Federal Environmental Protection Agency, 1999). It has also

impacted adversely on the socio-economic activities of coastal communities, as it hinders fishing, navigation and fuel wood supply (Isebor et al., 2001). The habitat for migrant marine turtles in Alaska Beach, one of the known turtle nesting areas, is infested with the weed which sheds leaves and fruits in such abundance that it constitutes an obstacle to the turtle population in the surrounding water (United Nations Environment Programme, 2007). Local use of, and economic benefits from the plant are minimal (Udofia and Udo, 2005). Hyacinth (*Eichhornia sp.*) is another invasive species, though its pressure is minimal compared with *Nypa* palm, especially towards the coast because it is intolerant to salt water (Akinyemiju, 1987).

4.4.3.5 Discussion

These four main impacts vary in importance across the Niger Delta. Oil development is most prevalent in oil-producing communities such as Bonny, Ogoni and others along the creeks, whilst reclamation activities are most common in urban centres such as Yenegoa and Port Harcourt. Other impacts on the Niger Delta include the indiscriminate use of fertilizer resulting in eutrophication (Obire et al., 2008); the rapid growth of aquaculture (fish, snail, crabs) which converts mangrove area to shrimp ponds as an economic activity, with consequent wetland impacts (Davies et al., 2009; Zabbey et al., 2010); climate change (Uyigue and Agbo, 2007); industrial and domestic effluents (Ajao and Anurigwo, 2002); unsustainable hunting and overfishing (Luiselli, 2003; Phil-Eze and Okoro, 2009); and damming activities (Abam, 1999) (Appendix 4.4). According to Abam (1999) there are 49 dams in the Niger Delta catchment area with a combined reservoir capacity of 36 million cubic metres.

4.5 Wetland Institutions in Nigeria

Many countries have special programmes and institutions focusing on wetlands, but none exist for Nigeria. The lack of focus on wetlands is evident in the lack of specific legislation targeted at wetlands. However, Nigerian laws and other institutions that relate to wetlands can be discussed under three periods: pre-colonial (before 1830), colonial pre-Independence (1830 to 1960) and the period from independence in 1960 to the present day.

4.5.1 *Pre-Colonial Period (Before 1830)*

Many local communities in Nigeria managed their wetlands long before the advent of colonial rule (Alagoa, 1971; Berkes et al., 2000; Etkin, 2002; Sarch, 2001). Management regimes were mostly driven by traditional and religious motives and conducted through the designation of traditional reserves and harvesting periods. For instance, traditional institutions in Oporoma in Bayelsa State (in the Niger Delta) have long regulated human activities on Boupere Lake. The lake is normally closed to fishing, logging, farming, or any other human activity until the time the leaders (the King and Inkiye - the traditional spiritual leader) give permission. Breaking these informal laws is considered taboo. Similar institutions still exist throughout Nigeria, and local communities respect them. During a recent informal discussion in the Niger Delta, many locals suggested that when faced with either traditional institutions or formal laws, they would honour the traditional informal institutions since potential repercussions were viewed as being of greater severity. This can benefit wetland management, although some aspects of traditional practices may be detrimental to wetland integrity. Yet, most communities still perceive wetlands as wastelands and tend to treat them as such (Fig. 4.3d).

4.5.2 *Colonial Period (1830 to 1960)*

The first formal law governing wetland management in Nigeria can be traced back to the creation in 1897 of a Department of Woods and Forests for the Colony and Protectorate of Lagos. Wetlands and forests are often interlinked and interact to produce healthy and productive ecosystems, although functional differences exist. As such, forestry laws will not always address challenges faced by wetlands.

In 1901, the first Forest Ordinance to regulate the sale of timber concessions and minimize exploitable girth limits was enacted (Okali and Eyog-Matig, 2004). This law was targeted at controlling the exploitation of some timber products such as African mahoganies (*Khaya anthotheca*) which are abundant in the wetland areas of Benin, Degema and Lagos. Forestry fees and export taxes were also imposed on exported logs and concessionaires were required to replant 20 tree seedlings at each stump site.

It was not until 1916 (after the 1914 amalgamation of the northern and southern protectorates to form the Nigerian state) that the foundation for nature conservation laws in Nigeria was established with the Forestry Ordinance of 1916. The principal activities of the Forestry Department at that time were the selection and demarcation of suitable sites as forest reserves, and the preparation of working plans (Okali and Eyog-Matig, 2004). Under the Ordinance, forest reserves could be established by the central government and subsequently handed over to local authorities for management. In the same year, the Wild Animals Preservation Act of 1916 also came into force to ensure the preservation of indigenous wildlife (Anadu, 1987). Other relevant legislation during this period were the Forestry (Southern Provinces Native Authorities) Rules of 1943, the Forestry (Northern Provinces Native Authorities) Rules of 1951, the Forestry (Northern Region Native Authorities) Rules of 1955, the Eastern Region Forest Law of 1955, the Forestry Regulations Eastern Region of 1956, the Forestry Ordinance with Amendments, and the Northern Region of 1960 (Ebeku, 2004).

Although these colonial acts did not specifically target wetlands, they covered various aspects of wetland ecosystem services, including trees and wild animals. Their effectiveness was diminished because the policies were not really intended for the sustainable management of natural resources, but to secure a constant supply of timber for colonial infrastructure and export (Hogendon, 1975). For instance, exploitation of timber intensified in Nigeria during and after the Second World War to meet wood shortages in Europe (Bee, 1990; Okali and Eyog-Matig, 2004).

4.5.3 From Independence in 1960 to the Present Day

4.5.3.1 1960 to 1979

When Nigeria gained Independence in 1960, most of the nature conservation laws followed prior colonial practices in focusing on forestry and wildlife conservation. As a result, legislation relied largely, as far as its substantive content was concerned, on the structure and provisions of the Forestry Ordinance. Some of the legislation during the early period of Independence included the Northern Nigeria Wild Animals Law of 1963, the Eastern Nigerian Wild Animals Law of 1965, and the Western State Forestry (amendment) Edict of 1969 (Ebeku, 2004).

During this period, there were a number of oil industry regulations with sections addressing issues of the pollution of land, water and air. These regulations, if properly implemented, could serve the purpose of protecting wetlands, especially those of the Niger Delta. Some of the legislation promulgated in colonial times was amended in the early years after independence.

While these laws look good on paper, the government does not enforce them because they would affect the oil industry and the elites. The rising influence of crude oil during this period also brought in a wave of legislation aimed at continued exploitation of natural resources, some of which ran counter to sustainable development. An example is the Land Use Act of 1978, which nationalized all land and vested its management in the state governments. The law provides that occupancy can be revoked if the land is required for mining or oil sector activities (Constitutional Rights Projects, 1999). This law makes it easy to continue exploitation of wetlands to the benefit of the ruling elites and multinational companies, and wetland areas under control of local communities have been acquired and reclaimed for various purposes.

4.5.3.2 From 1981 to the Present

In 1981, a bill came before the then Federal House of Representatives for the establishment of the Federal Environmental Protection Agency but the bill was not enacted. The discovery of five ship loads of toxic waste of Italian origin in 1988 at the small port town of Koko in the Niger Delta became the catalyst that spurred the government into action and the populace to greater environmental awareness. The government's response was swift and decisive with the immediate promulgation of the Harmful (Toxic) Wastes Criminal Provisions in Decree 42 of 1988. Furthermore, the Federal Environmental Protection Agency (FEPA) was created by Decree 58 in 1988. There has since been a series of laws and legislation aimed at conserving and protecting the environment in Nigeria (Table 4.2).

Table 4.2. Post Independence Laws That Affect Wetland Management in Nigeria.

Name of act	Year	Summary of law	Possible implication for Wetland management
The Navigable Waterways Declaration Act	1985	Prohibits the taking of such natural resources as sand, gravel or stone from rivers, creeks, lakes, lagoons and intra-coastal waterways. It also bans the erection of permanent structures within the right of way or the diversion of water from wetlands.	Control resource extraction from wetland and wetland diversion
River Basin Development Authority	1986	Established River Basins Development Authorities which will ensure that surface and underground water resources are used for agriculture, irrigation, forestry and fisheries with utmost environmental care. The agencies are to develop and keep comprehensive and an up-to-date data of all water resources.	Protects wetlands from adverse human activities. In addition, it encourages the collection of important data needed for the wise use of wetlands. It is the lack of such readily available data and information that has been blamed for wetland degradation (Bamford et al 2002)
Petroleum Regulation Act	1988	It requires operators (license holders) to implement acceptable precautionary measures, while relevant authorities must provide equipment for preventing the pollution of inland, territorial waters or high seas from oil or related fluids.	Protects both inland and coastal wetlands against pollution from oil pollution and makes it mandatory for operators to take precautionary measures; opens up opportunity to legally challenge oil pollution due to poor equipment's.
Harmful Waste Act	1988	Prohibits carrying, depositing and dumping harmful waste on any land and waters of Nigeria.	By this act wetlands should be protected from harmful waste including waste from oil exploration that may affect human physical and mental health. By the act's definition of gas flaring is a "harmful waste" and as such this activity goes contrary to the act and can be challenged in the law courts
Federal Environmental Protection Agency	1988	Established the Federal Environmental Protection Agency as the first environmental regulatory and enforcement agency to promote natural resource conservation in the country.	Formally established a government agency for coordinating activities on wetland conservation and ensures that laws such as EIA Decree No. 86 of 1992 and other aforementioned which have implications for wetlands are thoroughly enforced. However, bureaucracy, frequent changes of administrative heads and non-release of budgetary allocations at the right time have affected the agency and instead of been an enforcement agency it has become another administrative entity.
Endangered Species Act	1990	Prohibits extinction and over exploitation of wildlife especially those on endangered species list through conservation and management of Nigeria's wildlife	Encourages conservation of important biodiversity of wetland areas, for example, the Niger Delta Pigmy Chimpanzee is protected by this legislation.
Environmental Impact Assessment Decree no. 86	1992	This is probably the most widely recognized environmental law in Nigeria. The law mandates that an EIA must be conducted for projects or any activity that is likely to affect the environment or have environmental effects. In schedule 3, it makes an EIA mandatory for any activity relating to the drainage of a wetland, wild-life habitat or of virgin forest covering an area of 100 hectares or more.	It ensures that any developments in wetland areas, irrespective of their size, are well screened through the EIA process.
Inland Fisheries Decree	1992	Regulates inland fishing through restricting the use of fishing gear, prohibiting certain fishing methods (such as the use of explosive substances, noxious or poisonous matter and electricity for fishing), prohibiting exportation or importation of live fish, and controlling closed areas, restricted seasonal fishing and construction of dams in inland waters.	This law can be applied to the protection of wetland areas by preventing over-fishing and the use of destructive fishing methods as well as protecting wetlands from the introduction of invasive fish species. However, this legislation seems outdated and in need of updating if it is to achieve its aim. For example, the penalty for fishing with prohibited fishing gear stipulates a fine of N500 (about \$3) which was substantial in 1992, but is too meagre to serve as deterrent today.
The Water Resource Decree	1993	Vests the rights and controls of water resources within the Federal Government. The policy states that the government will ensure the application of appropriate standards and techniques for the control, protection and management of water resources for the watering of animals, irrigation, agricultural purposes, domestic, and non-domestic uses such as the generation of hydro-electric energy, navigation, fisheries and recreation. The government will also ensure safe disposal of sewage, effluent and water-borne wastes, and control and prevent damage to watershed areas, protect inland and estuarine fisheries as well as flora and fauna and ensure that the possible consequences of particular water development proposals on the environment are properly investigated and considered before approval.	This legislation makes it a moral duty of government to protect wetlands.

Table 4.2 (Cont)

Name of act	Year	Summary of law	Possible implication for Wetland management
The National Inland Waterways	1997	Established the National Inland Waterways Authority with the responsibility, among others, of prescribing offences relating to the obstruction and pollution of waterways (such as rivers, creeks, lakes, tidelands and lagoons) in addition to prescribing the penalties for such offences. The agency is also responsible for ensuring that an EIA is conducted for any navigation and dredging activities within inland water and its rights-of-way.	Makes it mandatory for EIA to be conducted for developments in wetland areas.
The National Park Service Decree (first promulgated in 1976)	1999	Enabled the establishment of National Parks to enhance ecological processes and life support systems through the permanent preservation of its natural condition to the greatest possible extent, to protect and preserve its cultural and natural resources and values, and to ensure that its use shall be naturally based and ecologically sustainable.	Wetland areas are established as National Parks as a means of protecting them.
Niger Delta Development Commission Act	2000	This established the NDDC with the aim, amongst other things, of tackling ecological and environmental problems that arise from the exploration of oil mineral in the Niger Delta region.	NDDC, as one of the richest governmental parastatals in Nigeria, can contribute funds necessary for the protection of the Niger Delta wetlands. This may ameliorate the challenge of lack of funds frequently complained of by stakeholders. However, the huge budgetary allocation has exposed the commission to corrupt practices and frequent changes in leadership has limited policy direction and has proved inimical to achieving its goal of sustainable development of the Niger Delta wetlands.
The Coast and Inland Shipping Act	2003	Stipulates the nature and type of vessel engaged in fishing on Nigerian coastal and inland waters. Section 22 of the Act requires specified types of vessels, including fishing trawlers, to register on the Special Register for Vessels and Ship Owning Companies.	By this act, heavy ships that are capable of disturbing the benthic flora and fauna can be regulated out of wetland zones especially around coastal wetlands.
National Environmental Standard and Regulation Enforcement Agency Act	2004	Established NESREA to regulate and enforce environmental standards through protecting and developing strategies for quality environment, biodiversity conservation and sustainable development of Nigeria's natural resources.	After the scrapping of FEPA, Nigeria lost all environmental regulation; this act creates again the regulation of activities in freshwater environments. The agency can also liaise with relevant stakeholders within and outside Nigeria on matters regarding the enforcement of environmental standards, regulations, rules, laws, policies and guidelines and as such benefit from international best practices from Ramsar commission and other agencies working to protect wetlands.
National Oil Spill Detection and Response Agency Act	2006	Established NOSDRA which is expected to restore and preserve Nigeria's environment by ensuring the best oil field, storage and transmission practices in exploration, production and use of oil in the quest to achieve sustainable development in Nigeria.	An enforcement agency targeted at the activities of oil operators in the Niger Delta wetlands. Unlike other established agencies, this agency can focus specifically on cleaning up the wetlands without being side-tracked by other functions.
The Nigerian Minerals and Mining Act.	2007	Intended to monitor and ensure that mine operators comply with Nigerian environmental requirements. This Act prohibits water pollution or water courses during mining operations and ensures the reclamation and rehabilitation of mining sites.	Since wetland areas are rich in natural resources, this act goes a long way to protect these ecosystems from contamination. However, according to the act, "minerals" means "any substance whether in solid, liquid, or gaseous form occurring in or on the earth, formed by or subjected to geological processes including occurrences or deposits of rocks, coal, coal bed gases, bituminous shale, tar sand, any substances that may be extracted from coal, shale, or tar sands, mineral water, and mineral components in tailings and waste piles, but with the exclusion of petroleum and waters without mineral content". This detailed description conspicuously leaves out mining for petroleum products, the biggest threat to the Niger Delta wetlands. However, mining activities for kaolin, gravel, silica sand, bauxite, river sand and clay are covered.

None of these specifically and comprehensively deal with wetlands by addressing wetlands in their own right. Rather, wetland management is merely covered in general forestry laws and, more recently, nature conservation laws. The lack of even a specific wetland policy document in Nigeria is an indication that wetlands have not yet been given the adequate attention they demand in Nigeria. On the other hand, the sheer number of laws that relate to wetland ecosystems suggests that the reason for wetland degradation is not the lack of laws or policy documents, but weak enforcement of existing ones. A close look through the laws, especially in the post-Independence era, revealed that much of it was aimed at establishing organizations, e.g. the River Basin Development Authorities, National Environmental Standards and Regulations Enforcement Agency, and National Oil Spill Detection and Response Agency. This was probably done with the hope that relevant institutions would be generated and enforced. Instead, various organizations were created with often conflicting duties, which may have led to no action or even friction among the organizations.

4.5.4 *Other Institutions Governing Wetlands in Nigeria*

4.5.4.1 International Conventions

During this later period of post-Independence, Nigeria signed and domesticated five international laws, treaties and agreements that are central to the regulation and management of wetlands (Table 4.3). The Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention), is the one directly addressing wetlands, aiming at conservation and sustainable utilization. However, the adoption of these conventions has not necessarily translated into actual wise use of wetlands. By signing, domesticating and designating a Ramsar site, Nigeria received substantial international financial support from donor agencies, such as Birdlife International, the Royal Society for the Protection of Birds, the Ramsar Convention Secretariat and Wetlands International. With this support, and basking in the euphoria of designating a Ramsar site, a National Wetlands Unit was established in the Federal Ministry of Environment. The unit existed for about seven years but was subsequently scrapped and/or merged with other units. This might have affected the process of developing a national wetland policy, which has been in draft form since about 2001.

Table 4.3. International Conventions Relating to Wetland Management.

Conventions	Year Signed	Aim /Remark
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1974	Aims to ensure that the international trade of wild animal and plant specimens does not threaten their survival. Implemented in Nigeria as Endangered Species (Control of International Trade and Traffic) Act 1985
Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region	1981	The convention (also known as the Abidjan Convention) provides an important framework through which national policy-makers and resource managers implement national control measures in the protection and development of the marine and coastal environment of the Region.
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	1987	Aims to conserve terrestrial, marine and avian migratory species throughout their range. Also known as CMS or the Bonn Convention.
Convention on Biological Diversity	1994	Aims to conserve biological diversity, sustainable use of the components of biological diversity, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. This convention was the basis of the National Biodiversity Strategy and Action Plan 2003
Cartagena Protocol on Bio-safety	2000	Aims to ensure the safe handling, transport and use of living modified organisms resulting from modern biotechnology that may have adverse effects on biological diversity, taking into account risks to human health.
Convention on Wetlands of International Importance Especially As Waterfowl Habitat	2001	An international treaty for the conservation and sustainable utilization of wetlands. Also known as the Ramsar convention

Another relevant international convention is the Convention on International Trade in Endangered Species of Wild Fauna and Flora, aimed at ensuring that international trade of wild animal and plant specimens does not threaten their survival. There are a number of endangered species found in wetlands across Nigeria, especially in the Niger Delta. There is also the Convention on the Conservation of Migratory Species of Wild Animals, aimed at conserving terrestrial, marine and avian migratory species throughout their range. The Hadejia-Nguru Wetland is prominent because it is a nesting ground for migratory birds. The signing of these conventions was mostly a result of international pressure on the federal government, such as the conditions for financial aid, in which the country is required to adopt the principles of the convention in exchange for bilateral and multilateral donor grants (Sand, 1999; Agrawal, 2007). The government often signs conventions without fully appreciating their real aims. This may explain why, despite being a signatory on conventions including Ramsar, there is as yet no specific document or legislation addressing wetlands management in Nigeria.

4.5.4.2 State and Local Government Laws

During this period, especially after 1999 (the return to democratic rule), some of the thirty six states and seven hundred and seventy four local governments have enacted relevant laws on conservation of natural resources. Most of these generally follow the federal laws. For example, according to the FEPA Act, each state in the country is expected to set up its own environmental protection body for the protection and improvement of the environment. Likewise, state laws take lead root from federal laws, which are also direct outcomes of the colonial forest laws. For instance, in Cross Rivers, one of the Niger Delta states, the government has set up a task force on deforestation and enacted a law on forest management through timber bans. None of the identified state government laws and policy documents specifically addresses wetland as a unique ecosystem but instead lumps it with forestry laws. Besides, these state laws can only operate under the federal laws.

4.5.4.3 Private (Voluntary) Initiatives

There is a trend in Nigeria for private establishments to adopt environmental regulations as part of their cooperative social/environmental responsibilities. Statements made by operators in the oil industry are of most interest, considering the fact that their activities produce great stress on Niger Delta Wetlands. For example, Shell's Sustainability Report 2006 asserted that they would end "routine gas flaring everywhere in the world by 2008" (Royal Dutch Shell plc, 2006), but this is yet to come to fruition in Nigeria. There is also the voluntary adoption of the ISO 14000 (Environmental Management System) by other local and multinational oil companies. These initiatives are usually defined in the company's mission and environmental policy statements and are an independent voluntary contribution to improve the environment. To appreciate their commitment to preventing oil spill, in November 1981, eleven major oil companies collectively established the Clean Nigeria Associates, an outfit with the primary aim of combating oil spills in members' or third party areas of operation (Nwilo and Badejo, 2006). The outfit is equipped with the equipment required for fast and effective spill response, in addition to the technical expertise and equipment in its repository readily available to complement individual members' requirements when combating oil spills (Nnubi, 2008). Despite this, routine oil spills by the same organizations continue

unabated in the delta. The voluntary measures appear to be mere publicity statement/documents because actual actions are not a reflection of the statements.

4.5.4.4 Discussion

The first mention of wetland legislation was in the Environmental Impact Assessment (EIA) Decree No. 86 of 1992. No other policy document or legislation specifically mentions wetlands, which is indicative of the low relevance given to wetlands in environmental decision making in Nigeria. The focus has been on establishing organizations to enforce environmental laws, but some of these are caught up in bureaucracy, corruption and interference to protect vested interests in the oil industry.

4.6 Conclusion

This chapter provided an overview of the geography of the Niger Delta wetlands, the complex human impacts on them, the emergence of conflicts over these impacts, and the formal institutions which could be used to regulate these impacts. The myriad institutions and networks at play at various scales (national, regional and local) in this environment of conflict, coupled with the weak to strong nature of the Nigerian state, make the Niger Delta an ideal context in which to test the Network Communication Framework.

CHAPTER 5

METHODS

5.1 Introduction

This chapter describes the methods that were used to test the NCF framework, by applying it to the management of the Niger Delta wetlands in Nigeria. The chapter outlines the research approach and investigative methods that were used in this study.

5.2 Location of Study

5.2.1 Bayelsa State

The main field study was conducted in Bayelsa State – one of the core Niger Delta states (Asuni, 2010). Bayelsa State was created on October 1, 1996 out of the old Rivers State. There are eight Local Government Areas: Nembe, Ogbia, Yenagoa, Kolokuma/Opokuma, Southern Ijaw, Sagbama and Ekeremor.

Bayelsa State is geographically located within latitude 4° 15¹ North, 5° 23¹ South and longitude 5° 22¹ West and 6° 45¹ East (Bayelsa State e-Governance Office, 2012). It shares boundaries with Delta State on the North, Rivers State on the East and the Atlantic Ocean on the West and South (Fig. 4.1). Bayelsa state, with an area of about 21,110 square kilometres, lies in the heaviest rainfall area in Nigeria, with a long rainy

season and a short dry season (from November to March). More than three quarters of the state is covered in wetlands with vegetation characterized by mangrove forest.

A diversity of languages is spoken in Bayelsa State. These have been subdivided into two Ijoid languages (Nembe-Akaha and Izon (comprising 19 different dialects and inland Ijaw); the Edoid group (Southern Edoid and Delta Edo); and the central Delta languages (Alogoa, 1999). The predominant religions are Christianity and Traditional worship. The major occupations of the people are fishing, farming, palm oil milling, logging, palm wine tapping, local gin making, trading, carving and weaving. Bayelsa State is also a major oil and gas producing state, contributing over 30% of Nigeria's oil production. Oloibiri, in the Ogbia Local Government Area, is where oil was first struck in Nigeria in commercial quantities in 1956.

5.2.2 *Choice of Communities*

At least one community from each of the eight local government areas in Bayelsa state was selected for data collection (Table 5.1). The sites were selected based on the occurrence of wetlands in the area and the presence of diverse pressures (identified through an initial literature review). Table 5.1 provides a description of the 19 sites and the nature of data collection in each site. Data were also collected from relevant organizations outside Bayelsa State, mainly in Abuja and Port Harcourt.

At the start of the field work I sourced the list of settlements and their population from the National Population Commission. I was given a list that was based on the 1996 census when Bayelsa State had only three Local Government Areas (LGA). Although this list is somewhat outdated, it was still useful for site selection. With the help of my field assistants and a staff in the commission I was able to identify the current LGA of each of the settlements. One criteria was to select sites from each of the current eight local government areas in Bayelsa state, taking into consideration other factors, such as occurrence of wetlands in the area and the presence of diverse pressures as well as logistic, ease of study and available funds. Having teased out settlements based on these criteria, I then randomly selected twenty settlements covering all the local government areas with the intention of administering all the data collection instruments in all twenty settlements. However, for reasons of time and logistics it was only possible to visit

Table 5.1. Details of Sample Settlements.

Settlement	Local Government Area (LGA)	Population	Linguistic group	Nature of Environment	Main Human activity	Main pressure	Data collection activity
Akassa	Nembe	2,511	Nembe-Akaha	Coastal	Fishing	Coastal erosion	Key informant interviews and informal discussion
Amassoma	Southern Ijaw	71,516	Izon	Creeks and swamps crossing the low-lying plains	Material collection, farming and fishing	Resource extraction, e.g. logging	All
Angiama	Southern Ijaw	15,708	Izon	Riverine	Fishing and material collection	Oil exploration	All
Apoi	Southern Ijaw	1,583	Izon	Creek Forest	Fishing, Logging	Oil exploration, deforestation	All
Biseni	Yenagoa	7,315	Inland Ijo	Freshwater swamp forests and lowland rainforest	Material collection	Oil exploration	Key informant interviews
Ekeremor	Ekeremor	20,370	Izon	Saltwater swamp	Fishing	Excessive resource exploration/extraction	Key informant interviews and informal discussion
Kaima	Kolokuma/Opokuma	17,174	Izon	Riverine	Farming and Fishing	Land reclamation	All
Odi	Kolokuma/Opokuma	23,020	Izon	Riverine	Farming and fishing	Land reclamation	All
Odioma	Nembe	9,492	Nembe-Akaha	Coastal	Fishing	Oil exploration	All
Ogbia	Ogbia	11,675	Central Delta	Riverine	Material collection	Land reclamation, oil exploration	All
Ogobiri	Sagbama	4,518	Southern Edoid	Freshwater swamp forests	Fishing and material collection	Excessive resource exploration/ extraction	Key informant interviews
Okodia	Yenagoa	7,381	Inland Ijo	Freshwater swamp forests and lowland rainforest	Material collection	Oil exploration	Key informant interviews
Okpoama	Brass	29,353	Izon	Coastal	Fishing	Coastal erosion and oil exploration	All
Oloibiri	Ogbia	24,108	Central Delta	Riverine	Material collection	Oil exploration	Key informant interviews and informal discussion
Onyioma	Southern Ijaw	4,192	Izon	Riverine	Fishing and material collection	Oil exploration	All
Oporoma	Southern Ijaw	20,822	Izon	Riverine	Fishing and material collection, logging	Oil exploration	All
Twon Brass	Brass	28,273	Nembe-Akaha	Coastal	Fishing	Oil exploration	Key informant interviews and informal discussion
Yenagoa	Yenagoa	17,112	Izon	Freshwater swamp forests, relatively higher land	Farming	Land reclamation	All
Zarama	Yenagoa	8,317	Delta Edoid	Creek	Material collection	Invasive plants and Land reclamation	All

nineteen settlements and administer all instruments in just twelve of these settlements. The twelve settlements were those where procedures for gaining consent were straightforward and there were limited language barriers. The dialect spoken in Sagbama and Ekeremor LGAs is different from that understood by my field assistants, and before I could identify contacts in these settlements time and logistics constrained the administration of the household questionnaire. This explains why household questionnaires were not administered in Ekeremor and Sagbama LGAs. However, I still visited these sites for interviews and informal discussions.

5.3 Types of Approaches

According to Creswell (2003), research may involve qualitative, quantitative, or mixed approaches.

Qualitative study is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, and reporting the detailed views of informants (Creswell, 2003). Quantitative research is a type of research that explains phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics). The qualitative approach is said to be useful as an exploratory research technique providing descriptions of how people experience a given research issue, thereby effective for getting deeper understanding of specific situation (Gorman and Clayton, 2005; Bogdan and Biklen, 2007). It can be criticized for being subjective and not allowing for generalization (Dornyei, 2007). The quantitative approach, on the other hand, does permit generalization, predictions and comparison (Kraniz, 1995), but is less flexible (Johnson and Christensen, 2012).

There has been widespread debate in recent years regarding the relative merits of quantitative and qualitative strategies for research. Some researchers see the two strategies as entirely separate and based on alternative views of the world (Hughes, 1997). Others suggest the possibility to combine these strategies within their research projects as the 'best of both worlds' (Bryman, 1988). The latter school of thought encourages a mixed approach. Exponents of this suggest that there are no `paradigm

wars', in which quantitative and qualitative research are seen as belligerent and incompatible factions. Instead, the two approaches are not mutually exclusive, and can be combined if appropriate (Morgan, 1998; Maanen, 1979; Patton, 1990).

Mixed approaches are being increasingly employed (Brannen, 2010), though many terms are used to describe them, often with slightly different words or phrases which can be sometimes confusing (Creswell et al., 2003). One of their chief advantages is triangulation (Denzin, 2009), which increases the credibility and validity of results (Baxter and Eyles, 1999) – though this view has been contested on the grounds that, even if results from different data sources tally, there is no guarantee that inferences involved will be accurate (Hammersley and Atkinson, 1995). So triangulation must not only be concerned with corroboration, and there are at least three other possibilities (Hammersley, 1996; Brannen, 2011). These include: elaboration or expansion (the use of one type of data analysis adds to the understanding gained by another); initiation (the use of a method sparks new research questions that can be pursued using a different method); complementarity (each type of data analysis enhances the other); and contradictions (qualitative data and quantitative findings conflict). These multiple meanings of triangulation justify using a mix of qualitative and quantitative approach here.

In this study mixed approaches are seen as complementary, in that they provide different perspectives and answer different questions within one broad area. Qualitative methods, such as participant observation, in-depth interviews, content analysis and focus group discussions were useful for obtaining a specific type of data, especially those relating to behaviour in customary contexts, individuals' personal histories, perspectives, and experiences and eliciting data on the cultural norms and discourses of groups. For instance, through interviews and content analysis, the narratives and discourses of actors were uncovered. In contrast, quantitative data were collected using questionnaires, e.g. it was possible to quantify the monetary contribution of various wetland ecosystem services to local community livelihoods.

Creswell (2003) identified three strategies to use mixed methods: sequential procedure, concurrent procedure, and transformative procedure. The approach adopted here is

consistent with concurrent procedure, which is a multi-stranded design in which both quantitative and qualitative data are collected independently at the same time or with a time lag (Tashakkori and Teddlie, 2003). This does not suggest that I have oversimplified the procedures by reducing this research to phases. Data collection began with informal discussions to gain further insights that can help improve data collection instruments (such as questionnaires and interview guides etc). There was an initial questionnaire interview with stakeholders to identify scenarios, and then subsequently a group discussion/workshop to discuss the scenarios with them. In this way participants were also involved in agenda setting.

5.3.1 Interviews

To avoid ambiguity and ensure a high rate of return, a face-to-face approach was the preferred mode of data collection for all instruments. In a few instances where for logistical reasons this was not possible, telephone or email correspondence was used.

There are three fundamental types of research interviews: structured, semi-structured and unstructured. Structured interviews essentially comprise verbally administered questionnaires, in which a list of predetermined questions is asked, with little or no variation and no scope for follow-up questions to responses that warrant further elaboration. These fit with the household questionnaires used in this study. Unstructured interviews contain questions which can be changed or adapted to meet the respondent's intelligence, understanding or belief. Unlike a structured interview, they do not offer a limited, pre-set range of answers for a respondent to choose, but instead advocate listening to how each individual person responds to the question.

I personally administered the majority of the data gathering tools, except for a few questionnaires administered by two field assistants in communities which were far off and which I could not revisit because of time constraints (Fig. 5.1). Although the majority of my respondents could communicate in English or Pidgin English, I still needed an initial conversation to be made in the local dialect by field assistants. I sometimes asked for assistance from field assistants during interviews with participants

who were more fluent or comfortable in another language (i.e Ijaw) which I cannot speak.



A. Interview with loggers



B. Interview with a community leader



C. On a trip to a Niger Delta community



D. Interview with fishermen

Figure 5.1. The Author Conducting an Interview.

5.3.1.1 Structured Interviews

In this study, structured interviews were used to administer household questionnaires, whose principal aim was to identify the main ecosystem services provided by the wetlands and highlight the worth of these services to local residents. Information was sought from households on such issues as: the quantity of resources collected from wetlands, the associated benefits and costs, and people's knowledge, perceptions, attitudes and concerns about wetlands (Appendix 5.1). In order to be sure that the questions were clear and appropriate, a draft questionnaire was pre-tested on four

volunteers living near my base. The questionnaire was also revised after an initial reconnaissance survey and informal interviews.

The household was used as the unit of analysis, with the questionnaire survey administered to the head of each household. Households in the sample frame were selected from each of twelve sample settlements in the Niger Delta region. Samples from each settlement were selected, based on the proportion of their population in the entire sample frame. The initial intention was to administer 350 questionnaires with no more than 20% of this allocated to any one settlement. A systematic sampling approach was adopted to select respondent households. In this approach every n th household is chosen from the settlement. For example, every 10th household starting from an household adjudged to be in the centre of the community. This was repeated in all the twelve communities selected for household questionnaire. In the end, a total of 283 households were visited for face-to-face interviews.

5.3.1.2 Unstructured Interviews

Unstructured interviews contain several key questions that help to define the areas to be explored, while also allowing the interviewer or interviewee to diverge in order to pursue an idea or response in more detail. This interview format provides participants with some guidance on what to talk about, which many find helpful. The flexibility of this approach, compared to structured interviews, also allows for the discovery or elaboration of information that is important to participants but may not have previously been thought of as pertinent by the researcher.

Unstructured interviews (Appendix 5.2) were used to collect data from various types of respondents. First, in-depth interviews were held with representatives of key categories of groups. These categories, with the number of informants shown in brackets, were government (15), local (11), corporate (5), non-governmental organization (6), academia (3), multilateral organization (1) and media (1). Organizations within each group were selected based on their relevance and participation in issues relating to the management of the Niger Delta wetlands. Some organizations were purposively identified based on literature review and researchers knowledge of the area before

beginning field work; others were selected through a "snowballing" approach, which identifies hidden populations for whom adequate information is not readily available (Faugier and Sargeant, 1997). The respondent from each organization was in a position to know the issue being discussed very well.

Interviews were personally administered, with responses noted down on each interview guide. Some were also digitally recorded if the respondent agreed to this. Interviews lasted 2 hours 30 minutes on average and sought to explore how various actors value wetland ecosystem services; their institutions (origins and changes); and their narratives, networks and major areas of interaction.

Some government representatives showed little interest and told me to interview a subordinate. While this was helpful in that it gave me opportunity to interview some field staff, I was still very much interested to hear from the "key" staff. In a few instances, I was persistent and successful.

There were also some officials with whom I had made an appointment but on arriving at their office found that they were either out of office, needed more time or suggested I call again. The Ecological Funds Office refused to participate for example, and numerous efforts made to interview staff at various oil companies were not successful despite, emails, calls and visits. A total of 43 interviews were conducted across all actor categories.

Members of each actor group were asked if they were aware of, and supported, different categories of institutions. *Awareness* means that informants were able to spontaneously mention aspects of this institution. *Support* means that informants believe in the main aspects of an institution, whether or not they adopt it. If an informant could not spontaneously mention a particular institution, they were given an explanation of its main tenets. For example, a forest law was described as a "state law that regulates the size, quantity and type of wood that can be cut down". If the informant could still not identify an institution, it was concluded that they were unaware of it and they were not asked if they supported it. Informants were also asked to identify what influences their

choice of institutions. This relied on open-ended questions, except for local informants, for whom a questionnaire with a list of seven pre-defined attributes was used.

In addition, a number of key informants were also identified and interviews held with them too. At the beginning of the field work, I identified various groupings in local communities and within these groups I identified key informants, who were preferably the head of their group. Key informants included the chairmen of associations of timber dealers, hunters and fishermen, as well as community leaders and youth leaders. Sixteen local community key informants were interviewed in depth. Twenty more local respondents were also interviewed in depth, selected from respondents to questionnaire-based interviews. Based on responses from the first 126 questionnaires, and on knowledge gained during field interactions and discussions, I identified the five main local uses (and user groups) of wetland ecosystems as farming, fishing, hunting, material collection and logging. Subsequent data collection was targeted towards these groups, and 5-6 respondents from each group were selected for in-depth interviews .

I also held informal interviews with other local people, including loggers, military men, and a local youth who regarded himself as an ex-militant. There were no predetermined questions and the interview “went with the flow”.

5.3.1.3 Focus Group Interviews

Focus groups are groups of usually 6-10 selected individuals who are brought together to discuss a specific topic of interest (Powell et al., 1996). The interviewer only serves as a moderator (or group facilitator) who introduces topics for discussion and helps the group to participate in a lively and natural discussion.

Although I had a list of key themes (Appendix 5.3) which I expected to be covered during discussions, this did not interfere with the direction that participants took the discussion, as I had approached focus groups with an open mind and as few preconceptions as possible about what participants were likely to say or not say. The sessions began with a welcome, followed by overview of the topic of interest and then the discussion procedure. Participants were told that they were the experts, their

opinions mattered the most, and I had come to learn from them. I ensured that my participation was minimal, only clarifying issues when necessary, especially on points that remained unclear after the structured and unstructured interviews.

Five focus group discussions were held in this study, one for each of four wetland user groups (excluding loggers), and one bringing together a representative from each actor category. Between six to eight participants were carefully recruited to cover a wide social spectrum. Depth of knowledge expressed during structured interviews and availability played a major role in participant selection. The discussions, which lasted 4 hours on average, allowed participants to agree or disagree with each other, so as to provide insights into the range of opinions and ideas about an issue, and the inconsistencies and variation that exist in a community in terms of beliefs, experiences and practices.

5.3.2 Direct Field Observations

Participant observation involves the researcher participating in a situation, while at the same time recording what is being observed. The phenomenon being observed can include practices, behaviours, environmental conditions etc. that are of interest to the researcher. Of the four types of participant observer identified by Gold (1958), in this case the type employed was "observer as participant", in which the observer has only minimal involvement in the social setting under study. Observations were made throughout this study when collecting data, in order to understand the context of actors' discourses. I also visited communities to observe how fishing and material collection are carried out, and took notes and photographs.

5.3.3 Secondary Data Sources

Secondary data sources are those already in existence for which permission is often needed to secure access. Because of the nature of this study, it relied heavily on official documents and reports from various organizations, literature from non-governmental organizations, national and local governments, as well as journals, books and conference presentations, newspaper, radio and television reports, essays and memoirs,

private business briefing notes and communiqués by local communities websites, as well as podcast and webcasts.

Such sources were particularly important for identifying texts to represent the main types of narrative about the Niger Delta wetlands. As it was not until the 1990s that counter narratives to the dominant modernist narrative of oil production achieved public prominence only texts published since 1990 are analysed here. The narratives of local communities were identified by analysing communiqués of meetings by local communities, such as the Ogoni Bill of Rights, presented by MOSOP to the federal government in 1990, and the Kaiama Declaration, issued after the Ijaw youth conference, held in the town of Kaiama on 11th December 1998.

For some of these sources, a formal application for access had to be made to the relevant organization (for example, population data), but in other instances they were made readily available for me to make copies.

5.3.4 Data Analysis and Presentation

Data collected in this study were rich and extensive. Digitally recorded data were transcribed and saved in MS Word documents. This was done using the function in NVIVO 8 that enabled me to play content more slowly. NVIVO is software that supports qualitative research. My intention was to use this software to analyse qualitative data, and I attended training for this. However, it was time consuming as I had not built in the necessary database such as codes and links into NVIVO from the onset of my research. Therefore, I resorted to the manual transcription of qualitative data. I also attempted to use Dragon (a speech recognition software), but also found this time consuming for the software to recognize my accent.

Data analyses depend on the nature and purpose for which the data had been collected. Qualitative data were subjected to detailed content analysis using markers to identify and highlight statements quoted in the Results Chapters (7 and 8). Two main tools were utilized to analyse quantitative data: UCINET for network analysis and SPSS for

statistical analysis. Quantitative data were presented using descriptive statistics and graphs constructed using MS Excel.

5.4 Researcher's Diary

This section provides an account of field data collection between 13th June and 15th November 2010. Although there were prior contacts and visits to the field, no data were collected until this time.

The first four days were spent in Abuja, the capital city of Nigeria, firming up interview appointments with government agencies and ministries which had been previously identified before commencing the field study. The procedure was to apply to the executive head of the agency/ministry. A letter of introduction obtained from the departmental postgraduate research tutor at the University of Leeds was presented with a brief application letter stating the nature of the interview and the type of questions to be asked. In most instances I received a positive response, referring me to the most relevant official in the organization. I then visited the official and arranged a time for the interview. The officials also gave me their telephone numbers so I could send them reminders when the interview date was near. All the officials found suitable time slots in the first week of August. Interactions with these officials enabled me to identify other organizations I was not aware of. For example, the Director of the Federal Ministry of Environment, Abuja, introduced me to the Head of the Community and Social Development Centre in Bayelsa State.

I then travelled to the Niger Delta state of Bayelsa, the first of the three states where I initially planned to collect data. The Department of Geography, Niger Delta University, was my research base during the field work. This link was facilitated through professional contacts, as I worked for a sister university and so was welcomed as a colleague. Through the help of university staff I found two students to employ as field assistants. They served as guides and translators and also assisted in administering a few household questionnaires.

The next few days were used to firm up interviews with officials of organizations in Bayelsa State, following a similar approach to that used in Abuja. As part of my starting strategy I also had informal discussions with university staff knowledgeable about conducting research in the state. Through these discussions I was able to identify some communities of interest based on my site selection criteria. At this point it became clear that studying in three states would not be feasible, considering time and logistics. I had originally thought that field studies in three states in the Delta would represent various points of view, especially based on the ethnic distinctions between the states. However, on the assumption that differences were minor I concentrated only on Bayelsa, but with day trips to wetland communities in Delta State (Sapele) and Rivers State (Ahoada). Besides, it has been suggested that the institutions of one area in the Niger Delta are derived from those of others (Alagoa, 1971).

My first contact with local communities was for the purpose of testing data gathering tools. The draft questionnaire was tested with a number of adjustments made before the actual survey. This enabled me to assess my plan with possible field realities and gain additional knowledge. My first trip within Bayelsa State was to Oporoma, an oil producing community where I spent a day having extensive informal discussions with local people, including some of the chiefs.

I then commenced household questionnaire administration, visiting various communities, usually returning to my base as there was no suitable accommodation in most of the sites. After personally administering about 126 questionnaires, I halted questionnaire administration to spend a week meeting government officials in Bayelsa state. The following week I travelled back to Abuja to fulfil appointments fixed at the beginning of the field work. Most interviews went smoothly, however some officials failed to keep their appointments, and I had to reschedule these for near the end of field work when I would be in Abuja again. I then moved back to Bayelsa state with a stopover in Port Harcourt (Rivers State), where some relevant non-governmental organizations and government agencies have their offices. On returning to Bayelsa state, I began interviewing key informants and representatives of local communities, and concluded household interviews and interviews with representative of organizations. Throughout these activities I also interviewed other people informally. During visits to

organizations, I collected their key publications and other documents. I spent the last week of field work reviewing Nigerian environmental laws at the International Centre for Nigerian Law. Throughout the field period, I visited nineteen communities. Interviews were held in all these communities but questionnaires were only administered in twelve (Table 5.1).

Data collection required travelling through difficult terrain, around swamps and creeks, and covering long distances (up to 600 km/370 miles). This made my work difficult and more costly than initially anticipated.

5.5 Ethical Issues

I recognized the significance of ethical considerations in conducting my research, following established guidelines for dealing with ethical issues in social science research. I applied for, and received, clearance for ethical review from the University of Leeds. According to Hay (2010), ethical considerations should address issues of privacy and confidentiality, informed consent, and harm to participants.

First, I ensured that participants were not coerced into participating in my research, but participated voluntarily after being informed of the procedures and possible risks involved (if any). This was done verbally before beginning data collection. Participants were allowed to withdraw from the research at any time if they so wished. In the case of observation, permission was sought from the person concerned (for example while observing fishermen), and from the head of the group, i.e. from the village head when observing activities in a community. The confidentiality of participants was guaranteed and in no part of the report would names be mentioned. Respondents would not be put in harm's way, physically or psychologically. Finally, efforts were made to organize workshops at the end of the research to share findings with respondents verbally and through a synthesis report. This was ethically justified and also provided valuable feedback that benefited subsequent analysis. A later section (Section 9.5) provides further insights into the rigours of fieldwork and ethical challenges faced and how they were handled.

5.6 Conclusions

To address the goals of this study this chapter described the overall study design, and the various methods used to collect and analyse data. The next chapter focuses on the benefits and costs of ecosystem services in the Niger Delta, while Chapters 7 and 8 present the results obtained when the Network Communication Framework was tested in the Niger Delta.

CHAPTER 6

DISTRIBUTION OF WETLAND BENEFITS AND COSTS ACROSS NETWORKS

6.1 Introduction

This chapter evaluates the benefits and costs associated with using the Niger Delta wetlands, thereby complementing the discussion in Chapter 4 of the physical geography of the wetlands and the policies and institutions involved in their management. The way in which these benefits are realized has become a major issue. The inequitable sharing of benefits and costs amongst the various groups is generally seen as the underlying cause of conflict in the management of the wetlands (Akpan, 2010; Omeje, 2005).

The aim of this chapter is not to present a full-scale economic analysis of ecosystem services derived from the wetlands. Instead, it focuses on what the distribution of benefits and costs can contribute to understanding the management of such complex ecosystems. To do this, it divides all the groups involved into three main categories – local communities, government and the corporate sector – which it portrays as being linked in three networks. The first section looks at the monetary benefits for each of three major networks (local community, government and corporations). This is followed by a section describing the cost of each network's activity in the wetlands. The final section aggregates the benefits and costs of wetland use across the three main networks

and describes how these are distributed among them. Benefits and costs are expressed in monetary terms so that their distributions are expressed on a common basis.

6.2 Data Sources and Description

To characterize wetland resources, comprehensive data accounting for each network's benefits and/or costs is required. However, not all of these data are readily available for the Niger Delta. While information on governmental and corporate network benefits are available from secondary sources (websites, reports and budgets), little is known of the benefits accruing to local communities. Therefore, it became imperative to collect data to assess the value of the wetland benefits for the local people. As such, this chapter is based on a mix of primary and secondary data.

In order to estimate (in monetary terms) the benefits local people derive from their use of the Niger Delta wetlands, data were first collected for the purpose of identifying the main ecosystem services provided by the wetlands. The identification and selection of these services were based on a review of the relevant literature, personal experience and informal interviews, complemented by an initial questionnaire survey. Then, using the year 2009/2010 as a baseline, the present use and non-use values of ecosystem services provided by the Niger Delta wetlands to local residents were estimated from data collected through the questionnaire (Appendix 5.1). The household (the number of people living together, sharing the same facilities, such as a kitchen and a toilet, and who feed from the same cooking facility) was used as the unit of analysis for the survey, with the questionnaire administered to the head of each household. Households in the sample frame were chosen by first purposively selecting twelve settlements (see Table 5.1) in the Niger Delta region to cover the wide range of economic activities taking place in the wetlands. Then, a representative sample of households was randomly selected from each settlement based on their population. A total of 283 households in twelve communities of the Niger Delta region were visited for face-to-face interviews between July and November 2010.

The number (percentages) of households that indicated that they derive an ecosystem service from the wetlands gave an indication of its importance. The responses were then

organized based on the categorization of ecosystem services into (a) provisioning services; (b) regulating services; (c) cultural services and (d) supporting services (Millennium Ecosystem Assessment, 2003). In order to estimate the magnitude of each main ecosystem's provisioning service (use value) respondents were asked to quantify the amount harvested (used), while the average price was generated through group discussions and visits to local markets. For non-use values of the other ecosystem services a stated preference approach was used in contrast to the price-based approach used for provisioning services. This is because the other classes of ecosystem services often do not have a market price.

6.3 Direct Economic Benefits of the Wetlands to Local Communities

6.3.1 Biographical Data

A set of biographical data was collected for the sample of 283 respondents, 70% of which are male with an average age of 50 years (Appendix 6.1). 31% of respondents do not have any formal education. With about 34% of respondents considering themselves as unemployed, the main occupation is farming (28%) followed by the civil service (16%). About 30% of households have other income sources that are not derived directly from the wetlands. The average monthly household income amounted to ₦21,700 (\$145) (1 Naira (₦) is equivalent to approximately 0.0067 US dollars (\$)) When related to an average of six people per household this indicates that the daily per capita income falls below the commonly used poverty threshold of \$1 per person per day (Anand and Sen, 1997). This emphasizes the critical role that ecosystem services, particularly those of a provisioning nature, are expected to play in livelihoods.

Unsurprisingly, provisioning services emerged as the most important category of ecosystem service to local residents. The collection of materials such as snails, edible insects and food is the provisioning service from which all households derive a benefit. This is followed by fishing (89%), crop production (86%), hunting (57%) and logging (9%). The wetland, however, is also used as a source of cultural services. It is a place for recreation by 31% and spiritual worship by 26% of respondents. The importance of ecosystem regulation services was mentioned by 15% of respondents, while 6%

mentioned benefiting from the supporting services of the wetlands (Appendix 6.1). Most households benefit from the multiple services provided by the wetland. For example, an household with a farmland (cropping) will also fish and collect materials from the wetlands. These activities are carried out by several members of the household. In the next section, the monetary value of these services is presented.

Although the term ‘ecosystem services’ as such was unfamiliar to the respondents, they recognized the concept, especially in the case of provisioning and cultural services. On the other hand, regulating and supporting services were poorly recognized. The mention of provisioning and cultural services cut across all education groups; however, 82% of those indicating regulating services and 65% of those indicating supporting services had at least a post-secondary/university degree. This suggests that knowledge of these non-use services is dependent on the respondents’ level of education. Generally, all respondents were aware of the availability of the wetlands in their environment. They associated the wetlands with the presence of fish, forest, raffia palm, wild animals and water.

6.3.2 *The Monetary Value of Material Collection*

The collection of materials such as spices, wild food, insects, medicinal plants, and firewood (Fig. 6.1) is the service from which all households in the Niger Delta region derive a benefit. One respondent described the wetlands as a place where “you just go to and pick what you want”. This is indicative of the diverse materials available in the wetlands that support the livelihoods of the local residents.

Access to the wetlands in order to collect these materials is generally open to all. There are some materials, however, for which access is restricted, especially to non-natives (people who are Nigerians but not indigenous to the community). These people will be required to pay an amount of money before they can be permitted to collect some of these materials. A non-native snail collector reported that the registration fee (for the community to acknowledge you and allow you into the wetlands to collect materials) is ₦4,500 (\$30). A monthly arrangement payment is ₦3,000 (\$20), while for an annual permit the fee is ₦10,000 (\$66).



Snail



Bark of trees collected as chewing stick



Material used for local sleeping mat



Kolanut

Palm weevil roasted as *Bayelsa suya*

Ogbono

Figure 6.1. Selected Materials Collected from the Niger Delta Wetlands.

Collection of some of these materials is seasonal, while others can be found all year round. Bush mango is widely collected between May and August; snails and crabs during the rainy season; while sand mining, palm weevil and art and craft materials can be found all year round. Whilst most of these materials are collected throughout the year, their periods of abundance are seasonal. For example, shrimp are abundant between June and September when households may collect up to a basket per day using

basket traps. The collection of spices, medicinal plants, wild food and insects are female and children-dominated, while the collection of wood and material extraction is male dominated.

The economic value of material collection in the Niger Delta wetlands is estimated at \$4,266 per participating household (Appendix 6.2). The gross financial value generated by the 283 participating households is \$1,207,245. Of this, 75% is in cash income, while the remainder is used for other purposes such as subsistence use, as gifts to neighbours and relatives and for making other products. On account of the diversity in type of materials collected, the economic cost and time spent on each activity can differ widely. There are some materials that only require buckets to be collected in the backyard, while others need specialized tools and labour. For most of the materials, the economic cost is associated with cutlass, buckets, baits or poison, torchlight, canoes, paddles and bags. Taking cost into consideration, the net financial value of material collection in the Niger Delta wetlands is estimated at \$1,051,101 for the 283 households or \$3,714 per participating household. The average time spent collecting materials (excluding sand mining) is 5.5 hours per day per household. For sand mining most respondents spend about 10 hours a day on the activity.

Materials collected from the wetlands have diverse uses in the local communities. Spices have multiple uses as they play an important role in food preparation. They also have medicinal value, which includes a cure for the common cold and hypertension. Wild foods are very important in income generation and for subsistence household use. Bush mango is highly priced in the market and is a delicacy for most people in Nigeria. Palm weevil is an insect that yields high economic value when roasted. Popularly called *Bayelsa suya*, it is becoming a national delicacy craved by many visitors to the state. Although some communities in the Delta do not eat snails, which are also highly priced, they collect them all the same and sell them to traders from as far away as Lagos. Apart from being a delicacy, the fluids contained in the mantle cavity have medicinal values. The other marine and freshwater molluscs also constitute an important food source and their shells are used as reinforcement for concrete (Fig. 6.2). Shrimps, which are rich in protein, minerals and vitamins, are utilized as condiments for soup and pottage. Art and craft materials are used in the home or sold for cash. These include baskets, fish traps,

mats and brooms. The palm wine and native gin collected from the palm trees are important for medicinal and cultural activities.



Figure 6.2. Shells Used for Concrete Reinforcement.

The collection of medicinal plants is another main use to which the wetlands are put. Some of the materials collected and eaten (such as Kolanut and Aziza) have diverse medicinal uses. Informal interviews with three traditional doctors (in Odi, Zarama and Yenagoa) revealed the main medicinal plants collected from the wetland (Appendix 6.3). The practitioners see an average of four patients per day and charge between ₦1,000 (\$7) and ₦5,000 (\$33) per consultation, most of which are midwifery- and massage-related. The indication is that this form of health care is predominant in places with no transport, such as in the interior where residents cannot often go to town for western style treatment. In some instances, they indicated that nurses in hospitals recommend some of these native remedies. When checked with ethno-biological knowledge, a number of these plants were found to be used for similar cures in western medicine (Maduka and Okoye, 2002; Odeunmi et al., 2010). This underscores the importance of traditional medicine in the overall health of the people who live in rural areas. To avoid double counting, since these materials are already valued as food or material collection, medicinal plants are not included in the monetary valuation.

6.3.3 *The Monetary Value of Fishing*

The Niger Delta is home to a wide variety of fish species. About 196 species belonging to 105 genera in 46 families have been identified (Otobotekere and Sikoki, 1999). These species are spread across the various eco-regions from the freshwater in the inland to the

saline water around the coastal region. This makes fishing a dominant aspect of the Niger Delta economy. Fishing grounds/ponds/lakes are generally under the ownership of the community, compound or family. Open access fishing can be carried out in open swamps and flooded areas around the homestead. Access to community ponds is open to members of the community. Likewise, the family-owned fishing grounds are open to members of the family. Non-natives are mostly required to seek the permission of the compound, community or family head and they are often required to pay a small fee. It is now common practice for owners of fishing grounds to lease them out to experienced non-native fishermen. About 4% of fishing households indicated that they depend on fishing grounds they had on lease.

