S. Richards-Kennedy

Caribbean researcher experiences with societal impact: A case study of the Research and Development Impact Fund

Thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Education

2018

Caribbean researcher experiences with societal impact: A case study of the Research and Development Impact Fund

Stacy Richards-Kennedy

Thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Education

School of Education

The University of Sheffield

September 2018

Acknowledgements

Consistently carving out blocks of quiet time amidst competing professional and family commitments and staying the course of this intellectual journey have taught me some important life lessons about being persistent yet patient, ambitious yet accommodating. Importantly, it taught me about achieving freedom of spirit through the discipline of the mind.

I am grateful for the support, encouragement and generosity of those who accompanied me on this journey: my parents, Clare and Steve, sister, Leah-Mari, husband, Kit, children, Alexandra and Matthew, other relatives as well as several colleagues and friends.

Sincere thanks to my supervisor, Dr. Vassiliki Papatsiba, and the Caribbean EdD programme coordinator, Prof. Pat Sikes, for their guidance and encouragement at different stages.

This is indeed a shared accomplishment. It is intended to honour the sacrifices made by so many who may not have had the opportunity but who dared to believe.

Dedication

To Alexandra, Matthew, Marianna
and the next generation of knowledge creators.

May you always have a passion for knowledge and
be motivated by an inner quest to learn and grow.

May you always remember that a scholar is someone
with both intellect and compassion
… use knowledge to enlighten and uplift others.

ABSTRACT

Gaining a more in-depth understanding of how research and knowledge can contribute to societal change is essential to the effective execution of any university's mission. At The University of the West Indies St. Augustine Campus in Trinidad and Tobago (T&T), the RDI Fund provides grants to promote research that addresses national and regional development issues. This research is expected to generate societal impact but the pathways and processes through which knowledge from these projects leads to impact have never before been investigated.

This case study of the RDI Fund is complemented by embedded case studies of selected RDI Fund projects and delves into the operational dynamics of knowledge flows and processes. In so doing, it exposes the need for a conceptual framework which captures the enabling and oppositional forces that support or inhibit effective and efficient knowledge flows in research to societal impact processes. Expanding on Meagher, Lyall and Nutley's (2008) model, my conceptual framework confronts the range of factors and forces at the micro, meso and macro levels, which serve as countercurrents to anticipated flows of knowledge.

This research study thus calls into question the appropriateness of research impact measurement in contexts with fragile research ecosystems and underdeveloped linkages between knowledge intermediaries, as is the case in T&T. Processes and mechanisms for knowledge utilization and knowledge brokerage are vital to achieve sustained societal impact and thus, need to be enhanced. Moreover, this research study contends that a focus on the 'micropolitcs of research' as well as renewed emphasis on the 'enlightenment effect' of knowledge are essential to navigate and mitigate the oppositional forces present in research communities. By generating more effective and efficient knowledge flows, UWI researchers can strengthen the various pathways through which university research can contribute to societal impact in the Caribbean.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

A&P	Assessment and Promotion
ASL	American Sign Language
JRC	Jade Research Centre
CARICOM	Caribbean Community
CRPF	Campus Research and Publication Fund
EDAB	Economic Development Advisory Board
ERA	Excellence in Research for Australia
GATE	Government Assistance for Tuition Expenses Programme
HERF	Higher Education Research Fund
HMIC	High Middle Income Country
ICTA	Imperial College of Tropical Agriculture
NGO	Non-governmental Organization
NIHERST	National Institute of Higher Education, Research, Science and Technology
OMS	Innovations Outcome Measurement Study
ORDKT	Office of Research Development and Knowledge Transfer at the UWI St. Augustine Campus
PBRF	Performance-based Research Funds
RCF	Research Contributions Framework
R&D	Research and Development
RIMS	Research Information Management System
RDI Fund	UWI-Trinidad and Tobago Research and Development Impact Fund
RQ	Research Question
RURU	Research Unit for Research Utilization

SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
STA Campus	The UWI St. Augustine Campus
STAR	Science and Technology for America's Reinvestment
SWMCOL	Trinidad and Tobago Solid Waste Management Company Limited
TTSL	Trinidad and Tobago Sign Language
T&T	Trinidad and Tobago
UCWI	University College of the West Indies
UK	United Kingdom
UWI	The University of the West Indies

CHAPTER 1: SETTING THE CONTEXT

1.1 Preamble

The Tunapuna market is a traditional Caribbean marketplace. On Saturdays and Sundays, in particular, it is a space that is bustling with activity with hundreds of persons coming together to buy and sell a wide range of produce and products. As one walks through the narrow lanes in this market, an eclectic mix of aromas from tropical fruits like mangoes, watermelons and pineapples as well as vegetables and fresh fish, fills the air. Items for sale are displayed in heaps on wooden tables with the prices of the day hand-written on little cardboard signs. Vendors shout their latest promotion hoping to catch the attention and interest of prospective buyers as they walk by.

Located a mere kilometre from the St. Augustine Campus (STA Campus) of The University of the West Indies (UWI), the Tunapuna market is also the research site for one of the projects of the STA Campus' Research and Development Impact Fund (RDI Fund). Entitled AgriNeTT, this project has developed new ICT applications to assist farmers with financial management, pricing for trade and land use information. It has also led to the creation of several open access databases, thus making available electronically, for the very first time, critical data for agricultural planning, decision and policy-making.

Far removed from the nondescript classrooms where they typically spend countless hours writing, discussing and testing computer codes, research students in the Faculty of Science and Technology, alongside their lecturer - the lead researcher for the AgriNeTT project - participate in applying academic research to help solve issues affecting local farmers' contribution to the agricultural sector, interacting with farmers to explain how the new mobile apps could help track agricultural produce, prices, the cost of inputs, etc., thereby allowing farmers to be better understand how they could monitor their productivity and efficiency using their mobile phone. Described by the Head of the

Caribbean Agricultural Research and Development Institute (CARDI), as 'a breath of fresh air, probably the best idea for the acceleration of agricultural development in the Caribbean in the last 10 years' (RDI Fund 2016 p.42), this project is one example of a research solution to address a specific development challenge in Trinidad and Tobago (T&T), which was made possible through a research grant from the RDI Fund.

1.2 Introduction

The RDI Fund of the STA Campus based in Trinidad was established in 2012 as a funding mechanism to provide incentives to researchers to pursue research projects that would lead to societal impact. In examining the notion of research impact on society, Epstein and Yuthas (2014) refer to the effect of research on development issues such as equality, livelihoods, health, nutrition, poverty, security and justice. The RDI Fund was set up to support research that addresses development issues in Trinidad and Tobago and the wider Caribbean. While the term development impact is used in the title of the Fund, for the purpose of this research study, development impact is treated as synonymous with societal impact. Based on my review of the literature and my own professional experience, my working definition of societal impact refers to the changes and benefits to society that occur as a result of the exchange of knowledge, the absorption and translation of research-informed ideas and the engagement of stakeholders. It is therefore anticipated that activities that enable and support the exchange and translation of knowledge should occur throughout the research process, that is to say, before, during and after the research is undertaken, in order to facilitate the achievement of the desired changes and benefits. At the time of its launch, the RDI Fund was considered pioneering since this was the first time that the STA Campus had established a dedicated research funding instrument to encourage researchers to go beyond academic impact, which focuses on deepening understanding and advancing knowledge.

This study contends that in Caribbean Small Island Developing States (SIDS), traditionally too much emphasis has been placed on research production as an end in

itself and conversely, too little attention paid to the processes that facilitate societal impact. This study thus seeks to present new insights that go beyond the 'what' of research impact to the 'how', by examining knowledge pathways, which are depicted in my study as knowledge flows, that is to say, the passing of knowledge (Zhuge, Guo and Li, 2007) between knowledge producers and other actors involved in knowledge processes, based on the experiences of RDI Fund researchers. These experiences elucidate additional dimensions for understanding research impact in small states, particularly in Caribbean countries that grapple with unique vulnerabilities, not only because of their small size, but also because of the resulting systemic challenges when small island vulnerabilities are compounded by the legacies of colonization. This includes high and persistent inequality, a culture of ambivalence, the historical and geographic separation of Caribbean islands hindering collaboration, linkages, critical mass and an enabling environment for a thriving research culture.

This study uses a novel approach in that it draws on and seeks to contribute to three distinct but inter-related bodies of knowledge by adding a Caribbean postcolonial perspective to discourses on the sociology of knowledge; research evaluation and the research impact agenda; and knowledge utilization and knowledge management. In so doing, it also places specific emphasis on the micropolitics of development or rather the 'micropolitics of research', that is to say, the social, cultural and power relations of individuals and groups at the organizational or community levels, which influence the outcomes of research projects and of development initiatives. While micropolitics has been examined in the educational research literature, the literature has tended to focus primarily on the school as a site of political tensions at the micro level. However, since RDI Fund projects constitute what Carden (2009) refers to as development research, understanding the politics at play when executing development research projects in Caribbean communities, is a critical component of understanding processes to promote research and societal impact in Caribbean SIDS. This is often overlooked or completely ignored by UWI researchers who, even in instances where they may have an interest in

carrying out research that has a direct benefit to society, may not have been trained to effectively navigate social, cultural and power relations at the community level.

For my study, I have used Morton's (2015) definition of research impact as a guide since it refers to a *change* in 'awareness, knowledge and understanding, ideas, attitudes and perceptions, and policy and practice as a result of research' (p. 406). My examination of RDI Fund researchers' approaches to achieve impact will focus primarily on the societal (not academic) impact of research, which includes economic impact. A major component of better understanding how to achieve societal impact is my investigation into the knowledge exchange mechanisms and public engagement activities of UWI researchers, which support knowledge flows during the execution of RDI Fund projects. The three research questions underpinning my study are:

- What are the characteristics of research impact that the RDI Fund seeks to achieve?
- What strategies were used by RDI Fund researchers to facilitate knowledge flows among key stakeholders?
- From the perspective of the RDI Fund researchers, how can the STA Campus enhance the societal impact of its research?

With Caribbean countries increasing their focus on building knowledge economies to counter sluggish economic growth and limited economic diversification, the region's universities are increasingly being called upon to demonstrate the contribution of research to advancing national and regional development. But what exactly does this mean? What strategies must be implemented to connect research more directly to national and regional development? What activities can help to ensure that the knowledge emanating from university research is understood, absorbed and translated into decisions and actions that will produce meaningful change for individuals, communities and by extension, the wider society?

Since issues surrounding research and societal impact in Caribbean SIDS have been under-investigated in the international literature, this study aims to contribute to the discussion by highlighting important considerations, stemming from the experiences of RDI Fund researchers, which could help deepen the understanding of the dynamics at play during the knowledge production, knowledge utilization and knowledge translation processes. Some of these considerations are consistent with those reflected in the literature on research impact in developed countries. Others, however, present unique insights into key factors at the micro (individual), meso (institutional) and macro (research community/societal) levels in Caribbean societies, which may resonate more with universities located in other developing countries and in particular, with universities operating in small island developing territories. Nevertheless, it is a contribution that I hope could be instrumental to re-conceptualizing how research projects are designed and executed; how research funds are set up and managed; how university researchers are supported and assessed; how universities align their internal structures and resources to provide an enabling institutional research ecosystem; and how governments, particularly those in Caribbean SIDS, understand research for development processes and the long-term investment and commitment required to achieve societal impact.

1.3 Research impact at the UWI St. Augustine Campus

The STA Campus' focus on research impact at the time of the establishment of the RDI Fund in 2012 was sharpened by a growing interest of the governments that fund the UWI and in particular, the government of Trinidad and Tobago, in the university's demonstration of how its publicly-funded research agenda was contributing to society and to national and regional development. This reaction by regional governments was not surprising; it was consistent with the experiences of universities internationally since the late 1990s, with a noticeable trend towards a more managerialist approach to university administration and greater emphasis on public accountability in countries such as the United Kingdom and USA, among others. In the case of the STA Campus, the setting up of the RDI Fund was a Campus-specific initiative, which emerged from a

multi-stakeholder, institutional approach to support action-oriented research that would make more visible the multiple types of impact (beyond the academic) that university research has on society. These issues are explored more fully in Chapter 4, which presents a case study of the RDI Fund.

While there is extensive literature on the ways in which researchers in well-established North American and European universities have embraced, pushed back or selectively engaged with research impact and corresponding national research assessments (Smith 2010; Watermeyer 2011, 2012, 2016), this study approaches the issue of research impact from a different angle and context. It is different in that in the context of Trinidad and Tobago (T&T), while there has been increased attention placed on the societal impact of university research, there is no mandatory national research assessment exercise; neither are there national research councils or funds set aside annually for block research grants to universities as is the case in the UK, for example. Overall expenditure on research and development activities in Trinidad and Tobago is very low and has decreased as a percentage of GDP between 2005-2010, well below that of even emerging economies (Guinet 2014). The RDI Fund, therefore, though modest in its capitalization, represents an important stimulus for strengthening the linkages between university research and development in T&T.

This research study sets out to understand the experiences of a subset of UWI researchers from early cohorts of RDI Fund projects operating in one of the four Campuses of a 70-year old comprehensive regional university with limited dedicated research funding, compared to universities in developed countries. It also recognizes that to execute research projects that achieve societal impact in the Caribbean is no easy undertaking; neither is it in countries with established research systems, large private endowments in addition to dedicated resources from government as well as the international recognition, experience, networks and track record typically associated with universities that have been in operation for several centuries. Nevertheless, this study seeks to shed light on

practical steps that could be taken by researchers operating with small research budgets in Caribbean SIDS who would like their research to have greater societal impact. It is premised on the notion that to achieve development outcomes, it is not sufficient for universities to produce research and assume or hope that societal impact would automatically occur on its own.

In order to fully appreciate the mission undertaken by the RDI Fund researchers, some historicization and contextualization of research as a scholarly activity at the STA Campus is needed, against the backdrop of the evolution of the UWI as the first indigenous regional university in the Caribbean. As mentioned earlier, based on my review of the literature on research impact, little has been documented on the societal impact of university research in the Caribbean. Thus, rather than attempting to trace the contribution of the outcomes of RDI Fund projects to society or measure societal impact (which in itself is an undertaking fraught with conceptual and methodological contentions), my research study focuses instead on an examination of researcher experiences in seeking to achieve societal impact within an overarching case study of the RDI Fund. This is useful in that it brings to the fore, the strategies that enable knowledge to circulate or flow between the university and its various stakeholders (internal and external) and to facilitate processes that enable societal impact to occur. These strategies are considered within the framework of a conceptual model developed by Meagher, Lyall and Nutley (2008), which is presented later (in Chapter 2), and my own re-conceptualization of knowledge flows that occur in RDI Fund projects, based on the experiences of RDI Fund researchers. It thus recognizes important socio-cultural and political factors that characterize research processes in T&T, which studies that place greater emphasis on research impact assessment in purely output terms, would fail to capture.

This is my approach as I set out to tell another type of research impact story; one that allows for crystallization (Ellingson 2009), thereby refracting multiple rays of light on

the relationships, processes, cultural and organizational dynamics that impinge on research; a story that also prioritizes the real-world experiences of researchers over attempts to quantify impact or trace its attribution. In so doing, this research study, is itself seeking to offer new dimensions that are more relevant to the realities of Caribbean SIDS and other developing countries, to present diverse ways of producing, exchanging, utilizing and translating knowledge as well as alternate uses of knowledge, beyond the conceptual and instrumental (Leviton & Hughes 1981; Lavis, Ross, McLeod & Gildiner 2003; Rich 1977; Weiss 1998). It draws on Weiss' (1977) foundational work on knowledge for enlightenment and is inspired by the circuitous diffusion of knowledge to influence, often in indirect and unanticipated ways, new understandings, behaviours and actions. It contends that enlightenment is also a fundamental dimension of societal impact in Caribbean SIDS and while this cannot be easily traced or measured, an examination of knowledge flows would bring us closer to understanding how societal impact is achieved, given that research does not always lead directly to change but rather influences the '…long-term percolation of social science concepts, theories, and findings into the climate of informed opinion' (Weiss 1977, p. 534).

In this chapter, I begin by situating myself within the research study, exploring not only the connection of my personal and professional history to the chosen subject area for my research, but also elucidating how this has shaped my interactions with my research participants. Next, I will situate the research context – the UWI STA Campus – within the regional university's growth and development and the wider geo-political context of the Caribbean, by outlining salient historical, political and economic dimensions that are important to gain an understanding of the UWI and its role in leading a research agenda that advances national and regional development. Lastly, in outlining the STA Campus' current research environment, I provide a sketch of specific dimensions of the research capacity at the STA Campus, which inevitably forms part of the institutional research context that also shapes the experiences of RDI Fund researchers as well as the execution of RDI Fund projects.

1.4 Situating myself in my research

My interest in this topic was born out of a personal commitment to use knowledge to empower individuals and uplift communities. As a development specialist, I believe that knowledge is at the centre of development. I have a deep interest in better understanding how knowledge can serve to unlock the potential for improving the economic and social well-being of Caribbean citizens. While the causal chain for 'knowledge to development impact' processes is one that is complex and contentious, I believe that access to new knowledge and the exchange of knowledge through research processes can be of immense value in myriad ways (direct and indirect, anticipated and unanticipated, explicit and tacit) and at multiple levels (individual, household, community, firm, institution, society and region) even if this value cannot be easily demonstrated or measured.

Education and development have been central to my personal and professional life. I am a graduate of the UWI and a Caribbean national whose professional experience has been primarily in the field of international development and later, in higher education management. I have witnessed and experienced the transformative power of education and its centrality to development processes, serving to enlighten and empower individuals and communities. In my own life, I also have seen how successive generations in my family have been lifted out of poverty and how women have gained financial independence and greater control over their lives, affording new opportunities to their children for continued advancement.

Professionally, I have spent the past 20 years working both in multilateral development agencies (UNESCO, the World Bank, the Inter-American Development Bank and the UNDP) at varying levels of responsibility and in higher education management at the multi-Campus regional UWI, firstly in the Office of the Campus Principal at the STA Campus (Trinidad) and over the past two years, in a regional role, as Director of Development. This has allowed me to examine issues related to research and societal

impact from multiple angles, with an appreciation of the political and ideological debates that have influenced the work programmes of multilateral development organizations and international research funding agencies as well as the inner workings of academia and higher education management in the Caribbean.

As a national of a country where thousands of Africans and East Indians were brought as free or cheap labour for colonial expansionist agendas and their human rights and freedoms denied for centuries, I am fully cognizant of the power of education to shape a nation's sense of self and to help find its place in regional and global affairs; to open doors of opportunity and social mobility to communities that had been previously excluded and disenfranchised; and to equip Caribbean peoples for greater self-determination and self-actualized citizenship. My engagement of the discourse on research and societal impact is, therefore, framed within this context as I unravel issues at the micro, meso and macro levels that simultaneously affect research demand, research supply, knowledge utilization and knowledge translation and the ways in which these impinge on societal impact in Caribbean SIDS.

I view all of this as relevant to the contextualization of my research study because it lays bare my positional and situated identity as a researcher and offers insight into how this may shape my data analysis and research findings. For me, undertaking this research study has, without a doubt, been a process of '…continual co-creation of self and social science which are known through each other…' (Richardson 1997, p. 89). It has been a process about finding my voice, which over the years, had gradually begun to be substituted by corporate institutional messaging; a process of confronting my own 'mis-education' about Caribbean development; and a process of unravelling and deconstructing my previously taken for granted assumptions and beliefs, having been professionally moulded by Bretton Woods institutions in which neo-liberal, market-driven policies are subliminally embedded. Undertaking this research study has, therefore, served as a journey in self-reflection, in being reflexive, reflective, and honest

as a researcher (Sikes 2004) as I seek to dissect issues, analyze researcher experiences, examine linkages and offer my own narrative on pathways for achieving societal impact in Caribbean SIDS.

The following section historicizes the situation of education in the Caribbean from the post-emancipation period into the post-independence period. It tries to do so in a succinct way while still underscoring the most salient historical moments and contextual markers that have contributed to shaping the research environment and research capacity that currently exist at the regional UWI and in particular, the STA Campus where the RDI Fund is located.

1.5 Post-emancipation education in the English-speaking Caribbean

With the abolition of slavery in 1834 and the end of the apprenticeship period in 1838, education in British colonies gained increasing attention and mixed levels of support from the imperial government, the plantation owners and the blacks themselves (Bacchus 1994). It was felt that education would alienate '…the 'labouring classes' from their ordained role as agricultural labourers [and]…. make them a threat to the stability of these societies' (Ibid., p.302). Religion was also used to maintain the former slaves in mental and physical conditions of acceptance, compliance and subservience. Slaves were expected to accept their 'station in life' as ordained by God and '…to faithfully discharge their duties…and contentedly bear its inconveniences' (Ibid., p. 22). Furthermore, the structure and content of the formal education system followed the British model, detached from the reality of the Caribbean colonies.

With regard to higher education, global developments at the close of the 19th century and beginning of the 20th century, caused Britain to aggressively pursue new avenues for

exploiting the natural resources of the colonies. This led to the establishment of the Imperial Department of Agriculture in Barbados in 1898:

> …to conduct research on Caribbean crops and agricultural problems, encourage the development of crops other than sugar…and assist planters and farmers to improve their operations by adopting scientific methods. (Brereton 2011, p.6)

World War I and II and the Cold War also contributed to the stronger emphasis placed by European governments on research and scientific advancements and the deepening of research collaborations with universities that could help strengthen their military and tactical positioning (Brereton 2011; Williams & Harvey 1985). In the case of Britain, in particular, this meant supporting scientific research to help increase the returns from its agricultural exploits in Caribbean colonies. This paved the way for the establishment of the Imperial College of Tropical Agriculture (ICTA) in Trinidad in 1921 – a landmark moment for research and postgraduate training in T&T – though it occurred on the heels of a crash of the world market for tropical products and the onset of the Great Depression (Brereton 2011). While this was a tremendous step for a colony, on the part of Britain, there was no real interest in the training and development of local students or the conduct of research that was relevant to Trinidad. ICTA projected itself as a very British institution with '…British staff, many British students…a British 'ethos'…' (Brereton 2011, p.39). Moreover, the British West Indian governments had '…little control over ICTA's research agenda, which was driven more by imperial rather than regional concerns' (Ibid. p.32).

The Asquith Commission established in 1943 examined the education needs of the British Empire with a focus on 'the promotion of higher education, learning, research and the development of universities in the colonies' (Report of the Commission on Higher Education in the Colonies, 1945, p. 3). The report that was produced by this Commission, commonly referred to as the Asquith Report, also provided guidance on '…the development of universities, and how the process might be assisted by universities and institutions in the United Kingdom' (Nwauwa 1997, p. 134). Given the focus of my

study, it is worth mentioning that the Asquith Commission, at the time it conducted its enquiry between 1943 and 1945, viewed knowledge as important primarily for its intrinsic value, emphasizing that:

> … it is fundamental research which is proper to a university. It follows that utilitarian results must not be demanded from the research activities of members of the staff of a university and that their work must not be judged by its immediate bearing upon practical problems. (Colonial Office 1945, p. 27)

While the Commission recognized the urgent need to use science to improve sectors such as health, agriculture and industry in the colonies, the application of scientific knowledge was not considered the role of universities and '…to do so would be to divert them from their proper purpose…' (Colonial Office, 1945, p. 29). The Commission saw universities in the colonies as having a critical role to play in producing future employees for the public service who could demonstrate the leadership that self-rule required (Colonial Office 1945).

The Irvine Committee, which was set up in 1944 to review higher education needs in British colonies in the Caribbean, recommended the establishment of the University College of the West Indies (UCWI) as a residential, unitary institution, which '…should enter into a special relationship with an established university in the mother country' (Braithwaite 1958, p. 48). This would, in effect, ensure that Britain maintained its ideological, intellectual and cultural dominance over British colonies (Braithwaite 1958). The mission of the UCWI was to 'guide the colonies to self-rule through the promotion of higher education without sacrificing British interest and influence' (Cobley 2000, p.13).

1.6 The birth of the regional University of the West Indies

It is out of this Eurocentric arrangement that the UCWI was born in 1948, beginning with the establishment of a medical school in Jamaica and a special working relationship with the University of London (Sherlock and Nettleford 1990). Emerging from the recommendations of the Irvine Committee was the integration of the prestigious ICTA

into the UCWI, through a four-year degree in agriculture – two to be spent in residence at Mona, Jamaica and two to be spent at ICTA, St. Augustine, Trinidad, setting the stage for what would later evolve into the multi-Campus regional UWI. Against the backdrop of a fervent regionalist movement that had been making important strides towards a West Indian Federation (which would not come to fruition) and growing nationalist ambitions for greater self-governance and independence from Britain, the UWI STA Campus was established on October 12, 1960, through a merger of ICTA and UCWI. The Premier of Trinidad and Tobago at the time, Dr. Eric Williams envisioned the university as the conscience of the nation, fully charged with the responsibility of ending intellectual colonialism in the West Indies (Sherlock and Nettleford 1990). In an article written well before Trinidad and Tobago's independence in 1962, Williams (1946) underscored the importance of creating:

> …a truly progressive and modern university [that] should frankly serve as a potent weapon on economic readjustment and social and political change. It should make itself responsible ideologically, for the reorientation of the entire educational system in harmony with the needs and aspirations of the people. (p.149)

Throughout the 1960s, a growing 'West Indianization' of the university could be observed in its staff, students and curriculum (Brereton 2011, p. 46-65). The granting of a new Royal Charter in 1962 renamed the UCWI and formally established The University of the West Indies as an autonomous degree awarding institution, no longer dependent on the University of London (Cobley 2000, p.17) – another significant milestone in the evolution of higher education in the English-speaking Caribbean. In 1963, the third UWI residential campus, the Cave Hill Campus, was established in Barbados and in 2008, the Open Campus was created to deliver online/blended courses and degree programmes, primarily to the Eastern Caribbean and also across the entire region.

The UWI has experienced steady growth over the years – in its students, staff and physical footprint – growing from 33 UCWI students in 1948 at the Mona Campus in Jamaica to an enrolment of close to 50,000 students across four UWI Campuses in 2017 (UWI 2017a). It is one of only two regional cross-country universities in the world, the other being the University of the South Pacific (UWI 2015). The UWI was established as a not-for-profit higher education institution, funded, in part, by seventeen contributing Caribbean governments: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago and Turks and Caicos Islands.

Since the RDI Fund is located at the UWI STA Campus, it is worth pointing out that this Campus has a student enrolment of close to 18,000 and a staff complement of approximately 3,000, including 653 academic (teaching and research) staff for the academic year 2015-16 (UWI 2017b). With the introduction of the Government Assistance for Tuition Expenses (GATE) Programme in 2004, annual first-year enrolment at UWI STA jumped significantly, rising from 2,923 in 1980 to 4,137 in 1990 to 6,967 in 2000 and crossing 19,000 in 2012-13 and 2013-14 (UWI 2017a). With regard to student output at UWI STA, for the 2015-16 academic year, over 4,000 students graduated, including 1,469 at the postgraduate level, of which 56 were research degrees (UWI 2017b). This growth has also been reflected in the expansion of the number of Faculties to eight covering the following disciplines: food and agriculture, engineering, medical sciences, law, social sciences, humanities and education, science and technology and sport; the latter being the most recent addition, launched in August 2017. Each of these Faculties has sought to build a repository of indigenous knowledge; to forge partnerships with the public and private sectors and civil society; and to meet workforce demands through the preparation of thousands of skilled graduates, many of whom go on to hold key positions in the public and private sectors. However, what continues to be elusive is a fuller understanding and appreciation of the university's contribution to society, both by the general public and by decision makers in the public

and private sectors. This is further compounded by the fact that stakeholders often focus their attention solely on research outputs, outcomes and impact without interrogating the factors and processes that facilitate impact. In so doing, there is a missed opportunity to nurture a synergistic triad relationship between research agenda, research culture and research environment, which can serve to foster more sustained societal impact.

1.7 Research Capacity at the STA Campus: the 'meso' context

Research capacity broadly refers to the ability of individuals and institutions to undertake high-quality research and to engage with the wider community of stakeholders (Essence 2014). It is linked to a country's ability to generate knowledge and has been recognized as an important factor for promoting new insights, ideas, solutions to practical problems as well as a country's overall competitiveness and prosperity (Li, Millwater & Hudson 2008). In attempting to capture the essence of the research capacity at the STA Campus, I have chosen to focus on research capability (staff and graduate students), infrastructure, productivity, reward and recognition, innovation and entrepreneurship as well as funding.

The STA Campus is a community of approximately 653 academic staff (among them 61 professors, 137 senior lecturers, 327 lecturers and 35 assistant lecturers) and roughly 6,000 graduate students (of which 925 are MPhil and PhD students) (UWI 2017b). Given the quality, recognition, volume and diversity of UWI's research outputs, research is what distinguishes the UWI among other tertiary institutions operating in the region. The STA Campus is recognized for its '…wide range of options to graduate students who wish to engage in either pure or applied research at the master's/doctoral level' (UWI 2017b, p. 297). With regard to physical spaces for research, the STA Campus has numerous buildings, laboratories (for engineering, science, computing, etc), a museum, herbarium, the International Cocoa Genebank – T&T as well as agricultural lands at Orange Grove (east Trinidad) and Debe (south Trinidad), among other spaces, which support the STA Campus' research enterprise. In instances where facilities are not

available or specialized technology is required, staff members try to overcome these challenges through collaborations with international universities (UWI 2017b).

In terms of reward and recognition, academic staff assessment and promotion (A&P) is based on high quality and impactful research outputs. Traditionally, the focus has been on peer-reviewed publications and only recently, has a proposal been made to recognize a wider range of scholarly outputs in the A&P process at the STA Campus. This proposal is still under review. A Research Awards Ceremony is organized bi-annually to recognize and celebrate the accomplishments of outstanding researchers in areas such as Most Impacting Research Project, Most Outstanding Graduate Researcher and Most Productive Research Institute, Centre or Unit. The Vice Chancellor also hosts a regional Awards Ceremony annually, in which excellence in areas such as research, teaching, service and cross-Campus research collaborations is recognized. Research Expos are organized at the Faculty and Campus levels and the STA Campus hosts a wide range of seminars and conferences on a weekly basis.

Innovation and entrepreneurship constitute important elements of the UWI Strategic Plan 2017-2022. There are currently 26 active patents (of which 16 have been granted) across all four UWI Campuses (UWI 2017c). Greater emphasis is being placed on encouraging research commercialization and the formation of spin off companies. There have been a number of innovative products, approaches and solutions to existing problems generated through research at the STA Campus, however, only one research spin-off company exists PHI Innovations Limited, established in 2013 to commercialize the patent for the Percussive Harmonic Instrument (PHI), which produces a digitally amplified sound for the steel pan (UWI 2017c).

With regard to research funding, the STA Campus has a good track record for winning external research grants. This has increased from approximately US$8.8 million (£6.6

million) in 2010 to roughly US$49 million (£36.2 million) in 2015 (UWI 2017b, p. 319), with the main funding sources being EU-funded research programmes. The majority of these projects involve collaborations with international universities, research institutes and foundations, which contribute to strengthening the research culture through the cross fertilization of ideas and the expansion of partner networks. The Campus Research and Publication Fund (CRPF) provides seed funding for academic staff as well as research students to undertake scholarly work and publish research outputs. In 2015-16, 73 grants were awarded totaling approximately US$373,000 (Ibid, p.318).

In 2013, the Business Development Office was restructured to create the Office of Research Development & Knowledge Transfer (ORDKT) to provide more targeted support for research management, knowledge transfer and commercialization at the STA Campus. With the main objective of leveraging the intellectual and technical resources of the Campus to build a vibrant research culture, promote innovation and foster synergies with the public and private sectors for increased application of research, the ORDKT provides leadership and guidance to STA researchers on policies and practices for research management, research commercialization, intellectual property rights, opportunities for research funding and the preparation of research proposals. The ORDKT now manages the RDI Fund (effective 2016) as well as the Research Information Management System (RIMS) for the STA Campus, which is a live ICT platform that provides information on STA researchers, their research projects (current and completed), research interests, etc. with a view to promoting interdisciplinary research collaborations and supporting greater academic-industry alignment. In keeping with the emphasis of the UWI Triple A Strategic Plan 2017-2022 on academic-industry alignment, the ORDKT was renamed the STA Centre for Innovation and Entrepreneurship in 2018.

In addition to the CRPF, the RDI Fund is the only other Campus-based source of funds for research and it is geared towards addressing development challenges and generating

societal impact. It has awarded US$2.5 million (£1.9 million) to a range of projects since its establishment in 2012. By placing emphasis on stakeholder engagement, research application, knowledge mobilization and uptake, the RDI Fund encourages researchers to focus on how their research activities can help to achieve development outcomes and thus, impact society. Taken together, these 'meso-level' or institutional factors in the research environment at the STA Campus are important contextual elements for framing the discussion of research and societal impact in T&T.