Fishing takes place all year round, but the fish catch is highest in the dry season when the wetlands are not flooded. The reduced water levels during this period make fish harvesting easy. Most of the fishermen spend more time fishing during the dry season compared to the rainy season when they take to another wetland activity. The excess catch is processed by drying, smoking, roasting or frying to preserve them for sale or use during the period of fish shortage. There are a variety of fishing methods in the Delta. Common fishing gear includes the use of traps, hook and line and drifting gill nets. The use of spear or cutlass, cast net, lift net and fence is also common. Dynamite and poisonous substances, though prohibited and punishable is often used by some members of the communities. Men who are mostly engaged in commercial fishing are responsible for setting the nets (especially cast nets and lift nets), while women mostly collect fish consumed for household subsistence and are the processors and traders in fish. The fish is mostly sold on the spot to traders who come in from as far as Lagos. Generally, fishing in the Delta is an activity engaged in by all, irrespective of age or gender. There are no formal fishing associations. However, because commercial fishing can hardly be performed by an individual it is common for fishermen to call on other fishermen to work with them. In the end, they will be paid in cash or the yield will be shared.

The economic value of fishing in the Niger Delta wetlands was estimated at \$4,139 per participating household (Appendix 6.4). The total gross financial value by the 251 participating households is estimated at \$1,038,815. Of this, 80% was used to generate

cash income, while the rest was used for household subsistence, as gifts to neighbours and relatives and in exchange for other services, such as labour. The economic cost incurred while engaged in fishing relates to the purchase of traps and nets, baskets, containers, cutlass, and canoes/paddles. About 15% of the gross value of fishing goes to offset the economic cost of fishing. This brings the net financial value for the fishing households to \$854,409; \$3,404 per participating household. On average, about 8 hours of household labour is spent daily on fishing. This includes the time spent by fishermen commuting to and from their homestead, setting their gear and eventual landing.



Tilapia (*Tilapia guineensis*)



Flying fish (*Exocoetidae*)



Snake-Head (*Channa channa*)



Lung fish (*Protopterus annectens*)

Figure 6.3. Some Fish Species Common In The Niger Delta Wetlands.

Fish are the most abundant and easily available source of animal protein for consumption and income generation in the Niger Delta (Allison and Okadi, 2009). Therefore, fishing is an important source of livelihood (household income) for many households in the region, as the economic activities of the whole population are either dependent on or related to it. The above valuation is based on the sale of freshly-caught

fish. When fish is processed (dried, smoked, fried or roasted), however, the net value can increase by up to 25%.

6.3.4 *The Monetary Value of Crop Production*

Varieties of crops are cultivated in the Niger Delta wetlands. Cassava, cocoyam, maize, sugarcane, yam and different varieties of leafy vegetables are some of the major crops (Fig. 6.4; Appendix 6.5). Each cropping household has access to an average of three plots, each measuring about 0.11 ha. For most households, at least one of the plots is located in close proximity to their homestead where they mainly cultivate food crops, such as leafy vegetables, plantain and pepper, as well as some tree crops, such as orange. The majority of plots are acquired through inheritance (72%) and the remainder are leased, especially from native land-owners to non-native cropping households.



Leafy vegetables



Plantain



Oil palm



Cocoyam

Figure 6.4. Some Crops Common In The Niger Delta Wetlands.

A typical cropping season begins with the clearing of farmland towards the end of the dry season, usually between November and February, while cultivation begins at the start of the wet season around March. The common cropping system in the region is

traditional bush fallowing, in which the farmer cultivates a plot, usually for about one to three years, and then abandons it temporarily (for a period of three to ten years) to allow the plot to regain soil fertility. However, rapid population growth and land shortage have drastically reduced the amount of arable land available to farmers, reducing fallow periods considerably and in most cases, continuous cultivation has emerged.

Intercropping of yam, cassava, maize, okra and pepper is widespread in the wetlands. Mono-cropping, where a single crop is cultivated year after year, is also practised. Agroforestry is also observed, in which case farmers integrate tree crops (such as oil palm and rubber) into their farmland. Labour expended on farmlands is predominantly household labour. There is a widespread specialization and division of labour along gender lines. Men are involved in the more strenuous farm activities, such as land clearing and cultivation of crops such as oil palm, rubber and yams, while the women are mainly responsible for weeding, harvesting and cultivation of crops such as pepper and okra. Although there are no formal cropper associations, it is common for other croppers, friends and relatives to pitch in to help each other when the need arises. In exchange, the benefiting household will offer similar help or give a part of the yield in appreciation.

Crop production in the Niger Delta wetlands is significant in terms of its contribution to household income and subsistence, but is also important in terms of exchange with neighbours and relatives and the role of some crops as medicinal ingredients. The economic value of crop production in the Niger Delta wetlands (Appendix 6.5) was valued at \$5,340 per participating household and \$15,632/ha in gross financial value. The total gross financial value generated by the 242 cropping households is \$1,292,228. Of this amount, about 51% is in cash income, while the remainder was used for other purposes, mainly household subsistence. The economic costs associated with cropping in the wetlands range from farm tools and implements (hoe, cutlass, shovel, axe, spade, wheel barrow, knife, baskets and sacks), to planting materials (seeds) and agrochemicals (fertilizer). Also, households have canoes and paddles used for transportation. If costs are taken into consideration, the net financial value of crop production in the Niger Delta yields \$4,825 per participating household or \$14,596/ha. This cost does not include household labour for which money is not paid, but includes externally hired

labour for which money is paid. An average cropping household spends about 18 hours a day on farm activities, which include land clearing, planting, watering/irrigation, pest control, fertilizer application and harvesting.

6.3.5 *The Monetary Value of Hunting*

The wildlife component of the Niger Delta wetlands is distinct as it harbours a wide variety of animal species, some of which have only recently become known to science. These animals occur across the varied ecological regions within the Delta. Access to hunting grounds abides to the same rules as material collection.

Game hunting is predominantly a male-dominated activity, conducted all year round. Women are involved in the sale of game animals, which are sometimes cut into pieces (if not sold on the day of catch) and sold in the market (for the bigger animals). Fresh or live animals are more higher priced. Hunting is one wetland activity that is somewhat regulated through local associations. These associations basically regulate the activities of hunters who use Dane guns for hunting. Alternatively, small-scale hunters using traps are not regulated. About 13% of the hunting households have a professional hunter. Hunters are also imbued with traditional powers believed to protect them against wild animals.

There are about 24 commonly hunted animals in the wetlands (Appendix 6.6). The economic value of hunting in the Niger Delta wetlands accrues a gross financial value of \$5,468 per participating household and a total of \$88,410 for all 162 participating households. Of the total gross financial value, 69% is generated as cash income, while the remainder is used mainly for household subsistence. The economic cost associated with hunting includes the buying of Dane guns, traps, cutlass, torchlight's, spears, dogs and bags. Taking the costs into consideration, the net financial value of hunting in the Niger Delta wetlands is \$473 per participating household. An average of 4 hours per day is spent hunting by each household. In addition to being an important source of income, game hunted in the wetlands is eaten by the local residents as it supplies necessary meat protein. Game is also an important source of hides and skin used in the production of local drums, while the horns are used for fashioning local trumpets.

6.3.6 *The Monetary Value of Logging*

A distinction is made between wood collection for fuelwood and logging, in that the former relates to wood collection for energy, while logging is restricted to the collection of wood for use as timber. Logging for timber in the Niger Delta wetlands is the provisioning service least used by local residents. This is because logging has never been a widespread activity among the natives. Even when the natives cut down trees it is either to build their own huts or to make canoes, none of which are of a grand scale. However, there is a considerable number of non-resident individuals and companies who log in the wetland region. Access to logging grounds is controlled by communities and the families who own the land. Mostly, the forested lands are leased to loggers (most of whom are non-natives) for a fee. At best, the natives serve as a source of labour to the loggers. However, this is changing as the natives are now becoming aware of the economic value of timber. This is a fast growing activity. As one respondent put it:

“Before now our people are not interested in wood, even if you tell the chief he will say is it not just wood, allow them to take it, but now even the chiefs are selling the land and giving it out on lease” (Resident of Oporoma community).

Eleven of the twenty-six logging households are non-natives of the communities within which they operate. This number (26) relates only to logging households that are resident within the community. Field observation and discussions reveal that the majority of the main loggers in the Niger Delta wetlands come from outside the Niger Delta and do not necessarily reside there. This group often has the backing of the military and logs lands located far away from residential zones, without the knowledge of the landowners. According to one respondent, his family have fallen victim of these external loggers:

“I woke up in the morning only to hear that our family land has been destroyed by some people who came with the army (military officers).”

Logging is a predominantly male-dominated activity carried out throughout the year, including the rainy season. As one respondent put it:

“We log a lot during the wet (rainy) season because during flood period, you can load (float) your logs or planks easily and free from restriction as in the dry period” (Logger in Amassoma community).

Logging is not directly regulated at the local level. There exist associations of traders in sawn wood. These associations act to regulate the activities of traders of sawn wood and labourers who cut down trees. Normally, all types of tree can be logged, except for economically valuable tree crops, such as the Bush mango tree.

Based on the assumption (derived from personal observation) that an average log has a length of 20-30 meters and a trunk diameter of 0.6-0.9 meters, the economic value of logging in the Niger Delta wetlands is estimated to be \$6,045 per participating household (Appendix 6.7). The total gross financial value for the twenty-six logging households is \$157,175, of which 96% was used to generate cash income. The economic cost of logging relates to the cost of canoes used for transportation, axes, machetes, rope, machines, labour and fuel for boats. If the economic cost is taken into consideration, the net financial values of logging in the Niger Delta wetlands will yield \$4,114 per participating household.

Apart from sawnwood, logged trees have many other uses. For example, mangrove trees are rich in tannin used for the manufacture of inks, while the African oil bean is used as a medicinal plant. Logged woods are also used in canoe and paddle construction, the making of traditional masks, mortar and pestle, planks and electric poles. Sawdust is also collected and used for cooking and other artefacts. The economic value presented is only of the fresh log. The economic worth of the wood, however, will increase after being sawn or used in canoe construction. It takes about 6 months to make an averagely sized canoe and about a year to construct a big one.

6.3.7 Aggregate Value of Provisioning Services

Based on the monetary value of each provisioning service derived from the Niger Delta wetlands, the aggregate monetary value of wetland provisioning services for the 283 households in the sample was estimated at \$3,783,928 for gross financial value, \$3,256,837 for net financial value and \$ 2,591,632 for cash income (Table 6.1). On the assumption that the 283 households are a reliable sample of all households in the Niger Delta, in terms of the composition of provisioning services which they harvest, the mean net financial value or provisioning services is \$11,508 per household per annum. Note that these estimates are based on yields from one section of the Niger Delta and different values may be derived for tribes elsewhere in the Delta. For instance, farming assumes considerable importance in the drier landward part of the Niger Delta than the swampier zone characterized by extensive creeks. The valuation is also based on the price of the actual service collected from the wetland. In most cases, however, there is an added value since the materials are mostly used to make other products. For instance, cassava cropping is popular because it is used for making garri, fufu and starch, which are popular West African foods made from cassava tubers. Finally, some provisioning services have not been valued because their value is judged negligible e.g. grazing. Some livestock grazing takes place in the Delta but involves mainly small animals such as sheep, goats, pigs and rabbits.

Table 6.1. Aggregate Value of the Niger Delta Wetlands Provisioning Services.

Activity	Number of participating households (PPH) (n = 283)	Gross financial value (\$)	Net financial value (\$)	Cash Income (\$)	Gross financial value/PPH (\$)	Net financial value/PPH (\$)	Cash Income/PPH (\$)
Material collection	283	1,207,246	1,051,101	900,813	4,266	3,714	3,183
Fishing	251	1,038,815	854,509	826,045	4,139	3,404	3,291
Cropping	242	1,292,282	1,167,714	652,997	5,340	4,825	2,698
Hunting	162	88,410	76,552	60,938	546	473	376
Logging	26	157,175	106,961	150,839	6,045	4,114	5,802
Total		3,783,928	3,256,837	2,591,632			
Average (N=283)		13,371	11,508	9,158			

One factor identified by respondents as important for their continued benefits from the wetlands are social relationships that enable individuals (friends and relatives) to help one another when need arises. This is because most of the activities are carried out in groups. According to a fisherman in Zarama, interviewed while fishing with his colleagues:

“I could not have got this much if I have tried to come here alone ... maybe I will just use hook and it will take me days before I can catch this much every one person is important even if one of us is not here today, it will affect us ... it is also important because when things are difficult we come together to share among ourselves.”

The importance of social relationships is supported by a correlation analysis using SPSS (Statistical Package for the Social Sciences, Version 14). This showed a significant correlation between respondents who indicated that they rely on their social network to maximize benefit (Pearson correlation = 0.857).

6.3.8 *Non-Use Values*

Cultural, regulating and supporting services are also derived from the wetlands.

The Niger Delta wetlands serve as an important source of cultural services. They have significant spiritual and religious value to about 26% of the respondents. Shrines are set up in lakes and forests for spiritual worship. An example is the case of the Bouper Lake, which is an important sacred lake with spiritual value to the residents of Oporoma (Adekola, 2011). There are also numerous cultural festivals that relate either directly or indirectly to the wetlands (Bayelsa State Art Council, 2006). Local residents also mention the wetlands as a place for recreational swimming. The wetlands are also an important place of study for local and international scholars. Some of the provisioning services derived from the wetlands are important components for cultural services. For example, canoes and masks, which are made from logged woods, are essential components of cultural and spiritual activities. Likewise, some of these sacred lakes and forests are home to diverse flora and fauna some of which are considered sacred by the

local residents. This underscores the interconnectedness between the various categories of ecosystem services.

Residents of the Niger Delta also benefit from regulating services of the wetlands. This is recognized by 15% of the respondents. The wetlands regulate air quality, climate, water quality, flood and erosion and serve as a source of waste treatment. One respondent recognized that shrimps, which are provisioning services important for the human diet, also regulate the population of fishes, such as croakers, catfish, and threadfins. Shrimps therefore occupy a very strategic position in maintaining the ecological balance between the wetlands and aquatic environments. On the other hand, the distribution of shrimps is greatly influenced by the presence of sediments.

Although, they are the least recognized from the ecosystem services, some of the local residents (6%) recognize the benefits of supporting services. A respondent identified the role of the crown of wetland trees in supporting undergrowth and protecting animals through the provision of tree cover.

To estimate the non-use value of the Niger Delta wetlands, I used the stated preference method (Hanemann, 1994; De Groot et al., 2002) to explore respondents' willingness to pay (WTP) for the improvement of the quality of the wetlands so that they can secure the benefits from the wide-ranging ecosystem services of the wetlands, and their willingness to accept (WTA) compensation for foregoing these services during the improvement period. Willingness to pay is the maximum amount that an individual states they are willing to pay for a good or service, while willingness to accept is the minimum amount they would be willing to accept (as compensation) to forgo it (Whittington, 1998; Hanemann, 1991).

The stated-preference methods use specially constructed questionnaires to elicit estimates of the WTP or WTA (see Appendix 5.1, section E) in attempt to solve the problem of non-use valuation by capturing benefits that may not be sold on the market. There are two categories of stated preference methods: contingent valuation methods, which focus on the valuation of a non-market good as a whole; and choice modelling methods, which focus on valuing specific attributes of a non-market good (Fujiwara and

Campbell, 2011). The contingent valuation method is used in this thesis. There is a considerable literature on the complexity, problems and sometimes controversial application of the stated preference approach (Deshazo and Fermo 2002; Diamond and Hausman 1994). There is a risk of people overstating or understating their responses under such experimental conditions. Also, using contingent valuation might result in speculative value estimates which might suffer from income constraints expected in such poor society. However, stated preference approaches are also identified as a reliable source of valuation information (Carson et al. 1996).

The first key task in gathering the respondents' stated preference was to describe a scenario and ensure that they understood it. The stated preference aspect of the survey was divided into two sections: the first asked for the bid of the respondents and the second elicited the reason behind their bid. Also, the contents of the key concepts, such as ecosystem services (including regulating and supporting services), were explained to the respondents beforehand, and their enquiries about the questionnaire were answered during the interview. In all, 267 of the 283 household questionnaires were adjudged complete. The remainder included respondents who refused to take part for personal reasons, such as the length of the interview. In addition, nine respondents gave a protest value of zero during the elicitation of willingness to pay. These were not included in the willingness to pay analysis. One respondent said:

“This is what our fathers live on that allowed them to train their children, build their house and marry their wives so why should they tell me to pay anything.”

The mean willingness to pay (WTP) and willingness to accept (WTA) compensation were estimated at \$284 and \$4,576 respectively. Although the WTP is small and none of the households was willing to pay as much as the mean value of provisioning services, 97% of households were happy to make a financial contribution towards the quality improvement of the wetlands. The average WTA (\$4,576) is low compared to the average gross financial value, net financial value and cash income at \$13,371, \$11,508 and \$9,158 respectively. By implication, the local residents themselves appear to undervalue the worth of the ecosystem to them. The average willingness to pay is

closest to the average cash income, which suggests that the subsistence value of the wetlands seems to be suppressed by the improvement of the quality of the Niger Delta wetlands environment. This implies that the respondents are only willing to pay much to continue to benefit from the wide-ranging ecosystem services of the wetlands. This is due to the fact that the majority believe that it is their right to have free access to the wetlands.

Respondents asked for high compensation (Appendix 6.8) mainly because they have the impression that the government and the oil companies make a lot of money from the region, hence they should be able to meet higher demands. This was an important factor that influenced the willingness to accept, while willingness to pay was mostly influenced by the fact that respondents did not trust that such a fund would be judiciously used and not fall into the hands of corrupt government officials.

The estimate for overall non-use value is considerably lower than the estimate for the use value and suggests it may be less reliable; hence the value is set at zero. Therefore, to plot the benefit flow from the local communities that is comparable to that of other networks, I relied on the net monetary value of provisioning services. Based on an estimate of \$11,508/household/year for 2,172,842 households, a population of 13,037,053 people in the Niger Delta (Bayelsa, Delta and Rivers States) (Table 4.1), and a mean household size of six people (Appendix 6.1), I estimate the total benefit from provisioning services alone, derived by the local community, to be in the region of \$25 billion.

6.4 Direct Economic Benefit of the Wetlands to Governmental Networks

The Niger Delta environment has always played a crucial role in the Nigerian economy. During the colonial era, the region provided access for the import and export of essential commodities between Nigerians and the European traders. Until the 1960s, the Delta was globally renowned as the second largest producer of palm oil, after Malaysia, which even obtained its first palm seedlings from the Delta (Initiative for Public Policy Analysis, 2010). The importance of the Niger Delta to Nigeria became higher still after the discovery of huge oil and gas reserves, which today make Nigeria the world's sixth

largest exporter of crude oil. The importance of the Delta's crude oil has pushed agriculture, the traditional mainstay of the economy from the early fifties and sixties, into the background. By 1970, petroleum exports accounted for 58% of the country's export value, rising in the 1980s to 97%, 94% in 1990, and 95% in 2001 (Akpabio and Akpan, 2010). Presently, it is widely believed that the Niger Delta, which is the storehouse of petroleum resources, accounts for more than 80% of Nigeria's revenue and more than 90% of its total export value (Etekpe, 2007; Frynas, 2000). The Niger Delta is estimated to have 37 billion barrels of proven oil reserves as of January 2010, with a production capacity of around 2.9 million barrels per day (bpd) (US Energy Information Administration, 2011). Based on an estimated total government revenue of ₦1.01 trillion (\$6.73 billion) in 2010 (Federal Ministry of Finance, 2011) and the fact that about 80% of this would have been generated from the Niger Delta, it is estimated that the annual revenue to the Nigerian government from the Niger Delta is \$5.38 billion (Appendix 4.2).

6.5 Direct Economic Benefit of the Wetlands to Corporate Networks

The major corporate sector in the Niger Delta is the oil and gas industry. There are 7 major oil companies operating in the Niger Delta (Appendix 4.1). Benefits to corporate groups have steadily increased since 1958 when Shell-BP Petroleum Development Company of Nigeria Limited, at the time the sole concessionaire, discovered crude oil in the Niger Delta. In 1958 when the first oil field came on stream production was 5,100 barrel per day (bpd). Today this is over 2.9 million bpd.

Specific data on the profit of oil companies operations in Nigeria is not available. However, it is suggested that about 57% of the annual oil revenue is paid to the Nigerian government (this is the Nigerian government's revenue from the Niger Delta) while the oil companies take 43% (Okonjo-Iweala, 2012). Therefore, revenue accruing to the corporate network is estimated as \$4.06 billion in 2010, based on the \$5.38 billion government revenue from the Niger Delta in 2010.

6.6 Distribution of Benefits

It is generally suggested that benefits derived from the Niger Delta wetlands may not be distributed uniformly and increase disparities within and across groups. Such disparities in social equity are a key factor in power relations. This section evaluates how derived benefits are distributed between the networks.

6.6.1 *Distribution of Benefits Accruing To Local Community Networks*

The majority of provisioning benefits derived by local people accrue directly to them and are retained for subsistence and cash income, whilst indirectly, provisioning services support residents farther afield, beyond the Delta. Buyers of wetland products include traders from major Nigerian cities, such as Port Harcourt and Lagos. About 30% of total local cash income is from traders from outside the host state. Ecosystem services, particularly food production, timber, and fisheries, contribute significantly to local employment and national economic activity. However, government receives little from these benefits, as most locals pay hardly any taxes, and basic food items such as cassava, maize, rice, and fish, are VAT free (Ajakaiye, 1999). A direct flow of local benefits to other networks is, thus, negligible to non-existent.

6.6.2 *Distribution of Benefits Accruing to Government Networks*

It is widely argued that the benefits of oil exploration and production that have accrued to the government have not trickled down to local communities (Watts, 2004; Oviasuyi and Uwadiae, 2010). The major factor governing the sharing formula is *derivation*: the proportion of the nation's wealth given back to the source region. Successive governments (especially military governments) have unilaterally abrogated the derivation principle that existed before the discovery of oil in commercial quantities and imposed an authoritarian system. Before crude oil became an important source of revenue to the Nigerian government (i.e. pre-1960), derivation was 100%, meaning that host communities had almost total control of the benefits from the resources found in their area. However, subsequently this changed to as little as 1.5%, after the volume of agricultural exports from the three main regions (groundnut from the Hausa-Fulani in

the North, cocoa from the Yoruba in the South West and palm oil from the Igbo in the South East) declined from a share of more than 80% at independence to less than 4%, while that of oil rose to 95% in the 1970s (Ikpeze et al., 2004). Other factors, such as population and land area in which these major regions had a competitive advantage became the basis of revenue sharing. Derivation to host communities did increase in 1999, but only to 13%.

Concerning the allocation of *overall* government revenue to different regions over the years, benefits to the Niger Delta were minimal. For instance, capital allocation to the region in the Third National Development Plan, (1975-80) showed that while other regions had allocations of up to 38%, the Niger Delta region had the lowest allocation of just 6% (Akpabio and Akpan, 2010). This is despite the fact that the majority of revenues originated from the region. The disparity is worsened by the fact that these monies, intended for infrastructure and social services, do not actually get to the people because of corruption (Obi, 2010; Elebeke, 2012). While the proportion of national revenue accruing to the Niger Delta states has increased since 1999, it is not clear how much of this reaches local communities because the process is hardly transparent or free from corrupt practices.

Based on the estimated total government revenue of \$5.38 billion generated from the Niger Delta in 2010, I estimate that about 20% was directly allocated to the Niger Delta states (Appendix 4.2). There are no direct flows of benefits from the government to the corporate sector. Indirectly, the government contributes to the maintenance of a safe working environment for the oil industry, deploying its troops to the facilities. However, it is on record that the oil companies also pay for some of these services (Brock, 2012; Frynas, 2001).

6.6.3 *Distribution of Benefits Accruing to Corporate Networks*

The corporate network contributes to the Nigerian economy by generating revenues for the government, as well as paying taxes and royalties. In addition to the above, the corporate actors pay a statutory contribution of 3% of their annual budget to a regional developmental agency, the Niger Delta Development Commission (NDDC), whose

mission is to develop the Niger Delta. The NDDC was established in 2000 with the aim of facilitating the rapid, even and sustainable development of the Niger Delta into a region that is economically prosperous, socially stable, ecologically regenerative and politically peaceful. In 2010, SPDC paid \$161 million to the Niger Delta Development Commission.

Corporate actors also support community projects directly. In 2010 SPDC and SNEP provided more than \$22.85 million to local community projects (Shell International Petroleum Company, 2011). This represents about 1.3% of corporate actors' profit. In addition, the corporate sector in Nigeria employs thousands of Nigerian employees and contractors, even if it is generally argued that this favours people from the three main regions who are employed in the top cadre, compared to the indigenes of the Niger Delta who are employed in the lower cadre and as casual staff. Oil companies also assist local communities by funding projects implemented by non-governmental organizations.

Benefits from the corporate networks are widespread, with foreign nations benefiting from the oil products they import from the Niger Delta. The USA is the largest importer of Nigeria's crude oil, accounting for about 43% of the country's total oil exports. This is about 10% of the overall U.S. oil imports. Other destinations of crude oil from the Niger Delta include India, Brazil and Spain (Fig. 6.5). There is evidence that these countries and MNOCs influence government policies by infiltrating relevant government departments (Smith, 2010).

6.7 Costs Associated With the Activity of the Principal Networks

These benefits come at a cost, which may not be equitably shared among the different actors. Local communities, in particular, could lose out because they have less power in the decision-making processes (Adams and Hulme, 2001).

To estimate the environmental costs of activities I need to place a monetary value on the consequences of the pressure in a two-step process. First I quantify the environmental degradation. In this case I consider only the main impacts e.g. changes in soil

productivity. Secondly, I make a monetary valuation of the consequences e.g. the cost of soil productivity losses using the avoided cost, replacement and substitute cost methods. These are all related methods that estimate monetary values, based on either the costs of avoiding damages due to lost services, the cost of replacing ecosystem services, or the cost of providing substitute services. Other costs, such as foregone benefits as well as psychological and emotional costs, hospitalization and deaths are not included.

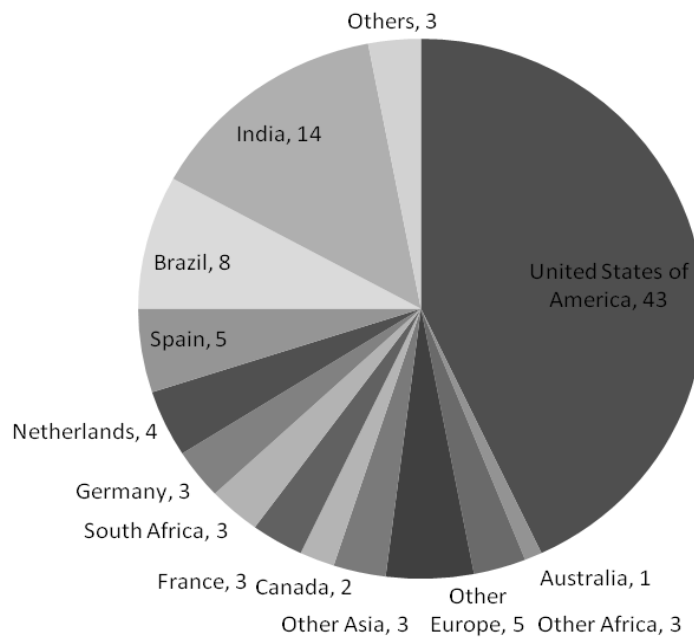


Figure 6.5. Nigeria Crude Oil Exports by Destination (% 2010).

6.7.1 *Costs Associated With Local Network Activities*

The main consequences of local community activities include changes in soil productivity and decline in forest cover (Adekola and Mitchell, 2011). It has not been possible to estimate this cost because of lack of reliable data. The majority of the cost generated by the local community is borne by the local communities and government. Costs such as that of family labour or the value foregone when land is used for productivity management has not been included.

6.7.2 *Costs Associated With Governmental Network Activities*

The government is generally responsible for dredging and the reclamation of wetlands, which result in increased incidences of flooding and erosion. This is carried out as part of oil and gas exploration to facilitate activities of the oil companies.

6.7.3 *Costs Associated With Corporate Network Activities*

The main pressure of corporate network activities in the Niger Delta results largely in ecosystem and biodiversity loss. The cumulative cost of environmental degradation due to oil extraction in Ogoniland alone is \$1 billion (United Nations Environment Programme, 2011). This translates to an average of \$19 million a year since oil extraction began there in 1958. Extrapolating from the 1,000 km² of Ogoniland to the entire 39,900 km² of the Niger Delta gives an annual cost of \$753 million. Of this, the Niger Delta States spend about \$187 million a year on remedial work (about 14% of their revenue). So local communities bear on average a cost of \$566 million, which accounts for a large share of the cost of ecosystem degradation resulting from the activities of the corporate sector. Apart from biodiversity loss, corporate actors are responsible for burning down farmlands, polluting water and destroying crops by floods and pests. The implications of these changes are economic (less food for households; less money for food, medicine and sending children to school); emotional (inability to assist relatives and neighbours) and social (poor health and religious desecration). The cost of this degradation is particularly serious for the local communities as most households have little capacity to adapt to change. Locals indicated that they somehow cope, as government assistance is minimal. When asked how they do so, respondents revealed that they switched activities or relocated to a less affected area.

Although no quantitative relationships have been established, costs also flow to other regions, both within and outside Nigeria. These costs do not include those resulting from oil and gas related conflicts, which is estimated as costing \$4 billion yearly between 1996-2004, when 500 people died every month (Okolo and Etekpe, 2010) and

on which Royal Dutch Shell spent almost 40% of its \$1 billion global security budget between 2007 and 2009 (Brock, 2012).

6.8 Aggregating Cost and Benefits of Niger Delta Activities

The data that currently exists allows only an estimate of the 'static' benefits and costs of wetland ecosystems use, as there are substantial uncertainties associated with these benefits and costs estimates. However, the estimate is likely to be conservative because many costs are not included.

The local community network derives a substantial part of their net benefits directly from the wetlands. The costs associated with exploiting ecosystem services are not known. The oil extraction activities which contribute to the government and corporate network generate a high cost, and about 75% of this cost is borne by the local network. Such disparities feature prominently in the discourse and institutions of the three main networks.

The distribution of benefits and costs is influenced by existing regimes and institutions. This implies that proposals concerning payments for ecosystem services, which suggest that the safeguarding and increasing of flow benefits will contribute to well-being and poverty alleviation (Wunder, 2008) are gross oversimplifications.

6.9 Conclusion

This chapter has roughly estimated the benefits accruing to the three main networks – local communities, government and corporate – for exploiting the Niger Delta and the costs which they generate. The way in which these benefits and costs are distributed is a matter of great political debate, as will be discussed in Chapters 7 and 8. What is clear, however, is that the annual value of provisioning services to local people (\$25 billion) is about three times the value of oil production, but local communities also have to bear about 75% of the environmental costs of oil extraction which altogether are equivalent to about 19% of the oil industry revenue.

CHAPTER 7

NARRATIVES, DISCOURSES AND NETWORKS IN THE NIGER

DELTA

7.1 Introduction

In highly contested environments, such as the Niger Delta, various actors attempt to implement a range of management practices. The Network Communication Framework, described in Chapter 3, aims to explain the overall impact of multiple actors by viewing them not as discrete agents but as members of multiple interacting networks. One category of content that is communicated within and between networks comprises institutions, and the evidence for this analysed in Chapter 8. This chapter provides the first part of the test of the Network Communication Framework by analysing the evidence for the complementary communication of information.

The way in which different actors use particular environments can be linked to differences in perception. Each actor has a different discourse, which is “a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities” (Hajer, 1995a). According to the Discourse Coalition Framework (DCF), groups compete to be the dominant coalition that determines policy and preferred management practices. Each coalition clusters around a story line of a

problem. This is "a condensed sort of narrative" (Hajer, 2005) that is consistent with the discourses of all member groups (Hajer, 1995a). A narrative, constructed within each actor's discourse, is a set of statements giving a meaningful totality of past and future events (Barton, 2001). The DCF implicitly assumes that generally only one narrative of a problem is constructed within one discourse, though there is flexibility for relatively similar discourses to be consistent with a common story line. Explaining the impact of multiple actors on an environment is more challenging if actors are not as discrete as the DCF assumes but function as members of multiple interpersonal networks. This chapter tests a prediction by the Network Communication Framework that in such conditions discourses are more heterogeneous in content and consistent with multiple narratives. The mix of discourses will vary along a spectrum from one in which contested environments can escalate to "environments of conflict" - complementing the "economies of violence" of Watts et al. (2004) - to mutuality at the other extreme, though conflict will be the most visible outcome.

This chapter begins my analysis of contested environments in the Niger Delta by examining the diversity of narratives held by the main actors involved, and linking these to their discourses and the networks of which they are members. It focuses on the narratives of government; two main non-state groups competing to use environments - the corporate (private business) sector and local communities; two groups with advocacy or mediating roles - non-governmental organizations and multilateral organizations; and two groups with professional roles - academic groups who should in principle have disinterested narratives or provide technical support to land users, and journalists who should provide unbiased reporting of facts.

The first part of this chapter outlines the principal public narratives about managing the Niger Delta as identified from published texts. Part two describes the narratives of actors interviewed in field studies. Part three uses these data to make inferences about informants' discourses. Part four uses other data collected in field studies to identify the structure of the networks of these actors. Part five compares the network membership of informants with their discourses. The main finding is that most informants do subscribe to multiple narratives and that these can be linked to the multiple networks of which they are part.

7.2 Niger Delta Narratives

This section identifies and compares a range of narratives that have been published in various written and spoken texts since 1990. Oil spills and other forms of environmental degradation have featured in narratives about changes in the wetland ecosystems of the Niger Delta ever since crude oil exploration and production began there in 1956 (Nwilo and Badejo, 2005; Omotola, 2006). However, it was not until the 1990s that these counter-narratives to the dominant modernist narrative of oil production achieved public prominence and moved to the centre-ground of local and international debates. So only texts published since 1990 are analysed here.

The narratives are structured according to the following questions. First, how are the causes of wetland change in the Niger Delta explained? Second, what solutions are possible to improve the Niger Delta environment? Third, how are the various actors involved represented in these narratives, e.g. as victims, villains, victors, heroes etc.? Fourth, what is downplayed or left unsaid? Fifth, which ecosystem services or resources are emphasized?

7.2.1 Government Narrative

The government narrative portrays the challenges facing the Niger Delta as part of those expected in the process of *regional development*. Economic, infrastructural and human capital developments are therefore seen in turn as the panacea to the Niger Delta problem (Table 7.1). Thus, the governor of Delta State suggested that:

“To solve the Niger Delta problem there are many things that must be done. The greatest solution is economic development” (Uduaghan, 2008).

The President of Nigeria (Goodluck Jonathan) also declared that to solve, transform and develop the Niger Delta region:

Table 7.1. Texts Representing the Government Narrative.

a. Development

- i. “To solve the Niger Delta problem there are many things that must be done. The greatest solution is economic development. (Uduaghan, 2008).
- ii. ‘It is essential for us to widen our development base ... many of our essential human needs can be met only through goods and services provided by industry’ (Jonathan, 2012).

b. Actors as Partners

- i. “...the strong support of international agencies, particularly the contributions of the United Nations Development Programme, The World Bank, DFID (UKs Department for International Development) and the European Union The oil companies, being major players in the region are significant contributors to the successful completion of the Master Plan. Indeed, of importance are the contributions of Shell Petroleum Development Company (SPDC) who not only partnered with us but also went as far as to assign its staff to work on the project” (Niger Delta Development Commission, 2006).

c. Environmental Constraints

- i. “You have rightly noted the challenges we have in this region in terms of security and development. You know we have a difficult terrain that makes development very difficult, that was the major reason the NDDC was set up as an interventionist agency Amnesty proclamation, and subsequent post-Amnesty disarmament, demobilization and reintegration (DDR) programme, is the sincerest, boldest and most profound effort by any Federal Government of Nigeria since 1960 to address the agitation for fairness, equity and development in the oil-bearing Niger Delta” (Oboh, 2012)

d. Need for Regulation

- i. “The Petroleum Industry Bill is an attempt to bring under one law the various legislative, regulatory, and fiscal policies, instruments and institutions that govern the Nigerian petroleum industry. The Bill is expected to establish and clarify the rules, procedures and institutions that will entrench good governance, transparency and accountability in the oil and gas sector. It aims to introduce new operational and fiscal terms for revenue management to enable the Nigerian government to retain a higher proportion of the revenues derived from operations in the petroleum industry” (Ndubuwa, 2012)

“Policies are being put in place to fast-track developments of the region through construction of the East-West Road, rehabilitation of abandoned railway system and building power plants” (Jonathan, 2012).

This narrative downplays neo-colonial and socio-political factors implicated in the problems of the Niger Delta. It usually avoids categorizing actors, but when it does it generally portrays all actors as *partners*. Thus, Timi Alaibe, former Director of the Niger Delta Development Commission, referred to:

“The strong support of international agencies, particularly the contributions of the United Nations Development Programme, The World Bank, DFID (UK Department for International Development) and the European Union The oil companies, being major players in the region are significant contributors to the successful completion of the Master Plan. Shell Petroleum Development Company (SPDC) ... not only partnered with us but also went as far as to assign its staff to work on the project” (Niger Delta Development Commission, 2006).

The government narrative also emphasizes *environmental constraints* on development. Christian Oboh, Managing Director of the Niger Delta Development Commission, recently said that:

“You have rightly noted the challenges we have in this region in terms of security and development. You know we have a difficult terrain that makes development very difficult” (Oboh, 2012).

Although the official government narrative emphasizes the need for regulation, the seriousness of institutional failures as cause of wetland degradation is downplayed. While government has initiated various institutions to improve sustainability of management of the Niger Delta environment (see Chapter 4), senior government officials have downplayed and deflected the focus away from the environmental challenges facing the Niger Delta. Thus, the Minister of Environment, while reiterating the present administration’s commitment to developing relevant institutions promoting

sustainable development, adequate management and development, identified the environmental challenges facing the country and needing urgent regulation as including:

“Deforestation, arising from tree felling, without replenishment for various purposes; land degradation as a result of oil and other resource exploitation activities; erosion of coastal areas of large areas in southern Nigeria, the flood plains of the major rivers in the country, and some flat low-lying urban areas; the menace of pollution, solid, toxic and electronic wastes; the incremental and devastating effects of recurring oil spills, the unrelenting surge of the Sahara desert and drought downwards into the country, and the impact of climate change, against which no country as yet has any apparent bulwark” (Mailafia, 2012).

7.2.2 *Local Narrative*

The beginning of a coherent local narrative, representing those circulated by people living in the Niger Delta concerning the social and environmental ills which confront them, can be linked to the establishment of the Movement for the Survival of the Ogoni People (MOSOP) and its proclamation in 1991 of the Ogoni Bill of Rights. This narrative, which associates the environmental, social and economic development impediments that underpin the crises prevailing in the Niger Delta with the repression of local people, was popularized in the numerous texts of local activists who presented them to the wider world. For example, in 1993, Ken Saro Wiwa sent an address to the Third General Assembly of the Unrepresented Nations and Peoples Organization. Here 'local community' is used as a general term, and so groups such as the Niger Delta Volunteer Force (NDVF) and MOSOP are considered as part of the local community network because this is the constituency they generally claim to represent.

Central to the narrative is *colonial and neo-colonial domination* by Britain. According to the Ogoni Bill of Rights:

"[The Ogoni people] laid claim as a people to their independence which British colonialism had first violated and then handed over to some other

Nigerian ethnic groups in October 1960... The Ogoni Bill of Rights rejects once and for all this incompetent indigenous colonialism ... that in 1951 we were forcibly included in the Eastern Region of Nigeria where we suffered utter neglect" (Movement for the Survival of the Ogoni People, 1991).

Similar claims are made in the Kaima Declaration of Ijaw Youths (the Ijaw are another group of peoples in the Niger Delta) and by a local chief (Table 7.2a).

Colonial and neo-colonial domination has, in this narrative, also left the Niger Delta deprived, in spite of the immense wealth generated in the region. Economic injustice is both absolute, and relative to that of other peoples in Nigeria (Table 7.3b). Indeed, peoples from other regions (especially the three main tribes of Hausa, Ibo and Yoruba) are perceived as part of the neo-colonial cliques depriving Niger Delta peoples of their rights. This is enumerated in the Derivation Principle (see Chapter 6), which specifies the share of oil revenues accruing to oil producing areas:

"The Principle of Derivation in Revenue Allocation has been consciously and systematically obliterated by successive regimes of the Nigerian state. We note the drastic reduction of the Derivation Principle from 100% (1953), 50% (1960), 45% (1970), 20% (1975) 2% (1982), 1.5% (1984) to 3% (1992 to date)" (Ijaw Youths of the Niger Delta, 1998).

The international community is not portrayed as a "third sector" independent of colonial or Nigerian states, but as inextricably implicated in the neo-colonial cliques:

"What has happened and is happening to the Ogoni is strictly not the fault of the Nigerian elite and Shell Company alone; the international community has played a very significant role in it. If the Americans did not purchase Nigerian oil, the Nigerian nation would not be, nor would the oppressive ethnic majority in the country have the wherewithal to pursue its genocidal intentions...There is a sense in which the "Nigerian" oil which the Americans, Europeans and Japanese buy is stolen property Therefore, these buyers are receiving stolen property" (Wiwa, 1992).

Table 7.2. Texts Representing Colonial and Economic Aspects of the Local Narrative.

a. Colonial and Neo-Colonial Domination

i. Ogoni Bill of Rights: The Ogoni people “laid claim as a people to their independence which British colonialism had first violated and then handed over to some other Nigerian ethnic groups in October 1960... The Ogoni Bill of Rights rejects once and for all this incompetent indigenous colonialism ... that in 1951 we were forcibly included in the Eastern Region of Nigeria where we suffered utter neglect (Movement for the Survival of the Ogoni People, 1991).

ii. Kaima Declaration: "It was through British colonization that the Ijaw Nation was forcibly put under the Nigerian State ...for the economic interests of the imperialists, the Ijaw ethnic nationality would have evolved as a distinct and separate sovereign nation, enjoying undiluted political, economic, social, and cultural autonomy ... the division of the Southern Protectorate into East and West in 1939 by the British marked the beginning of the balkanization of a hitherto territorially contiguous and culturally homogeneous Ijaw people into political and administrative units, much to our disadvantage (Ijaw Youths of the Niger Delta, 1998).

iii. Local Chief: "It was through the British colonial administration that the Niger Delta, which would have grown up as a distinct and separate sovereign country enjoying total economic, cultural, social and political autonomy, was put under the Nigerian state as minorities who suffer cultural economic, psychological and social political deprivations" (Evilewuru, 2006).

b. Economic Injustice

i. Kaima Declaration: "The principle of Derivation in Revenue Allocation has been consciously and systematically obliterated by successive regimes of the Nigerian state. We note the drastic reduction of the Derivation Principle from 100% (1953), 50% (1960), 45% (1970), 20% (1975) 2% (1982), 1.5% (1984) to 3% (1992 to date) (Ijaw Youths of the Niger Delta, 1998).

ii Local Chief: "Crude oil from Niger Delta is the lifeblood of Nigeria’s economic wealth. It built the dual carriageways across other parts of Nigeria; it continues to build the extravagant physical structures in Nigeria's new capital city of Abuja.. The total length of flyovers and bridges in dryland Abuja is more than the length of all bridges in the Niger Delta put together" (Evilewuru, 2006).

Table 7.3. Texts Representing International and Citizenship Aspects of the Local Narrative.

a. Role of the Wider International Community

i. Saro Wiwa (1992): "For what has happened and is happening to the Ogoni is strictly not the fault of the Nigerian elite and Shell Company alone; the international community has played a very significant role in it. If the Americans did not purchase Nigerian oil, the Nigerian nation would not be, nor would the oppressive ethnic majority in the country have the wherewithal to pursue its genocidal intentions. Indeed, there is a sense in which the "Nigerian" oil which the Americans, Europeans and Japanese buy is stolen property Therefore, these buyers are receiving stolen property".

ii. Ogoni Bill of Rights: "It is the intention of the Ogoni people to draw the attention of the American government and people to the fact that the oil which they buy from Nigeria is stolen property and that it is against American law to receive stolen goods..... The Ogoni people will make representation to the World Bank and the International Monetary Fund to the effect that giving loans and credit to the Nigerian Government on the understanding that oil money will be used to repay such loans is to encourage the Nigerian government to continue to dehumanize the Ogoni people and to devastate the environment and ecology of the Ogoni and other Delta minorities among whom oil is found" (Movement for the Survival of the Ogoni People, 1991).

iii. Critique of a 1995 World Bank report on the Niger Delta by a local activist: "Neatly excluded from the report (World Bank, 1995) is discussion of the exacerbation of environmental and social problems by the destructive macroeconomic policies institutionalized by the IMF, IFC, and World Bank, in service to western predatory capitalism" (Harmon, 1997).

b. Citizenship Alienation

i. Movement for the Emancipation of the Niger Delta: discussions must go beyond "mere provision of electricity and water" and focus on the political marginalization of the Ijaw because "we believe that we have to seek first our political freedom and every other thing will follow" (Ofehe, 2009).

ii. Urhobo Historical Society (1999): "No Oron man has ever been appointed or elected a governor of a state and from 1984 till date, none of our sons and daughters has been deemed fit to hold ministerial position in spite of the fact that successive regimes in the country have zoned key positions to Akwa-Ibom State."

iii. Urhobo Historical Society (1998): "The Summit notes the total marginalization of Urhobos in government, federal parastatals (including those located in Urhobo land) and the oil companies."

Table 7.4. Other Texts Representing the Local Narrative.

a. Local People as Victims

i. Wiwa (1992): "I have watched helplessly as they (local communities) have been gradually ground to dust by the combined effort of the multinational oil company, Shell Petroleum Development Company, the murderous ethnic majority in Nigeria and the country's military dictatorships".

b. Ecosystem Provisioning Services Are Secondary to Oil Production

i. Kaima Declaration: The degradation of the environment of Ijawland by transnational oil companies and the Nigerian State arise mainly because Ijaw people have been robbed of their natural rights to ownership and control of their land and resources through the instrumentality of undemocratic Nigerian State legislations..... The political crisis in Nigeria is mainly about the struggle for the control of oil... resources which account for over 80% of GDP, 95% of national budget and 90% of foreign exchange earnings. Of which 65%, 75% and 70% respectively are derived from within the Ijaw nation (Ijaw Youths of the Niger Delta, 1998).

ii. Ogoni Bill of Rights: "The result of such unchecked environmental pollution and degradation are that (i) The Ogoni can no longer farm successfully. Once the food basket of the eastern Niger Delta, the Ogoni now buy food (when they can afford it); (ii) Fish, once a common source of protein, is now rare. Owing to the constant and continual pollution of our streams and creeks, fish can only be caught in deeper and offshore waters for which the Ogoni are not equipped. (iii) All wildlife is dead. (iv) The ecology is changing fast. The mangrove tree, the aerial roots of which normally provide a natural and welcome habitat for many a sea food - crabs, periwinkles, mudskippers, cockles, mussels, shrimps and all - is now being gradually replaced by unknown and otherwise useless plants (Movement for the Survival of the Ogoni People, 1991).

c. Local Control as a Solution

i. Ogoni Bill of Rights: "The Ogoni people in particular demand political autonomy as a distinct and separate unit within the Nigerian nation with full right to (i) control Ogoni political affairs; (ii) use at least fifty per cent of Ogoni economic resources for Ogoni development; (iii) protect the Ogoni environment and ecology from further degradation; and (iv) ensure the full restitution of the harm done to the health of our people by the flaring of gas, oil spillages, oil blow-outs, etc. by the following oil companies: Shell, Chevron and their Nigerian accomplices" (Movement for the Survival of the Ogoni People, 1991).

ii. Kaima Declaration: "... but to demand and work for Self Government and resource control for the Ijaw people ..finally, Ijaw youths resolve to set up the Ijaw Youth Council (IYC) to coordinate the struggle of Ijaw peoples for self-determination and justice" (Ijaw Youths of the Niger Delta, 1998).

iii. Urhobo Historical Society (1999): "Every region should control its resources 100% from which it will allocate funds for running the central government".

"The Ogoni people will make representation to the World Bank and the International Monetary Fund to the effect that giving loans and credit to the Nigerian Government on the understanding that oil money will be used to repay such loans is to encourage the Nigerian government to continue to dehumanize the Ogoni people and devastate the environment and ecology of the Ogoni and other Delta minorities among whom oil is found" (Movement for the Survival of the Ogoni People, 1991).

This element is also apparent in the Kaima Declaration and in a critique of a World Bank report by a local community activist (Table 7.3a).

External influences that lead to economic injustice are institutionalized in ways that undermine the citizenship of people living in the Niger Delta, who are effectively treated as aliens on whom policies and political processes are imposed whether they like them or not. Thus, a spokesperson for the Movement for the Emancipation of the Niger Delta argued that discussions must go beyond "mere provision of electricity and water" and focus on the political marginalization of the Ijaw because "we believe that we have to seek first our political freedom and every other thing will follow" (Ofehe, 2009). This element is also found in two communiqués of another local group (Table 7.3b).

People of the Niger Delta are viewed in this narrative as *victims* and other actors as villains (Table 7.4a). For example, Saro Wiwa (1992) wrote that:

"I have watched helplessly as they (the local communities) have been gradually ground to dust by the combined effort of the multinational oil company, Shell Petroleum Development Company, the murderous ethnic majority in Nigeria and the country's military dictatorships".

Central to this is the almost exclusive dependence of the Nigerian state on a single commodity – crude oil:

"The political crisis in Nigeria is mainly about the struggle for the control of oil... resources which account for over 80% of GDP, 95% of national budget and 90% of foreign exchange earnings. Of which 65%, 75% and 70% respectively are derived from within the Ijaw nation" (Ijaw Youths of the Niger Delta, 1998).

So the interests of oil companies play a greater role in government policy than those of farming and fishing communities in the Niger Delta which harvest renewable provisioning services of ecosystems that feature strongly in the local narrative:

"The results of such unchecked environmental pollution and degradation are that (i) The Ogoni can no longer farm successfully: once the food basket of the eastern Niger Delta, the Ogoni now buy food (when they can afford it). (ii) Fish, once a common source of protein, is now rare. Owing to the constant and continual pollution of our streams and creeks, fish can only be caught in deeper and offshore waters for which the Ogoni are not equipped. (iii) All wildlife is dead. (iv) The ecology is changing fast. The mangrove tree, the aerial roots of which normally provide a natural and welcome habitat for many a sea food is now being gradually replaced by unknown and otherwise useless plants" (Movement for the Survival of the Ogoni People, 1991).

Central to the solution element of the narrative is for local people to *control their resources* (Obi, 2007), and this inspires agitation for concessions in respect of self-determination, regional autonomy and resource control (Ifeka, 2001; Ikelegbe, 2006). This text is found in virtually all community communiqués and texts, including the Kaima declaration, the Oron Bill of Rights (Table 7.4c) and the Ogoni Bill of Rights:

"The Ogoni people demand political autonomy as a distinct and separate unit within the Nigerian nation with full right to (i) control Ogoni political affairs; (ii) use at least fifty per cent of Ogoni economic resources for Ogoni development; (iii) protect the Ogoni environment and ecology from further degradation; and (iv) ensure the full restitution of the harm done to the health of our people by the flaring of gas, oil spillages, oil blow-outs, etc. by the ... oil companies... and their Nigerian accomplices" (Movement for the Survival of the Ogoni People, 1991).

Implicit in this demand for autonomous resource control is that local communities possess the requisite knowledge to manage their environments. Reference is made to the

idea that their forefathers who first inhabited the Delta had traditional knowledge which has been passed down to their successors.

One thing missing from the local narrative is any acknowledgement that local communities degrade wetland ecosystems. During field observation, I did see local people using chemicals for fishing.

7.2.3 *Corporate Narrative*

The other principal group of land users is the corporate sector. The longstanding corporate narrative has been one of exploiting untapped natural resources of the Niger Delta in the interests of *development* of the country and the region. For example, according to the Managing Director of ExxonMobil Nigeria, Mark Ward:

"Nigeria's hope for realizing growth and creating new jobs is to put in place an enabling environment for investment in the oil and gas industry and now is the time for government and the industry to partner and achieve this vision" (Tene, 2012).

However, in response to criticism in the local narrative a new corporate narrative has evolved which incorporates additional features.

The first new element is *lack of culpability* (Table 7.5b). Shell Petroleum Development Company, the main oil company operating in the region, claimed in 2009 that it is not responsible for some 80% of the pollution in the oil-rich wetlands area (Cable News Network, 2009).

This is supported by an assertion of *criminality*, e.g. Mutiu Sunmonu, Managing Director of the Shell Petroleum Development Company of Nigeria (SPDC) has said that:

Table 7.5. Texts Representing Internal Aspects of the Corporate Narrative.

a. Exploiting Resources for Development

i. Expressing dismay that in the last 20 years Nigeria has declined in its exploration activity. Managing Director of Total Nigeria, Guy Maurice, noted that the capacity of the Nigeria to renew its exploration activity will determine the nation's energy future (Total, 2012).

ii. Mark Ward (ExxonMobil Nigeria): "Nigeria's hope for realizing growth and creating new jobs is to put in place an enabling environment for investment in the oil and gas industry and now is the time for government and the industry to partner and achieve this vision" (Tene, 2012).

b. Lack of Culpability

i. Shell Petroleum Development Company claimed it is not responsible for some 80 percent of the pollution in the oil-rich wetlands area (Cable News Network, 2009).

c. Corporate Sector as Heroes

i. Chevron (2011): "Chevron will be joining the U.S. Agency for International Development in contributing \$50 million to the Niger Delta Partnership Initiative (NDPI) Foundation, which Chevron established to address the socioeconomic challenges facing the area. Chevron's \$25 million commitment is drawn from a \$50 million endowment we created in 2010 to launch the NDPI Foundation. Since 2005, Chevron has provided funding to the Niger Delta Development Commission, a government agency tasked with the responsibility of developing the Niger Delta [This has] generated approximately 200 projects in more than 400 communities, villages and chiefdoms and benefited some 600,000 community members. CNL supports the process by providing funding for governance, administration, and project and partner costs. Local Nigerian non-governmental organizations (NGOs) are essential to the process. NGOs are providing technical assistance and are helping to resolve conflicts that arise in the communities" (Chevron, 2011).

ii. Shell International Petroleum Company (1993): "We have a programme of continuing improvement to facilities and environmental performance, and of community assistance in infrastructure, health, agriculture and education ... This commitment is not cosmetic or token, it is something which has been established over many years Although community development is a responsibility of government, SPDC has been running formal community assistance programmes for more than 25 years. These are carried out in consultation with the communities. They include building roads, providing water and health facilities, assisting with agricultural development and offering educational scholarships"

iii. Total (2006): "contributing to the development of communities where [we] operates and their neighbours. The company provides skills development for youths, scholarship awards, upgrades of educational infrastructure, water supply, electricity, health, roads, income generating projects and agriculture. More projects will be undertaken in the coming years to ensure sustainable development of the host communities".

Table 7.6. Texts Representing External Aspects of the Corporate Narrative.

a. Criminality

- i. Mutiu Sunmonu, responding to a UNEP report on assessment of oil spills in Ogoniland: "What is happening in Ogoniland is however not typical of the rest of the Niger Delta. SPDC stopped producing oil in Ogoniland in 1993 and shut down oil production there because of threat and violence against our staff and facilities. Much of the oil field equipment have either been vandalized or stolen. And SPDC joint venture facilities there are subject to multiple attacks by oil thieves. In the first four month of 2011 for instance, there were 8 separate attacks on SPDC joint venture pipelines which cross Ogoniland resulting in social disruption, damage to the environment and loss of revenue to the country. Though UNEP does not comment on the causes of spill in the report, a UNEP report from summer 2010 made it clear that theft and illegal refining is causing widespread environmental damage in Ogoniland (Sunmonu, 2011).
- ii. Royal Dutch Shell (2012b): "Urgent action is still needed to tackle the oil theft and illegal refining by criminal gangs which continue to cause the majority of spills. Although mostly occurring in a few areas, the environmental impact of these activities is severe. In one case, in the Imo River area, we chose to shut down our operations in 2011 because of the environmental and social damage these oil thieves were causing."

b. Poverty

- i. Royal Dutch Shell (2010): "Why do these illegal activities continue? These men do it to survive, but they don't earn much. Poverty in the Niger Delta is widespread. The real winners are the organized criminal gangs."

c. Failure of State Institutions

- i. Royal Dutch Shell (2012b): "Around 80% of this continuous flaring took place in Nigeria, where the security situation and lack of government funding has previously slowed progress on projects to capture the gas."
- ii. Mutiu Sunmonu (2011): "We also need the authorities to take concerted action to curb the illegal activities, in particular oil theft and refining, that are exacerbating so many of the environmental and social issues. Unless these activities are brought to a halt, any action we take will be of limited impact. until effective action is taken to curb all illegal activity there is little that can be done to bring an end to the problem of spill, we are talking with our partners, government and NGOs about how to solve this problem and SPDC will work with the Nigerian government on the next step to help clean Ogoniland" (Sunmonu, 2011).

"Crude theft is terrible for the environment, a lot of spills are occurring because of violence and vandalism, a lot are occurring because of crude theft" (Royal Dutch Shell, 2010).

This has been repeated in other texts by Mr Sunmonu and by the parent company, Royal Dutch Shell (Table 7.6a).

Criminal behaviour is facilitated in two ways, according to the narrative. First, by the *poverty* of local people, which causes them to cooperate with organized criminal gangs:

"Why do these illegal activities continue? These men do it to survive. They don't earn much. Poverty in the Niger Delta is widespread. The real winners are the organized criminal gangs" (Royal Dutch Shell, 2010).

Second, by the *failure of state institutions*, though the language used is less critical than that used to describe local communities. For example, in its 2011 sustainability report, Royal Dutch Shell (2012b) reported that:

"In Nigeria, the security situation and lack of government funding has previously slowed progress on projects to capture the gas."

From such statements it is clear that the corporate narrative portrays the various actors differently. Local communities are *villains* who engage in illegal oil theft and sabotage despite receiving a lot of support from corporate actors. The government is perceived as *incompetent*, owing to the failure of state institutions, and at the same time as a *partner* together with non-governmental organizations. Corporate actors are portrayed as *heroes* who are trying to correct local and government failures by providing development to the local communities and cleaning up spills not caused by their activities. According to Chevron (2011):

"Chevron will be joining the U.S. Agency for International Development in contributing \$50 million to the Niger Delta Partnership Initiative (NDPI) Foundation, which Chevron established to address the socioeconomic

challenges facing the area. Since 2005, Chevron has provided funding to the Niger Delta Development Commission, a government agency tasked with the responsibility of developing the Niger Delta The memorandums have generated approximately 200 projects in more than 400 communities, villages and chiefdoms and benefited some 600,000 community members".

Shell communicates this element of the narrative too (Table 7.6c)

Oil companies portray themselves as *victims*, e.g. "We face various risks in our Nigerian operations. These risks include security issues surrounding the safety of our people" (Royal Dutch Shell, 2012a).

Two solutions are recommended in the narrative. First, further exploitation of crude oil in the Niger Delta will ensure *economic growth* that will help solve the social and economic problems faced by Nigeria and the Niger Delta. Second, local people are uneducated and poor, with primitive institutions, and need *education* to improve their environmental awareness, and capacity to sustainably manage the environment:

"There has got to be a lot of education there.....for the people to appreciate what this is doing to the environment and what it is doing to their economy" (Royal Dutch Shell, 2010).

7.2.4 *Non-Governmental Organization Narrative*

The narrative of non-governmental organizations views problems in the Niger Delta as a *human rights/environmental justice* challenge which requires their advocacy (Table 7.7a). This narrative is generally critical of the Nigerian state. For example:

"The Government of Nigeria bears significant responsibility for the impacts of oil pollution in the Niger Delta. The government has failed to enforce existing laws and regulations to prevent pollution and hold the oil industry to account, meaning they are freely flouted by companies like Shell without any concern for the consequences" (Amnesty International, 2012)

“The Niger Delta has for some years been the site of major confrontations resulting in extra-judicial executions, arbitrary detentions, and draconian restrictions on the rights to freedom of expression, association, and assembly” (Human Rights Watch, 1999a).

This narrative is also critical of the multinational oil companies. In 2009, the Socio-Economic Rights and Accountability Project (SERAP) brought a case before the ECOWAS Community Court of Justice against the Federal Government and six oil companies over alleged violation of human rights and associated oil pollution in the Niger Delta. SERAP, had alleged that:

“Violations of the right to an adequate standard of living, including the right to food, to work, to health, to water, to life and human dignity, to a clean and healthy environment; and to economic and social development – as a consequence of: the impact of oil-related pollution and environmental damage on agriculture and fisheries; oil spills and waste materials polluting water used for drinking and other domestic purposes; failure to secure the underlying determinants of health, including a healthy environment, and failure to enforce laws and regulations to protect the environment and prevent pollution” (SERAP, 2010).

Yet, this narrative also portrays the oil multinationals as helpless victims of a *weak Nigerian state* (Table 7.8a). So Human Rights Watch (1999) stated that:

“The multinational oil companies operating in Nigeria face a difficult political and economic environment, both nationally and at the level of the oil producing communities where their facilities are located.”

Table 7.7. Texts Representing Human Rights and Government Aspects of the Non-Governmental Organization Narrative.

a Human rights/environmental justice challenge

- i. "This report is an exploration of human rights violations related to oil exploration and production in the Niger Delta..... The Niger Delta has for some years been the site of major confrontations resulting in extra-judicial executions, arbitrary detentions, and draconian restrictions on the rights to freedom of expression, association, and assembly (Human Rights Watch, 1999b)
- ii. Human Rights Watch (1999) found: "repeated incidents in which people were brutalized for attempting to raise grievances with the companies; in some cases security forces threatened, beat, and jailed members of community delegations. Most of the companies cited in the report failed publicly to criticize security force abuses related to their operations."
- iii. Popular actress and activist: "Oil pollution has destroyed the livelihoods of tens of thousands of people who depend on the environment to make a living and feed their families" (Jalade-Ekeinde, 2012).

b Government and corporate entities bear significant responsibility

- i. "The Government of Nigeria bears significant responsibility for the impacts of oil pollution in the Niger Delta. The government has failed to enforce existing laws and regulations to prevent pollution and hold the oil industry to account, meaning they are freely flouted by companies like Shell without any concern for the consequences" (Amnesty International, 2012)
- ii. "We want to highlight the need for the multinational oil companies to stop the devastation of the Niger Delta and for the Nigerian government to enact laws that will compel them to respect the people and their environment," (Olukoya, 2001)
- iii. "Shell must face up to the overwhelming body of evidence demonstrating that for decades the company has failed to properly prevent or address oil pollution in the Niger Delta, leaving communities exposed to sustained violations of their economic, social and cultural rights. The company cannot continue to make excuses – affected communities need a comprehensive clean up of pollution and proper compensation for what they have lost" (Amnesty International, 2012)
- iv. Niger Delta Youth Parliament: "The crime against the people of the Delta was made possible only through a pattern of collaboration that took place over the heads of the indigenous peoples, collaboration between exploiting petroleum companies, backed by corrupt regimes that held sway at the critical point of intersection between exploitation and resource environment" (Akasike, 2012).

Table 7.8. Texts Representing Oil Company, Internal and Sustainable Development Aspects of the Non-Governmental Organization Narrative.

a. Oil multinationals as helpless villains

i. "The multinational oil companies operating in Nigeria face a difficult political and economic environment, both nationally and at the level of the oil producing communities where their facilities are located (Human Rights Watch, 1999a)"

ii. One of the major factors that led to these massive protests had to do more about the issue of mismanagement, corruption and bad governance in the sector. So, there was a need for government to address those issues of accountability and so on. This will greatly enhance the activities of the oil multinationals.

b. NGOs as well intentioned groups

i. "[We are] dedicated to the study, conservation and management of the natural resources of the Niger Delta and to the improvement of the quality of life of its people" (Niger Delta Wetland Centre, 2012).

ii. "[We are] a voluntary Non - Governmental organization. working in the swamps to confront the challenges to protect the Niger Delta communities and environment. engaged in a working collaboration with other local and foreign NGOs, government/private sectors, towards preserving and conserving natural resources and the general environment, and striving to achieve sustainable development" (FEPEN, 2008).

c. Sustainable development as panacea

i. "[We are] a Non-Governmental Organization clearly committed towards promoting environmental conservation and sustainable development in the Niger Delta Region (Save Earth Nigeria, 2010)

The main solution recommended in this narrative is a call for sustainable development (Table 7.8c). Thus in 2004, a group of NGOs under the coordination of the Earth Right Institute established a Niger Delta Fund Initiative as a solution to the Niger Delta problem with the objective of:

“a transparent and equitable distribution of resource rents and royalties for integrated restoration and sustainable development of Nigeria's oil bearing communities” (Earth Rights Institute, 2004).

The non-governmental narrative focuses on all ecosystem services, but tends to place emphasis on those services with global benefits, such as biodiversity:

“Both at this local level and at the national and global levels, people are recognizing the need for formal protection of significant portions of land to ensure that there are places where natural resources in the form of ecosystems and biodiversity are kept in their natural state, and to prevent the kinds of deterioration that leads to erosion, flooding, and water and air pollution and conflict” (Niger Delta Wetland Centre, 2012).

7.2.5 *Multilateral Organization Narrative*

The narrative of multilateral organizations recognizes that there is a crisis in the Niger Delta but is more even-handed than NGOs in identifying causes (Table 7.9). Multilateral organizations portray themselves as non-political, non-ideological and *non-partisan intermediaries* in tackling the crisis. For example, the UN Environment Programme (2011) referred in a study of oil spills in Ogoniland to:

“Lack of trust between actors; political tensions between communities; regional and national governments;.... UNEP in the end agreed to undertake the study as it represented the only tangible option for possibly breaking the decades of deadlock”.

Table 7.9. Texts Representing the Multilateral Organization Narrative.

- a. "We were confronted with a unique challenge: lack of trust between actors; political tensions between communities; regional and national governments; gaining access to Ogoniland; security considerations and technical and logistical challenges. Despite imperfect conditions, UNEP in the end agreed to undertake the study as it represented the only tangible option for possibly breaking the decades of deadlock while providing the government and stakeholders with a potential foundation upon which trust might be built and action undertaken to remedy the multiple health, environmental and sustainable development issues facing millions of people in Ogoniland and beyond" (United Nations Environment Programme, 2011).
- b. "The report examines the major obstacles to sustainable development in the Niger Delta and presents strategic options for overcoming them. Sustainable development will require a balance between accelerated economic growth and environmental protection to ensure that the people of the Niger Delta benefit as much as possible from the exploitation of their resources" (World Bank, 1995).
- c. "This new support demonstrates the importance the EU attaches to its relations with Nigeria as the dominant political and economic force in West Africa and a key player on the African continent. The grant will assist Nigeria to consolidate peace in the Niger Delta, improve governance, reduce poverty and make progress towards the attainment of the Millennium Development Goals" (European Commission, 2012).

In the multilateral narrative lack of accountability and transparency has led to a general lack of trust. This explains the mindset behind a project in the Niger Delta funded by a national development aid agency which aims to:

“Strengthen transparency and accountability in the Niger Delta beginning with selected LGAs and diverse communities in the states of Delta, Bayelsa and Rivers” (Department for International Development, 2012).

The World Bank (1995), in one of its earliest reports on the Niger Delta crisis, recommended a “middle way” solution:

“Sustainable development will require a balance between accelerated economic growth and environmental protection to ensure that the people of the Niger Delta benefit as much as possible from the exploitation of their resources”.

A similar approach was taken recently by Andris Piebalgs, European Commissioner for Development, in describing a new EU funding programme:

“The grant will assist Nigeria to consolidate peace in the Niger Delta, improve governance, reduce poverty and make progress towards the attainment of the Millennium Development Goals” (European Commission, 2012)

Also inherent in the multilateral narrative, and in the above quotation, is the idea that Nigeria is a developing country needing assistance.

This narrative ignores the role of imperialism in both the exploitation of resources in the wetlands and in lending support to the state and multinational oil corporations.

7.2.6 *Academic Narrative*

The academic narrative is the most disinterested of all narratives described here. It portrays the Niger Delta environment as a *complex system* comprising both complex

ecosystems and interdependent multiple uses and users, about which knowledge is very limited (Table 7.10a). For example, Twumansi and Merem (2006) stated that:

“Current attempts to assess the state of the environment and the environmental stewardship of economic development along the Niger Delta ecosystem are often handicapped by the lack of complete access to a comprehensive regional environmental information system.”

This narrative generally avoids dogmatic characterizations of actors. Instead it recognizes that all actors have a tendency to be classed as victims, villains or heroes, depending on the perspective. Thus, Michael Watts (2008) has stressed that both local people and oil companies contribute to the Niger Delta crisis:

"The field of violence operates at a number of levels. There are a number of insurgent groups engaged in armed struggle against the state and the oil companies. There are also inter-community (both inter-ethnic and intra-ethnic) conflicts, often driven by land and jurisdictional disputes over oil-bearing lands (and correspondingly over access to cash payments and rents from the oil companies). Oil companies have a long history of doing very little in the name of community development. It was only in the wake of Ken Saro-Wiwa's death that significant resources were deployed, but the rhetoric of corporate social responsibility obscures a much more pernicious set of practices.”

Chatham House (2012) emphasizes the *duality* of the Nigerian government:

“While outwardly Nigeria projects an image of power, influence and control, its inward reality contradicts this. Despite a huge domestic market and great entrepreneurial acumen, the country is held back by corruption, poverty and unaccountable government. Institutions often lack the capacity to deliver public services to the people”.

Table 7.10. Texts Representing the Academic Narrative.

a. *Complexity and Uncertainty*

i. Current attempts to assess the state of the environment and the environmental stewardship of economic development along the Niger Delta ecosystem are often handicapped by the lack of complete access to a comprehensive regional environmental information system. The design of a regional environmental information system on the ecology of the Niger Delta will serve as a decision support tool for policy makers, oil sector and research by facilitating data collection capabilities of users and access to a state of the art technical infrastructure of relevance to the management of the coastal zone (Twumasi and Merem, 2006)

ii. While the Nigerian government's approach to the militant agitation linked to the natural resources conflict is cosmetic, it appears to be completely silent on the issue of climate change to which the region has been exposed because of the natural resources exploration. Nigeria does not appear to have considered any policies apropos climate change or global warming (Ayodele, 2010).

b. *Multiple Actor Labels*

i. "The field of violence operates at a number of levels. There are a number of insurgent groups engaged in armed struggle against the state and the oil companies. There are also inter-community (both inter-ethnic and intra-ethnic) conflicts often driven by land and jurisdictional disputes over oil-bearing lands (and correspondingly over access to cash payments and rents from the oil companies). Oil companies have a long history of doing very little in the name of community development. It was only in the wake of Ken Saro-Wiwa's death that significant resources were deployed but the rhetoric of corporate social responsibility obscures a much more pernicious set of practices" (Watts, 2008).

ii. "Impacts from drilling and field development include land taken for access and locations and flaring of gas, disposal of wastes, chemicals and sludge and spills. Since the majority of the local population depend on rapid logging of forests for survival, the concept of sustainable management arouse less enthusiasm. The political system at both local and national levels failed to provide any form of sustainable development for the majority of the population" (Joab-Peterside, 2007).

iii. "While outwardly Nigeria projects an image of power, influence and control, its inward reality contradicts this. Despite a huge domestic market and great entrepreneurial acumen, the country is held back by corruption, poverty and unaccountable government. Institutions often lack the capacity to deliver public services to the people" (Chatham House, 2012).

The academic narrative often emphasizes the need to *quantify* corporate impacts on various ecosystem services, but has so far not addressed the uncertainties involved. Recommended solutions include both *techno-centric* and *participatory* approaches (Okoh, 2007; Twumasi and Merem, 2006).

7.2.7 *Media Narrative*

The mass media have given extensive coverage to the Niger Delta since the return to democratic rule in 1999. The media narrative portrays the challenges facing the Niger Delta as a conflict between two sides – the elite minority and the poor majority. In this view, the elites of society are responsible for the problems in the Niger Delta because they only seek to enhance their own economic fortunes.

So the media narrative portrays the Niger Delta as a classic case of failure of leadership and corruption. Thus, in an editorial, The Nigerian Tribune (2012) wrote:

“In Nigeria, oil has been of benefit mostly to members of a tiny elite and the companies that have worked with them. Oil has become a weapon of oppression by the ruling class and the few individuals referred to as “the oil cabal”.....Oil has been exploited in Nigeria always against the majority interest”.

The media narrative often juxtaposes competing claims without making any effort to look for the truth behind the claims. Although media narratives often stress the complexity of the situation, and draw upon the views of all sides, myths such as “reliable source or informant” are used to downplay and cover up, their inability to effectively investigate and explain claims made by competing sides.

7.2.8 *Discussion*

These diverse narratives, summarized in Table 7.11, illustrate how groups compete for discursive hegemony in the Niger Delta, and to be recognized as the 'normal' way of understanding the challenges facing the region. Diplomatic attempts to resolve this

Table 7.11. Summary of Niger Delta Wetland Narratives.

Narrative type	Problem definition	Solution	View of other actors	Downplayed or left unsaid	Land management focus
Government narrative	Niger Delta problems, while magnified by extreme environments, are typical of development challenges faced by all nations.	Continuing economic development is the key.	Current problems will be solved by working with all other actors as partners.	Myths, such as "Rome was not built in a day", are used to hide inadequacies.	Provisioning services and oil.
Local narrative	Colonial and neo-colonial domination is at the root of environmental degradation, economic injustice and alienation of citizens in the Niger Delta.	Local people should control wetland ecosystem services as they own the wetlands and have traditional knowledge needed for management.	Government and other actors have connived to impoverish the Niger Delta. Local people are victims. So government, multinational companies and other actors are morally obliged to provide development assistance.	The role of local people in degrading wetlands is not acknowledged.	Provisioning and regulating ecosystem services.
Corporate narrative	Local people are uneducated and poor, and so engage in criminal practices that lead to environmental degradation and other socio-economic problems which government is not tackling. Oil companies are not culpable.	Enhancing oil production in the Niger Delta will provide economic growth to solve the region's problems. Locals must be educated to improve environmental awareness and national patriotism.	The corporate sector are heroes working with other actors to improve living standards in the Niger Delta. They are also victims of kidnapping and attacks. Locals are dangerous and untrustworthy. Government is trying to enforce the law but is failing.	Operational spills and leakages are downplayed.	Crude oil extraction.
Non-Governmental narrative	The Niger Delta faces major environmental justice and human rights challenges as a result of international capitalism and a weak Nigerian state.	Sustainable development.	NGOs are well-intentioned groups dedicated to making the world a better place for the poor, marginalized and downcast by being advocates for them. Social elites cause problems in the Niger Delta to enhance their own economic fortunes.	Colonial and neo-colonial links of NGOs are downplayed.	All ecosystem services.
Multilateral Organization narrative	The Niger Delta crisis results from political tensions and a general lack of trust.	Sustainable development, by balancing economic growth and environmental protection, will reduce poverty and conflict.	Multilateral organizations are non-political and non-partisan groups who can be intermediaries between other actors.	A neo-liberal approach to ecosystem services, and the ambiguity of 'sustainable development', are both downplayed.	Oil and all ecosystem services.
Academic narrative	Socio-economic and environmental problems in the Niger Delta have many causes. Degrading activities of locals and oil companies are only one side of the story. Other factors, such as climate change and flooding, are important too.	Technological solutions and participatory approaches are both important.	All actors can be classed as victims or villains. It is best to avoid general categorizations.	Uncertainty of their data and information.	All ecosystem services.
Media narrative	A two sided conflict between the elites and the masses. In their bid to enhance their economic fortunes, the elites who are also the leaders have compromised the integrity of the Niger Delta environment.	A need for national referendum to enable all ethnic nationalities determine how to	The elites who are the minority are "bad", while the masses are helpless. The media is non-partisan and tell the story from a neutral perspective with the aim of uncovering the truth.	Reliability of information is downplayed, using myths such as "a reliable source"	Oil.

contest, by recognizing the existence of more than one plausible interpretation of reality, often require considerable ambiguity. If, however, the diversity of narratives is embraced it sheds much valuable light on the processes underlying these environments of conflict.

7.3 Analysis of Actors' Narratives

I then undertook interviews to see how these public narratives correspond to the everyday narratives of individuals and draw inferences about their discourses. The competing public narratives of the Niger Delta, reviewed above, would normally be expected to fully coincide with the narratives of actors representing the relevant groups. However, given the ambiguity and complexity of the Niger Delta, and the networking of actors, I also tested for more complex linkages.

7.3.1 Information on Interviewees

The unit of analysis for interviews was the "organization". To represent the diversity of organizations involved in managing the Niger Delta wetlands actors were divided into seven main organizational categories (the number of informants are shown in brackets): government (15), local (11), corporate (5), non-governmental organization (6), academia (3) multilateral organization (1) and media (1) (Table 7.12).

At least one person from each organization was interviewed, and this was usually the person within the organization who takes decisions about managing the Niger Delta wetlands. Forty-two semi-structured interviews were held. For some organizations more than one informant was interviewed, but analysis here is based on the interview with the most senior official. Thus, two National Oil Spill Detection Agency staff were interviewed - a director and a chief scientific officer - but analysis here is based on the responses of the director, who is the senior of the two.

Of the forty two informants 88% were male and 12% female, with a mean age of 49 years. This mirrors the male-dominated public and private sectors in Nigeria. Of these respondents (including locals), 69% have at least a university first degree.

Table 7.12. Information on Interviewees.

Actor category	No. of Informants	Mean Age	Sex M:F (%)	Average years of education ¹	Average number of years with organization	Organizations (No. of interviewees in brackets if >1)
Government	15	47	93:7	20	9	Bayelsa State Ministry of Environment; Nigerian National Petroleum Corporation; National Oil Spill Detection Agency; Community and Social Development Agency; Federal Ministry of Culture and Tourism; Federal Ministry of Niger Delta Affairs; Federal Ministry of Water Resources; Niger Delta Development Commission; National Environmental Standards and Regulations Enforcement Agency Federal Ministry of Environment (3); Ministry of Agriculture (2)
Local community	11	50	82:18	3	13	Chairman Timber Dealers Association; Chairman Hunters Union; Vice Chairman Fishermen Union, Youth leader (2), Community Head and two elderly community leaders (male and female).
Non-governmental organization	6	47	71:29	18	7	Living Earth Nigeria; MPO Dore; Nigerian Conservation Foundation; Niger Delta Wetland Centre; Pro-Natura International (Nigeria); WWF/Wetland International
Multilateral organization	1	49	100:0	22	10	United Nations Development Programme
Corporate	5	52	100:0	20	10	Shell Petroleum Development Company (3); Yenagoa Oils Resources (Nigeria) Ltd; Bavaria Enterprises Nigeria Ltd
Academia	3	47	100:0	19	8	Rivers State University of Science and Technology and Niger Delta University (2)
Media	1	47	100:0	14	15	Journalist
Total	42	49	88:12	17	10	

¹Years of education was calculated as follows: no formal education (0); primary (6); secondary (12); OND (14); HND and BSc (16); MSc (18); PhD (22).

This profile resulted from placing emphasis on interviewing people who have significant decision making responsibility and are highly involved in the mission of their organization in the Niger Delta. No official interviewed was below level 8 (senior cadre). (Administrative officers at grades 1-7 are junior staff (such as clerks, drivers, typists, security personnel and cooks), while levels 8 – 17 are regarded as senior administrative staff. Level 17 is the peak of the Nigerian civil service and includes directors or permanent secretaries.)

Informants have worked for their organizations for 10 years on average, and so had sufficient knowledge to understand and respond to questions. None of the local respondents hold a university degree, but have lived most (if not all) of their lives in the Niger Delta region and are very knowledgeable about how things work there.

Informants were asked about their organization's activities in the Niger Delta wetlands; their ideas and understanding of what constitutes a wetland and the benefits it provides; their perceptions of challenges facing the Niger Delta region and solutions to these challenges; interactions between organizations; and perceptions of trust, influence and importance of other organizations (Appendix 5.2). The names and organizational affiliations of informants are withheld, as explained in Chapter 5.

7.3.2 *Government Actors*

As expected, the government narrative was the most popular among the fifteen government informants, being adopted by fourteen of them (93%). However, one member of this group did not use the government narrative. This might be because the organization he represented had been established as a World Bank funded project and had only been recently converted into a government agency.

The most popular additions/alternatives were the multilateral organization narrative, adopted by eleven informants (73%), the non-governmental organization narrative, adopted by eight informants (53%) and the corporate narrative, adopted by eight informants (53%) (Table 7.13). Two informants adopted six of the seven narratives, another two adopted five narratives, three adopted four narratives, four adopted three narratives, three adopted two narratives, and one actor had only one narrative.

Typical of the government informants exhibiting six narratives was GOV8, who emphasized the government's attempts to secure economic and infrastructural development in the Niger Delta region:

“Government provides medical services for the aged and children; education is free; and the state government pays for all candidates sitting for NECO and WAEC examinations. Workers in state organizations, in addition to having their regular salary paid monthly, earn double salary in December. The people are now seeing the benefit of government; all this is from oil money.”

“Although I cannot say we are there yet, you need to know that successive governments have tried to stem the crisis in the Niger Delta and this government in particular, together with various foreign partners, have done a lot for the Niger Delta region At least people can also see the effort and investment made into the Amnesty programme There can be no meaningful development without peace. Let them give government time; government needs time to right the wrong that has been done for many years. After all Rome was not built in a day. We are not there yet, but by God's grace we shall get there.”

GOV8 also exhibited use of the corporate narrative, by downplaying the role of the oil companies in degrading the Niger Delta environment. Indeed, he ranked social problems over environmental degradation as the main challenge facing the region:

“Sustainable development will require a balance between accelerated economic growth and environmental protection to ensure that the people of the Niger Delta benefit as much as possible from the exploitation of their resources”.

“The agitation, kidnapping and bombing go hand in hand. Most of the suspects, currently in various cells across the commands, who were arrested for kidnapping, have confessed that there is no crime they cannot commit, as far it will fetch them money. So don't be surprised that this set of people, if allowed to be in society, can be used to cause terrorism like using explosives.”

“Some of the companies are trying I know. They have supported us in building community health centres throughout the Niger Delta. This benefits people in the regions, many of whom live in remote villages and easily die from treatable diseases like malaria. Shell also have a scholarship dedicated to Niger Delta students alone.”

Table 7.13. Actors and their Narratives (by number).

Actor Category	Number of Actors	Narratives Held by the Specified Number of Actors						
		Government	Local	Corporate	Non-Governmental Organization	Multilateral Organization	Academic	Media
Government	15	14	5	8	8	11	3	4
Local	11	4	11	2	4	3	1	1
Corporate	5	2	1	5	3	3	3	0
Non-Governmental Organization	6	1	4	3	6	6	4	0
Multilateral Organization	1	1	1	0	1	1	1	0
Academic	3	0	3	0	2	2	3	0
Media	1	1	0	0	0	0	0	1
Total	42	23	25	18	24	25	15	6

The same informant also used the local narrative. While calling for the cooperation of the local people to enable government to pursue its development objectives in the region, he argued that the present money from the Derivation allocated to the region will not make much impact. As such he suggested that in the long run the government should look into increasing the Derivation or granting the people control over their resources:

“These states (Niger Delta states) simply do not have enough money to meet basic needs. The truth of the matter is that the oil-bearing states of the Niger Delta need more funds to develop the area. Government will have to plan to increase Derivation to the Niger Delta and later allow all states to control their resources.”

His suggested solutions to the problem included:

“Strengthening governance practices and institutions that engender an environment that promotes accountability and transparency [and] liberalization of the downstream oil sector in order to attract investors.”

This is consistent with the non-governmental narrative which suggests that government is corrupt and economic liberalization is needed. He also suggested

“A need to set up an organization to promote probity, transparency and accountability in governance of the Niger Delta”.

This is consistent with the multilateral organization narrative that portrays the crisis in the Niger Delta as a general lack of trust among actors.

Other informants adopted the corporate and non-governmental narratives on the weakness of government. For example:

"A lot of staff are ready to work but don't have the training.....Personnel costs remain high, leaving no funds for other expenses such as training. If they can provide us with the training abroad and give us enough attention our agency can stop this destruction (in the Niger Delta)" (GOV9).

"Even if the best legislations are enactedthis will not improve the status of our environments. We lack the transparency and political will in government" (GOV23).

An interesting use of the partnership element of the government narrative was displayed in explaining to local people the government's relationship to the oil companies:

"There was a time when we visited a community in the Delta. They complained and we told them that the oil companies are visitors to the Nigerian government, so we cannot send them away. This is what I always tell them when they want me to stop oil production. It is like a son chasing away his father's visitors. It is not possible" (GOV6).

7.3.3 *Corporate Actors*

All five corporate informants adopted the corporate narrative. Three also adopted the academic, multilateral and non-governmental narratives, two adopted the government narrative and one adopted the local narrative. None adopted the media narrative. Three informants adopted four of the narratives, while the remaining two adopted two narratives.

The responses of one of the corporate actors with four narratives, identified as BUS2, are now discussed to highlight how his narratives were identified. He referred to various

aspects of the corporate narrative, especially those emphasizing the role of oil theft and sabotage in the degradation of the wetlands, downplaying operational leaks and emphasizing the contribution of the corporate actors in the development of the Niger Delta region:

"These adverse fallouts of petroleum production have become inevitably synonymous with the Niger Delta environment, but by virtue of the fact that oil production must continue in the region if the tempo of economic development in Nigeria must be sustained, I wonder at times why we can't look around and see how actions of others contribute to the degradation of the environment These people (locals) have their own share of destroying their environment, have you been reading newspapers lately? I will advise you to read what the army is now saying they found out in the creeks of the Niger Delta. Recently, the Joint Task Force unearthed and destroyed over 600 illegal refineries here in the Niger Delta."

"My company is committed to contributing to regional development of the Niger Delta and we spend a lot annually on projects promoting our biodiversity guidelines that ensure protection of the flora and fauna ... In 2005, we spent about \$32 million on community projects in the Niger Delta."

In describing the challenges facing the region, the informant pointed out that there are several factors responsible for degradation of the Niger Delta wetlands. This is suggestive of an academic narrative in which the local community narrative and the corporate narrative are but two sides of a multifaceted story:

"The reasons for this kind of environmental decline are numerous and complex, Population factors also play a significant role. Today, the population of the Delta has increased significantly compared to what it was when oil was discovered here. So it is not a single factor, it is the combined effects of booming population growth and economic and technological development that are threatening the wetlands."

The informant also refers to the failure of government institutions in influencing the current state of compliance of the oil companies to existing institutions:

"The lack of genuine commitment on the part of our leaders has slowed down a genuine drive toward making right the wrong that has been done for many years. Even when the companies want to act, the laws are just not there ... There is too much confusion among the regulators, they all operate different legal regimes. This patchwork of several incompatible and conflicting laws is causing more problems than it is able to solve The oil companies receive the blame but we forget that they can only operate within the laws of the federal republic of Nigeria."

Yet BUS2 also adopts the government narrative by praising the government and highlighting its efforts in developing the Niger Delta region:

"The on-going efforts of the Federal Government to rehabilitate former militants in the Niger Delta are commendable and all hands must be on deck to ensure that the efforts of the government in this regard are not in vain."

Other corporate informants adopted the non-governmental and multilateral narratives on the need for sustainable development as panacea. For example:

"We mobilize resources to promote sustainability in the Niger Delta.... Our biodiversity projects promote sustainable consumption patterns and economic development. We also partner with communities, to develop Biodiversity Action Plans (BAP) to conserve forest reserves" (BUS7).

"Government needs to do more to fight corruption in the oil industry" (BUS8).

7.3.4 *Local Actors*

All eleven local informants adopted the local narrative. Adoption of other narratives was less pronounced: four adopted the government narrative and the non-governmental

narrative, three adopted the multilateral narrative, two the corporate narrative and one the media narrative. One informant adopted five narratives, three adopted three narratives, five adopted two narratives and one adopted just one narrative.

LOC1, an informant with five narratives, is quoted for purposes of illustration. Marginalization of the Niger Delta region, in this informant's view, was evident in its neglect before crude oil was discovered, even by the colonial authorities:

"Most of the early oil prospecting was done in the Onitsha, Oweri, Benin and Ondo areas. Even the government did not see anything good with the Niger Delta then, and they called our area "the white man's grave". But the story changed after they found oil in Oloibiri here in Bayelsa state."

"We know how far [oil companies] go to stop spills in [western] countries. But in Nigeria, oil companies ignore their spills, cover them up and destroy our people's livelihood and environments. All because they want to increase their profit, at the detriment of other people's life."

The neglect continues, despite a recent spill in his community:

"As the community leader, I have not seen anyone in my community since the incident occurred. No NNPC official, no AGIP official has visited us They have destroyed our land, water, palm trees and streams. We are rural dwellers but here, the people have not taken the laws into their hands. If it were not for chiefs and elders here we wouldn't have been calm like this. My people would have acted otherwise but for the community chiefs who calmed frayed nerves. We want a quick response of payment to affected persons and families otherwise we will take our protest to the Presidential Villa, Abuja."

In repeating the government narrative, he was full of praise for government and emphasized the role of environmental constraints:

"The present government has tried, and they seem to have changed their former divide and rule and violent approach to the problem in the Niger Delta. We know there are problems (making reference to the difficult terrain in the Niger Delta) and this government has not shied away from those problems. The state government has made enormous achievements in infrastructural development and opened up those communities that were hitherto difficult to reach, I pray/hope they will do more and we will support them."

Despite this, LOC1 also adopted the corporate narrative when he acknowledged the contributions of the oil multinationals:

"We should also mention areas where they (the oil multinationals) are trying; no matter how little it is.... SPDC awards scholarships to students at post-primary and tertiary levels. They also provided us with pipe-borne water, and with electricity by donating a generator to the community"

By calling for help from foreign governments he also repeated the multilateral narrative:

"The government alone is not capable of curbing the restiveness. so they do need the assistance of foreign governments who can provide technical and logistical support. These foreign people have satellites, so they can see things that are going on that the government doesn't know about."

He further stated that that:

"Government and the oil companies have cheated us for too long"

This is consistent with the non-governmental narrative which suggests that the challenges facing the Niger Delta is a result of longstanding injustice to the local people. Other local informants adopted the non-governmental and multilateral narratives:

"We can achieve one Nigeria based on equity and fairness when the leadership is transparent and accountable to the people" (LOC9).

“We will continue to struggle until they can guarantee our right to live in our environment and meet our livelihoods” (LOC12).

Another informant (LOC6) adopted both the local and corporate narratives, stating that:

"The efforts of local fishermen are yielding far below expectation. Many fishermen were forced out of business for the greater part of the year due to pollution of the Atlantic“.

LOC6, again uncharacteristically, stressed the degrading activity of local community members whom he called “radicals and hawks”. This narrative is more characteristic of the corporate narrative:

"Because of their ignorance and love for money, our people have also joined them in destroying the wetlands which have long been an important part of our life, since the times of our forefathers. Now the wetlands face serious abuse and we are all in serious danger. The people join the oil companies in illegal mining and dumping waste in the wetlands while others have turned them into agricultural fields. The worst destruction these wetlands face is as a result of the current construction of both residential and commercial buildings."

7.3.5 *Non-Governmental Organization Actors*

The non-governmental organization narrative was adopted by all six non-governmental informants. They all also adopted the multilateral organization narrative. Four informants adopted the local community and academic narratives, three the corporate narrative and one the government narrative. One informant adopted six narratives, three informants adopted four narratives, and two adopted three narratives.

NGO4, who adopted six narratives, typifies the non-governmental organization narrative in referring to his organization's work in improving the life of the Niger Delta people:

"Ours is a non-profit organization that carries out research, natural resources management and human development activities. It implements goal-directed project activities for community driven development actions to contribute to the protection of global environment and improve the quality of life and alleviate poverty in the Niger Delta."

The informant also emphasized the failure of government institutions:

"One lesson I have learnt from these episodes in the Niger Delta is that change has to come from the very top. All the environmental laws and legislations have come to naught because they were actually designed to fail. No matter how self-righteous a person is, his effort would always be a drop in the ocean when surrounded by a multitude of political demons. He can only go as far as his boss wants him to go. To combat the continued degradation of the Niger Delta environment, government will need to remove all impediments for all relevant policies to be updated to capture the essence of what is happening to the Niger Delta Region today, without which, the sustainable development in that area would only be a stunted development. No sustainability whatsoever."

The informant also adopted the academic narrative in referring to the diversity of impacts on the wetlands and the potential for scientific solutions:

"Let us leave the problem of the oil companies. What people need to know is that unlike what happened before, there are now a lot of important industrial activities causing pollution here in the Niger Delta. When you visit most of our communities you will see massive logging using heavy machinery. At the same time a lot of agricultural plantations and fish farms are springing up. Apart from this there is the problem of global warming and government is not doing anything about these as well."

"I don't believe policies are the most effective way to get compliance with best practices. It is good to have a policy as a guideline but it will be useful only to those who are already convinced.... We should increasingly

encourage the adoption of selected tools of modern science and technology to energize development activities and empower people to access external resources, such as renewable energy technologies and especially solar energy ... [and] biotechnology applied to selection and domestication of indigenous biodiversity."

The local narrative is also evident in the idea that local communities are victims of connivance between the multinational oil companies and the Nigerian elites:

"Although the Niger Delta has contributed enormously to the Nigerian national economy the people of the Niger Delta have suffered from environmental degradation of their land and the displacement of their communities and have received no benefits from over 50 years of oil extraction. There seems to be connivance between the government and the oil companies, whereby government and oil companies do not replicate what obtains overseas where an industry transforms a whole. This is why resource control agitation needs to be given serious consideration in the Nigerian polity."

The informant's emphasis on the developmental activities of corporate actors is typical of the corporate narrative:

"In places they have provided people with 24 hour electricity and 24 hour water. Even when I am in Abuja, I don't get 8 hours of electricity."

"Shell has adopted an approach that concentrates efforts on promoting economic empowerment, human capital development, healthy living, and basic services in the Niger Delta."

The informant also repeats the government narrative in suggesting that the Niger Delta is facing a developmental challenge that will be overcome:

"This is not the first time we have had a crisis in the Niger Delta I think this latest one is just part of the challenges facing a developing country like ours and we will overcome it also."

By suggesting that "the deregulation of the downstream and upstream sector (of oil production in Nigeria) will also create more jobs for the people (in the Niger Delta) and grow the economy", NGO4 is adopting the multilateral organization narrative which suggests a neo-liberal approach to the management of resources.

Other informants adopted the academic narrative when they suggested:

"Because of their low elevation, the coastal zones are at risk from flooding, rising sea levels and coastal surges" (NGO3).

"There is now agricultural productivity and diversification of the traditional farming patterns by introducing modern approaches. Introduction of mechanized farming and fishing are good for the economy but bad for the environment, the people fertilizer application and indiscriminate spraying pesticides have effect on the environment and their produce" (NGO1).

7.3.6 *Academic Actors*

The academic narrative was adopted by all three academic informants. They all also adopted the local narrative. Two also adopted the non-governmental and multilateral organization narratives, but none adopted the corporate and governmental and media narratives. Two informants adopted four narratives, and one adopted two narratives. The responses of academic informant ACA1, who exhibited four narratives, are used for illustration. This informant stressed that continued failure of the oil industry to conform to regulations was the fault of the government, not the oil companies:

"Shell has adopted an approach concentrating efforts on promoting economic empowerment, human capital development, healthy living, and basic services in the Niger Delta."

"There are laws but no honest people to implement these laws. If you see the Ministry of Environment ... most of them just sit in Abuja. The way the Federal Ministry of Environment is run is wrong; the Ministry should carry the component states along so they can make their inputs."

In the same vein, the narrative of ACA1 used the multilateral narrative when he suggested that:

"The solution is to drive sustainable growth in the region. This will require a good regulatory framework that will attract private sector investment in the region and ensure that the integrity of the environment is maintained with strong focus on people-centred development that respects the needs of the people. In addition to present use, government should promote responsible and sustainable tourism to promote the conservation of the wetlands. This means that the people can also benefit from tourism, because visitors will buy things and pay for various services."

Climate change was expressed as a factor having caused changes in the wetlands:

"The wetlands are now endangered due to climate variability. There was a recent paper that showed that some of the problems we face here in the Niger Delta are actually a result of the poor rainfall regime upstream in Niger."

This is consistent with the academic narrative which suggests that other factors are responsible for the degradation of the Niger Delta environments.

To buttress his use of the local narrative, ACA1 depicted the local people as victims:

"The region holds the most vulnerable people living far below poverty level as shown by recent statistics ... What the Niger Delta needs is an agenda that will put an end to illiteracy, joblessness, poverty, vicious circle of man-made devastation on daily bases"

7.3.7 *Multilateral Organization Actor*

The multilateral organization informant adopted five narratives.

Characteristic of the multilateral narrative, MUL1 praised the effort of his organization, suggesting that it is a non-partisan organization and only "plays an advisory role to the government in promoting good governance and nothing more". He went on to say:

"Our projects support investments in an effective, sustainable and participatory manner and we have also promoted systems for both institutional and participatory monitoring and evaluation of investments, including poverty reduction indicators related to the Millennium Development Goals."

By equating the challenge facing the Niger Delta to other developmental challenges facing other countries of Sub-Saharan Africa, MUL1 is adopting the government narrative, which suggests that the challenge facing the Niger Delta is similar to other regional development challenges:

"Our projects focus on the issues not only in the Niger Delta, but also other counties in Sub-Saharan Africa where projects are enabling them to achieve the Millennium Development Goals".

MUL1 was also critical of the Nigerian government and the multinational oil companies

"We cannot deny the fact that the Nigerian government and the oil companies have sometimes responded harshly to local unrest They are all complicit in abuses committed in the region"

This is consistent with the non-governmental narrative.

While narrating his experience on a recent visit to the Niger Delta, MUL1 said:

“I saw the incredible difficulties the people have to live with. I heard many stories of how oil spills have virtually rendered every piece of land unproductive. Knowing that this is the life of the people, you cannot but ask yourself if they are a part of Nigeria”.

MUL1 showed his use of the academic narrative when suggesting that the focus should not be on environmental pollutants alone:

“The increasing attention to environmental pollutants is great, but we also need to realize another important feature we observed in the region is the almost complete absence of forests in some areas that were previously forested”.

7.3.8 *Media Actor*

The single media informant adopted only two of the seven narratives: those of the media and government. MED1 described the Niger Delta as:

“A picture of man’s inhumanity to manThese people are rendered wretched and miserable even though their lands and waterways are part of the gold mine, the nation’s breadbasket ... The elites and state governments in the oil-producing region are responsible. These powerful individuals in and outside of the region are also responsible for the ill, the indifference and the calamities that have come to characterize the region”.

This narrative is consistent with the media narrative that paints a scenario of a two-sided conflict between the elites and the masses.

MED1 also advocated the “initiation of transformative projects that will bring human development to the Niger Delta region”. Such statements are consistent with the government narrative which calls for the economic development of the Niger Delta as key solution.

7.4 Making Inferences about Discourses

The results of these interviews, summarized in Table 7.14 and listed in full in Appendix 7.1, show the heterogeneity of narratives adopted. Of the forty two interviewees, at least half adopt the local, government, multilateral and non-governmental narratives. The academic, corporate and media narratives are less popular (36%, 43% and 14%, respectively). Although some actors adopted just one narrative, three actors adopted six of the seven. The wide uptake of different narratives indicates that they have become entrenched in everyday life in the Niger Delta and are considered legitimate.

Table 7.14. Actors and their Narratives (in %).

Actor Category	Narrative Types (%)						
	Government	Local	Corporate	Non-Governmental Organization	Multilateral Organization	Academic	Media
Government	93	33	53	53	73	20	27
Local	36	100	9	36	27	9	9
Corporate	40	20	100	60	40	60	0
Non-Governmental Organization	17	67	50	100	100	67	0
Multilateral Organization	100	100	0	100	100	100	0
Academic	0	100	0	67	67	100	0
Media	100	0	0	0	0	0	100
Total	55	60	43	57	60	36	14

The findings also lead to interesting inferences about the discourses of informants.

First, the discourses of local, corporate, multilateral and non-governmental informants are all entirely consistent with the assumed narratives of the groups for whom they work. Second, in all the actor groups, informants have discourses consistent with more than one group narrative. Government employee discourses are also consistent with the non-governmental narrative (which is unexpected) and with the corporate narrative, which is understandable from the encroachment of the neo-liberal paradigm into government operations. Non-governmental informant discourses are also highly consistent with local and academic narratives, which is understandable given their distance from government and corporate narratives. Corporate informant discourses are also consistent with the non-governmental narrative (which is unexpected) and with the academic narrative, which is understandable given its techno-centric element. Local community informants have the least diverse discourses of all, being most consistent with the government narrative (which is unexpected) and with the non-governmental

narrative, which is expected given the support which local communities in the Niger Delta receive from non-governmental organizations. Given the often close partnerships of academic, non-governmental and governmental agencies with multilateral organizations, the discourses of the informants from these groups are highly consistent with the multilateral organization narrative.

7.5 Informant Discourses and Network Relations

7.5.1 Network Composition

Each of the forty-two informants was also interviewed to gather data about how their personal networks affect management of the Niger Delta wetlands. They were asked to identify their immediate partners (alters) and their organizational affiliations, and then presented with a list of relevant organizations (Appendix 5.2) and asked whether they interacted with anyone working for these. If so they were asked to name these contacts. They were also requested to indicate on a scale of 1 (weakest) to 5 (strongest) how strong these interactions/relationships were. This helped to explore the multiple ties that exist in social networks. For the purpose of this analysis these scores were transformed to binary (0s and 1s), by converting all ties less than 2.5 to 0 and all ties greater than 2.5 to 1. The conversion was made to reduce complexity as the initial intention was to explore strength of ties.

To generate each actor's structural location so it could be compared with their narratives the resulting network data were analyzed in UCINET (Borgatti et al., 2002) - a software package (<https://sites.google.com/site/ucinetsoftware/home>) for analysing social network data that is part of the NetDraw network visualization tool. Using the ego network of GOV8, an example of the structure of the network generated is presented in Appendix 7.2.

This comparison helped to ascertain the relationship between the narratives of the informants and the structure of the network to which they belong. Most respondents were able to identify alters by organization but not by name. So in discussing the possible influence of an actors' ego network on their discourse, it was decided to limit analysis to one informant from each organization. Since more than one informant was

interviewed for some organizations, the analysis in this section is based on the actor informant mentioned most, and where this is not available, the most senior of the actor informants was selected. Altogether thirty-three informants were included in the network analysis.

Sixty-one alters were identified (Table 7.15). Twenty two (36%) were government actors and 11 (18%) non-governmental actors. Another eleven were local actors, six (10%) were corporate actors, five (8%) were multilateral actors and four (7%) more were in the 'other' category. While most informants identified interactions with academic and media actors, they are often not able to provide the name of their organization. Hence all mentions of media and academic actors are grouped as a single alter. The number of alters per informant ranges from two to 44, with a mean of 20. This indicates that actors involved in managing the Niger Delta wetlands generally have quite large personal networks.

The location of alters of informants from the various categories was identified (Table 7.16). All of the government informants have at least one alter from the government and local groups. Also, at least one informant from all the other groups has a government actor in their ego network. The main alters for corporate actors are those from similar organizations as well as government and local actors, those for international organizations are from similar organizations, and the main alters for locals and the NGOs are locals. So most of the alters of local people come from among themselves and from government actors.

Table 7.15. Alters in Actor Informants Ego Networks.

Actor category	Number of actors from actor category	Number of alters			Standard Deviation
		Minimum	Maximum	Average	
Government	22	3	42	20	11
Local community	11	12	44	25	8
Non- governmental	11	9	36	19	8
Corporate	6	12	32	21	7
Multilateral	5	16	27	21	5
Academic	1	26	26	26	
Media	1	13	13	13	
Others	4	2	12	7	4
Total	61	2	44	20	9

Table 7.16. Percentages of Informants by Network Category Having Alters in Eight Networks (% = all informants have all alters in this category in their network).

Alters in ego network	Informants								
	Government	Local	Corporate	Nongovernmental	Multilateral	Academic	Media	Others	
Government	100	100	100	100	100	100	100	100	
Local	100	100	100	64	60	100	100	75	
Corporate	64	82	100	55	20	100	100	25	
Non-governmental	64	91	83	100	100	100	100	50	
Multilateral	59	55	17	100	100	100	0	0	
Academic	32	45	50	64	80		0	0	
Media	23	18	50	18	0	0		25	
Others	27	91	17	18	0	0	100	50	

The nature of interactions in networks varies. For instance, the most common form of interaction between non-governmental organizations and local actors is through information dissemination and advocacy (Table 7.17). NGOs are also increasingly commissioned by corporate actors to undertake consultancy work and by government agencies to dispense funds or services to local communities. Non-governmental organizations also approach corporate actors to seek funds for their activities.

Table 7.17. Nature of Interactions between Actors.

	Government	Local	Non-governmental	Corporate	Others
Government	Policy development and administrative issues, fact finding, funding	Complaints about spill issues, project planning, management, land acquisition	Advocacy, funding requests	Policy development, project development	Media briefing
Local		Resource use activities, community meetings	Information dissemination, advocacy, training, memoranda of understanding, socio-economic development issues, disbursement of aid, fact finding, research	Legal matters, spill control, complaints	Research data collection
Non-governmental			Project planning and implementation, conferences, funding	Training, memoranda of understanding, disbursement of funds to locals, consultancy	Consultancy, conferences
Corporate				Press releases, conferences	Consultancy, business
Others					Collaboration

7.5.2 Linking Narratives with Network Structures

I next tested for relationships between actors' narratives and the structures of their networks, using tools in UCINET to calculate key indices. This analysis is based on 33 informants who were interviewed to determine their narratives and who were also included in the network.

Generally, the larger the size of an actor's ego network, the more opportunities they have to communicate with other types of actors. The number of alters an ego is connected to defines their *degree centrality*. The number of alters to which informants are connected network ranged from 12 to 44 with a mean of 25 (Table 7.18). The size of the informants ego network was significantly correlated with the number of narratives they use ($r = 0.594$) (Table 7.19).

Table 7.18. Variables in the Ego Networks of Informants.

Ego Network Variable	N	Minimum	Maximum	Mean	Standard Deviation
Degree centrality (Size)	33	12	44	25	9
Egonet Density	33	0.43	0.79	0.59	0.06
Betweenness	33	0.04	6.26	1.57	1.73
Closeness	33	51.28	75.95	61.48	6.34
Homophily	33	0.00	0.67	0.36	0.16

Table 7.19. Correlation Analysis between Network Variables of Actors Informants and Their Discourses.

Network Structure Indices	Number of Discourses Used		
	Pearson correlation, r	Sig. (1-tailed), p	N
Degree centrality (Size)	0.594**	0.000	33
Egonet Density	0.582**	0.000	33
Betweenness	0.560**	0.000	33
Closeness	0.582**	0.000	33
Homophily	-0.372*	0.015	33

* = Correlation is significant at the 0.05 level; ** = Correlation is significant at the 0.01 level

On the other hand, the higher the network density, the stronger or more cohesive the ties are, and the more difficult it is to communicate with other groups and access their narratives. The ego network density ranged from 0.43 to 0.79 with a mean of 0.591 (Table 7.18). Network density would be expected to be negatively associated with the number of narratives, but here a positive correlation ($r = 0.582$) was found (Table 7.19).

Another network measure relevant to this study is homophily, namely the tendency of informants to relate with alters similar to them. This should reinforce the ability of actors in one group to share that group's narrative and be less exposed to other narratives. Here the proportion of close associates in informants ego networks ranged from 0 to 0.67 with a mean of 0.36 (Table 7.18). As expected, this was weakly, but significantly, negatively correlated with the number of an informant's narratives ($r = -0.372$) (Table 7.19).

The number of organizations in each actor category for which five informants had alters were tabulated and the percentage of organizations in which each actor had alters was calculated (Table 7.20; Table 7.21). For example, GOV 8 had alters from 100% of local communities for which the other four actors had alters. The percentage of alters for each actor was then compared with the presence of different narratives. This showed that where an actor has at least 45% of all alters from a group in their ego network they tend to adopt the narrative corresponding to that group. This is illustrated using the narratives and network structure of actor informants within each category with the maximum (GOV8, BUS2, and MUL1, LOC1 and NGO 4) and minimum (BUS1, GOV4, LOC5 and NGO3) number of discourses.

The actor GOV8 with 42 alters has all (100%) of the local community actors, corporate and academic actors in their network, 68% of the government actors, and 45% of non-governmental actors in his ego network. This actor had narratives corresponding to all of these groups. However, GOV8 does not have any alter from the media group and did not adopt the media narrative (Table 7.20).

The case of LOC5, who adopted only the local narrative, strengthens this finding. While LOC5 has alters from all other groups, these were less than 45% of actors from this group. On the other hand, for the local actors with whom the actor had 91% as part of his ego network, he shared the same narrative (Table 7.20)

The narratives of actors were also compared with their tribal affiliations. All the informants that are natives of the Niger Delta region (irrespective of their group affiliation) shared the local narrative. On the other hand, only 11% of actors who are not natives of the Niger Delta shared the local narrative. One of these is an informant who has worked and lived most of his adult life in the region.

Table 7.20. Association between Narrative Acquisition and Percent of Alters in the Networks of Five Actors.

Actor Category/ Narratives	GOV8		LOC1		BUS2		NGO4		MUL1	
	% alters	Narrative present?	% alters	Narrative present?	% alters	Narrative present?	% alters	Narrative present?	% alters	Narrative present?
Government	68	Yes	68	Yes	64	Yes	45	Yes	45	Yes
Local	100	Yes	91	Yes	36	No	91	Yes	55	Yes
Corporate	100	Yes	100	Yes	83	Yes	50	Yes	17	No
Non-governmental	45	Yes	55	Yes	55	Yes	45	Yes	55	Yes
Multinational	60	Yes	60	Yes	20	No	100	Yes	60	Yes
Academic	100	Yes	100	No	100	Yes	100	Yes	100	Yes
Media	0	No	0	No	0	No	0	No	0	No
Others	25	na	75	na	25	na	50	na	0	na

Table 7.21. Association between Narrative Acquisition and Percent of Alters in the Networks of Four Actors.