In spite of the ongoing efforts of the STA Campus to build its research capacity, these may not be sufficient given the critical mass of research and level of research application needed to truly generate substantial and recognizable societal impact. In an assessment of the national innovation ecosystem of Trinidad and Tobago, Guinet (2014) asserts that:

> The UWI remains too 'conservatively academic'. Many faculties have a too low motivation and insufficient capabilities to interact effectively with the business sphere in accomplishing their educational (definition of curricula) and research missions (contracts. partnerships, spinoffs) (p. 19).

Guinet (2014), however, singles out the RDI Fund in his list of exceptions, that is to say, as an example of

> …places where the intensification of science-industry relationships is undertaken as a core mission…as well as some university-wide efforts to make research more socially impactful… (p. 19).

1.8 Research and development in T&T: the macro context

This research study on the RDI Fund needs to also be considered within the macro context of T&T and the current research environment in T&T. T&T is an English-speaking twin island Republic state located 11km north east of the coast of Venezuela. It is classified by the World Bank as a middle income country based on its per capita GDP.

As an island territory of roughly 5,000 square kilometres with a population of only 1.3 million, T&T is a member of the regional Caribbean Community (CARICOM) and also a member of the international grouping of SIDS, recognized by the United Nations as countries that are in need of special attention and assistance given their small size and unique vulnerabilities. These vulnerabilities include: a narrow resource base, lack of economies of scale, limited domestic markets and relative exposure to the outside world, high per capita infrastructural costs, remoteness, vulnerability to natural disasters and limited access to international markets (Bray 2011). Because of these intrinsic characteristics, it has been widely recognized that SIDS face unique challenges when trying to achieve sustained economic and social growth. I contend that these unique characteristics of Caribbean SIDS, coupled with the structural underdevelopment biases as a result of their colonial past (Beckford 1999) create a contextual reality that is distinct from other developing countries and must be viewed as an important dimension when examining processes for societal impact.

While it is true T&T is affected by many of the issues that are characteristic of SIDS, it also stands out among its Caribbean neighbours as one of the countries with the highest GDP per capita in the region, thanks in large part to its oil and gas revenues, which account for more than 40% of GDP and 80% of exports (IDB 2007). The benefits from the oil and gas sector, however, have not had a ripple effect on the rest of the economy as it only accounts for 5% of employment (IDB 2007) and income inequality stands at 21.9% (UNDP 2016). Economists have stated that T&T suffers from what is referred to as the 'resource curse', the 'Dutch disease' or the 'paradox of plenty' whereby countries that are well-endowed with natural resources underachieve in other areas of development and are unable to achieve the socio-economic development outcomes that countries with fewer resources manage to achieve (Farrell 2012). Ewart Williams, the former Governor General of the Central Bank of T&T refers to the post-independence economic experience of Trinidad and Tobago as a story not of opportunities lost but rather of opportunities wasted (Williams 2012). Moreover, with the continued depression of global energy prices over the past 2-3 years, the national economy has experienced

successive years of negative growth between 2014 and 2016, with recorded growth rates in 2016 at -5%. This has led to reductions in government budget allocations to tertiary education and a streamlining of the GATE programme, which in effect reduced the number of students eligible for free tertiary education. There have been reports that even where institutional budgets have been approved, the funds released by the Ministry of Education on a monthly basis have been much lower than the approved allocation, thus presenting challenges for effectively running tertiary institutions and for executing teaching, learning and research activities.

This wider macro context has contributed to fostering a research environment at the meso or institutional level, which is not only disadvantaged by its small size, lack of critical mass and its relative disconnection from international research funding networks but is also woefully under-resourced given shrinking institutional budgets and the unpredictability of government contributions. This, in turn, has affected planning and the proactive management of business operations and has prevented investment in research infrastructure, facilities, capacity, etc. The World Bank (2000) underscores these 'conditions of initial disadvantage' (p. 94) in developing countries, which stymie scientific enquiry. It also includes not having in place 'a suitable intellectual culture' and a critical mass of scholars and teachers. Authors such as Lewis and Simmons (2010) also highlight the region's post colonial heritage of dependence and weak demand for research-based knowledge as key factors affecting research capacity and research culture in the Caribbean.

1.8.1 Negligible Investment in R&D

As a result of T&T's poor macro-economic performance in recent years, there has been a continued decline in government funding to higher education institutions, from the local equivalent of US$3.5 million (£2.7 million) in 2005 to US$2.4 million (£1.8 million) in 2008 (Guinet 2014). Based on data from the UNESCO Institute for Statistics, the World Bank (n.d.) database cites Trinidad and Tobago's investment in R&D as a percentage of

GDP as having declined from 0.1% in 1996 to 0.08% in 2014.[1] This seems counterintuitive at a time when Caribbean SIDS are looking to R&D to increase their capacity for innovation to effectively compete in the global space. Bray (2011, p. 104) asserts that

> Priority attention is therefore being directed at efforts to strengthen or "boost" knowledge societies throughout SIDS, to diminish the digital divide as a way of reducing the traditional isolation of small states, to take into account the diversity of knowledge cultures and to foster an ethic of collaboration and the promotion of knowledge-sharing cultures.

In this challenging economic climate, the RDI Fund itself was not spared. In 2012, the government decided to suspend its annual research contribution to the STA Campus stating that the funds would be used to establish a wider national research scheme called the Higher Education Research Fund (HERF), which would be based on a similar operational framework as the RDI Fund but open to other public universities and research institutions in T&T. To date, the HERF has not been operationalized. The RDI Fund has been able to issue subsequent Calls for Proposals using funds in reserve and continues to provide oversight of all projects in execution. No new Calls for Proposals were issued between 2015 and 2018 and only recently (August 2018) was the 4th Call for Proposals announced for approval in the 2018-19 academic year. Since the appointment of a new Campus Principal in 2016, the STA Campus has been renewing its outreach to government and other donors to support the capitalization of the Fund.

1.8.2 Weak linkages and research demand

Another notable characteristic of the research environment in T&T is the fact that there are weak linkages between government, academia, industry and civil society and a low demand for research to inform policy or product/process innovation. This is compounded by a high degree of risk aversion by the private sector and financial

[1] In 2014, countries such as Malaysia and Singapore had spent 1.26% and 2.19% of GDP respectively on R&D while Sweden and Denmark had invested 3.16% and 3.17% of GDP in R&D.
Source: https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS

institutions to invest in R&D initiatives (Guinet 2014). The private sector of the Caribbean is made up mainly of firms that engage in importation and distribution on the local market and with the exception of a few companies that engage in international export of locally manufactured products (for example Sacha Cosmetics and SM Jaleel), there is little evidence of investment by local firms in science, technology and innovation (Farrell 2017). Swift (2017) in his presentation at the 2017 National Innovation Conference in Trinidad and Tobago summarizes that some of the main challenges to national innovation include insufficient collaboration between academia and industry, suboptimal public and private sector investment in R&D and innovation, inadequate governance arrangements, weak innovation readiness of firms and insufficient application of research.

Ramkissoon and Kahwa (2010) view the lack of investment by the productive sector in R&D as a possible reason for these weak linkages as this provides 'little incentive for researchers to pay the requisite attention to the problems of the industry' (p. 137). Consequently, there is a tenuous relationship between research supply and research demand as the public and private sectors do not demonstrate a passion for scientific discovery nor a thirst for new knowledge from academia. Lewis and Simmons (2010, p. 340), in addressing the weak demand for research in the Caribbean, adopt a postcolonial lens and assert that this may be the result of the Caribbean's historical dependence on 'the importation of ideas, and of expertise'.

These gaps between the demand, supply and utilization of knowledge as well as the weak links between research and development priorities have been cited as major challenges for universities in developing countries (Zakri 2006). My research study is concerned with how Caribbean SIDS can begin to close these gaps by influencing knowledge flows, increasing knowledge utilization and strengthening linkages between knowledge beneficiaries. Over the decades, at the UWI, much more emphasis has been placed on knowledge supply. In fact, the UWI is recognized as producing 71.2% of all scientific

publications by universities in CARICOM countries (Ramkissoon and Kahwa, 2010, p. 140), over the period 2001-2007. But the systematic processes for facilitating the translation of UWI research to contribute to societal impact have not been formally established. By examining the RDI Fund researcher experiences, my study seeks to better understand how the specific strategies employed by these researchers can lead to more effective knowledge flows and thus, enhanced opportunities for societal impact in T&T.

1.9 Preserving the societal mission of the UWI

In spite of the challenging environment in which it finds itself, the UWI remains steadfastly committed to its mission 'to advance learning, create knowledge and foster innovation for the positive transformation of the Caribbean and the wider world' (UWI 2017d). Various authors have highlighted the important role played by universities to develop 'the life of the mind' (Saiydain, 1965), 'the spirit of truth' (Graham 2005), 'a culture of conscience' (Scott 2003), as well as 'democratic citizenship and the cultivation of humanity' (Nussbaum 2006), underscoring the contribution universities make to society, beyond teaching and research. While many universities have indeed become quite complex institutions serving multiple stakeholders with different sets of expectations, it is their institutional ability to transmit 'norms, values, attitudes and ethics as the foundation of the social capital necessary to conduct healthy civil societies and cohesive cultures' (De Ferranti, Perry, Lederman and Maloney 2002) that affords them a unique and powerful place in contemporary society. Referring to the university as 'a moral force', Scott (2003) asserts that

> The university is the one institution in society that, because of its mission, is more than fact alone…more than belief alone…and more than emotion alone. It is a place in society dedicated to the search for the truth, the transformation of meaning, the examination of intended and unintended consequences, and the concern for equity, equality, fairness and, justice. (p. 33)

How to reconcile the tension in contemporary universities between the economic imperative and the social imperative continues to be debated among scholars internationally. This is beyond the scope of my study. What is, however, relevant to my study is the recognition that if the Caribbean is to assert itself in today's competitive globalized world, the capacity of the university to contribute to advancing national and regional development must be reinforced from within. The important impact of tertiary education on development processes in developing countries has been recognized by authors such as Oketch, McCowan and Schendel (2014), with research and innovation being identified as one of the three major pathways through which universities have an impact on development, in addition to teaching and service. However, as my study will highlight, it cannot be assumed that research will automatically produce benefits and have an impact on society. A deliberate strategy that draws on indigenous research and integrates knowledge brokerage, utilization and translation efforts with development planning and development management principles will be vital if university research is to shape the future development trajectory of the Caribbean.

This is consistent with the developmental university model, which maintains that a publicly funded university should meet the expectations of society and be socially responsible by proactively contributing to national development (Sutz 2005). Karunanayake (2012) emphasizes that a developmental university has to 'generate knowledge for a national purpose to bring about developmental outcomes'. Castells (1993) explains that the developmental university plays an important role in national development but does not do so solely through the production of knowledge but rather through other instrumental roles including focusing on the reconstruction of society, the manpower development paradigm and the political socialisation model, thereby also serving as an ideological and socialization apparatus.

My research study seeks to extend the thinking of the developmental university model beyond *producing* knowledge for development to encouraging more effective *utilization*

and *application* of knowledge for societal impact. This will serve to increase public enlightenment and to generate specific development solutions for the Caribbean, both of which are needed for change to become sufficiently embedded and lead to societal impact.

In my view, the university in a postcolonial society is, more than an institution of teaching, learning, research and service; it is a developmental force. Knowledge, by itself, does not cause change. It must be understood, mobilized, captured and translated into action in order for knowledge to generate benefits. My research study, thus, seeks to deepen our understanding of these complex processes and the capacity of the UWI to fully achieve its societal mission.

My thesis is structured as follows:

- Chapter 1 sets the stage for the overall research study. It situates the discussion on research impact at the STA Campus, asserts my positionality vis à vis the issue and presents an overview of the evolving research context and capacity of the STA Campus against the backdrop of wider geo-political events that shaped the evolution of the UWI from the 1960s to the present.
- Chapter 2 engages the literature on key concepts of research, knowledge and impact from a postcolonial perspective and reflects some of the taken for granted assumptions and areas of dissonance when analyzed within the context of Caribbean SIDS such as T&T. It expands on a conceptual framework developed by Meagher et al's (2008) to offer a new conceptual framework that places greater emphasis on the societal dimension of knowledge systems and more comprehensively captures the dynamic interplay between various knowledge actors and the factors and forces occurring in the wider research environment at the micro, meso and macro levels.
- Chapter 3 outlines the methodological orientation of my research and the methods used for data collection and analysis.

- Chapter 4 presents a detailed description of the RDI Fund as the main case study together with three embedded case studies of RDI Fund projects with the aim of highlighting the main characteristics of impact the Fund seeks to achieve and how the RDI Fund projects actually operationalize research geared towards societal impact. It puts the spotlight on researcher experiences during the execution of RDI Fund projects and exposes key insights about the strategies used to support knowledge flows, contextual factors at the micro, meso and macro levels and some salient resulting outputs, intermediate impacts and occasions of influence to date. It also discusses the main findings from my analysis of the main case study, embedded case studies and collection of interviews with my research participants. Based on my analysis of knowledge flows as well as the forces at the micro, meso and macro levels, the chapter highlights key considerations for strengthening the contribution of UWI research to societal impact.
- Chapter 5 presents a summary of the main points from the study, its conceptual contributions, limitations, insights for future research and policy implications for mechanisms that would be more supportive of research for societal impact in T&T.

Summary

This chapter outlined the rationale for my interest in the topic of research and societal impact at the STA Campus as well as my positionality. In detailing the evolution of higher education in T&T and the Caribbean during the post-emancipation period, in spite of the narrow, self-serving interests of the British colonizers, the UWI's enduring societal mission as a catalyst for national and regional development was brought more sharply into focus. The consistent growth of the STA Campus in staff, students, teaching and research programmes as well as physical footprint over the past 58 years has demonstrated the UWI's efforts to build its research capacity against a backdrop of consecutive years of negative economic growth, decreasing government funding allocations to tertiary education, weak research demand and underdeveloped linkages in both the macro context and meso research environment. The establishment of the RDI Fund in 2012, as the only significant source of Campus-based research funding has, nevertheless, helped the Campus

develop a portfolio of projects aimed at going beyond traditional academic impact to achieve societal impact.

In seeking to better understand the processes that lead to societal impact, the innovative features of the RDI Fund as a stimulus for research and development impact as well as the specific experiences of RDI Fund researchers at the micro level will be explored in the following chapters. Chapter 2 will focus specifically on my adoption of a postcolonial perspective, which outlines the rationale for my assertion that the developmental model of the university continues to be not only relevant but also essential for creating an enabling environment for societal impact in the Caribbean. Chapter 2 also engages the literature on research, knowledge and impact and challenges some underlying assumptions of developed country approaches to these concepts, by presenting specific dimensions, which manifest themselves and are experienced differently in the context of Caribbean SIDS.

CHAPTER 2: RESEARCH, KNOWLEDGE AND IMPACT – A POSTCOLONIAL PERSPECTIVE

2.1 Introduction

This chapter introduces a postcolonial perspective to the discussion of research, knowledge and impact in Caribbean SIDS. History, ideology, geo-politics and colonization have all played an important role in shaping Caribbean economies and societies. This chapter firstly outlines why I have chosen to examine issues surrounding the societal impact of research using a postcolonial lens. By engaging the literature on the conceptual underpinnings of research, knowledge, knowledge utilization and research impact, key assumptions are interrogated, particularly as these are manifested in and experienced by former colonies in the Caribbean. A conceptual framework by Meagher at al (2008) is also introduced as an analytical tool for examining more closely the processes and conditions that facilitate (or inhibit) flows of knowledge in research processes. This chapter thus lays the analytical foundation for my research study and seeks to unravel the ways in which unique contextual factors at the macro, meso and micro levels impinge upon the ability of STA Campus researchers to operationalize research with societal impact in T&T.

In the following sections of this chapter, I will critically engage the concepts of research, knowledge and impact as a precursor to my examination of Meagher at al's (2008) model of flows of knowledge and influence. This is important as I seek firstly to confront, the insidious relationship between research, knowledge and power and then draw attention to some of the ways in which this has contributed to maintaining 'hegemonic systems of reasoning' (Rizvi, Lingard and Lavia 2006, p.250, 257) in the former colonies of the Caribbean. This is further compounded by the problematique of research impact, given its complex and contested nature. While recognizing the limitations of Meagher et al's (2008) conceptual framework, the model is presented in detail to allow for a structured examination of pathways through which knowledge flows during the execution of research projects.

2.2 A postcolonial perspective

Education and research are, in many respects, political. The evolution of higher education in the Caribbean from the colonial period to the post-independence period outlined in the previous chapter attests to this. Referred to as 'a field of political struggle' (Bristol 2012, p. 33), higher education is not merely about teaching, learning and research; rather it can be described as '…a contestation over whose knowledge should be given legitimacy and for what purpose, how this knowledge should be transformed…and how this knowledge should be interrogated' (p. 34). Several factors that facilitate or inhibit the societal impact of university research in Caribbean SIDS have their roots in the Caribbean's colonial experience and manifest themselves in Caribbean institutions, politics, culture and social norms. Beckles (2013) emphasizes that more than 400 years of European industrialization and enrichment were achieved through the exploitation of the Caribbean's human, physical and natural resources and at the expense of its own development. Beckford (1999) contends that as a result of colonial exploitation, specific 'underdevelopment biases' (p. xxvi) are endemic to Caribbean countries and these are visible in the social and political structure, in education and in the conformity of thought and behaviour, among other areas.

During the post-independence period, the institutional structures, policies, education, curricula and research agenda of the former colonies were 'borrowed' from the metropolitan countries or imposed as part of development assistance conditionalities. Since these did not sufficiently take into account the social, cultural and environmental specificities of the Caribbean context, they served to promote different forms of 'epistemological colonialism' (Kincheloe 2008), a weak foundation for indigenous research and a timid, outwardly-looking research culture, limited in scope by underdeveloped linkages with key sectors of the economy (Lewis and Simmons 2010). A postcolonial perspective is, therefore, fundamental to my analysis of research and societal impact in T&T. This perspective is one which '…actively works to counter…a Westernized discourse around what counts as research and how it could be enacted…'

(Bristol 2012, p. 27). It is an approach that I consider central to my research paradigm as it allows me to historically and culturally situate my interrogation of contemporary issues surrounding research impact in the Caribbean. The underlying rationale for my adopting a postcolonial perspective is not to cast blame on the colonizers; neither is it to hastily attribute all the current challenges faced by the Caribbean to its colonial past. Rather, my postcolonial perspective recognizes and underscores the enduring connection between the Caribbean's past, present and future. It seeks to make visible the ways in which the exercise of European imperialist ideology and power has permeated the psyche, political and social relations of successive generations in the Caribbean, thus providing a discursive framework for understanding the ongoing effects of colonialism in today's society. At the same time, it recognizes that it is the responsibility of Caribbean people to 'revise the theory of society' (Best 1997, p. 21) and to liberate it from mental constructs and theoretical models based on assumptions of different institutional and historical contexts.

2.3 Challenging assumptions about research, knowledge and impact

In my view, phenomena exist across different locations but each location has its unique conditions and norms and as a result, the ways in which these phenomena are experienced by different actors in different contexts give rise to completely new understandings. To adopt a postcolonial perspective on research impact thus warrants an interrogation of perceptions and assumptions surrounding research, knowledge and impact in the Caribbean, as this serves to strip away the meanings that have been ascribed to these concepts based on Western assumptions and experiences. The following section is not intended as a comprehensive review of the literature on research, knowledge and impact. Rather, it is a selective engagement of specific dimensions of these very complex concepts with a view to elucidating the ways in which the legacies of the colonial experiment have resulted in varying degrees of dissonance and ambivalence towards the articulation of research and knowledge in T&T. With respect to impact, in particular, it allows for an illumination of various dimensions of the research impact problematique, possible implications for Caribbean SIDS and specific aspects of the

research impact agenda which continue to present conceptual and methodological challenges.

2.3.1 Research

Research is 'the machine that produces new knowledge' (Appadurai 2000, p. 9). It is widely considered to be a systematic process that 'aims to contribute to the advancement of knowledge' (Pring 2000, p.7). In many ways a philosophical endeavour (Sikes 2004), it is also a conscious, structured, rigorous and deliberate activity that seeks to find out about and understand phenomena (Burton and Bartlett 2009). Over the years, numerous authors including Minogue (1973), Newman (1996), Nixon (2004), Nussbaum (2006), Saiydain (1965) and others, have underscored the valuable contribution of research to the construction of knowledge and society. In Western societies, research helped to propel the agricultural revolution as well as successive industrial revolutions (steam-powered mechanization, electricity and more recently, electronic and digital technologies) (Schwab 2015). However, in territories that experienced colonial domination, research has been a much more problematic and contested endeavour. Equated to a dirty word (Smith 2012), research in the developing world is often perceived by local communities as a situated activity within an institution that is '…embedded in a global system of imperialism and power' (Smith 2012, p.ix) and a process capable of exploiting people, their culture, local knowledges and resources (Ibid.). Conducting research and managing research projects in developing countries is, therefore, quite complex. As mentioned in the previous chapter, the effect of colonization on Caribbean SIDS is a distinguishing factor that has shaped thinking and attitudes to research. Mansingh, Osei-Bryson and Reichgelt (2009) highlight that '…in certain societies which have been colonized it is difficult to break away from shackles of colonization' (p. 2861). In analyzing how research and knowledge can effectively influence policy in developing countries, Carden (2009) emphasizes that many of the underlying assumptions in Northern models of policy making and public administration do not hold true in developing countries:

> Nobody familiar with the difficult uncertainties and scarcities that characterize governance in a developing country gives great weight to these Northern-based

> schemes, and for good reason. Whatever their strengths are in explaining government in rich countries, they seldom yield a very convincing portrayal of decision making in poor countries. (p.4)

2.3.2 The research enterprise in the T&T context: Dissonance and Ambivalence

As mentioned in Chapter 1, the research enterprise in the Caribbean during the post emancipation period supported the research and economic agendas of Britain. In spite of government commitments to a regional university over the past seventy years, research in the Caribbean continues to rest upon a tenuous foundation with inadequate resources and infrastructure. More specifically, in T&T, research is conducted within a wider environment best described as 'patchy with several gaps and weak linkages between key institutions' (Guinet 2014, p.7), creating a glaring dissonance between the vision of an innovative, knowledge society as articulated in the country's national development plan Vision 2030 and the reality that exists.

In spite of increased access to higher education over the past decade, the Latin America and Caribbean (LAC) region's gross tertiary enrolment rate lags behind other regions (UNESCO 2014). In T&T, only a small number of persons, approximately 0.002% of the population (1.3 million) is officially engaged in a research profession (NIHERST 2012) in T&T. At the STA Campus in the 2015-16 academic year, only 16% of all graduate students enrolled were pursuing research degrees, reflecting a mere 5% of the overall student enrolment (UWI 2017b, p. 83; p. 311). The education culture that has evolved at the primary, secondary and tertiary levels in T&T is one that is extremely competitive, placing significant emphasis on memorization, testing, academic grades and certification. There is greater demand for taught courses by university students and an increased focus on accumulating academic certificates as a means of enhancing their relative marketability in the world of work. Based on the experiences of RDI Fund researchers at the community level, there is a mixed view of the university, with some showing great respect for the UWI

as the regional institution of higher learning, and others remaining distrustful of the work of UWI academics and researchers.

More broadly, there seems to be an under-valorization of research and the contribution researchers make to their respective fields. The 2012 Public Perception of Science produced by the National Institute for Higher Education, Research, Science and Technology (NIHERST) highlights that 57% of the respondents indicated that they had little or no interest in science while 56% believed that persons who want to be scientists had to work overseas. While I recognize the limitations of such surveys and also that research itself is much broader than science, I do believe that such statements are indicative of the wider public perception of research. Moreover, the consistent under-funding of R&D in consecutive national budgets further diminishes the role of research and reinforces the under-valorization of research and indigenous knowledge in the public domain.

This is, however, at odds with government policy pronouncements, which project a commitment to building 'a knowledge-based society that improves the ability of local businesses to compete globally' (Ministry of Planning and Development 2016b, p. 41). As Farrell (2017) highlights, 'outside the oil and gas sector, there is little investment by Trinidadian businesses in enterprises based on science and technology and virtually no investment in R&D' (p. 158). When compared with Chile whose per capita GDP of US$14,310 is close to that of T&T (US$14,780 (IMF 2017), Chile invests ten times more in R&D than T&T (Guinet 2014, p. 13). In addition to financial resources, Carden (2009) makes the point that governance is also an important factor, which together with a 'mix of distinguishing features' (p. 34), makes managing research in developing countries especially challenging:

> Assembling needed facilities and equipment in the midst of shortages; overcoming funding uncertainties and disappointments; recruiting, training, and retaining talented staff—all these and innumerable other difficulties inevitably confront the development research manager. (p. 34)

This dissonance in government policy position versus action is reflected in organizational behaviour and public attitudes. In an assessment of T&T's progressive and non-progressive cultural factors of development (Ministry of Planning and Development 2016a), T&T was rated as having a progress-resistant culture, attributed in part to the persistence of the colonial value system in education and the 'lack of courage' to convert the existing system into a more 'dynamic, authentic force for development' (Ministry of Planning 2016a, p. 2). The fact that our own leaders in the public and private sectors have traditionally relied more heavily on research conducted by foreigners or by multilateral institutions (though, admittedly this is sometimes part of the conditionality of development assistance) further weakens the demand for indigenous knowledge. Lewis and Simmons (2010) emphasize that:

> Governments of these countries tend also to rely on the imprimatur of the foreign expert or agency to bring credibility to and to cultivate political support for local initiatives. This kind of reflexivity, where more credence is given to the foreign expert than the local, arguably constitutes a psychological hurdle for indigenous researchers in the region (p. 340).

Furthermore, universities in Caribbean SIDS have emulated the British higher education system's 'publish or peril' research culture, which has maintained a narrow, conservative view of research outputs (primarily peer-reviewed publications in journals with high impact factors, though a gradual shift in the recognition of open access journals as well as other forms of research outputs, is slowly occurring). This, in spite of the range of decolonizing methodologies, traditional knowledges and research formats (such as visual representation and oral traditions) that are more culturally-relevant and better suited to the Caribbean context.

This then prompts the question: how can research flourish and achieve societal impact within this wider context? My research study recognizes the historical, political and

cultural traits of T&T as factors which exacerbate the challenges experienced by researchers in the wider research environment. It acknowledges that research produced in and by Caribbean SIDS is less visible, less valued and not always well understood. It is research that often occurs in an environment that may inhibit (at best) or even undermine the ability of researchers to achieve societal impact.

Within academic institutions, 'what gets accepted as knowledge is influenced by a larger climate of ideas and conventional wisdom' (Levin 2004, p. 6) and as a result, in countries like T&T, academic traditions and customs governing the way research is packaged, presented, disseminated, recognized and accepted or rejected continue to be largely influenced by external standards that are disconnected from its social and cultural reality. This is one aspect of the issue mentioned earlier in which education, knowledge and power come together to reinforce a longstanding hegemonic system that imposes a certain order, which places research and knowledge from small, developing states 'at the global margins' (Marginson and Ordorika 2011, p.94). Yet in seeking to rise above these systemic challenges, researchers in T&T also need to take societal and cultural norms into account.

In the context of T&T, cultural norms, attitudes and behaviours may, themselves, be considered antithetical to the goals of research and societal impact. Farrell (2012), in his interrogation of the myriad factors that have contributed to making T&T an 'underachieving society' points to the culture factor as one that should not be discounted. He highlights the 'carnival mentality' and explains that citizens have developed a sense of entitlement and:

> They may choose to work less hard, be less innovative and productive, and consume more because they value leisure, conviviality and pleasure more than they value work.' (p. 248)

Farrell (2012) also underscores the notion of ambivalence, which was mentioned at the beginning of this chapter. He presents it as a distinct cultural trait in T&T and believes

that this ambivalence is the 'taproot of our values, attitudes and behaviour…[and] the cause of economic underachievement in Trinidad and Tobago and the Caribbean' (p. 41). A multi-layered concept with historical, psycho-social, cultural and emotional dimensions, this ambivalence is a product of the 'living conditions and circumstances of survival in colonial societies marked by institutions of plantation slavery and indentureship' (Farrell 2017, p. 42). Farrell (2017) explains further that:

> The colonized mind identifies with the colonizer – adopting his language, manner of speaking, dress and idiosyncrasies – but also, and perhaps simultaneously, rejects the colonizer and repudiates his worldview. (p. 44)

Reflected also in the work of Lamming (2009) as the 'uncertainty of self' (p. 6) and in the work of Rohlehr (1992) as 'the loss of the capacity and the possibility for self-hood' (p. 9) as a result of the destruction of will during the colonial process, ambivalence has unwittingly been fused into Caribbean consciousness and way of life. Farrell (2012) mentions T&T's 'ambivalence towards things local and things foreign' (p. 249); our simultaneous celebration of symbols of national pride such as the steelpan, calypso, local cricket and football icons (like Brian Lara and Dwight Yorke) and yearning for overseas products and experiences as well as foreign lifestyles; and our ironic position as host country to the Caribbean Court of Justice (to which other Caribbean countries such as Barbados and Guyana have already acceded) while still maintaining the UK's Privy Council as the final court of appeal (Farrell 2012), as examples of an ambivalence that permeates the macro environment in which the RDI Fund researchers operate.

2.3.3 Knowledge

Knowledge is at the core of the research enterprise. It is a concept that is multifaceted with multilayered meanings (Nonaka 1994). Perceived as socially constructed (Levin 2008), knowledge is 'personalized information…related to facts, procedures, concepts, interpretations, ideas, observations and judgments' (Alavi and Leidner 2001, p. 9). Several authors have examined the hierarchy of data, information and knowledge (Bell 1999) as well as the continuum along which data is converted to information and

knowledge, with knowledge requiring the maximum level of human judgment (Tsoukas and Vladimirou 2001). Alavi and Leidner (2001), drawing on the work of McQueen (1998), Zack (1998), and Carlsson, El Sawy, Eriksson and Raven (1996), assert that knowledge can manifest itself in many ways: as a state of mind, as an object, as a process of simultaneously knowing and acting, as access to information and as a capability (p. 10). Knowledge, therefore, has both tacit and explicit dimensions (Polanyi 1962), which can interact in a spiral process of knowledge conversion (Nonaka 1994). While some may present these dimensions as oppositional, Tsoukas (2002) posits that tacit knowledge is simply the other side of explicit knowledge. While an in-depth examination of the tacit and explicit dimensions of knowledge is outside the scope of my research study, my study does, however, recognize tacit knowledge as an important element in my examination of knowledge flows in RDI Fund projects. Though invisible and difficult to measure, intra-personal flows of knowledge are critical to increasing enlightenment and strengthening the influence of knowledge on understanding and action.

The multiple taxonomies of knowledge are reflected in the wide-ranging literature covering various disciplines including information technology, strategic management and organizational theory (Alavi and Leidner 2001). They should not, however, be perceived as mutually exclusive but rather, serve to exemplify the multi-dimensionality and conceptual complexity of knowledge. For the purpose of my research study, I view knowledge as information that has been captured and processed by an individual or group of individuals. It is simultaneously an input and an output of research and innovation endeavours (Roper and Hewitt-Dundas 2015). Prior knowledge serves as the foundation for research and the quest for new knowledge while the production of new ideas is codified and documented as knowledge outputs. Consistent with Weiss' (1977) concept of 'research for enlightenment', knowledge could also be perceived as a higher-level, longer-term outcome of the process of research, whereby tacit knowledge and knowledge that is embedded in practice, serve to unlock the 'capability' and 'agency' dimensions of knowledge (Carlsson et al 1996; Ryle 2009), both critical to facilitating

the societal impact of research. It is this enlightenment dimension of knowledge, which infuses research processes with the power to transform individuals, communities and societies.

2.3.4 Understanding knowledge in the context of Caribbean SIDS

More than in any other era of human existence, contemporary societies are driven by an insatiable appetite for technology and innovation. Knowledge is thus perceived as a valuable asset (Gupta, Iyer and Aronson 2000), a factor of production (Arrow 2000), a driver of competitiveness and productivity as well as the foundation of development in contemporary economies (World Bank 2007). However, as mentioned earlier, to understand the place, role and value of knowledge in the context of former colonies like T&T, is to be mindful of 'the ways in which systems of knowledge…represent power' (Sheppard, Porter, Faust and Nagar 2009, p.105).