Actor Category/ Narratives	GOV4		LOC5		BUS1		NGO3	
	% alters	Narrative present?	% alters	Narrative present?	% alters	Narrative present?	% alters	Narrative present?
Government	45	Yes	23	No	27	No	23	No
Local	9	No	91	Yes	73	Yes	0	No
Corporate	17	No	17	No	50	Yes	33	No
Non-governmental	27	No	27	No	0	No	45	Yes
Multinational	40	No	20	No	0	No	60	Yes
Academic	0	No	0	No	0	No	100	Yes
Media	0	No	0	No	0	No	0	No
Others	0		25		0		0	

7.6 Conclusions

1. This chapter has identified the diverse public narratives of major stakeholder groups concerning the causes of, and possible solutions to, the economic, social, political and environmental problems facing the Niger Delta region.

2. Although these narratives would normally be expected to fully coincide with the narratives of actors representing the relevant groups, interviews with individuals from each group have shown that their everyday narratives are far more heterogeneous. Of the forty two interviewees, at least half adopted the local, government, multilateral and non-governmental narratives. Although some actors adopted just one narrative, three actors adopted six of the seven.

3. This provides support for the Network Communication Framework, which predicts that when actors are members of a variety of networks, communication within and between these networks will influence their discourses and narratives more than was initially thought.

4. Indeed, further questioning suggested that if an actor has at least 45% of immediate partners, or alters, from a group in their personal, or ego network they tend to adopt the narrative corresponding to that group.

5. These findings shed valuable new light on the influence of multiple actors on environmental management in the Niger Delta. The next chapter takes this further by analyzing the communication of institutions within and between networks and the impact this has on institutional change.

CHAPTER 8

INSTITUTIONAL INTERACTIONS IN THE NIGER DELTA

8.1 Introduction

The role of institutions, or repeated practices (Crawford and Ostrom, 2005), in ensuring sustainable environmental management and sustainable livelihoods in Africa is receiving wide attention (Markelova and Swallow, 2008; Massuanganhe, 2008; Koku and Gustafsson, 2003). Existing state institutions are believed to have been rendered ineffective and ambiguous by compromised parliaments, traditional leaders and police (Collier and Gunning, 1999; Poteete, 2009), and traditional indigenous institutions are not recognized by the state. This has led to claims by policy makers, non-governmental organizations, professionals and others that Africa needs "strong institutions" (Roe and Nelson, 2009; Obama, 2009). In recent years there has also been increasing concern about so-called "illegal logging" which is in breach of state institutions (Alemagi and Kozak, 2010; Hansen and Treue, 2008). Yet such views ignore how actual institutions originate, and make many assumptions about the potential to modify state institutions, and about the exclusiveness of state institutions even within governments.

The view taken in this chapter is that it is necessary to transcend such assumptions and to look instead at the institutions that actually exist in Africa. This can reveal the presence of complex sets of institutions, including quite stable hybrid institutions that are formed by interactions between different types of institutions. This chapter explores

institutional interactions of this kind that are apparent in the management of the Niger Delta wetlands. Using the Network Communication Framework described in Chapter 3, which integrates institutional change through design and evolution, as called for by Kingston and Caballero (2009), it explains how these interactions emerge and help to coordinate resource use among actors with diverse interests, prevent conflicts, and promote synergies between state and traditional institutions.

The Niger Delta of Nigeria has become an archetypal case of what Buhaug and Gates (2002) have called a “zone of conflict”, and its wetlands, which have been called “one of the most endangered ecosystems in the world” (Nigerian Conservation Foundation, 2006), pose very sharply the crisis of rule and legitimacy in environmental management. Conflict centres on the long struggle between the institutions of local communities, on the one hand, and those of the Nigerian state and oil multinationals, on the other, with actors such as multilateral and non-governmental organizations serving as intermediaries. The institutions of these actors are, however, multi-faceted and complex because they share diverse interrelated and sometimes opposing narratives (see Chapter 7). It is no exaggeration to say that institutional interactions within the Niger Delta strike to the very heart of the management of the wetlands. Yet while state and traditional unidirectional non-adaptive institutions are well documented, the genesis and mechanisms of multidirectional adaptive institutions, which bring some semblance of stability and are analysed in this chapter, remain undocumented and not well understood.

8.2 Institutions Affecting the Management of Niger Delta Wetlands

8.2.1 Fourfold Framework

The Network Communication Framework (NCF) described in Chapter 3 follows Richards (1996) in recognizing that in African societies the chains of command of government ministries, stretching from national scale to local scale and composed of modern formal state institutions, can be complemented by chains of traditional (indigenous) institutions that also stretch from national to local scales. Traditional institutions may be found in the practices of employees in state organizations, neo-patrimonial networks serving the Head of State and other indigenous networks, and in

the practices of staff of domestic or foreign commercial bodies whose chains of command are populated by formal institutions too.

Direction/Adaptation

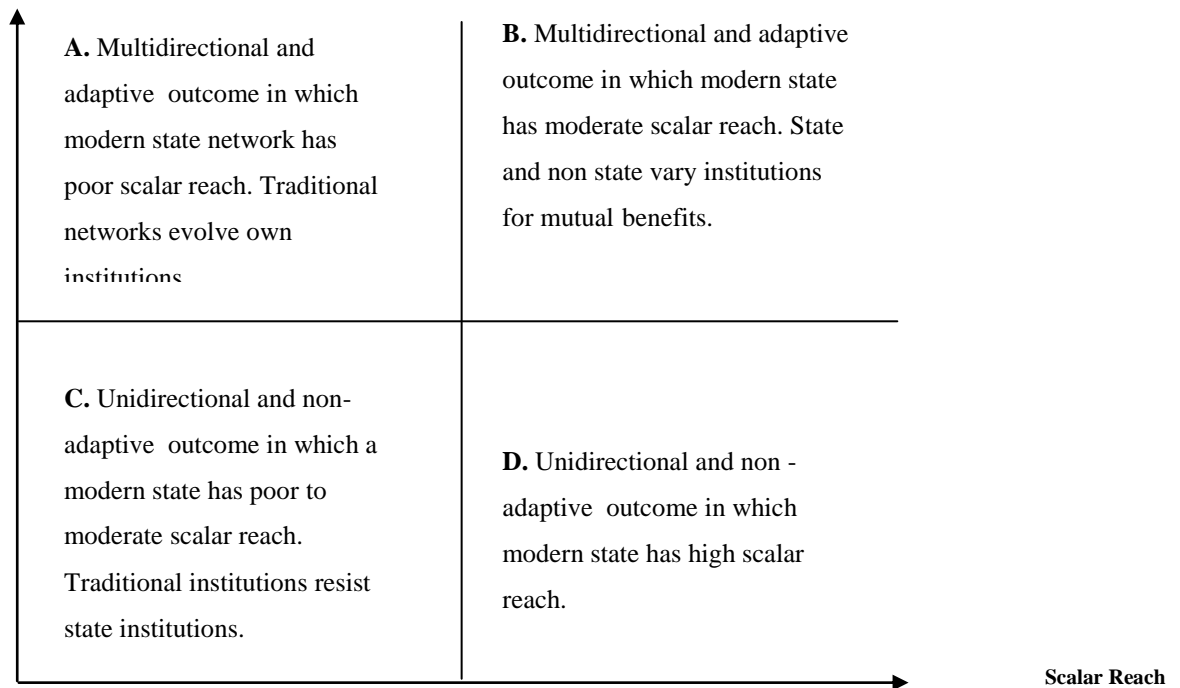


Figure 8.1. Mechanisms of Institutional Formation based on the Network Communication Framework.

The NCF allows modern state institutions and traditional institutions reproduced in networks to interact with and influence one another. This can occur horizontally, e.g. between networks, and vertically, e.g. when formal institutions transmitted from national scale encounter indigenous institutions at lower scales. Communication between networks has four dimensions: direction, autonomy, adaptation and reach.

Classifying institutional outcomes using axes of (a) scalar reach and (b) direction and adaptation highlights four main categories of institutional outcomes (Fig. 8.1):

1. Unidirectional and non-adaptive state institutions with high scalar reach. This is the ideal in which modern state policies are perfectly implemented (Fig. 8.1d).
2. Unidirectional and non-adaptive institutions in which the modern state network has poor to moderate scalar reach (Fig. 8.1c). This describes real situations in which

policies of the modern state are poorly implemented. Traditional institutions resist state institutions, and if they have high scalar reach themselves they can form a 'shadow state' that dominates institutions of the modern state, even if it has moderate scalar reach.

3. Multidirectional and adaptive institutions in which the modern state network has poor scalar reach. Traditional networks evolve their own institutions to fill the vacuum (Fig. 8.1a).

4. Multidirectional and adaptive institutions in which the modern state network has moderate scalar reach. Hybrids of state and non-state institutions evolve for mutual benefits (Fig. 8.1b).

While the third category has been highlighted and documented by Ostrom (1990, 2005), in numerous studies of the emergence of institutions for managing common pool resources, the fourth category has until now remained unnoticed. It is relevant to the phenomenon of "illegal logging" (Alemagi and Kozak, 2010) because it refers to actual rules in use that transcend the dichotomy between "legal" and "illegal" actions since government actors are involved in their formation. The rest of this section outlines the two well-known types of unidirectional non-adaptive institutions, and then discusses in more detail the two types of multidirectional institutions.

8.2.2 *Unidirectional Non-Adaptive State Institutions*

Unidirectional non-adaptive state institutions for managing the Niger Delta wetlands are easier to identify because they are better documented (Table 8.1). Some date back to the colonial era but are still in force today. Chapter 4 contains detailed information about specific aspects of these state institutions.

The first law to regulate the sale and management of timber concessions was enacted in 1901, after a Department of Woods and Forests for the Colony and Protectorate of Lagos was established in 1897 (Okali and Eyog-Matig, 2004). The law controlled the exploitation of timbers such as African mahogany (*Khaya anthotheca*) which is abundant in the Niger Delta.

The first national Forest Ordinance, and the foundation for nature conservation laws in contemporary Nigeria, was not enacted until 1916, after the northern and southern protectorates were amalgamated to form the Nigerian state in 1914. Under the Forest Ordinance, forest reserves could be established by central government and delegated to local authorities for management. The Wild Animals Preservation Act also came into force in 1916 to protect indigenous wildlife (Anadu, 1987). Further conservation related statutes were introduced throughout the colonial era (Ebeku, 2004).

After Nigeria gained independence in 1960, most nature conservation laws followed colonial practices in focusing on forestry and wildlife conservation. Consequently, the provisions of the Forest Ordinance were maintained, supplemented by new regulations and amendments as necessary (Table 8.1). The most important new land legislation was the Land Use Act of 1978, which nationalized all land, vested its management in state governments, and allowed occupancy to be revoked if land was required for mining or oil extraction and processing.

Since 1960, a number of laws to regulate the oil industry have been enacted which, if properly implemented, could protect wetlands in the Niger Delta today. For example, the Petroleum Act of 1969 contained rules for safe drilling, storage and handling of mineral oils, stipulated that storage tanks should be constructed to contain leakages, and regulated the discharge of noxious gases from tanks. The Oil Pipelines Act of 1965 aimed to prevent pollution of land and water crossed by oil pipelines. The Oil in Navigable Waters Regulations of 1968 aimed to prevent the discharge of crude oil into territorial or navigable waters. The Petroleum Refining Regulations of 1974 regulated construction of oil storage tanks to minimize damage resulting from leakage. The Petroleum Production and Distribution (Anti-Sabotage Act) of 1975 made it illegal to sabotage the distribution of petroleum products. The Associated Gas Reinjection Act of 1979 outlawed gas flares.

Table 8.1. Nigerian Legislation Containing State Institutions Relevant to Wetlands Management.

Date Title

Colonial Period

1916 Forestry Ordinance
 1916 Wild Animals Preservation Act
 1943 Forestry (Southern Provinces Native Authorities) Rules
 1951 Forestry (Northern Provinces Native Authorities) Rules
 1955 Forestry (Northern Region Native Authorities) Rules
 1955 Eastern Region Forest Law
 1956 Forestry Regulations Eastern Region

Post-Independence Period

1960 Forestry Ordinance with Amendments
 1963 Northern Nigeria Wild Animals Law
 1965 Eastern Nigerian Wild Animals Law
 1969 Western State Forestry (amendment) Edict
 1969 Petroleum Act
 1967 Petroleum Regulation
 1965 Oil Pipelines Act
 1968 Oil in Navigable Waters Regulations
 1974 Petroleum Refining Regulations
 1975 Petroleum Production and Distribution (Anti-Sabotage Act)
 1978 Land Use Act
 1979 Associated Gas Reinjection Act
 1985 Navigable Waterways Declaration Act
 1986 River Basin Development Authority Act
 1988 Petroleum Regulation Act
 1988 Harmful Waste Act
 1988 Federal Environmental Protection Agency Act
 1990 Endangered Species Act
 1992 Environmental Impact Assessment Decree
 1992 Inland Fisheries Decree
 1993 Water Resource Decree
 1997 National Inland Waterways Act
 1999 National Park Service Decree
 2000 Niger Delta Development Commission Act
 2003 Coast and Inland Shipping Act
 2004 National Environmental Standard and Regulation Enforcement Agency Act
 2006 National Oil Spill Detection and Response Agency Act
 2007 Nigerian Minerals and Mining Act

Since 1980 these laws have been joined by sixteen other major pieces of legislation that affect wetland management, including a 1988 law that established a Federal Environmental Protection Agency (Table 8.1). So Nigeria is certainly not lacking in formal state institutions for sustainable wetland management, but the difficulty lies in enforcing these.

Following the return to democratic rule in 1999, only a few of the 36 states and 774 local governments have enacted their own laws on conserving natural resources. Most generally follow federal laws, e.g. according to the Federal Environmental Protection Agency Act of 1988 each state was expected to set up its own environmental protection body for the protection and improvement of the environment. In Cross River State, one of the states in the Niger Delta, the government has set up a task force on deforestation and enacted a law on forest management through timber bans. No state legislation or policy specifically addresses wetlands as a unique ecosystem, but instead they are treated as forests and therefore subject to forest laws.

Since 1980 the Nigerian government has signed and ratified several international conventions relating to wetlands, most notably the Ramsar Convention on Wetlands of International Importance (2001), but also the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1974); the Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (1981); the Convention on the Conservation of Migratory Species of Wild Animals (1987); and the UN Convention on Biological Diversity (1994) together with its Cartagena Protocol on Bio-Safety (2000). Yet no extra legislation has been passed to facilitate implementation of commitments to any of these conventions. The National Wetland Policy is the most direct consequence but has been in draft form since 2001.

8.2.3 Unidirectional Non-Adaptive Traditional Institutions

Local communities in the Niger Delta managed the wetlands long before formal institutions were introduced (Alagoa, 1971; Anwana et al., 2010; Ogon, 2006). Their traditional institutions still continue, but are difficult to identify as they are poorly documented.

Traditional political institutions that govern ownership of land in the Niger Delta are associated with autonomous kingdoms or clans. Within each *kingdom* there are about seven *communities*, each further divided into about eight *compounds*. Each compound is made up of up to fifty *families*, each of which in turn could actually comprise seven *nuclear families*.

The highest political authority in the community is the *council of chiefs*, with representatives elected from each compound. They are supported by the *community development council* and the *youth association*. The council of chiefs is presided over by the *Amanyabo* (King or paramount ruler), who has authority over the kingdom and is deferred to on all political and resource use issues.

Lands and fishing grounds are collectively owned and administered by this tightly knit political structure. Access to and use of resources owned by compounds and families are generally open to members of that group. Non-members need the permission of the compound or family (represented by the compound or family head) to access and use the resource. All authority on the ownership of lands, fishing grounds and other resources is vested in the *Amanyabo*. Within the village, the authority of compounds over members is strong and rights over compound resources are secured against the rival claims of neighbouring communities by the clan. These traditional political institutions mirror the pre-colonial institutions in the Niger Delta (Alagoa, 1971).

Other institutions, driven by traditional religious motives, regulate traditional reserves and harvesting periods in the wetlands. Religious ideas underlying these institutions bind the kingdoms together, since they refer to the combined spiritual well-being of the entire region. These institutions are presided over by *Inkiye* (priest or traditional spiritual leader), who decides the times of periodic festivals; when fishing grounds are opened and closed to fishing; restrictions on fishing and logging in sacred lakes and forests, respectively; and farming types and seasons. Ideally, in the Niger Delta permission to harvest any resource should be sought from the priests as well as from political leaders. There are grievous consequences for breaking these rules, which include sickness and even death. Another type of traditional religious institution prohibits the killing and eating of some wetland fauna, especially crocodiles which, according to a local hunter, never harm local people. Traditional institutions in the Delta

consider the crocodile a sacred animal which must be protected. The hunter tells of elders saluting the crocodile as *Oh-dau* (father).

A third category of traditional institutions governs relations between individuals using the wetlands. Thus, trade in wetland ecosystem services is governed by the institution of oath taking. All individuals, including migrant traders in the kingdom, are required to take an oath to cement trade agreements.

8.2.4 *Multidirectional Adaptive Endogenous Institutions Where the State has Poor Scalar Reach*

8.2.4.1 Origins

Multidirectional adaptive institutions emerge endogenously as 'rules in use' in response to the lack of effective exogenous institutions at a particular scale. In the Niger Delta they govern land ownership and access to wetland resources. Under traditional institutions resources cannot be sold to individuals or companies since they are communal properties, so state agencies must approach local communities to seek permission whenever they require communal lands. However, communities often refused access to lands, even when it was not some of the choicest, and this prompted the introduction of formal institutions, such as the Land Use Act 1978. Consequently, the two sets of institutions were at odds, and this often led to conflicts. Local communities maintained their pre-colonial societal organization whereby ownership of farm lands, fishing ponds etc is vested in compounds and not individuals, while the government used the Land Use Act 1978 to forcibly displace local communities and assign the land to oil companies instead.

In response to these conflicts, and the inability of the state to enforce its institutions, previous institutions have been transformed into a set of informal networked rules rooted in the exchange of mutual influences, intermediaries and entanglements of power between actors. Thus, new institutions governing the sale of wetland plots emerged as a result of interplay between willing local sellers and willing buyers who buy land from locals instead of relying on forceful acquisition backed by the state. Access to and transfer of ownership of land and other resources now takes place outside the influence

of local community and government institutions. For oil companies this includes lands needed for oil exploration and exploitation, pipelines, staff housing estates, and transportation infrastructure. Other groups acquire wetland plots to harvest timber, catch fish or reclaim wetland to construct roads and other infrastructure.

This prevalence of this type of institution was especially highlighted by respondents in Oporoma, where the sacred Boupere Lake was sold by the community leadership to an oil company. This is corroborated by a recent report which indicated that a community leader in the Niger Delta sold a sacred site (cemetery) to senior officers in the State Security Service, Army, Navy and Police (Agbakwuru, 2012).

8.2.4.2 Mechanisms

Under the new institutions, private entities requiring land are expected to apply to communal owners, i.e. to the clan through the King, or the compound head if the land is family land. Alternatively, actors may approach the clan through intermediaries, such as a politician, businessman, chief or even the paramount leader. This process is usually more effective than following traditional and state institutions, e.g. the land in question may even include sacred sites in the wetlands that should be protected by traditional institutions and state laws. Some land might not have been released without such informal exchanges.

The application is considered by members and conditions are imposed as necessary, e.g. loggers are often not permitted to cut some economic tree crops. So when land was sold by the Oporoma community to the Nigerian AGIP Oil Company Limited (the operator of a joint venture with the Nigerian National Petroleum Corporation), AGIP was warned of the consequences of violating the Boupere Lake.

Narratives *used in the open* in the presence of members of the clan mostly suggested that the land would be put to a use that would benefit local economic development needs, e.g. health centres and schools, employment for local youths, and monetary compensation to the community. Any possible negative impacts were downplayed. The comment of an elderly woman in Oporoma as to why she supported acquisition of land by the Nigerian AGIP Oil Company Limited clearly illustrates this:

“When they came, they said they will give us development, they gave us a generator for the community [the community had not had electricity since 1975], but they did not say that they will destroy Boupere. I am beginning to see clearly their plot to destroy our culture and wipe us out to deprive us of our land. They were not honest enough to tell us that this would happen”.

Similar institutions can emerge when non-governmental or governmental actors need land in the wetlands. This process is often *mediated* by non-governmental actors who are trusted by local communities and help them to develop their ‘community development action plans’, often under contract to corporate actors. For example, the New Nigeria Foundation (a non-profit, non-governmental organization) facilitated negotiation of a Global Memorandum of Understanding (GMOU) between Chevron Nigeria Limited (CNL), communities in the Niger Delta and state governments. The outcome of the negotiation became a preferred template for CNL’s negotiations with other community councils of chiefs (New Nigeria Foundation, 2009).

8.2.4.3 Exchanges of Materials

To cement these agreements, adequate compensation is paid. It is reported that oil companies pay up to ₦25,000,000 (\$166,000) for land (land to build supporting infrastructure) and loggers pay up to ₦30,000 (\$150) to gain access to log for wood., depending on negotiations.

The fate of these informal payments to communities through their leaders is often difficult to trace. While some community members said they have benefited from such payments in the past, others claimed they have not. In most cases the money is not accounted for. It is believed that the amount that oil companies pay to communities is far higher than the formal fees they would have paid to the government had they followed formal institutions.

By providing clans with such developmental projects in exchange for their support to acquire communal lands, clans become enrolled in *the oil company's network*. In response to the question on how AGIP gained access to land in one of the communities, a community leader shook his head in sign of pity and said “we were deceived”. He

indicated that they were invited to the AGIP offices through officials from other groups who served as intermediaries and informed the community that the company had made arrangements to transform the community and make it the pride of the whole Niger Delta if they gave AGIP the land. He suggested they kept good and constant contact with the company until the lake was polluted. This attests to the fact that some government officials, as well as officials from other actor categories, served as conduits between local communities and corporate actors. The statement above suggests that this may occur unconsciously (Table 8.2).

Table 8.2. Interview With Community Leader in Oporoma on Bouper Lake.

<p>Researcher: So ... what happened?</p> <p>Response: When they (AGIP) first approached us for the land, we were not interested. We were concerned that their activity was too big and not good for our environment. Some people also reminded us that we had the lake close by the land they wanted to acquire.</p> <p>Researcher: Okay</p> <p>Response: But when they came back again, this time, they came with different people telling us the potential of their project and what the community stands to benefit.</p> <p>Researcher: Who are the people they came with?</p> <p>Response: They helped us with generator and also built a road for us</p> <p>Researcher: That is good, but who are the people they came with?</p> <p>Response: I don't know them, but I think they are from government and different places (suggesting non-governmental organizations).</p> <p>Researcher: Okay, they came with them to the community?</p> <p>Response: Yes, the first time those from government invited us to their office (AGIP) In the end, we agreed for them to have the land, but we gave them conditions, most of which they have broken.</p>
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Gaining access to the wetland often involves exchanges with key individuals in the clan, such as paramount leaders (Table 8.3). Thus, according to a local youth who said he did not support the sale of the land adjacent to the Bouper Lake in Oporoma:

Table 8.3. Interview With a Local Youth in Oporoma about Bouper Lake.

Researcher: What has been the response of leaders of your community to this pollution (Bouper)?

Response: There are people who are now playing a double game. I will say they trying to favour themselves. The categories involved are all these politicians; the community leaders and government as well, because they know the truth. Some of them are professionals already, they come to the site and at the end of the day, they cover up their report in favour of the oil company, the government, or the avoidance of problems. These people cover up some of these issues.

Researcher: You mean members of your community that are in positions of authority?

Response: That is why I said the issue is relating to the politicians who are the leaders, then the community leaders as well as the companies. These are people who have agents to gain from the oil production, and want to ensure that there are people who protect their interests. That is why I am saying the oil companies improvise the divide and rule tactics, where some people are favoured and some people are antagonized, so this group of people cuts across the political class, the community leaders as well as the oil company. So it is a kind of collaboration.

Researcher: That means you may not re-elect them again?

Response: They are not chosen, they are self-made. They just projected themselves as concerned citizens or they are the people protecting the interest of the community. That is how they project themselves and get known by the SPDC or other oil companies as well as politicians.

Researcher: But why won't the other community members act?

Response: All the other farmers are always silent because they are busy at their farm site, working either in the river fishing or in the farm, so they are not always contacted. So these people often project themselves as the real farmers and at the end of the day they betray the community. They even have agents in the community council of chiefs and youth organization, they even sponsor some of these leaders. The SPDC sponsors some community leaders, the youth president, CDC chairman and even the council of chiefs, and at the end of the day when these people are at the helms of affairs they cover up some of these sensitive issues. These are the areas we trying to address. It is a kind of tripartite arrangement involving all these different sections.

Researcher: So why do they do this? do they exchange things, like ...?

Response: Yes things are exchanged for either personal benefit, or the interests of the group or SPDC, because maybe the international laws that requires them to carry out cleanups or remediation. They are trying to avoid the cost, they use local groups to protect their interests and they cover up and spill sites remain. And during the flood season, the flood is spreading the oil to other areas, destroying the ecosystem both plant and marine ecology. That is why I am saying it is tripartite. I cannot mention names but they themselves they know themselves. This is what is happening and making the wetland degraded, we want the wetland area to be well preserved.

“It was obvious from the onset that all they wanted was our oil, I knew nothing good was going to come out of the agreement with AGIP. I am sure that they paid the council members a ₦5 million (\$33,000) bribe”.

Such payments, which are not recognized by existing institutions, include monetary payments, gifts of cars and houses, the renovation of palaces, holidays abroad for family members etc. Once the support is secured of a key member of the community - often someone who is highly educated and has political capital within the clan - it becomes easier to gain the support of the whole clan.

Continuous interactions between representatives of the interested party and the community are essential, to take care of any challenges that may arise during community consultations. For instance, in some cases, the land required may belong to a family, whose consent will be needed. During these interactions, materials will continue to be exchanged, either as payments or narratives to placate any section of the community that might be unhappy with the land request. The poor living standard of local actors often encourages them to put personal profit over other considerations. Some of these exchanges fuel conflicts in the communities, as claimed by an independent report commissioned by Shell, in which it was stated that Shell “feeds conflict by the way it awards contracts, gains access to land, and deals with community representatives” (Shell Petroleum Development Company, 2003).

8.2.4.4 Enforcement

If sections of the community, or individuals, decide not to take payment and oppose the sale of the land, pressure will be put on them by the leaders of the community. If they still refuse, the Land Use Act may be invoked, and they will not get any compensation. They may even be subject to litigation. For example, a local hunter-cum-farmer refused to release his land to a government agency for the construction of infrastructure, even though the request was supported by community leaders. He claimed that overnight “some unknown persons wilfully destroyed and burnt my land and properties”. He believed that the culprits were backed by the traditional ruler who had initially pleaded with him to release the land, indicating that the government agency would employ him afterwards. After complaining to the chief he was arrested by police and on his return was informed that his land had been acquired under the Land Use Act 1978.

Government officials who are incorruptible and want to follow the formal institution may experience similar treatment. For example, a government actor mentioned the case of an official stationed in the field who reported the illegal activities of a community leader to his superior. The commissioner (the head of a state ministry) said that he “will personally handle it”. A few days later the commissioner telephoned, said that he had spoken to the community leader and advised the official to “just leave him (the community leader) alone”. He asked rhetorically: “Do you think tomorrow that boy (the official in the field) will go there again or will he come and report again? If they give him something, he will just collect his own share and keep quiet”. When asked to explain why government actors might become entangled in extra-legal exchanges that subvert state institutions, the official suggested that maybe the commissioner had received “instructions from above” and did not want to lose his job. This suggests the influence which traditional institutions have through the chain of command of the state network.

If a private actor acquires land outside these arrangements, and chooses to follow formal state institutions, they could also face sanctions, including frequent confrontations with the communities, destruction of property and disruption of activities. This might explain why some communities can behave confrontationally to one oil company operating in their area and yet be friendly to another.

8.2.4.5 Institutionalization

An endogenously evolved institution provides an avenue for frequent monitoring of compliance that is central to its functioning and perceptions of its legitimacy. By institutionalizing the norm of discretionary rights as informal obligations, the institution appears to practitioners to be a legitimate protocol for gaining access to wetland. As it does not appear unethical to the actors who collude to subvert pre-existing institutions, it further stabilizes the system. When asked why corporate actors go through local people, and not the state as enshrined in the law, two corporate informants pointed to the bureaucratic nature of government activities and the fact that government organizations also follow the same approach.

After corporate actors, such as oil companies, paid off clans, their leaders and youth groups, others soon followed suit. So throughout the 1990s there were frequent instances of youth gangs extorting payments from oil companies in exchange for uninterrupted activities in communities (Oruwari, 2006). This has now become the norm throughout the Niger Delta.

With the constant expansion of activities in the Niger Delta and high demand for wetland plots, such practices have become repetitive and thereby institutionalized. This leads to the building of trust in the institution and the clan that makes it easier to acquire more land from the same clan or from another clan. Corporate actors are willing to pay more than they would if they followed the formal institution since it reduces their transaction cost (e.g. by avoiding public protests) and ensures they gain access to the land needed.

8.2.4.6 Benefits

Local communities enjoy some developmental benefits from the new endogenously evolved institutions, while the operations of corporate actors are not disturbed by these communities. Owning land gives local people a sense of identity and membership in social groups, while selling land gives them a sense of fulfilment and participation in the process of exploration and exploitation of oil. This is evident in the words of a fisherman who represents his family in the local community development council:

“We were compelled by the actions of the government who deal with us mercilessly if we refuse to release the land. They continuously harass us with the army so we have no choice. At least if we sell to them we can get some money to develop the community and get them to make promises to us. Though all the good words and all their promises are soon broken”
(Resident of Zarama Community).

Communities of oil bearing areas in the Niger Delta still feel dispossessed of their local resources by the Land Use Act 1978 and have been able to introduce these institutions to get some benefit from their own land. Their discontent is apparent in the Kaiama Declaration of December 1998 which declared that:

“We, the youths of Ijawland, hereby make the following resolutions to be known as the Kaiama Declaration: 1. All land and natural resources (including mineral resources) within the Ijaw territory belong to Ijaw communities and are the basis of our survival. 2. We cease to recognize all undemocratic decrees that rob our peoples/communities of the right to ownership and control of our lives and resources, which were enacted without our participation and consent. These include the Land Use Decree and The Petroleum Decree etc.”(Ijaw Youths of the Niger Delta, 1998)

There is evidence that communities whose lands have been acquired in this manner are more peaceful than communities whose land was acquired through the imposition of the formal legislation of the Land Use Act 1978. Of all the major conflicts in the Niger Delta, majority are in communities where land has been acquired through formal state institutions. Despite the desecration of the sacred Boupere Lake, the community still maintains a semblance of peace with AGIP. Moreover, as these institutions take root in society, they may reduce inter- and intra-organizational tensions that often pervade governmental agencies in Nigeria. As the institutions require interactions between multiple actors, they are also not undermined by duplication and overlap between jurisdictions that characterizes state organizations.

8.2.4.7 Evolution of Institutions of Resistance

Local communities employ democratic institutions to protest about their inequitable treatment, but these institutions have also been supplemented by institutions evolved by local youths.

Local communities seek legitimacy for their discourse through the same kind of campaigning strategies found in Europe. This involves forming various organizations, such as MOSOP, writing letters to politicians, and issuing communiqués of meetings to governments and media houses. These communications are picked up by the media, disseminated and discussed locally and internationally.

However, a confrontational dimension was introduced by youths in the year 2000, and has resulted in the institutionalization of *resistance* (otherwise known as militancy) as a

means of protest and of governing access to resources in the Niger Delta. This is treated here as an important evolved endogenous institution in its own right.

Youth violence became pronounced after the 2003 state and federal elections when politicians seeking re-election were unable to adequately compensate the youths whom they had recruited, armed and used as political thugs. These youths then became free agents, letting themselves loose on the oil fields. In contrast to the texts of the democratic campaign groups, messages from youths include threats. Thus, a popular Niger Delta youth leader, Alhaji Mujahideen Asari-Dokubo said in 2004 that he has 10,000 men ready to reclaim the resources of the Niger Delta for its people (Wiwa, 2006). He also suggested that local people have the right to engage in “illegal oil production”

"The people who own the oil have a right to take the oil which has been stolen from them by a small clique in Abuja for the advancement and betterment of that clique that siphons this money to foreign bank accounts in Europe and the United States and the CaribbeanThe oil belongs to us. We're not stealing it. It is the Nigerian state stealing our oil from us" (Dokubo, 2004).

Local youths now demand financial payments to allow oil companies to explore for and extract oil and gas without interruption. While the traditional authorities provide access to lands, these youths ensure uninterrupted activities in the wetlands, and also enjoy widespread support among local people. Failure to be consulted and compensated can result in kidnapping and other criminal acts targeted against the oil companies. Indeed, oil companies do not just pay negotiated prices for uninterrupted activities, they also use youths as security guards, and as their voices within local communities. Consequently, youths are often provided with arms and ammunitions to confront any rival group that may wish to threaten oil and gas exploration activities in the Delta. Even state governments comply with this institution. For example, in a recent television broadcast, the governor of Rivers State (the largest state in the Niger Delta region) revealed that he has paid youths large sums of money from the state coffers to keep the state peaceful (Amaechi, 2010). There is also evidence to link the youths to local politicians and traditional rulers.

8.2.5 *Multidirectional Adaptive Exogenous Institutions When the State has Moderate Scalar Reach*

8.2.5.1 Origins

Multidirectional adaptive exogenous institutions originate outside the Niger Delta but subsequently evolve through interplay between modern state institutions with moderate scalar reach and non-state (traditional) institutions. Logging, oil and gas exploration, infrastructure development and other activities in the wetlands are subject to laws outlined in Section 7.2.2 that should be enforced by government agencies. Institutions in these laws should govern how people use the wetlands, and acceptable relationships between individual actors. Yet, over the years these institutions have been transformed through continual interactions between actors, generating a system in which formal and informal institutions are intertwined as rules in use, made possible by communication between relevant networks. Under these rules, users of the wetlands often engage in activities prohibited by existing formal state and traditional regimes for mutual benefits. Thus, loggers might harvest more than the number of trees specified in the forestry laws, or fell restricted species and sell traditional sacred sites. Oil companies flare gas, dump industrial waste and spill oil in the environment. This subverts existing laws and enables actors to benefit economically to a level that would not have been possible otherwise.

8.2.5.2 Mechanisms

In multidirectional adaptive communication actors follow some aspects of state institutions and vary other aspects for the mutual benefit of actors in the modern state and non-state networks. Thus, a state official may enforce a state institution and expect a non-state actor (e.g. a logger) to indicate their desire to engage in this form of institution. This is facilitated by the state officials' overbearing enforcement of state institutions even beyond the provisions of the law. For instance, a state official may destroy illegally logged trees even though they are not permitted to do so under the law. In other instances the official can interpret and enforce the law in a manner that makes even legitimate activity look illegal. One informant said that:

“I cooperate with them [forest official]. If not I am not able to feed my family As for the police if we don't cooperate they will accuse us of overloading our lorry even when it is not overloaded. They use this as an excuse to detain us”.

The state official will also emphasize the power he wields and the potential impact on the livelihood of the logger should he bring the full weight of his power to enforce the modern state institution. The comment of another informant illustrates this:

“They have the authority to arrest us This is what they are employed to do They also know things are difficult and we cannot survive without logging”.

A show of interest does not necessarily set the institution in motion. The state official may behave as though he/she is not interested or even prove difficult. As detailed by an informant who narrated his first experience with an official of the state..

“He [state official] said he will speak to his boss on my behalf after about a week he told me I was lucky and that his boss has agreed for my name to be added to the list”

There is no suggestion that he actually seeks the permission of his superior before enlisting any new member. All that is necessary is to make the logger aware of aspects of state law that need to be kept. For instance, most loggers are aware that despite varying of state institutions they are not under any circumstance allowed to burn forest as this may have detrimental effects given that oil is extracted nearby. The same informant also indicated that during the one week period he had to wait, he was allowed to conduct his activity with some restriction. He believed that during this period, the official was trying to learn more about him.

The official makes it a point of duty to inform the loggers that what they are paying is not for him, but that a part will go into state coffers as a payment for logging permits while another part will go to his superior in the office. Such explanation may in the long

run make some of the loggers feel the official is not really getting much and may even increase or provide occasional increase.

Once both parties agree to work for mutual benefits by varying state institutions, institutionalization of this practice is made easy. The first time an actor participates in this institution is probably the single most important step in the institutionalization process.

Although the institutional mechanism is illustrated here in relation to "illegal logging", similar mechanisms also emerge when state officials are expected to enforce pollution laws on oil companies. The only difference might be that in the case of oil the mechanism may be facilitated from a higher scale of the state network than for illegal logging. Such institutions make it easier for oil companies responsible for pollution to dodge their responsibility, by allowing them to vary institutions e.g. by paying minimal compensation to communities affected by oil spills while ignoring remediation.

8.2.5.3 Exchange of Materials

The adaptation of prevailing institutions is facilitated by the exchange of materials between actors. Such exchanges, which are also not permitted by law, may involve not only junior field officials, but also senior officials who should enforce laws. An interview with a logger informant revealed that all loggers (legal and illegal) in and around the wetland make monthly monetary contributions which are delivered to senior officers at the Forestry Department. This is in addition to money they need to pay to junior field staff every time they transport their produce from the wetland to the market. He also suggested that highly placed loggers pay senior officials directly.

Junior field staff are expected to make returns to senior officers in order to keep their jobs in the field. Failure to make such returns may result in them being replaced and sent back to work in offices where they will not get such benefits. Senior staff also compensate field staff with continued postings to the field and also gifts.

By making these payments loggers are able to cut down unlimited numbers of trees, including those of restricted species, and are not compelled to replant trees either. A

senior forestry official argued that money paid by the loggers is the official permit fee and is always remitted to the government coffers: “I’m not aware that they pay money to our officials; the money they pay goes to the government coffers and is receipted; it is official government revenue”. However, another official acknowledged that these exchanges do take place: “In some cases our officers on patrol resort to collecting money from loggers in the full glare of all to see.” He also said some staff threatened loggers with the connivance of police officers who use guns when enforcing laws.

It was not possible during this study to trace the fate of these payments, but it is believed that most end up with officials, since three logger informants suggest that payments they make are not receipted. Apart from payments to forestry staff, it was learned that loggers pay between ₦10,000 (\$66) to ₦12,000 (\$80) per month to security officers (police and army) who patrol roads to prevent illegal activity. Vehicles conveying logs are allowed to pass through security check points without being checked if security officers are on board. The officers concerned will also share some of the money with their colleagues.

Actors have found these exchanges increasingly useful for facilitating their activities in the wetland. One logger informant, describing his first experience in these exchanges, told how it is now a rule to him:

“We fought (referring to a confrontation between him and a government official) and argued till he destroyed all of my wood (despite having his permit and complying with the formal institution); it was after he spoiled some of my wood with a hammer that one man from the village told me I should have given him some money. The next time when I came, even before he asked for my permit, I just gave him his own share (money) When he left (was transferred) I was not happy because he was already like my brother you know”.

At some point, institutions become so widespread that they take on an air of legitimacy and the government is *powerless* to prevent such transactions. Once the foundations have been laid in this way they structure interactions that continue irrespective of which personnel are involved. The same informant mentioned that when dealing with a new

official: “I was careful because I do not know if he will cooperate, but I still find a way to give him and (he) collects”.

Similar practices occur in interactions between oil companies and officials responsible for regulating their activities in the wetlands. Two senior government officials confirmed that they have good working relationships with oil companies, who recently sponsored them to train abroad, in what was their first trip overseas. Interestingly, one of these officers was accused by a representative of a non-governmental organization of conniving with oil companies by not reporting illegal oil spills to the government. He believes he is a contractor to oil companies operating in the area. Although illegal, it is not uncommon for a government official to also own a private company that does work for oil companies. It is often common knowledge that officials are awarded such contracts in exchange for their support.

Corporate actors are happy to participate in these exchanges as they allow them to carry out activities that are illegal under existing laws. For example, the logger informant said his wood is not checked for compliance once he makes these payments, even though he might have cut down some restricted species, such as Abura (*Mitragyna ciliata*), which is scarce and one of the most highly priced timber species in the wetlands.

Exchanges occur between groups as well as individuals. Thus, logging companies and oil companies may provide infrastructure and facilities for governmental organizations which are supposed to regulate their activities. Such practices have become so widespread that they are widely perceived to be legitimate.

8.2.5.4 Enforcement

The institution is enforced by the members of both the state and non-state networks, who may punish any defaulting actor. As such, there is both an internal and external mechanism for addressing and sanctioning violations of the institutions since all actors are made aware of what is and is not permissible.

If a logger chooses for any reason not to comply with the tenets of this rule in use, it is likely that his activities in the wetland will be hindered. This was the situation with the

informant cited above - his produce was destroyed because of his refusal to make the exchange as expected by the rule in use. His own colleagues may also ignore him as a “persona non grata”. If a government official chooses not to align with this institution he might end up being transferred or even victimized by his superior. The loggers whose activity will be affected will not only by-pass him but can also make requests to his superiors for him to be transferred and sanctioned. It was suggested that a previous official was transferred as punishment:

“He collected money but did not deliver everything to his boss, so they moved him back to the office ... It was when the other one also misbehaved that he was brought back”.

The networks not only enforce institutions, they also act to defend their members from victimization when they feel this is not justified.

8.2.5.5 Institutionalization

The systematic communications that flow between state and non-state networks soon gain social approval through their appeal to a large section of the society who see such arrangements as beneficial to both networks. While recognizing that the current practice does not fully match, and even violates, aspects of modern state institutions, a senior government official emphasized aspects of the law that is being kept and the benefit to the loggers:

“Despite the shortage of staff we are experiencing we are able to stop them [loggers] from indiscriminate burning If we have to fully enforce the law it means they cannot feed their family”

With such approval across networks, the institution assumes legitimacy in society. The legitimacy is further enhanced by the fact that high ranking members of society, including politicians, state officials, judges and big businessmen, participate in these institutions. Institutionalization of this practice is also entrenched by the operation of have its own systems of accountability and enforcement.

8.2.5.6 Benefits

Under formal laws actors have restricted access to wetland for activities such as logging, and the only way loggers can gain access to satisfy their interest is to engage in an adaptive institutional arrangement with the government officials who are willing to vary state institutions. Within this arrangement aspects of the formal laws are built into the informal arrangements. For instance, the forest officials buy seedlings to replant and the loggers are not under any circumstance allowed to cut these down. This informal arrangement enables exchanges that are based on reciprocal relationships between loggers and government officials. This informal arrangement also protects some selected aspects of state institutions protecting the wetlands.

In 2009, the effort of the Bayelsa state government to enforce the forestry law of the state “in order to put a stop to illegal felling of trees” led to a temporary interruption in the existing informal institution. Obviously, the government did not officially recognize an *effective solution* that had taken time to work out through efficient interactions between loggers and state officials. Activities that hinder this informal regime and access to forested parts of the wetland affected loggers. When these logging patterns are affected, the loggers are *forced* to use destructive means. This was exactly what happened when the government posted more forestry officials to the wetlands to enforce the law. The loggers resorted to going into marginal forests to evade government officials and prosecution. To get to these sites, they set fire to a large area of the wetlands, something they would not have done under the multidirectional institutional arrangement.

8.2.6 *Institutions of Memoranda of Understanding*

Another example of adaptive exogenous institutions involves the signing of Memoranda of Understanding (MoU). These are agreements in which oil companies commit themselves to invest in social projects and programmes in communities, and host communities agree not to attack oil facilities and provide a peaceful operating environment. Ordinarily, the state is responsible for the development of the communities and they establish the rules of the game. However, with the MoU, the institution of the state is varied to enable the creation of a single central leadership

board - a Cluster Development Board, or CDB - whose leadership is drawn from the local elite and community representatives, the companies, state and local governments, and civil society. The agreements reached are ceremonial and their informal institutions are not legally binding.

When these agreements are signed either freely, or as is often the case, in the heat of a crisis that impeded operations of oil companies (Faleti, 2009), state institutions are easily relaxed by officials to enable oil company activities to continue. This is the case where some locals are allowed to engage in oil prospecting or the state turns a blind eye to illegal activities in a community. To seal the agreements, companies usually part with some “rentier dividends” (Omeje, 2006) and other benefits (such as jobs, contracts, and scholarships), most of which are handed over to community leaders and other members of the CDB. Thus, the MoU can easily turn into another form of rentier accumulation through opportunistic mechanisms. In other instances, benefits go directly to communities through the building of schools, health centres etc. This can also be viewed as institutionalizing the corporate social responsibilities of private enterprises.

8.3 Awareness of and Support for Institutions

To gain a better understanding of these four categories of institutions, members of each actor group were asked about their awareness of, and support for, selected institutions from each category. *Awareness* means the ability of informants to spontaneously mention aspects of this institution. *Support* means that an informant believes in the main aspects of an institution, whether or not they adopt it or have adopted it in the past. If an informant was unable to spontaneously mention aspects of the institution, they were provided with an explanation of its main tenets. For example, a forest law was described as a “state law that regulates the size, quantity and type of wood that can be cut down”. If the informant was still unable to identify an institution, it was concluded that they were not aware of it and they were not asked if they supported it. The overall level of awareness and support for multidirectional adaptive and unidirectional non-adaptive institutions was calculated on the assumption that all informants in each category are aware of, or supported, the institutions.

The results show that government actors are poorly aware of unidirectional non-adaptive traditional institutions (Table 8.4). Only 13% of government informants were aware of local traditional religious institutions governing use of Niger Delta wetlands, for example. They were more aware of institutions that had emerged through interplay between actors (multidirectional adaptive institutions) than those imposed without interplay (unidirectional non-adaptive institutions). Thus, the average awareness of multidirectional adaptive institutions was 93%, but awareness of unidirectional non-adaptive institutions was only 59%. Levels of support followed a similar pattern: 61% of government informants' supported multidirectional adaptive institutions but only 40% supported unidirectional non-adaptive institutions.

Non-governmental and corporate actors were more aware of all categories of institutions than government informants. The lowest level of awareness of non-governmental informants was 67% for local traditional religious institutions. Their levels of awareness of multidirectional adaptive and unidirectional non-adaptive institutions were both high: 100% were aware of multidirectional adaptive institutions and 94% of unidirectional non-adaptive institutions. As with government informants, multidirectional adaptive institutions and unidirectional non-adaptive institutions received moderate support (54% vs 50%, respectively). Awareness among corporate informants resembled that of non-governmental informants: 89% were aware of unidirectional non-adaptive institutions and 100% of multidirectional adaptive institutions. Their support for unidirectional non-adaptive institutions was, at 72%, only slightly lower than for multidirectional adaptive institutions (75%).

Local actors are the least aware of forest laws, even though these are some of the oldest formal laws governing wetland use. Only 37% of the local informants were aware of forest laws. They intuit what is in existence and what is acceptable, but most are not interested or bothered by the laws. Like all other actor categories, local actors were more knowledgeable about multidirectional adaptive institutions than unidirectional non-adaptive institutions and supported the former more than the latter. They were aware of the right of their community and traditional rulers to sell land to willing buyers

Table 8.4. Institutional Awareness, Support and Satisfaction for Four Actor Groups.

Institutional mechanism	Examples	Government actors (N=15)			Local actors (N=27)			Corporate actors (N=6)			Non-governmental actors (N=6)			Multilateral actors (N=1)			Academic actors (N=3)			Media actors (N =1)		
		Aware	Support		Aware	Support		Aware	Support		Aware	Support		Aware	Support		Aware	Support		Aware	Support	
			Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No
Unidirectional non-adaptive state institutions	Land Use Act	15	3	12	25	1	24	6	4	2	6	0	6	1	1	0	3	0	3	1	0	1
	EIA Law	14	10	4	10	3	7	6	5	1	6	4	2	1	1	0	3	2	1	1	0	1
	Forestry laws	10	3	7	17	9	8	6	5	1	6	3	3	1	1	0	3	2	1	1	1	0
Unidirectional non-adaptive traditional institutions	Local/communal land ownership	9	2	7	26	23	3	6	4	2	6	4	2	0	0	0	3	3	0	0	0	0
	Communal religious institutions	2	1	1	24	21	3	4	3	1	4	4	0	0	0	0	3	3	0	0	0	0
	Communal method of resource extraction	3	2	1	13	9	4	4	2	2	6	2	4	0	0	0	3	1	2	0	0	0
Multidirectional adaptive endogenous institutions	Institution of land sale by communities	13	10	3	27	27	0	6	6	0	6	4	2	0	0	0	3	3	0	1	1	0
	Institution of militancy	15	5	10	27	17	10	6	2	4	6	0	6	1	0	1	3	1	2	1	1	0
Multidirectional adaptive exogenous institutions	Varied state institution exchanges	15	12	3	27	23	4	6	4	2	6	3	3	1	0	1	3	1	2	1	1	0
	Memorandum of Understanding	13	10	3	27	21	6	6	6	0	6	6	0	1	1	0	3	3	0	1	1	0
Total		Aware %	Support %		Aware %	Support %		Aware %	Support %		Aware %	Support %		Aware %	Support %		Aware %	Support %		Aware %	Support %	
			Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No
	Unidirectional	59	40	60	71	57	43	89	72	28	94	50	50	50	100	0	100	61	39	50	33	67
	Multidirectional	93	66	34	100	81	19	100	75	25	100	54	46	75	33	67	100	67	33	100	100	0

and that they and the families own the land and should control it. They were also aware of traditional institutions for protecting crocodiles, establishing sacred lakes and forests, and harvesting materials.

Some local informants agreed that traditional methods of harvesting resources are not always the best. Six informants who participated in a group discussion with fishermen admitted to previously using traditional fishing institutions in the wetlands which they now regard as destructive, e.g. using chemicals and poisons extracted from oil palm and raffia palm trees. They claim to have stopped using this institution after being encouraged to do so by a non-governmental organization, which informed them about the health and environmental hazards of their actions. Yet field observations showed that many fishermen still use this practice because it is easier, quicker and less stressful.

During a similar group discussion with hunters, they were asked if they would kill any animals that are “endangered species”. Three of them said they would because the animals were given to them and their forefathers by God, so they see no reason why they cannot hunt any animal. Others cite ecological reasons similar to those used by the fishermen. The increased ecological awareness of local actors seems to be responsible for the high proportion of local actors who do not support traditional institutions for harvesting resources from the wetland. Although fewer local informants supported the customary land ownership institution, this was attributed to a lack of trust in communal or family custodians of the land. According to an informant who does not support this institution:

"They will just collect money and not tell other people, before sharing it with their friends and family”.

In the same vein, the three informants who do not support traditional religious institutions cite their Christian beliefs as the reason for this. They also suggested that these institutions are archaic and not relevant in a modern society.

Although all local actor informants are aware of the Memorandum of Understanding (MOU) institution and most support it, others do not support it as they claim that the oil companies do not always comply with the content of these agreements. During a recent

community protest about the refusal of an oil company operating in the area to sign a MOU with them, the Youth President of the community association said:

“We are here to block the company because of their neglect of the people of Orukun, and entire Mbo.... We don't want them to continue with their work except they come down and sign the memorandum of understanding Before any operation goes forward, the work should stop; that's our position.” (Etim, 2012).

On the institution of militancy in the Niger Delta, many local informants claim they do not support unprovoked violence, yet they tacitly support the activities of those involved. This is reflected in the statement by a local youth who claimed he previously participated in “militancy” and a community leader.

“It was not our intention to kidnap and bomb them (referring to oil companies). But you know that as freedom fighters, fighting for our rights we can do anything If we don't fight they will destroy us”
(local youth)

“You cannot fully blame our youths, we have to plead with them and keep telling them every time to give government a chance. But we have governments that never learn from past mistakes. Hopefully this one will be different” (community leader)

Seventeen local informants supported this approach. The remainder did not do so because of the violence or because, as they claimed, they realized that youths are actually out to enrich themselves and not to better the community. One informant said: “Do you think they are fighting for the development of their communities or for themselves? Some of them have limousines and choice houses in Port Harcourt”.

Overall, it is clear that multidirectional adaptive institutions are popular with all actor groups, enjoy the greatest level of support, and bring the greatest satisfaction to people across all networks. Local actors suggested that unidirectional non-adaptive institutions are not helping their activities and often lead to conflicts among the various resource users. From the survey, the majority of respondents claimed that unidirectional non-

adaptive institutions have influenced their access to important ecosystem services through either destruction or restrictions. In contrast, few users saw opportunities in unidirectional non-adaptive institutions to fully realize the potential for tourism in the wetlands or for protecting biodiversity by designating Ramsar sites in the Delta.

8.4 Explaining the Choice of Institutions

To understand what influences the choice of institutions for using and managing Niger Delta wetlands, a list of six pre-defined attributes was presented to local informants in 283 households with an option of further open-ended discussions, and informants from other actor categories were asked open-ended questions.

The results indicated that local actors generally adopt institutions that maximize their economic benefits from the wetlands (Table 8.5). The next most important factors are the risk implications of their actions, e.g. if it will lead to catastrophic damage to the environment or human life, and the potential repercussions for themselves and their immediate family if they break the rules. The repercussions associated with disobeying unidirectional traditional institutions are viewed more seriously more than those for other categories of institutions. A local fisherman, explaining why he will choose to obey the local institution governing forests and sacred lakes rather than state formal laws restricting access to same resource, reasoned that the latter will only lead to his imprisonment or fine, but the former might lead to his death and the destruction and disgrace of his family. This suggests that religious beliefs also influence adoption of institutions, but with the rising popularity of Christianity an increasing number of local people no longer believe in some traditional institutions and so are willing to risk the repercussions. Consideration of the social networks of other actors involved is another influential factor.

Corporate actors generally adopt any institution that does not interfere with business operations. This can be inferred from the statement by an oil company informant:

“It must be clear to the youths that the Niger Delta region cannot develop if they continue to disrupt production activities of the oil companies and destroy the capacity of the government to export oil. It is discouraging if the

uninterrupted activities of the company cannot be guaranteed They will continue selling off their concessions in Nigeria” (BUS7).

Table 8.5. Average Ranking of Factors Influencing Local Actors’ Adoption of an Institution.

Factor	Average rank (1 highest, 6 least)
Profit maximization	1.6
Risk avoidance	3.2
Repercussion/punishment	3.4
Upholding biodiversity and natural environment	4.0
Protection of cultural values	4.3
Ethnic/religious and social considerations	4.5

Another inference is that monetary payment or inducement is not a major challenge for corporate actors provided it ensures business continuity.

Non-governmental actors are influenced by the need to avoid conflict with other actors and ensure consistency of the institution with their organizational mission statement. For example:

“We stand by what we believe and do not show different loyalties nor do we take sides... This is why we have been able to maintain good working relationship with local communities and the oil companies" (NGO2).

The flexibility of institutions to be adaptable to local realities is another important consideration for non-governmental actors. One informant suggested that one of the issues she would like resolved in the management of the wetlands is:

"The issue of whether or not the Land Use Decree is to be enforced (i.e. the State is the landlord) or whether the community (as landlords/owners) can use/sell/exploit their land without permission. It is unacceptable if land belonging to identifiable peoples and communities is forcibly taken away to make way for a so-called development with virtually no compensation to the people who are alienated from their lands, and rendered internally displaced persons but lacking all the rights and privileges accorded them by UN conventions.” (NGO4).

One government informant suggested that he can sympathize with poor, uneducated people who violate formal laws, but not with those who know that their actions are forbidden under the law. Another informant commented that it is difficult if not impractical for him to enforce in the field some state laws which are not well understood by local people and which he himself finds complicated:

"I know....what the law states, but it is not possible for me to stop the people from living their lives; some of them do not even understand why someone will tell them not to cut down some treesThe people believe they are the true guardians of the forest Until the government understands and makes these laws relatively simple and easily understood by local people and those who work in local areas, such as loggers and farmers, enforcement will be difficult" (GOV1).

Also evident from this statement is another factor influencing government actors' choice of institutions – the ability of local people to benefit from the environment. GOV1 suggested that he would relax his enforcement if the actions of local people were designed to sustain their livelihoods.

From the foregoing, it is evident that individuals from the various groups are willing to participate in multidirectional adaptive institutions.

8.5 Important Factors in the Institutionalization Process

The institutionalization process is complex and influenced by various factors. Five key requirements are discussed here: opportunities for formal and informal interactions; the exchange of materials; trust building and learning; transaction costs of interactions; and the involvement of key persons.

8.5.1 Opportunities for Formal and Informal Interactions

Central to institutional change is the possibility for formal and informal interactions between actors. It is difficult to distinguish between where one interaction starts and another begins, but while formal interactions are important for agenda setting, it is

during informal interactions that policies and other far-reaching agreements are made which ordinarily would be impossible during formal interactions. According to a local youth:

“After we meet in the open they (the chiefs) meet them (officials of Nigerian AGIP Oil Company Limited) behind (closed doors), saying they want to iron out some important points. Before we know it they have agreed with them”.

This was how he explained how land adjacent to the sacred Boupere Lake was given to the Nigerian AGIP Oil Company.

In these informal settings, actors are able to *act as themselves*, which they might not do in formal settings. According to a government official:

“You know sometimes even we government officials have to behave like the politicians, and speak what the people want to hear even though we don’t really believe it. Some people want to show off, so that people can see that they are working even though they know that what they are saying is not possible. They (the officials) do not really believe in what they are arguing for (in a formal setting), but when we meet them later (in informal settings) they are able to tell us that if they don’t behave like that the people will kill them.”

To support this point, an NGO official said that:

“Informal interactions are actually more effective for our work here. In public (formal settings), there is a lot of playing to the gallery or suspicion of motives, and unwillingness to share information..... from research, on sources of funding etc. But you know if you meet them later, the things they cannot tell you or want everybody to hear they can tell you”.

Apart from supporting the assertion that informal settings are important when actors interact, this suggests that there is often suspicion and lack of trust in formal settings which is often not the case in informal interactions.

8.5.2 *Exchange of Materials*

Informal interactions also make possible the exchange of materials between actors that fall outside formal institutions. These exchanges are not limited to tangibles such as money and gifts of houses, but also include local and foreign training trips, medical trips, contracts, employment etc. In a society where poverty is high, salaries cannot sustain households and staff training is almost non-existent, any offer of this kind will be strongly considered. All government officials regard their salary, training and facilities provided by government as inadequate. As one government official pointed out: “You see these people (the oil companies) know what they want and know how to get it”. Another government official, justifying his department's close relationship with multinational oil companies, said:

“Government will not provide us with the materials and funds needed to work Do you want me to work with my teeth?, They don't give us materials, they don't give us anything, even the salary is difficult for them to pay us and now you think it is not good for us to relate with the oil companies ... My brother, it is crucial for us to have good relationships with people who can help us”.

A senior NGO official describes how poor support from government agencies for their field staff is responsible for corrupt practices and sabotage of formal institutions:

“Their staff have been turned into beggars. They (referring to military personnel) are sent from far places to this place and yet they don't pay their entitlements when due. In the process of looking for help they come across these thieves and thugs who will offer them heaven and earth ... They don't know when they will get their entitlements and cannot reject these offers because at the end of the day government might not be able to pay them This is why enforcement has suffered”.

Exchanges may include NGOs too. An NGO official agreed that they get a lot of support from the multinational oil companies and complained of the difficulty in getting any financial assistance from government. Most of their projects are sponsored by multinational oil companies, and some NGOs also double as contractors to oil companies to fund their activities. Another NGO official said:

"At one point we wanted to do a programme (in the Niger Delta) that will benefit the people. We approached a government organization but were bluntly declined. We then went to the oil companies and without stress they agreed to support the project."

These material exchanges achieve two purposes. First, they act as personal *favours* to the people receiving them, to supplement their livelihoods, for reasons stated above. Second, they serve as a form of *protection*, enabling actors to overcome possible obstacles from rival actors. For instance, it is speculated that oil companies have paid rival youth groups to protect their operations in the region. This money is used to purchase guns to protect oil facilities. It is believed that oil companies also bought weapons for the Nigerian military in the guise of corporate social responsibility. The weapons are then used to protect oil facilities and harass local people who protest about their activities in the Delta. The military see such gifts, e.g. guns, speedboats, helicopters etc., as supportive of their mission. A representative of the Inspector General of Police said, when receiving these items, that: "With these provisions by the oil companies we feel pretty much empowered to carry out our duties."

It is reasonable to conclude that the exchange of materials persuades people to work against formal institutions and to sustain informal institutions in use. This suggests that the concept of exchange of materials should be expanded to include formal exchanges between employers and employees in the form of salary and training, for it is because of the inadequacy of these formal exchanges that informal exchanges have become so important.

8.5.3 *Trust Building and Learning*

Formal and informal interactions also enable trust building and learning, which facilitate repetition of multidirectional adaptive institutions. When actors lack trust they become suspicious of each other's position and actions, but by building trust actors establish a minimum degree of cooperation and so strict and overzealous enforcement and scrutiny is avoided.

Actors will always prefer to interact with those with whom they have built trust, irrespective of the economic cost. This explains why a logger informant suggests that even though he pays more to transport his produce through a route manned by officials whom he trusts, he prefers to remain with this route rather than trying to go through an alternative route where he is not well known by officials. He said apart from the fact that one of the officers is a friend of one of his relatives, they have built a social bond because they often socialise together and he often gives the official a lift in his car.

While social, cultural and religious affinities enhance trust, mutual learning and understanding, enhanced by repeated practices, are also essential. For example, a local chief stated in an interview that his community will only allow oil companies with whom they have engaged in the past, and trust, to buy lands within the clan, even if other companies offer a higher price. That there is more to these exchanges than economic benefits is shown by the example of Shell in Ogoniland where, despite promises of massive development, local communities have so far refused Shell permission to resume production. A leading member of the community said that:

"We do not trust them because past incidents show that the company consistently under-reports the amounts and impacts of its carelessness."

This underscores the importance of past practices and learning in trust building and institutionalization. Actors build on past experiences to determine if others are trustworthy or not. In this process the repetition of actions is important. For instance, the more an actor engages in exchanges in a network the more trust is built. Of the three logging informants interviewed, the one who engages in weekly interactions with forestry officials trusted them more than did the other two who met officials less

frequently. This can in the long run even reduce the volume of exchanges. The logger informant also suggested that because of the bond between him and the forestry officials, there are times when he does not have the required exchange amount of money to exchange, yet the official allows him to make payments at other times or to conduct his activity without payment. In appreciation, when he has more cash in hand, he buys him food or may decide to pay more than usual to demonstrate to the officer that he still a willing and regular participant in the institution.

Another way to cement trust in networks is to be proactive with such exchanges and not just wait to make exchanges during the activities. A local informant praised the activities of an oil company who, though not operating in the community, have introduced an “educational programme to the people in a bid to reduce the gap of illiteracy”. The company has also awarded scholarships to local people, and he perceives it as the only oil company which is “trying to fix the problem because they are focused on trying to do the right thing”. The only other organizations who received similar praise from local people were non-governmental organizations.

Learning is important in building trust where there is no pre-existing social bond. Regular interactions between actors enables them to learn by observing the behaviour of others and the outcomes of this behavior. Past practices that were mutually acceptable and had understandable benefits are continued, but practices that have proven “unhelpful” are not repeated.

8.5.4 Transaction Costs of Interactions

Actors generally engage in institutions in which the costs they incur do not outweigh the benefits. Where the cumulative transaction cost of adopting an institution is higher than that of adopting an alternative institution then the latter is chosen. Interviews with actors across all categories suggest that the transaction costs of following formal institutions tend to outweigh those of informal institutions.

One factor that raises the transaction cost of interacting with government is physical distance. Most government agencies responsible for managing the Niger Delta wetlands have offices in the region, but most decisions are made in the capital Abuja, about 600

miles away. Leading governmental representatives hardly ever visit the region, and a government official heading one of the key units responsible for conservation in the Niger Delta stated that he has never been to the wetlands. From the perspective of a government enforcement officer in the Delta, officials in Abuja like to retain responsibility for decision making, because if "they award the contract, they will get all the benefit." Physical distance increases the cost of following formal institutions. For example, after a recent oil spill in his community, a local hunter met representatives of the local government, NGOs and the oil company, but nobody from the federal or state governments. When he tried to complain to the Niger Delta Development Commission that his fish pond and farmland were polluted he was directed to the State Ministry of Environment, who in turn sent him back to the Niger Delta Development Commission. At this stage he was told that the responsible body was the National Oil Spill Detection Agency in Abuja, but as he could not afford to travel there he had to drop his complaint.

The complexity of government also raises the transaction cost of interacting with government organizations. The structures of even single government organizations are often in constant flux, and a government official also highlighted the lack of integrated planning and the difficulty of cooperating with other ministries: "We meet them but they don't cooperate". The lack of a coordinated strategy by government thus creates a situation in which the enforcement system within agencies works against stated formal institutions and transaction costs within government are too high. Half of the local people interviewed had difficulty determining whom they should meet when they have issues about the management of the wetlands. An academic commented that:

"Government enjoys creating many organizations that end up confusing themselves to know who is responsible for what and make the work of those of us interested in the environment difficult, because if you go here they tell you to go there and this is how they keep throwing you up and down".

Another aspect of complexity is the need to engage in cumbersome procedures. A logger informant stated that the procedure for gaining a permit is too burdensome for an illiterate person like him, who only works to support his family. If he were to follow formal rules to gain permits to fell trees in the wetlands, he would have to queue for hours in the local bank to make the legally required payment for the permit. He would

then take the receipt to the ministry to put in his application, and wait for weeks or months for his permit to be approved, assuming that he is one of the few successful ones. He also pointed out that permits will not be granted unless a bribe is paid. Acquiring the permit does not offer him anything more than he gains by participating in an informal interaction. Indeed, both those with permits and those without permits still have to make the 'normal' exchanges with the field staff.

This was confirmed by an oil company informant who suggested that, despite payments made to government to acquire land in the Niger Delta, his company is often disappointed because it does not receive the best lands. However, it can gain access to such lands through informal interactions with local communities. So in exchanges in networks where trust building is an important factor, the transaction cost is significantly reduced. This makes these exchanges attractive to actors, and explains why oil companies are willing to pay *more* through these networks to secure their activities than to adopt formal state institutions that do not satisfy their needs.

8.5.5 *The Role of Key Persons in Networks*

In an environment where multidirectional adaptive institutions are built on trust generated in formal and informal settings, key persons have sufficient understanding of the processes and people that they have to manage and interact with. The key persons are thus in a position to make a difference to practices at both individual and collective levels. This is achieved through interventions where they apply their knowledge and utilize techniques and processes, as well as material and symbolic resources, to achieve the desired change in individual and group behaviour.

Because of the unequal hierarchical relationships that often exist in Africa, there are two categories of key persons in the society that play important roles in the institutionalization process: those at the top and those occupying mid to low-level positions. These hierarchies are assumed to be pyramidal in nature, hence there are more people at the bottom than at the top. While those at the top are important in cementing the process, those at the bottom are the 'foot soldiers' responsible for exercising multidirectional adaptive institutions. An example is a low-level forestry

official who provides feedback to his superior which influences how things are done. These lower level key persons are as important as those at the top of the hierarchy.

Key persons at the top of the network also belong to diverse networks, including those with strong links to oil companies. They include the past and present heads of the Petroleum Resources Ministry, staff in other agencies who were former directors of oil companies, and family members of people with business interests in the oil and gas sector.

While most informants tended to ignore low-level key persons, they emphasized the importance of top ranking and middle level officials. The key persons are those who set the climate for practices based on the interests of the organization.

The level of adoption of multidirectional adaptive institutions is greatly influenced by the way in which the key person uses their managerial ability to influence behaviour in the organizational setting. This process is often used in organizations, not only for formal purposes, but to also give lower level officials - especially - a sense of worth and unambiguous perceptions of what the organization stands for and what the organizational culture is ("the way we do things around here").

At other times, the perceived interest of the top level key person also influences the behaviour of other actors. A government official said that:

"When Jonathan (current president of Nigeria) came into power, we think he was going to protect us (indigenes of the Niger Delta) and that he will act to help the Niger Delta region, but what did we get, nothing. Being that I am personally concerned about the environment, I saw this as an opportunity to do the right thing, but we soon realize that there is no difference as the oil companies still basically have their way".

To buttress this point an NGO official recalled an exchange with military personnel:

"In the early days of the Yar-Adua regime (a former president of Nigeria), shortly after the swearing in, they expected that illegal bunkering will

continue since most of them are from the north (from where the president came), and they didn't do anything to stop them, but they were surprised the regime made an effort to stop bunkering."

These instances suggest that, given the understanding by subordinates that at the highest levels of decision making informal interactions are having sway, they will become relaxed and will hardly focus on achieving the stated institution but focus instead on achieving agency objectives.

The role of key persons was regarded by most informants as the 'golden thread' that runs through the multidirectional adaptive institutionalization process. The implication was clearly that, without interactions with key persons, multidirectional adaptive institutions could not be very successful. A junior official described the informal approach by his superior in handling a crisis between local communities and oil companies as "articulating ideas, persuading, and cajoling and coercing".

It also seems that effective two-way communication (verbal or symbolic) between the key person and the other members of his group (especially those lower down the pyramid) is regarded as a prerequisite for institutionalization to succeed. In this study, most informants that indicated that they have informal discussions with key persons in their organization on a regular basis suggested that these discussions enable them to use real life situations to help to solve problems and make decisions.

8.6 Linking Institutional Support with Network Structures and Narratives

A test was made, using a tool in UCINET, for the relationship between the institutions supported by informants and the structures of their networks. The results showed that the size of the informant's ego network was positively correlated with the number of multidirectional institutions they support ($r = 0.743$). On the other hand, the ego network density was negatively correlated ($r = -0.565$) with the number of multidirectional institutions they supported (Table 8.6). This suggests that, because of the difficulty communicating with informants with strong density, it is less possible for them to adopt multidirectional institutions. Finally, there was a positive correlation between the number of multidirectional institutions supported by informants and the

number of narratives they adopt. This suggests that the more narratives an actor adopts, they more likely they are to support multidirectional institutions.

Table 8.6. Correlation Analysis between Network Variables of Informants and Their Support for Multidirectional Institutions and their Narratives.

Indices	Number of Adaptive Institutions Supported		
	Pearson correlation, r	Sig. (1tailed), p	N
Degree centrality (Size)	0.743**	0001	33
Egonet Density	- 0.565**	0.001	33
Betweenness	0.567**	0.001	33
Narratives	0.495**	0.004	33

Support for multidirectional adaptive and unidirectional non-adaptive practices by informants was also analysed. Findings showed that multidirectional adaptive institutions were initially controversial but came to be adopted by many individuals and organizations. Despite their informality, the multidirectional adaptive institutions spread quickly through cohesive ties among members belonging to the same network, and are now more widespread than unidirectional non-adaptive institutions. Support for unidirectional non-adaptive institutions does not appear to be linked to networks; instead, informants support them because that is what their organization expects.

Networks provide a compelling answer for support for institutions. Of the 22 informants who interact more informally than formally, 17 of them support all four multidirectional adaptive institutions. On the other hand, of the 11 informants who interact more formally than informally, 9 support at least 4 of the unidirectional non-adaptive institutions. Multidirectional adaptive institutions spread from one individual to another across various networks because informal networks have no strict boundary, unlike the formality associated with the unidirectional non-adaptive institutions. This suggests that informants who indicated they interacted informally with actors from other groups were the conduits through which multidirectional adaptive institutions spread. Unidirectional non-adaptive institutions, in contrast, are not easily circulated because they only exist in formal settings.

8.7 Conclusions

1. This chapter has examined institutions in the Niger Delta in the framework of the Network Communication Framework. It found that unidirectional non-adaptive traditional institutions are well established but often not complied with, for while they have evolved endogenously they are increasingly seen as archaic. Unidirectional non-adaptive state institutions - the archetypal 'institutions by design' - are plentiful but also not widely followed, as they are imposed exogenously by actors who mostly lack knowledge of local conditions.
2. Two categories of evolutionary institutions predicted by the Network Communication Framework were found to be prevalent and popular in the Niger Delta. The first are multidirectional adaptive endogenous institutions where the state has poor scalar reach, and include the evolution of institutions through the interplay between traditional institutions and the institutions of oil companies. These correspond generically to the autonomous evolution of institutions in the vacuum created by the low scalar reach of state institutions, identified by Ostrom (2005), but in this case they do not necessarily lead to sustainable environmental management.
3. The other form of evolutionary institution has been identified here for the first time. Multidirectional adaptive exogenous institutions when the state has moderate scalar reach originated outside the Niger Delta but subsequently evolved through interplay between modern state institutions and non-state (traditional) institutions. They are found in the widespread circumvention of forest laws and underline the simplicity of the concept of "illegal logging".
4. When actors representing the main categories of groups in the Niger Delta were questioned they showed good awareness of, and support for multidirectional adaptive institutions. Support for unidirectional non-adaptive institutions was generally lower.
5. The most important factor influencing the adoption of multidirectional adaptive institutions was found to be profit maximization. Moreover, the number of multidirectional institutions supported by an actor was found to be positively correlated with the size of their personal network.

6. There is evidence to show that multidirectional adaptive institutions are more attractive because they provide an opportunity for inputs to occur from a wide range of actors, so that their practices, customs, values, and beliefs can be taken into account. This increases the likelihood that these institutions will be consistent with local conditions, attitudes, and practices.
7. Multidirectional adaptive institutions also provide an opportunity for all parties involved to determine how much they can pay or accept in exchange, and when and how it should be paid. The informality of these institutions ensures flexibility, so they can be modified in response to changes in the preferences of the actors adopting them.
8. However, while multidirectional adaptive institutions are effective, they may not necessarily lead to environmentally optimal outcomes, and this neatly represents the contrast between the ideal of purposely designed institutions and the reality of evolved institutions.

CHAPTER 9

CONCLUSIONS

9.1 Introduction

This thesis sought to understand the roles of networks and institutions in environmental management, particularly in an African context. In doing so, a new model – the Network Communication Framework (NCF) - was designed (Chapter 3) and empirically tested in the Niger Delta wetlands in Nigeria (Chapter 7 and Chapter 8). In this chapter, the salient findings of this research are summarized and conclusions are drawn based on the research findings. Also presented in this chapter are personal reflections and insights gained from the researcher’s experiences throughout the process of this study. The chapter concludes with recommendations for future research and suggestions for achieving more sustainable management of the Niger Delta wetlands.

9.2 Summary of Findings

This study aimed at gaining new insights into how institutions governing the management of the environment are adopted wholly, partially or not at all by state and non-state actors. Situating this approach within theories of institutional change enable the conceptualizing and testing of a new framework for understanding institutional change, whereby networks interact via four important communication contents (information, institutions, material resources and power) and four dimensions of

communication (direction, autonomy, adaptation and reach). The framework shows that the four dimensions of communication may be combined to predict a range of different outcomes for communications between networks. Based on this, four combined outcomes involving communication between two networks were identified. The first is unidirectional non-adaptive communication, whereby a modern state network imposes communication content on non-state networks. The second is unidirectional non-adaptive communication, whereby even though a modern state network has high scalar reach it is resisted by traditional networks. The third is multi-directional adaptive endogenous communication, according to which a modern state network has poor scalar reach and a traditional network is able to assert its autonomy and adapt to the virtual absence of the state at the local scale by devising its own institutions for sustainable management. The fourth is multi-directional adaptive exogenous communication in which a modern state network has moderate scalar reach and state and non-state networks modify state institutions for their mutual benefit. Together, these combinations represent some of the institutions that govern the management of the environment in many societies, especially in Africa. While the first two types of institutions are well documented (Koku and Gustafsson, 2003; Adekola et al., 2012; Mafabi, 2000), and the third is highlighted in the works of the late Eleanor Ostrom (see Ostrom 1990, Ostrom 2005, Ostrom 2008), the genesis and mechanisms of the fourth remain wholly undocumented and poorly understood. In order to gain further insights, the Network Communication Framework was tested using the case study of the Niger Delta wetlands in Nigeria. This provides a suitable study site considering its position as an ecosystem with attention spanning diverse networks.

Seven distinct groups represented by networks were identified as relevant to the management of the Niger Delta wetlands: government, local communities, corporate, non-governmental, multilateral and academic organizations, and the media. Each network has distinct public narratives about managing the Niger Delta wetlands. In this study, network membership was found to have an overwhelming influence on the narratives of actors. Although actors have a latent narrative of the main network they belong to, they also belong to other networks with which they interact. Such relationships facilitate multidirectional communication between actors from diverse networks, i.e. between state and non-state networks. This led to actors adopting

narratives that correspond to those of the other networks to which they belong, while still retaining the narratives of their own network.

Unidirectional non-adaptive state institutions are not widely followed, as they are imposed by actors who mostly lack knowledge of local conditions. Unidirectional non-adaptive traditional institutions are well established, but are often not complied to because they are perceived as archaic. Multidirectional adaptive institutions are more popular across all networks because they provide an opportunity for input to be transferred from a wide range of actors. As such, their interests, practices, customs, values, and beliefs can be taken into account.

Adaptive institutions characterized by multidirectional flows of communication content between state and non-state networks bring some semblance of stability to the management of the Niger Delta wetlands. This type of communication blurs differences between state actors and non-state actors and enables them to negotiate terms that are mutually beneficial. Synergy between state and non-state networks, which result in some form of stability in the management of the environment, was shown to be possible through multidirectional communication, where both networks negotiate and engage in mutually beneficial practices. These have resulted in non-state actors gaining access to more resources and better meeting their livelihood requirements than they ordinarily would if they had followed formal state institutions. On the other hand, they have halted a number of activities that could degrade the environment, such as burning wetland vegetation to gain access to wetland services such as timber. Also, part of the materials given in exchange is used for purchasing seedlings for replanting. In addition to the materials exchanged, opportunities for formal and informal interactions, trust-building and learning, the transaction costs of interactions and the role of key persons within networks are important factors in the institutionalization process between state and non-state networks.

This study also found that the distribution of benefits and costs from the Niger Delta wetlands is unevenly distributed with local communities having to bear about 75% of the cost of oil extraction which is almost 20% of the revenue/profits of the oil industry (Chapter 6). This disparity sheds some light on the interactions between the various networks.

9.3 Discussion

Most existing theories of institutions focus more on explaining how institutions resist change, rather than how they actually change (Hall and Taylor, 1996). This situation is partly due to the fact that research on institutions has focused either on 'design' or 'evolution' with little attention on building theories that integrate the processes of evolution and design within a broader framework (Kingston and Caballero, 2009). Furthermore, existing theories do not explain how communication between networks influences institutional change. This is because research into institutions and networks has proceeded on largely separate trajectories and little effort has been made towards understanding the mutuality between institutions and networks (Owen-Smith and Powell, 2007). New institutionalism has emphasized the importance of theory-building as opposed to description, and exploring dynamic, as opposed to static interaction. More specifically, sociological institutionalism, which posits that institutional processes should be seen in the light of culturally specific practices, emphasizes not just formal rules but also informal norms, symbol systems, cognitive scripts, and moral templates that provide the 'frames of meaning' that guide human action (Hall and Taylor, 1996). New institutionalism in sociology is a particularly promising prism through which to understand much of social behaviour and change (Nee and Ingram, 1998). Despite these useful contributions, most institutional theorists have provided limited explanations for the interactions between networks and institutions. Consequently, there is still no model that can be used to analyse the process of institutional change in environmental management involving multiple actors. Any improved model of institutional change should show how interrelations between institutions and networks influence the dynamics of institutions.

Given the limitations of the existing institutional change models, the first aim of this study was to *design a framework for analyzing the institutional change process in environmental management involving multiple actors*. As the central parameter was the network, the first step taken by the author was to outline a new approach to modelling networks (Chapter 3). This was based on the social network analysis perspective, which defines a network as "a set of actors (e.g. person(s), teams organizations, concepts etc) ... often called nodes connected by a set of ties" (Borgatti and Foster, 2003). Based on this perspective, a new framework called the Network Communication

Framework (NCF) was devised. It addressed the main shortcomings of existing institutional change theories, especially their (a) failure to explain interaction (as well as mutuality) between institutions and networks (Owen-Smith and Powell, 2007); (b) their neglect towards building theories in which processes of evolution and design are integrated (Kingston and Caballero, 2009); (c) their lack of explanation regarding the communication between networks by incorporating flows that have been analysed separately.

In addressing the communication between networks and allowing for interactions between flows, the author has used concepts developed in social network analysis in order to describe communication within networks through various 'flows' (such as information and institutions, power and materials) (Borgatti et al., 2009). It was assumed that flows (communication) between networks involve similar processes, and are also affected by communication within networks (see Section 3.2.3). As well as combining different flows that were previously analysed separately (Kosfeld et al., 2006), the NCF also allows for interactions between flows, leading to more complex effects that mirror real life situations, especially in an African context.

The framework identified the flows that link networks together (Section 3.2.4). These flows are the principal categories of communication content in a network. All networks in an arena influence each other through the contents of their communication, whether actors are aware of it or not. As the basis for a new integrated framework that explains the contribution of design and evolution to institutional change, and in response to Kingston and Caballero (2009), each communication can be considered as having four dimensions: direction, autonomy, adaptation, and reach (Section 3.2.5). In doing this, the NCF was able to predict various institutional outcomes (Section 3.2.6).

The simplest combinations involve communications between two networks that vary in direction, autonomy, adaptation and scalar reach. For a developing country with a modern state network and a non-state network centred in traditional society, four institutional outcomes were predicted. In unidirectional, non-autonomous and non-adaptive communication, a modern state network with high scalar reach could impose flows of information, institutions etc. on a traditional network. The second is also characterized by unidirectional, autonomous and non-adaptive communication. Even

though a modern state network has high scalar reach, the traditional network is not passive and can, therefore, successfully resist such attempts at imposition. This describes what happens today in many developing countries. In multidirectional and adaptive endogenous communication, in which a modern state network has poor scalar reach, a traditional network can assert its autonomy and adapt to the virtual *absence* of the state at local scale by devising its own institutions for sustainable management. This describes the widespread autonomous management of common pooled resources by local communities as identified by Ostrom (2005). In multidirectional and adaptive exogenous communication, in which a modern state network has moderate scalar reach, interactions between state and non-state networks could modify state institutions for their mutual benefit. The first two involve the design of institutions, while the latter two concern their evolution. This fits with Kingston and Caballero's (2009) 'design' and 'evolution' categories. Thus, this is the first time that a framework has been developed to integrate processes of institutional evolution. This framework also provides a platform for analyzing the institutional change process in environmental management involving multiple actors.

As a way of testing the robustness of this new framework and in order to explain the role of networks and institutions in environmental management, the second aim of this thesis was to *use the designed framework to test its applicability in the management of the Niger Delta wetlands in Nigeria*. In fulfilling this aim, data were collected through various means (see Chapter 5). The NCF was specifically used to test two categories of content that were communicated within and between networks: information and institutions. The first category aimed at testing the NCF by analysing the evidence for the complementary communication of information (Chapter 7). This was followed by an analysis of institutions as carriers of communication content. The relevant evidence for this was analysed in Chapter 8.

The empirical findings are largely consistent with the predictions of the NCF. Each network was found to have public narratives concerning the causes of, and possible solutions to, the economic, social, political and environmental problems facing the Niger Delta region. Although these narratives would normally be expected to coincide fully with the narratives of actors representing the relevant groups, interviews with individuals from each group have shown that their everyday narratives are far more

heterogeneous. In-depth interviews were held with forty two representatives of the key groups. These included government (15), local (11), corporate (5), non-governmental organization (6), academia (3), multilateral organization (1) and media (1). Out of the forty two interviewees, at least half adopted the local, governmental, multilateral and non-governmental narratives (section 7.3). Although some actors adopted just one narrative, three actors adopted six out of the seven. The results also suggested that if an actor has at least 45% of immediate partners, or alters, from a group in their personal, or ego network, they tend to adopt the narrative corresponding to that group. Such adoption of narratives is characteristic of communication both within and between networks. This provides support for the Network Communication Framework, which predicts that when actors are members of a variety of networks, communication within and between these networks will influence their discourses and narratives.

It was found that wetland management in the Niger Delta followed the four institutional outcomes predicted by the NCF (Chapter 8). It was also shown that unidirectional non-adaptive traditional institutions are well established but are often not complied with. In spite of their endogenous evolution, they are increasingly seen as archaic. Unidirectional non-adaptive state institutions - the archetypal 'institutions by design' - are plentiful but also not widely followed, as they are imposed exogenously by actors who, for the most part, lack knowledge of local conditions. The two categories of 'evolution' institutions predicted by the NCF were also found to be prevalent in the Niger Delta. The multidirectional and adaptive endogenous communications were also identified, however they were found to often lead to opportunism by "community leaders" and sometimes conflict with a poor scalar reach state *struggling* to enforce its institution. Most importantly, the fourth institutional arrangement predicted by the NCF for the first time was widely found among all networks.

A second form of evolutionary institution has been identified here for the first time. Multidirectional adaptive exogenous institutions originate outside the Niger Delta but subsequently evolve through the interplay between modern state institutions and non-state (traditional) institutions. They are found in the widespread circumvention of forest (wetland) laws and underline the simplicity of the concept of "illegal logging". When actors representing the main categories of groups in the Niger Delta were questioned

they showed good awareness of, and support for, multidirectional adaptive institutions. Support for unidirectional non-adaptive institutions was generally lower. The most important factor influencing the adoption of multidirectional adaptive institutions was found to be profit maximization. Moreover, the number of multidirectional institutional outcomes supported by an actor was found to be positively correlated with the size of their personal network. There is evidence to show that multidirectional adaptive institutional outcomes are more attractive because they provide an opportunity for inputs to be transferred from a wide range of actors, so that their practices, customs, values, and beliefs can be taken into account. This increases the likelihood that these institutions will be consistent with local conditions, attitudes, and practices.

Multidirectional adaptive institutional outcomes also provide an opportunity for all parties involved to determine how much they can pay or accept in exchange, and when and how this sum should be paid. The informality of these institutions ensures flexibility, so they can be modified in response to changes in the preferences of the actors adopting them. However, while multidirectional adaptive institutional outcomes are effective, they may not necessarily lead to environmentally optimal outcomes. This neatly represents the contrast between the ideal of purposely designed institutions and the reality of evolved institutions.

Based on this evidence (Chapters 7 and Chapter 8) it is evident that environmental management depends in large measure on the networks and communication content of actors.

9.4 Relationship with Previous Research

Several studies have focused on explaining the process of institutional change (North, 1990; Traxler et al., 2001; Pierson, 2000b) and have shown the importance of such changes in environmental management (Young, 2008; Hoffman, 1999). However, so far a general methodological framework to analyse institutional change involving multiple actors is still lacking. Besides, no one has attempted to build theories in which ‘evolution and design’ are integrated (Kingston and Caballero, 2009). Although Kingston and Caballero (2009) rightly called for such a framework, they provide very few indicators about how this can be done. Nor did they foresee the complexity and

myriad institutions that can emerge from such integration. This thesis presents such a methodological framework, and the applications it presents can provide guidance in future research efforts to further understand the role of networks in the process of institutional change. The new Network Communication Framework for understanding institutional change presented in this study addresses the failure to explain interaction between institutions and network. This framework embraces an important area of research (integrating processes of evolution and design in one framework) needed for understanding institutional change.

Beyond the focus on economics (rational choice), history (path dependence) and sociology advocated by the dominant schools of new institutionalism, (Hall and Taylor, 1996) the current study has also unravelled the importance of discourses of actors in the institutionalization process. These discourses have been largely overlooked by many scholars, even though there is now a newest “new institutionalism” - discursive institutionalism (Schmidt, 2008; Kulawik, 2009; Schmidt, 2010). While the discursive institutionalism emphasizes the role of ideas and discourse in providing a more dynamic approach to institutional change (Schmidt, 2008), like many other models it fails to integrate other communication contents in explaining institutional change and focuses only on “ideas”.

This study also shows that a good way to understand institutions and explain how actors adopt institutions wholly, partially or not at all, is to employ a framework that allows for the analysis of all possible communication contents and takes into consideration the dimensions of communication in a network. This is a departure from current theories which have tried to explain institutional change while focusing only on one communication content. It is concluded that institutional change must not only be understood in terms of rational choice, history or sociology, instead detailed attention needs to be paid to how networks and their communication contents (especially information, material exchange, institutions and power) are important factors in the process of institutional change.

This study showed how the discourse of networks expands in scope to include some of the terms found in the discourse of other networks, and vice versa. This shows that it would be possible for one actor’s expanded discourse to be consistent with more than

one narrative reflected in the texts communicated by that actor. This contrasts with the Discourse Coalition Framework (Hajer, 1993), which implicitly assumes that one discourse is consistent with only one narrative. This study has shown that in an African context where most actors are members of multiple networks, they are bound to advocate a discourse that is more heterogeneous in content and consistent with multiple narratives.

While it is established in this study and elsewhere that the social network of actors has an influence on their behaviour (which emphasizes sociological institutionalism), I also found that profit maximization does to some degree influence the behaviour of actors which is consistent with rational choice institutionalism. This underscores the call for greater interchange among the three schools of new institutionalism by Hall and Taylor (1996). See also Thelen (1999), who has called for similar interchange between historical institutionalism and radical choice institutionalism.

The findings have demonstrated the importance of the Network Communication Framework in predicting the prevalence of multiple institutions for environmental management, especially in the context of a developing country. This calls into question much analysis which has narrowly focused on formal state institutions and traditional indigenous institutions as though these are the only institutions that exist in the society (Berkes et al., 2000; Cortner et al., 1998; Dixon and Wood, 2007; Maconachie et al., 2009). This conception is also widespread in many international organizations, such as the Ramsar Convention (2010), which suggests that state laws recognizing traditional institutions will make for effective wetland management. Such a narrow conception does not properly represent reality on the ground. This study underscores the need to look deeper into how things work in reality and the possibility of unearthing other institutional categories which need to be taken into consideration when managing environments. The result of this study tallies with the sociological dimension of institutionalism, which showed that even though institutions are not socially optimal, they become legitimate in as much as they are popular within the social context in which they are developed. This downplays the emphasis by some scholars on the fact that imported institutions can become endogenized (Bayart, 1996). However, evidence shows that such institutions lack widespread acceptance and legitimacy across all actor categories. This calls into question many western constructed institutions that are

imposed on African cultures, and explains why such institutions have failed to achieve their aims.

This study follows others (e.g. Bell et al., (2012)) who have called for greater clarity about the participatory approach to development (Chambers, 1983) that has been the dominant development paradigm since 1980. Paradoxically, while unidirectional institutional outcomes are generally not participatory they are often promoted by organizations that emphasize participatory approaches. On the other hand multidirectional institutional outcomes that are participatory receive very little or no attention, and are even regarded as “bad”. For example, the general concept of “illegal logging” is often used by many governments, multinational and nongovernmental organizations. In view of prevalence and participatory nature of multidirectional institutional outcomes, it is time to reconsider the place of concepts such as “illegal logging” which in reality can be participatory.

Perhaps the reason why such inconsistencies are now emerging between participation and the sustainability of development is that participation was vital to moderate the top-down approach to development that was common when states were all powerful in governing, but the shift to networked governance (Rhodes, 1996) has fundamentally changed the overall social setting. Consequently, while previously rural people in developing countries had their development planned for them by outsiders, now they have the autonomy to assert their own development aspirations and institutions.

This thesis has demonstrated the importance of the Network Communication Framework in explaining why the Niger Delta wetlands are degraded despite the numerous formal state institutions that have been designed over the years. Given the importance and influence of multidirectional institutional outcomes in the management of the Niger Delta wetlands, it has been concluded that any analysis of wetland management in terms of unidirectional non-adaptive institutional outcomes alone, and one which ignores multidirectional adaptive institutional outcomes, is inappropriate and will not yield an accurate picture of how things work in an African context. While strengthening formal state institutions and recognizing traditional institutions are important, concentration on these unidirectional non-adaptive institutional outcomes alone is not likely to result in better management of the Niger Delta wetlands.

Management efforts must be accompanied by greater multidirectional communication between networks. It is hoped that such processes, if made transparent, can help in the improvement of the management of the wetlands.

9.5 Personal Reflections on the Research Process

During this study, especially during the data collection and analysis phase, I faced a number of ethical challenges. In Chapter 5, I discussed the place of ethics in terms of informed consent and the guarantee of anonymity and confidentiality in this research. One challenge pertaining to informed consent faced during this research was the appropriateness of written informed consent as widely promoted in the western world, compared to verbal consent, which is preferred and accepted in African societies. This challenge was most obvious while interviewing informants in communities of the Niger Delta. There was practically no way to receive written consent from the majority of informants, mainly because many were illiterate. I considered the option of thumb printing, but quickly rejected this as it might have raised suspicions considering that thumb printing in this society is associated with very serious and formal issues, such as election voting and bank withdrawals. In the end, I decided to follow the general approach of getting consent from the community leader who appointed a member of the community to guide me during my stay there. This was done after explaining the full details of the research to the community leader. Despite the fact that the community leader had given his consent to conduct interviews in the community and mandating a local to inform all households to be of assistance and cooperate with me, I ensured that I also received similar verbal consent from all the interviewees. Given the cultural difference between what the university expects (in terms of written consent) and what seemed appropriate in the community, I believe I have been able to adapt to this challenge, while still maintaining high ethical standards.

Another ethical challenge during this research that also relates to consent involved an instance when a senior official with whom I had been interacting mandated a subordinate officer who had no prior knowledge of my study to attend to me. Although he [the subordinate] felt obligated to participate, I observed that he was not too comfortable. I started by explaining to him that he was not bound to participate and that he had a choice. He understood me and asked for further information before deciding

whether or not to participate. I made sure I provided him with all the information and sought out his own consent. He accepted to participate but requested for the interview to take place on another day. Even though this was not very convenient considering research logistics, I was able to fit in this interview. Reflecting on this incident, I believe this might be a common ethical dilemma confronting researchers in societies where hierarchical divisions are prevalent. Under such circumstances, I believe it would have been unethical to obtain data from the official if he had not provided an informed consent for himself.

Another core ethical principle relevant to research is maintaining the anonymity and confidentiality of the informants. Considering that the nature of this research involved the investigation of informal exchanges that are generally secretive and may even be regarded as illegal, it was important to ensure the anonymity of the informants and the confidentiality for the information provided. After all, this was one of the conditions on which the majority of the informants granted their consent to participate in this research. While I have anonymized my informants by withholding their names and specific information on their organizational affiliations, I found that there were instances where the availability of more specific information would have rendered the information being conveyed clearer.

Generally, it is not considered ethical to provide incentives to informants in order for them to take part in research. During my field data collection, there were instances where informants perceived the research to have a business purpose and requested incentives before they would accept to participate. In such instances, the purpose of the research as an academic one was re-emphasized, as well as the fact that the researcher was a student and not a government official or contractor. This seemed to work in most instances and where it did not, informants were advised that such incentives could not be provided. Although as a mark of appreciation a token (maximum £2) was offered to the majority of the informants at the end of the interview, they did not have prior knowledge of this. During one of the focus group discussions, for the purpose of logistics, the informants were requested to travel. In this case, they were informed beforehand that their transportation and subsistence costs would be covered.

It has been argued that ethical challenges faced when conducting research in a developing country can differ considerably from similar studies conducted in a developed society (Benatar, 2002). My experience supports this assertion. As I collected data in the field, I was faced with ethical challenges which were not covered in the literature focusing on developed society scenarios. Hence, I had to improvise what I believed was best practice. This calls for an expansion of the literature into the complexities associated with the ethics of research in developing countries.

It is generally agreed that the positionality of a researcher vis-à-vis the researched can significantly lead to bias from the researcher, as well as the researched, if not properly managed (Herod, 1999). My position as a young Yoruba-speaking Nigerian from the south-western part of the country registered as a research student at a foreign university, previously lecturing in a local Nigerian university, returning home to conduct fieldwork, was a bit tricky; not least the fact that my research relied on interviews with people from a cross-section (ethnic, religious, professional, cultural and economic) of Nigerian society.

My experiences, some of which I describe here, resonate with theoretical debates on the "insider-outsider" perspective of positionality (Griffith, 1998, Kikumura, 1998). It has been argued that "insiders" (researchers who study a group to whom they belong) have an advantage because they are able to use their insider knowledge and are more likely to be perceived as neutral, and therefore be given information that would not be given to an "outsider" (Abu-Lughod, 1988, Hill-Collins, 1990). A counter-argument suggests that "outsiders" that do not belong to a group have a greater degree of objectivity and ability to observe behaviour without distorting its meaning. This aids these researchers in gaining access to different levels of information (Fonow and Cook, 1991). However, it has also been suggested that the general binary implied in the "insider-outsider" debates is in reality a boundary that is not only highly unstable, but also one that is subject to the dynamism of positionalities in time and through space (Mullings, 1999, Ward and Jones, 1999). My experience during this study fits with the latter assertion. There were times and places where I found myself being an "outsider" from multiple points of view, a situation which disturbed access to certain types of information and informants.

To illustrate this point, I briefly recount here my experience with two particular categories of informants. Firstly, while interviewing officials of a State Ministry, the majority of whom were literate and professionals in environmental management, I felt I should position myself as a privileged insider, because we shared similar attributes, such as professional affiliation and academic status. However, these same people considered me an "outsider". One of these officials, the most senior and one who claimed to have studied in the United Kingdom, asked me if there were no wetlands in the Western part of Nigeria (referring to my place of origin in Nigeria). He was adamant that he would not participate in the interview. Rather he informed me that all the information I needed was on the Ramsar website. He then mandated other staff not to participate in interviews. It appeared that in this instance there was suspicion of the underlying reasons for my interest in the topic of the Niger Delta wetlands. This could be understandable considering tension in the region. Over the course of my study, there was a fear that I might not be a student and that the intention of the study was aimed at gathering information that could be used against the people of the region.

On the other hand, in local communities with which I had very few similar attributes, i.e. I did not speak the local language and the majority of the informants were illiterate and elderly, I could be represented as an "outsider" in a more 'predictable' sense, as little in my background would have 'endeared' me to these informants. However, some of my most informative discussions came from these particular categories. Nevertheless, among the same group of informants there were instances where people had perceived me as an "outsider". In one of these instances, an informant demanded an incentive to participate in the interview. His reasoning was that I was a privileged Nigerian with better economic status. Consequently, the notion of a stable "insider-outsider" binary comes into question. As a whole, my positionality within the communities was quite fluid, depending on the circumstance and the group. While household heads were generally welcoming, local professionals, such as loggers, treated me with some level of suspicion, thinking that I could be a government official disguised as a research student!

My field assistants, who were students of the State University, introduced me as a "student conducting research in the Niger Delta". This seemed to remove any suspicions towards me because local people are generally friendly and sympathetic towards

students. I also observed that the fact that the introductions were made in the local language, understood by my informants, helped them feel more comfortable. As such, most local household respondents treated me like they would normally treat a local student conducting research.

A dimension of positionality that was evident during household interviews was the age difference between the researcher and the researched. As most respondents were elderly, they tended to position me as “young”, some even referring to me as “my son”. While I tried to downplay such differences, it was difficult considering the propriety of showing some level of respect towards the elders, which is common in Nigerian culture. Some local informants also perceived me as advanced, more educated and knowledgeable than them. Hence, they tended to be formal, not wanting to be seen as less knowledgeable. One such informant asked my assistants if they were saying the right thing (this was at the beginning of the interview). In this case, I informed the respondent that they were the knowledgeable ones, and that I was there to learn from them. Subsequently, I made sure that I explained this to the informants at the beginning of all interviews. This worked well to make them more relaxed and less formal. In addition, I realized that having a 5-10 minute chat and general discussion (jokes and sharing life experiences) before the interview helped the informants feel relaxed and enthusiastic when responding to my questions. However, the result was that the interviews often took longer than anticipated.

While my positionality as an insider with most households could have been influenced by the presence of my field assistants who were Ijaw speaking and indigenes of Bayelsa State, this was not the case in one community. This community had a different origin and language and had in the past clashed with the community from which my assistants originated. Here, I was initially treated with suspicion until at the request of the community leader I was assigned a local youth to accompany me during the interviews, while my assistants took some needed rest. This was effective in dissipating suspicions.

Local loggers and field officials were the most difficult to interview, considering the secretive nature of their practices. I had to show my university ID card and in one instance, an informant requested to see my international passport to confirm that I truly

did have a visa for the United Kingdom. Even so, some of them were reluctant to provide detailed information about some issues relating to their informal institutions. It took days of constant informal interaction for me to build rapport with them before they accepted to participate. Still, the majority refused to have their interviews recorded.

My interaction with government officials proved sometimes challenging in terms of power relations, as they believed they were more knowledgeable and some even saw the interview as an opportunity to educate me. This had both positive and negative effects. On the positive side, they provided me with detailed information. On the negative, they were prone to be egocentric and exaggerate. It also appeared that some were particularly suspicious regarding the main reasons behind this research. Thus, some were not willing to give specific bits of information and did not consent to being recorded. On the other hand, there were those who felt sympathetic to me as a student. They granted me access to their personal library and allowed me to make copies of documents I needed. In other instances, my affiliation to a United Kingdom university made certain interviewees more helpful than expected, because they had also studied abroad and claimed to understand my need for information. I observed that they were helpful, to the extent of providing me with contact details of more possible informants.

Negotiating access to conduct research with non-governmental organizations was quite straightforward, as they seemed to be less suspicious and treated me more like an insider. My positionality with informants from the oil companies was the one I thought would present the greatest status imbalance, precisely because these are some of the highest paid employees in Nigeria. However, I soon realized that this was not the case because the informants were themselves at one time doctoral students. Hence, the status imbalance was greatly reduced and the interviews were carried out normally. This group were also helpful in providing me with some academic advice.

During my research, I found that most of the positionality issues I experienced differed considerably between groups (i.e. depending on age, class and educational differences), a point that has been emphasized by Cormode and Hughes (1999). It is therefore important to develop the skills as a researcher to identify these differences and take proactive steps to influence the insider/outsider dichotomy.

I wanted to be sure that the findings of this thesis were unbiased and accurate and reflected the true perceptions of the informants, as well as reality. To that end, I made very minimal adjustments to the responses of the informants. I only made minor editorial corrections in order to make the ideas that they were conveying clearer. A number of techniques, including probing, cross-checking of responses and the use of triangulation, were adopted to ensure that the research findings were valid and reliable.

Throughout this study I kept an open mind, which made the research an iterative process with the possibility of taking on board new ideas. While I generally used the random sampling technique, there were instances where I purposively selected informants, as I felt the need to ensure that the best and most appropriate informants were invited, especially for the focus group discussions. In conclusion, I consider my research findings as reasonably representative of the empirical evidence, having taken into due consideration all ethical implications. I have minimized the potential positionality bias for myself as a researcher and for my informants as the researched, using the appropriate techniques. This has increased both the validity and reliability of my research results.

9.6 The NCF in Practice: Lessons Learned and a Way Forward

To the best of my knowledge, the NCF presented in this study is the first example of a framework for analysing interactions between networks in a way that is consistent with interactions within networks.

Because of the nature and context of the research some respondents were initially unwilling to speak and participate in the study. This could have made it difficult to understand their networks. However, by framing open ended discussions with the NCF I was able to penetrate the inner workings of networks with relatively simple questions that enabled me to get the information I wanted with relative ease, since responses were wide ranging and covered a number of areas relevant to the research.

Testing the NCF in the demanding context of an environment in conflict has shed a great deal of light on the practicality of the NCF, which rightly proved its predictive power. Although the NCF was developed to analyse the functioning of multiple

networks in African societies, and for environmental management, the NCF is generic and could be applied anywhere one finds networks and indeed in any sector of society. To avoid the trap of simplistic globalized packages (Ostrom et al., 2007), and to further improve the NCF, the next test of the NCF should ideally be in a developed country. This could find that analysis of the overlaps between discourses, networks and institutions is even more complicated in a western situation.

One of the lessons learned in testing the NCF is the recurring theme of trust in networks. This is because trust is generated through repetitive interactions involving discourses, institutions, exchange of materials etc. In my view, bringing trust explicitly into the NCF could be an important way to elaborate and enhance it. Other ways to improve the NCF would include expanding interactions by mediation through intermediary organizations, which is highlighted but not yet fully developed in the NCF (see section 3.2.6.3). More work on the communication contents of material resources and power could also improve the NCF.

9.7 Limitations of this Research

This study has generated important findings. Nevertheless, there are some limitations to it.

On account of time and logistical constraints, data collection for this study was confined to only one of the nine states representing the Niger Delta. The replication of the study at different states of the Delta could enable the formation of more accurate generalizations associated with the findings of this study. One other limitation of this research relates to the number of interviews that were conducted with some groups, and in particular oil companies, multilateral organizations and the media. Gaining access to different organizations in these groups was not possible during this study. The views of a broad range of informants from these groups could have provided additional insights. For instance another limitation is the absence of religious (Christian/Muslim) network even though religion is important in Nigerian context. Respondents appear to have internalized this network as part of traditional network and did not specifically mention these in their responses. Hence it was not included as a distinct network on its own. The present study has relied largely on a qualitative methodology (though quantitative

methods were also used to a limited extent) and is therefore restrictive. Further rigorous quantitative analysis could provide a wider perspective to the present study. The paucity of data was another limitation of this research. For instance, in Chapter 6 I would have liked to present more detailed information on the benefits and costs of the ecosystem services. Such detailed information, however, either does not exist or access to it is vigorously guarded.

These limitations notwithstanding, the present study advanced research in the area and the overall quality of data presented in this thesis has not been affected. The use of the method of triangulation, the combination of different sources of data, and reliance on secondary data from very reputable sources was very helpful in offsetting some of the limitations discussed above by providing complementary and supplementary information. Overall, all of the aforementioned parameters have contributed significantly in ensuring that the data in this research were valid and reliable to a high degree.

9.8 Recommendations

This section makes recommendations for making the management of the Niger Delta wetlands more sustainable, and for further academic research.

9.8.1 Management Recommendations

9.8.1.1 Recommendations to the Nigerian Government

The findings of this study are consistent with earlier comments that states in Africa do not fit the description of a “modern state” (Englebert, 1997). This means that any statement, such as the request by the Economic Community of West African States (ECOWAS) Court of Justice that the Nigerian government “punish oil firms for pollution” (Ebiri, 2012), is fundamentally lacking in insight into the real nature of the Nigerian state. Consequently, the recommendations presented here to the Nigerian government are based on the understanding that Nigeria is not a typical modern state.

My first recommendation to the Nigerian government is that if it wishes to realize its aspirations generally it should recognize its “weakness” - and the weakness of state institutions at various scales in similar developing societies - and focus on understanding how actually things work in Nigeria, instead of assuming that it is a “modern state”. This will help the government look inward, instead of outward by spending time and resources in trying to develop and implement more formal state institutions, some of which are copied from developed countries in the West. If it follows this more realistic path, the state should be better able to foresee the interactions that will emerge between its institutions and the institutions of other groups (e.g. local communities).

Regarding the difficult challenge of attaining environmentally sustainable development in the Niger Delta wetlands, this study has shown that this is unlikely to be achieved by unidirectional non-adaptive institutional outcomes alone. Given the importance and influence of multidirectional institutional outcomes, any approach to wetland management which ignores these will not succeed. The government of Nigeria should therefore make every effort to promote the intensification and greater 'transparency' of multidirectional communication between networks. The resulting enhanced learning process should help to reveal how to make management more environmentally sustainable.

9.8.1.2 Recommendations to Non-Governmental and Multilateral Organizations

This study has shown that unidirectional institutions are neither participatory nor flexible, although in principle they could be environmentally sustainable. On the other hand, evolved multidirectional institutions that are participatory and flexible may not be environmentally sustainable. It is therefore important for non-governmental organizations and multilateral organizations that have traditionally promoted participatory approaches to reconsider their various emphases on concepts such as “illegal logging”, which could be an evolved participatory institution. As this thesis has shown, environmental management in Nigeria should be based on how things actually work there, rather than on some idealistic representation of the design of institutions promoted by non-governmental and multilateral organizations. If multidirectional institutions are the new participatory reality, which organizations are better suited to

finding how to make them environmentally sustainable than non-governmental and multilateral organizations, which have so strongly promoted participation in the past?

9.8.2 Recommendations for Future Research

This study has covered a fledgling area of research which requires further theoretical and empirical attention. The findings of future studies will be relevant to the Niger Delta and to other societies too.

In order to provide a broader view of institutional processes in the Niger Delta, future research could collect more data from a broader range of organizations, with the purpose of giving a more in-depth understanding of the whole process of institutional change. Such detailed data could take empirical verification of the Network Communication Framework further by presenting evidence of communication arrangements between more than two networks. Since this study has focused only on one state in the Niger Delta, a subsequent study that analysed the applicability of the NCF in other states in the region would enable further generalization and comparison of the NCF sites. In addition, testing the applicability of the NCF in a developed society would greatly enhance its generalization across societies, given that governance is globally moving towards a complex multidirectional adaptive approach (Rhodes, 1996). The challenges facing the Nigerian government will therefore increasingly face the governments of developed countries, as well as those of many other developing countries.

During this research several other ideas presented themselves that would be worthwhile to investigate more thoroughly. For example, it would be interesting to study more closely the importance of trust and trust-building in networks, incorporate trust in more detail in the Network Communication Framework, and assess the implications of this for the institutionalization process. The trust dimension has not yet been adequately theorized in contemporary research on institutions. Such a study would illustrate how trust can enhance multidirectional communication and how repetitive interactions and practices can in turn enhance trust.

From an environmental justice and decision-making point of view, and in line with the initial interest at the start of this research, more information needs to be gathered on the relationship between livelihoods and ecosystem services provided by the Niger Delta wetlands, and how these are distributed in space and time and how the distribution of benefits relates to actors/networks within the NCF. This will require further research to fully understand the flows of wetland benefits and costs through networks (both static and dynamic), so as to better understand interactions between networks, institutions and the natural resource base. Another interesting theme for future study is to understand how ecosystem services are affected by various institutional settings (Gómez-Baggethun and Kelemens, 2008). This relates to the idea by Janssen et al. (2007), who distinguished two main types of challenges when ecosystems adapt to institutional changes: slow, persistent change, that usually leads to a relatively smooth adaptive process; and top-down interventions that do not recognize the original adaptive mechanisms inherent in local systems.

This research has gained many insights from the three schools of new institutionalism. Yet while the processes identified in these perspectives may combine to influence institutional change in reality, the three "new institutionalisms" remain distant from each other theoretically. A new model that synthesizes the three approaches could greatly help to explain reality. Although Hall and Taylor (1996) do not see this as "immediately practicable or even necessarily desirable" (Hall and Taylor 1996), I believe the field of institutional research has more to gain from forays into such arenas than it will lose.