Tikly (2004) contends that 'new imperialism' goes beyond the economic and political strategies of a state or a group of states wishing to promote specific interests to the rest of the world. It is not the same as colonialist claims to overseas territories but rather involves 'the practice, theory and attitudes of a dominating metropolitan centre ruling in a distant territory' (Said 1994, p. 8). Colonial education laid the groundwork for the transplantation of hegemonic structures, the promotion of governmentality (Tikly 2003) and the inculcation of Western cultural values and ways of thinking in colonized peoples. This created fertile ground for the subsequent perpetuation of Western hegemonic interests through neoliberal economic theory and the establishment of the Bretton Woods system (including the IMF and World Bank) following World War II. Development, thus, became equated with trade liberalization, export-led growth, modernization and Westernization (Tikly 2003). A postcolonial perspective on knowledge production, as a critical element of the research process, therefore, calls for a recognition of power dynamics throughout the global higher education system and an acceptance that higher

education continues to be ‘a relational field of power shaped by inequality and hierarchy’ (Marginson and Ordorika, 2011, p.71).

Knowledge and power are concepts that have been analyzed by numerous classical and contemporary scholars – Plato, Aristotle, Socrates, Descartes, Locke, Kant, Foucault, Bourdieu, Newman, Lukes, Hardt and Negri, Giddens, Hook and many others. The link between knowledge and power, more specifically, has been examined by Alvesson (1993), McKinlay (2002) and Willmott (2013). The epistemological, philosophical, sociological, psychological and geo-political dimensions of these two concepts are as broad as they are profound and complex. Many of them are outside the scope of this study and while they will not be discussed, they are acknowledged. For the purpose of my study on examining processes for strengthening the societal impact of university research in Caribbean SIDS, I will confine myself to two specific modalities through which knowledge and power are articulated in the university research context in the Caribbean - ideas and funding. By focusing on ideas and funding, I believe that I am able to highlight the ways in which knowledge and power coalesce to reinforce hegemony in higher education research, thus maintaining a structure whereby Western (Anglo-European) knowledge (fueled by its related means of production) remains at the core and knowledge from the developing world, on the periphery (Plewhe, Walpen and Neunhoffer 2006). This, in turn, influences what is accepted as knowledge, which ideas receive support and funding (to be further developed and shared) and which knowledge is considered to have an impact on society.

2.3.5 The ideas conundrum

While many authors such as Rodney (1972), Williams (1946), Beckford (1999), Escobar (1995) and others have challenged the Eurocentric approaches so readily offered to developing countries as prescriptions for ‘becoming developed’, these approaches are able to persist through ‘the application of specific technologies of government (policies, technical assistance programmes, projects, etc.)’ (Tikly 2003, p. 182), which, in turn,

serve to propagate dominant epistemological frameworks and discourses. For instance, Tikly (2003) highlights that the disproportionate emphasis placed on primary education in developing countries by World Bank policies and programmes, particularly during the 1980s and 1990s put tertiary level teaching and research at a disadvantage, negatively affecting:

> …the indigenous capacity for research and innovation which is centrally important if countries are to link education to indigenously determined future development priorities. (p. 190).

Across international markets for research, ideas and innovation, there are notable asymmetries of power (Rizvi 2004) and of information (Stiglitz 2003), which continue to place developing countries at a disadvantage and to compound their comparative weakness. Supporting Williams' (1960) notion of hegemony as 'an order in which a certain way of life and thought is dominant, in which one concept of reality is diffused throughout society in all its institutional and private manifestations' (p. 587), Marginson and Ordorika (2011) assert that hegemony is reproduced 'in and through institutions with their own autonomy and techniques' (p. 79), pointing out the role of the university as an institution that 'standardizes and inculcates the dominant language and authoritative knowledge' (Ibid. p. 80). They highlight the ways in which elite research universities in the USA and UK maintain their leading position in league tables through deliberate and calculated support for research infrastructure, personnel, electronic publishing, journal production, superior publication rates in high impact journals, hiring of international talent, leadership of international collaboration and ability to attract large endowments. Moreover, authors such as Mendez (n.d.) and Qin (2010), emphasize the challenges with underrepresentation of publications by researchers from the developing world in citation indices because of biased geographic coverage and the language in which publications are written. The continued dominance of the English language for academic publications (as indicated by worldwide patterns of book translations) inevitably promotes a specific value system as well as the perception that 'knowledge [is]… more "true" if it begins in English' (Ibid. p. 88).

Knowledge on and by the developing world is further disadvantaged because of the need for recognition and acceptance by Western knowledge systems. Appadurai (2000) emphasizes the subjectivity of validating new knowledge and its dependence on dominant epistemological and ontological frameworks, asserting that the conventional research ethic ensures that knowledge produced meets certain criteria:

> It has to plausibly emerge from some reasonably clear grasp of relevant prior knowledge. The question of whether someone has produced new knowledge in this sense, requires a community of assessment, usually preexistent, vocational and specialised. (p. 9-10)

The inequality in the global production of ideas is further compounded by the disconnection (ideological, political, geographical, cultural and otherwise) of Caribbean intellectuals scattered across various islands, with each disparate territory having an inadequate resource base (financial, infrastructural, technological, etc.) to build a sufficient critical mass of research in specialized areas to effectively compete and gain international recognition. Without a doubt, writers and researchers from Caribbean SIDS possess the ingenuity, creativity and intellectual acuity to contribute to the global repository of novel ideas. The scholarly accomplishments of Arthur Lewis, Eric Williams, George Lamming, Dereck Walcott and many others attest to this. However, the supporting pillars for research, knowledge production and the mobilization and translation of ideas are notably weaker and more uneven in developing countries, thereby limiting the flow and uptake of their ideas.

2.3.6 The funding factor

Unequal access to funding between developed and developing countries coupled with the imposition of dominant Western discourse and methodologies have fuelled the marginalization of researchers from developing countries. For Caribbean SIDS, a heavy

reliance on funding from international partners to carry out research puts constraints on local research agendas and forces researchers to have to decide whether to conduct research that matters in their context or conduct research that is likely to get published (Tijssen, Mouton,Van Leeuwen and Boshoff 2006) and funded. Furthermore, the research conducted by multilateral institutions as part of their development and structural adjustment programmes perpetuates the neoliberal ideologies of these institutions. Their research agenda is purported to benefit developing countries but is not built from these countries' experience (Carden 2009). Research and knowledge production in Caribbean SIDS is thus not a free and unfettered undertaking. The dependence of Caribbean SIDS on international development programs, international research funding schemes and externally-sponsored research, in effect, serves to legitimize certain knowledge claims and these may differ significantly from knowledge claims that would have emanated from purely indigenous research. In this vein, funding thus constitutes an important determinant of knowledge production and in turn, can influence not only the content and utilization of knowledge but also the different types and scale of societal impact that university research can achieve in Caribbean SIDS.

On many occasions during my career as an international development specialist, I have heard the adage 'funding follows ideas'. However, it is evident that international funding provides the means for knowledge production and also reinforces the dominance of certain ideas and ideologies, over others, through mechanisms that govern the access to and the use of funding for research. In reality, therefore, it is equally true that 'ideas follow funding' and in Caribbean SIDS that are classified as high middle income countries (such as T&T) and have limited access to development financing yet find themselves constrained by paltry national allocations for research, researchers often find themselves hard pressed to access research funding. This in turn puts pressure on researchers to strategically align their research to the funding opportunities presented by international research agencies and multilateral development organizations.

Confronting this dynamic interplay between research, knowledge, funding and power is an important aspect of my postcolonial perspective. It has also helped me to recognize the potential tensions and distortions caused by research and development funds, in and of themselves, while at the same time, better appreciating the value of locally-available research funding instruments, such as the RDI Fund, to support indigenous research by Caribbean scholars and strengthen the linkages between university research and societal impact.

2.4. An array of knowledge terms: From knowledge transfer to knowledge brokerage

Knowledge transfer was initially described as a one-way flow of knowledge from researchers to potential users (Johnson 2005). It is an issue that has been under study since the 1950s (Huberman 1990) and that has become increasingly popular since the 1990s and was premised on the understanding of research processes being influenced either by the science push/knowledge driven model or the demand-pull/problem-solving model (Landry, Amara and Laamary 2001, Weiss 1979). This, however, does not depict the multi-directional knowledge flows now understood as necessary to sustain research to policy and innovation processes. Contemporary models are broader, more sophisticated, focusing more on knowledge processes rather than knowledge products (Jacobson, Butterilll and Goering 2003) and moving away from one-way transfer towards more reciprocal processes of interaction and exchange among producers and users of knowledge (Huberman 1994). Thus, there is a strong recognition that 'successful uptake requires more than one-way communication, instead requiring genuine interaction among researchers, decision makers and other stakeholders' (Mitton, Adair, Mc Kenzie, Patten and Perry 2007, p.730). The nuances between knowledge transfer, dissemination, mobilization, exchange and brokerage are often missed and these terms tend to be used interchangeably, even though each has a distinct meaning. For the purpose of my research study, it is important that the subtle differences between key concepts be understood. Table 1 outlines definitions selected from the literature, which most closely align with the objective and

scope of my research study and will serve to create a shared understanding of the processes involved in knowledge utilization and knowledge transfer. Understanding these definitions as distinct but connected and overlapping processes (Morton 2015, p. 407) is fundamental to an appreciation of the complexity of achieving societal impact, which will be discussed later in this chapter.

Table 1: Key Terms used in the literature on knowledge utilization

Knowledge Transfer	Knowledge transfer is a term that emerged in the 1990s and refers to a process by which research messages are 'pushed' by producers of research to users of research (Lavis, Robertson, Woodside, McLeod and Abelson 2003)
Knowledge Translation	Knowledge translation is concerned with moving research findings into practice (Grimshaw, Eccles, Lavis, Hill & Squires 2012). It refers to 'the steps between the creation of knowledge and its application' (Johnson 2005, p.12) but there is an acknowledgement that there needs to be an active, multidirectional flow of information from project inception. Based on a review done by Tetroe, Graham, Foy, Robinson, Eccles, Wensing, Durieux, Légaré, Palmhoj Neilson, Adily, Ward, Porter, Shea and Grimshaw (2008), as many as 29 terms have been detected in the literature to have been used to mean knowledge translation and this lack of conceptual clarity is considered a major drawback to the advancement of the knowledge translation agenda (Ibid.).
Knowledge Dissemination	Knowledge dissemination has to do with executing deliberate activities aimed at sharing research findings with targeted stakeholders for example by mailing a synthesis of research findings to specific groups or organizing workshops and conferences. It is one of the three types of activities identified by Lomas (1993) involved in knowledge transfer and knowledge translation. The other two types of knowledge transfer activities mentioned in the literature are diffusion, which focuses on promoting awareness (i.e. getting the information

	out) and implementation, which entails more active approaches aimed at overcoming barriers, creating a behaviour change and encouraging adoption, using strategies like face to face meetings with experts, audit and reminder systems (Lomas 1993, Tetroe et al 2008).
Knowledge Exchange	Knowledge exchange is based on a recognition of the need for interactive exchanges between knowledge producers and users (Kiefer, Frank, Di Ruggerio, Dobbins, Manuel, Gully and Mowat 2005) and refers to activities that facilitate a genuine interaction between researchers, decision makers and other stakeholders to increase the uptake of research (Lavis, Robertson et al 2003, Morton 2015).
Knowledge Mobilization	Knowledge mobilization refers to ways in which 'well validated bodies of knowledge…are connected to or influence policy and practice' (Levin 2008)
Knowledge Utilization	Knowledge utilization refers to the ways in which the ideas and evidence emanating from research are put into use for a purposeful end. It also has to do with how these shape policy and influence behavior (Levin 2008).
Knowledge Brokerage	Knowledge brokerage is 'all the activity that links decision makers with researchers, facilitating their interaction so that they are able to better understand each other's goals and professional cultures, influence each other's work, forge new partnerships, and promote the use of research-based evidence in decision-making' (Lomas 2007, p. 131).

This lack of agreement on terminology has been cited in the literature as 'the largest looming barrier' (Tetroe et al 2008, p. 152) to advancing knowledge application and knowledge translation. Another drawback is the two communities theory (Caplan 1979; Webber 1984) whereby researchers and users are thought to operate in different worlds, not sharing the same focus, language, culture or research agenda (Johnson 2005), which in turn impedes knowledge transfer and utilization. Criticisms of this theory as being pessimistic and self-fulfilling (Dunn 1983; Wingens 1990) point to the need to reconceptualize these barriers and to look more broadly at structural 'conditions and

constraints' (Wingens 1990, p. 32-33). On the operational side, Mitton et al (2007) also explain that researchers have difficulty in adapting their research cycle to fit real-world timelines and in establishing relations with decision makers; while policy makers have challenges with understanding the research process and receiving timely research evidence and research that is relevant to practice-based issues. It has been proposed in the literature that, over time, the interaction between researchers and policy/decision makers will help to create certain cultural shifts whereby each group learns from each other producing 'a decision-relevant culture … among researchers and a research-attuned culture … among decision makers' (Huberman 1994).

2.4.1 Knowledge Utilization

The use of knowledge has received significant attention over the past five decades, primarily because of the increased emphasis on knowledge and knowledge societies (Nonaka1994). Different terms are used in the literature to refer to knowledge use, including knowledge translation, knowledge transfer, knowledge exchange and research implementation, among others (Graham, Logan, Harrison, Straus, Tetroe, Caswell & Robinson 2006; Jacobson, Butterill & Goering 2003). For the purpose of my study, however, the term 'knowledge utilization' will be used as I believe 'utilization' goes beyond 'use' to connote something being put to use towards a purposeful end, which is distinct from more generic use. Inherent in utilization, therefore, are connotations of intent, purpose and agency. Authors such as Weiss (1979) contend that knowledge utilization focuses on factors or processes that facilitate 'information processing'. Levin (2008) goes further to assert that knowledge utilization has to do with 'the way ideas or evidence shape policy and behaviour' (p.3).

Described as 'complex and fuzzy' (Weiss 1977, p. 533), Weiss also contends that knowledge utilization '…stresses application of specific research conclusions to specific decisional choices' (Ibid.). It is recognized that the knowledge produced by research has three main uses: instrumental use (for decision-making), conceptual use (for influencing

understanding) and persuasive/political/symbolic use (to mobilize support for a specific position) (Lavis, Robertson et al 2003; Rich 1977; Weiss 1998). Weiss (1979) proposed seven models of research use; namely research that can be knowledge-driven, research for problem-solving, research that is interactive, political, tactical, an intellectual enterprise and for enlightenment.

In the early stages of analysis of research utilization, researchers focused on identifying direct connections between a research project or evaluation report and subsequent policy decisions as evidence of research utilization. This was referred to as 'utilization as support for discrete decisions' by Cousins and Leithwood (1986) who also identified two other types of research utilization: utilization as education and utilization as processing. Utilization was initially perceived either as a linear, logical, one-way flow of information from researchers to policy makers (the science push or knowledge driven model) or as research commissioned by policy makers to address a specific problem (the demand-pull or problem-solving model) (Landry et al 2001; Weiss 1979). Furthermore, it was believed that in order to increase the prospects for research utilization, researchers needed to produce a critical mass of research or 'bodies of consistent evidence' (Levin 2008, p. 6) and this research evidence needed to be not only robust but generalizable and considered to have a 'high potential for population level impact' (Glasgow and Emmons 2007, p. 415).

Two research utilization models that emerged – the dissemination model and the interaction model – responded to the growing recognition that knowledge transfer does not happen automatically (Dunn 1986). These emphasize the need to identify useful knowledge and putting mechanisms in place to help transfer this knowledge to potential users. The dissemination model, however, has been criticized because of specific limitations pertaining to the involvement of users in the production of the knowledge and in the selection of the information to be transferred, thus limiting its later use and impact. The interaction model seeks to overcome these limitations as well as address the concern that it is the lack of interaction between researchers and potential users that was the root

cause of the under-utilization of research. This model thus places greater emphasis on 'the relationships between researchers and users at different stages of knowledge production, dissemination and utilization' (Landry et al 2001, p. 5).

Several authors have highlighted key considerations for maintaining the level and quality of interaction needed to support effective utilization. Yin and Gwaltney (1981) and Wingens (1990), for example, point to the importance of building and maintaining relationships between researchers and users, establishing differentiated communications links that support a continuous process of engagement and a dynamic transfer of information as well as ensuring the quality and flexibility of diverse research products. With respect to the interactive, public engagement dimension of knowledge utilization, while essential for the two-way flow of knowledge, some challenges have been noted in the literature. Grand, Davies, Holliman and Adams (2015), for instance, highlight five challenges related to practical considerations such as who should be engaged, when, how often, how will the engagement be organized, etc.; how to acknowledge expertise for public engagement within existing systems of academic validation (for instance, peer-reviewed publication); the effect of a more open and distributed approach to research on researchers' professional identities; the ownership of the research and control over the ideas, data and intellectual property; and the extent to which genuine reciprocity and dialogue are practised during engagement activities. Another challenge cited in the literature relates to ensuring that decision makers and researchers alike assign sufficient priority (and resources) to engagement activities and that they are integrated throughout the research project. These are all relevant to the work of the RDI Fund and have been noted in the experiences of RDI Fund researchers in seeking to achieve societal impact.

External environmental factors such as power relationships, political dynamics, human biases and 'on-the-ground realities and constraints' (Lavis, Posada, Haines and Osei 2004, p.1618) did not in the early stages receive explicit attention or analysis but are now understood to impinge directly on research utilization. Levin (2004) points out that '...the

use of research is embedded in a set of personal and organizational beliefs and practices that are complicated and often deeply entrenched...' (p.5). Johnson (2005) identifies additional barriers to research uptake that are instructive since these can exist both at the system (or institutional) level and at the individual level. At the system level, Johnson (2005) cites a lack of administrative support, crowded schedules and insufficient time for reading research reports and integrating information presented into practice. At the individual level, barriers exist when decision or policy makers have limited skills to adequately interpret and apply research findings (Johnson 2005, p.12).

Knowledge utilization is a core component of knowledge brokerage (which is explained in the following section) and focuses on moving research findings into action (Graham, et al 2006). As mentioned earlier, the enlightenment dimension of knowledge is vital for research to influence understanding and action. This is even more critical if the impact potential of research is to extend beyond the walls of the university (and the immediate groups of research participants, users or beneficiaries associated with a specific research project) and go into the wider society. In examining the utilization of social research in public policy making, Weiss (1977) emphasizes that:

> Evidence suggests that government officials use research less to arrive at solutions than to orient themselves to problems. They use research to help them think about issues and define the problematics of a situation, to gain new ideas and new perspectives. They use research to help formulate problems and to set the agenda for future policy actions. (p. 533-534).

Thus, in my investigation of knowledge flows, pathways and processes that can help bridge knowledge to policy and knowledge to practice gaps in Caribbean SIDS, intra-personal knowledge flows are highlighted as a necessary precondition for societal impact.

2.4.2 Knowledge Brokerage

Over the past decade, knowledge brokerage has received increasing attention in knowledge to impact processes. Knowledge brokerage goes beyond moving information from a producer to a user; it connotes interaction, exchange and facilitation of linkages between key stakeholders involved in research utilization and research translation processes. It seeks to increase the utilization of research outputs while also stimulating ideas for new research geared towards meeting the needs of the policy and practice spheres (CHSRF 2003; Karner, Rohracher, Bock, Hoekstra and Moschitz (2011); Schroeder and Pauleen 2007; Van Kammen, de Savigny, and Sewankambo 2006). Recognizing the complexity and multi-dimensionality of knowledge brokerage as a social activity as well as the wide range of activities knowledge brokerage entails, Oldham and McLean (1997) propose three context-specific frameworks for thinking about knowledge brokerage: the knowledge system framework, the transactional framework and the social change framework. These frameworks form the basis of the three main models of knowledge brokerage: the knowledge management model (identifying, translating and disseminating information), the capacity building model (developing capacity to effectively participate in successful knowledge exchange, from both the demand and supply side) and the linkage and exchange model (facilitating relational activities between knowledge producers and users) (Bornbaum, Kornas, Peirson and Rosella 2015; Chew, Armstrong, and Martin 2013; Ward, House, and Hamer 2009a, 2009b). Quite often a blurring and mingling among the three models tend to occur, whereby knowledge brokers combine elements from all three frameworks to respond to the needs of different contexts (Ward et al 2009b). The ultimate goals of knowledge brokerage are varied and dependent on the context and project. They include encouraging knowledge exchange, fostering communication among disparate groups, advocating for research utilization, facilitating the transformation of policy issues into research questions, understanding and communicating researcher and decision maker priorities, identifying synergies and opportunities for partnership and collaboration, strengthening alignment between academia and industry and facilitating research impact (Lightowler and Knight 2013).

The underlying rationale for knowledge brokerage is that the facilitation of productive social interaction is a key determinant for effective knowledge transfer (Armstrong, Waters, Roberts, Oliver and Popay 2006). Perceived primarily as a social role (Ward et al 2009b), knowledge brokerage is therefore considered a fitting response to challenges encountered with effective utilization of research (Kislov, Wilson, and Boaden 2016). Knowledge brokers are considered to play an important role as a catalytic interface between knowledge creators and knowledge users, serving as a neutral go-between to foster equitable relationships between the two (Ward et al 2009b). In so doing, knowledge brokerage facilitates a two-way flow of information where traditional knowledge producers benefit from knowledge exchanges with potential beneficiaries.

Knowledge brokerage is relevant to my research study given its focus on the multi-dimensional, longer-term and often political nature of the work involved in mobilizing and utilizing knowledge. For RDI Fund projects, if STA researchers are expected to conduct research with impact, knowledge brokerage cannot be viewed as an add-on but instead, should be mainstreamed into their research processes. I therefore view the embracing of knowledge brokerage by Caribbean universities such as the UWI as vital to effectively navigate the 'power relationships, political dynamics and human biases in the processes that lead to research use' (Levin 2004, p. 5) and to activate the capability and agency dimensions of knowledge that can change practices, influence habits and ultimately, generate societal impact.

2.5 Impact

Impact is a multifaceted issue that is anchored in different schools of thought. Brewer (2011, p. 255) refers to it as a terrain that is traversed from at least 3 directions: the policy evaluation tradition; the philosophy and sociology of knowledge and a consequence of the audit culture in higher education. For the purpose of my research study, however, a fourth strand that emphasizes theories surrounding knowledge brokerage and knowledge flows has been brought to bear on my analysis of research

impact with a view to going beyond the 'what' to examine 'how' to achieve societal impact in Caribbean SIDS.

2.5.1 A growing audit and managerialist culture in the university

Over the past four decades, universities have found themselves increasingly subjected to what some authors have termed 'transparency regimes' and a growing 'audit culture' (Deem, Hillyard and Reed 2007, p.2). Performance benchmarking and metrics-driven research impact assessment have been developed in several countries to encourage universities to go beyond academic outputs and to demonstrate the societal benefits of research. Broadly speaking, societal impacts refer to development issues such as equality, livelihoods, health, nutrition, poverty, security and justice (Epstein and Yuthas 2014, p. 15). Research impact assessment has been promoted as a means of demonstrating the benefits of research to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia (HEFCE 2011). It is also used as a means of justifying decisions surrounding the investment of public funds in university research. Consequently, in many developed countries, universities, research institutions and international funding agencies have been placing increased emphasis on impact as an important dimension of research excellence and development effectiveness.

The UK's Research Excellence Framework (REF) is an example of a research quality assessment mechanism that was instituted for UK universities in 2014 (following its predecessor Research Assessment Exercises (RAE) of 1986, 1989, 1992, 1996, 2001 and 2008). Throughout my study, some references are made to the REF (and to a lesser extent, the RAE) as an example of the approach used by UK universities to examine and capture the societal impact of university research. The REF, however, is just one approach. Hicks (2011) identified fourteen countries in which performance-based research funding systems had been established. Rogers, Bear, Hunt, Mills and Sandover (2014, p.3) attest that an increased focus on assessing research impact was being experienced in other parts of Europe, the USA, Australia and New Zealand. The linking

of 20% of UK government research-related funding to the REF outcomes has served to institutionalize research impact in the UK higher education system, facilitating the dominance of an 'impact agenda' that has expanded the range of outputs, outcomes, benefits and results typically expected from a university's research endeavour. As highlighted by Ferguson (2014), there is now an expectation that '… publicly funded research should have impact beyond academia and yield demonstrable and direct economic, environmental and social benefits'. My reason for using the REF and the UK university experience with research impact as a point of comparison is that, because of historical ties, many of the UK's educational policies have influenced and continue to influence our own policies on education, at all levels.

In keeping with my postcolonial perspective on this issue, it is important to highlight that what is often broadly referred to as 'the impact agenda', in reality, is underpinned by a system of values linked to neoliberal ideology and managerialist organizational control, which in turn, have influenced the organizational culture as well as individual performance and behaviour within Western universities. At the centre of this ideology and set of organizational controls is knowledge and how knowledge is created, treated and valued, as a result. Managerialism is a general ideology that views managing and management as '…being functionally and technically indispensable to the achievement of economic progress, technological development and social order, within any modern political economy' (Deem et al 2007, p. 6). From the 1960s, neo-corporatist, neo-liberal and neo-technocratic variants of managerialism provided 'a framework of governance mechanisms and practices' (Ibid, p. 14) in which efficiency, productivity and market-led decisions were prioritized.

From the mid-1980s, these neo-liberal managerialist approaches went beyond UK public sector organizations and infiltrated the university systems. The impact of managerialism has been greatest in higher education given the focus on transforming it into a marketable commodity globally (Marginson 2006). It has also led to the introduction of a range of

performance management indicators and benchmarking tools. Such changes have permeated all aspects of higher education and are reflected in the systems, policies, procedures, jargon and work culture, reinforcing the view that managerialism is more than a set of management practices. Rather, as Clarke and Newman (1997) assert, it is a complex series of organizational changes - social, political and economic – which are all linked to neo liberalism as a political project. These institutional control technologies (Deem et al 2007) integrated with an organizational culture that fosters the necessary conditioning of employee behaviour and thinking help to create a self-reinforcing system that advances the neoliberal political project, and are referred to as the 'organizational arm of neo-liberalism' (Lynch 2014, p.1).

The 1993 White Paper entitled 'Realising our Potential' is often cited as a landmark policy document in the UK's contemporary higher education system in which the impact agenda has its origins. This White Paper outlined a new strategy for publicly-funded UK universities, whereby the government, working closely with scientific and industrial communities determined '...the appropriate mechanisms for setting priorities both in terms of the areas of research to support and the levels of funds to be committed to them' (Cabinet Office 1993). By emphasizing the importance of links with industry and non-academic research users, the 1993 White Paper, in effect, ushered the way for greater emphasis on the economic impact of research in subsequent research assessments and increased selectivity in research funding. The 2006 Warry Report also served to further define mechanisms for strengthening the leadership and influence of the UK Research Councils on knowledge transfer practices of universities and Research Council Institutes as well as their engagement with user organizations.

As Christians (2005, p.146) points out, the research impact agenda is primarily 'a utilitarian agenda'. Ideology and geo-political power have strongly influenced the environment in which research is conducted and in which research is managed; that is to say academic institutions, funding agencies, social and political institutions as well as

academic (research) culture and traditions. Against this backdrop, national research assessments serve to operationalize this deliberate political and policy agenda. Aligning research funding with research quality, performance and impact, has enabled the UK government and research councils to promote mangerialist policies and tighter controls in higher education administration, allocate funding according to specific criteria and in so doing, exert increased influence on the kind of research produced by universities, all through the lens of return on public investment and societal impact of research. In so doing, the UK government and research councils not only influence how much funding goes to specific research institutions; they also influence what gets funded and what is recognized as valuable knowledge and impactful research. This ideological and operational approach in effect has established a '…new code of values underlying decisions about what constitutes valuable knowledge' (Lynch 2014, p. 9); what knowledge is considered marketable; and what knowledge should receive funding. It has provoked '…a change in the character of knowledge and assumptions about a new process for producing knowledge' (Pettigrew 2011, p. X).

Though the effects may manifest themselves differently in different contexts, unravelling the ways in which research, knowledge, funding and impact come together to shape the dynamics within a research environment is fundamental to my research study. Beyond the effect at the macro environmental level, these dynamics also exert forces and pressures at the meso level, through the operational frameworks and criteria for awarding funding, reporting and disseminating research outputs and at the micro level, through their effect on researcher values, attitudes and decisions regarding research topics and methodological approaches. The impact of forces in the wider research environment on knowledge flows will be discussed in more detail later in this chapter.

2.5.2 The problematique of research impact

I use the term 'problematique' when examining research impact as it refers to a host of issues - definitional, methodological, contextual and otherwise - that are difficult to

untangle, inherently conflicted and impossible to resolve easily (Rose 1974). Furthermore, as highlighted by Warfield and Perino (1999), the relationship among the 'interwoven issues' of a problematique is perceived as 'one of aggravation rather than causality' (p. 221). That is to say, the complexity of each issue taken individually is compounded as other issues are factored into the analysis. It is not that one necessarily causes or influences the other but rather, that the co-existence of these factors surrounding the problematique further exacerbates its complexity. The problematique of research impact is, in my view, a useful metaphor given the diverse, multi-layered issues that arise when seeking to unpack 'research impact' for a better understanding of how this may be evidenced or experienced in Caribbean SIDS.

In the following section, I will briefly outline some salient points surrounding this problematique, recognizing the inherent tensions caused by myriad approaches to defining and assessing research impact as well as the different assumptions about the nature of knowledge, the purpose of research and strategies for achieving impact. This section does not pretend to provide a comprehensive examination of each issue but rather, serves as an illumination of how these factors when taken together produce a fuller context for understanding the research impact problematique. In examining each of the following points, I am inspired by the well-known quote by James Baldwin 'the purpose of art is to lay bare the questions which have been hidden by the answers'. For too often information is presented as an accepted truth or an incontestable fact without recognizing the underlying assumptions or contextual considerations that give rise to nuanced interpretations. I have therefore sought to put the spotlight on some fundamental *questions* at the core of selected issues discussed in the literature, which are most relevant to my research study.

2.5.3 How should research impact be defined?

After more than five decades of academic work seeking to evaluate the impact of social science and public health programmes, research impact continues to be projected and

perceived as a notion that is broad, vague and nebulous. Different definitions of impact abound; some focus on the *application* of research '…to achieve social, economic, environmental and/or cultural outcomes' in a way that is considered beneficial (Duryea, Hochman & Parfit 2007); others on a *change* in 'awareness, knowledge and understanding, ideas, attitudes and perceptions, and policy and practice as a result of research' (Morton 2015, p. 406) or the long-term *effect* produced by the research whether intended, unintended, positive, negative, direct or indirect (OECD-DAC n.d.); others on the *action(s)* instigated by research, whereby '…research, in any of its multiple forms, makes a difference to subsequent actions that people may take or refrain from taking' (Levin 2004, p.3); others on the *interface* between academic and non-academic communities '…in the (co) production, transfer and translation of knowledge' (Etzkovitz 2002, 2003; Leydesdorff & Etzkowitz 1996); while some interpretations of impact are more removed, limiting attention solely to the moment in which research has the *opportunity* to have an effect, referred to as 'an auditable or recordable occasion of influence' (as opposed to the actual change effected) based on the view that it is not methodologically feasible to determine causality beyond this point (Bastow, Dunleavy and Tinkler 2014, p.53).

The lack of consensus around what exactly research impact is and which specific dimension of research impact should be the primary focus of research impact assessments poses major challenges in arriving at a consistent approach to capture impact, report on impact and consistently execute measures to achieve impact. This is further problematized by the varied interpretations of impact by researchers from different disciplines (Oancea 2013). Brewer (2011, p. 255) underscores these challenges, emphasizing that the lack of a shared vocabulary and common ground inhibits 'a universal conversation' about impact. Boaden & Cilliers (2001, p.8) argue that 'the definitions of quality are so varied and vague that the term, itself, is open to misuse'. This then begs the question of whether it is possible to measure something that has not been clearly defined. Can academic and practice communities across different contexts develop a cogent body of knowledge, expertise and experience on research impact if the

phenomenon is approached from multiple entry points and using varying definitions and conceptual parameters?

The reality is that this lack of an agreed definition of research impact has resulted in a plethora of approaches to assessing research impact. Godin and Doré (2005), for instance, adopt a very broad range for categorizing research impact highlighting eleven dimensions of impact, namely: scientific, technological, economic, cultural, social, political, organizational, health, environmental, symbolic and training impacts. Meagher (2009) puts forward 5 categories of impact: instrumental, conceptual, capacity building, cultural change and enduring connectivity impacts. Salter and Martin (2001) recognize six categories of impact, which they define as benefits derived from publicly-funded research, namely increasing the stock of useful knowledge, training of skilled graduates, creating new scientific instruments, networks and ability to solve complex problems, networks and social interactions, the capacity for scientific and technical problem solving and the creation of new firms.