REFERENCES

- ABAM, T. & OKOGBUE, C. 1993. Utilization of marginal lands for construction in the Niger Delta. *Bulletin of Engineering Geology and the Environment*, 48, 5-14.
- ABAM, T. K. S. 1999. Impact of dams on the hydrology of the Niger Delta. *Bulletin of Engineering Geology and the Environment*, 57, 239-251.
- ABAM, T. K. S. 2001. Regional hydrological research perspectives in the Niger Delta. *Hydrological Sciences*, 46, 13-25.
- ABOWEI, J. F. N., DEEKAE, S. N., ALLISON, M. E., TAWARI, C. C. & NGODIGHA, S. A. 2006. *A Review of Shrimp Fisheries in Nigeria*, Port-Harcourt, Nigeria, Pre-Joe Publishers.
- ABU-LUGHOD, L. 1988. Fieldwork of a dutiful daughter. In: ALTORKI, S. & FAWZI EL-SOLH, C. (eds.) *Arab Women in the Field: Studying Your Own Society*. Syracuse: Syracuse University Press.
- ACHARYA, G. 2000. The value of biodiversity in the Hadejia-Nguru Wetlands of Northern Nigeria. In: PERRINGS, C. (ed.) *The Economics of Biodiversity Conservation in Sub-Saharan Africa: Mending the Ark*. Cheltenham: Edward Elgar Publishing Ltd.
- ACHEBE, C. 1966. *A Man of the People*, London, Heinemann.
- ACHESON, J. M. 2006. Institutional failure in resource management. *Annual Review of Anthropology*, 35, 117-134.
- ADAMS, W. M. 1993. Indigenous use of wetlands and sustainable development in West Africa. *The Geographical Journal*, 159, 209-218.
- ADAMS, W. M. & HULME, D. 2001. If community conservation is the answer in Africa, what is the question? *Oryx*, 35, 193-200.
- ADEJUMOBI, S. 2000. Elections in Africa: a fading shadow of democracy? *International Political Science Review*, 21, 59-73.
- ADEKOLA, O. 2011. *Oil Smears The God's Of The Niger Delta* [Online]. Wageningen, The Netherlands: EarthCollective. [Accessed 15th November 2011].
- ADEKOLA, O. & MITCHELL, G. 2011. The Niger Delta wetlands: threats to ecosystem services, their importance to dependent communities and possible management measures. *International Journal of Biodiversity Science, Ecosystem Services & Management*, 7, 50-68.
- ADEKOLA, O., WHANDA, S. & OGWU, F. 2012. Assessment of policies and legislation that affect management of wetlands in Nigeria. *Wetlands*, 32, 665-677.
- ADHIKARI, B. & LOVETT, J. C. 2006. Institutions and collective action: Does heterogeneity matter in community-based resource management? *The Journal of Development Studies*, 42, 426-445.
- AGBAKWURU, J. 2012. C-River Community Disowns Monarch For Allegedly Selling Cemetery. *Vanguard* 1st June 2012.
- AGBOGIDI, O. M. & OFUOKU, A. U. 2006. Biodiversity conservation and poverty alleviation in the Niger Delta area of Nigeria. *Agriculturae Conspectus Scientificus*, 71, 103 - 110.
- AGRAWAL, A. 2007. Forests, governance, and sustainability: common property theory and its contributions. *International Journal of the Commons*, 1, 111-136.
- AGWU, A. & ABAH, H. 2010. Attitude of farmers towards cost-sharing in the second national fadama development project (NFDP-II): the case of Kogi State of Nigeria. *Journal of Agricultural Extension*, 13.

- AJAKAIYE, O. 1999. *Macroeconomic effects of VAT in Nigeria: A computable general equilibrium analysis*. Nairobi: African Economic Research Consortium.
- AJAO, E. A. & ANURIGWO, S. 2002. Land-based sources of pollution in the Niger Delta, Nigeria. *Ambio*, 31, 442-445.
- AJONINA, G., DIAMÉ, A. & KAIRO, J. 2008. Current status and conservation of mangroves in Africa: An overview. *World Rainforest Movement Bulletin*, 133.
- AKASIKE, C. 2012. N'Delta Needs N600bn Annually For Development. *Punch*, 30th March 2012.
- AKE, C. 1995. *Political Economy of Nigeria*, London, Longman.
- AKINTOLA, F. O. 1982. *Relief and Drainage. Nigeria in Maps*, London, Hodder and Stoughton.
- AKINYELE, R. T. 2001. Ethnic militancy and national stability in Nigeria: a case study of the Oodua People's Congress. *African Affairs*, 100, 623-640.
- AKINYEMIJU, O. A. 1987. Invasion of Nigerian waters by Water Hyacinth. *Journal of Aquatic Plant Management*, 25, 24-26.
- AKPABIO, E. M. & AKPAN, N. S. 2010. Governance and oil politics in Nigeria's Niger Delta: the question of distributive equity. *Journal of Human Ecology*, 30, 111-121.
- AKPAN, N. S. 2010. Governance and communal conflicts in a post-democratic Nigeria: a case of the oil-producing Niger Delta Region. *Journal of African Studies and Development*, 2, 65-74.
- ALAGOA, E. J. 1970. Long-distance trade and states in the Niger Delta. *The Journal of African History*, 11, 319-329.
- ALAGOA, E. J. 1971. The development of institutions in the states of the eastern Niger Delta. *The Journal of African History*, 12, 269-278.
- ALAPIKI, H. 2004. *Politics and Governance in Nigeria*, Port Harcourt, Nigeria, Amethyst and Colleagues Publishers.
- ALEMAGI, D. & KOZAK, R. A. 2010. Illegal logging in Cameroon: causes and the path forward. *Forest Policy and Economics*, 12, 554-561.
- ALI-AKPAJIAK, S. C. A. & PYKE, T. 2003. *Measuring Poverty in Nigeria. Oxfam working paper*. Oxfam.
- ALLEN, J. 2003. *Lost Geographies of Power*, Oxford, Blackwell Publishing.
- ALLEN, T. 1984. *Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within The R&D Organization*, Cambridge MA, MIT Press.
- ALLEN, T. J. 1977. *Managing the Flow of Technology*, Cambridge, MA, MIT Press.
- ALLISON, M. E. & OKADI, D. 2009. Species distribution and abundance in the lower Nun River, Niger Delta, Nigeria. *Journal of Fisheries International*, 4, 13-18.
- ALOGOA, E. J. 1999. Traditions of origin. In: AALAGOA, E. J. (ed.) *The Land and People of Bayelsa State: Central Niger Delta*. Port Harcourt: Onyoma Research Publications.
- Scorecard Rivers state*, Year. Directed by AMAECHI, R. Port Harcourt: African Independent Television.
- AMAESHI, K. & AMAO, O. 2009. Corporate social responsibility in transnational spaces: exploring influences of varieties of capitalism on expressions of corporate codes of conduct in Nigeria. *Journal of Business Ethics*, 86, 225-239.
- AMNESTY INTERNATIONAL. 2012. *Document - Nigeria: Shell Must Own Up, Pay Up, and Clean Up the Niger Delta (Joint Civil Society Statement)* [Online]. Available: <http://www.amnesty.org/en/library/asset/AFR44/030/2012/en/477c25e6-b7ee->

- 4fc8-93e2-81181662aa53/afr440302012en.html [Accessed 10th November 2012].
- AMNESTY INTERNATIONAL PUBLICATION 2009. *Nigeria: Petroleum, Pollution and Poverty in the Niger Delta*. International Secretariat, London, United Kingdom: Amnesty International Publications.
- ANADU, P. 1987. Wildlife conservation in Nigeria: problems and strategies. *The Environmentalist*, 7, 211-220.
- ANAND, S. & SEN, A. K. 1997. *Concepts of Human Development and Poverty: A Multidimensional Perspective*. Human Development Papers. New York: United Nations Development Programme (UNDP).
- ANDERSON, J. E. 1975. *Public Policy Making*, New York, Praeger Publishers.
- ANTONIADES, A. 2010. *Producing Globalisation: Politics of Discourse and Institutions in Greece and Ireland*, Manchester University Press.
- ANWANA, E. D., MARTIN, A. M., CHEKE, A., OBIREKE, L., ASE, M., OTUFU, P. & OTOBOTEKERE, D. 2010. The crocodile is our brother: conservation management of the sacred lakes of the Niger Delta, Nigeria. In: VERSCHUUREN, B., WILD, R., MCNEELY, J. & OVIEDO, G. (eds.) *Sacred Natural Sites Conserving Nature and Culture*. London: Earthscan Publications Ltd.
- ASUNI, J. B. 2010. *Understanding the Armed Groups of the Niger Delta*, Council on Foreign Relations (CFR).
- ATIENO, R. 2001. *Formal and informal institutions' lending policies and access to credit by small-scale enterprises in Kenya: An empirical assessment*. Nairobi: African Economic Research Consortium.
- ATTAH, M. O. 1987. The national language problem in Nigeria. *Canadian Journal of African Studies / Revue Canadienne des Études Africaines*, 21, 393-401.
- AWOSIKA, L. 1995. Impacts of global climate change and sea level rise on coastal resources and energy development in Nigeria. In: UMOLU, J. C. (ed.) *Global Climate Change: Impact on Energy Development*. Nigeria: DAMTECH Nigeria Limited.
- AYODELE, B. 2010. Silence on climate change and the natural resources conflict in Nigeria: the Niger Delta region experience. In: MWITURUBANI, D. A. & WYK, J.-A. V. (eds.) *Climate Change and Natural Resources Conflicts in Africa*. Pretoria South Africa: Institute of Security Studies.
- BACHRACH, P. S. & BARATZ, M. S. 1970. *Power and Poverty: Theory and Practice*, Oxford, Oxford University Press.
- BAKER, M. J. 2002. Argumentative interactions, discursive operations and learning to model in science. In: P. BRNA, M. BAKER, STENNING, K. & TIBERGHIE, A. (eds.) *The Role of Communication in Learning to Model*. Mahwah New Jersey: Lawrence Erlbaum Associates.
- BARABÁSI, A.-L. 2009. Scale-free networks: a decade and beyond. *Science*, 325, 412-413.
- BARBIER, E. B. 1994. Valuing environmental functions: tropical wetlands. *Land Economics*, 70, 155-173.
- BARBIER, E. B. 2003. Upstream dams and downstream water allocation: the case of the Hadejia-Jama'are floodplain, northern Nigeria. *Water Resources Research*, 39, 1311.
- BARNETT, M. & DUVAL, R. 2005. Power in global governance. In: BARNETT, M. & DUVAL, R. (eds.) *Power in Global Governance*. Cambridge: Cambridge University Press.

- BARTON, E. 2001. Sanctioned and non-sanctioned narratives in institutional discourse. *Narrative Inquiry*, 10, 341-375.
- BAXTER, J. & EYLES, J. 1999. The utility of in-depth interviews for studying the meaning of environmental risk. *The Professional Geographer*, 51, 307-320.
- BAYART, J. F. 1996. *La greffe de l'Etat*, KARTHALA Editions.
- BAYELSA STATE ART COUNCIL. 2006. *Backgorund Information* [Online]. Yenagoa, Nigeria: Bayelsa State Government. Available: <http://www.bayelsaartsng.com/sub1.html> [Accessed 25 May 2009].
- BAYELSA STATE E-GOVERNANCE OFFICE. 2012. *Bayelsa State* [Online]. Bayelsa State e-Governance Office Available: <http://www.bayelsa.gov.ng/home/about-us> [Accessed 29th September 2012].
- BECKERT, J. 2010. How do fields change? the interrelations of institutions, networks, and cognition in the dynamics of markets. *Organization Studies*, 31, 605-627.
- BEE, O. J. 1990. The tropical rain forest: patterns of exploitation and trade. *Singapore J. Trop. Geogr*, 11, 117-142.
- BELL, S. 2002. The limits of rational choice: new institutionalism in the test bed of central banking politics in Australia. *Political Studies*, 50, 477-496.
- BELL, S., MORSE, S. & SHAH, R. A. 2012. Understanding stakeholder participation in research as part of sustainable development. *Journal of Environmental Management*, 101, 13-22.
- BENATAR, S. R. 2002. Reflections and recommendations on research ethics in developing countries. *Social Science & Medicine*, 54, 1131-1141.
- BÉNÉ, C., NEILAND, A., JOLLEY, T., OVIE, S., SULE, O., LADU, B., MINDJIMBA, K., BELAL, E., TIOTSOP, F., BABA, M., DARA, L., ZAKARA, A. & QUENSIERE, J. 2003. Inland fisheries, poverty, and rural livelihoods in the Lake Chad Basin. *Journal of Asian and African Studies*, 38, 17-51.
- BERKES, F., COLDING, J. & FOLKE, C. 2000. Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications*, 10, 1251-1262.
- BIENEN, L. 2005. Nigerian communities demand end to gas flaring. *Frontiers in Ecology and the Environment*, 3, 299.
- BIRDLIFE INTERNATIONAL. 2008. *Community Led Wetland Restoration in Nigeria* [Online]. Cambridge: Birdlife International. Available: <http://www.birdlife.org/datazone/sowb/casestudy/36> [Accessed 4th April 2011].
- BISINA, J. 2006. Environmental Degradation in the Niger Delta. *Niger Delta Environmental Roundtable*. Hotel Presidential Port Harcourt, Nigeria.
- BLAIKIE, P. & BROOKFIELD, H. C. 1987. *Land Degradation and Society*, London, Methuen.
- BLATTER, J. 2003. Beyond Hierarchies and Networks: Institutional Logics and Change in Transboundary Spaces. *Governance*, 16, 503-526.
- BLENCH, R. & DENDO, M. 2007. *Mammals of the Niger Delta, Nigeria*, Cambridge.
- BOETTKE, P. J., COYNE, C. J. & LEESON, P. T. 2010. Institutional stickiness and the new development economics. *American Journal of Economics and Sociology*, Vol. 67, No. 2, 2008.
- BOGDAN, R. C. & BIKLEN, S. K. 2007. *Qualitative Research for Education: An Introduction to Theories and Methods*, Needham Heights, MA, Allyn & Bacon.
- BORGATTI, S. P., EVERETT, M. G. & FREEMAN L. C. 2002. *Ucinet for Windows: Software for Social Network Analysis*, Harvard, MA, Analytic Technologies.
- BORGATTI, S. P. & FOSTER, P. C. 2003. The network paradigm in organizational research: a review and typology. *Journal of Management*, 29, 991-1013.

- BORGATTI, S. P., MEHRA, A., BRASS, D. J. & LABIANCA, G. 2009. Network analysis in the social sciences. *Science*, 323, 892-895.
- BORO, I. J. A. 1982. *The Twelve-Day Revolution*, Nigeria, Idodo Umeh Publishers.
- BÖRZEL, T. 1997. What's so special about policy networks? An exploration of the concept and its usefulness in studying European governance. *European Integration online Papers (EIoP)*, 1.
- BOURDIEU, P. & PASSERON, J. C. 1977. *Reproduction in Education, Society and Culture*, London [etc.], Sage.
- BOYCE, J. K. 2002. *The Political Economy of the Environment* Cheltenham, Edward Elgar.
- BRANNEN, J. 2010. Mixed Methods Research: A discussion paper. *ESRC National Centre for Research Methods NCRM Methods Review Papers*.
- BRANNEN, J. 2011. Mixed Methods Research *Swiss Methods Festival - Qualitative Research Methods and Mixed Methods Designs*. Basel.
- BRATTON, M. 2007. Formal and Informal Institutions in Africa. *Journal of Democracy*, 18, 96-110.
- BRETON, R. 1991. *The Governance of Ethnic Communities: Political Structures and Processes in Canada*, New York, Greenwood Press.
- BREUNIG, P. 1996. The 8000-year-old dugout canoe from Dufuna (NE Nigeria). In: PWITI, G. & SOPER, R. (eds.) *Aspects of African Archaeology*. Harare, Zimbabwe: University of Zimbabwe.
- BROCK, J. 2012. Nigeria took 40 pct of Shell security spend in late 2000s. *Reuters*, 20 August, 2012.
- BROCK, W. A. & CARPENTER, S. R. 2007. Panaceas and diversification of environmental policy. *PNAS*, 104, 15206-15211.
- BRUIJN, H. D. 2005. Roles for unilateral action in networks. *International Journal of Public Sector Management*, 18, 318 - 329.
- BRYANT, R. L. 1992. Political ecology : an emerging research agenda in third-world studies. *Political Geography*, 11, 12-36.
- BRYANT, R. L. & BAILEY, S. 1997. *Third World Political Ecology*, London, Routledge.
- BRYMAN, A. 1988. *Quantity and Quality in Social Research*, London, Routledge.
- BUCHANAN, K. M. 1955. *Land and people in Nigeria : the human geography of Nigeria and its environmental background / K.M. Buchanan and J.C. Pugh ; with a contribution by A. Brown and a foreword by L. Dudley Stamp*, London :, University of London Press.
- BURGESS, J., CLARK, J. & HARRISON, C. M. 2000. Knowledges in action: an actor network analysis of a wetland agri-environment scheme. *Ecological Economics*, 35, 119-132.
- BURKHARDT, M. E. 1994. Social interaction effects following a technological change: A longitudinal investigation. *Academy of Management Journal*, 869-898.
- BURLESON, B. & MACGEORGE, E. 2011. Supportive communication In: KNAPP, M. L. & DAL, J. A. (eds.) *Handbook of Interpersonal Communication*. California: Sage Publications Inc.
- BURT, R. S. 1992. *Structural Holes: The Social Structure of Competition*, Cambridge, Harvard University Press.
- BURT, RONALD S. 2004. Structural holes and good ideas. *American Journal of Sociology*, 110, 349-399.
- CABLE NEWS NETWORK. 2009. *Nigeria Oil Company Rejects Damning Amnesty Report* [Online]. Cable News Network. A Time Warner Company. Available:

- <http://edition.cnn.com/2009/WORLD/africa/07/01/nigeria.amnesty.report/index.html> [Accessed 10th April 2012].
- CALLAGHY, T. & RAVENHILL, J. 1993. How hemmed in? lessons and prospects of Africa's responses to decline. In: CALLAGHY, T. & RAVENHILL, J. (eds.) *Hemmed in, Responses to Africa's Economic Decline*. New York: Columbia University Press.
- CALLON, M. 1986. The sociology of an actor-network: the case of the electric vehicle. In: M. CALLON, J. LAW & RIP., A. (eds.) *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World*. Houndmills, UK: Macmillan.
- CALLON, M. 1991. Techno-economic networks and irreversibility. *A sociology of monsters: Essays on power, technology and domination*, 38, 132-161.
- CALLON, M. & LAW, J. 1995. Agency and the hybrid «Collectif». *The South Atlantic Quarterly*, 94, 481-507.
- CALVO-ARMENGOL, A., DE MARTI, J. & PRAT, A. 2011. *Communication and influence*. Universitat Autònoma de Barcelona, Universitat Pompeu Fabra and London School of Economics.
- CAMPBELL, J. L. 1989. Institutional analysis and the role of ideas in political economy. In: MARCH, J. G. & OLSEN, J. P. (eds.) *Rediscovering Institutions*. New York: Free Press.
- CARSON, R. T., FLORES, N. E., MARTIN, K. M. & WRIGHT, J. L. 1996. Contingent valuation and revealed preference methodologies: comparing the estimates for quasi-public goods. *Land Economics*, 80-99.
- CHAMBERS, R. 1983. *Rural Development: Putting the Last First*, Harlow, Longman.
- CHANDRA, K. 2006. What is ethnic identity and does it matter? *Annual Review of Political Science*, 9, 397-424.
- CHATHAM HOUSE. 2012. *Nigeria Project* [Online]. Available: <http://www.chathamhouse.org/research/africa/current-projects/nigeria> [Accessed 08 April 2012].
- CHAVANCE, B. 2008. Formal and informal institutional change: the experience of postsocialist transformation. *The European Journal of Comparative Economics*, 5, 57-71.
- CHEVRON 2011. *Nigeria Fact Sheet*.
- CLARK, H. H. 1996. *Using Language*, Cambridge, Cambridge University Press.
- CLELAND, D. I. 1998. Stakeholder management. In: PINTO, J. (ed.) *Project Management Handbook*. San Francisco: Jossey-Bass, Project Management Institute.
- COE, M. T. & FOLEY, J. A. 2001. Human and natural impacts on the water resources of the Lake Chad basin. *J. Geophys. Res.*, 106, 3349-3356.
- COLLIER, P. & GUNNING, J. W. 1999. Explaining African economic performance. *Journal of Economic Literature*, 37, 64-111.
- COMMONS, J. R. 1931. Institutional economics. *American Economic Review*, 21, 648-657.
- CONSTITUTIONAL RIGHTS PROJECTS 1999. *Land, Oil and Human Rights in the Niger Delta Region*. Lagos: Constitutional Rights Project (CRP).
- CORMODE, L. & HUGHES, A. 1999. The economic geographer as a situated researcher of elites. *Geoforum*, 30, 299-300.
- CORTELL, A. P. & PETERSON, S. 2001. Limiting the unintended consequences of institutional change. *Comparative Political Studies*, 34, 768-799.

- CORTNER, H. J., WALLACE, M. G., BURKE, S. & MOOTE, M. A. 1998. Institutions matter: the need to address the institutional challenges of ecosystem management. *Landscape and Urban Planning*, 40, 159-166.
- CRAWFORD, S. & OSTROM, E. 2005. *A Grammar of Institutions*, Princeton, NJ, Princeton University Press.
- CRAWFORD, S. E. S. & OSTROM, E. 1995. A grammar of institutions. *The American Political Science Review*, 89, 582-600.
- CRESWELL, J. W. 2003. *Research Design : Qualitative, Quantitative, and Mixed Method Approaches*, London, Sage Publications.
- CRESWELL, J. W., PLANO CLARK, V. L., GUTMANN, M. L. & HANSON, W. E. 2003. Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, 209-240.
- CROOK, R. C. 2009. Customary justice institutions and local alternative dispute resolution: what kind of protection can they offer to customary landholders. In: UBINK, J. & AMANOR, K. (eds.) *Contesting Land and Custom in Ghana: State, Chief and the Citizen*. Leiden: Leiden University Press.
- CROSSAN, M. M., LANE, H. W. & WHITE, R. E. 1999. An organizational learning framework: from intuition to institution. *The Academy of Management Review*, 24, 522-537.
- CURRY, T. 2001. *Countries and Their Cultures: Nigeria* [Online]. Macmillan Reference USA. Available: <http://www.everyculture.com/Ma-Ni/Nigeria.html#ixzz1eky2Wja5> [Accessed 17th January 2012].
- DALBERG, J. E. E. & ACTON, L. 1906. Beginning of the modern state. In: FIGGIS, J. N. & LAURENC, R. V. (eds.) *Lectures on Modern History*. London: Macmillan.
- DAHL, R. A. 1957. The concept of power. *Behavioural Science*, 2, 201-215.
- DAVIES, R. M., DAVIES, O. A. & ABOWEI, J. F. N. 2009. The status of fish storage technologies in Niger Delta Nigeria. *American Journal of Scientific Research*, 1, 55-63.
- DAY, J., BRITSCH, L., HAWES, S., SHAFFER, G., REED, D. & CAHOON, D. 2000. Pattern and process of land loss in the Mississippi Delta: a spatial and temporal analysis of wetland habitat change. *Estuaries and Coasts*, 23, 425-438.
- DE GROOT, R. S., WILSON, M. A. & BOUMANS, R. M. J. 2002. A typology for the classification, description and valuation of ecosystem functions, goods and services. *Ecological Economics*, 41, 393-408.
- DE MONTCLOS, M. A. P. 2008. Conversion to Islam and modernity in Nigeria: a view from the underworld. *Africa Today*, 54, 71-87.
- DENZIN, N. K. 2009. *The research act: A theoretical introduction to sociological methods*, Aldine De Gruyter.
- DEPARTMENT FOR INTERNATIONAL DEVELOPMENT. 2012. *Strengthening Transp, and Accountability in Core Niger Delta* [Online]. London. Available: <http://projects.dfid.gov.uk/project.aspx?Project=104185> [Accessed 26th December 2011].
- DESHAZO, J. & FERMO, G. 2002. Designing choice sets for stated preference methods: the effects of complexity on choice consistency. *Journal of environmental economics and management*, 44, 123-143.
- DIAMOND, P. A. & HAUSMAN, J. A. 1994. Contingent valuation: Is some number better than no number? *The Journal of economic perspectives*, 8, 45-64.
- DIKE, K. O. 1956. *Trade and Politics in the Niger Delta, 1830-1885: An Introduction to the Economic and Political History of Nigeria*, London, Clarendon Press.

- DIXIT, A. & OLSON, M. 2000. Does voluntary participation undermine the Coase theorem? *Journal of Public Economics*, 76, 309-335.
- DIXON, A. B. & WOOD, A. P. 2007. Local institutions for wetland management in Ethiopia: sustainability and state intervention *In: VAN KOPPEN, B., GIORDANA, M. & BUTTERWORTH, J. (eds.) Community-Based Water Law and Water Resource Management Reform in Developing Countries*. Sri-Lanka: International Water Management Institute
- DOKUBO, A. 2004. *Nigeria: Self-Styled Rebel Seeks Independence for Oil-Producing Niger Delta* [Online]. Port Harcourt: Integrated Regional Information Networks. Available: <http://www.irinnews.org/Report/50696/NIGERIA-Self-styled-rebel-seeks-independence-for-oil-producing-Niger-delta> [Accessed 15th December 2012].
- DOOLIN, B. & LOWE, A. 2002. To reveal is to critique: actor-network theory and critical information systems research. *Journal of Information Technology*, 17, 69-78.
- DORNYEI, Z. 2007. *Research Methods in Applied Linguistics*, Oxford, Oxford University Press.
- DOWDING, K. 1995. Model or metaphor? a critical review of the policy network approach. *Political Studies*, 43, 136-158.
- DUBLIN-GREEN, C. O., NWANKWO, J. N. & IRECHUKWU, D. O. 1998. Effective Regulation And Management of the Issues in the Petroleum Industry in Nigeria. *SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production*. Caracas, Venezuela.
- DUGAN, P. Year. Wetlands Management: A critical Issue for Conservation in Africa. *In: MATIZA, T. & CHABWELA, H. N., eds. Wetlands Conservation Conference for Southern Africa, 3rd-5th June 1991 1992 Gaborone Botswana*. IUCN, 1-8.
- DUGAN, P. J. (ed.) 1990. *Wetland conservation: a review of current issues and required action*, Gland, Switzerland: IUCN - The World Conservation Union.
- DUPONT, L. M., JAHNS, S., MARRET, F. & NING, S. 2000. Vegetation change in equatorial West Africa: time-slices for the last 150 ka. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 155, 95-122.
- DUVERGER, M. 1966. *Political parties: Their organization and activity in the modern state*, Taylor & Francis.
- EARTH RIGHTS INSTITUTE. 2004. *Niger Delta Fund Initiative - Executive Summary* [Online]. Available: <http://www.earthrights.net/nigeria/intro.html> [Accessed 03 April 2010].
- EASTON, D. 1958. The perception of authority and political change. *In: FRIEDRICH, C., J (ed.) Authority, Nomos I*. Cambridge.
- EATON, D. & SARCH, M. T. 1997. The economic importance of wild resources in the Hadejia-Nguru Wetlands, Nigeria. *Collaborative Research in the Economics of Environment and Development (CREED)*. London: International Institute for Environment and Development (IIED).
- EBEKU, K. S. A. 2004. Biodiversity conservation in Nigeria: an appraisal of the legal regime in relation to the Niger Delta area of the country. *J Environmental Law*, 16, 361-375.
- EBIRI, K. 2012. ECOWAS Court Asks Nigeria to Punish Oil Firms For Pollution. *The Guardian*, 16th December 2012.
- EKUNDAYO, E. O. & FODEKE, V. O. 2000. Microbial densities and physico-chemical quality of some crude oil flow stations' saver pit effluents in the Niger

- Delta Basin of Southern Nigeria. *Environmental Monitoring and Assessment*, 65, 523-530.
- ELEBEKE, E. 2012. Oil communities Allege Misappropriation of 13% Derivation Funds. *Vanguard*, 20th December 2012.
- ENE-ITA, A. 2009. Investment Opportunities In The Environmental Sector Of The Niger Delta. *Workshop on The Niger Delta: Challenges and Rewards for Foreign Investors organised by Commonwealth Business Council in London*. Marriot, Hotel, Grosvenor Square, London, UK.
- ENEMUGWEM, J. H. 2009. The development of the Niger Delta of Nigeria, 1900 - 1966. *Journal of Sustainable Development in Africa*, 10, 162-178.
- ENGLEBERT, P. 1997. Future review: the contemporary African state: neither African nor state. *Third World Quarterly*, 18, 767-776.
- ERHABOR, O., OK, O., AWAH, I., UKO, K. E. & CHARLES, A. T. 2007. The prevalence of Plasmodia parasitaemia among donors in the Niger Delta of Nigeria. *Tropical Doctor*, 37, 32-34.
- ERNSTSON, H., SÖRLIN, S. & ELMQVIST, T. 2008. Social movements and ecosystem services—the role of social network structure in protecting and managing urban green areas in Stockholm. *Ecology and Society*, 13, 39.
- ETEKPE, A. 2007. *The Politics and Conflicts Over Oil and Gas in the Niger Delta Region: The Bayelsa Experience*, Port Harcourt, Nigeria, Tower Gate Resources.
- ETIM, E. 2012. Youths Sack Oil Workers From Marginal Oil Field in A/Ibom. *Vanguard* 29th February 2012.
- ETKIN, N. 2002. Local knowledge of biotic diversity and its conservation in rural Hausaland, northern Nigeria. *Economic Botany*, 56, 73-88.
- ETUONOVBE, A. K. 2007. Economic Benefit of Hydrography: Land Reclamation in Bayelsa State: A Case Study of Saipem Camp. *Strategic Integration of Surveying Services, FIG Working Week 2007*. Hong Kong SAR, China.
- ETZIONI, A. 1995. The spirit of community: responsibilities and the communitarian agenda. *London: Fontana*.
- EUROPEAN COMMISSION. 2012. *European Union Helps Nigeria to Consolidate Peace in the Niger Delta and Ensure Better Governance and Improved Service Delivery* [Online]. Available: http://ec.europa.eu/commission_2010-2014/piebalgs/headlines/news/2012/02/20120203_en.htm [Accessed 3rd May 2012].
- EVILEWURU, A. 2006. *The Case of the Peoples of the Niger Delta*, Nigeria, Evilewuru Publishers.
- FALETI, S. Year. Challenges of Chevron's GMOU Implementation in Itsekiri Communities of Western Niger Delta In: BOUTILLIER, C., ed. IFRA Conference on Conflict and Violence in Nigeria, 2009 Ibadan, Nigeria.
- FALOLA, T. & HEATON, M. M. 2008. *A History of Nigeria*, Cambridge, United Kingdom Cambridge University Press.
- FAUGIER, J. & SARGEANT, M. 1997. Sampling hard to reach populations. *Journal of Advanced Nursing*, 26, 790-797.
- FEDERAL ENVIRONMENTAL PROTECTION AGENCY 1999. *National Policy on Environment*, Lagos, Nigeria, Royal Press Ltd.
- FEDERAL MINISTRY OF FINANCE 2011. *Nigeria FAAC Report Monthly*. Abuja: Federal Ministry of Finance.
- FENTIMAN, A. 1996. The anthropology of oil: the impact of the oil industry on a fishing community in the Niger Delta. *Social Justice*, 23.

- FEPEN. 2008. *Our Vision/Mission* [Online]. Port Harcourt, Nigeria: The friends for the preservation of the Niger Delta environment (FEPEN). Available: <http://fepen.org/> [Accessed 13th November 2011].
- FINLAYSON, C. M. & REA, N. 1999. Reasons for the loss and degradation of Australian wetlands. *Wetlands Ecology and Management*, 7, 1-11.
- FINLAYSON, M. 2007. Managing wetland ecosystems - balancing the water needs of ecosystems with those for people and agriculture. In: KING, C., RAMKISSOON, J., CLÜSENER-GODT, M. & ADEEL, Z. (eds.) *Water and Ecosystems: Managing Water in Diverse Ecosystems to Ensure Human Well-being*. Ontario, Canada: The United Nations University.
- FISCHER, F. 2003. *Reframing Public Policy: Discursive Politics and Deliberative Practices*, Oxford, Oxford University Press.
- FLIGSTEIN, N. 2001. Social skill and the theory of fields. *Sociological Theory*, 19, 105-125.
- FONOW, M. & COOK, J. 1991. Back to the Future: A Look at the Second Wave of Feminist Epistemology and Methodology. In: FONOW, M. & COOK, J. (eds.) *Beyond Methodology*. Bloomington: Indiana University Press.
- FOREST, J. F. & SOUSA, M. V. 2006. *Oil and terrorism in the New Gulf: Framing US Energy and Security Policies for the Gulf of Guinea*, New York, Littlefield Pub.
- FOUCAULT, M. 1978. *The History of Sexuality*, New York, Pantheon Press.
- FOUCAULT, M. 1980. *Power/Knowledge : Selected Interviews and Other Writings, 1972-1977*, Brighton, Harvester.
- FOUCAULT, M. 1995. *Discipline & Punish: The Birth of the Prison*, Vintage.
- FREEMAN, L. 1979. Centrality in social networks conceptual clarification. *Social Networks*, 1, 215-239.
- FRIENDS OF THE EARTH INTERNATIONAL 2004. *Clashes with Cooperate Giants: 22 Campaigns for Biodiversity and Community*. Amsterdam, The Netherlands.: Friends of the Earth International.
- FRYNAS, J. G. 2000. *Oil in Nigeria: Conflict and Litigation Between Oil Companies and Village Communities*, London, Transaction Publishers.
- FRYNAS, J. G. 2001. Corporate and state responses to anti-oil protests in the Niger Delta. *African Affairs*, 100, 27-54.
- FUJIWARA, D. & CAMPBELL, R. 2011. Valuation Techniques for Social Cost-Benefit Analysis: Stated Preference, Revealed Preference and Subjective Well-Being Approaches. London: HM Treasury.
- FUNKE, N. & SOLOMON, H. 2002. *The Shadow State in Africa: A Discussion*. Addis Ababa, Ethiopia: Development Policy Management Forum (DPMF).
- GALLAGHER, J. 1950. Fowell Buxton and the new African policy, 1838-1842. *Cambridge Historical Journal*, 10, 36-58.
- GALLOWAY, W. E. 1975. Process framework for describing the morphologic and stratigraphic evolution of deltaic depositional systems. In: BROUNSSARD, M. L. (ed.) *Deltas: Models for Exploration*. Houston Geological Society.
- GARNIER, B. J. 1967. Weather conditions in Nigeria. *Climatological research series*. Montreal: McGill University.
- GARTON, L., HAYTHORNTHWAITE, C. & WELLMAN, B. 1997. Studying online social networks. *Journal of Computer-Mediated Communication*, 3, 0-0.
- GATZWEILER, F. 2003. *Patterns Of Institutional Change For Sustainability In Central And Eastern European Agriculture*. Berlin, Germany: Sustainable Agriculture in Central and Eastern European Countries (CEESA)

- GAVENTA, J. 2003. Power after Lukes: an overview of theories of power since Lukes and their application to development. *typescript, Brighton: Participation Group, Institute of Development Studies.*
- GIDDENS, A. 1998. *The Third Way. The Renewal of Social Democracy*, Cambridge, Polity Press.
- GILL, G. 2003. *The Nature and Development of the Modern State*, Palgrave Macmillan.
- GLOBAL ENVIRONMENT FACILITY. 2011. *Nigeria: SPWA-BD Niger Delta biodiversity project* [Online]. Available: http://www.thegef.org/gef/sites/thegef.org/files/documents/document/Council%20document_15.pdf. [Accessed 27 Sep 2011].
- GOLDSMITH, S. & EGGERS, W. D. 2004. *Governing by Network: The New Shape of the Public Sector*, Brookings Inst Press.
- GÓMEZ-BAGGETHUN, E. & KELEMENS, E. 2008. Linking institutional change and the flows of ecosystem services. case studies from Spain and Hungary. In: KLUVÁNKOVÁ-ORAVSKÁ, T., CHOBOTOVA, V. & JÍLKOVÁ, J. (eds.) *Institutional Analysis of Sustainability Problems*. Bratislava Slovak Academy of Sciences.
- GOPHEN, M. Year. Lake Management Perspectives in Arid, Semi-Arid, Sub-Tropical and Tropical Dry Climates. In: SENGUPTA, M. & DALWANI, R., eds. 12th World Lake Conference, 28th October - 2nd November 2007 2008 Jaipur, India. 1338-1348.
- GORMAN, G. E. & CLAYTON, P. 2005. *Qualitative Research for the Information Professional. A Practical Handbook*, London, Facet Publishing.
- GORSKI, P. S. 2000. Historicizing the secularization debate: Church, State, and Society in late Medieval and Early Modern Europe, ca. 1300 to 1700. *American Sociological Review*, 65, 138-167.
- GRAINGER, A. & KONTEH, W. 2007. Autonomy, ambiguity and symbolism in African politics: The development of forest policy in Sierra Leone. *Land Use Policy*, 24, 42-61.
- GRIFFITH, A. I. 1998. Insider / Outsider: Epistemological Privilege and Mothering Work. *Human Studies*, 21, 361-376.
- HAJER, M. 1993. Discourse coalitions and the institutionalization of practice: the case of acid rain in Britain. In: FISCHER, F. & FORESTER, J. (eds.) *The Argumentative Turn in Policy Analysis and Planning*. Durham, NC: Duke University Press.
- HAJER, M. 1995a. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*, Oxford, Clarendon Press.
- HAJER, M. A. 1995b. Interpreting Policy Change: Discourse Coalitions versus Advocacy Coalitions. *Annual Meeting of the American Political Science Association*. Chicago.
- HAJER, M. A. 2005. Rebuilding ground zero. the politics of performance. *Planning theory & practice*, 6, 445-464.
- HAJER, M. A. 2010. *FAQ* [Online]. Available: http://www.maartenhajer.nl/?page_id=14 [Accessed 15th April 2012].
- HALL, P. A. 1986. *Governing the Economy: The Politics of State Intervention in Britain and France*, New York, Oxford University Press.
- HALL, P. A. & TAYLOR, R. C. R. 1996. Political science and the three new institutionalisms. *Political Studies*, 44, 936-957.
- HAM, C., HILL, M. & POLLOCK, F. 1984. *The Policy Process in the Modern Capitalist State*, Wiley Online Library.

- HAMMERSLEY, M. 1996. The relationship between qualitative and quantitative research: paradigm loyalty versus methodological eclecticism. In: RICHARDSON, J. T. E. (ed.) *Handbook of Research in Psychology and the Social Sciences*. Leicester: BPS Books.
- HAMMERSLEY, M. & ATKINSON, P. 1995. *Ethnography: principles in practice*. London: Routledge.
- HANEMANN, W. M. 1991. Willingness to pay and willingness to accept: how much can they differ? *The American Economic Review*, 635-647.
- HANEMANN, W. M. 1994. Valuing the environment through contingent valuation. *The Journal of Economic Perspectives*, 8, 19-43.
- HANSEN, C. P. & TREUE, T. 2008. Assessing illegal logging in Ghana. *International Forestry Review*, 10, 573-590.
- HARDIN, G. 1968. The tragedy of the commons. *Science*, 162, 1243-1248.
- HARMON, Z. 1997. *World Bank, Big Oil and the Niger Delta* [Online]. Urhobo Historical Society. Available: http://waado.org/Environment/OilCompanies/WorldBank_BigOil.html [Accessed 10th March 2012].
- HAY, I. 2010. *Qualitative Research Methods in Human Geography*, Canada, OUP
- HECLO, H. 2010. Issue networks and the executive establishment. In: STILLMAN, R. J. (ed.) *Public Administration: Concepts and Cases*. 9th ed. Boston: Wadworth, Cengage Learning.
- HECLO, H. & WILDAVSKY, A. 1974. *The Priote Government of Public Money*, London, Macmillan.
- HERMANN, M. G. 1998. One field, many perspectives: building the foundations for dialogue. *International Studies Quarterly*, 42, 605-624.
- HEROD, A. 1999. Reflections on interviewing foreign elites: praxis, positionality, validity, and the cult of the insider. *Geoforum*, 30, 313-327.
- HILL-COLLINS, P. 1990. Learning from the outsider within the sociological significance of black feminist thought. In: FONOW, M. & COOK, J. (eds.) *Beyond Methodology Feminist Scholarship as Lived Research*. Bloomington: Indiana University Press.
- HILTON-TAYLOR, C. 2000. *IUCN Red list of threaten species*. Gland Switzerland I.U.C.N
- HODGE, I. & MCNALLY, S. 2000. Wetland restoration, collective action and the role of water management institutions. *Ecological Economics*, 35, 107-118.
- HODGSON, G. M. 2006. What are institutions? *Journal of Economic Issues*, 1- 26.
- HOFFMAN, A. J. 1999. Institutional evolution and change: environmentalism and the US chemical industry. *Academy of Management Journal*, 351-371.
- HOGENDON, J. S. 1975. Economic initiative and African cash farming. In: PETER D & LEWIS H. G (eds.) *Colonialism in Africa, 1870-1960: The Economics of Colonialism*. New York: Cambridge University Press.
- HUGHES, C. 1997. Mystifying through coalescence: the underlying politics of methodological choices. In: WATSON, K., MODGIL, C. & MODGIL, S. (eds.) *Educational Dilemmas: Debate and Diversity, Quality in Education*. London: Cassell.
- HUGHES, R. H. & HUGHES , J. S. 1999. *A Directory of African Wetlands*, Gland, Switzerland, Nairobi, Kenya, and Cambridge, UK, World Conservation Union, United Nations Environment Programme and World Conservation Monitoring Centre.
- HUMAN RIGHTS WATCH 1999a. *Nigeria: Crackdown in the Niger Delta*. New York: Human Rights Watch.

- HUMAN RIGHTS WATCH 1999b. *The Price of Oil: Corporate Responsibility and Human Rights Violations in Nigeria's Oil Producing Communities*. Washington, DC: Human Rights Watch.
- HUMAN RIGHTS WATCH 2002. *Nigeria: The Niger Delta: No Democratic Dividend*. New York: Human Rights Watch.
- HUMAN RIGHTS WATCH 2005. *Rivers and Blood: Guns, Oil and Power in Nigeria's Rivers State*. Human Rights Watch.
- HUMMEL, D., ADAMO, S., SHERBININ, A., MURPHY, L., AGGARWAL, R., ZULU, L., LIU, J. & KNIGHT, K. 2012. Inter- and transdisciplinary approaches to population–environment research for sustainability aims: a review and appraisal. *Population and Environment*, 1-29.
- IBIAM, A. 2012. Ibori Bags 13 Years Jail Term in UK. *Thisday*.
- IDEMUDIA, U. 2009. Oil extraction and poverty reduction in the Niger Delta: a critical examination of partnership initiatives. *Journal of Business Ethics*, 90, 91-116.
- IDODO-UMEH, G. 2003. *Freshwater Fishes of Nigeria: Taxonomy, Ecological notes and Utilization* Benin city, Nigeria, Idodo Umeh Publishers Limited.
- IFEKA, C. 2001. Oil, NGOs & youths: struggles for resource control in the Niger delta. *Review of African Political Economy*, 28, 99-105.
- IGHODARO, O. 2005. *The Political Economy of Oil and Niger Delta Crisis*. PhD, Northern Arizona University, USA.
- IJAW YOUTHS OF THE NIGER DELTA 1998. The Kaiama Declaration.
- IKE, R. M. Year. Advocacy Coalition Framework: An Approach to Critical Theory and Belief Systems in Policy Making. In: The Annual Convention of the British Political Studies Association. Manchester, UK, 2009.
- IKELEGBE, A. 2006. The economy of conflict in the oil rich Niger Delta region of Nigeria. *African and Asian Studies*, 5, 23-56.
- IKPEZE, N. I., SOLUDO, C. C. & ELEKWA, N. N. 2004. Nigeria: the political economy of the policy process, policy choice and implementation document(s) In: CHARLES CHUKWUMA SOLUDO, MICHAEL OSITA OGBU & CHANG, H.-J. (eds.) *The Politics of Trade and Industrial Policy in Africa: Forced Consensus?*. New Jersey: Africa World Press, INC.
- INGOLD, K. 2011. Network structures within policy processes: coalitions, power, and brokerage in Swiss climate policy. *Policy Studies Journal*, 39, 435-459.
- INITIATIVE FOR PUBLIC POLICY ANALYSIS 2010. *African Case Study: Palm Oil and Economic Development in Nigeria and Ghana; Recommendations for the World Bank's 2010 Palm Oil Strategy*. Lagos, Nigeria: Initiative for Public Policy Analysis.
- INTERNATIONAL COUNCIL FOR SCIENCE, UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANISATION & UNITED NATIONS UNIVERSITY 2008. *Ecosystem Change and Human Well being: Research and Monitoring Priorities Based on the Millenium Ecosystem Assesment*. Paris International Council for Science.
- ISEBOR, C., AJAYI, T. & ANYANWU, A. 2001. The incidence of *Nypa fruticans* (Wurmb) and its impact on fisheries production in the Niger Delta mangrove ecosystem. *16th Annual Conference of the Fisheries Society of Nigeria (FISON)*. Maiduguri, Nigeria.
- JALADE-EKEINDE, O. 2012. *Nollywood' Star Omotola Jalade Ekeinde Calls On Shell to Clean Up the Niger Delta* [Online]. Amnesty International Available: <http://www.amnesty.org/en/blog/art-for-amnesty/nollywood-star-omotola-jalade-ekeinde-calls-shell-clean-niger-delta> [Accessed 18th December 2012].

- JAMES, G. K., ADEGOKE, J. O., SABA, E., NWILO, P. & AKINYEDE, J. 2007. Satellite-based assessment of the extent and changes in the mangrove ecosystem of the Niger Delta. *Marine Geodesy*, 30, 249 - 267.
- JANSSEN, M. A., ANDERIES, J. M. & OSTROM, E. 2007. Robustness of social-ecological systems to spatial and temporal variability. *Society & Natural Resources*, 20, 307-322.
- JANSSEN, M. A., BODIN, Ö., ANDERIES, J. M., ELMQVIST, T., ERNSTSON, H., MCALLISTER, R. R. J., OLSSON, P. & RYAN, P. 2006. Toward a network perspective of the study of resilience in social-ecological systems. *Ecology and Society*, 11, 15.
- JOAB-PETERSIDE, S. 2007. *Green Governance: The case of Akassa Community Forests Management And Development Plan*.
- JOHN, P. C. 2000. Policy networks. In: NASH, K. & SCOTT, A. (eds.) *Blackwell Companion to Political Sociology*. Oxford: Blackwell.
- JOHNSON, B. & CHRISTENSEN, L. 2012. *Educational Research: Quantitative, Qualitative, and Mixed Approaches*, Sage Publication Inc.
- JONATHAN, G. 2012. Jonathan Plans To Address Implementation Of Revolutionary Programmes. *Leadership*, 26th April 2012.
- KEDDY, P. A., FRASER, L. H., SOLOMESHCH, A. I., JUNK, W. J., CAMPBELL, D. R., ARROYO, M. T. K. & ALHO, C. J. R. 2009. Wet and wonderful: the world's largest wetlands are conservation priorities. *BioScience*, 59, 39-51.
- KELLERT, S. R., MEHTA, J. N., EBBIN, S. A. & LICHTENFELD, L. L. 2000. Community natural resource management: promise, rhetoric, and reality. *Society & Natural Resources: An International Journal*, 13, 705-715.
- KENIS, P. & SCHNEIDER, V. 1991. Policy networks and policy analysis: scrutinizing a new analytical toolbox. *Policy networks: Empirical evidence and theoretical considerations*, 25-59.
- KICKERT, W. 1995. Steering at a distance: a new paradigm of public governance in dutch higher education. *Governance*, 8, 135-157.
- KIKUMURA, A. 1998. Family life histories: A collaborative venture. In: PERKS, R. & THOMSON, A. (eds.) *The oral history reader*. London; New York: Routledge.
- KING, R. P. & UDO, M. T. 1997. Vegetational succession - mediated spatial heterogeneity in the environmental biology of *Periophthalmus Barbaras* (Gobiidae) in the estuarine swamps of Imo River, Nigeria. *International Journal of Mining, Reclamation and Environment*, 11, 151 - 154.
- KINGSTON, C. & CABALLERO, G. 2009. Comparing theories of institutional change. *Journal of Institutional Economics*, 5, 151-180.
- KLIJN, E. H. & KOPPENJAN, J. F. M. 2000. Public management and policy networks. *Public Management an International Journal of Research and Theory*, 2, 135-158.
- KOKU, J. E. & GUSTAFSSON, J. E. 2003. Local institutions and natural resource management in the South Tongu District of Ghana: a case study. *Sustainable Development*, 11, 17-35.
- KOSFELD, M., OKADA, A. & RIEDL, A. 2006. *Institution Formation in Public Goods Games*. Maastricht, Netherlands: Maastricht University.
- KRANIZ, D. L. 1995. Sustaining vs Resolving the Quantitative-Quaitative Debate. *Evaluation and Program Planning*, 18, 89-96.
- KULAWIK, T. 2009. Staking the frame of a feminist discursive institutionalism. *Politics & Gender*, 5, 262-271.
- LAË, R., WILLIAMS, S., MORAND, P. & MIKOLASEK, O. 2004. Review of the Present State of the Environment, Fish Stocks and Fisheries of the River Niger

- (West Africa). In: WELCOMME, R. & PETR, T. (eds.) *2nd International symposium on the management of large river for fisheries*. Phnom Penh, Cambodia: Food and Agriculture Organization of the United Nations (FAO).
- LATOUR, B. 1992. Where are the missing masses? The sociology of a few mundane artifacts. *Shaping technology/building society: Studies in sociotechnical change*, 225-258.
- LATOUR, B. 2005. *Reassembling the Social: An Introduction to Actor-Network Theory*, Oxford, Oxford University Press.
- LAUBER, T. B., DECKER, D. J. & KNUTH, B. A. 2008. Social networks and community-based natural resource management. *Environmental management*, 42, 677-687.
- LAUMANN, E. O., MARSDEN, P. V. & PRENSKY, D. 1983. The boundary specification problem in network analysis. In: BURT, R. S. & MINOR, M. J. (eds.) *Applied Network Analysis*. Beverly Hills: SAGE.
- LAURIER, E. & PHILO, C. 1999. X-morphising: review essay of Bruno Latour's Aramis, or the love of technology. *Environment and Planning A*, 31, 1047-1071.
- LAW, J. 1992. Notes on the theory of the actor-network: ordering, strategy, and heterogeneity. *Systemic Practice and Action Research*, 5, 379-393.
- LAW, J. & CALLON, M. 1988. Engineering and sociology in a military aircraft project: a network analysis of technological change. *Social Problems*, 35, 284-297.
- LAWRENCE, T. B. & PHILLIPS, N. 2004. From moby dick to free willy: macro-cultural discourse and institutional entrepreneurship in emerging institutional fields. *Organization*, 11, 689-711.
- LEFTWICH, A. & SEN, K. 2010. *Beyond Institutions: Institutions and organizations in the politics and economics of growth and poverty reduction – a thematic synthesis of research evidence*. Manchester: IDPM, School of Environment and Development University of Manchester.
- LIU, J., DIETZ, T., CARPENTER, S. R., ALBERTI, M., FOLKE, C., MORAN, E., PELL, A. N., DEADMAN, P., KRATZ, T., LUBCHENCO, J., OSTROM, E., OUYANG, Z., PROVENCHER, W., REDMAN, C. L., SCHNEIDER, S. H. & TAYLOR, W. W. 2007. Complexity of coupled human and natural systems. *Science*, 317, 1513-1516.
- LOISELLE, S., CÓZAR, A., DAM, A., KANSIIME, F., KELDERMAN, P., SAUNDERS, M. & SIMONIT, S. 2006. Tools for wetland ecosystem resource management in East Africa: focus on the Lake Victoria papyrus wetlands. In: VERHOEVEN, J., BELTMAN, B., BOBBINK, R. & WHIGHAM, D. (eds.) *Wetlands and Natural Resource Management*.
- LUISELLI, L. 2003. Comparative abundance and population structure of sympatric Afrotropical tortoises in six rainforest areas: the differential effects of "traditional veneration" and of "subsistence hunting" by local people. *Acta Oecologica*, 24, 157-163.
- LUISELLI, L., POLITANO, E. & LEA, J. 2006. Assessment of the vulnerable status of *Kinixys homeana* (Testudines : Testudinidae) for the IUCN Red List. *Chelonian Conservation and Biology*, 5, 130-138.
- LUKES, S. 1974. *Power: A Radical View, First Edition*, London, Macmillan.
- MAANEN, J. V. 1979. Reclaiming qualitative methods for organizational research: a preface. *Administrative Science Quarterly*, 24, 520-526.
- MACONACHIE, R., DIXON, A. B. & WOOD, A. 2009. Decentralization and local institutional arrangements for wetland management in Ethiopia and Sierra Leone. *Applied Geography*, 29, 269-279.

- MACOS URBAN MANAGEMENT CONSULTANTS. 2010. *Lists of Nigerian States by Landmass and Population* [Online]. Abuja, Nigeria: MACOS Urban Management Consultants. Available: <http://macosconsultancy.com/Lists%20of%20Nigerian%20State%20by%20Landmass%20and%20Population%20Densityyy.html> [Accessed 11th February 2012].
- MADUKA, H. C. C. & OKOYE, Z. S. C. 2002. The effect of *Sacoglottis gabonensis* stem bark extract, a Nigerian alcoholic beverage additive, on the natural antioxidant defences during 2,4-dinitrophenyl hydrazine-induced membrane peroxidation in vivo. *Vascular Pharmacology*, 39, 21-31.
- MAFABI, P. 2000. The role of wetland policies in the conservation of waterbirds: the case of Uganda. *Ostrich*, 71, 96-98.
- MAHONEY, J. 2000. Path dependence in historical sociology. *Theory and Society*, 29, 507-548.
- MAILAFIA, H. I. 2012. We're Committed to Sustainable Environment. *Tribune*, 29th May 2012.
- MARCH, J. & OLSEN, J. 1984. The new institutionalism: organizational factors in political life. *The American Political Science Review*, 78, 734-749.
- MARCH, J. & OLSEN, J. 1989. *Rediscovering Institutions: The Organizational Basis of Politics*, The Free Press.
- MARCUSSEN, M. 2000. *Ideas and Elites: The Social Construction of Economic and Monetary Union*, Aalborg, Aalborg University Press.
- MARKELOVA, H. & SWALLOW, B. 2008. By-laws and their Critical Role in Natural Resource Management: Insights from African Experience. *12th Biennial Conference of the International Association for the Study of Commons (IASC)*. Cheltenham, England.
- MARTÍNEZ-LÓPEZ, B., PEREZ, A. M. & SÁNCHEZ-VIZCAÍNO, J. M. 2009. Social network analysis. review of general concepts and use in preventive veterinary medicine. *Transboundary and Emerging Diseases*, 56, 109-120.
- MASSUANGANHE, I. J. 2008. *Policies, Natural Resource Governance and Local Development in Mozambique*. PhD, University of Free State.
- MCADAMS, R. H. 1997. The origin, development, and regulation of norms. *Michigan Law Review*, 96, 338-433.
- MIGDAL, J. S. 1988. *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World*, Princeton University Press.
- MILLENNIUM ECOSYSTEM ASSESSMENT 2003. *Ecosystems and Human Well-Being: A Framework for Assessment*, Washington, Island Press.
- MILLENNIUM ECOSYSTEM ASSESSMENT 2005. *Ecosystem And Human Well-Being: Synthesis*, Washington DC, Island Press.
- MISCHE, A. 2003. Cross-talk in movements: reconceiving the culture-network link. In: DIANI, M. & MCADAM, D. (eds.) *Social Movements and Networks*. Oxford Oxford University Press.
- MITCHELL, B. 2004. *Resource and Environmental Management in Canada : Addressing Conflict and Uncertainty*, Don Mills, Ont, Oxford University Press.
- MITCHELL, J. 1969. The concept and use of social networks. In: MITCHELL, J. (ed.) *Social Networks in Urban Situations*. Manchester: Manchester University Press.
- MITSCH, W. J. & GOSSELINK, J. G. 2007. *Wetlands*, Hoboken, New Jersey, John Wiley and Sons.
- MKANDAWIRE, T. 2001. Thinking about developmental states in Africa. *Cambridge Journal of Economics*, 25, 289-314.