At the unit or project level, approaches to capturing and measuring research impact include the 'Payback Framework' (Donovan and Hanney 2011) developed by Martin Buxton and Stephen Hanney of Brunel University (and later further expanded with support from the National Health Service and RAND Europe) and the SIAMPI (Social Impact Assessment Methods through the study of Productive Interactions) used by the Royal Netherlands Academy of Arts and Sciences. The former provides a logic model comprising seven stages and two interfaces 'between the research system and the wider political, professional and economic environment' (Donovan and Hanney 2011, p. 181) and facilitates consistent data collection at the same stage of the research process. The latter focuses on 'productive interactions' that is to say the contact between researchers and non-academic stakeholders which may then lead to impact in the form of stakeholders doing new things or doing things differently (Molas-Gallart and Tang 2011, p. 219). In an effort to treat with issues related to attribution and context, Mayne (1999),

Kok and Schuit (2012) and Morton (2015) adopt a contributions approach to guide their understanding and evidencing of impact, whereby Research Contributions Frameworks (RCFs) are premised on the belief that research can only contribute to outcomes, not cause them. RCF therefore seeks to overcome issues surrounding the identification and categorization of types of impact produced by focusing on processes as well as key drivers for research uptake such as networks of research users and successful engagement (Morton 2015).

At the institutional level, evaluation exercises in specific countries compile data on research quality, performance and impact, allowing for some comparison across higher education institutions. For example, the already-mentioned REF and its predecessor the RAE in the UK, the Excellence in Research for Australia (ERA); the Innovation Outcome Measurement Study (OMS) used by the Canada Foundation for Innovation; the Performance Based Research Fund (PBRF) in New Zealand and the Science and Technology for America's Reinvestment - STAR metrics, in the USA. While each of these has a unique approach and not all assessments are conducted on a national scale or used to determine government research funding allocations through research councils (as is the case in the UK), they reflect the disparate approaches currently in practice, both at the project and institutional levels, and the impossibility of aggregating findings to facilitate a fuller understanding of research impact.

Based on my review of the literature, the difficulty in achieving consensus on a systematic approach to capturing and measuring research impact may have to do with the long, non-linear causal chain, whereby many different social forces contribute to the effects of research on society and thus, determining where impact begins or ends and what exactly triggered it, becomes highly problematic. For the purpose of my research study, therefore, I have approached research impact from a functional perspective, trying to better understand *how* research can lead to positive results for specific beneficiaries (Davis and Carden 1998), prioritizing a focus on *processes*, while at the same time

remaining mindful of the often indiscernible dimensions of impact, which I referred to earlier as the 'enlightenment effect'. It is this invisible dimension of research that prepares the terrain for research-informed decision-making, even if direct attribution to specific research publications is impossible.

Davies, Nutley and Walter (2005) underscore the significance of this sometimes invisible impact in explaining that 'research may also be absorbed and internalized into professional tacit knowledge as it emulsifies with many other sources of knowledge …' (p. 11). This therefore makes it difficult to ascertain where the conceptual use of knowledge ends and its instrumental use begins (Leviton and Hughes 1981). Weiss (1979) highlights how '…social science research diffuses circuitously through manifold channels… and over time, the variables it deals with and the generalizations it offers provide decision makers with ways of making sense out of a complex world' (p. 429). Thus, the potential of research to 'contribute not only to decisional choices but also to the formation of values, the creation of new understandings and possibilities and to the quality of public and professional discourse and debate' (Chib and Harris 2012, p. 181), should not be glossed over, even if it is difficult to capture in research assessment frameworks. Godin and Doré (2005) point out that '…the absence of impact of research is not necessarily the sign of research that is too fundamental or useless, it may be that the transfer is not yet achieved' (p.11). Guigale (2014) also reminds us that while the language of impact assessments may mislead us into thinking that the truth is measurable, research should not be deemed to only have value in instances where its impact can be seen and measured.

2.5.4 Whose perception of impact is valid?

One of the main interpretations of impact is that it should manifest itself as a change or benefit to society, thereby placing significant emphasis on the public value of research and its ability to directly respond to the needs of society. However, attempts to capture impact by focusing on '…an effect on change or benefit to the activity, attitude,

awareness, behaviour, capacity, opportunity, performance, policy, practice, process or understanding of an audience, beneficiary, community, constituency, organization or individuals' HEFCE (2011, p.48) fail to recognize the fact that to identify 'benefits' is, in itself, a value judgment. The benefits identified may vary depending on the person who is evaluating the research. Furthermore, as with all assessments or judgments, the evaluation snapshot is taken at a specific point in time and with the passing of time, other effects may emerge. The time sensitive nature of impact and the challenges presented by the extended time lag for research impact to become evident are well recognized throughout the literature.

It is important to signal here that impact is also not seen through the same lens for researchers, research participants, research collaborators, donors and governments alike (Brewer 2011). Each group extrapolates instances of impact based on the purpose for which impact capture is needed. What may be considered as having high impact for a funding agency may not be as highly ranked from the perspective of research participants in a specific community. Brewer (2011) underscores this point of personal values impinging on the identification of impact stating that the impact captured depends on whose perspective is projected and 'varies according to normative evaluations from a particular standpoint' (p. 255). Moreover, perceptions of value or benefit are not static; neither are they isolated from other experiences and influences that individuals may have as they engage with the wider society, thus creating a difficulty in arriving at an accurate and impartial capture of impact. Highlighting this 'evaluation timescale' problem, Watermeyer (2016) questions (rhetorically perhaps) whether research impact could appreciate or depreciate with the passing of time, '…does research claimed as 2* in 1992 translate as research claimed adjudged to be 2* in 2014?' (p. 207). Davies et al (2005, p.14) also contend that all approaches to assessing impact are challenged by the methodological approaches to treat with time (what timeframe to use when measuring impact) and scope (how wide to cast the net when looking for impact). McCowan (2018) goes further than acknowledging the timescale dimension of impact to highlight the relationship between time and intensity of impact, asserting that:

> …in some cases there may be an intense impact to start off with, but one that dissipates rapidly; in others the impact may be slow to emerge, but prove to be highly significant in the long term (p. 285).

At a more fundamental level, the notion that research may or may not have resulted in an impact still depends on a judgment of the worthiness, contribution and value of that knowledge, which opens the door for additional critique and subjectivity.

The pressures exerted by the research impact agenda have inevitably led to a growing culture of research selectivity and a recognition (in some cases, an acceptance) of research as a 'managed' activity. The judgment of which research reflects 'quality', 'excellence' and 'impact' and is therefore, worthy of receiving government funding, is perhaps one of its most pernicious consequences. Badat (2009, p.11) reinforces the point that the competition for resources means that 'certain kinds of knowledge and research...are privileged to the detriment of [others]...' The resulting divergence of funding away from certain subjects and towards more traditional disciplines (within universities) and away from already under-resourced universities towards the more well-resourced universities, highlights the inherent contradictions of the research assessment philosophy. Tijssen et al (2006) also caution that researchers, in turn, feel pressured to choose between conducting research that matters in their context and research that is likely to get published, since 'research that addresses local needs of developing countries is unlikely to attract much attention from the world's academic community (Tijssen et al 2006, p.172). In the context of Caribbean SIDS, the 'publish or peril' academic tradition, compounded by the resultant knowledge bias and research selectivity of the research impact agenda, could serve to undermine the potential of research to address national and regional development challenges and this, in a wider research environment already challenged by inadequate infrastructure and weak linkages, further complicates the quest for societal impact in the Caribbean.

2.5.5 Is it empirically possible to trace societal impact back to research? The Paradox of Attribution and Additionality.

Throughout the literature on research impact, attribution has been cited as an elusive goal. Several authors refer to the attribution problem, attribution gap or attribution challenge as a primary concern in any attempt to capture and measure research impact (Douthwaite, Kuby, Van de Fliert and Schultz 2003, Davies et al (2005), Bourguignon and Sundberg 2007, Pettigrew 2011, Bornmann 2012, White 2005, and others). Attribution is an inherent problem in the research impact discourse because of the many different actors and forces at play in any process that leads to a societal change or benefit. The long causal chain and complex environments make it very difficult or as some researchers contend, 'methodologically infeasible' (Bastow et al 2014, p. 53) to establish a direct causal link between research and a specific outcome or improvement in society.

There is also the serendipitous nature of impact mentioned earlier, which is highlighted in the literature by Brewer (2011), Watermeyer (2012) and others, and must be taken into account as it blurs even further any direct causal line between research and a societal change or outcome. As Watermeyer (2012, p.120) puts it '…change in 'real world' contexts may be serendipitous or incidental even though intended'. This is further complicated by the difficulty in separating the influence of individual research from group research given the high degree of interaction and collaboration among researchers both within and across institutions (Meagher et al 2008). The reality is that the nature of knowledge processes is inherently multidirectional and the true effect emerges over an extended period, in a non-linear, indirect manner involving many stakeholders and co-producers of knowledge across space and time. When new knowledge interacts with tacit knowledge through serendipitous events in dynamic, political, social and cultural contexts, it becomes impossible to accurately pinpoint causal links. This has led researchers like Spaapen and van Drooge (2011) and Kok and Schuit (2012) to develop the concept of research *contribution* (rather than attribution), which focuses on the

processes involved in knowledge production and utilization as alternate entry points for assessing research impact.

Similar to an examination of the counterfactual when assessing development impact, the additionality factor refers to an assessment of what would have occurred if the research project had not been executed. Would there still have been evidence of the results, benefits or changes that are being traced? Molas-Gallart, Tang and Morrow (2000, p. 172) assert that additionality can manifest itself both within the institution, referring to additional research results because of a specific research project and also outside of the university, depending on the additional effects brought about by the use of the research externally. This additionality can be captured once the research design incorporates baseline data before the start of the project, which can be distinguished from data collected during and after the project (Ibid.). Georghiou (2002, p. 58-59) further problematizes additionality by examining three dimensions of additionality: input – looking at the extent to which resources provided to an entity are additional; output – examining to what extent outputs would not have been achieved without the specific support or funding; and the way in which a project may have been modified or altered in the process. Many of the critiques of research impact assessment centre around issues of attribution and additionality (Bornmann 2012; Mayne 1999; Morton 2015; Spaapen et al 2011).

2.5.6 What are appropriate metrics for measuring impact?

2.5.6 (i) Counting what can be measured

Drawing on the points outlined earlier in this chapter, it is not surprising that measurement continues to be an area that is fraught with methodological tensions. The main indicator of academic impact has been bibliometrics. Citation counts, publication rates and journal impact factors have traditionally been widely recognized and used as verifiable metrics of authorship and academic influence across various disciplines. While bibliometrics continue to be widely accepted as a measure of research quality, they are not without criticisms of gaming in the form of citation cartels, ghost writers and

guest authors (Grimson 2014, p.33) and of limitations of the peer review process as the basis for the validity of bibliometrics, given concerns surrounding conservatism in specific disciplines and the contested issue of gender bias in peer review (Grimson 2014, p. 34). On the side of non-academic impact, several authors (Bastow et al 2014; Chib and Harris 2012; Davies et al 2005; Levin 2004; LSE Public Policy Group 2011; Watermeyer 2012, 2014, 2016 and others) highlight the myriad challenges with accurately tracing and capturing the societal benefits that can be imputed to specific research conducted in a dynamic, multi-causal settings.

In the field of research impact assessments, more specifically, different approaches - quantitative, qualitative or mixed methods - are used to measure impact, each having its advantages and disadvantages. Qualitative approaches are considered subjective and resource intensive; while quantitative approaches have been criticized for only capturing certain types of impact and ignoring areas that are more nuanced and contextually dependent. The specific indicators used for research impact assessments have also been a point of contention. Authors such as Tijssen et al (2006), Garlick and Pryor (2004), Elton (2000), Smith (1990), among many others, have critiqued the entire spectrum of research metrics - from quantitative citation indices, journal impact factors and research funding levels to the more qualitative peer assessment reviews. An analysis of the virtues and shortcomings of different metrics, while interesting, will not form part of my study. More broadly, what I have deduced from the literature is that impact assessment methods, though still inexact in many ways, seek to structure, capture and make meaning of a very diffuse, complex process of knowledge production, transfer, utilization and uptake. Whether more emphasis should be placed on enhancing metrics for more accurate impact capture or on the processes which actually facilitate the exploitation of research to lead to impact, continues to be debated. In my view, beyond issues surrounding methodological capability and accuracy, context also matters. For this reason, a focus on process is more relevant in the context of Caribbean SIDS, given the nature of the wider research environment (which I would characterize as a nascent or emerging research system) and the need to strengthen the mechanisms that enable

research to provide indigenous solutions for national and regional development challenges.

Performance assessments and rankings directly and indirectly put pressure on institutions (and individuals working there) to meet stipulated goals. Elton (2000, p.276) emphasizes that '…all performance indicators distort performance'. This is a cautionary message for Caribbean SIDS where the absence of a *critical mass* of indigenous knowledge in key areas affects the potential of research to influence economic and social development. Research impact measurement, if applied through a type of national assessment, could therefore bring perverse incentives that cause researchers to focus almost exclusively on meeting set targets at the expense of valuable knowledge production and the pursuit of knowledge exchange, knowledge uptake and translation opportunities; a scenario that Oancea (2013) facetiously describes as 'hitting the target but missing the point' (p. 248). In Caribbean universities, therefore, we must be careful not to cause research impact indicators to become the goal of our research endeavours.

2.5.6 (ii) Measuring what counts

Capturing and measuring societal impact relies heavily on proxy indicators. Proxy indicators cannot provide a complete assessment of a variable and thus, there are limitations on the conclusions that can be drawn (Majchrzak 1984). If we understand impact to mean 'change' or 'benefit' to society, then the proxy indicators used in research assessments should seek to capture exactly this. In many instances, however, this is not the case. However, as observed with research assessments like the REF, these tend to be heavily slanted towards an evaluation of the university's public engagement efforts. Watermeyer (2012) explains that:

> 'HEFCE proposes 'reach' and 'significance' when assessing the societal impact of academic research. Within the subtext of these qualifiers is an intimation that what REF will scrutinize is less the capability for research to implement change

> and more the success and durability of its interlocution between academic and non academic actors that might culminate with change…' (p. 120)

This reflects a disproportionate focus on evaluating the results from researchers' interactions and engagement with others, over the processes through which research helps to bring about change or the actual benefits generated by the research. Thus, in examining how RDI Fund researchers seek to achieve impact, my review of the literature has reaffirmed that a distinction should be made between research dissemination, public engagement, research brokerage and research uptake – all very essential elements for ensuring that research brings benefits to stakeholders – and research impact itself. While my research study does not attempt to measure impact, understanding these distinctions is fundamental not only to better understand research impact processes, but also to ensure that these activities, themselves, are not conflated with impact.

Moreover, knowing what counts in research processes (as opposed to what can be counted) is heavily influenced by the context. The full range of benefits (direct and indirect, tangible and intangible) cannot be understood without a prior understanding of the micropolitics of the research site or beneficiary community. Thus, research metrics and impact assessments, which prioritize outputs and results over processes, learnings and other intangible aspects of knowledge mobilization and exchange (Morton 2015) risk capturing some dimensions of research impact while omitting or overlooking others. It is this 'broader and richer picture' (Watermeyer 2012, p. 126) of impact that my study seeks to explore.

2.6 Exploring Conceptual Models

Various models for knowledge transfer, knowledge utilization and research impact exist in the literature. This section mentions some salient examples that are relevant to my research study. Lavis, Robertson et al (2003) propose 3 models of knowledge transfer depending on the degree to which it is researcher-directed: researcher-push, user-pull and exchange. Newman and Conrad's (2000) General Knowledge Model focuses on the four

primary activity areas of knowledge flows, namely: knowledge creation, retention, transfer and utilization. The Payback Framework developed by Buxton and Hanney (1994) presents a logic model that connects the various stages of the research process to the different categories of paybacks or multidimensional benefits derived from research. Their model incorporates multiple feedback loops catering for the non-linearity of research processes. The Payback Framework was developed originally to trace impact in the area of healthcare research but has since been adapted and applied to impact assessments in other disciplines such as social sciences and the humanities (Donovan and Hanney 2011).

The Productive Interactions Framework in SIAMPI (the Social Impact Assessment Methods project) seeks to overcome challenging methodological issues surrounding extended time lags and attribution by focusing on contributions made by research at different stages of the research process. It focuses on collecting data on 'productive interactions' between researchers and stakeholders, which fall into three main categories: direct, indirect and financial (Spaapen and van Drooge 2011). While this framework is useful for examining the processes and relationships between key actors involved in research processes, it goes beyond the scope of my study in seeking to assess 'efforts by stakeholders to somehow use or apply research results or practical information or experiences' (p. 213). My study is primarily concerned with the lessons that can be learnt from the experiences of the researchers in seeking to 'operationalize impact' in T&T and related issues such as the strategies used, challenges encountered and mitigating measures.

Based on my review of the various models, I have found that the conceptual framework developed by Meagher et al (2008) is the most useful for my research study. Cognizant that one of the main pitfalls of the impact agenda is a failure to bypass a performance culture that suggests that everything must be measured' (Watermeyer 2012, p. 126), I have chosen to prioritize the processes involved in seeking to achieve societal impact.

According to Alavi and Leidner (2001), knowledge is a process and this implies a focus on 'knowledge flow and the processes of creation, sharing, and distribution of knowledge' (p. 110). I am also guided by the reasoning that '…it may be inappropriate to measure something which one has not deliberately tried to bring about' (Meagher et al 2008, p. 171).

2.6.1 Meagher, Lyall and Nutley's (2008) Flows of Knowledge Conceptual Framework

The conceptual framework established by Meagher et al (2008) (henceforth referred to as Meagher's (2008) Conceptual Framework) adopts a forward-tracking methodological approach, from research production to research utilization to research impacts. It focuses on the main actors in knowledge transfer and exchange processes and 'the likely flows of knowledge, expertise and influence between them' (Meagher et al 2008, p. 166). The main knowledge actors include groupings of knowledge producers, knowledge brokers and intermediaries, knowledge users and knowledge beneficiaries. The conceptual framework positions these groups of knowledge actors within a wider context characterized by societal issues, external influences and national and local research cultures. The flows of knowledge as well as the interactions between these actors are considered 'indications of connectivity', which could serve as proxy indicators of impact. For the purpose of my research study, knowledge flows are understood as 'the set of processes, events and activities through which data, information, knowledge and meta-knowledge are transformed from one state to another' (Newman and Conrad 2000, p. 2).

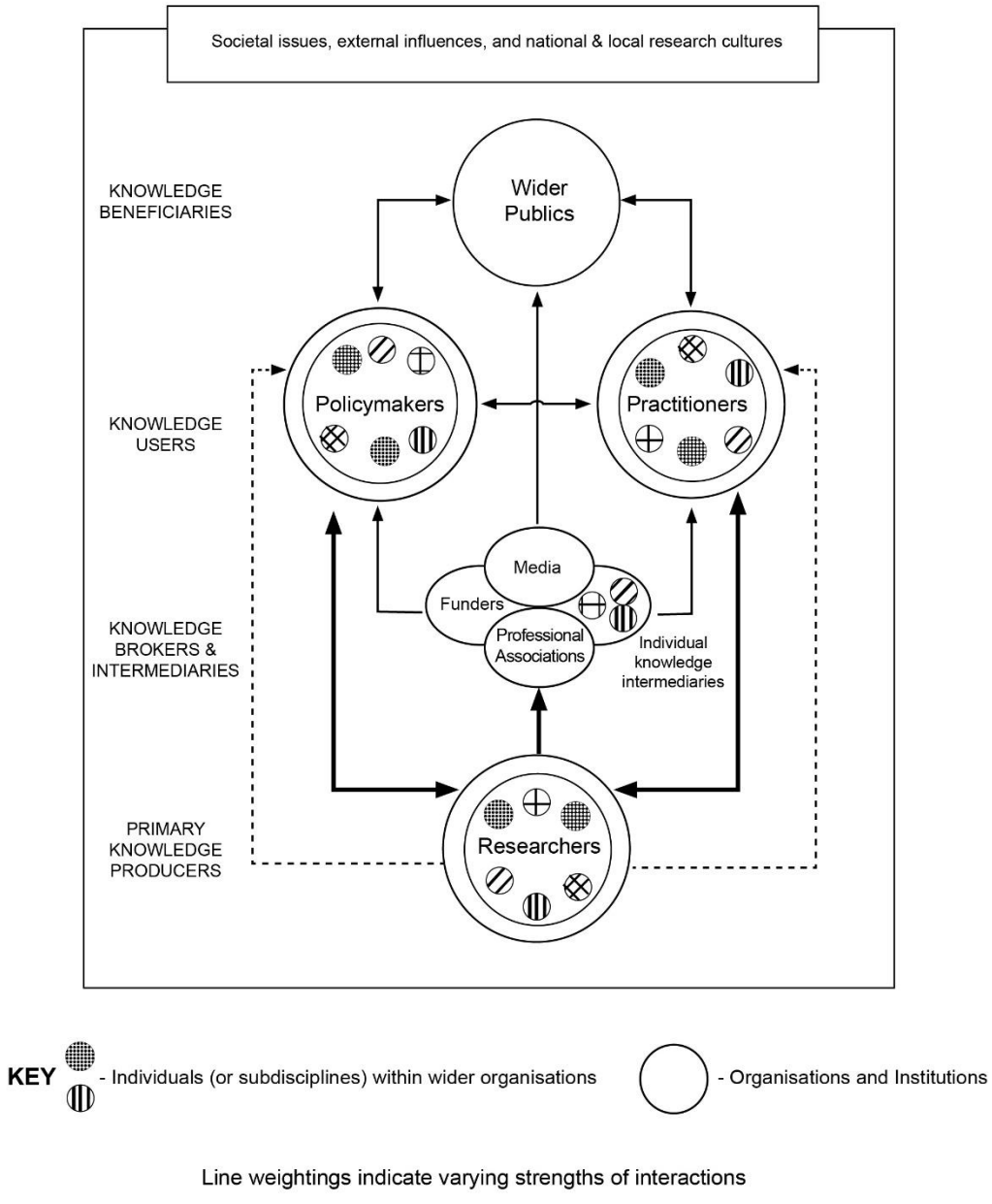
Meagher's (2008) Conceptual Framework uses line weightings to distinguish the varying strengths of interactions between the different actors in the knowledge flow processes. Beginning with the primary *knowledge producers* (researchers), the framework depicts a uni-directional flow of knowledge to *knowledge brokers and intermediaries*, encompassing multiple groups such as funders, professional associations, the media and also individual knowledge intermediaries. There is a simultaneous flow of knowledge

from the knowledge producers (researchers) to the knowledge users (policymakers and practitioners). This flow is depicted as a two-way flow from knowledge producers to users. At the same time, two-way knowledge exchange occurs among different groups of *knowledge users* (i.e. researchers, policymakers and practitioners) to share findings and receive feedback or insights for new research areas. Knowledge also flows *from the knowledge intermediaries and knowledge users*, with these two groups engaging in their own processes of knowledge exchange. Another set of knowledge flows and exchanges occurs *between the intermediaries and knowledge beneficiaries* in the wider public as well as between the public and the policymakers and practitioners. All of these flows and processes happen within an external environment depicted by the outer frame of Figure 1 (below), which represents the wider societal issues, external influences and national/local research cultures.

Other analytical frameworks I reviewed are much more narrowly focused on tracing the outputs, benefits or contribution of the research with little emphasis on the processes or the context. The iterative process of knowledge flows and stakeholder interactions that underpins Meagher's (2008) Conceptual Framework is reflected in the processes through which RDI Fund projects execute their activities in an effort to achieve societal impact. A diagram depicting the model developed by Meagher et al (2008) is reproduced below:

Figure 1

Conceptual Framework for Research Impact Assessment developed by Meagher, Lyall and Nutley (2008)



Source: Meagher, Lyall and Nutley 2008, p. 166.

In her 2014 presentation at the RURU Workshop on Evaluating Knowledge Mobilisation, Meagher stresses the importance of recognizing subtleties, ranges and dynamics in our approaches to evaluating knowledge mobilization and impact. She emphasizes the need to capture subtle indicators, factors and roles, to identify the full range of impacts and to be alert to longer-term processes, what she refers to as 'unfolding impacts over time' (Meagher 2014). This conceptual framework is particularly useful for my research study because it presents a system-wide overview (as opposed to a project-specific lens) that focuses on processes (not research outputs or outcomes), which aligns closely with my research study. It also helps me to identify the contact points, relationships and flows of knowledge between the main actors and entities at different stages of the research process, which serve as pathways to facilitate the exchange of knowledge. It is through these processes that knowledge is mobilized and exchanged, that potential research users are engaged and that opportunities are created for generating an impact on policy, practice, new products and services, new ways of thinking, etc.

While Meagher's (2008) model has been quite helpful in facilitating a better understanding of knowledge flows and engagement processes, I do recognize its limitations. The authors themselves mention challenges posed by the type of research awards included in the sample, the time lag for detecting impacts on policy and practice as well as the difficulty with attributing a specific impact to a particular project's research findings. In my view, the graphical representation of Meagher's (2008) Conceptual Framework, as currently presented, when applied to RDI Fund research projects, fails to adequately capture the complexity of the forces and dynamics at play in the research to impact processes, particularly in the context of Caribbean SIDS. Firstly, it seems to assume that knowledge creation, defined as 'activities associated with the entry of new knowledge into the system' (Newman and Conrad 2000, p.2), begins with or emanates from researchers as the primary knowledge producers and thus, while other stakeholders such as policymakers, practitioners, the wider public etc., are involved in channeling knowledge flows, they are not represented in the framework as co-creators of knowledge. Neither is the flow of knowledge from research back to teaching and

research endeavours explicitly identified as an important flow in knowledge systems. In the case of RDI Fund projects, postgraduate students and other researchers are considered key knowledge actors who contribute to generating knowledge flows on the research topic even beyond the life of the project.

Secondly, the framework does not depict any direct interface between researchers and the wider public and seems to imply through the direction of connecting lines and arrows, that the flow of knowledge between researchers and the wider public is or should be mediated through knowledge brokers (funders, professional associations, media, etc.) and knowledge users (policymakers and practitioners). This is not necessarily the case in T&T, where research intermediary institutions exist but are few and still very young, too small, under-resourced or insufficiently engaged (Guinet 2014) to be able to effectively execute critical knowledge transfer or knowledge brokerage functions. Moreover, it should be highlighted that in T&T and Caribbean SIDS, because of their small populations, the 'distance' between knowledge producers and knowledge users and beneficiaries tends to be much shorter because of informal networks and familial relations, thus facilitating closer interaction between these groups which can support faster knowledge exchange. The key persons who can assist with decisions on facilitating knowledge to policy and practice processes are usually more easily identifiable and more accessible than in large Western countries, thereby increasing the opportunities for fostering flows of knowledge, once the processes for strategic public engagement and knowledge brokerage can be clearly mapped out, understood and executed as part of the research process.

Thirdly, while I recognize that graphical representations cannot fully capture the dynamic human element, the diverse external environmental factors nor the recursive nature of knowledge exchange processes, one major shortcoming in Meagher's (2008) Conceptual Framework is the fact that it projects the 'wider societal issues, external influences and national and local research cultures' in an outer box, without any directional lines or

arrows, which, in my view, implies a static or neutral external context. A more realistic depiction would have included arrows between the external environment and the 'knowledge system', on all four sides of the rectangular frame, to represent the environmental, institutional, political and cultural forces occurring in the university, the research community, local institutions, the research environment and wider society. These factors are real; they are broader and more complex than Meagher's (2008) 'societal issues, external influences and national and local research cultures' (p. 166). In effect, these factors present enabling or oppositional forces that affect the flow of knowledge.

As with other types of flows, knowledge flows have an energy (Zhuge 2006) or force, which when met with an enabling force at the micro, meso or macro levels in the external environment inevitably gains increased potential energy and momentum. These enabling forces would move in the same direction as the knowledge flows and are, therefore, already captured in the arrows between knowledge producers, intermediaries, users and beneficiaries. However, when knowledge flows are confronted by oppositional forces such as societal, cultural and political factors and challenges at the micro, meso and macro levels, these obstruct the flow of knowledge between knowledge actors, thereby negatively affecting opportunities for knowledge brokerage and in turn, the potential for societal impact. This is not captured in Meagher's (2008) Conceptual Framework. I have included this very important dimension in my conceptual framework (Figure 2) and have sought to represent the oppositional forces as 'countercurrents' to knowledge flows. In so doing, my conceptual framework provides a more accurate depiction of the dynamics among knowledge producers, users and beneficiaries (who all produce knowledge flows) *as well as* the forces at play at the micro (researcher/individual), meso (institutional) and macro (societal, political, cultural) levels, based on the experiences of STA Campus researchers executing RDI Fund projects.

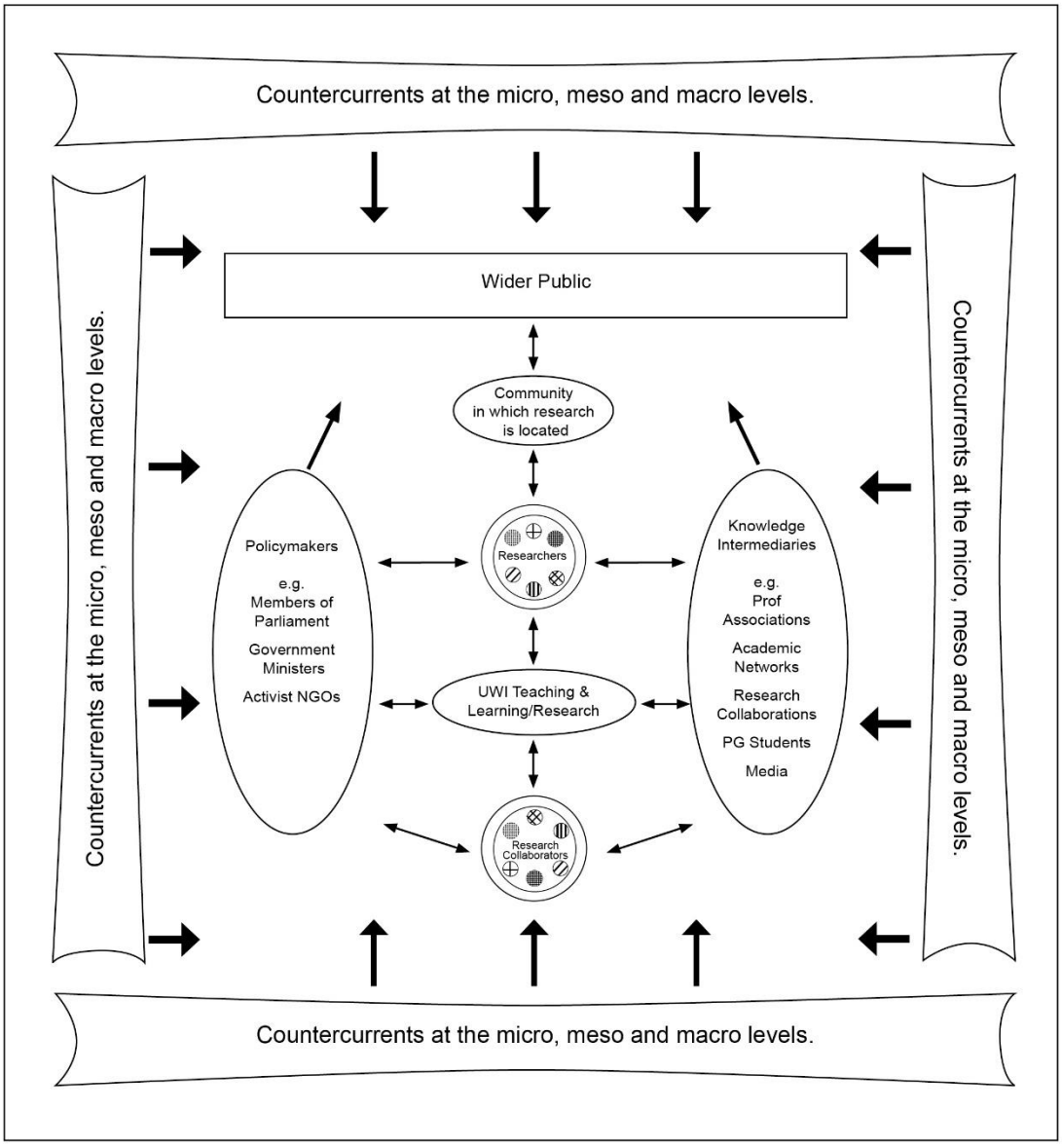
I believe that in order to achieve societal change, knowledge flows must be effective, and in order to be effective, knowledge must flow easily and consistently between actors in the knowledge system. Akin to the gravitational potential energy of water as it flows along a river or through pipes, it is essential that knowledge be allowed to flow from a position of high potential energy to a position of low potential energy (Zhuge 2006). Zhuge (2006, p. 2068) goes further to emphasize that in order for a knowledge system or knowledge team to be effective, 'knowledge must flow to where it is needed'. However, this does not happen automatically. In fact, in any knowledge system, the micropolitics of the research community comprises diverse forces that exist at multiple levels. This implies that researchers not only have to be equipped to map out the societal, cultural and political dynamics of the research community and identify anticipated opportunities and challenges at the micro, meso and macros levels, they also need to be adept at executing strategies to maximize opportunities presented by enabling forces and mitigate countercurrent forces by reducing blockages to knowledge flows, if they are to increase their chances of achieving societal impact.

In my own Conceptual Framework below (Figure 2), I have incorporated a deliberate shift from Meagher's (2008) linear flow to a more *circular* flow among the knowledge actors, with researchers being placed at the centre of the diagram and the practitioners, policymakers, knowledge intermediaries, research collaborators/practitioners, UWI teaching and learning/research (staff and students) and the research community positioned on all sides of the researchers to demonstrate the *shorter distance*s between knowledge actors in Caribbean SIDS as well as the multiple pathways for interaction and engagement with each other and the wider public. I have also included the university's *teaching and learning* as well as research function as a key component of the knowledge system. In my conceptual framework, the researchers *at the centre* are UWI researchers and may be part of an *expanded research team* incorporating other research actors interacting with UWI researchers in a *dynamic* way to facilitate knowledge exchange and co-production of knowledge (as depicted in Figures 5 and 6). The enabling or driving forces in the wider research environment are subsumed in the directional arrows of the

knowledge flows as these forces allow knowledge to flow more efficiently and effectively from a position of high potential energy to a position of low potential energy. Countercurrent forces, on the other hand, whether at the micro, meso or macro level, are depicted on all four sides of the knowledge system with bold arrows reflecting the oppositional force exerted on the flows of knowledge among knowledge producers, intermediaries, users and beneficiaries. While it is not possible to depict every instance in which an *oppositional force* arises as knowledge tries to flow from one user to another, the diagram seeks to highlight the myriad countercurrents that occur at all stages and at all levels of the research process in RDI Fund projects in T&T. One additional detail worth noting is that intra-personal knowledge flows that reinforce tacit knowledge are not depicted in the diagram but rather, are captured in the descriptive text. Furthermore, while Meagher et al (2008) refer to flows of knowledge, expertise and influence in their analysis, my conceptual framework seeks to map knowledge flows and forces and for the purpose of this research study treats expertise and influence as subsumed within knowledge flows.

Figure 2

Conceptual Framework Mapping Knowledge Flows and Forces in RDI Fund Projects in Trinidad and Tobago



For each of the embedded case studies outlined in Chapter 4, my conceptual framework has been applied with a view to highlighting the actual processes involved in the flows of knowledge that occurred in the execution of selected RDI Fund projects in the T&T context. To achieve this, I have made small adjustments to Figure 2 to more accurately capture the flows of knowledge as they occurred in the respective RDI Fund projects (Figures 4, 5 and 6). In extending Meagher's (2008) Conceptual Framework to bring the forces in the wider environment more centrally in the analysis of knowledge flows, the importance of the micropolitics of research has been underscored. The application of my conceptual framework to RDI Fund projects also brings more clearly into focus the intense pressure that multiple countercurrents exert simultaneously on research processes in T&T, which if not recognized and addressed, can undermine researchers' best intentions with regard to achieving societal impact.

2.7 Relevance to my research

By drawing on and extending Meagher's (2008) Conceptual Framework to incorporate a deliberate focus on oppositional forces at the micro, meso and macro levels that obstruct efficient and effective knowledge flows, I have been able to develop a conceptual framework that not only examines the interconnection of groups of research actors at different stages of the research process and the flows of knowledge and expertise that lead to the mobilization, utilization, uptake and translation of knowledge but also to better understand the environmental factors that facilitated or inhibited these knowledge flows in the context of RDI Fund projects in T&T. In so doing, I not only achieve a deeper understanding of the processes and pathways through which knowledge flows from producers to users but more importantly, I am also able to identify the factors or characteristics that exist in small Caribbean societies such as T&T, which serve as accelerators for or countercurrents to moving research into the policy and practice domains. My research study therefore challenges assumptions made about research, knowledge and impact, particularly in the context of Caribbean SIDS and provides a conceptual framework that brings together the factors and forces surrounding knowledge, power, ideas and funding in a context characterized by ambivalence, dissonance and

other historical and structural 'conditions of disadvantage' (World Bank 2000). I believe that this unique analytical lens would provide new insights for strengthening the capacity of university researchers to better understand and better navigate the micropolitics of research in Caribbean SIDS.

Summary

This chapter outlined the rationale for adopting a postcolonial perspective in my analysis of research and societal impact in T&T. It underscored the way in which financial and political power have been complicit in the perpetuation of hegemonic ideologies and interests, particularly in former Caribbean colonies and are manifested in the political and contested nature of research, knowledge and impact as well as their related institutions, frameworks and processes. Key concepts surrounding research, knowledge and impact, including various terms associated with the knowledge transfer process, were interrogated, explained and applied to the context of my research study. The contested nature of the research agenda was elucidated and the co-existence of multiple factors that exacerbate the complexity of impact were outlined with a view to unravelling the problematique of research impact, both in theory and practice. In order to better appreciate the routes through which knowledge actually flows to produce societal impact, various conceptual frameworks were explored. Meagher's (2008) conceptual framework for research impact assessment was highlighted as a useful model that depicts flows of knowledge. Building on this model, I have developed my own conceptual framework that seeks to better capture and map out the environmental factors at the micro, meso and macro levels as countercurrent forces, which are present in the research communities of RDI Fund projects, hence potentially affecting the efficiency and effectiveness of knowledge flows and in turn, the achievement of societal impact.

CHAPTER 3: ON METHODOLOGY AND METHODS

3.1 Introduction

This chapter outlines the methodological orientation of my research study as well as the methods used for data collection and analysis. The aim of the chapter is to make explicit the approach, methods, characteristics and assumptions of the main case study of the RDI Fund as well as the embedded case studies or 'vignettes' of selected RDI Fund projects and to provide a theoretical justification for the methods used in conducting my research study. In preparation for the presentation of my findings in Chapter 4, key methodological issues that are relevant to my analysis of the data - such as rigour, positionality, reflexivity, context, culture and interviewing elites - are interrogated. This assists in presenting a fuller picture of methodological considerations which were taken into account in my investigation of the processes for achieving the societal impact of research in T&T and in demonstrating coherence in my research design, data generation, data analysis and presentation of findings. The potential limitations of my study as well as the imagined audiences who would be interested in or benefit from this study, are also discussed in this chapter.

3.2 Worldview and research paradigm

Researchers bring their ways of thinking, assumptions and worldviews to bear when conducting research. This is often broadly described as a knowledge claim or paradigm. It refers to the set of beliefs that define a researcher's worldview and guide his or her actions (Guba 1990). Research paradigms influence the ontological, epistemological, methodological and axiological stance taken towards a research study (Lincoln and Guba 2013, p. 37). In examining how research can achieve societal impact, I had to confront the dominance of the positivist paradigm that underpins the managerialist approaches to higher education management, research impact assessment and research evaluation, which have all fed into the impact agenda, as outlined in the previous chapter. Positivism is premised on the view that there is one objective truth, which is proved through scientific methods. Research is considered to be a value-free activity and a

researcher's values should be kept distant from their investigation (Guba 1990). Positivism has influenced the neo-liberal, public managerialist discourse of many governments, research councils and multilateral funding agencies and their position vis à vis research impact metrics being used to determine research funding allocations. Crossley (2008) criticizes the positivist assumptions about the nature (and transferability) of knowledge and the close alignment of the powerful, contemporary evidence-based policy movement to neo-liberal policy agendas, emphasizing that this is particularly worrying for small states given that embedded in this movement is a tendency to transfer international 'best practices' that could be inappropriate for small states.

As a Caribbean national who has had the experience of living and working both in Europe and North America, my own worldview is shaped by the belief that the socio-economic, cultural and environmental challenges facing Caribbean SIDS are not caused merely by the lack of development. Rather, they are the result of complex historical circumstances (Rist 1997, p.79), which have served to severely burden these small states with excessively high debt levels (in some cases as high as 145% (Barbados) based on debt to GDP ratios (CDB 2016), highly concentrated economies, weak institutions and high levels of vulnerability, inequality, unemployment and crime. In Chapter 2, I explained that from a postcolonial perspective, the UWI has a critical role to play in shaping the Caribbean's future development trajectory. To effectively execute this role, the work of the university will need to extend beyond traditional teaching and research to embrace new areas such as knowledge brokerage and to adopt a more systematic approach to knowledge mobilization, public engagement and knowledge translation, given the importance of the 'enlightenment effect' in sustaining knowledge flows for societal impact. This is the rationale for my investigation into the pathways and processes that can strengthen the societal impact of UWI research in T&T.

Guba and Lincoln (1994) describe a paradigm as '…a worldview that defines, for its holder, the nature of the 'world', the individual's place in it, and the range of possible relationships to that world and its participants' (p. 759). Morrison (2012) refers to a

paradigm as a ‘set of beliefs or epistemological assumptions’ that guides how ‘research evidence might be understood, patterned, reasoned and compiled’ (p. 3). Given my recognition of the influence of historical and geo-political factors on the internal dynamics of former colonies in the Caribbean and my interest in examining subjective experiences within the real-life context of the RDI Fund, my research paradigm is situated within the overarching anti-positivist paradigm, more specifically oriented towards interpretivist/constructivist principles, yet maintains a critical realist perspective. By this, I mean that in conceptualizing and implementing my research project, I was mindful of building an understanding of a world in which the research participants at the micro level, the UWI as an institution at the meso level and T&T as the wider macro environment shaped by its historic, political and cultural factors, all simultaneously determine the inter-relationships and outcomes of RDI Fund research processes. This approach resonates with what Archer (2010) describes as an ontological realism that accepts ‘a form of epistemological relativism or constructivism’ (p. 151).

3.3 Interpretivism, realism and critical realism

My study on RDI Fund researcher experiences is anchored in the interpretivist paradigm because this paradigm projects an understanding of the world based on multiple and varied subjective meanings and experiences (Creswell 2003). It is concerned with producing reconstructed understandings (Denzin and Lincoln 2003) of the processes for generating societal impact while recognizing the co-existence of unique and multiple realities based on each researcher’s individual experience. Assumptions surrounding constructivism include: meanings are constructed by individuals as they engage with the world they are interpreting; individuals make sense of the world based on their historical and social perspective; and meaning is always social as it emerges from interaction with a human community (Crotty 1998). Thus, interpretivism/constructivism supports inductive reasoning, whereby I am able to gather data which can then be useful for building ‘concepts, hypotheses, or theories, rather than deductively testing hypotheses as in positivist research’ (Merriam and Tisdell 2016, p. 17).

The theoretical and philosophical foundations of interpretivism/constructivism have been traced to the works of several authors such as Schutz, Weber, Winch, Heidegger, Gadamer, Geertz, Goodman, Guba and Lincoln (Denzin and Lincoln 2003). It assumes a relativist ontology and methodological procedures that are set in the natural world, with the typical positivist criteria of internal and external validity, reliability and objectivity being replaced by credibility, transferability, dependability and confirmability (Denzin and Lincoln 2013). Trustworthiness is an important criterion for qualitative research and has to do with the quality of an inquiry; whether the findings and interpretations can be trusted and whether they have been drawn based on a systematic process (Lincoln and Guba 1985). Later, authenticity was given greater emphasis (over trustworthiness) as 'a more appropriate standard for the relativist and value-bound nature of naturalistic research' (Guba and Lincoln 1994). Authenticity emphasizes the importance of qualitative research upholding principles of fairness to the values and views of stakeholders, consciousness-raising, increasing awareness of researcher and participant values and differences as well as conducting research that could provoke action and change (Armour, Riveaux and Bell 2009, p. 103). These are important concepts, which will be discussed later in this chapter.

Realism contends that 'there is a real world with which we interact, and to which our concepts and theories refer' (Archer 2010, p. 150). Over the past five decades or so, realism has held a prominent position in the philosophy of science as well as other areas of philosophy (Kulp 1997). Across its diverse strands, realism, in general, asserts that the existence of entities is independent of our perceptions and theories of them (Phillips 1987). Objective knowledge is denied and the possibility of alternative accounts is recognized as grounded in different perspectives and based on knowledge that is partial and fallible (Archer 2010). Critical realism, in particular, drawing on the work of Bhaskar (1978, 1989), has made significant contributions to social science research. Its assumptions include the notion that the production of knowledge is a social practice; that the world is differentiated and stratified; that natural and social objects in the world have powers and ways of acting that are independent of our conceptions of them; that social

phenomena can be interpreted though a researcher's frames of meaning and that these phenomena exist regardless of that interpretation; that entities have causal powers and liabilities; that social science must be critical of its object; and that it has emancipatory potential (Bhaskar 1989, Easton 2010, Archer 2010).

Where interpretivism and critical realism coincide is around the importance of meaning. For while realism rejects the notion of multiple realities or 'independent and incommensurable worlds in which different individuals or societies live' (Archer 2010), it does, however, recognize that there are multiple perspectives of the world, which are held by those being studied as well as researchers themselves and that physical and behavioural phenomena do have explanatory significance and can influence the interpretive nature of our understanding (Sayer 2000). Thus, a critical realist perspective is not only compatible with the interpretivist methodological approach for my research study, it is also helpful in that it supports the point of view that phenomena have intrinsic meaning which cannot be *counted* but rather, must be *understood* (Sayer 2000) and that in order to achieve a fuller understanding, one needs to examine the ways in which *context* impacts on and conditions social interactions.

Critical realism prioritizes context and the notion that social and physical contexts have a causal influence on individuals' beliefs and perspectives. Maxwell and Mitapalli (2010) assert that this is a notion that constructivism has tended to deny and which, positivism and some forms of post-positivism, have tended to dismiss. The recognition of the influence of context and the role it plays in shaping meaning and experiences, however, is crucial to my analysis of how research can achieve societal impact in a former colony in the Caribbean. The notion of context is further problematized when considered as a causal mechanism and when the contingent relationship between causal mechanisms and their effects (Pawson and Tilley 1997) is examined. It is therefore not simply a matter of asserting that a causal relationship exists between a phenomenon and its context; more

fundamentally, it must be recognized that the context within which a causal process occurs is also intrinsically involved in that process (Sayer 2000).

3.4 Relevance to my research study

In my view, an interpretivist approach that maintains a critical realist perspective enables me to achieve a fuller appreciation of these complexities. Given the purpose of my research study and the rich, deep and complex dimensions of interpretivism/ constructivism (Schwandt 1997), I consider this research paradigm well-suited for my study. It allows me to delve into the individual realities of each researcher, to understand the contours and nuances of each research project, the research discipline, context, participants, reactions, relations, challenges, unanticipated developments and outcomes and then connect these back to the overarching goal of the RDI Fund to achieve societal impact in Trinidad and Tobago. It also recognizes the link between the 'enlightenment effect' of knowledge, the emancipatory potential of social science research (Bhaskar 1989) and the importance of human agency, all of which are essential if UWI research is to lead to societal impact.

This methodology allows me to unpack the issues and challenges that are experienced by researchers at the micro (individual), meso (institutional) and macro (wider national research environment) levels. My decision to use the case study method to examine the RDI Fund was based on my recognition that 'case research allows the researcher the opportunity to tease out and disentangle a complex set of factors and relationships' (Easton 2010, p. 119) and that given the 'context dependent nature of the knowledge which case studies unearth' (Case and Light 2011, p. 191), this in effect would be 'the source of its methodological strength' (Ibid.).

3.5 Methodological orientation

My research study goes beyond the 'counting culture' (Lincoln and Guba 2013) typically associated with the impact agenda and focuses on seeking to understand researcher experiences, which are influenced and shaped by environmental and contextual factors and the university's interaction with society in a Caribbean small state. It maintains that 'social reality is relative to the individuals involved and to the particular context in which they find themselves' (Lincoln and Guba 2013, p. 39). It is located within the broad spectrum of educational research whose aim is not solely enquiry but more importantly, '…critical enquiry aimed at informing educational judgments and decisions in order to improve educational action' (Bassey 2012, p. 155). It employs a research strategy whose methodological approach is situated within the overarching anti-positivist paradigm, more specifically oriented towards interpretivist/constructivist principles. Qualitative methods were employed with a view to producing an in-depth case study of the RDI Fund with embedded mini case studies of individual researcher experiences with specific RDI Fund projects.

The RDI Fund promotes research that addresses a development issue with the aim of generating societal impact. Many research impact assessment frameworks focus on outputs and proxy indicators of impact. However, as mentioned earlier, I am cognizant of the limitations of the wider research context of Caribbean SIDS and the time lag typically needed for impact to manifest itself. This study, therefore, is an investigation into processes and experiences. By analyzing RDI Fund researcher approaches to achieving societal impact, it goes beyond the 'what' to get a fuller understanding of the 'how' and the 'why' (Yin 2003). My study has been guided by three research questions (RQs):

RQ#1: What are the characteristics of research impact that the RDI Fund seeks to achieve?

RQ#2: What strategies were used by RDI Fund researchers to facilitate knowledge flows among key stakeholders?

RQ#3: From the perspective of the RDI Fund researchers, how can the STA Campus enhance the societal impact of its research?

3.6 Research Strategy

3.6.1 Main Case Study

The case study research strategy is often used when researchers want to acquire an in-depth understanding of a phenomenon, situation, event or programme. There are many definitions of a case study; those that focus on a case study as a research process resonate the most with me because of their affinity to my research study. For instance, Yin (2014, p.16) defines a case study as 'an empirical inquiry that investigates a contemporary phenomenon (the 'case') within its real-life context' and views the case study design as a useful approach when dealing with situations in which it is difficult to separate the phenomenon's variables from their context. Merriam (1998) contends that a case study is anchored in real-life situations and is a means of investigating complex social units comprising multiple variables, thus resulting in rich, holistic accounts of a phenomenon. Campbell, Svensen and Roman (2016, p. 1265) view case studies as 'an appropriate methodology when detailed and holistic investigation of phenomena is used to build upon existing theory'.

I chose a single case study approach for my analysis of the RDI Fund as the instrument that established an operational framework and provided dedicated support for research projects of the STA Campus aimed at achieving societal impact. Within the wider institutional context of my study, the RDI Fund is treated like a single, bounded unit for the purpose of examining the main characteristics of research impact that the Fund seeks to achieve. The case study enabled a deliberate focus on the examination of these characteristics with a view to answering my first research question (RQ#1). It is important to point out that within my main case study, there are also embedded case studies that re-narrate the experiences of some of the researchers who sought to achieve

societal impact through the deliberate strategies of their RDI Fund projects, thereby providing evidence for my second research question (RQ#2).

3.6.2 Embedded Case Studies

Embedded case studies refer to cases involving more than one object or unit of analysis (Scholz and Tietje, 2002). They allow for more detailed inquiry. Yin (2003) highlights that embedded case studies allow researchers to place specific attention on a smaller unit or several smaller units of analysis within a single case, citing the example of a case study about a single public program in which the sub-unit level of analysis may include outcomes from individual projects within the larger public program. This is very similar to the approach taken for my research study where the larger case study is the RDI Fund as the overarching mechanism for promoting research with societal impact and the embedded cases are the individual RDI Fund projects through which the objectives of the RDI Fund are operationalized.

My embedded case studies, also referred to as 'vignettes', re-present the experiences of researchers who implemented specific RDI Fund projects. Three RDI projects were selected using a purposive sampling method because this method allows the researcher to identify cases that are most closely associated with the questions the research study is seeking to answer (Teddie and Yu 2007). With purposive sampling, as contrasted with probability sampling, representativeness is not the goal, but rather the focus is on the relevance of the information that can be gathered from the selected units for analysis (Maxwell 1997). The selection of the units or participants is not done randomly neither is it based on convenience, that is to say, the availability and willingness of the participants or ease of access to information on the units. Instead, the underlying purpose in this selection is to elucidate the unique and special characteristics of each RDI Fund project as the respective researchers interact with different groups of knowledge actors within the wider research context to implement a research project that seeks to achieve societal impact in T&T.

Within the range of purposive sampling techniques, I have chosen to employ the technique that focuses on unique and special cases (Teddie and Yu 2007) as each of these three RDI Fund projects is an intrinsic case study in itself (Stake 1995) and reveals important dimensions that are critical to an understanding of the processes for achieving societal impact in T&T. These embedded case studies are also considered critical cases (Etikan, Mousa and Alkassim 2016) with each having important characteristics for understanding the phenomenon of societal impact in the T&T context. Each of the three RDI Fund projects selected addresses a different development priority (under the Fund's six thematic priority areas); one focuses on climate change and environmental issues (thematic area 1); the second corresponds to technology and society: enhancing efficiency, competitiveness, social and cultural well-being (thematic area 6), while the third seeks to address economic diversification and sector competitiveness (thematic area 3). These researchers thus approach impact from different disciplinary lenses and their research is grounded in diverse epistemological and methodological underpinnings, spanning three UWI Faculties. Nationality, gender and years of experience as a researcher are all key considerations when examining researcher experiences at the micro level as they influence the approaches used by researchers and colour their experiences when navigating the micropolitics of research communities. This information is presented later in this chapter in Table 2. It was thus important to keep these individual characteristics and traits in mind when analyzing the embedded case studies. However, further analysis on how gender, nationality and years of experience could have influenced the execution of the project or the achievement of societal impact is outside the scope of this study.

While purposive sampling allows for closer examination and deeper information from a small number of carefully selected cases (Patton 2002), I am mindful that the selection and analysis of the cases are based on my individual judgment. I have carefully reviewed all RDI Fund projects and selected the projects for my embedded case studies not based on any perceived notions of success or failure of the project but rather, based on

characteristics that were most relevant to depicting research processes that supported stakeholder engagement and knowledge flows. Furthermore, in seeking to preserve the anonymity of my research participants and respect the research ethics principles underpinning my study, I have used pseudonyms for the researchers and fictitious place names in an effort to anonymize more salient distinguishing characteristics of each project. I have also chosen not to use quotes that can be attributed to any specific research participant. Sentiments shared by several research participants were captured as a collective to highlight consistency or consensus on a particular viewpoint. In instances where there was a differing opinion worth highlighting, this was done without reference to the specific RDI Fund project as this could potentially compromise the anonymity of the research participant.

These embedded case studies facilitated a deeper understanding of the strategies employed by RDI Fund researchers to facilitate knowledge flows (RQ#2) as well as provided important insights for my third research question on ways to enhance the societal impact of research at the STA Campus (RQ#3). They allowed me to immerse myself in relevant details about executing research projects for societal impact at the project level and to extrapolate from the micro to the macro (Burawoy 1998, Stake 1995). These embedded cases constitute a small purposive sample from the early cohorts of RDI Fund projects examined in my research study. These vignettes serve as a window into the processes of knowledge mobilization, public engagement and knowledge brokerage that facilitate the achievement of societal impact. This diversity among the embedded case studies is important not only to be able to appreciate the nuances in perspectives, processes, outcomes and insights across the different RDI projects, but also to mitigate the potential limitations of my research findings, had I selected RDI projects with similar characteristics, methodological approaches, disciplines, etc.

Using an embedded case study approach has allowed me to conduct more extensive analysis at the sub-unit level with a view to drawing additional insights that could strengthen the main case study. A mix of sources – documents and archival records for

the main case and a combination of qualitative interviews and documents for the embedded cases – helped to give breadth and depth to my study. During the analysis of the data collected, I was mindful of the pitfalls of embedded case studies. For instance, I recognized the need to ensure that not too much attention is placed on the sub-units and in my analysis, I tried to connect the insights from the sub-units to the larger unit of analysis in order to avoid shifting the orientation of the case study, thereby ensuring that the larger unit remains the target of the study (Yin 2003). The challenge with seeking to achieve a holistic perspective from the analysis of the various sub-units was also emphasized by Rowley (2002). Scholz and Tietje (2002) underscored that different methods of knowledge integration should be used in order to facilitate effective data analysis when working with embedded case studies. This was achieved by identifying common themes and propositions emerging from the data, mapping these at the micro, meso and macro levels and also linking the data from the sub-units to these propositions in the wider analysis (Baxter and Jack 2008). The vignettes of RDI Fund projects offer insights into contextual realities that are specific to each project and to the lived experiences of the respective researchers through my interpretation of the perspectives and stories shared by the individual researchers.

3.7 Research Methods

Qualitative research methods in combination with documentary analysis were used to facilitate building a case study of the overarching Research and Development Impact Fund and constructing embedded case studies (vignettes) of selected RDI Fund projects. Documentary analysis allowed for a closer examination of the RDI Fund as an instrument to support research with societal impact while in-depth interviews with researchers from early cohorts enabled a deeper understanding of the strategies employed to bring about change or benefits to society, the challenges faced during the process as well as the outcomes and learnings.

3.7.1 Documentary Analysis

In addition to my review of the literature on topics relevant to my research study, several documents more specifically related to the research environment in T&T, at the UWI, the STA Campus, and in particular, reports related to the establishment and management of the RDI Fund (including annual reports, project progress reports, completion reports and impact reports) were reviewed with the aim of analyzing factors at the macro and meso level that influenced or impacted upon the operation of the RDI Fund. These were all public documents that are either available on institutional websites or were made available by contacting the relevant officials at the UWI and other institutions like the Ministry of Planning, Ministry of Finance, Caribbean Development Bank (CDB), etc. The wide range of documents also made it possible to compile a range of data for the main case study on the RDI Fund, which could then be cross-checked, analyzed and critiqued based on my interactions with my research participants as well as my own professional knowledge and experience. A list of the main documents is provided in Appendix 1.

3.7.2 In-depth Interviews and Interviewing Elites

In-depth, semi-structured interviews with fourteen researchers and research administrators (my research participants) for projects approved in early RDI Fund cohorts were conducted between March and October 2016. Given the well-recognized time lag for research to translate into societal impact (Watermeyer 2014, Godin and Doré 2005, Pettigrew 2011 and several others), I chose to focus my interview sample on early cohorts since the majority of these projects were approved in 2012 and 2013 and have since been completed, thus having a range of project outputs and a greater potential for evidence of preliminary impacts or intermediate outcomes. While my research study does not seek to assess the impact of these projects, a focus on the early cohorts was useful in that these researchers would have had time to fully process the experience of having implemented an RDI Fund project as well as distil the results of their knowledge mobilization and public engagement activities. A pilot interview was conducted to do a

dry-run for timing, most optimal sequencing of the questions and possible areas for further probing.

Below is a table outlining the list of research participants interviewed for this study and a brief profile of each research participant to assist with situating them in the context of my case study. Pseudonyms have been used for each interviewee. More detailed notes on the rich perspectives and backgrounds of these interviewees unfortunately cannot be provided as this would compromise their anonymity, particularly given the small research community in which the RDI Fund operates.

Table 2: Pseudonyms and profiles of my research participants

Name	Gender	Profile
Cassie	Female	Mid-career researcher; national
Chris	Male	Experienced researcher and senior research administrator; non-national;
David	Male	Mid-career researcher; national
Gina	Female	Early-career researcher; national;
Jim	Male	Experienced researcher; non-national
John	Male	Experienced researcher; non-national
Lisa	Female	Experienced researcher and senior research administrator; national
Mary	Female	Mid-career researcher; non-national
Owen	Male	Early-career researcher; non-national

Randy	Male	Experienced researcher and senior research administrator; national
Shelly	Female	Early-career research administrator; national
Steve	Male	Experienced research administrator; national
Tom	Male	Experienced researcher; non-national
Rachel	Female	Experienced researcher; national

Access to my research participants was acquired via e-mail requests and a date, time and location agreed for the interview. In all instances, research participants kept their appointment and were quite willing to share information about their project and experience executing the project. An information sheet summarizing my research proposal (Appendix 2) and a participant consent form (Appendix 3) were shared with each participant ahead of the interview. Each participant was encouraged to read these documents before deciding whether they wished to participate and be interviewed. They were advised that the interviews would last approximately 45 minutes but in most cases, the actual duration of the interview was between 60 and 120 minutes. Research participants were assured of the confidentiality of the interviews and of anonymity in the research write-up and submitted their signed consent forms to me either before the interview or on the date of the scheduled interview.

Semi-structured interviews were conducted using an interview protocol as a guide (Appendix 4). The questions were framed to encourage participants to speak candidly about their experiences. A deliberate questioning sequence was employed, beginning with more general questions followed by questions of a more specific nature. This questioning sequence was designed to facilitate an understanding of how environmental factors in the researchers' social and physical context influenced their own experiences

from a critical realist perspective (Archer 2010), while at the same time, exploring relevant 'mental attributes' (Bhaskar 1975) - that is to say, the emotions, beliefs and values of the research participants that shape their perception of reality (Sayer 1992) – and probing issues related to strategies for public engagement and research translation. A specific question focused on the effect the process of implementing a project designed to achieve societal impact had on the researcher himself or herself. This was intended to provide preliminary insight into the agentic potential of his/her research and the personal transformation, which occurred as a result of his/her participation in the RDI Fund research project.

The written guide questions were complemented by additional questions depending on the responses of each participant. My interviewing approach was informed by the principles of elite interviewing. All interviews were conducted in the research participant's office. This was both for their convenience and also to neutralize the perception of authority or reporting pressure since I was the person formerly charged with managing the RDI Fund and the Fund Secretariat was located in the Office of the Campus Principal. All RDI Fund researchers were aware that I was no longer working in the Office of the Campus Principal as I was on secondment to the UNDP when these interviews were conducted. Nevertheless, I believed that it was important to distance my research interviews from any perception of management oversight of the RDI Fund projects and to shift the focus away from any instinctive pressure 'to report to the RDI Fund Secretariat', towards a relaxed discussion about their experiences. By going to the research participants' offices, I sought to neutralize any preconceived power differentials so that our dialogue could be more open and candid. In all instances this was achieved, though to varying degrees. Interviews were audio recorded and later transcribed with the help of a professional transcriber who signed a confidentiality agreement. The transcriptions were reviewed several times to ensure accuracy when cross-checked with the recordings.

As mentioned earlier, interviewing elites is central to my research methodology as it is one of the qualitative methods I used to collect data. I view my research participants collectively as a group of elites because of their status as academics, which typically is regarded with a high level of respect. In postcolonial Caribbean societies, academics are perceived as persons of authority and influence by the general population. There is a wide range of literature by authors such as Aberbach & Rockman (2002), Berry (2002), Desmond (2004), Hunter (1993), Kezar (2003), Kvale (2006), Mikecz (2012), Rose (1997), Smith (2006) and McDowell (1992,1994,1998) and many others, on the issues surrounding elites as participants in qualitative research. These issues range from the definition of elites, getting access to them, building rapport, gaining trust, power dynamics and strategies for overcoming power asymmetry.

Because research impact is such a contested issue, the RDI Fund researchers were quite willing to participate in my research study and thought the topic under investigation was one that would help improve their understanding of a very complex issue. I was able to contact my research participants directly and did not have to wait long periods for responses to my emails. Gaining access was, thankfully, more a matter of aligning schedules and blocking time for my interviews (as opposed to having to work around gatekeepers who typically try to restrict access to persons in authority). This allowed me more time to work on my research protocol to ensure that questions were well sequenced; that there was sufficient preparation for the interaction with each research participant; and that the flow of our discussions was relaxed yet engaging, as I sought to neutralize any perceptions of power asymmetry.

The aspect of elite interviewing that was most appealing to me as a researcher was the potential for transformation of thinking and of previously-held perspectives on an issue during or as a result of the interview process. This is in keeping with Kezar's (2003, p. 400) view that there is transformative potential in the research process, as opposed to the traditional focus on research findings and outputs, and that elite interviews have the

potential to bring about transformation through consciousness raising, advocacy and demystification. One of the questions I included in my interview protocol and asked each research participant was: 'How did the process of working on an RDI Fund project impact on you as an individual?'. This question allowed me to shift the discussion from the process of engaging with external stakeholders to the personal experience, learning and development of tacit knowledge resulting from the researcher's participation in the RDI Fund project. In each instance, this question provoked deep thought and reflection. It seemed to cause each research participant 'to hold up a mirror' and was my way of both practising 'multivocality' (Kezar 2003, p. 410) and encouraging my research participants to address the issue of the societal impact of research from multiple angles.

The literature on interviewing elites helped me to conceive my methodology as 'a political act' (Hunter 1993, p. 36). It is consistent with my own worldview and overarching research paradigm. The research methods used have allowed me to take a critical stance vis à vis my research, fully cognizant of the influence of personal belief systems, culture and power on research processes. Thus, in my interaction with my research participants, my goal was not only to better understand specific social phenomena but also, where necessary, to encourage deeper reflection and action (Grogan and Simmons 2012).