- MORGAN, D. L. 1998. Practical strategies for combining qualitative and quantitative methods: applications to health research. *Qualitative Health Research*, 8, 362-376.
- MORSE, S. & MCNAMARA, N. 2012. Trade-offs in the exploration of sustainable livelihoods: experience from a micro-credit intervention in Nigeria. *The Geographical Journal*, 178, 162-174.
- MOVEMENT FOR THE SURVIVAL OF THE OGONI PEOPLE 1991. Ogoni Bill of Rights.
- MOVEMENT FOR THE SURVIVAL OF THE OGONI PEOPLE. 2010. *About Us* [Online]. Movement for the Survival of the Ogoni People (MOSOP). Available: http://www.mosop.org/about_us.html [Accessed 15th November 2012].
- MULLINGS, B. 1999. Insider or outsider, both or neither: some dilemmas of interviewing in a cross-cultural setting. *Geoforum*, 30, 337-350.
- MURADIAN, R. & RIVAL, L. 2012. Between markets and hierarchies: the challenge of governing ecosystem services. *Ecosystem Services*, 1, 93-100.
- MUTCH, A. 2002. Actors and networks or agents and structures: towards a realist view of information systems. *Organization*, 9, 477-496.
- MÜTZEL, S. 2009. Networks as culturally constituted processes. *Current Sociology*, 57, 871-887.
- NAFZIGER, E. W. 1988. *Inequality in Africa: Political Elites, Proletariat, Peasants and the Poor*, Cambridge University Press.
- NATIONAL POPULATION COMMISSION 2006. *2006 Population And Housing Census of the Federal Republic of Nigeria 2006 Census: Priority Tables*. Abuja, Nigeria: National Population Commission.
- NAYAR, S., MILLER, D. J., HUNT, A., GOH, B. P. L. & CHOU, L. M. 2007. Environmental effects of dredging on sediment nutrients, carbon and granulometry in a tropical estuary. *Environmental Monitoring and Assessment*, 127, 1-13.
- NDUBUWA, B. 2012. Nigeria: PIB to Curb Environmental Degradation and Gas Wastages. *Leadership*, 10th June 2012.
- NEE, V. & INGRAM, P. 1998. Embeddedness and beyond: institutions, exchange and social structure. In: BRINTON, M. & NEE, V. (eds.) *The New Institutionalism in Sociology*. Stanford, USA: Stanford University Press.
- NEW NIGERIA FOUNDATION. 2009. *Facilitation of Company-Community Partnerships* [Online]. New Nigeria Foundation. Available: <http://www.nnfng.org/Pages/Social/Compcomm.aspx> [Accessed 10th January 2012].
- NIGER DELTA DEVELOPMENT COMMISSION 2006. *Niger Delta Regional Masterplan*. Port Harcourt, Nigeria: Niger Delta Development Commission.
- NIGER DELTA WETLAND CENTRE. 2012. *Niger Delta Wetland Centre* [Online]. Available: <http://www.nigerdeltawetlands.org/index.html> [Accessed 15th February 2010].
- NIGERIAN CONSERVATION FOUNDATION. 2006. *Niger Delta Named Most Polluted Ecosystem* [Online]. Available: http://www.ncfnigeria.org/inthenews/news_feeds.php?article=21 [Accessed 26 July 2009].
- NIMMO, R. 2011. Actor-network theory and methodology: social research in a more-than-human world. *Methodological Innovations Online*, 6, 108-119.
- NNUBI, C. 2008. Clean Nigeria Associates Limited: Development, Challenges And Future Of An African Oil Spill Co-Operative. *International Oil Spill*

- Conference*. Savannah International Trade & Convention Center, Savannah, Georgia, USA.
- NORTH, D. 1990. *Institutions, Institutional Change and Economic Performance*, Cambridge University Press.
- NORTH, D. C. 1993. The new institutional economics and development. *Economic History*, 1-7.
- NORTH, D. C. 1998. Five propositions about institutional change. In: KNIGHT, J. & SENED, I. (eds.) *Explaining Social Institutions*. Ann Arbor: University of Michigan Press.
- NWACHUKWU, I., AGWU, N., EZEH, C., MBANASOR, J., ONYENWEAKU, C. & KAMALU, C. 2008. Evaluation of Second National Fadama Development Project in Nigeria: A Rapid Policy Appraisal. Munich: Munich Personal RePEc Archive.
- NWILO, P. C. & BADEJO, O. T. 2005. Oil Spill Problems and Management in the Niger Delta. *International Oil Spill Conference*. Miami, Florida, USA, .
- NWILO, P. C. & BADEJO, O. T. (eds.) 2006. *Impacts and management of oil spill pollution along the Nigerian coastal areas*, Fredriksberg, Denmark: International Federation of Surveyors.
- NYANANYO, B. L. 1999. Vegetation. In: ALAGOA, E. J. (ed.) *The Land and People of Bayelsa State: Central Niger Delta*. Port Harcourt: Onyoma Research Publications.
- NYANANYO, B. L. 2002. Vegetation In: ALAGOA, E. C. & DEREFAKA, A. A. (eds.) *The Land and People of Rivers State: Eastern Niger Delta*. Port Harcourt, Nigeria: Onyoma Research Publications.
- NYANANYO, B. L. 2006. *The Plants of the Niger Delta*, Port Harcourt, Nigeria, Onyoma Research Publications.
- O'HARA, K. 2001. Niger Delta: peace and co-operation through sustainable development. *Environmental Policy and Law*, 31, 302-308.
- OATES, J. F. & STRUHSAKER, T. 2008. *Procolobus pennantii ssp. epieni*. In: IUCN 2012. *IUCN Red List of Threatened Species. Version 2012* [Online]. IUCN. Available: www.iucnredlist.org [Accessed 26th March 2013].
- OBAMA, B. 2009. *Remarks by The President to the Ghana Parliament* [Online]. Washington, DC: The White House. Available: <http://www.whitehouse.gov/the-press-office/remarks-president-ghanaian-parliament> [Accessed 15th May 2011].
- OBI, C. 2007. The struggle for resource control in a petro state: a perspective from Nigeria. In: PAUL, B., VELTMEYER, H., SCARLETT, C., INVERNIZZI, N. & KWONG-LEUNG, T. (eds.) *National Perspectives on Globalisation*. Hampshire / New York: Palgrave Macmillan.
- OBI, C. I. 2010. Oil extraction, dispossession, resistance, and conflict in Nigeria's oil-rich Niger Delta. *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, 30, 219-236.
- OBIRE, O., OGAN, A. & OKIGBO, R. N. 2008. Impact of fertilizer plant effluent on water quality. *International Journal of Environmental Science and Technology*, 5, 107-118.
- OBOH, C. 2012. Jonathan Committed to Security, Growth, Unity of Nigeria. *Tribune*, 27th March 2012.
- OBOT, E. 2007. Ensuring Ecosystem Integrity. *National Stakeholders Forum on the New Mechanism for Environmental Protection and Sustainable Development In Nigeria*. Nikon Luxury Hotel, Abuja, Nigeria.
- ODEBUNMI, E., OLUWANIYI, O., AWOLOLA, G. & ADEDIJI, O. 2010. Proximate and nutritional composition of kola nut (*Cola nitida*), bitter cola (*Garcinia cola*)

- and alligator pepper (*Aframomum melegueta*). *African Journal of Biotechnology*, 8.
- ODEKUNLE, T. O., BALOGUN, E. E. & OGUNKOYA, O. O. 2005. On the prediction of rainfall onset and retreat dates in Nigeria. *Theoretical and Applied Climatology*, 81, 101-112.
- ODOEMENE, A. 2011. Social consequences of environmental change in the Niger Delta of Nigeria. *Journal of sustainable development*, 4, p123.
- OFEHE, S. 2009. *Trip to the M.E.N.D. Headquarters* [Online]. Available: <http://www.youtube.com/watch?v=kJSVFnJruxM> [Accessed 15th June 2011].
- OGAH, D. & ODITA, S. 2009. River Niger dredging: Matters. *The Guardian Newspaper*, Wednesday, June 10, 2009.
- OGINNI, F. O., ASUKU, M. E., OLADELE, A. O., OBUEKWE, O. N. & NNABUKO, R. E. 2010. Knowledge and cultural beliefs about the etiology and management of orofacial clefts in Nigeria's major ethnic groups. *The Cleft Palate-Craniofacial Journal*, 47, 327-334.
- OGON, P. 2006. Land and Forest Resource Use in the Niger Delta: Issues in Regulation and Sustainable Management. California: Green Governance Project, Institute of International Studies; UC Berkeley.
- OHIMAIN, E., ANDRIESSE, W. & VAN MENSVOORT, M. 2004. Environmental impacts of abandoned dredged soils and sediments. *Journal of Soils and Sediments*, 4, 59-65.
- OHIMAIN, E., IMOIBE, T. O. & BAWO, D. 2008. Changes in water physico-chemical properties following the dredging of an oil well access canal in the Niger Delta. *World Journal of Agricultural Sciences*, 4, 752-758.
- OKALI, D. & EYOG-MATIG, O. 2004. *Rain forest management for wood production in West and Central Africa. A report prepared for the project Lessons Learnt on Sustainable Forest Management in Africa for The African Forest Research Network (AFORNET), Nairobi, Kenya, The Royal Swedish Academy of Agriculture and Forestry (KSLA), Stockholm, The Food and Agriculture Organisation of United Nations (FAO). Rome, Italy.*
- OKOH, A. I., BABALOLA, G. O. & BAKARE, M. K. 1996. The microbial and physico-chemical qualities of crude oil flow station effluents in the Niger Delta region of Nigeria. *Fresenius Environmental Bulletin*, 5, 102-106.
- OKOH, R. N. 2007. Conflict management in the Niger Delta region of Nigeria: a participatory approach. *African Journal on Conflict Resolution*, 5, 91-114.
- OKOLO, P. & ETEKPE, A. 2010. Oil pipeline vandalization and the socio-economic effects in Nigeria's Niger Delta region. Available at SSRN 1723169.
- OKONJO-IWEALA, N. 2012. Nigeria: Foreign Firms Take 43 Percent of the Country's Oil Revenue. *Daily Trust*, 20th December 2012.
- OKONNY, I. P. 2002. Geology. In: ALAGOA, E. C. & DEREFKA, A. A. (eds.) *The Land and People of Rivers State: Eastern Niger Delta*. Port Harcourt, Nigeria: Onyoma Research Publications.
- OKONNY, I. P., AYOLAGHA, G. & DICKSON, A. 1999. Geology and soils. In: ALAGOA, E. C. (ed.) *The Land and People of Bayelsa State: Central Niger Delta*. Port Harcourt, Nigeria: Onyoma Research Publications.
- OKPOKO, I. 1998. Archaeology and the study of early urban centres in Nigeria. *African Study Monographs*, 19, 35-54.
- OKUYAMA, T. & HOLLAND, J. N. 2007. Network structural properties mediate the stability of mutualistic communities. *Ecology Letters*, 11, 208-216.
- OLOMUKORO, J. O. & EZEMONYE, L. I. N. 2007. Assessment of the macro-invertebrate fauna of rivers in southern Nigeria. *African Zoology*, 42, 1-11.

- OLUKOYA, S. 2001. *Environmental Justice from the Niger Delta to the World Conference Against Racism* [Online]. Available: <http://www.corpwatch.org/article.php?id=18> [Accessed 06 January 2010].
- OMEJE, K. 2005. Oil conflict in Nigeria: contending issues and perspectives of the local Niger Delta people. *New Political Economy*, 10, 321-334.
- OMEJE, K. 2006. *High Stakes and Stakeholders: Oil Conflict and Security in Nigeria*, Hampshire, England, Ashgate Publishing Limited.
- OMOTOLA, J. S. 2006. The next Gulf? oil politics, environmental apocalypse and rising tension in the Niger Delta. Durban, South Africa: The African Centre for the Constructive Resolution of Disputes (ACCORD).
- ORIMOOGUNJE, O. O. I., OYINLOYE R. O & SOUMAH M 2009. Geospatial Mapping of Wetlands Potential in Ilesa, Southwestern Nigeria. *FIG Working Week 2009: Surveyors Key Role in Accelerated Development*. Eilat, Israel.
- ORUWARI, Y. 2006. *Youth in Urban Violence in Nigeria: A Case Study of Urban Gangs from Port Harcourt*. NIGER DELTA ECONOMIES OF VIOLENCE WORKING PAPERS. Institute of International Studies, University of California, Berkeley, USA
- The United States Institute of Peace, Washington DC, USA
- Our Niger Delta, Port Harcourt, Nigeria.
- OSTROM, E. 1990. *Governing the Commons :The Evolution of Institutions for Collective Action*, Cambridge University Press.
- OSTROM, E. 2005. *Understanding Institutional Diversity*, Princeton, NJ, Princeton Univ. Press.
- OSTROM, E. 2008. Institutions and the environment. *Economic Affairs*, 28, 24-31.
- OSTROM, E. & BASURTO, X. 2011. Crafting analytical tools to study institutional change. *Journal of Institutional Economics*, 7, 317-343.
- OSTROM, E., JANSSEN, M. A. & ANDERIES, J. M. 2007. Going beyond panaceas. *Proceedings of the National Academy of Sciences*, 104, 15176-15178.
- OSUJI, L. C. & NWOYE, I. 2007. An appraisal of the impact of petroleum hydrocarbons on soil fertility: the Owaza experience. *African Journal of Agricultural Research*, 2, 318-324.
- OTOBOTEKERE, A. J. T. & SIKOKI, F. D. 1999. Aquatic fauna. In: ALAGOA, E. C. (ed.) *The Land and People of Bayelsa State Central Niger Delta*. Port Harcourt: Onyoma Research Publications.
- OVIASUYI, P. O. & UWADIAE, J. 2010. The dilemma of Niger-Delta region as oil producing states of Nigeria. *Journal of Peace, Conflict and Development*, 110-126.
- OWEN-SMITH, J. & POWELL, W. W. 2007. Networks and institutions. In: GREENWOOD, R., OLIVER, C., SAHLIN, K. & SUDDABY, R. (eds.) *The SAGE Handbook of Organizational Institutionalism*. London: Sage Publications.
- OYATOMI, K. & UMORU, H. 2009. Dont Blame Yar'Adua if he is Slow - IBB. *Nigerian Guardian*, 19th January 2009.
- OYEBANDE, L., OBOT, E. O. & BDILIYA, H. H. 2003. *An inventory of wetlands in Nigeria*. Ouagadougou, Burkina Faso: World Conservation Union-IUCN, West African Regional Office.
- OYEGUN, C. U. 1999. Climate, relief and drainage. In: ALAGOA, E. C. (ed.) *The Land and People of Bayelsa State: Central Niger Delta*. Port Harcourt, Nigeria: Onyoma Research Publications.
- PALACPAC, E. 2009. *Science-Society Interface in Philipines*. PhD, University of Leed.
- PANAYOTOU, T. 1993. *Green Markets: The Economics of Sustainable Development*, San Francisco, ICS Press.

- PATTERBERG, P. 2005. What role for private rule-making in global environmental governance? analysing the forest stewardship council (FSC). *International Environmental Agreements*, 5, 175–189.
- PATTON, M. 1990. *Qualitative Evaluation and Research Methods*, Beverly Hills, CA, Sage. .
- PAULSON, S., GEZON, L. L. & WATTS, M. 2003. Locating the political in political ecology: an introduction. *Human Organization*, 62, 205-217.
- PELUSO, N. L. 1992. *Rich Forests, Poor People: Resource Control and Resistance in Java*, California, University of California Press.
- PETERS, G. 2005. *Institutional Theory in Political Science: The New Institutionalism*, London, Continuum.
- PETERSIDE, S. 2007. *On The Militarization Of Nigeria Niger Delta: The Genesis Of Ethnic Militia In Rivers State, Nigeria. Niger Delta Economies Of Violence*. Institute Of International Studies, University Of California, Berkeley.
- PETERSON, J. 2003. *Policy Networks. Political Science Series*. Vienna: Institute for Advanced Studies.
- PFETSCH, F. R. 1998. Negotiating the European union: a negotiation-network approach. *International Negotiation*, 3, 293-317.
- PHIL-EZE, P. O. & OKORO, I. C. 2009. Sustainable biodiversity conservation in the Niger Delta: a practical approach to conservation site selection. *Biodiversity and Conservation*, 18, 1247-1257.
- PHILLIPS, N., LAWRENCE, T. B. & HARDY, C. 2004. Discourse and institutions. *The Academy of Management Review*, 29, 635-652.
- PIERRE, J. & PETERS, G. 2000. *Governance Politics and the State*, London, Macmillan Press.
- PIERSON, C. 1996a. *The Modern State*, London, Routledge.
- PIERSON, P. 1996b. The path to european integration: a historical institutionalist analysis. *Comparative Political Studies*, 29, 123-163.
- PIERSON, P. 2000a. Increasing returns, path dependence, and the study of politics. *The American Political Science Review*, 94, 251-267.
- PIERSON, P. 2000b. The limits of design: explaining institutional origins and change. *Governance*, 13, 475-499.
- POTEETE, A. R. 2009. Defining political community and rights to natural resources in Botswana. *Development and Change*, 40, 281-305.
- POWELL, R. A., SINGLE, H. M. & LLOYD, K. R. 1996. Focus groups in mental health research: enhancing the validity of user and provider questionnaires. *International Journal of Social Psychology*, 42, 193-206.
- PRATT, A. 2003. The emerging shape and form of innovation networks and institutions. *Innovation Networks and Learning Regions?*, 18, 120.
- PREBOYE, I. C. 2005. *The Core Delta: Iduwini Clan: Otoukuku "The Lost Tribe"*, Ibadan, Nigeria, Rural Development Nigeria Ltd.
- PRINCEWILL, K. I. (ed.) 2000. *The city-states of eastern Niger Delta*, Copenhagen: Kgl Danske Videnskabernes Selskab.
- PUTNAM, R. D. 1993. The prosperous community. *The American Prospect*, Spring, 1-8.
- RAMSAR CONVENTION SECRETARIAT 2007. *Wise Use of Wetlands: A Conceptual Framework for the Wise Use of Wetlands. Ramsar Handbooks for the Wise Use of Wetlands*. 3rd ed. Gland, Switzerland.: Ramsar Convention Secretariat.
- RAMSAR CONVENTION SECRETARIAT 2010. *Laws and Institutions: Reviewing Laws and Institutions to Promote the Conservation and Wise Use of Wetlands*.

- Ramsar Handbooks for the Wise Use of Wetlands*. 4th ed. Gland, Switzerland: Ramsar Convention Secretariat.
- RAMSAR CONVENTION SECRETARIAT. 2012. *The Ramsar Convention on Wetlands* [Online]. Gland, Switzerland: Ramsar Convention Secretariat Available: http://www.ramsar.org/cda/en/ramsar-home/main/ramsar/1_4000_0 [Accessed 15th May 2012].
- REBELO, L. M., MCCARTNEY, M. & FINLAYSON, C. 2010. Wetlands of Sub-Saharan Africa: distribution and contribution of agriculture to livelihoods. *Wetlands Ecology and Management*, 18, 557-572.
- REID, R. S., THORNTON, P. K. & KRUSKA, R. L. 2004. Loss and fragmentation of habitat for pastoral people and wildlife in east Africa: concepts and issues. *African Journal of Range & Forage Science*, 21, 171-181.
- RENEMA, W., BELLWOOD, D. R., BRAGA, J. C., BROMFIELD, K., HALL, R., JOHNSON, K. G., LUNT, P., MEYER, C. P., MCMONAGLE, L. B., MORLEY, R. J., O'DEA, A., TODD, J. A., WESSELINGH, F. P., WILSON, M. E. J. & PANDOLFI, J. M. 2008. Hopping hotspots: global shifts in marine biodiversity. *Science*, 321, 654-657.
- RENO, W. 1995. *Corruption and State Politics in Sierra Leone*, Cambridge, Cambridge University Press
- RHODES, R. A. W. 1990a. Policy Networks. *Journal of Theoretical Politics*, 2, 293-317.
- RHODES, R. A. W. 1990b. Policy networks: a British perspective. *Journal of Theoretical Politics*, 2, 293-317.
- RHODES, R. A. W. 1996. The new governance: governing without government. *Political Studies*, 44, 652-667.
- RICHARDS, P. 1996. *Fighting for the Rain Forest: War, Youth & Resources in Sierra Leone*, Oxford, The International African Institute in association with James Currey.
- RIM-RUKEH, A., IKHIFA, G. O. & OKOKOYO, P. A. 2007. Physico-chemical characteristics of some waters used for drinking and domestic purposes in the Niger Delta, Nigeria. *Environmental Monitoring and Assessment*, 128, 475-482.
- RINGIUS, L. 2002. Soil carbon sequestration and the CDM: opportunities and challenges for Africa. *Climatic Change*, 54, 471-495.
- ROBBINS, P. 2004. *Political Ecology : A Critical Introduction*, Malden, MA, Blackwell Pub.
- RODRIGUEZ-POSE, A. 2009. Institutions, Innovation and Growth. *Presentation at London School of Economics IRIS Stavanger*. London.
- ROE, D. & NELSON, F. 2009. The origins and evolution of communitybased natural resource management in Africa. In: ROE, D., NELSON, F. & SANDBROOK, C. (eds.) *Community Management of Natural Resources in Africa: Impacts, Experiences and Future Directions*. London: International Institute for Environment and Development.
- ROSAMOND, B. 2000. Europeanization and discourses of globalization: narratives of external structural context in the European Commission.
- ROSE, R. 1973. Models of Governing. *Comparative Politics*, 5, 465-496.
- ROYAL DUTCH SHELL. 2010. *Shell Film About Illegal Oil Refining in the Niger Delta* [Online]. Available: <http://www.youtube.com/watch?v=jXeTw11fVpU&feature=relmfu> [Accessed 18th June 2011].
- ROYAL DUTCH SHELL 2012a. *Building an Energy Future: Annual Report*.

- ROYAL DUTCH SHELL 2012b. *Shell Sustainability Report 2011*. ROYAL DUTCH SHELL
- ROYAL DUTCH SHELL PLC 2006. Meeting the energy challenge: The Shell Sustainability Report 2006. UK: Royal Dutch Shell plc.
- RUSSELL, B. 2004. *Power: A New Social Analysis*, Routledge.
- RUSSELL, J. 1839. *Copy of a Letter from Lord John Russell to the Lords Commissioners of Her Majesty's Treasury* [Online]. Available: http://www.pdavis.nl/PP_Niger.htm [Accessed 10th November 2011].
- RYDIN, Y. 2007. Indicators as a governmental technology? The lessons of community-based sustainability indicator projects. *Environment and Planning D: Society and Space*, 25, 610-624.
- RYDIN, Y. & FALLETH, E. 2006. *Networks and Institutions in Natural Resource Management*, Cheltenham, UK., E Elgar Publisher.
- SABATIER, P. A. 1988. An advocacy coalition framework of policy change and the role of policy-oriented learning therein. *Policy Sciences*, 21, 129-168.
- SABATIER, P. A. 1998. The advocacy coalition framework: revisions and relevance for Europe. *Journal of European Public Policy*, 5, 98-130.
- SABATIER, P. A. & JENKINS-SMITH, H. C. 1993. *Policy Change and Learning. An Advocacy Coalition Approach*, Boulder, Westview Press.
- SABATIWER, P. A. & JENKINS-SMITH, H. C. 1993. *Policy Change and Learning. An Advocacy Coalition Approach*, Boulder, Westview Press.
- SAND, P. H. 1999. Carrots without sticks? new financial mechanisms for global environmental agreements. *Max Planck Yearbook of United Nations Law*, 3.
- SARCH, M. T. 2001. Fishing and farming at Lake Chad: institutions for access to natural resources. *Journal of Environmental Management*, 62, 185-199.
- SAVE EARTH NIGERIA. 2010. *Welcome to Save Earth Nigeria (SEN) Online* [Online]. Available: <http://www.senigus.interconnection.org/> [Accessed 21 September 2011].
- SCHARPF, F. W. 1997. *Games Real Actors Play: Actor-Centred Institutionalism in Policy Research*, Westview Press.
- SCHMIDT, V. A. 2008. Discursive institutionalism: the explanatory power of ideas and discourse. *Annual Review of Political Science*, 11, 303-326.
- SCHMIDT, V. A. 2010. Taking ideas and discourse seriously: explaining change through discursive institutionalism as the fourth 'new institutionalism'. *European political science review*, 2, 1-25.
- SCHMIDT, V. A. & RADAELLI, C. M. 2004. Policy change and discourse in Europe: conceptual and methodological issues. *West European Politics*, 27, 183-210.
- SCHOFIELD, J. 2001. Time for a revival? public policy implementation: a review of the literature and an agenda for future research. *International Journal of Management Reviews*, 3, 245-263.
- SCHUYT, K. D. 2005. Economic consequences of wetland degradation for local populations in Africa. *Ecological Economics*, 53, 177-190.
- SCOTT, J. 1991. *Social Network Analysis: A Handbook*, Newbury Park, California, Sage Publications.
- SCOTT, J. 2000a. *Social Network Analysis: A Handbook*, London, Sage Publications Ltd.
- SCOTT, W. R. 1994. Institutions and organizations: toward a theoretical synthesis. In: SCOTT, W. R. & MEYER, J. W. (eds.) *Institutional Environments and Organizations*. London: Sage.
- SCOTT, W. R. 2000b. *Institutions and Organizations* Thousand Oaks, California, Sage Publications Ltd.

- SELZNICK, P. 1996. Institutionalism" old" and" new". *Administrative Science Quarterly*, 270-277.
- SENED, I. 1991. Contemporary theory of institutions in perspective. *Journal of Theoretical Politics*, 3, 379-402.
- SEO, M.-G. & CREED, W. E. D. 2002. Institutional contradictions, praxis, and institutional change: a dialectical perspective. *The Academy of Management Review*, 27, 222-247.
- SERAP. 2010. *N' Delta: FG, NNPC can be Sued but not Shell, ELF, Chevron, & Total, Rules ECOWAS Court* [Online]. Available: <http://serap-nigeria.org/n-delta-fg-nnpc-can-be-sued-but-not-shell-elf-chevron-total-rules-ecowas-court/> [Accessed 15th February 2012].
- SHARP, P., RUTLEDGE, P., PHILO, C. & PADDISON, R. 2000. *Entanglements of Power: Geographies of Domination/Resistance*, London, Routledge.
- SHELL INTERNATIONAL PETROLEUM COMPANY 1993. *Tensions in Nigeria. Shell Briefing Note*. London: Shell International Petroleum Company.
- SHELL INTERNATIONAL PETROLEUM COMPANY 2011. *Shell in Nigeria – Working in a Complex Environment*.
- SHELL PETROLEUM DEVELOPMENT COMPANY 2003. *People and the Environment Annual Report*.
- SHEPSLE, K. & WEINGAST, B. 1981. Structure-induced equilibrium and legislative choice. *Public Choice*, 37, 503-519.
- SHEPSLE, K. A. 1986. Institutional equilibrium and equilibrium institutions. In: WEISBERG, H. (ed.) *Political Science: The Science of Politics*. New York: Agathon Press Inc.
- SHEPSLE, K. A. 2006. Rational choice institutionalism. In: RHODES, R. A. W., BINDER, S. A. & ROCKMAN, B. A. (eds.) *Oxford Handbook of Political Institutions*. Oxford: Oxford University Press.
- SHINE, C. & DE KLEMM, C. Year. Wetlands, Water and the Law. In: Using law to advance wetland conservation and wise use. Ramsar Convention Bureau. Gland, 1999.
- SHORT, K. C. & STAEUBLE, A. J. 1967. Outline of geology of Niger Delta. *AAPG Bulletin*, 51, 761-799.
- SIBEON, R. 2000. Governance and the policy process in contemporary Europe. *Public Management: An International Journal of Research and Theory*, 2, 289-310.
- SILVIUS, M. J., ONEKA, M. & VERHAGEN, A. 2000. Wetlands: lifeline for people at the edge. *Physics and Chemistry of the Earth, Part B: Hydrology, Oceans and Atmosphere*, 25, 645-652.
- SIMON, H. A. 1991. Bounded rationality and organizational learning. *Organization Science*, 2, 125-134.
- SKOCPOL, T. & PIERSON, P. 2002. Historical institutionalism in contemporary political science. In: KATZNELSON I & HV, M. (eds.) *Political Science: State of the Discipline*. New York: W.W. Norton.
- SMITH, D. E. 2001. Texts and the ontology of organizations and institutions. 7, 159 - 198.
- SMITH, D. 2010. WikiLeaks cables: Shell's grip on Nigerian state revealed. *The Guardian*.
- SOWUNMI, M. A. 1999. The significance of the oil palm (*Elaeis guineensis* Jacq.) in the late Holocene environments of West and west central Africa: a further consideration. *Vegetation History and Archaeobotany*, 8, 199-210.
- STACEY, R. D. & STACEY RALPH, D. 1996. *Complexity and Creativity in Organizations*, Berrett-Koehler Publishers San Francisco:.

- STEINMO, S. 2008. *Historical Institutionalism: Approaches and Methodologies in the Social Sciences*, Cambridge University Press.
- STEINS, N. A. 2001. New directions in natural resource management the offer of actor network theory. *IDS Bulletin*, 32, 18-25.
- STOKMAN, F. N. Year. What Binds us When With Whom? Content and Structure in Social Network Analysis. In: Keynote Address at the SUNBELT XXIV International Network for Social Network Analysis Conference, Portorož (Slovenia), 2004.
- STRAYER, J. R. 1970. *On the Medieval Origins of the Modern State*, Princeton University Press.
- STREECK, W. & THELEN, K. 2005. *Beyond Continuity – Institutional Change in Advanced Political Economies*, Oxford, Oxford University Press.
- SUBERU, R. 2001. *Federalism and Ethnic Conflict in Nigeria*, Washington, DC, United States Institute of Peace Press.
- SUNMONU, M. 2011. *Mutiu Sunmonu Comments on UNEP Ogoniland Oil Spill Report* [Online]. Available: http://www.shell.com.ng/home/content/nga/environment_society/our_response/unep_response.html [Accessed 18th April 2012].
- TAKSHE, A. A., HUBY, M., FRANTZI, S. & LOVETT, J. C. 2010. Dealing with pollution from conflict: analysis of discourses around the 2006 Lebanon oil spill. *Journal of Environmental Management*, 91, 887-896.
- TASHAKKORI, A. & TEDDLIE, C. 2003. *Handbook of Mixed Methods in Social and Behavioral Research*, Thousand Oaks, California, Sage Publications Inc.
- TENE, R. 2012. Need To Intensify Exploration Activities Amid Increasing Oil Demand. *Leadership*.
- TEYE, J. K. 2008. *Forest Resource Management in Ghana: An Analysis of Policy and Institutions*. PhD, University of Leeds.
- THE ECONOMIST. 2011. Nigeria's prospects: A man and a morass. *The Economist*.
- THELEN, K. 1999. Historical institutionalism in comparative politics. *Annual Review of Political Science*, 2, 369-404.
- THELEN, K. & STEINMO, S. 1992. Historical institutionalism in comparative politics. In: STEINMO, S., THELEN, K. & LONGSTRETH, F. (eds.) *Structuring Politics: Historical Institutionalism in Comparative Analysis*. Cambridge: Cambridge University Press.
- THIOMBIANO, L. & TOURINO-SOTO, I. 2007. Status and trends in land degradation in Africa. In: SIVAKUMAR, M. V. K. & NDIANG'UI, N. (eds.) *Climate and Land Degradation*. Berlin Heidelberg: Springer.
- THOMAS, D. H. L. & ADAMS, W. M. 1999. Adapting to dams: agrarian change downstream of the Tiga Dam, Northern Nigeria. *World Development*, 27, 919-935.
- TICHY, N. M., TUSHMAN, M. L. & FOMBRUN, C. 1979. Social network analysis for organizations. *The Academy of Management Review*, 4, 507-519.
- TOTAL 2006. *Total Upstream in Nigeria*. Lagos, Nigeria: Elf Petroleum Nigeria Limited.
- TOTAL. 2012. *NOG 2012: Total, Others Seek Better Operating Environment* [Online]. Available: http://www.ng.total.com/06_total_nigeria_press/0608_28Feb2012_tepng_news_1.htm [Accessed 12th April 2012].
- TRANSPARENCY INTERNATIONAL 1999. The 1999 Transparency International Corruption Perceptions Index (CPI).

- TRAXLER, F., BLASCHKE, S. & KITTEL, B. 2001. *National Labour Relations in Internationalized Markets: A Comparative Study of Institutions, Change, and Performance*, Oxford University Press Oxford.
- TURNER, R. K. 2008. *Valuing Ecosystem Services : The Case of Multi-Functional Wetlands*, London :, Earthscan.
- TWUMASI, Y. A. & MEREM, E. C. 2006. GIS and remote sensing applications in the assessment of change within a coastal environment in the Niger Delta region of Nigeria. *Int J Environ Res Public Health*, 3, 98-106.
- UDOFIA, S. & UDO, E. 2005. Local knowledge of the utilization of Nipa palm (*Nypa fruticans*, Wumb) in the coastal areas of Akwa Ibom State, Nigeria. *Global Journal of Agricultural Sciences*, 4, 33-40.
- UDUAGHAN, E. 2008. *How to Solve Niger -Delta Problem* [Online]. Government House Asaba. Available: http://www.governoruduaghan.org/news_fetcher.php?fid=209 [Accessed 13th March 2012].
- UK TRADE AND INVESTMENT 2011. *Developing Your International Trade Potential: Time to Export*. London: UK Trade & Investment.
- UKIWO, U. 2009. Causes and Cures of Oil-related Niger Delta Conflicts. *Policy Notes*. Uppsala, Sweden: The Nordic Africa Institute.
- ULUOCHA, N. & OKEKE, I. 2004. Implications of wetlands degradation for water resources management: Lessons from Nigeria. *GeoJournal*, 61, 151-154.
- UMOH, S. G. 2008. The promise of wetland farming; evidence from Nigeria. *Agricultural Journal*, 3, 107 - 112.
- UNITED NATIONS 2011. *World Population Prospects: The 2010 Revision*, New York United Nations, Department of Economic and Social Affairs, Population Division.
- UNITED NATIONS ENVIRONMENT PROGRAMME 2007. *Mangroves of Western and Central Africa*. In: CORCORAN, E., RAVILIOUS, C. & SKUJA, M. (eds.) *Report produced for UNEP-DEPI under the UNEP Biodiversity Related Projects in Africa*. Cambridge, UK: UNEP World Conservation Monitoring Centre.
- UNITED NATIONS ENVIRONMENT PROGRAMME 2011. *Environmental Assessment of Ogoniland*. Nairobi, Kenya: United Nations Environment Programme.
- URHOBHO HISTORICAL SOCIETY. 1998. *Urhobo Foundation: First Urhobo Economic Summit on Oil, Gas and Sustainable Development Communiqué* [Online]. Available: <http://www.waado.org/organizations/UF/UFFirstEconSummit.html> [Accessed 17th April 2012].
- URHOBHO HISTORICAL SOCIETY. 1999. *The Oron Bill of Rights* [Online]. Available: <http://www.waado.org/nigerdelta/RightsDeclaration/Oron.html> [Accessed 17th April 2012].
- US ENERGY INFORMATION ADMINISTRATION 2011. *Country Analysis Brief: Nigeria*. Washington, DC: US Energy Information Administration.
- UYIGUE, E. & AGBO, M. 2007. *Coping with Climate Change and Environmental Degradation in the Niger Delta of Southern Nigeria*. Nigeria: Community Research and Development Centre.
- VAN ARKADIE, B. 1999. *The State and Economic Change in Africa*, Oxford Clarendon Press.
- VAN DER DUIM, R. 2007. Tourismscapes an actor-network perspective. *Annals of Tourism Research*, 34, 961-976.

- VANBERG, V. 1989. Carl Menger's evolutionary and John R. Commons' collective action approach to institutions: a comparison. *Review of Political Economy*, 1, 334-360.
- VARUGHESE, G. & OSTROM, E. 2001. The contested role of heterogeneity in collective action: some evidence from community forestry in Nepal. *World Development*, 29, 747-765.
- VAYDA, A. & WALTERS, B. 1999. Against political ecology. *Human Ecology*, 27, 167-179.
- WALKER, A. 2008. *My Brother, the Niger Delta Militant* [Online]. London: The BBC. Available: <http://news.bbc.co.uk/1/hi/world/africa/7257363.stm> [Accessed 28th June 2012].
- WALKER, P. A. 2005. Political ecology: where is the ecology.? *Progress in Human Geography*, 29, 73-82.
- WARD, K. G. & JONES, M. 1999. Researching local elites: reflexivity, 'situatedness' and political-temporal contingency. *Geoforum*, 30, 301-312.
- WASSERMAN, S. & FAUST, K. 1994. *Social Network Analysis: Methods and Applications*, New York, Cambridge University Press.
- WATKINS, F. M. 1968. State: the concept. In: SHILLS, D. (ed.) *International Encyclopedia of the Social Sciences*. New York: Macmillan.
- WATTS, M. 2000. Political ecology In: BARNES, T. & SHEPPARD, E. (eds.) *A Companion to Economic Geography*. Oxford: Blackwell.
- WATTS, M. 2003. Economies of violence: more oil, more blood. *Economic and Political Weekly*, 38, 5089-5099.
- WATTS, M. 2004. Resource curse? governmentality, oil and power in the Niger Delta, Nigeria. *Geopolitics*, 9, 50-80.
- WATTS, M. 2007. Petro-insurgency or criminal syndicate? conflict & violence in the Niger Delta. *Review of African Political Economy*, 34, 637-660.
- WATTS, M. 2008. *Sweet and Sour. Niger Delta Economies of Violence*. Institute of International Studies, University of California, Berkeley.
- WATTS, M. & PEET, R. 2004. Liberating political ecology: environment development social movements In: PEET, R. & WATTS, M. (eds.) *Liberation Ecologies*. 2nd ed ed. London: Routledge.
- WEYLAND, K. 2002. Limitations of rational-choice institutionalism for the study of Latin American politics. *Studies in Comparative International Development*, 37, 57-85.
- WHITTINGTON, D. 1998. Administering contingent valuation surveys in developing countries. *World Development*, 26, 21-30.
- WHITTLE, A. & SPICER, A. 2008. Is actor network theory critique? *Organization Studies*, 29, 611-629.
- WIWA, K. 1995. *Writer Hero: Ken Saro Wiwa* [Online]. Laguna Beach, CA: The My Hero Project. Available: http://www.myhero.com/go/hero.asp?hero=k_sarowiwa [Accessed 15th September 2012].
- WIWA, K. 2006. Death Rules the Delta in Battle to Control Oil. *The Observer*, 5th March 2006.
- WIWA, K. S. 1992. *Genocide in Nigeria: The Ogoni Tragedy* Port Harcourt, Saros.
- WOLF, C. P., EMERHI, E. A. & OKOSI, P. H. 2002. Community Impact Assessment of Lower Niger River Dredging. *Comparing Rivers: The Mississippi and the Niger - The Fifth Randall L. Gibson Tulane University-U.S. Army Corps of Engineers Conference on the Mississippi River*. French Quarter of New Orleans, Louisiana: Tulane University.

- WORLD BANK 1995. *Defining an Environmental Strategy for the Niger Delta*. Nigeria: World Bank Industry and Energy Operations Division, West Central Africa Department.
- WORLD RESOURCES INSTITUTE. 2012. *Complex Institutional Frameworks for Sustainability* [Online]. Washington, DC: World Resources Institute. Available: <http://www.wri.org/event/2012/06/complex-institutional-frameworks-sustainability> [Accessed 07/07 2012].
- WRONG, D. H. 1995. *Power: Its Forms, Bases, and Uses*, New Jersey, Transaction Publishers
- WUNDER, S. 2008. Payments for environmental services and the poor: concepts and preliminary evidence. *Environment and Development Economics*, 13, 279-297.
- YATES, J. & ORLIKOWSKI, W. J. 1992. Genres of organizational communication: a structural approach to studying communication and media. *The Academy of Management Review*, 17, 299-326.
- YOUNG, O. R. 2002. *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale*, Cambridge, MIT Press.
- YOUNG, O. R. 2008. *Institutions and environmental change : principal findings, applications, and research frontiers / edited by Oran R. Young, Leslie A. King, and Heike Schroeder*, Cambridge, MA ; London :, MIT Press.
- ZABBEY, N. 2004. Impacts of Extractive Industries on the Biodiversity of the Niger Delta Region, Nigeria. *National Workshop on Coastal and Marine Biodiversity Management*. Pyramid Hotel, Calabar, Cross-River State, Nigeria.
- ZABBEY, N., ERONDU, E. & HART, A. 2010. Nigeria and the prospect of shrimp farming: critical issues. *Livestock Research for Rural Development*, 22.

APPENDIXES

Appendix 4.1. The Major Oil Companies Operating In the Niger Delta.

Company Name	Entry Year	Average Production (Barrels Per Day - bpd 2010)	% of production	*Joint Venture Allocation (%)	Country of Origin	Estimated Profit	Remarks
Shell Petroleum Development Company of Nigeria Limited (SPDC)	1937	899,000	38	NNPC (55), Shell (30), Elf (10) and Agip (5)	Netherlands and United Kingdom	1,800,000,000	Accounts for about 40% of Nigeria's total oil production. Oil mining lease area of 31,000km ² which is more than half of the country's oil reserves
Mobil Producing Nigeria Unlimited (MPNU)	1955	543,000	23	NNPC (60) and Mobil (40)	United States of America	1,087,208,009	
Chevron Nigeria Limited (CNL)	1961	524,000	22	NNPC (60) and Chevron (40)	United States of America	1,049,165,740	Operates in about 8,900 sq km n the Niger Delta region
Texaco Overseas Petroleum Company of Nigeria Unlimited (TOPCON)	1961	60,000	3	NNPC (60), Texaco (20) and Chevron (20)	United States of America	120,133,482	
Elf Petroleum Nigeria Limited (EPNL) (now Total Nigeria Plc as a result of merger between Total Nigeria Plc and Elf Oil Nigeria Ltd)	1962	125,000	5	NNPC (60) and Elf (40)	France	250,278,087	
Nigerian Agip Oil Company Limited (NAOC) (Now Oando)	1965	150,000	6	NNPC (60), Agip (20) and Phillips Petroleum (20)	Italy	300,333,704	
Other Producers (Ashland (USA), Deminex (Germany), Pan Ocean (Switzerland), British Gas (British), Sun Oil (USA), Conoco (USA), BP (British), Statoil (Norway), Conoil (Nigeria), Dubri Oil (Nigeria)	various between 1992-2000	35,000	1			70,077,864	
Total		2,336,000	100			4,677,196,885	

*Some joint venture includes offshore drilling but majority on dry land or in the swamps of the Niger Delta

Appendix 4.2. Summary of Revenue Allocation by State 1999 – 2010.

State	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Abia	13,033,079	54,916,532	65,594,977	72,991,095	104,135,034	137,236,045	159,464,232	192,858,753	187,141,525	265,444,854	207,110,233	137,914,089
Adamawa	14,678,002	56,020,051	62,961,687	64,409,407	91,793,392	121,926,863	143,390,527	172,860,017	178,157,117	256,328,067	185,666,795	131,587,667
Akwa Ibom	18,144,272	166,178,724	163,030,921	119,056,336	261,767,829	403,036,126	548,441,436	647,994,998	737,962,134	1,466,031,709	887,538,767	697,664,499
Anambra	14,675,211	55,561,783	64,128,871	68,133,971	94,045,752	124,238,318	145,862,004	175,321,042	179,926,007	262,680,074	190,630,207	134,829,438
Bauchi	15,362,652	58,718,075	67,467,662	71,572,133	98,426,002	136,079,830	162,072,425	195,524,143	201,188,105	300,784,654	216,571,593	153,335,343
Bayelsa	14,205,540	134,470,531	152,047,021	162,731,057	267,765,479	455,922,663	690,641,347	784,189,325	527,452,392	1,014,539,862	441,262,780	333,052,231
Benue	16,629,364	63,720,366	71,378,716	75,444,833	103,959,562	133,304,601	155,520,102	187,802,316	193,584,022	278,339,352	201,653,336	142,161,502
Borno	16,982,094	65,203,092	72,837,299	76,878,294	106,112,625	139,234,052	163,786,687	198,661,261	203,152,527	303,117,141	218,029,091	154,905,900
Cross Rivers	14,219,944	54,380,720	54,785,030	67,193,887	100,688,270	136,320,544	173,349,480	212,958,709	227,190,163	351,930,427	176,489,488	124,097,288
Delta	20,035,569	209,148,463	239,124,213	263,444,682	374,826,115	488,941,170	572,618,893	704,956,493	577,258,209	991,146,912	794,943,657	603,052,682
Ebonyi	11,374,926	43,334,973	55,061,548	59,356,154	82,118,600	104,927,795	122,051,657	147,431,944	152,096,740	215,688,390	156,765,490	110,398,477
Edo	14,512,268	57,908,872	63,102,621	66,888,801	97,692,775	137,202,574	165,564,631	202,525,171	188,962,335	259,073,198	221,223,924	160,153,739
Ekiti	11,824,697	45,049,155	49,794,009	52,418,030	72,552,067	101,553,136	121,721,063	147,118,084	151,682,717	217,921,968	158,195,993	111,515,742
Enugu	12,717,876	48,391,704	58,636,187	62,913,164	87,301,355	115,825,141	137,050,995	164,310,092	169,994,653	236,986,017	177,380,077	116,689,762
Gombe	11,856,140	44,673,155	52,053,799	55,371,282	76,637,052	104,963,968	124,130,781	150,076,963	153,785,892	228,338,764	165,691,785	117,086,418
Imo	14,067,435	64,541,680	74,924,760	76,330,878	112,326,509	151,568,859	177,617,157	212,427,759	217,998,453	346,772,499	226,864,293	163,304,052
Jigawa	15,275,951	58,371,447	64,509,557	67,912,384	93,815,551	131,505,866	157,653,249	190,186,850	195,855,611	285,681,707	205,686,613	145,853,049
Kaduna	19,751,684	73,580,024	78,653,188	82,189,192	113,420,655	152,016,745	179,400,316	215,335,215	221,288,520	326,050,760	235,690,986	166,940,656
Kano	21,617,740	82,142,263	94,571,579	100,259,908	138,383,083	183,812,614	218,549,800	265,748,778	272,899,200	414,173,976	300,133,125	212,963,594
Katsina	18,167,879	69,531,546	72,743,768	75,928,579	104,834,162	142,541,726	169,322,096	204,316,520	210,563,865	311,124,305	225,256,847	159,425,382
Kebbi	13,855,223	53,001,507	60,153,742	63,526,425	87,857,813	118,423,061	140,195,370	169,024,808	174,748,510	258,486,665	186,767,291	132,153,346
Kogi	14,086,593	53,871,909	62,950,576	66,944,988	92,484,265	120,056,212	140,705,281	170,992,350	176,105,099	256,901,977	190,869,679	132,863,460
Kwara	13,550,922	51,802,735	55,733,579	57,770,445	79,361,374	108,236,127	128,253,241	154,293,924	158,725,725	225,869,562	162,100,454	112,404,513
Lagos	29,519,773	99,741,287	115,795,842	119,261,484	171,395,635	226,265,769	267,473,173	331,531,953	369,965,831	541,666,234	469,556,110	323,510,038
Nassarawa	11,890,062	45,339,621	51,135,719	53,945,804	74,588,417	101,672,077	120,670,931	145,374,630	151,246,554	221,661,314	159,057,037	112,641,321
Niger	16,564,194	63,612,934	68,450,490	71,561,383	98,802,999	135,438,899	161,083,425	194,336,153	199,851,298	287,246,889	214,228,338	151,856,228
Ogun	15,583,344	58,577,282	62,727,950	65,582,852	90,345,129	118,505,465	139,804,181	167,188,315	172,888,822	253,904,498	184,068,200	130,088,379

Appendix 4.2 (cont

Ondo	14,655,302	86,866,346	99,481,635	80,679,962	124,085,289	166,638,978	224,916,284	315,383,863	332,928,562	549,485,487	316,780,912	234,676,772
Osun	14,083,525	53,657,349	57,526,579	60,203,798	83,218,843	112,145,076	132,917,087	160,009,189	165,640,710	230,999,707	175,142,363	115,200,351
Oyo	17,745,973	66,846,758	73,900,700	78,175,009	107,275,336	141,810,054	167,105,116	200,232,706	207,258,222	304,977,542	221,843,594	156,488,260
Plateau	13,858,945	52,495,094	59,331,291	62,612,453	86,417,887	118,213,650	140,768,748	170,655,948	175,179,317	241,421,631	183,086,234	129,457,308
Rivers	19,900,455	152,867,099	173,645,711	218,649,062	318,378,925	454,630,579	815,738,245	1,028,259,577	1,086,583,814	2,225,490,531	862,057,176	396,897,698
Sokoto	14,466,908	55,352,091	61,119,366	64,342,199	88,751,134	124,408,154	149,167,106	179,289,772	185,731,231	269,854,476	194,711,002	136,965,546
Taraba	13,713,272	52,732,934	58,431,293	61,497,890	84,910,918	115,640,742	137,395,503	165,854,363	171,525,072	251,114,322	180,529,741	128,008,624
Yobe	13,270,008	50,907,661	60,749,575	64,815,496	89,460,553	114,620,140	133,484,079	160,944,590	167,683,841	250,406,160	179,664,635	127,426,601
Zamfara	12,909,054	49,226,002	57,712,633	61,516,869	85,050,049	117,191,957	139,556,599	168,065,284	173,448,760	253,721,550	182,696,386	129,363,240
Total	558,785,877	2,552,741,765	2,856,254,094	2,992,510,186	4,344,986,434	5,996,055,573	7,627,443,248	9,254,041,863	9,217,651,555	14,955,363,183	9,655,944,232	6,726,933,194

Appendix 4.3. A Highlight of Major Conflict and Incidences in the Niger Delta.

Location and association involved	State	Year	Incident	Nature of violence
All Delta (Ijaw, Urhobo and Itsekiri youths)	All delta	1886	Youth revolt against the British stop of middlemen in the trans-Atlantic trade	Riot
Isaac Adaka Boro	All delta	1966	Also called the 12 day revolution. Led by Issac Boro, who declared a Niger Delta Republic	Secessionist
Umuechem in Rivers state	Rivers	1990	Peaceful youth protest against Shell	The Community was virtually destroyed on 31 October 1990; 80 people were killed and about 500houses were destroyed.
Ogoni (MOSOP)	Rivers	1993 - 1996	Closure of oil production, Killing of four Ogoni leaders (intra communal) and Ogoni vs Adoni disturbance (inter communal)	Killings, arrests floggings, rapes, looting.
Nembe Creek	Bayelsa	1994	Nembe-Kalabari communal crisis over fishing rights	Soldiers were sent in
Kaima and Yenagoa	Bayelsa	1998/1999	Youth gave ultimatum to oil companies to vacate the Niger delta	Killings, flogging by police and state controlled military.
Odi (Odi youth)	Bayelsa	1999	Killing of seven Nigerian policemen in the community	Killings and destruction of properties.
Opia and Ikenyan	Delta	1999	Youth demanding money and development from Chevron	They (Chevron) reported to military who invaded the community killing scores.
Choba	Rivers	1999	To disperse protesters outside the gate of Wilbros Nigeria Ltd a subsidiary of an American pipeline construction company.	Rape especially of University students in Close by University of P/H
Rumuekpe	Rivers	2003	Police hired by SPDC to protect them from the community while fixing a broken pipe.	
Finima	Bayelsa	2001	Youth occupied Mobil Terminal demanding more benefits to the community	Arrests
Liama	Bayelsa	2002	Kidnap of Chinese National Petroleum Corporation (CNPC) staff.	Indiscriminate shooting, arrest and killing
Kalabari/Bille	Rivers	2000/2001	Inter-communal conflict over ownership of oil flow station	
Gbarantoru	Bayelsa	2002	Inter-communal fight over oil wells	
Warri	Delta	2003	Inter ethnic Urhobos and Itsekiri, fight over ownership of wards in Warri	The military did not play much active part
Various places in rivers including P/H, Okrika, Waterfront		2003-2007	Cult clashes which extended to clashes with military and oil companies	
Odioma	Bayelsa	2005	A detachment of army, navy, police to arrest some alleged criminals in the community	At least 17 people were killed, including a two year old child.
Ayakoromor community	Delta	2010	Renewed violence by Arm of MEND after Amnesty	Killing, military claimed to be hunting down militant leader(John Togo) whose men killed military men.

Appendix 4.4. Threats to the Niger Delta Wetlands.

Pressure	Major service at risk/Impact	Source
Aquaculture	Loss of mangrove with its rich biodiversity and attendant impact on livelihoods	Davies et al. (2009), Zabbey et al. (2010)
Oil exploration and exploitation activities	Narcotic effects and mortality of fish and other faunal organisms/ dynamite shooting causes increases in turbidity, blockage of filter feeding apparatuses in benthic (bottom dwelling) fauna, and reduction of plant photosynthetic activity due to reduced light penetration.	Ekundayo and Fodeke (2000), Ulocha and Okeke (2004), Twumasi and Merem (2006), James et al. (2007), Uyigue and Agbo (2007), Obot (2007), Ugochukwu and Ertel (2008), Luiselli (2009), Phil Eze and Okoro (2009), Zabbey et al. (2010)
Dredging	Direct burial and destruction of fringing mangroves and associated fauna/ Changing topography and hydrology/ Increased erosion and siltation/ Excessive flooding and ponding of the backswamp/ Estuarine acidification and heavy metal pollution/ Succession to freshwater vegetation	Ohimain et al. (2004), Rim-ukeh et al. (2007), James et al. (2007)
Invasive Plants (Nypa palm)	Decrease in genetic diversity through loss of genetically distinct populations and hybridization with native species	James et al. (2007), Phil-Eze and Okoro (2009), Zabbey et al. (2010).
Damming activities	reduction in water flow and sediment	Abam (1999); Uluocha and Okeke (2004)
Human activities (such as deforestation unsustainable hunting, overfishing, logging)	Loss of flora and fauna	Luiselli (2003), Luiselli et al. (2006), Phil-Eze and Okoro (2009)
Wetland reclamation (agricultural and urbanisation)	Loss of flora and fauna	Wolf (2000), Twumasi and Merem (2006), James et al. (2007), Phil-Eze and Okoro (2009)
Climate change	Sea level rise, flooding, loss of lives and properties	Uyigue and Agbo (2007)
Other industrial and domestic effluents	Soil and Water pollution	Ugochukwu and Ertle (2008)
Indiscriminate use of Fertilizer	Water pollution	Obire et al. (2008)

Appendix 5.1. Household Questionnaire.