During the interviews, I was sure to make notes of my research participants' body language, facial expressions and other non-verbal cues, which would not be captured by the recording. This was to assist with my recollection of the emotional reactions that were displayed by the respective research participants during my subsequent analysis of the data and writing up of my research findings. I was mindful of Poland's (1998) caution that 'texts generated through the transcription of interview recordings…[are] only partial accounts of the original interactions, which are themselves imperfect windows into naturally occurring experiences' (p. 302). By listening to the audio recordings several times, I was also able to practise attentive listening, focusing not only

to what was spoken but also seeking to interpret silences and the multiple meanings silence may have in an interview, be it 'what is taken for granted…what goes without saying, or…that which cannot be said' (Poland 1998, p. 294). In conducting the interviews, I was also conscious of my role as the interviewer and my ability to influence the flow of the discussion, to make decisions about the questions, the order of the questions, the amount of time given for participants to respond to each question, etc. Being mindful of my positionality in the interviewing process was important because an interview is 'a conversation with a purpose' (Kvale 2006, p. 483) and has inherent power dynamics, which must be carefully managed. Issues related to positionality and reflexivity are discussed later in this chapter.

3.7.3 Fit for purpose

The use of multiple methods in my research design was intentional and sought to ensure a comprehensive approach that is 'fit for purpose'. Fit for purpose in qualitative research design means that appropriate methods were used to help answer specific research questions, thereby allowing the researcher to '…to draw comprehensible, logical and believable conclusions from the evidence obtained…' (Banerjee 2013, p.441). The rationale for this approach is my belief that research is a situated activity (Denzin and Lincoln 2013) and that in order to undertake an examination of research impact in a postcolonial society, research methods that enable a fuller appreciation of the context, culture and processes are necessary. My critical realist perspective also recognizes 'individuals' perspectives and their situations as real phenomena that causally interact with one another' (Archer 2010, p. 157), thus allowing for a deepening of understanding of the influence that economic, social and cultural conditions have on beliefs, ideologies and individuals' experiences. Maxwell (2004) further emphasizes the importance of context and processes in order to justify an understanding of particular situations or events and supports the view that 'qualitative research can be scientific in the full sense of the term, providing explicitly developed, testable explanations for the phenomena studied' (p. 8-9). In addition to culture and context, Stephens (2012) puts the spotlight on local knowledge as an important consideration when conducting and interpreting

research. This is especially relevant to my examination of contextual factors that may affect research impact in T&T since many approaches to research impact assessment employed in Western societies place greater emphasis on identifying evidence of impact and on seeking to establish a causal link between the research and its impacts on society. Conversely, my study is preoccupied with researcher experiences and this examination reveals the ways in which engagement processes with RDI Fund research participants have contributed to the co-creation of local knowledge that is specific to the achievement of societal impact in T&T.

3.8 Context and Culture

In qualitative research, context and culture are important dimensions throughout all stages of the research process. Stephens (2012) stresses that culture impacts upon the way research is not only conducted but also interpreted, given its centrality to our choice of concepts to research, the values and ideals underpinning our research, the way in which a research inquiry is constructed and how issues of power and ideology are treated throughout the research process.

In seeking to better understand research impact in Caribbean SIDS, I recognized that I had to keep context and culture in the forefront of my mind. As I carried out my field research and engaged with the literature, going back and forth between the data and emerging themes, I sought to ensure through the questions asked as well as my personal reflections and notetaking/journaling, that I was being sensitive to context at the micro level and also reflexive at the macro conceptual level, which Stephens (2012) highlights as essential. Henke and Reno (2003, p. xii) underscore the importance of having an appreciation for '…the cultural idiosyncrasies of Caribbean people and societies'. They explain that:

> Through its history and through its contemporary challenges, the Caribbean has revealed a great complexity of social relations and the influence of such variables as race, ethnicity, migration and multifaceted dependency (for example, of

> institutional mimicry, strategies of reproduction of metropolitan models by local elites, socio-economic conditions, popular culture) on politics (p. xii).

Best (1997, p.21) points to some of the problems related to the legacy of colonialism and its impact on Caribbean institutions when he refers to '…knotty issues of leadership and management, government and administration, power and submission, power and obedience, authority and participation'. More specifically, in Trinidad and Tobago, the conflation of race, ethnicity, politics and power, which some may argue, has become more intense over the years, further complicates research carried out in the field.

Based on my interviews with RDI Fund researchers and my review of the information presented in the RDI Fund Progress Reports, the lived experiences of the researchers in the field attest to the importance of context. In fact, many of the explanations given for challenges with research project implementation centre around political and cultural factors, which, while not unique in themselves, are manifested or experienced in a unique manner within the research context of T&T. These include concerns that local institutional systems, procedures and processes are not well developed or lack transparency and consistency in their application, thus creating delays or obstacles for researchers trying to gain access to data. With regard to accessing research participants for their RDI Fund projects, researchers indicated that they found the environment highly political, and depending on the topic under investigation, research participants, both from the public and private sectors, were distrustful of researchers.

In T&T, over the past ten years there has been significant shuffling and turnover of staff in key positions at Ministries, in some cases because of retirement, in others because of changes in Ministerial appointments following elections or a Cabinet re-shuffle. Guinet (2014) highlights this as a problematic characteristic of the research and innovation ecosystem in T&T:

> The government structure is fragmented, with a (too) large number of ministries, with frequently changing portfolio of responsibilities, and a tendency to address institutional weaknesses by creating new organisations rather than increasing synergies between exiting ones (p. 27).

This contextual reality impinges on research since it often results in delays in the accessing or sharing of information. Frequent turnover in Permanent Secretaries or Deputy Permanent Secretaries mean that the incumbents need time to learn their portfolio and also affects the scheduling of meetings or interviews when the person originally contacted is no longer in the position and the replacement may not have sufficient institutional memory, particularly in cases whereby career civil servants may have been replaced by political appointees. While this did not affect my interviews, it did come up as a challenge encountered by RDI Fund researchers in the execution of their respective projects and stakeholder engagement initiatives.

Another unique cultural trait is the tendency of persons in Trinidad and Tobago to avoid situations of tension or confrontation by appearing to be understanding and sympathetic to the objective of a research study and not openly refusing to cooperate or accede to a researcher's request. However, in reality they have no intention of acting on the request and are instead using stalling or avoidance tactics. In a context with historical legacies of colonial domination and exploitation, this corresponds with Farrell's (2017, p. 188) 'masquerade' as a coping mechanism for conflict avoidance. It is an example of what Few (2001) refers to as resistance being just as much a mode of power as domination. This trait, which I call 'disingenuous acquiescence' is indeed nebulous and often difficult to discern but is nonetheless detrimental to any research study because it is disguised rejection which ultimately, results in significant lost time, dead ends and cold trails of investigation. Thus, it should not be viewed as a problem of technique but rather, a 'cultural mode of self-presentation' or a 'strategic act' of censorship (Poland 1998, p. 294, 300). These examples reflect the ways in which culture and other contextual factors can affect the execution of research projects and ultimately, flows of knowledge. It therefore underscores the importance of understanding the 'micropolitics of research'

when seeking to achieve societal impact in Caribbean SIDS. This will form part of my analysis and discussion (Chapter 4).

3.9 Data Analysis

My process for analyzing the data entailed listening to all audio recordings and reviewing all the transcriptions of the interviews, keeping in mind my three overarching research questions, the main features of Meagher's (2008) model, my own expanded conceptual framework as well as some preliminary propositions that would have emerged from my review of the literature and my personal and professional experience (Baxter and Jack 2008). The recordings were listened to and the transcripts read multiple times to have a broad overview of the data and begin to interpret and construct meaning out of them within the context of my research. Notes were made in the margins of each page based on emerging issues or themes that seemed to recur in different interviews and that reflected consistency with or divergence from the main points on knowledge flows depicted in Meagher's (2008) model. Such instances of commonality and of divergence were noted together with any individual, project-related, institutional or environmental factors that may have been associated with them.

Coding was done in two ways. Firstly, the data were coded as they related to each of the three research questions, thus highlighting how the research participants' views and experiences related to: (RQ#1) the characteristics of research impact promoted by the RDI Fund; (RQ#2) the specific strategies used to facilitate knowledge flows among key stakeholders; and (RQ#3) researcher recommendations for enhancing the societal impact of UWI research. Further review and analysis of the data led to another layer of coding whereby the data were coded focusing on enabling and oppositional forces, according to the three levels of analysis: macro (environmental, highlighted in green on the transcripts); meso (institutional, highlighted in yellow on the transcripts) and micro (individual/researcher, highlighted in pink on the transcripts). Many of the issues emerging at the micro level, for instance, related to RQ#2 and RQ#3, while issues at the

meso level converged around RQ#1 and RQ#3 and issues at the macro level corresponded more to RQ#3. The themes emerging from this dual coding were subsequently mapped against the main parameters for flows of knowledge as presented in my conceptual framework to consider their relevance and applicability to the T&T context, based on the experiences shared by the RDI Fund researchers. A schematic of the coding sequence as well as the coding structure and emerging themes from interviews with RDI Fund researchers are included in Appendices 5 and 6. Once all the themes were laid out and mapped against my conceptual framework, I was able to move between my various sources of data – recordings, transcripts, notes, RDI Fund reports and the wider literature – to highlight knowledge flows, environmental forces, connections, relationships and gaps. Through a process of inductive reasoning, patterns of thematic coherence as well as dissonance emerged, which are discussed in Chapter 4. Based on my research findings, I was also able to detect new and interesting areas, which were not directly related to my research questions and could point to areas for further investigation in the future.

An example of how the coding assisted my analysis of the data related to RQ#2 is that at the micro level, participant responses dealing with individual researcher experiences with implementing RDI Fund projects revealed a range of strategies used to promote research translation and stakeholder engagement in T&T, what worked, what didn't work, why and how the strategies were operationalized. This also highlighted some inner tensions with regard to researchers' perceptions of their skills to do public engagement, knowledge brokerage and other activities to promote greater research utilization and research translation as well as their sense of identity as researchers as they embrace the new approaches promoted by the RDI Fund for research with impact, reflecting some considerations to be taken into account when seeking to enhance the societal impact of UWI's research in the future, thus responding to RQ#3. An excerpt showing the application of the coding structure to my analysis of interview transcripts is provided in Appendix 7.

My triple coding method of analysis is consistent with the critical realist perspective adopted for my research study in that it enables a disentanglement of issues related to context, structure, the economy, culture, institutional capacity as well as personal beliefs (for example, about researcher identity and researcher skills), all of which are essential to be able to deconstruct and reconstruct the problematique of research impact when analyzed within the context of a postcolonial Caribbean SIDS like T&T. These are all central elements for consideration in seeking to understand the ways in which the 'micropolitics of research' impinges on the ability of RDI Fund researchers to achieve societal impact. This triple coding of the data from the interviews complemented by the data from the literature review and documentary analysis as well as the application of my conceptual framework to my analysis of the embedded case studies, facilitated the integration of findings across the different methods and forms the basis for the discussion of my findings in Chapter 4.

In addition to making visible the steps taken to collect and analyze my data for this research study, below are some other considerations that were taken into account in my research methods.

3.9.1. Building rigour in case studies

In much of the literature on qualitative research, issues such as rigour, reliability and validity have been heavily scrutinized. Critics have attacked qualitative researchers claiming that their work is not 'scientific' as it focused too much on individuals' thoughts, emotions and experiences. Writers such as Kvale (2006), Mikecz (2012), Smith (2006), Al-Hindi and Kawabata (2002) and several others highlight different approaches that could be used to strengthen validity and reliability such as member checking, debriefing sessions with interviewees, sharing research findings and inviting observations, as well as triangulation with other primary and secondary sources. Similar checks and balances are also reflected in the literature on case studies (Yin 2003, Eisenhart 1991, Stake 1995, Darke, Shanks and Broadbent 1998), among others). In-

depth analysis of the divergent views and ongoing debates on these methodological challenges are beyond the scope of this chapter.

I have drawn on the work of various authors to build rigour into my approach to this case study, both in its execution as well as in my analysis. Lincoln and Guba's (1985) trustworthiness criteria of credibility, transferability, dependability and confirmability have been particularly instructive. Guba and Lincoln (1994) further refined their approach introducing the notion of authenticity and suggesting that being fair to the values and viewpoints of diverse stakeholders, raising consciousness, increasing awareness of the values and difference among stakeholders and conducting research that leads to change, constitute more appropriate criteria for rigorous qualitative inquiry. These criteria all resonate with my study and are reflected throughout the various chapters.

I had to confront my own assumptions as a researcher very early on given the position I occupied previously as the person responsible for managing the RDI Fund. It was uppermost in my mind from the moment I began conceptualizing my research study. How to achieve a balance between my interpretive approach, my values and worldview and a systematic inquiry into this phenomenon I have been working closely on and feel quite passionately about? Would I allow myself to become partial to the projects, the researchers or the findings, to colour them with my own perspectives, interests or aspirations for evidence of impact? Throughout the conduct of my research, I used notebooks to capture thoughts and work through my reflective stance as the research evolved and progressed through the different stages. I was able to experience first-hand how a researcher's values, beliefs and interests 'intervene to shape their investigations' (Orlikowski and Baroudi 1991, p. 15).

Through the use of multiple sources, I was able to gather different evidence, which provided multiple perspectives of the same phenomenon (Yin 1994) and complementary data, which aided with corroboration, where necessary. I support the assertion that, triangulation is not the best measure for rigour in qualitative research because the different methods produce parallel datasets, each of which offers a partial view of the whole picture (Barbour 2001). Mays and Pope's (2000) 'comprehensiveness' comes closer to what I have sought to achieve through the use of various sources of evidence. Checking my interpretation of transcribed data with some research participants also provided opportunity for further clarification in an effort to accurately capture and better understand their perspectives. I was, however, mindful that research participants have an innate desire to see themselves in a positive light, thus, an inherent drawback of respondent validation (Barbour 2001; Sandelowksi 1993). Instead of having them review written transcripts, I opted for follow-up discussions in person or by phone to cross-check my interpretation of their statements and ensure that I fully understood the points made. This served to shift the emphasis away from cross-checking the accuracy of statements towards a deeper understanding of their communication of lived experiences, thus extending the dialectic interface that would serve as the foundation for subsequent theory building.

3.9.2 Positionality and Reflexivity

Reflexivity and positionality are central themes in the literature on qualitative research methodology. Inherent in this methodology is not merely a commitment to '…the interpretive understanding of human experience…' (Denzin & Lincoln 2013, p.13) but also an affirmation of reflexivity as '…a strategy for situating knowledges… and a means of avoiding the false neutrality and universality of so much academic knowledge' (Rose 1997, p.306). Authors such as Smith (2006), Mc Dowell (1998), Plesner (2011), Kezar (2003), Rose (1997), Cochrane (1998) and Ezzy (2010), among others emphasize the importance of being reflexive throughout the research process, of reflecting on the positioning of the researcher and the interviewees and the power dynamics between them, before, during and after the interviews and building these into one's research

findings. McDowell (1992 p. 409) stresses that '…we must recognize and take account of our own position as well as that of our research participants and write this into our research practice…'. Smith (2006, p. 647) asserts that '…by making one's position 'known' and 'visible' the specificity of research perspectives and claims to knowledge become clearer'.

Between 2009 and 2014, I worked as the Senior Programme Manager in the Office of the Campus Principal at the STA Campus and was responsible for setting up the framework and operational guidelines as well as managing the Secretariat of the RDI Fund. This was a key strategic initiative of the then Principal of the STA Campus. For five and a half years, I worked closely with the Campus Principal and senior management of the STA Campus, members of the RDI Fund's Technical Evaluation Committee and researchers from the various Faculties of the STA Campus. In 2014, I proceeded on secondment to the United Nations Development Programme in Trinidad and Tobago as the Assistant Resident Representative until August 2016. While conducting my field research, I was mindful of how I may have been perceived by my research participants, given their dual role as researchers for an RDI project with a reporting obligation to the Fund (which I previously managed) and also as faculty members of the STA Campus and their accountability ultimately to the Campus Principal with whom I had worked closely. My new appointment at the UNDP would have created some distance as STA researchers were aware that I was no longer involved in the day to day operation of the RDI Fund. However, I was mindful that UN agencies are often perceived as donor or funding agencies, which may have led researchers to believe that I had the ability to influence funding for new research projects. This was taken into account when developing my research methods and conducting in-depth interviews with research participants. In the latter half of 2016, I returned to the UWI as Director of Development working at the regional, cross-Campus level, reporting to the Vice Chancellor. I am still involved in discussions about research funding and research policy at the regional university level and find my learnings from this research study both relevant and valuable. I have outlined my career shifts over the period of this investigation and re-stated how I am

currently situated within my research study because I view intersubjectivity as an asset, allowing me to use my own experience to better understand the experience of my research participants. It has forced me to be even more disciplined in the conduct of my research and 'to reveal the pre-understandings and prejudice that can both obscure and illuminate …understanding of the phenomenon under study' (Armour et al 2009, p. 106).

The notion of a fully known and understood positionality is a contested one. Positionality is 'fluid' and 'on a continuum' (Mikecz 2012, p. 483), looking both 'inward to the identity of the researcher and outward to her relation to her research' (Rose 1997, p. 309) and also looking 'sideways' (Hannerz 2002; Nader 1974; Plesner 2011) when studying professional peers as I am doing. In spite of its limitations, the usefulness of positionality in qualitative research is well recognized. However, in addition to reflecting on oneself as a researcher, it is important to reflect on the research participants, the implications of the way in which research participants are perceived as well as the assumptions and biases of the researcher (Kleinman and Copp 1993). Self-presentation as it relates to the researcher's positionality is a common topic in the literature on qualitative interviews, since it is perceived to have an impact on the interviewee's recognition and acceptance of the researcher and the ease with which information is shared. It is interesting to note that on one hand, how the researcher presents him or herself is often treated as a part of logistical preparations for undertaking research. Writers such as Mikecz (2012), Kvale (2006), Berry (2002), McDowell (1998, 1992), and Daniels (1983) encourage researchers to dress appropriately, get background information on their interviewees, be knowledgeable of the subject, etc. to project a positive image of themselves with the aim of building a rapport with the interviewee, earning his or her trust and extracting the information the researcher requires. On the other hand, self presentation can be more problematic, as it is likened to a game being played between the researcher and the respondent with different personalities being assumed by the researcher as a means to an end (McDowell 1992). Whether to present oneself as an expert or an ignoramus (McDowell 1998), a supplicant (McDowell 1998, Desmond 2004), a self-effacing, unthreatening woman, or an intellectually sharp,

efficient professional (McDowell 1998), however, is clearly as much an issue of self-image and self-presentation as it is about power dynamics in interviews. In fact, it becomes part of the emotional framing and embodied emotional performance that Ezzy (2010, p.167) professes are necessary to 'engage theory and emotions reflexively' when conducting interviews. The concept of positionality is therefore equally applicable to the researched as it is to the researcher.

Since my research participants are also colleagues who work at the STA Campus, I was able to relate to the concept of 'studying sideways' Plesner (2011), which is characterized by familiarity, shared professional language/jargon, sensitivity to power dynamics and the blurring of borders. I drew on the advice of (McDowell 1998) to assist me with effectively navigating the 'double positionalities' (p.2140) present between the researcher and the interviewee. I also found Moss' (1995) 'double reflexive gaze' particularly useful in allowing me to understand my multilayered identity as positional and situated and to keep in mind when conducting my interviews that the self and the Other are co-created and re-presented in the findings. Thus, there is a need for reflexivity at all stages of the research process. This 'shifting self' (McDowell 1992, p.214) that is articulated through social interactions and situated within networks of power in relation to others, can now see through the eyes of the Other (McDowell 1994, p.243).

3.9.3 Positionality and Research Interpretation

In addition to influencing perceptions of self/other, positionality plays an important role in a researcher's interpretation of data and the compilation of his or her research findings. Throughout my research, I have paid close attention to the way in which positionality has influenced or impacted on my data analysis and research interpretation. Since positionality is situated in relation to others, the findings coming out of one's investigation are also relational. Desmond (2004, p.263) explains that the 'results have meaning when considered in relation to the many other places and times implicated in this process' and that a researcher's perceptions are shaped not only by what appears in the final text but

also by the interviews that may not have made their way into the text; stories that were eventually '…written out or not translated into academic knowledge' (pg. 264). McDowell (1994, p. 242) reminds us that there is politics in the construction of texts and in the work of representation and so, we must be careful not to erase ourselves (Grossberg 1989) but rather, when constructing texts, to situate ourselves within the networks of power relations relative to others (McDowell 1994, p. 246).

In compiling my research findings, I have kept these points firmly in mind and sought to stay true to the principles of emancipatory research. I view this research study, through the methods employed and the findings generated, as a means of challenging rather than accepting Western notions of research impact and research impact assessment. I fully embrace the democratic role a researcher can play and the catalytic potential of the research process (Hunter 1993, p. 53).

3.9.4 An Imagined Audience

Trying to imagine who the potential audience is for a research undertaking during the research process is referred to as 'audience conjuring' (Schatzman and Strauss 1973, p. 118). It is an important process as the perceived notion of an audience influences what is captured and documented, highlighted or downplayed, based on what the researcher believes the audience may wish to know about the study. The primary audience for my study would include groups of persons who are interested in or working on research fund management and research impact in universities in developing countries as well as persons who are seeking to better understand how researchers incorporate an understanding of cultural and contextual factors (the micropolitics of research) when implementing research projects that seek to achieve societal impact in the Caribbean. Another primary audience is academics who are seeking to contribute to contemporary discourses on the sociology of knowledge, particularly as this relates to the relationship between knowledge and its myriad social influences on Caribbean people and societies. Re-thinking how flows of knowledge can influence human thought, shape Caribbean

society's sense of itself and contribute to advancing development as an integral part of the next phase of nation-building in the young democracies of the Caribbean, is a fundamental component of my research endeavour. I anticipate that my primary audience would therefore comprise Caribbean leaders, academics, researchers, policy makers, research funding agencies and government officials. My secondary audience could include the private sector, civil society organizations and members of the general public (taxpayers) who may have an interest in how to strengthen the contribution of university research to national and regional development.

3.9.5 Potential Limitations

Although my research study does not focus on the *measurement* of impact, it is well established in the literature that the time lag for the societal impact of research to manifest itself is typically quite long (on average ten years or more). Since three to four years would have elapsed between the completion of these RDI Fund projects and my fieldwork for this study, I recognize that the full range of societal impacts would not yet have occurred and that the RDI researchers may only be able to share examples of the intermediate outcomes resulting from the projects. Though a limitation, this does not prevent me from deepening my understanding of the experiences of the RDI Fund researchers, their tactics used and challenges encountered as they implemented their respective projects. There is tremendous value in understanding the processes in which the RDI Fund researchers participated to facilitate knowledge flows between different actors with a view to generating societal impact.

Another limitation I have discerned is that there is an inherent tension in seeking to be sensitive to research context and to value local knowledge (Stephens 2012) in RDI Fund projects in Trinidad and Tobago, while at the same time being limited to using concepts, definitions and frameworks for research quality and impact that were established in Western cultures, for the mere purpose of comparability to international points of reference. This is unfortunately the case because the 'theory and practice of educational research is generally rooted in Western culture' (Stephens 2012, p. 5). However, effective strategies for engaging research actors and mobilizing knowledge flows in T&T

could be quite distinct than those in the United Kingdom or any other country. Context and culture matter significantly in this regard yet the methodologies and mechanisms for articulating these concepts and incorporating them into research processes, are still not sufficiently developed. This forms part of the conflicted and contradictory nature of research and higher education faced by universities in Caribbean SIDS and is captured by Rizvi, Lingard and Lavia (2006) when they state that:

> ...the contentions surrounding the relationship between knowledge and power are linked directly to education, both as an institution where people are inculcated into hegemonic systems of reasoning and as a site where it is possible to resist dominant discursive practices. On the one hand, it is an object of postcolonial critique regarding its complicity with Eurocentric discourses and practices. On the other hand, it is only through education that it is possible to reveal and resist colonialism's continuing hold on our imagination (p. 257).

Some critics may state that the fact that my research study was carried out with a small number of researchers, all from the same institution, is also a limitation and calls into question the external validity of the study. However, as mentioned in the earlier section on rigor, the objective of my study is not statistical generalization but rather analytical generalization (Yin 2003), which seeks to draw on the unique findings of my study carried out in a specific context, to interrogate, challenge, inform or confirm a theory on the societal impact of research in T&T. Case studies, because of their nature, may not generate universal theories but they do '…build scaffolds for other researchers to climb – with the hope that ultimately the climbers will be able to inform those who follow them' (Bassey 2012, p.157). When dealing with social science research, I maintain that it is critical that theoretical understandings be rooted in contextual experiences.

Summary

Ravitch and Riggan (2012) believe that '...somewhere between epistemology and reflexivity and design lies the question of 'how do you think about the relationship between you, your work, the audiences you're speaking to and the participants you are working with?'' (p. 69). This chapter has sought to do just that; to explain and make visible key aspects of my research methodology and methods and connect these to the overarching

paradigm and research strategy underpinning this study. Salient issues surrounding rigour, reflexivity, culture, context and elite interviews were also interrogated with the aim of highlighting how these concepts were discussed in the literature (with specific reference to case studies and embedded case studies) and their relevance to my research on the societal impact of university research in T&T. Finally, the chapter outlines the possible limitations of my research study and concludes by identifying which audiences could benefit from the findings of this study.

CHAPTER 4: THE RDI FUND AND RESEARCHER EXPERIENCES: RESEARCH FINDINGS AND ANALYSIS

4.1 Introduction

Chapter 4 presents a detailed description of the RDI Fund as the main case of my research as well as the embedded case studies or vignettes of selected RDI Fund projects. The main case study seeks to highlight the characteristics of impact that the RDI Fund seeks to achieve, while the vignettes serve to make more visible the ways in which specific RDI researchers have operationalized research with impact. In my analysis of the main case study, I have identified some limitations of the RDI Fund's operational approach. For the embedded case studies, in particular, I have applied my own conceptual framework to examine the flows of knowledge together with political, societal and cultural factors in the wider research environment, with a view to understanding the processes underpinning how knowledge gets shared, exchanged, understood and used.

4.2 Main Case Study: The Research and Development Impact Fund

4.2.1 Background

The RDI Fund has its origins in a Research Scheme set up by the Government of the Republic of Trinidad and Tobago (GORTT) in the 2005/06 academic year. Under this agreement, between 2006 and 2008, a total of 63 research grants were awarded totaling US$2.2 million (approx. £1.6 million). Besides the internal reporting requirements to the Campus Bursary, no overarching framework was developed to specifically monitor the activities, results, outputs and outcomes of these projects.

The installation of a new Campus Principal at the end of 2008 brought a new vision for reenergizing the research agenda of the STA Campus. Initiatives such as a Research Awards Ceremony to celebrate outstanding researchers, a Research Expo to showcase research undertaken by the various Faculties, a Campus research publication cataloguing

the research pursuits of the Campus' professoriate were all instituted to give increased visibility to the research efforts of the STA Campus. As the Senior Programme Manager in the Office of the Campus Principal under the new leadership, I was responsible to coordinating the execution of these initiatives.

With increased competition in the higher education landscape in T&T, reduced government contributions to public tertiary institutions and greater emphasis being placed by stakeholders on the returns of public investment in research, the Campus Principal sought to highlight even more the contribution the STA Campus was making to T&T's development and the impact that UWI research was having on society. This initiated the reconceptualization of the Research Scheme and its conversion to the RDI Fund. To achieve this, given the collegial management approach of the UWI, the STA Campus embarked upon a process of cross-Faculty consultation among the professoriate and active researchers of the Campus in the 2010-11 academic year to build consensus on a more targeted, impact-oriented approach to the research that would be supported by the RDI Fund. Six priority research areas linked to the national development policy framework at that time were identified and would become the main pillars of the RDI Fund [2]:

1. Climate Change and Environmental Issues
2. Crime, Violence and Citizen Security
3. Economic Diversification and Sector Competitiveness
4. Finance and Entrepreneurship
5. Public Health
6. Technology and Society: Enhancing Efficiency, Competiveness Social and Cultural well-being.

[2] At the time of the establishment of the RDI, these 6 thematic pillars were consistent with the national Medium-term Policy Framework (2012-2014) highlighting the government's focal areas for development, namely: Crime and Law and Order; Agriculture and Food Security; Health Care Services and Hospitals; Economic Growth, Job Creation, Competitiveness and Innovation; and Poverty Reduction and Human Capital Development.

The adoption of these priority research areas signaled a shift in the approach to funding large research projects of the STA Campus, instituting a more rigorous framework for the selection, monitoring, execution and reporting. In 2012, the Research Scheme was formally branded the UWI-Trinidad and Tobago Research and Development Impact Fund (RDI Fund) and its Operational Guidelines approved by Campus' Finance and General Purposes Committee (F&GPC).

In an environment where there are no national research councils and no dedicated funding for research, this was a significant development in that, for the very first time, the STA Campus would allocate funds (through the RDI Fund) for multi-disciplinary projects focused on specific thematic areas linked to development priorities. This was intended to complement the pure or blue skies research taking place in the Faculties as well as commissioned research and research funded by international agencies and foundations. Thus, it is worth highlighting that in the case of the STA Campus, the impact agenda emerged from within and was not linked to a national research assessment exercise or any regulatory, compliance or funding pressures from the government, as was the case in other countries. However, cognizant of the developments at UK universities with greater focus on assessing societal impact since 2008, the growing emphasis on impact reporting by international donors, and the financial challenges faced by Caribbean governments who support the regional UWI, the STA Campus voluntarily sought to strengthen the contribution of RDI Fund projects to advancing national and regional development.

4.2.2 Purpose

The RDI Fund seeks to strengthen the link between STA research and development. It is concerned with generating positive impacts for society, which in turn help to advance national and regional development goals. While the title of the Fund focuses attention on 'research and development impact', its underlying purpose is considered consistent with my understanding of societal impact as defined in Chapter 1, referring to changes and

benefits to society that occur as a result of the exchange of knowledge, translation of research-informed ideas and the engagement of stakeholders. It also aligns with Epstein and Yuthas' (2014) definition of societal impact as the effect of research on development issues.

The Fund provides grants of up to US$293,000 (£225,000) for projects that address a pressing developmental need linked to any of the six thematic pillars of the Fund. Projects are expected to emphasize research-directed action and to prioritize public engagement and knowledge transfer activities in their design and execution. Furthermore, RDI Fund projects are expected to 'demonstrate the synergy between scholarly quality and impact on policy and practice, for the benefit of communities in Trinidad and Tobago and the wider Caribbean' (UWI 2012, p. 3). The estimated timeframe proposed by the Fund for achieving societal impact was 3-5 years. The rationale for a 3-5 year impact time is not explicitly stated in the Fund's Operational Guidelines but notably diverges from the literature on research impact, which cautions that a long time lag for research to produce societal impact is typical and necessary for impact to manifest itself, though this time lag also contributes to the challenge of attribution making it difficult to trace the origin of the impact (Pettigrew 2011, Watermeyer 2014).

It is worth mentioning that in the Caribbean, significant attention (and therefore indirect pressure) is placed on public institutions' ability to demonstrate achievements within the 5-year electoral cycle. In national politics, there is a tendency for the ruling government administration to approve policies and initiate programmes, which are then changed or replaced when another political party assumes leadership following national elections. This has led to a culture that works counter to intergenerational planning and thinking (Farrell 2012) with short-termism now being widely promoted and accepted, though this is antithetical to sustained development planning.

At the 2012 ACU Conference on *University Rankings and Benckmarking – Do they really matter?*, the then Campus Principal highlighted that the Campus' decision to pursue a research impact agenda also took into account some wider goals or drivers for the Campus' research enterprise, namely: building capacity and critical mass in research; promoting multi-disciplinary research and building regionality; engaging stakeholders to create linkages; mentoring young scholars; enhancing international recognition of UWI research; and ensuring periodic monitoring and reporting (Sankat & Richards-Kennedy 2012). It should be noted that the STA Campus drew on the lessons and experiences of other countries (such as the UK, Australia, USA and Canada) with setting up university research impact frameworks and sought to develop a balanced approach to promoting research for societal impact. It is an approach that recognized the complexity of the research impact agenda, while at the same time sought to preserve research values considered important to the STA Campus such as: a strong nexus between research and teaching; respect for diversity in types of research outputs and impacts; and continuous stakeholder engagement throughout the research process (as stated in the RDI Fund's Operating Guidelines). It is this combination of UWI research values and impact strategies that support research-directed action, public engagement, knowledge mobilization and the synergy between academic excellence and societal impact, that constitute the main characteristics of research impact that the RDI Fund seeks to achieve.

4.2.3 Governance

The RDI Fund has a dual governance structure comprising:

i. the Secretariat, which is responsible for the management of Calls for Proposals, providing information and guidance to researchers/ research teams, liaising with the Technical Evaluation Committee on governance matters, preparing periodic and annual reports and organizing meetings with RDI Fund researchers as well as convening evaluation meetings of the Technical Evaluation Committee; and
ii. the Technical Evaluation Committee, which sets policy direction for and provides oversight of the Fund and its activities. It serves as the Board of the RDI Fund, conducts the evaluation of proposals submitted for financing and is the main

decision-making body on the Fund. It is chaired by the Campus Principal (or his designate) and comprises the UWI Pro Vice Chancellor for Research, the Campus Bursar, the Campus Coordinator for Graduate Studies and Research, Chair of the Committee of Deans, Director of the Office of Research Development and Knowledge Transfer, a UWI Professor Emeritus (or retired professor) and a representative from the public sector and/or private sector (business/industry).

In order to prevent potential conflicts of interest, members of the Technical Evaluation Committee cannot be members of project teams requesting funding from the RDI Fund and Committee members whose substantive position requires contact with faculty teams submitting proposals to the RDI Fund (such as the Chair of the Committee of Deans and the Director of the ORDKT) participate as non-voting members in evaluation meetings and as full members in other meetings. Members of the Secretariat participate in meetings of the Technical Evaluation Committee as observers to provide administrative support, procedural guidance and technical advice on the management of the Fund and any reporting requirements. The Secretariat also liaises with staff in the Bursary, Human Resource Department, School for Graduate Studies and Research, University Office of Research, ORDKT and all other offices to resolve bottlenecks and facilitate the smooth implementation of RDI Fund projects and reporting.

4.2.4 Selection Criteria

Projects are evaluated based on two sets of criteria: technical quality and support for RDI Fund objectives. Technical quality includes criteria such as clarity of purpose, description and suitability of methodology, critical nature of issue being addressed, soundness of project rationale and appropriateness of funding amount and project timeline. Support for RDI Fund objectives refers to practices that are consistent with the UWI research values mentioned earlier, and thus means that proposals should have evidence of:

- multi-disciplinary research
- cross-Faculty/cross-Campus collaboration and/or other strategic partnerships
- participation of PhD students and/or post-doctoral researchers

- focus on research-directed action that will have an impact on policy, practice, products and/or services or that will contribute to shaping the intellectual discourse on a policy issue of national/regional importance;
- and knowledge dissemination to enhance awareness, engagement and/or initiatives with the public and/or private sector. (UWI 2012).

Furthermore, proposals should include the anticipated project outputs and the potential of these outputs to generate impact in the short to medium-term (3-5 years). Research outputs could include scholarly research products as well as creative research products (such as films, curated exhibitions, etc.). Successful proposals are also expected to outline creative approaches for stakeholder engagement, sensitization and/or knowledge mobilization and a strategy for project execution. It is important to highlight here that activities linked to stakeholder engagement, sensitization and knowledge mobilization, while expected of RDI Fund projects, were not necessarily a part of STA Campus' researchers' background training or experience. Similarly, while the RDI Fund recognized a diversity of creative research products including films, exhibitions, etc., the formal procedure for academic assessment and promotion still focused on scholarly publications. This reflects a gap between the purpose of the RDI Fund/what it seeks to achieve and the institutional priorities, researcher capacity and support system (training, recognition and reward incentives, etc.) within which the RDI Fund functions.

An important distinction in the orientation of RDI Fund projects is that researchers are encouraged to 'strategize for impact', that is to say to begin mapping out a strategic pathway for achieving the desired societal impact. This includes identifying and prioritizing stakeholders, anticipating how each group will benefit from the research activities, arranging opportunities for stakeholders to derive these benefits, putting in place mechanisms for two-way communication and assigning a team member to track and document opportunities for fostering impact so that these can be captured in the RDI Fund progress, completion and impact reports. To help researchers maintain a focus on societal impact through the various stages of project execution, it was decided that an Impact Paper should also be submitted to the RDI Fund Secretariat within the first

semester following approval of the RDI Fund grant. This Impact Paper is intended to prompt researchers to think through in advance and document strategies that would be employed to engage with clearly identified stakeholders; communicate the value of the research activities; disseminate information on the results and expected outcomes; foster knowledge uptake and mobilization among identified beneficiaries; and plan for impact, mapping the linkages between the research activities and their outputs, outcomes and impacts (RDI Fund 2014). While these requirements are considered important and useful for documenting the way in which the RDI Fund seeks to bring about societal impact, it is worth mentioning that no dedicated training is provided to STA researchers on techniques such as stakeholder mapping, public engagement, storytelling, etc., which have been highlighted both in the literature and in practice as useful to move research further along the pathway to societal impact. Further, it is assumed that all researchers have an equally good understanding of the micropolitcs of research communities and appreciate how these dynamics could impinge on the relations with stakeholders as well as knowledge flows during project execution.

A compiled list of approved RDI Fund projects is provided in Appendix 8.

4.2.5 Reporting

Significant attention is placed on reporting in the RDI Fund's operational framework in order to monitor progress during project execution. Based on past experience with the GORTT Research Scheme (which existed prior to the establishment of the RDI Fund), projects had very long execution timeframes, annual reports submitted to the Bursary did not include a clear strategy for dissemination of research findings and there was little (if any) focus on research use or research translation to policy and practice. It was felt by the Campus Principal and senior staff who were consulted when the RDI Fund was being established, that a system needed to be put in place to ensure more efficient use of the resources in a timely manner, particularly in light of increased competition for research funding at STA Campus, thus underscoring the need to continuously monitor project execution. There was also the need to communicate to key stakeholders at specific intervals during project execution, about initial project outputs thus far, results that had

been achieved and the benefits to stakeholders in order to help increase public awareness of the contributions being made by university research to society. This needed to happen during the course of the execution of the project and not only upon completion of the project. The Fund's Progress Report is structured in such a way that researchers not only describe the activities executed during the reporting period but also indicate the completed deliverables and document any project outcomes and impacts to date.

In this vein, the RDI Fund requires progress reports every six months and progress meetings are also held with lead researchers and their teams to discuss the execution of the projects, challenges being encountered, assistance or support required and plans for ensuring that project activities for the next reporting cycle would be completed. These meetings also allow the Secretariat to provide guidance to researchers on strategies being implemented to engage stakeholders and increase knowledge dissemination/exchange as well as project visibility. The disbursement of the next tranche of project funding is linked to the submission of Progress Reports for the preceding reporting period.

Within two months of completing a project, the lead researcher submits a Completion Report as well as an Impact Report, highlighting activities and accomplishments in a range of areas such as research undertaken, student research activity, academic outputs, project execution activities, workshops/conferences and other knowledge mobilization activities, impacts and summary of expenditure. The Impact Report (a requirement instituted for cohorts from 2014 onwards), focuses on the range of academic and non-academic impacts that would have accrued over the project lifetime and also, what additional opportunities may exist for leveraging the findings, outputs and relations/networks formed by the project. The Impact Report helps researchers to think through not only the outputs and achievements of the project but also, a range of issues related to the research to impact process:

- how the actual outputs and outcomes align with the anticipated impacts initially stated in the Impact Plan;

- the strategies for stakeholder engagement and any new insights or lessons learned from this process;
- how the project helped to increase the visibility of UWI research;
- the ways in which strategic collaboration with external institutions assisted project execution;
- plans to support further knowledge mobilization and uptake;
- how the RDI Fund and other entities can assist in maximizing impact;
- any other impacts anticipated to occur within the next 3-5 years.

While all of these points are important to better understand and document research to impact processes, my research study points to challenges surrounding the latter three points, in particular, since research participants indicated that there seemed to be an assumption that activities linked to knowledge mobilization and knowledge brokerage as well as impact monitoring and capture beyond the completion of the RDI Fund project, would continue to be the responsibility of the lead researcher and that the researcher would have the time, capacity and funding to carry out these additional duties.

4.2.6 Main characteristics of impact that the RDI Fund seeks to achieve

At the time of its establishment, the RDI Fund did not prescribe a specific type or definition of impact that would limit researchers' attention to new policies, products, services or ways of thinking, for example. This was deliberate as it was recognized that the range of impacts that emanate from scholarly research is diverse and varied. Through its Operational Guidelines, the Fund provided guidance on the set of criteria that would enable researchers to access funding to execute projects with societal impact. Rather than impose a definition within which researchers from the STA's seven Faculties (spanning disciplines such as food and agriculture, medical sciences, engineering, law, social sciences, humanities and education and science and technology) would feel pressured to align their research, the RDI Fund instead placed emphasis on enabling researchers to operationalize impact by focusing on project design and methodological approaches that support research-directed action, multi-disciplinary research, strategic partnerships, knowledge dissemination, stakeholder engagement and efficient project

execution. These pathways to impact together with the research outputs that have the potential to generate a range of societal impacts can be considered the main characteristics of impact, which the Fund seeks to achieve.

The RDI Fund thus has a working definition of impact that is embedded in its operational guidelines and document templates. It places greater emphasis on how researchers activate 'research to impact' processes. The RDI Fund encourages projects to plan for impact and to mobilize knowledge for development by directly engaging key stakeholders and widely disseminating research findings and outputs throughout the research process. RDI Fund research teams are expected to establish connections between university research, knowledge users, decision makers and the wider public to create opportunities for their research to be understood and used in ways that could lead to new policy, practice, products, services, ways of thinking, attitudes and behavior, which ultimately contribute to societal impact. This helps to guide researchers through the process of project design so that they begin with the end in mind. By this I mean that the researchers are guided in their conceptual approach to project design, execution, reporting and engagement of key stakeholders throughout all stages of the process so that projects are positioned to achieve societal impact and for this impact to be monitored and documented. Through this emphasis on processes and strategizing for impact, the RDI Fund has helped to create a cultural shift in the approach of STA researchers to research project design and implementation. Two of my research participants involved in research administration support this view and stated that:

> I think that…there has been a shift towards an awareness in a higher proportion of staff or an appreciation of the value of doing the second type of impact, the developmental impact, and a feeling that they want to… (Chris, experienced researcher and senior research administrator)

And

> I think more people are thinking about impact. More people are thinking about it and appreciating it…(Shelly, early career research administrator)

RDI Fund researchers are expected to carry out research projects and report on the ways in which their research contributed to new product development, service enhancement or use of the project's research output by a stakeholder group in the public or private sector. The Fund also recognizes that research projects may have contributed to the formulation of new policies, the improvement of existing policies, changes in policy implementation and practice and increased sensitization on issues of national/regional importance. In the more traditional vein of academic impact, contributions to shaping intellectual discourse through publications as well as research communication, the stimulation of communities of practice and the organization of or participation in stakeholder conferences, symposia etc. are also encouraged. The incorporation of new knowledge into teaching via the development of new courses and new course material is another type of impact that is noted as is the generation of additional research funding from external sources as a result of increased visibility and partnerships during the execution of the RDI project. The list of the types of evidence of impact expected for RDI Fund reporting is stated in the Fund's Progress Report Template (Appendix 9). For the purpose of my research study, since the focus was not on assessing or confirming whether there was evidence of impact, a more tempered approach was used when compiling the matrices of core elements of my conceptual framework (Tables 3, 4 and 5), which highlight instead the most significant outputs, intermediate impacts and occasions of influence that were generated by the projects examined for the embedded case studies (at the time of compiling my findings for this research study).

4.2.7 Limitations of the RDI Fund's approach to supporting research with societal impact

The preceding sections outlined the different governance, operational, monitoring and reporting mechanisms that the RDI Fund established to put approved research projects on a path towards achieving societal impact. However, there is little evidence of mechanisms that were put in place by the STA Campus to foster *an enabling institutional environment* at the 'meso' level to support research geared towards societal impact.

Neither is it clear, from the Fund's operational guidelines or practices, how the STA Campus would promote *inter-institutional linkages* in the wider research environment of T&T to facilitate greater translation of research into policy and practice with a view to enhancing the visibility and receptivity of stakeholders to the research produced by the RDI Fund as envisaged at the time of its creation. Furthermore, there seemed to have been an assumption that researchers would be competent in the *skills needed for knowledge utilization, public engagement and research translation* as part of the process for ensuring efficient and effective knowledge flows. The capacity of research users to proactively and fully exploit research was thus not taken into account as a critical success factor for societal impact and was largely ignored or assumed to exist by the Fund. So too was the *capacity of research users to absorb and translate the new knowledge* emanating from the RDI Fund projects. These considerations feature prominently in the literature on research utilization and research translation and will be discussed later in this chapter.

These limitations become more apparent when I apply my conceptual framework to the RDI Fund embedded case studies. As mentioned in Chapter 3, Meagher's (2008) model seemed to imply that the knowledge flows would occur regardless of the individual researcher ability and credibility, the institution's capacity and the effectiveness of the linkages between knowledge actors in the wider system. However, such factors do affect the interactions between knowledge actors and serve as counter-currents to anticipated flows of knowledge, expertise and experience. Moreover, the static representation of 'societal issues, external influences and national and local cultures' in Meagher's (2008) model, fails to recognize how powerful the political, societal and cultural forces in the wider environment are and how these in fact affect the directional flow of knowledge. In the context of Trinidad and Tobago, political and socio-cultural dynamics are intense and if not astutely managed during the research process, can, in reality, undermine the effectiveness of knowledge mobilization and stakeholder engagement efforts. Ultimately, the countercurrents presented by the micropolitics of research are so strong that they can derail strategies for societal impact, which may seem feasible 'on paper' but

in reality, my get little traction when implementing a research project. Some specific contextual factors and forces are revealed in my analysis of each embedded case study later in this chapter, with a view to highlighting the practical implications of the micropolitics of research for effective knowledge flows during project execution.

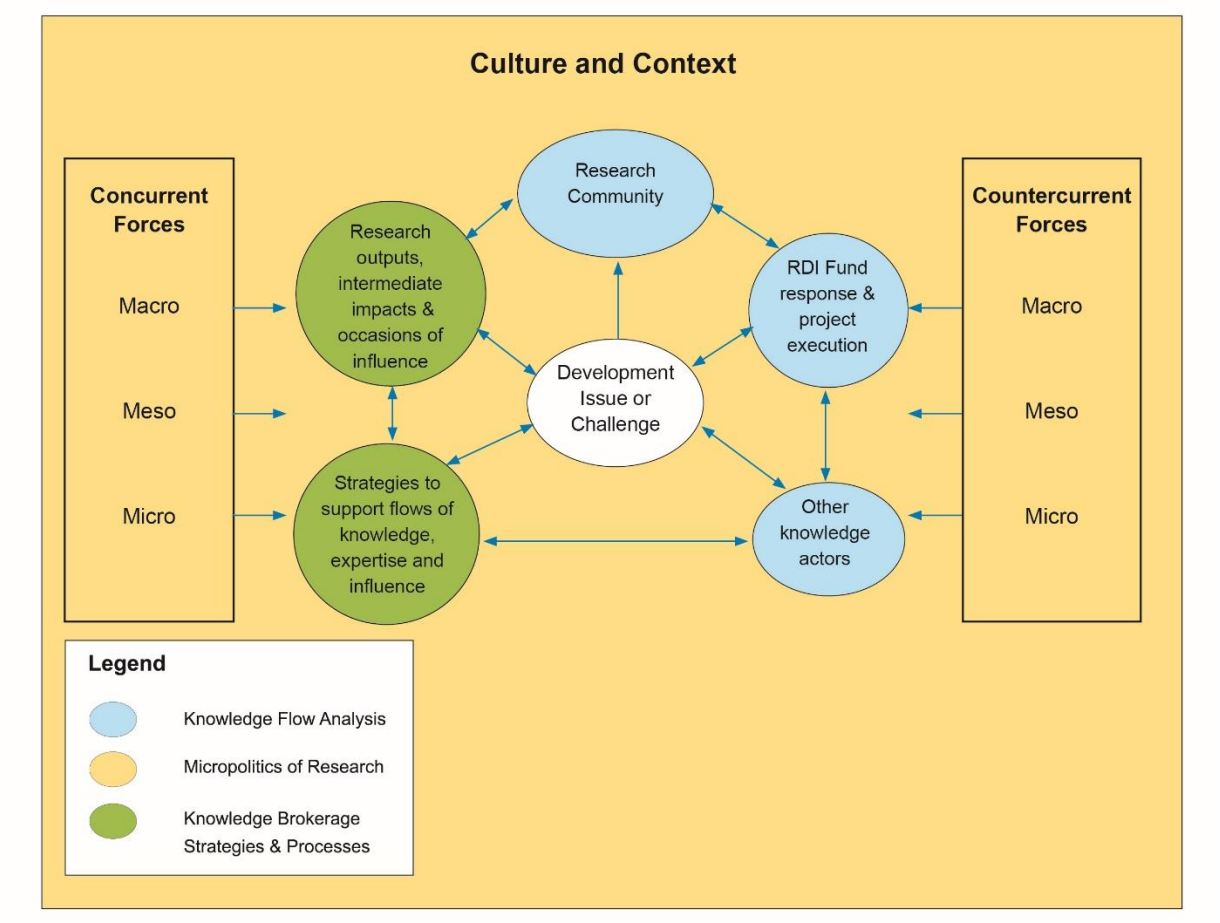
4.3 Embedded Case Studies: Vignettes of three RDI Fund projects

This section highlights the experiences of individual researchers by outlining mini case studies of selected RDI Fund projects. These vignettes aim to better understand the experiences of the researchers, the approaches they used to implement an impact-oriented project, the strategies that helped to facilitate flows of knowledge between key stakeholder groups and the forces, which they had to confront during project execution, which in turn, would have inhibited knowledge flows. In each case, I apply my own conceptual framework to extend the analysis of the embedded case studies beyond that which would be captured if Meagher's (2008) model were to be strictly applied. I examine the flows of knowledge and the interactions between the various stakeholder groups (i.e. knowledge producers, brokers and intermediaries, users and beneficiaries) within the context of factors and forces in the individual's space (micro), the institutional space (meso) and the wider research environment (macro), all of which are influenced by political, societal and cultural factors that characterize the micropolitics of research communities in T&T. This has enabled a deeper understanding of the processes for achieving societal impact and thus, point towards key considerations for effectively executing research projects seeking to achieve societal impact in T&T in the future.

What is unique about my approach, as mentioned in Chapter 1, is that it brings together knowledge flow analysis, the micropolitics of research (which includes the mapping of key knowledge actors, factors and forces) and knowledge brokerage approaches into one conceptual framework to examine the interaction of flows and forces that facilitate or inhibit knowledge flows in a dynamic research community. The diagram below depicts

the internal logic of my analysis of the three embedded case studies within my overarching conceptual framework.

Figure 3 **Internal Logic for Analyzing Knowledge Flows and Forces in RDI Fund Research Processes at the project level**



My analysis of the embedded case studies systematically follows the internal logic depicted above with a view to interrogating these elements and their interplay within the wider culture and context of T&T. As in the main case study, context is fundamental to my analysis of the embedded case studies and is considered, in fact, part of the study (Yin 1981, p. 59). I contend that an understanding of the processes for achieving societal impact is only possible through a closer look at these inter-related elements. To achieve

this, I have selected a purposive sample of three RDI Fund projects to delve more deeply into the ways in which the RDI Fund researchers have engaged in knowledge flows to advance research along various pathways to impact. Research Councils UK use the term 'pathways to impact' to refer to the strategies used by researchers to ensure that their research makes a difference in society. Similarly, the RDI Fund encourages researchers to 'plan for impact' and to develop stakeholder engagement plans and impact strategies in the early stages of project design. These three embedded case studies will enable a better understanding of the extent to which knowledge brokerage and public engagement processes were successfully executed in T&T and what factors in the wider environment (at the micro, meso and macro levels) presented facilitating or oppositional forces to efficient and effective knowledge flows.

4.3.2 Vignette A

Project A: Development Issue and RDI Fund Response

The Topaz Landfill is one of four major solid waste treatment plants in Trinidad and Tobago. It was established as a dump in the 1970s and was put under the management of Trinidad and Tobago Solid Waste Management Company Limited (SWMCOL) in 1983. The breakdown of the waste material within the landfill produces air pollutants like methane and carbon dioxide. Additionally, the contact of water with the waste generates leachate, which may contain heavy metals, organic pollutants and pathogenic microorganisms and is highly toxic. This contaminant-carrying leachate liquid can contaminate the soil and underground drinking water supplies, thereby posing an environmental risk to the surrounding communities.

In 2012, the RDI Fund approved US$158,000 (£112,800) for a 2-year project entitled 'The Impact of the Contaminants Produced by the Topaz Landfill on the Surrounding Environment' that aimed at examining the extent of contamination from the Topaz Landfill to the air, water and soil and identifying the potential impacts of this contamination on human as well as ecological receptors. The methodological approach included a contamination assessment (air, water and soil) and laboratory analysis program. Air, surface water and ground water samples were analyzed for organic/inorganic pollutants and compared to national and international standards. With regard to public health considerations, the project sought first to identify and quantify the contaminants, then conduct a qualitative assessment of the potential effects of the pollutants on humans with a view to producing guidelines to protect at-risk communities.

4.3.2 (a) Knowledge actors and flows of knowledge

The main knowledge actors in this project were the RDI Fund researchers, the T&T Solid Waste Management Company Limited (SWMCOL), the Water and Sewerage Authority (WASA), the Water Resources Agency (WRA) and the Topaz Community Development Group. From its inception, this project entailed a close collaboration with these stakeholders. The UWI research team consulted with the Topaz Community Development Group in the preparation and finalization of the project proposal to ensure that Topaz residents had the opportunity to share their expectations for the project and that these expectations were taken on board when executing the project activities. During initial project meetings, some Topaz residents expressed disappointment in the way other research studies had been conducted in the past. Some researchers themselves were also skeptical about whether the project would be able to bring about change at the policy level, stating that 'with my experience with government agencies, I would do all this work and I would give it to them and it would disappear' (Gina, early-career researcher, national). Thus, full transparency was needed to bring research collaborators on board and to have support from the Topaz community. Open communication with the main institutional partners, such as SWMCOL and WASA, was also key to maintaining good working relations. A researcher elaborated:

> I realized we had to be upfront across the board. I did not want any kind of underhand or impression of underhand [behaviour]. It was the same in the community…they were kept informed. We had quite a few community meetings, both formal and informal and the idea was to provide information. (Gina, early-career researcher, national)

In executing this project, the approach used to encourage knowledge flows was through knowledge management mechanisms such as regular meetings (both formal and informal) between the primary knowledge producers (researchers team) and knowledge intermediaries (UWI, SWMCOL, WASA, WRA) and feedback meetings with the community stakeholders. The first two formal meetings were held in the Heights of Topaz and the final formal meeting at the UWI STA Campus in St. Augustine (some 27km from

Topaz). For the latter, transportation had to be provided to bring the community stakeholders to the university to facilitate their participation. It is important to highlight this because Topaz is considered a low-income community and without the provision of transportation by the research project, the participation of the community stakeholders in a meeting at the STA Campus could not be guaranteed. Challenges with physically accessing the research community and ensuring the participation of community members in meetings outside of Topaz is discussed in the following section on countercurrents in the macro environment.

The project team reported that the meetings with representatives from institutions such as SWMCOL, WASA and WRA were well attended and this was considered an indication that the project partners recognized the value of the research findings to their respective work programmes. It is consistent with Zhuge's (2006) assertion that knowledge flows from a position with high potential energy (i.e. high energy nodes) to a position of low potential energy (i.e. low energy nodes). For instance, in one of the meetings convened to provide updated information to SWMCOL and WASA on the water and sediment quality in Topaz, the RDI Project team noted in a progress report:

> The meeting was well attended, and it was the first in a long time that so many upper management personnel from these two organisations had met around a table to discuss the water quality issues in the area. That alone would have made the meeting worthwhile. Everyone was informed, and a useful discussion about the problem and possible solutions ensued (RDI Fund 2013).

Other knowledge management and dissemination strategies used by the researchers in this project team included the more traditional academic publications and presentations in national and international conferences as well as newspaper articles in the national media.

In terms of the nexus between research and teaching - an important core value for the RDI Fund - five postgraduate students and one undergraduate student participated in the project

and were able to develop their skills in collecting samples, use of analytical instruments and methods as well as data analysis. The students also contributed to the creation of new knowledge and the distribution of additional knowledge flows from the preparation of their theses on topics such as:

- The impact of the Topaz Landfill leachate on heavy metal concentrations in the Topaz River
- Characterization and treatability study of leachate from the Topaz Landfill
- Variation in the physical and chemical soil properties of a municipal solid waste landfill in Topaz, Trinidad
- A needs assessment for long-term air pollution monitoring at the Topaz Landfill (RDI Fund Project Impact Report)

The flows of knowledge to graduate students, peer researchers at UWI and researchers in stakeholder organizations should be highlighted as an important dimension, since in the small societies of Caribbean SIDS, these students often move on after graduating to hold influential positions in the public and private sectors and civil society where this knowledge can inform decision making. Contrary to Meagher's model in which media, funders, professional associations and individuals within wider organizations are depicted as the main knowledge brokers, based on the experience of this RDI Fund project, graduate students, peer researchers and research collaborators were the main knowledge actors who served as research brokers and intermediaries, helping to increase the visibility of as well as share information on the project with persons in their respective networks. In the application of my Conceptual Framework to this project (Figure 4), I have included these knowledge actors (graduate students, UWI researchers) in the group of knowledge intermediaries. In fact, beyond the researchers, it was these individual knowledge intermediaries who helped to drive the flows of knowledge emanating from this RDI Fund project.

4.3.2 (b) Countercurrent forces at play during project design and execution

The important role played by context and culture was highlighted in previous chapters. Some factors relating to the micropolitics of research when working with this community include the high levels of poverty, unemployment and exclusion which create what could seem like a very harsh, closed community that is distrustful of outsiders and sees economic survival (and not environmental protection) as its primary concern. Researchers also mentioned the lack of trust of the community in university researchers and that significant time had to be spent getting the members of the community to 'buy into' the potential benefits of the RDI Fund project. A researcher stated:

> What I had to do was keep them informed the whole time. I didn't want it to become us against them…In order to keep the project moving, I wanted it to be a good experience for them working with us. (Gina, early-career researcher, national)

Given the high levels of poverty, many residents were concerned that the findings of the project could cause the government to close the Topaz landfill. Described by the journalist Desiree Seebaran, as a 'community hostile to outsiders', Topaz residents were initially not supportive of the project in spite of demonstrated environmental and health risks caused by the landfill, because their livelihood depended on the re-sale of scrap metals and other items collected from the landfill. According to Seebaran's (2012) newspaper article in the Trinidad Guardian:

> These men and women salvage expired food and clothing in good condition from the refuse and reuse it or resell it. It's how they feed themselves and their growing children…"We don't want the dump to close!" Michael Jacob nearly shouted. With close to 25 tonnes of scrap metal stockpiled for sale on 'his' property, closing the dump would definitely put an end to Jacob's lucrative business. He stated that nearly 300 people work in the dump by his estimation. "When allyuh [all of you] take that work from them people, what they go do?" Other members of the community answered that question for him. "It have a lot of guns around here," said one unnamed young man. "Fellas just doesn't use it. You think that if today or tomorrow you f**** close down the dump, I go sit down here and stay broken [without income]?

This gives a clear picture of powerful countercurrent forces at the macro level, which characterize the external environment in which STA researchers had to execute their research.

It is worth pointing out that the accessibility of research communities was also a factor in the macro environment, which served as a countercurrent to knowledge flows since logistical challenges to physical mobility inhibit direct stakeholder engagement and thus, restrict flows of knowledge. In this case, the project did not budget sufficiently for this and had to rely on in-kind support from stakeholders to transport the Topaz residents (knowledge beneficiaries) to these meetings. In T&T, stakeholders from remote and low-income communities often do not access knowledge via traditional academic outputs and researchers therefore need to support knowledge flows through in-person dialogue (and other creative tactics), which presents high costs (both staff time and transport) to the project. However, RDI Fund project teams have small budgets and are expected to work within strict budget thresholds for items not linked to core research activities such as transportation, meetings, marketing and promotions, etc. Based on the application of my conceptual framework, it is evident that these financial limits set by the RDI Fund can, in reality, thwart knowledge flows since they do not support the required level and appropriate forms of public engagement to achieve sustained knowledge flows and societal impact, particularly when working with remote and low income communities. One of the researchers emphasized the point that 'we have to get out and show people that it is not just an ivory tower and we can use this research but that requires us to get out there' (Gina, early-career researcher, national).

At the meso level, the researchers initially had to grapple with the typical 'silo' approach of many government institutions in T&T. It is noteworthy, however, that the project helped to enhance inter-institutional collaboration, turning what represented a countercurrent force in the early stages of project execution, into an enabling force. A researcher commented that 'the project helped to bring these entities around the same table… and facilitate data sharing' (Gina, early-career researcher, national). Building

trust among the staff of the collaborating institutions was also fundamental and this initially presented a countercurrent to knowledge flows between the institutional partners UWI, SWMCOL and WASA. There were initial reservations to collaborate with the RDI Fund researchers because the environmental threat caused by the Topaz landfill had received negative press in the past and there was a concern that the researchers would go to the media with information stemming from their research, which could affect the public's image of SWMCOL and WASA. The trust, therefore, had to be earned over time, which in turn slowed the flow of knowledge and diminished the rate of progress in early stages of project execution. A researcher explained:

> For every meeting we had their PR people there but I think eventually they got comfortable and realized we would not be calling the press or having [media] conferences and leaving them out…We also had a rep from their Health and Safety Dept…that person was always part of the planning process. Anytime data was generated they were informed. Any kids of public statement, announcement or presentation was passed through them first so that they could see what we were doing. (Gina, early-career researcher, national)

Institutional challenges with project execution within the UWI also contributed to countercurrents at the meso level. For this project, some challenges related to receiving the required support from different UWI team members and departments responsible for specific sub-components of the project. According to one of the research participants:

> The problem was to get those people to do their part…. when you have to delegate and your reputation is standing on what other people are doing, it is very difficult. I would say that was the challenge…(Gina, early-career researcher, national)

The lack of institutional incentives for academics working on research projects with societal impact (and not strictly academic impact) was also cited as a concern. This is because impact projects require significant additional effort on the part of researchers to organize stakeholder engagement sessions that facilitate knowledge exchange and

knowledge utilization, which often are not captured or recognized in traditional university assessment and promotion (A&P) processes. Thus, RDI Fund researchers explained that they often felt torn between investing time, energy and resources in activities that contribute to societal impact and activities that would help to boost recognition of the academic achievements and advance their career. These concerns constitute countercurrents at the meso level and no doubt affect each knowledge actor's knowledge energy defined by Zhuge (2006) as the 'degree of a node's knowledge and a person's cognitive and creative abilities' (p. 2070).