I am a PhD student of the University of Leeds and I am conducting my research on the uses of wetlands and the networks and institutions governing them. Please, kindly respond to the following questions as best as you can. If you feel uncomfortable or do not understand any question, please inform me and feel free to ask questions. I assure you that all information shall be treated in confidence and will be used only for academic purpose. Thank you in advance for your time and contribution to this study.

Section A: Bio-data of Respondent

Name: _____ Sex: Male [] Female []
 Age/ Year of Birth: _____
 Marital Status: Married [] Single [] Divorced [] Widowed []
 Educational Level or years of formal education: _____
 Main Occupation: _____ Number in Household _____
 Monthly Household Income _____ Main source of Household Income ____
 Name of Village/Community: _____ Date/ Time Begin/End: _____
 Questionnaire number _____

Section B: Knowledge and Use of Wetland

1. Are you aware of the wetland in your community? Yes [] No []
2. What are for you the main characteristics of a wetland? _____
3. Can you tell me all the benefits derived from this wetland? (**Table 1, Column 1**)
4. Which of these do you use the wetland for? (**Column 2**)
5. Rank in order of importance the services you use the wetland for (**Column 3**).

Table1: Q4 to Q6

Column 1	Column 2	Column 3

Section C: Value of Wetland (*fill this section for all service you use the wetland*)

1. Activity _____
2. How long have you been using the wetland for this? _____
3. How did you gain access to use the wetland for this purpose? Inheritance/lease/others
4. What time of the year (months) do you carry out this activity and why? ____
5. How many families in this community use the wetland for this purpose? ____
6. Which type of this service do you collect? (**Table 2, Column 1**)
7. How often do you collect each of these? (**Column 2**)
8. What quantity of each of these do you collect each time? (**Column 3**)

9. How much of your time does it take to collect this quantity? (**Column 4**)
10. What quantity (of each type) do you use personally? (**Column 5**)
11. What quantity did you give out? (**Column 6**)
12. What quantity did you give out in exchange? (**Column 7**)
13. What quantity did you sell? (**Column 8**)
14. What else do you do with this benefit? _____

Table 2 – Q6 to Q13

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8

1. How long is it from your home to the place of collection? _____(mins/hrs)
2. How do you transport from your home to and from the place of collection? Walk []
Public transport [Cost) _____ Personal Transport []Others (specify) _____
3. Why do you choose to use the wetland for this purpose? _____
4. Is this benefit available in other places outside the wetland? Yes [] No []
5. If yes, where? (describe)_____
6. Do you also use benefits from these source(s)? Yes [] No []
7. If yes, how will you describe access to this? Very easy [] Very difficult []
8. Which of these sources do you use the most? (rank) _____
9. Do you hire external labour for this activity? Yes [] No []
10. If yes, how much do you pay? _____
11. Please, list all the tools/equipments you use in this activity (**Table 3, Column 1**)
12. How do you get these? Bought, lease, borrowed etc (**Column 2**)
13. How many of each do you use/have (**Column 3**)

Table 3 – Q26 to Q28

Column 1	Column 2	Column 3

1. Where do you sell? In this community [] Outside this community (specify) _____
2. To whom do you sell them? _____
3. Did you incur transport cost? Yes [] No []
4. If yes, how much? _____

5. Do you make other product from these benefits? Yes [] No []
6. If yes, what other products? (**Table 4, Column 1**)

Table 4 – Q34 to Q36

Column 1	Column 2	Column 3

1. What do you use these for? (sell, personal use, gift, etc **Column 2**).
2. If you sell, indicate quantity made and price (**Column 3**).
3. How will you describe the recent status of this benefit in the wetlands in the past years?
Increasing[], Decreasing [], Not changing [], No Idea[]
4. What are the factors responsible for these changes? _____
5. How has these changes affected your household _____
6. How have you adapted to these changes? _____
7. What are the major factors that affect your ability to use the wetland for this activity?

Section D: General

1. From this list, please rank (1 is most important) in order of importance the factors that influences your action in the wetland

Social consideration (such as ethnicity and religion)	
Profit maximisation	
Protection of cultural values of the wetland	
Risk avoidance - protection against floods, erosion etc	
Uphold of the biodiversity and living environment	
Repercusion and punishment	

2. From this list, rank in order of importance the activity affecting your activity the most

Collection of materials	
Fishing	
Land reclamation	
Lumbering	
Oil pollution/exploration	
Protection of wetland areas as reserve	
Tourism	
Invasive plant	
Others (specify)	

3. Please, list at least 5 main people and or groups you interact with while using the wetland

1	
2	
3	
4	
5	

Section E: Willingness to Pay and Willingness to Accept

1. Willingness to Pay

The Niger Delta wetlands are important ecosystem in the region. It provides diverse ecosystem services of importance to local residents. The wetlands are threatened by various human activities and if care is not taken its ability to continually supply these important ecosystem services will be threatened.

A project is planned to improve the quality of the wetlands ecosystem so that it can continue to provide the services important to local residents. This project will entail you to make a financial contribution towards the cost of improving the wetlands.

Considering all the benefits your households derive from the wetlands (the concepts of ecosystem services (including regulating and supporting services) should be explained), how much will you be willing to pay monthly towards this project?

2. If not willing to contribute, please state why _____

3. Willingness to Accept

On the other hand during the execution of the project which will last one year, you will not be able to use any of the wetland ecosystem services you derive from the wetlands. However, in this scenario you are not expected to pay any money but the government will request the project managers to compensate each household for their foregoing these services. How much will you expect to be paid as compensation for foregoing these services?

4. Why did you choose this amount? _____

5. Any other comment?

Appendix 5.2. Questionnaire for Representatives of Various Organizations

I am a PhD student of the University of Leeds and I am conducting my research on the uses of wetlands and the networks and institutions governing them. Please, kindly respond to the following questions as best as you can. If you feel uncomfortable or do not understand any question, please inform me and feel free to ask questions. I assure you that all information shall be treated in confidence and will be used only for academic purpose. Thank you in advance for your time and contribution to this study.

Olalekan Adekola

University of Leeds, UK

Section A: Background Data

Questionnaire No: _____ Audio Number _____

Name (optional): _____ Gender: Male [] Female []

Age _____ Educational level _____

Organization _____ Rank/Status _____

How long have you been working in this organization _____

Please, describe your (and organizations) activities relating to the Niger Delta and the wetlands?

Section B: Institutions Governing Use of Wetlands

1. Are you aware of the rules guiding how people should use the wetland? If yes, which one and please, describe? (fill out Table 1 below).
2. What are the benefits and challenges of each of these rules and how have you and people you know adapted to these?
3. Do you think the current rules are appropriate? If yes, explain their strengths; if no which aspects of it do you think should be modified?
4. Have you ever been personally involved in setting rules on how people use the wetlands? If yes what was your role? If no are you aware of anyone who has?
5. For each of the rules you mentioned please can you tell me how it works (if not already described in 1 above).
6. What do you think of each of these rules with reasons?
7. Do you or have you previously practiced any of these rules or supported it? If not why?

8. If you have practiced or supported it, why did you and does it enable you to meet your objectives?
9. What factors influence your activities and action in the wetland?

Table 1: Question 1 - 8

Institution	Aware	Support
Land Use Act		
EIA Law		
Forestry laws		
Local/communal land ownership		
Communal religious institutions		
Communal method of resource extraction		
Institution of land sale by communities		
Institution of militancy		
Varied state institution exchanges		
Memorandum of Understanding		

Section C: Institutional Linkages

1. Which organizations (e.g. donor organization; NGOs, research institutes, etc) take part in wetland policy formulation and implementation and what specific roles do they play?
2. In what ways do you or your organization work with people from these organizations or relate with the organization?
3. How will you describe your interaction with these organizations and how frequently do you meet with people from their face to face?
4. What are the main contents of these interactions? Share information, capacity building etc
5. Are you able to freely discuss with other groups/individuals outside formal settings? If yes, on which issues, and is this always helpful? if no why?
6. How important is informal interaction with these organization to you (describe).
7. How has previous interactions with other people/groups affected your present mode of interaction?
8. Including people from the organizations you have already mentioned and those listed on Table 2, who are the people you interact with and which organization are they from. Give their names if you can or describe them with details of nature of interaction.
9. For each identified, please indicate on a scale of 1 (weakest) to 5 (strongest) how strong these interactions/relationships are.

10. Please, for each pair of people you mentioned can you kindly indicate if you think they interact and how strong these interactions are?
11. For each one can you describe positives and negatives of these interactions?
12. Including the organizations you mentioned, do you read about them? if yes, how frequently?
13. From the list of stakeholders provided in Table 1, please, on a scale of 1-5, please indicate how much you trust each of these actors, how much they influence you and how important you think they are to wetland management (1 is low, 5 is highest. If you don't know an organization indicate 0).

Section D. Actors Narratives

1. How will you describe the problems facing the Niger Delta region (specifically the wetlands) and how do you think these challenges can be solved.
2. If you are to describe the various groups in the Niger Delta as victims, villains, fixers and heroes how will you describe each of the organization you mentioned and why?
3. What suggestion would you make for improvement in wetland policy in Nigeria?

Section E: Actors Organization

1. Do you consider your organization to be independent with respect to planning its activities? Please, explain your answer.
2. What is the level of resource availability (finance, manpower, etc) to carry out its activities?
3. How will you describe the level of training you receive on your present job?
4. Is it always possible to strictly apply rules during your operations? Yes/No. if no, explain the condition under strict application of rules is not possible
5. What factors do you consider in taking decisions on your actions when you meet people engaging illegal things in the wetland?
6. Any other comments

Table 1: Pre Identified List of Actors

Identified Stakeholders	Trust	Influence	Importance
Anpez Centre for Environment and Development			
Birdlife international			
Donor Agencies (such as DFID, UNEP, World Bank)			
Ecological Fund Office			
Legislative officials			
Living Earth Nigeria Foundation			
Local communities			
Logging and Plantation Companies			
Ministry of Agriculture			
Ministry of Culture and Tourism			
Ministry of Environment			
Ministry of Justice			
Ministry of Niger Delta Affairs			
Ministry of Petroleum Resources			
Ministry of Water Resources			
Niger Delta Development Commission			
Niger Delta Wetland Centre			
Nigerian Conservation Foundation			
Nigerian Conservation Foundation			
Nigerian National Petroleum Corporation			
Oil Multinationals			
Pronatura Nigeria			
Ramsar Secretariat			
Researchers			
Royal Society for the Protection of Birds			
Wetland International			
Others (Indicate below)			
National Oil Spill Detection and Response Agency (NOSDRA)			
National Environmental Standards Regulations Enforcement Agency (NASREA)			

Appendix 5.3. Guide for Focus Group Discussion.

Date:

Time:

Venue:

Group:

Members:

1. Welcome: Explain purpose of the discussion and expected result. Explain the rules and encourage openness; indicate time to be taken and that they can clarify issues and that I only serve as facilitator.
2. General discussion about their activities in the wetland with specific emphasis on the main ecosystem service derived by the group (types of services, period of harvesting, challenges faced etc).
3. What is the procedure for different categories of people to gain access to the ecosystem service.
4. Describe labor and input requirement, price and durability as well as price of produce.
5. Why do you engage in this activity?
6. Knowledge of and experiences with various rules and institutions (detailed description needed) governing activity in the wetland.
7. Intra group interaction i.e. relationship among members and sources of knowledge and practices.
8. Categorisation of groups as victims, villains and fixers of the wetland and why?
9. General discussion
10. Thank them and tell them of final presentation and possibility they could still be met for further information.
11. Refreshments! With further discussions to clarify any grey areas one on one.

Appendix 6.1. Socio-Economic Characteristics of Respondents and their Households.

Particulars		Percentage N = 283	Average
Settlement	Amassoma	18.4	
	Angiama	7.4	
	Apoi	1.8	
	Kaima	8.1	
	Odi	11.3	
	Ogbia	6.4	
	Ogbolomabiri	2.8	
	Okpuama	11.0	
	Onyioma	2.1	
	Oporoma	14.1	
Yenagoa	11.0		
Zarama	5.7		
Gender	Male	70.5	
	Female	29.5	
Marital Status	Married	63.9	
	Single	23.0	
	Divorced	3.3	
	Widowed	9.8	
Age Group	<30	2.0	50.4
	30-39	8.2	
	40-49	46.9	
	50-59	19.4	
	60-69	20.4	
>70	3.1		
Education	None	31.1	
	Primary	14.4	
	Secondary	46.7	
	Post Secondary/Degree	5.6	
	Post Graduate	2.2	
Household Size	1-2	6.0	6.23
	3-4	12.7	
	5-6	40.3	
	7-8	29.3	
	>8	11.7	
Household Income (Naira)	< 20000	60.1	21653
	20000-39999	22.3	
	40000-59999	8.5	
	60000-79999	3.9	
	>80000	1.4	
No response	3.9		
Occupation	Business/Trader/Self employed	5.7	
	Civil servant	15.5	
	Company worker	6.7	
	Farmer	28.0	
	Fisherman	8.0	
	Unemployed	33.6	
Pension	2.5		
Main Uses (Ecosystem services)	Provisioning Services		
	Crop production	85.5	
	Fishing	88.7	
	Hunting	57.2	
	Logging	9.2	
	Material collection	100.0	
	Cultural Services		
	Spiritual and religious	25.8	
	Recreation (swimming)	31.4	
Regulating Services (mainly flood and erosion control, water purification and waste treatment and climate regulation)	14.5		
Supporting services (mainly nutrient cycling, primary production and transportation)	6.0		

Appendix 6.2 Monetary Value of Material Collection in the Niger Delta Wetlands.

	Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/PPH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Spices,	African nutmeg	Igina, Okogolo or pepper fruit	<i>Monodora myristica</i>	62	3.80	236	33.56	65.09	1.35	1,500	353,400	230,028	it is used as a popular spice in cuisine, the seeds are dried and sold whole or ground. The leaves and barks are also used for medicinal purposes
		Angei		54	2.50	135	24.15	72.04	3.82	2,500	337,500	243,123	
		Arigogo		72	2.20	158	19.05	76.26	4.70	3,000	475,200	362,370	
	Aridan plant	Opakipaki	<i>tetrapleura tetraptera</i>	13	0.89	12	3.65	95.99	0.35	200	2,314	2,221	is used as a spice, a medicine and as a dietary supplement rich in vitamins. Widely used in African traditional medicine for the management and/or control of an array of human ailments, including schistosomiasis, asthma, epilepsy, hypertension and so on
		Aziza	<i>Piper quineense</i>	101	3.20	323	49.06	42.90	8.04	3,000	969,600	415,961	
Wild food crops, nuts and fruits	Alligator pepper (Grain of paradise)	Sani	<i>Aframomum melegueta</i>	54	2.80	151	37.55	54.05	8.41	3,500	529,200	286,010	
	Bush Mango	Ogbono	<i>Irvingia gabonensis</i>	179	3.91	700	9.10	90.90	0.00	10,000	7,004,990	6,367,536	The kernel from the tree is eaten as soup. The bark of the tree is used for chewing stick and also an important timber, but seldom cut down because of its importance as a source of food.
	Oil palm	Lou/Banga	<i>Elaeis guineensis</i>	141	9.40	1325	15.00	45.00	40.00	5,000	6,627,000	2,982,150	This is an important source of kernel oil and palm (red oil) that have immense culinary and industrial uses. The stem, the fond, the mesocarp fiber and the kernel have various traditional and domestic uses
	Rafia palm	Koro or Bou	<i>Raphia hookeri</i> : Family, <i>Palmaceae</i> or <i>Palmae</i>	101	11.90	1202	0.00	100.00	0.00	4,250	5,108,075	5,108,075	It is an important source of traditional gin (Ogogoro) drank locally and used for traditional rituals. It is also used for art and craft purposes in making brooms, baskets, hats, mats, roofing
	Bush beans	Ukwachi, Oyun	<i>Phaseolus vulgaris</i>	56	4.50	252	64.07	23.46	12.47	3,000	756,000	177,329	
	Bitter Kola	Ikan/Akan	<i>Garcinia kola</i>	66	4.80	317	6.33	89.33	4.35	5,000	1,584,000	1,414,914	
	Fruit nuts (several)	Bread nut, Iginiyea, Karafeye		185	27.60	5106	83.33	6.24	10.44	3,500	17,871,000	1,114,328	
	Kolanut	Dabio	<i>Cola spp</i>	82	3.30	271	13.36	84.08	2.56	5,000	1,353,000	1,137,620	Kolanut is eaten and also has social and religious values as an item of hospitality and communing with deities respectively and are also important material in masticatory and in winery and pharmaceutical industries
	Oil bean	Ugbaka or	<i>Pentaclethera macroloba</i>	41	11.67	478	26.32	70.46	3.21	2,500	1,196,151	842,819	The fruits are used for food and medicinal purpose

Appendix 6.2 (cont)

	Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/PPH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
WOOD, ^{air} and craft	Snail	Osi	<i>Archachatina marginata</i>	189	29.05	5491	16.20	81.50	2.30	3,500	19,217,898	15,662,587	This is a Gastropod, the meat is eaten while the shell is used for ritual purpose or for reinforcement of concerns in place of gravels.
	Butterfly caterpillars	Abalabala	Mainly <i>Bunaea alcinoe</i>	57	5.94	339	8.33	90.42	1.25	3,500	1,185,888	1,072,275	Insect Aesthetic values and food for man and feed for animals, Pollination
	Mushroom (edible)		<i>agrarius spp. mushroom amanita</i>	99	2.15	213	90.90	8.24	0.86	5,000	1,062,765	87,523	edible ones are eaten while poisonous ones are used for medicinal purposes
	commonly Clam, mussels, water snails, oyster	Okpoku /Ogbou	<i>Bivalves</i>	137	12.25	1678	51.65	47.38	0.97	5,000	8,391,695	3,975,941	Mulucs eaten and the shell used as reinforcements in concrete in place of gravels.
	Crabs	Otor	<i>Cardisoma armatum</i>	78	12.29	959	25.00	66.70	8.30	5,000	4,794,343	3,197,827	
	Crayfish, Prawns and Shrimps	Azamu, Opu or Otutu	<i>Crustaceans</i>	183	25.10	4593	12.36	84.39	3.26	7,500	34,445,383	29,067,005	All lobsters are generally regarded as crayfish in the Delta.
	Palm beetle	Okoko	<i>Oryctes monocerus</i>	86	3.11	267	33.33	61.35	5.33	5,000	1,335,236	819,150	Insect Pretentious and food supplements for human and livestock feed, support biodegradation and pollination
	Palm weavel	Doun	<i>Rhyncophorus pheengis</i>	107	4.17	446	57.10	41.94	0.96	7,500	3,345,321	1,403,148	Is an insect delicious protenious and fatty food supplement for human. This is a very popular snack among the Ijaws that is fast gaining national acceptability.
	Periwinkle	Isanbi	<i>Tympanotonus fuscatus var radula (a brackish water habitat) and Pachymelania aurita (Fresh water)</i>	119	2.38	283	27.33	70.65	2.03	5,000	1,417,332	1,001,331	Sources of animal protein, the shells are also used in concrete reinforcements
	Indian Bamboo	Abadiipiri	<i>Oxytenanthera albyssinica</i>	88	26.80	2358	21.03	78.97	0.00	5,000	11,791,251	9,311,008	
Firewood and other wood materials	Fene		148	28.88	4275	35.33	61.42	3.26	250	1,068,657	656,348	Okulu is made from some wood collected from the wetland and used in fishing	

Appendix 6.2 (cont)

	Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/PPH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
	Cane rope for art and craft collected from raffia etc	Apie /Kana		53	2.37	125	20.38	11.26	68.37	3,000	376,035	42,337	
	Chewing stick	Duon		76	29.03	2207	2.94	95.70	1.36	500	1,103,298	1,055,878	
Material extraction	Sand mining	Youn-sai		23	978.35	22502	0.00	100.00	0.00	2,000	45,004,125	45,004,125	
	Native chalk	Tori	<i>Kaolin</i>	48	1.23	59	1.03	97.10	1.87	5,000	295,440	286,879	Used for medicinal and traditional (used during festivals and rituals) purposes It helps with indigestion, dydpepsia and heart burn
Others	Palm wine tapping	Koro	<i>raffa raffia</i>	29	11.56	335	14.33	84.44	1.24	5,000	1,676,573	1,415,672	
	Honey	Akama	<i>Apis mellifera</i>	49	1.52	74	6.33	92.36	1.32	5,000	371,216	342,842	source of energy and sweatness and used for medicinal purposes Honey as food and medicinal uses e.g to heal burns, Pollination and defoliation
	Native Gin	Ogororo		12	1.23	15	2.37	96.35	1.29	2,500	36,960	35,611	
Total (N)											181,086,845	135,121,970	
Total (\$)											1,207,246	900,813	
Average per participation household (\$)											4,266	3,183	
Net financial value (\$)											1,051,101		
Average ne financial value per participation household (\$)											3,714		

Appendix 6.3. Medicinal Plants and Materials Derived From the Niger Delta Wetlands.

Common Name	Local Name	Botanical Name	Ailment used for
Bitter Leaf	Orugbo	Vernonia Spp	to treat malaria
Bush Mango	Ogbono Tree		Morning sickness treatment
Bush Marigold		Aspilla Africana	wild margold , grass for blood clotting
Cocoa Palm	O Du		for abortion
Kernel Oil	E Ve On Dei		To heal convulsion in children
Mango Bark			For treating malaria
Native Gin	O Goo Goo Ru		to treat burns
Paw Paw Leaf/Unripe Pawpaw	Ondu	Carica Papaya	For Typhoid
Plantain Root / Bark	Abaghan		For treating broken bones (orthopaedic application)
Pumpkin Leaf	O Gu Leaf		for low blood pressure
Pumpkin Leaves	O Gu Leaf	Telera Occidentalis	Very rich in mineral nutrients also used as vegetable and blood supplement
Scent Leaf	Fro Ca Na/ Kanranforo	Amadalyner Sp	For headache
	To Bo Da Tu O		stop bleeding during pregnancy
	In Dem O		Used during pregnancy
	Ken Buo Tia		For male fertility
	E Yon Kor E		To heal wound
	Beri Soun Le		To heal convulsion in children
	A Bo E		As analthestic for pain relief
	Sis Se Re Se		To heal injuries
	Be Re Ba Bo		Treat burn apply to surface
	A Ba La La		To treat ear ache
	To Bo Da Tu O		so woman will not lose baby
	Be La Me Me		to abort babies safely
	Yon Ko Ra		Treat injury
	O Bu Do		to treat diabetics
	Da Sin Sin		to trat if you pass too much urine
	O Bu Le Me Me		For pregnant women
	Pow O Bre Ma		To treat injury
	Ko Bo Tor O		stop bleeding during pregnancy
	Beri Soun Le		for abortion and to remove placenta
	A Ba La La		for pregnancy to save a pregnancy
	A Bul Le Me La		same as above
	A Ga Ga Tree		to increase man's libido
	Tim Pa Lay		to heal fracture
	Bu Lo Bo		for chest and back pain
	A Ma Se De Re		for optometric application and as analgesic
	E Fen De Re		to treat malaria and ringworm
	En Ge		to treat joint pain
	Elephant Grass		to remove object from eye
	Native Chalk And Aligator Pepper		Used alongside many remedies

Appendix 6.4. Monetary Value of Fishing in the Niger Delta Wetlands.

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/P PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
African arowana	Akeo or ogolokolo	<i>Heterotis niloticus</i>	44	16.2	713	23.5	74.5	2.1	10,000	7,126,158	5,307,845	Eaten by many people, young ones are used for aquarium. It is popular fish in aquaculture in the delta. The fish is common when flood reside in the late flood season.
African Knife Fish	Ipelepele	<i>Xenomystus nigri</i>	18	4.2	76	17.4	78.4	4.2	1,500	114,206	89,526	This fish common in local fish ponds is becoming rare. It is widely eaten by many people.
African River Pike	Usawu	<i>Hepsetus odoe Hydrosy</i>	14	10.5	146	43.6	55.8	0.5	2,000	292,619	163,388	Used for human consumption by few because of its many tiny bones. It is also used to control the population of Tilapia in artificial ponds and control/wipe out leeches in water bodies.
Blood Fish	Okuwun	<i>Phractolaemus ansorgei</i>	39	20.2	787	9.1	77.3	13.6	2,000	1,574,653	1,216,892	Eaten by few people, still relatively abundant in the area.
Bonga fish	Fieru	<i>Ethmalosa fimbriata</i>	29	4.6	133	17.9	76.8	5.3	3,000	398,444	305,879	Widely eaten by many as source of animal protein. It is mostly processed dry before sale. Abundant in coastal wetlands
Butterfly fish or freshwater flying fish	Idoumakoti	<i>Pantodon buchoizi</i>	4	1.8	7	23.5	24.5	52.1	800	5,653	1,383	Eaten by few, but mainly used for aesthetic purposes in aquarium and as fish bait by fishermen.
Catfish (various types)	Opowei, Torio, Oloma, Obu, Oboro, Burian (Golden catfish), Ongolo (Silver catfish), Otoin	<i>Siluriformes or Arius species, clarias heterobrancus, Clarias Geritinus, Clarias anguillaris, Bagrus spp</i>	205	22.9	4700	4.1	95.3	0.7	9,500	44,648,840	42,530,252	Eaten by many people and widely farmed in aquaculture farms.
Croacker		<i>estuarine sciaenidae</i>	11	4.8	52	18.9	76.3	4.9	10,000	522,708	398,684	Widely eaten, but declining
Drum fish	Obubu	<i>Aplodinotus grunniens</i>	14	0.8	12	2.3	65.4	32.3	500	5,836	3,816	Eaten by few, mostly used for aesthetic purposes and as fish bait. It is becoming rare
Electric fish	Oma	<i>Malapterurus electricus</i>	100	14.9	1494	24.4	10.3	65.4	2,000	2,987,069	306,473	Used for human consumption and for aesthetic purposes in aquarium.
Freshwater herrings	Shoun	<i>Sierrathrissa leonensis</i>	23	4.6	106	34.8	57.7	7.5	7,000	742,710	428,815	Widely eaten by many and used in aquarium.
Grass eater	Eweri	<i>Family distichodontidae (mainly distichodus brevipinnis)</i>	13	2.6	34	11.0	88.0	1.0	13,000	439,491	386,693	Eaten by many however, has tiny bones which discourage some.
Leaf fish	Eepepe or Belegbolupe	<i>Polycentropsis abbreviate</i>	17	6.3	108	42.9	56.0	1.1	700	75,470	42,278	Used as food as well as aesthetic purposes in aquarium and as fish baits.
Lung fish	Ebiesieni	<i>Protopterus annectens</i>	94	20.0	1877	18.3	68.0	13.7	3,000	5,631,659	3,830,936	Used as food.
Moon fish	Afou or Apepe	<i>Family Cithranidae (such as Citharinus citharus)</i>	17	9.1	154	34.6	62.6	2.8	3,000	462,289	289,356	This common lake fish is widely eaten by many.
Mud fish	Olomo	<i>Clarias anguillaris</i>	158	18.5	2922	20.5	59.6	19.9	10,000	29,215,489	17,425,579	Eaten by many people and widely farmed in aquaculture farms.

Appendix 6.4 (cont ...)

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Niger perch or Nile perch fish	Kina or Gogoba	<i>Lates niloticus</i>	10	13.6	136	29.8	65.8	4.4	12,500	1,698,743	1,117,024	Widely eaten by many
Reed fish	Ogbaru	<i>Polyterus ansorgei</i> , <i>E. calabaricus</i>	14	6.3	88	13.5	85.1	1.4	4,500	395,549	336,672	Widely eaten as food and used for aesthetic purposes in aquarium
Silverside	Aza or Ewere or Ekolokolo or Iliye	<i>Arnoldichthys spilopetrus</i> or <i>brytinus spp</i>	10	6.8	68	62.2	36.9	0.9	2,000	135,899	50,206	Eaten for food.
Snake Head	Iyoruo	<i>Parachanna obscura</i>	98	32.8	3216	10.4	89.4	0.3	4,500	14,470,496	12,929,389	Widely eaten by many. Also effective has environmental (bio) cleaning effect.
Threadfin	Apuru	<i>family polynemidae</i>	14	4.2	59	29.2	69.3	1.6	10,000	588,162	407,352	Widely eaten as food.
Tilapia	Itabala	<i>Family Cichlidae (such as Sarotherodon galilaeus)</i>	143	56.4	8065	8.6	83.9	7.5	4,500	36,292,282	30,438,337	Widely eaten by many people and also popular fish in aquaculture.
Trunk fish	Ugbala or Aba or Izimu (Elephant trunk fish)	<i>Order mormyriiformes (especially Hyperoplsus bebe occidentallis), Gymnarchus niloticus</i>	37	8.0	294	17.5	76.2	6.3	4,500	1,324,543	1,009,224	Widely eaten as food.
Unknown	Hekpu, Igbiri, Ebedebe, Ahumo, Agiti		132	10.1	1335	24.6	73.3	2.1	5,000	6,673,206	4,890,792	These are the many fishes local names given but could not be identified.
Total (N)										155,822,175	123,906,790	
Total (\$)										1,038,815	826,045	
Average per participation household (\$)										4,139	3,291	
Net financial value (\$)										854,509		
Average ne financial value per participation household (\$)										3,404		

Appendix 6.5. Monetary Value of Cropping in the Niger Delta Wetlands.

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/ PPH	Total Yield	Self-used	Sold	Added value	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Yield/ha (ton/ha)	Uses
African pear	Ube	<i>Dacryodes edulis</i>	32	16.2	519	15.2	83.5	0.0	1.2	2,000	1,037,791	866,867		
Alligator pepper or Grain of paradise	Sani	<i>Aframomum melegueta</i>	19	2.0	39	2.6	96.3	0.0	1.1	3,500	135,306	130,300	2.7	Used as spice for cooking, medicinal purpose to cure common cough and in ritual observance. Also an important component in making traditional "bullet proof".
Avocado pear	Osonson	<i>Persea gratissima</i>	13	43.7	568	7.3	90.3	0.0	2.4	2,500	1,420,180	1,282,423	51.3	Commonly eaten with bread as substitute for margarine.
Banana	Pina Abana	<i>Musa paradisaca</i>	132	36.7	4,844	17.6	80.9	0.0	1.5	3,000	14,532,707	11,756,960	34.2	
Bitter kola	Ekann	<i>Garcinia kola</i>	47	9.3	438	1.5	97.5	0.0	1.1	5,000	2,191,489	2,135,606		Eaten widely for different purposes including medicinal as it has spiritual healing factors attached to it.
Cassava	Inbikaka or Ebiaburu	<i>Manihot esculenta</i>	217	72.8	15,805	15.3	19.4	60.2	5.2	1,000	15,804,661	3,062,153	22.3	Eaten as food and used for many other product such as garri, fufu, akpain, tapioka, chips, starch. Also used for animal feed.
Cocoa		<i>Theobroma cacao</i>	11	2.8	30	10.3	89.7	0.0	0.0	1,000	30,274	27,168	0.4	
Coconut	Okokodia	<i>Cocos nucifera</i>	70	7.2	506	23.6	68.1		8.3	1,500	759,717	517,298	2.8	The leaves are used for craft purpose i.e. for making brooms. Also grow wild.
Cocoyam	Amacy/Odu	<i>Colocasia esculenta</i> or <i>xanthosoma sagittifolium</i>	191	35.1	6,709	36.8	41.9	0.0	21.3	800	5,367,024	2,250,930	17.6	
Cucumber		<i>Cucumis sativus</i>	84	14.2	1,196	8.5	87.7		3.8	1,350	1,614,325	1,415,091	33.0	
Kolanut (White and Red)	Dabio	<i>Cola spp</i>	91	6.2	567	4.1	93.8		2.1	5,000	2,836,738	2,661,845		Eaten and used for medicinal purpose in cure of chest pain and as a stimulant
Fluted pumpkin fruit	Ogwu	<i>Telfairia occidentalis</i>	101	² 22.1	2,235	10.4	80.6	0.0	9.0	500	1,117,292	900,872	7.9	It is an important soup vegetable.
Garden egg	Osonson	<i>Solanum melongena</i>	67	12.2	820	25.5	54.5		20.0	1,350	1,106,624	603,464	9.9	Is the seasonal fruit and for its lovers having steamed yam and stew made with garden egg is a delight.
Ginger		<i>Zingiber officinale</i>	25	4.2	106	19.7	79.2		1.0	2,000	211,550	167,620		
Groundnut	Apapa	<i>Arachis hypogaea</i>	128	17.3	2,218	24.1	68.0		7.9	1,500	3,326,316	2,260,541	2.9	
Guava		<i>Psidium guajava</i>	58	11.2	652	22.0	76.9		1.1	1,750	1,140,310	876,839		
Leafy Vegetable (Ugwu, bitter leaf () etc)	Ugwu	Various such as <i>Vernonia amygdalina</i>	140	³ 14.7	2,052	53.3	45.6		1.1	2,000	4,104,462	1,872,382		
Maize	Agbodo	<i>Zea mays</i>	103	28.8	2,963	37.7	45.3		17.0	1,750	5,184,817	2,348,325	2.7	

Appendix 6.5 (cont ...)

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/PPH	Total Yield	Self-used	Sold	Added value	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Yield/ha (ton/ha)	Uses
Mango	Ogbein	<i>Mangifera indica</i>	64	14.3	917	28.4	65.3		6.3	875	802,228	524,031		
Mellon	Egusi		65	32.5	2,110	27.4	69.3		3.4	1,750	3,691,884	2,557,158	3.8	The Mellon seeds are used as a soup (Egusi)
Oil palm	Lou	<i>Elaeis guineensis</i>	76	³ 50.4	3,831	2.4	65.1	31.1	1.3	5,000	19,156,734	12,469,582		The palm is a source of vegetable oil, the fibres and hard shells of the fruits are used as fuel for cooking and heating, and the fronds for making brooms and baskets and other art and craft materials. The tree is also tapped for wine. It also grows wild and commonly used for local gin.
Okro/Okra	Okiapu	<i>Abelmoschus esculentus</i>	97	7.3	704	22.3	58.2		19.5	2,000	1,407,428	819,665	16.7	
Onions	Ayuo/Yabas	<i>Allium cepa</i>	41	7.2	297	20.0	79.0		1.0	2,000	593,803	468,982		
Orange	Ogo/Alalanda	<i>Citrus sinensis</i>	86	23.6	2,029	74.3	21.8		3.9	1,000	2,028,521	443,184		
Pawpaw	Oduon	<i>Carica papaya</i>	55	27.2	1,498	6.0	85.4		8.7	2,250	3,370,382	2,877,890		
Pepper	Igina/Egara	<i>Piperaceae</i>	107	4.9	519	24.9	55.8		19.3	2,750	1,428,325	797,005	2.6	
Pineapple		<i>Ananas comosus</i>	59	23.2	1,372	13.4	82.2		4.4	2,750	3,771,642	3,100,058	19.5	
Plantain	Abanghan	<i>Musa paradisiaca</i>	164	⁴ 43.7	7,165	38.0	41.4		20.6	800	5,731,794	2,371,816	25.4	
Raffia palm (value of native gin and material collection)	Koro/Bou	<i>Raphia hookeri</i> : Family, <i>Palmaceae</i> or <i>Palmae</i>	77	³ 23.3	1,791	2.3	43.7	50.7	3.3	4,250	7,610,063	3,323,682		Commonly a source of local wine
Rice	Atangbalanga	<i>Oryza sativa</i>	84	³ 10.2	858	35.2	62.9		1.8	5,500	4,719,233	2,970,555	2.7	
Rubber (seed)		<i>Hevea brasiliensis</i>	24	9.5	229	1.1	95.1	1.5	2.4	3,750	859,311	816,835		
Rubber (Latex)			12	⁵ 179.4	2,153		100.0			400	861,288	861,288		
Sugar cane	Okpu	<i>Saccharum</i>	178	⁶ 16.2	2,889	12.9	81.4		5.7	4,500	13,001,391	10,587,033	36.2	Juice is consumed and is an important material for sugar industry
Sweet potatoes	Kpukpunduku	<i>Ipomoea batatas</i>	121	27.2	3,293	51.6	36.9		11.5	1,500	4,939,443	1,824,908	6.7	
Tomatoes		<i>Solanum lycopersicum</i>	75	3.5	259	41.5	53.3		5.1	2,500	648,152	345,761		
Water yam	Bini Buru	<i>Dioscorea alata</i>	117	36.4	4,255	50.4	47.0		2.6	3,250	13,827,943	6,493,150	17.9	
Yam	Buru	<i>Dioscorea rotundata</i>	161	62.5	10,055	53.8	20.0		26.2	4,250	42,732,875	8,533,755	16.6	

Appendix 6.5 (cont ...)

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/ PPH	Total Yield	Self-used	Sold	Added value	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Yield/ha (ton/ha)	Uses
	Angei		17	5.2	89	12.9	78.1		9.1	2,250	199,462	155,747		Used as spice and also for some medicinal purpose such as sour throat
	Arigogo		32	3.2	103	8.2	89.9		1.8	3,000	308,598	277,545		Used as spice and also for some medicinal purpose such as sour throat
	Aziza	<i>Piper quineense</i>	21	3.7	77	13.1	83.9		2.9	3,000	230,254	193,293		Used as spice and also for some medicinal purpose such as sour throat
Total (₺)											193,842,338	97,949,605		
Total (\$)											1,292,282	652,997		
Average per participation household (\$)											5,340	2,698		
Net financial value (\$)											1,167,714			
Average net financial value per participation household (\$)											4,825			

1 All yields are in baskets excepts stated otherwise

2 Pieces

3 Bags

4 Bunches

5 Litres

6 Canoe loads

Appendix 6.6. Monetary Value of Hunting in the Niger Delta Wetlands.

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/P PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Antelope	Otubara	<i>Sitatunga trapelaphus spekii</i>	26	1.3	32.7	24.3	58.2	17.5	15,000	490,803	285,651	A source of meat, the skin serves as hides for making local drums.
Bear / moongoose not wild duck	Oporu		7	3.0	21.2	27.5	72.5	0.0	5,000	105,754	76,706	These are destructive especially to farm crops. Farmers do hunt them by setting traps on their farmlands
Bush Baby	Okini	<i>Otelemur spp/Loris spp</i>	10	32.1	321.3	30.0	63.2	6.8	350	112,439	71,070	
Bush pig/wild pig	Ombe	<i>Potamochoerus porcus</i>	28	1.3	37.1	31.1	56.4	12.5	14,000	519,557	293,152	
Crab eating fox/Bush dog	Bou-obiri	<i>Cerdocyon thous</i>	4	1.7	7.0	36.3	48.5	15.2	7,000	48,883	23,711	
Crocodile	Segi/igiere	<i>Crocodylus niloticus</i>	2	1.0	2.0	0.0	100.0	0.0	10,000	20,000	20,000	Crocodiles are not normally used for meat in most communities in Bayelsa state. They are regarded as sacred animals. There is cultural repercussion on those who eat or kill crocodiles.
Duicker	Bure	<i>cephalophus silvicultor</i>	17	1.8	30.0	14.0	83.0	3.0	5,000	149,879	124,414	This animal is now very rare in the wetland. Its natural habitat is in the low forest plains.
Dwarf crocodile	Aligator or Sobiri	<i>osteolaemus tetraspis</i>	28	25.2	706.0	5.7	92.8	1.5	3,500	2,471,114	2,292,647	Used as meat
Eegret	Ingolo, Boye	<i>Casmeridius alba</i>	4	12.3	49.0	67.4	32.6	0.0	200	9,807	3,202	It is a bird. This is common and widely eaten as meat in the coastal wetland communities. In some other communities it is an abomination for the blood to touch the soil.
Grass cutter	Ibuobuo	<i>Thryonomys swinderians</i>	39	58.4	2276.3	27.3	65.4	7.3	2,500	5,690,634	3,724,326	These are rodents just like rats, they are also pests on farmlands, hence farmers mostly use trap to hunt them. There is a thriving established market and even demand cannot be sustained by wild catch alone hence some have resorted to domestication as a substitute source.
Hare	Nwan	<i>Beira antelope Dorcatragus megalotis</i>	12	3.3	39.0	40.0	34.2	25.9	5,500	214,771	73,388	Consumed as meat and the skin is used as hides in making local drums and the horn for local trumpet.
Hyenna		<i>Hyaena hyaena</i>	8	1.4	10.9	8.1	87.1	4.8	8,000	87,411	76,123	This may not be hyena, some others called same game tiger while a local researcher advised it is leopard
Leopard	Oloror	<i>Panthera pardus</i>	2	1.0	2.0	0.0	100.0	0.0	25,000	50,000	50,000	
Malantee	emien	<i>Trichecus manatus</i>	1	1.0	1.0	0.0	100.0	0.0	40,000	40,000	40,000	This animal is very rare
Mangrove snakes or Cobra	Olipi	<i>boiga dandrophilla</i>	14	5.4	76.0	80.7	16.8	2.5	1,300	98,746	16,550	feed on birds
Monitor lizard or Iguana	Abedi	<i>Varanus niloticus</i>	32	2.8	90.7	39.3	53.0	7.7	5,000	453,385	240,294	Eaten as meat and also with traditional value especially to pregnant women.
Monkey (Black monkey, common monkey, bush baby)	Akan, Chemeobogu, Tomi, Kuni, Opowo, Sokosiko, Akeke, Obugo	<i>Cereopithecus sp</i>	20	4.9	98.7	23.0	64.1	12.9	4,500	444,209	284,714	

Appendix 6.6 (cont ...)

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/P PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Otter civet	Kiewe	<i>cynogale bennetti</i>	12	1.4	17.1	27.6	69.2	3.2	3,500	59,879	41,421	The numbers are declining
Pocupine	Igiri	<i>Thecurus sp</i>	16	7.0	112.0	27.8	67.9	4.4	2,500	280,000	190,019	
Pythons or Boas	Abua or Odomo	<i>Morelia argus</i>	8	3.3	26.1	9.3	87.5	3.3	1,500	39,185	34,270	These are not eaten in some communities
Squirrel	Ogboru or Ugbe or kakarugboru	<i>Xerus erythropus</i>	12	25.7	307.9	28.1	66.7	5.2	1,000	307,857	205,238	Availability is widely declining
Tortoise	biekiruwei / Ikagi		24	24.0	576.0	29.9	68.3	1.7	1,300	748,800	511,734	It is different from turtle in that it is on land while turtle is water based. It is becoming very rare.
Turtle	Biniwei or Ikagi		16	31.0	496.0	42.0	56.5	1.5	1,650	818,400	462,031	
Total (N)										13,261,514	9,140,660	
Total (\$)										88,410	60,938	
Average per participation household (\$)										546	376	
Net financial value (\$)										76,552		
Average ne financial value per participation household (\$)										473		

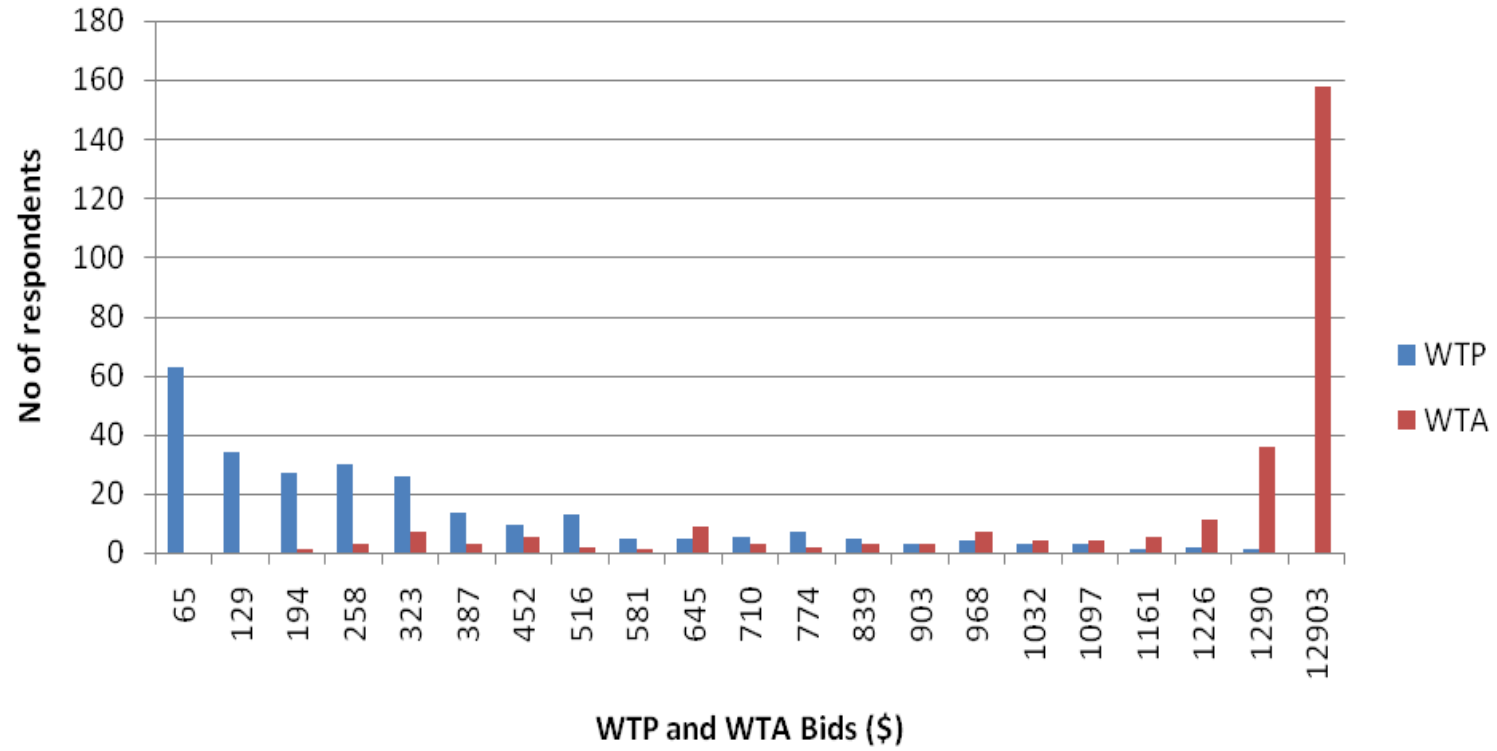
Appendix 6.7. Monetary Value of Logging in the Niger Delta Wetlands.

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/P PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Abura	Baya	<i>Mitragyna ciliata</i>	4	3.6	14.5	16.67	83.33	0	50,000	725,670	604,701	Mostly used for canoe carving, and making other stuff like drums. Canoes and drums are so important in the cultural life of the delta.
Africa Mahogany or Lagos mahogany		<i>Khaya ivorensis</i>	11	8.9	97.7	11	83.33	5.67	38,000	3,710,790	3,092,201	Woods are used for building for boat, the bark are used for chewing stick, and local medicines.
African oilbean		<i>Pentachletra macrophylla</i>	2	1.7	3.4	0	100	0	25,000	85,714	85,714	Common uses include food, salt substitute, edible oil, seed craft, dye, fencing and palings, charcoal, carving bowls, medicine (convulsion, itching, lactogenicity, wound, diarrhoea, seed wood and ornamental)
African Walnut	apopo, sida	<i>Lovoa trichilioides</i> or <i>Coula edulis</i>	1	1.0	1.0	0	100	0	85,000	85,000	85,000	The seeds are also collected as food and the bark is used locally to produce rinses or enemas for loin pains or kidney problems. It is generally becoming rare according to FGD. Extensively used for furniture and cabinetmaking.
Astronia	Kigbo		2	1.5	3.1	0	100	0	25,000	77,136	77,136	
Azobe		<i>Lophira procera</i>	3	3.0	9.0	0	100	0	35,000	315,000	315,000	
Bau Bau		<i>Anthocoleista sp.</i>	2	2.0	4.0	0	100	0	25,000	100,000	100,000	
Bilinga	Opepe	<i>Nauclea diderrichii</i>	2	2.0	4.0	0	100	0	45,000	180,000	180,000	
Black Afara	Owei-abo	<i>Terminalia ivorensis</i>	3	3.0	9.0	0	100	0	25,000	225,000	225,000	
Cyba	Isisaghe		3	3.0	9.0	0	100	0	24,000	216,000	216,000	
India Mahogany		<i>Swietenia mahagoni</i>	3	3.0	9.0	0	100	0	25,000	225,000	225,000	It is not much it is scarce in the Niger delta
Iroko		<i>Chlorophora excelsa</i> and <i>Chlorophora regia</i>	7	4.4	30.7	0	100	0	52,000	1,596,922	1,596,922	Used for ship and boat building, interior and exterior joinery.
Iron wood		<i>Newbouldia laevis</i>	3	3.0	9.0	0	100	0	25,000	225,000	225,000	
Jute plant		<i>Corchorus olitorius</i> and <i>Corchorus capsularis</i>	1	1.5	1.5	0	100	0	25,000	37,500	37,500	
Mangrove pulp	Angala-tin		3	3.5	10.5	0	100	0	25,000	262,500	262,500	for making paper
Mangrove tree		<i>Rhizophora sp</i>	3	5.0	15.0	0	100	0	25,000	375,000	375,000	Source of tannin used commercially in the manufacture of leather, inks dyes, potash for fertilizer industry, edible native salt and tannic acid
Masonia		<i>Masonia altisonia</i>	2	2.0	4.0	0	100	0	90,000	360,000	360,000	
Neem		<i>Azadirachta indica</i>	2	2.0	4.1	0	100	0	25,000	101,481	101,481	The leaves and bark are also used for medicinal purposes
Ogbono tree	Ogboin-tin	<i>Irvingia gabonensis</i>	1	1.0	1.0	0	100	0	25,000	25,000	25,000	It is seldom cut for timber because of its rich economic value. The seed is food and now also have medicinal value used for chewing stick, for building house and also as fish hook handle- stick

Appendix 6.7 (cont ...)

Common name	Local name	Botanical name	No of participating household (PPH)	¹ Yield/P PH	Total Yield	Self-used	Sold	Others	Price	Gross financial value (GFV)	Cash Income (CI)	Uses/Remarks
Ogea or Oziya		<i>Daniellia ogea</i>	2	2.0	4.0	0	100	0	25,000	100,000	100,000	
Okpolota			4	4.0	16.0	0	100	0	25,000	400,000	400,000	
Opoto		<i>Ficus capensis</i>	1	2.0	2.0	0	100	0	25,000	50,000	50,000	used to treat various types of ailments and diseases such as convulsion, stomach ache, respiratory disorders and threatened abortion
Ozouga	Atala	<i>Sacoglottis gabonensis</i>	2	2.0	4.0	0	100	0	25,000	100,000	100,000	
Puka		<i>Meryta sinclairii</i>	1	1.0	1.0	0	100	0	25,000	25,000	25,000	
Red iron wood		<i>Reynosia septentrionalis</i>	2	2.0	4.0	0	100	0	25,000	100,000	100,000	used in making ropes and bags
Red mangrove		<i>Rhizophora mangle</i>	2	2.5	5.0	0	100	0	25,000	125,000	125,000	
Silk Cotton tree		<i>Bombax</i>	7	5.5	38.3	0	100	0	30,000	1,150,440	1,150,440	
Spruce		<i>Picea</i>	1	2.0	2.0	0	100	0	40,000	80,000	80,000	for the manufacture of paper and paperboards
Teak		<i>Tectona grandis</i>	3	2.0	6.1	0	100	0	60,000	364,457	364,457	
White Afara	Ere-abo	<i>Terminalia superba</i>	10	4.2	42.2	8,335	91,665		60,000	2,529,647	2,318,801	Also use logged woods for carvings some of which are images of spirits
Unknown		include <i>Monodora myristica</i> (african nutmeg tree)	14	19.5	272.6	0	100	0	35,300	9,623,062	9,623,062	
Total (N)										23,576,321	22,625,917	
Total (\$)										157,175	150,839	
Average per participation household (\$)										6,045	5,802	
Net financial value (\$)										106,961		
Average ne financial value per participation household (\$)										4,114		

Appendix 6.8. WTA and WTA Bids.



Appendix 7.1. Narratives of Actors.

Actors	Government narrative	Local narrative	Corporate narrative	Non-Governmental narrative	Multilateral Organization narrative	Academic narrative	Media narrative	Total
ACA1	0	1	0	1	1	1	0	4
ACA2	0	1	0	1	1	1	0	4
ACA3	0	1	0	0	0	1	0	2
BUS1	0	1	1	0	0	0	0	2
BUS2	1	0	1	1	0	1	0	4
BUS6	1	0	1	0	0	0	0	2
BUS7	0	0	1	1	1	1	0	4
BUS8	0	0	1	1	1	1	0	4
GOV1	1	0	1	1	1	0	0	4
GOV3	1	0	0	0	1	0	0	2
GOV4	1	0	0	0	0	0	0	1
GOV5	1	0	0	1	1	1	1	5
GOV6	1	1	1	0	1	0	0	4
GOV7	1	0	0	1	0	0	0	2
GOV8	1	1	1	1	1	1	0	6
GOV9	1	0	0	1	1	1	1	5
GOV10	1	0	1	0	0	0	0	2
GOV11	1	0	1	0	0	0	1	3
GOV2	0	1	0	1	1	0	0	3
GOV23	1	0	1	1	1	0	0	4
GOV24	1	1	1	1	1	0	1	6
GOV25	1	0	1	0	1	0	0	3
GOV26	1	1	0	0	1	0	0	3
LOC1	1	1	1	1	1	0	0	5
LOC2	1	1	0	0	0	0	0	2
LOC3	0	1	0	0	0	0	0	1
LOC4	1	1	0	0	0	0	0	2
LOC5	0	1	0	0	0	0	0	1
LOC6	0	1	1	1	0	0	0	3
LOC7	1	1	0	0	0	0	0	2
LOC9	0	1	0	0	0	1	0	2
LOC10	0	1	0	1	1	0	0	3
LOC11	0	1	0	1	1	0	0	3
LOC12	0	1	0	0	0	0	1	2
MED1	1	0	0	0	0	0	1	2
MUL1	1	1	0	1	1	1	0	5
NGO1	0	1	0	1	1	1	0	4
NGO2	0	1	1	1	1	0	0	4
NGO3	0	0	0	1	1	1	0	3

Appendix 7.1 (cont ...)

Actors	Government narrative	Local narrative	Corporate narrative	Non-Governmental narrative	Multilateral Organization narrative	Academic narrative	Media narrative	Total
NGO4	1	1	1	1	1	1	0	6
NGO5	0	1	1	1	1	0	0	4
NGO6	0	0	0	1	1	1	0	3
Total	23	25	18	24	25	15	6	

Appendix 7.2. Ego Network of GOV 8.