For early career researchers, some of whom were involved in this RDI Fund project, this pressure is even more real. One researcher explained:

> I think people here must change a bit because they are mostly concerned with how many publications you have, what is the impact factor and how many citations…sometimes the [development] problem concerns the local environment and it needs research but it is not going to be publishable because it is a local version of something that has been done many times elsewhere…so if your work can't be published it is like pro bono work; a lot of work with no recognition in the end. (Gina, early-career researcher, national)

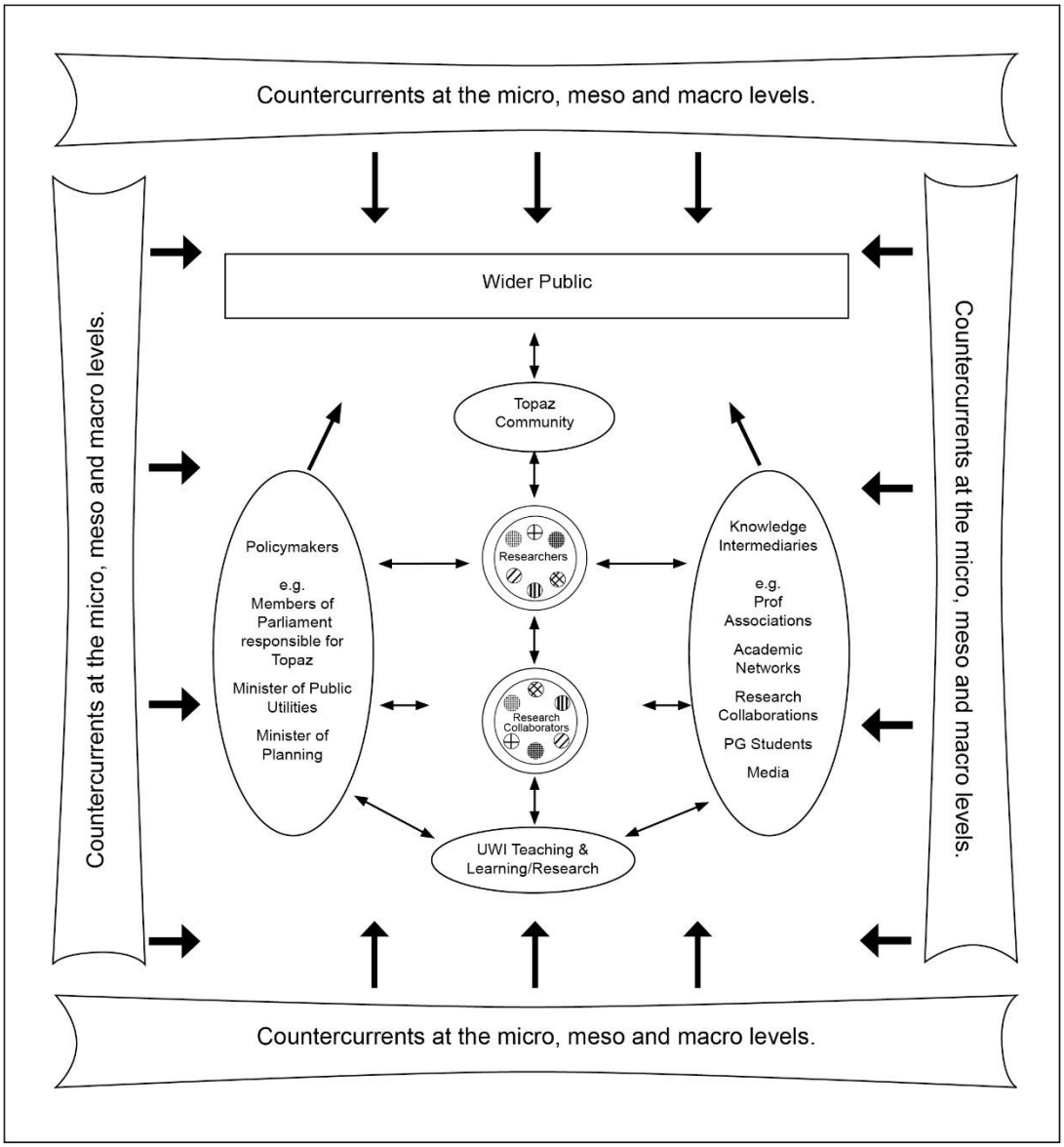
At the micro level, this project also highlighted the challenges experienced by some researchers with implementing research projects geared towards societal impact. The complexity of some stakeholder communities and the skills needed to manage complex research teams and map out strategies to navigate the micropolitics of research communities in T&T were not sufficiently understood prior to project execution. One of the researchers in the project team described this aspect of project execution as 'the most challenging…working in the community makes the work that much more difficult' (Gina, early-career researcher, national). Researcher skill and experience do not feature in Meagher's (2008) Conceptual Framework. However, based on the experiences of RDI

Fund researchers, these are important factors, which can constitute either an enabling or an inhibiting force at the micro level.

Figure 4 that follows is an adaptation of my conceptual framework to depict the most salient flows of knowledge that were experienced in this specific RDI Fund project. The UWI researchers were the main investigators conducting the scientific analyses and have been placed in the centre of the diagram to highlight the multiple directions for flows of knowledge. The placement of the Topaz community reflects the direct contact between researchers and the research community and the knowledge flows between them, as the community was treated as a user group receiving constant attention and influence directly by the researchers in order to increase the levels of trust. One of the project's research participants from the Topaz community explained that 'they wanted to know what the research was saying' (Gina, early-career researcher, national). Some key knowledge intermediaries and policymakers have been listed, with the latter group being shifted in my conceptual framework to be positioned closer to the UWI researchers (Figure 4) to reflect greater accessibility of these knowledge actors in small societies like T&T. This contrasts with more developed countries and can be considered a vital facilitating force for enhanced knowledge flows in Caribbean SIDS, as the relative accessibility of policymakers and decision makers increases occasions of influence and enhances the potential for achieving societal impact. The research collaborators such as SWMCOL, WASA and WRA have been placed close to the UWI researchers (at the centre) because of the close working relationship (which developed over time as trust was increasingly built). This differs from the experience of the other two embedded cases (Figures 5 and 6), for example, in that these collaborators did not embed themselves in the research team but rather, continued to maintain an institutional separation during project execution, perhaps given the potential political and social repercussions of what the collaborators perceived as a research project on an issue that was controversial.

The oppositional forces in the external environment mentioned earlier in this section are depicted on all four sides of the diagram as countercurrents that exist at the micro, meso and/or macro levels, exerting pressure on flows of knowledge and ultimately affecting the efficiency and effectiveness of the knowledge flows. The mistrust in the community and among the collaborating institutions as well as the high levels of poverty and exclusion of the Topaz community causing some residents to have a vested interest in keeping the landfill operational, all constituted potent oppositional forces to the flows of knowledge from this RDI Fund project. While the source of these countercurrents is not stated in Figure 4 due to lack of space, the countercurrents at the macro, meso and micro levels are specified in the Matrix of Core Elements of My Conceptual Framework (Table 3).

Figure 4: Knowledge Flows and Forces in RDI Fund Project A



4.3.2 (c) Outputs, Intermediate Impacts and Occasions of Influence

While an assessment of the impact of RDI Fund projects is not the focus of this study, I believe it is worth highlighting the intermediate impacts and contributions to development outcomes that were generated by each of the three projects since this follows the logical progression of the flows presented in my conceptual framework. As explained earlier, proving causality is not an objective of this study. However, a better appreciation of the effectiveness of the knowledge flows and strategies to support knowledge utilization can only be achieved alongside an understanding of the project's outputs and the intermediate development outcomes facilitated by the project. My summary of the respective outputs and outcomes are drawn from my field research, the RDI Fund project completion reports and impact reports as well as national media articles.

The Topaz landfill project provided much-needed data to inform policy and decision making at SWMCOL, WASA and LSA. UWI researchers and graduate students participated in the data collection and analysis, which in turn was useful for strengthening graduate student research skills and informing new areas of teaching and research. In the case of SWMCOL, the research findings were helpful to guide the design of a leachate treatment system that would mitigate the pollution from the landfill. Many of the recommendations for improving the environmental impact of the landfill were adopted, including the institution of waste diversion strategies to limit the amount of waste and to change the type of waste entering the landfill. The LSA used the data from the RDI Fund project to inform discussions on relocating the communities surrounding the landfill.

The project also provided clarity on a range of issues by making scientific knowledge more widely accessible and understood by a diverse range of stakeholders through the many meetings and community engagements organized. By maintaining open and transparent dialogue with the community, sharing the findings of the research and involving key stakeholder groups from the start of the project, the project helped to build trust between the community and the university as well as with state agencies like

SWMCOL, WASA and LSA and to strengthen working relations for ongoing and future collaborations. Moreover, different types of in-kind support were provided by the state agencies for this project, which is testament to their commitment and recognition of the added value generated by this project. Based on the RDI Fund Project Completion Report, WRA provided access to its databases at no cost (in a context where inter-institutional data sharing continues to be a major challenge) and provided transportation as well as access to its monitoring and production wells for sampling. SWMCOL also gave UWI access to its data as well as security, transport and access to the landfill for sampling. Both SWMCOL and WRA contributed to the organization of stakeholder engagement activities by providing refreshments for community meetings in Topaz.

During the execution of this project, partnerships with a range of institutions were both forged and strengthened. The UWI signed an MOU with the Caribbean Institute of Meteorology and Hydrology (CIMH) which also contributed to specific aspects of the project (at no cost) and partnered with WRA and WASA in the Adopt-a-River programme to promote river cleanliness and water safety. The collaboration with SWMCOL and WRA also led to internship opportunities for UWI students, particularly those pursuing a major in applied/industrial chemistry in which completing an internship is a prerequisite.[3]

With respect to attracting additional funding, the project inspired a proposal entitled 'Science education as a Climate Change Resilience Strategy: encouraging alternative energy innovation through community participation and practical science education for our children' which received US$94,000 in funding from UNDP/GEF and other sources. SWMCOL also submitted the RDI Fund project report as scientific justification for a new leachate treatment system to mitigate the environmental and health impact of the

[3] In addition to the communications outreach by the project team, there have been numerous media references to the RDI Fund Guanapo Landfill research study including: http://www.trinidadexpress.com/20170215/news/poison-water and http://www.wasa.gov.tt/AdPress_2017-02-17_WASAWaterSafe.html

Topaz landfill and received US$150,000 from the government's Public Sector Investment Programme (PSIP) in 2016.[4]

The following Table (Table 3) brings together in a matrix format the core elements of my conceptual framework. To allow for at-a-glance analysis, it presents a mapping of the primary knowledge actors, knowledge brokerage strategies, contextual challenges and countercurrents as well as research outputs and intermediate impacts for this specific RDI Fund project. In so doing, it enables a better understanding of the interplay between the factors, flows and forces during the execution of this project alongside some preliminary evidence of research outputs and societal impact. It also serves to emphasize the findings of my analysis of this embedded case study and the value added of the application of my conceptual framework, which integrates knowledge flow analysis, knowledge brokerage and the micropolitics of the Topaz community.

[4] Government support for the Guanapo Leachate Treatment Plant is mentioned on page 27 of the 2017 Report on the Public Sector Investment Programme Trinidad at: http://www.finance.gov.tt/wp-content/uploads/2016/10/Trinidad-PSIP-2017.pdf

Table 3: Matrix of Core Elements of My Conceptual Framework: Integrating Knowledge Flows, Knowledge Brokerage, Micropolitics of the Research Community and Intermediate Impacts in RDI Fund Project A

RDI Fund Project Short Name	Knowledge Actors or Agents	Strategies to support flows of knowledge	Contextual challenges at micro, meso and macro levels that are countercurrents to knowledge flows	Outputs, Intermediate Impacts or Occasions of Influence
Project A **Impact of Contaminants at Topaz Landfill**	▪ UWI Researchers ▪ UWI graduate students ▪ SWMCOL ▪ WASA ▪ WRA	Knowledge Management ▪ Meetings – formal & informal ▪ Presentations at national & int'l conferences ▪ Academic publications ▪ Newspaper articles ▪ Participation of graduate students in project ▪ New knowledge from graduate student theses.	Macro ▪ Lack of trust by community; ▪ High levels of poverty, unemployment and exclusion in Topaz; ▪ Residents see landfill as main source of income (through scavenging and sale of scrap metals); ▪ Persistent stigma and marginalization experienced by Topaz residents;	▪ Data to inform policy and decision-making; ▪ Technical info. for design of leachate treatment plant to mitigate pollution from landfill; ▪ Data to guide relocation of affected communities; ▪ Stronger inter-institutional relations between UWI, SWMCOL, WASA and LSA

			▪ Politics – very little government attention/resources traditionally for Topaz; Meso ▪ Government agencies working in silos, not always willing to share data; ▪ Initial reluctance to trust staff of partner institutions; ▪ Real costs to project for community engagement – transport, meetings, refreshments, etc.; ▪ RDI Fund budgetary thresholds for non-traditional knowledge brokerage activities;	▪ Increased sharing of data among institutions; ▪ New partnerships; ▪ New internship opportunities for students; ▪ RDI Project helped to shine light on development needs of Topaz community and to give residents hope; ▪ Additional funding for new research projects; ▪ Increased awareness among researchers, key institutions, wider public; ▪ More trust with community and other stakeholders; ▪ For individual researchers - key lessons on project management and

			▪ UWI traditional focus on academic publications in Assessment and Promotion (A&P) process perceived as disincentive for researchers to spend time on public engagement; ▪ UWI institutional challenges Micro ▪ Limited researcher skill and experience dealing with micropolitics, project management, public engagement etc. ▪ Researcher perception of academic trade-off for increased public	connecting research with users.

			engagement, which requires significant investment of time with little/no recognition in university A&P process.	

4.3.3 Vignette B

Project B: Development Issue and RDI Fund Response

Oral tradition is the cornerstone of many cultural artforms such as calypso, storytelling and spoken word, which make up T&T's heritage tourism product. However, negative attitudes towards Trinidadian Patois (French Creole) and Trinidadian Bhojpuri caused speakers to feel stigmatized. Over the decades, this has discouraged the transmission and use of these languages. In the case of Bhojpuri, the last fluent speakers are all over 80 years old. With regard to T&T Sign Language (TTSL), while many deaf persons use TTSL, it is different from American Sign Language (ASL), thus contributing to communication challenges with deaf interpreters who may be trained in ASL and increasing the exclusion of deaf persons as well as their lack of access to information on critical services (such as medical and legal services) when TTSL interpretation may not be available.

In 2012, the RDI Fund approved US$38,000 (£27,600) to support a two-year project aimed at documenting Patois, Bhojpuri and TTSL by creating digital archives of these three endangered languages and promoting public awareness of the languages, their speakers and their communities. The project also sought to help the wider public understand issues surrounding language endangerment and language death, where there are no remaining living speakers of a specific language or the level of linguistic competence has decreased to such an extent that it cannot support the use of the language.

4.3.3 (a) Knowledge actors and flows of knowledge

The approach adopted by this project's research team was to embed themselves in the respective communities of language speakers. This allowed for a high level of trust to be established from early on in project design and for the language users to be active participants fully committed to the success of the project. A researcher explained that 'it was work that only they could do as insiders in the community, as the people who knew how the community worked and had the language skills' (Owen, early-career researcher, non-national). As a result, knowledge was exchanged easily, freely and on a continuous basis. Given the project's emphasis on documenting spoken languages, this close interaction with research participants and stakeholders was essential for the research to be carried out. Another comment underscoring the value of this approach was:

> We learnt a lot from trying to do it… how to document these languages effectively… the more people you have involved the better…it's a learning research. There is a narrative sometimes about the researcher going and saving the language or something like that. And that can't work because a language only exists within a community and you have to build community strength and community interest from within'. (Owen, early-career researcher, non-national)

This RDI Fund project, in particular, highlights an important shortcoming in Meagher's (2008) conceptual framework depicting flows of knowledge with regard to the origination of knowledge. In Meagher's (2008) model, researchers (as individuals or disciplines within wider organizations) are depicted as the primary producers of knowledge, which is then transmitted to knowledge brokers and intermediaries, knowledge users and then knowledge beneficiaries. This is more accurate for traditional, discipline-based Mode 1 knowledge but less applicable in the cases of Mode 2 knowledge produced during the application of research to solve problems (Gibbons, Limoges, Nowotny, Schwartzman, Trot and Trow 1994). For instance, based on the work carried out in the Patois, Bhojpuri and deaf communities, this RDI Fund project demonstrates that these stakeholders were themselves custodians of knowledge and had a tacit understanding of their cultural heritage, which facilitated the documentation and

linguistic analysis of the endangered languages, working in close collaboration with the UWI researchers and actively co-creating knowledge in their local context. The notion of these two groups of knowledge actors coming together to co-create knowledge is captured in the Project Completion Report, which states:

> …it is important not just for researchers in the University to take their research 'into the community' but that community members and researchers are encouraged to find places for themselves within the University (RDI Fund 2015, p. 5).

This close collaboration and recursive research process with multi-directional flows of knowledge between the knowledge producers and knowledge beneficiaries contrasts with the more linear approach of Meagher's (2008) Conceptual Framework. The strategy employed by this project team entailed a continuous two-way flow of knowledge (and by extension, expertise and influence), between the researchers and research participants, which then percolated through to knowledge brokers, intermediaries, users, etc. The knowledge did not emanate solely from the researchers to subsequently be channeled to the knowledge brokers and intermediaries, as Meagher's model suggests. My conceptual framework seeks to highlight the multi-directional nature of knowledge flows by placing researchers at the centre. Figure 5 represents the application of my conceptual framework to this specific RDI Fund project and depicts my expansion of the box for researchers to reflect UWI researchers and students working closely with the endangered language speakers as members of a joint research team that co-produces knowledge and stimulates knowledge flows in multiple directions.

This project employed a range of knowledge brokerage strategies to facilitate knowledge utilization and societal impact. These included the more traditional academic papers, articles in journals such as Caribbean Journal of Cultural Studies, Society for Caribbean Linguistics Occasional Papers series, book chapters and presentations at academic conferences. It also included presentations to non-specialist

audiences, participation in public consultations on constitutional reform in which language rights was inserted into the discussions and a researcher's blog entitled 'Language Blag' (www.languageblag.com), which was intended to generate interest among wider, non-specialist audiences. One of the researchers commented that 'there is a huge potential in this area, in language, to have an interested audience'. (Owen, early-career researcher, non-national)

Seven print media articles and six television interviews as well as YouTube channels for Patois and TTSL assisted with disseminating information to the Patois and TTSL communities and with documenting the languages for future research. In addition to setting up a website about the project (www.sta.uwi.edu/rdifund/projects.ttel/index.asp), additional websites were established for the podcasts (https://caribbeanlanguagepodcast.wordpress.com), and thanks to additional financial support from the US Embassy, a website for disseminating health information to deaf persons (www.deaftt.com) was created and several Facebook pages and groups were formed.

Additionally, by serving as a member of the organizing committee for three international conferences on persons with disabilities, Patois and TTSL, the project team was able to share information on the RDI Fund project with international researchers and explore opportunities for research collaborations. Two films, entitled 'Endangered Sounds, Endangered Songs: Patois in T&T National Music Genres' and 'Linguistic Landscapes Patois Speakers Share Their Knowledge' were produced to depict the traditional culture associated with Patois. Members of the project team collaborated with another UWI colleague to produce another film entitled 'Dis abled, Mis-Labeled' which sought to build awareness of the day-to-day life experience of persons with disabilities in T&T. All films were screened to public audiences, including policy makers and government officials.

Another type of knowledge flow that was salient in this project and not depicted in Meagher's (2008) model but incorporated into the application of my conceptual framework to this RDI Fund project, is the flow of knowledge from the research project back to the university through new teaching and research possibilities emanating from the data collected. This flow was more prominent in the analysis of RDI Fund Project B than in my earlier analysis of RDI Fund Project A and is therefore represented as a discrete circle entitled 'UWI Teaching and Learning/Research' positioned between the RDI Fund research team and the Practitioners to reflect the important knowledge flows that supported the development of new course content for teaching and training programmes (for example, courses delivered privately by the researchers working in collaboration with NGOs and other entities such as the Caribbean Sign Language Centre and the Lloyd Best Institute) as well as new ideas for research projects. The nexus between research and teaching was very strong in this project, both via graduate and undergraduate student participation in the project and via the development of content for seven new undergraduate courses on French Creole and Caribbean Sign Language. One of the researchers emphasized that:

> We also used the materials as the basis for teaching at UWI. So since the project, for the first time I taught three [title withheld] courses…and the data we've gathered on that really provided the basis for a lot of what we taught in the programme. (Owen, early-career researcher, non-national)

Flows of knowledge and expertise were also observed when a novel approach for the teaching and practice of sign language interpretation in T&T emerged from one of the project's workshops that received support from the US Embassy for training by US specialists. One of the local deaf organizations working on the RDI Fund project selected a deaf interpreter trainer, which had never happened before and this trainer introduced the workshop participants to the use of a deaf and a hearing person working together for sign language interpretation (as opposed to the traditional way of using a hearing interpreter who can convert words into sign language). A member of the research team explained that 'there was a lot of enthusiasm from everyone that came out for that workshop' (Owen, early-career researcher, non-national) since the collaboration

between the deaf and hearing interpreters allowed for more accurate and clearer interpretation into sign language. This researcher elaborated further:

> As a native signer, he's got more skills in sign language and so he expresses it more clearly so the deaf will be able to understand… [it was] the first time that's ever been done and it was really a revelation to everyone involved that we could do it like that and it could work… (Owen, early-career researcher, non-national)

With regard to flows of influence, this small project made important strides towards better organizing the Patois, Bhojpuri and deaf communities through the compilation of stakeholder databases, building capacity, increasing visibility, advocacy and awareness of issues such as language endangerment and language rights. A research participant indicated that efforts undertaken to strengthen advocacy for deaf communities went beyond T&T:

> I personally have been trying to work out a more cross-Caribbean regional connection between deaf communities because their issues are very similar. I think advocacy on various united fronts is most likely to be successful. (Owen, early-career researcher, non-national)

Technology was leveraged to boost knowledge flows, particularly to the deaf community, by capturing vital health information on videos which were then uploaded to the project website and made accessible to all. This helped to overcome 'the challenge of the deaf [not] accessing health care because of privacy issues and their interpretation needs' (Owen, early-career researcher, non-national), which in the past had deterred deaf persons from seeking medical attention.

It should be noted, however, that for small research teams and projects with limited budgets, working on multiple fronts to ensure sufficient knowledge flows to a wide range of actors through active and continuous stakeholder engagement with diverse groups, including dedicated outreach to policy and decision makers, can be quite

challenging and time consuming. There are simply too many knowledge actors that need to be engaged and insufficient time and persons to carry out the activities. One researcher from the project team shared this concern:

> Working with the deaf community for a long time, I realized I hadn't met any of the people who were responsible for deaf education or policy making…but there comes a point when you just have to get the people who actually have the power to notice you, otherwise it's very difficult to get more ambitious things achieved…If you don't have institutional support from Ministries, Associations and powerful people, you're going to be limited in what you can achieve…(Owen, early-career researcher, non-national)

Additionally, project team members felt that there was less interest from peers outside their Department and thus, fewer occasions of influence and knowledge flows within the university itself on issues surrounding language endangerment. One of the researchers noted that 'we've been least successful in engaging the campus community' (Owen, early-career researcher, non-national) and lamented that when research expos are organized on the STA Campus and researchers go to great lengths to prepare presentations and other information material to share with colleagues, the persons who show up are those who are already knowledgeable on these issues. The comment, '…they already know about it and it is a complete waste of time. They already heard me say these things before…so that was frustrating' (Owen, early-career researcher, non-national), captures the exasperation shared by other researchers.

The researcher also added a postcolonial perspective based on personal experience:

> In my area of linguistics, the legacy of colonialism has manifested itself in our underappreciating all kinds of things which are indigenous, including languages. (Owen, early-career researcher, non-national)

Instituting effective ways to increase effective knowledge flows *within* the university community is thus also important. Increased inter-disciplinary knowledge flows present a distinct advantage in the approaches to conducting research that seeks to address

multidimensional development issues affecting society and would enable UWI researchers to build greater critical mass. A researcher emphasized:

> UWI is important in T&T and the people who are in UWI have a powerful voice in the wider society and if you can get the interest of people on campus, that can be quite significant. (Owen, early-career researcher, non-national)

4.3.3 (b) Countercurrent forces at play during project design and execution

Persons with disabilities and speakers of endangered languages are among the most marginalized groups in T&T society. While there has been some progress with increased enforcement of human rights laws and greater public awareness, culturally, there is still evidence of stigma, public unease and limited opportunities for integrating deaf persons into society. The project team recognized this and had a full appreciation of the macro context characterized by limited financial capacity as well as lack of power, voice and political influence of the research communities with which it was working – that is to say, the TTSL, Bhojpuri and Patois speakers.

Existing tensions, divisiveness and lack of organization among NGOs representing the deaf community initially presented significant challenges to knowledge flows. The micropolitics of this research community was characterized by allegations of mismanagement and corruption within the relevant NGOs, which made it even more difficult to build trust. Researchers interviewed mentioned 'rival boards' in operation at the same time, 'corruption and missing funds' and 'chaos' when describing the environment in which they were carrying out the research on TTSL. Thus, in order to prepare for this research collaboration, more time had to be invested in nurturing supportive working relations among key research participants to foster the knowledge flows needed for effective project implementation. In the case of the Bhojpuri and Patois speakers, there was no pre-existing database of native speakers and the project had to develop its network of research participants in an organic way, using the 'snowballing' approach. Given that many of the remaining speakers of Bhojpuri and

Patois were elderly (some 80 years and older), in some cases, research participants who were actively supporting the documentation of the endangered languages passed away during the project and naturally, this affected the project team, though at the same time reinforced the importance of the project.

At the institutional (meso) level, challenges linked to UWI bureaucracy, delays with receiving ethical review approval and delays experienced with the procurement of equipment affected project execution. One of the researchers complained that '…it is not easy and UWI does have problems and I find the bureaucracy incredibly frustrating' (Owen, early-career researcher, non-national). In the application of my conceptual framework, time and energy invested in battling bureaucratic procedures within the university are thus viewed as an oppositional force (at the meso level) to knowledge flows as it takes away time and energy that could otherwise be dedicated to knowledge brokerage activities that contribute directly to achieving societal impact. In describing the way in which executing this RDI project impacted on the researcher himself or herself, the researcher explained:

> It affected me a lot, in positive and negative ways…some parts were extremely challenging for me when dealing with the administrative and logistical things, it was incredibly frustrating…I've realized I need to think about having other people assist with administrative matters because it's not my strength…it's not a good way to run a project. (Owen, early-career researcher, non-national)

From a research management perspective, creating a more enabling UWI institutional environment for research project management and execution would serve to minimize the countercurrents at the meso level so that researchers' energy can be focused on supporting more efficient and effective knowledge flows.

At the micro level, my analysis of this RDI Fund project reiterated the importance of researcher skill and experience in helping to mitigate countercurrents to knowledge

flows. This research team comprised early-career researchers, some of whom had recently joined the UWI and were not nationals of T&T. This meant that researchers were still acquiring the institutional knowledge needed to effectively navigate the UWI as well as an understanding of the political, societal and cultural factors that impinge on research project execution in T&T. A researcher explained:

> It's the part that I find most difficult…because I am an academic and I am also a foreigner so I don't entirely understand how things get done in T&T at the level of project implementation, community engagement and policy change. (Owen, early-career researcher, non-national)

This was compounded by the fact that for this RDI project, the research community in fact comprised three distinct communities – TTSL, Bhojpuri and Patois communities – which were completely different. Not only are these communities located in different parts of T&T, but the history, culture and micropolitics of these communities are dissimilar, requiring mapping from different angles and at multiple levels. One of the researchers attested to the complexity of the project by commenting that:

> For me, this was also quite a big departure in that it was a very broad collaboration. So I was working to bring people together, working with different communities. Apart from the one I was working [directly] with, I'm not really familiar with those communities. I know them academically but I don't know the people and I don't really understand entirely how it all works and it wasn't my job to do that either. My job was to try to manage successful collaboration and communication, data handling and data sharing and how you create systems to allow you to do that successfully….Before I was much more focused on the details of the linguistic analysis and now I have a much greater sense of the importance of establishing effective working relationships and using what tools are available in order to allow that to happen. (Owen, early-career researcher, non-national)

The project team managed to embed itself in the respective communities by assigning different researchers as project leads for the research being carried out in the TTSL,

Bhojpuri and Patois communities respectively, who then fed their findings back to the principal investigator who collated the data. While this is a common practice for managing complex research projects, the small project budget to cover such a range of activities in multiple research communities in an effort to achieve societal impact, put added pressure on the capacity of the research team.

In Figure 5 that follows, my conceptual framework has been applied to this RDI Fund project to reflect the flows of knowledge that occurred. The knowledge producers group was expanded to include the endangered language speakers as co-producers of knowledge and this is one notable difference from Meagher's (2008) original model. The knowledge flows to the TTSL, Bhojpuri and Patois communities are also depicted. It should be noted that the weak organizational capacity and in some cases, divisive nature, of the NGO community with which this research team worked to execute this project, constituted a significant countercurrent, which if not astutely managed, could have adversely affected the flows, expertise and influence needed for the production of the research outputs and other project outcomes with the potential for societal impact.

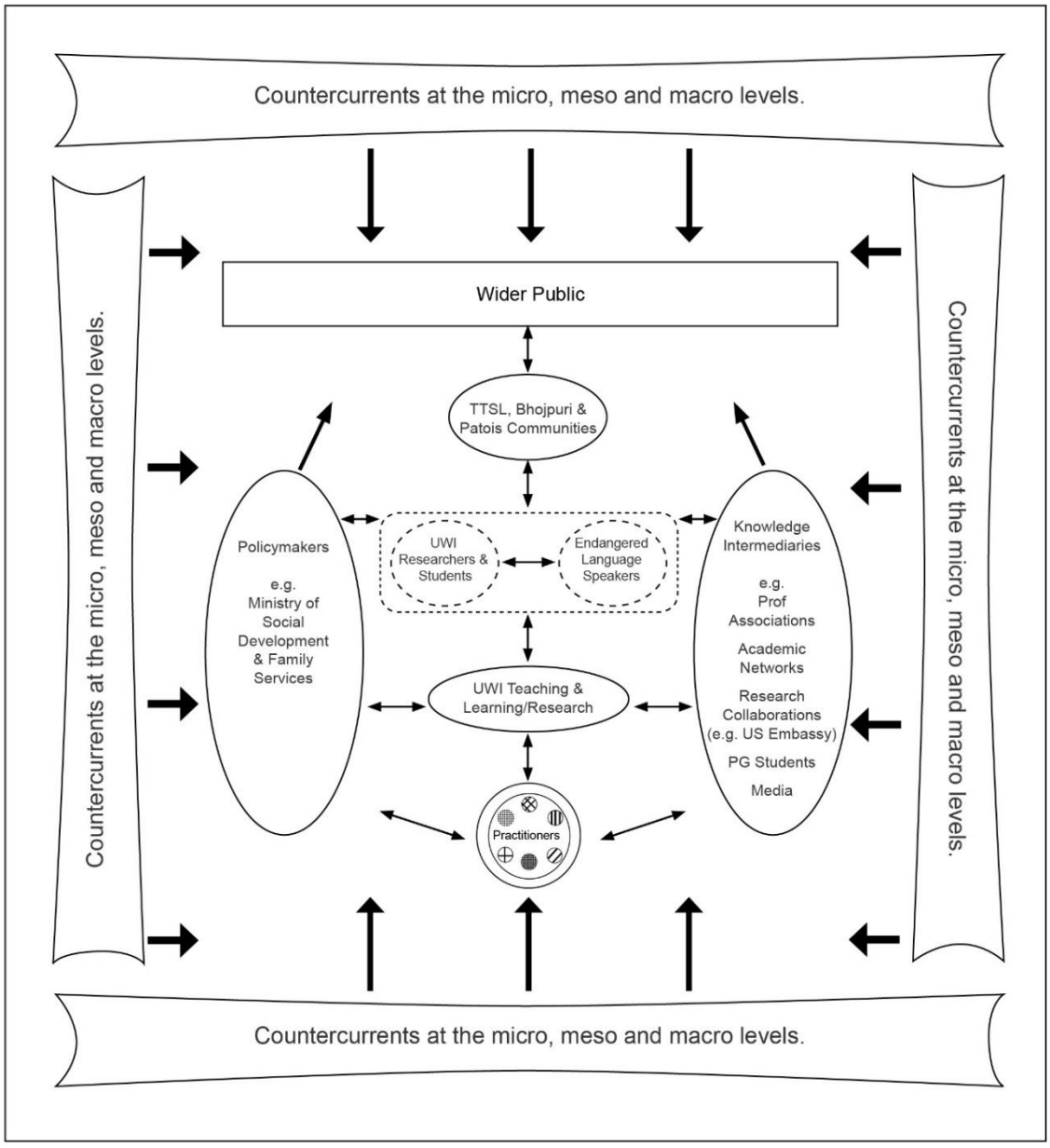
An important component that has been incorporated into this diagram is the recursive link between research and teaching, which was quite significant in this RDI Fund project and thus needed to be singled out as a separate knowledge actor, which helped to facilitate further flows of knowledge. One researcher commented:

> We used the materials as a basis for teaching at UWI…all the data we've gathered on that [TTSL] really provided the basis for a lot of what we taught in that program…. the research was partly about building new course content. (Owen, early-career researcher, non-national)

While some may argue that there is a nexus between research and teaching in all university research, in the case of this RDI Fund project, the contribution of the research to teaching through the development of new courses and teaching material was more

prominent than in other RDI Fund projects and contributed to its range of research outputs and intermediate societal impacts.

Figure 5: Knowledge Flows and Forces in RDI Fund Project B



4.3.3 (c) Outputs, Intermediate Impacts and Occasions of Influence

Although small in terms project funding amount (US$38,000 or £27,600), this RDI Fund project sought to bring awareness to an issue that is fundamental to the preservation of T&T's cultural heritage. The interventions supported by this project to protect three languages in imminent danger of becoming extinct in T&T have already begun to demonstrate important outputs and intermediate impacts. The podcasts have helped to build awareness of these endangered languages; the language archives have provided unique and valuable language resources for additional teaching and research activities and the screening of the films has enabled information to reach more diverse audiences in a format that is impactful and easy to digest. The website with over 80 videos with medical information has filled a fundamental gap by providing the deaf community with equal access to medical information translated in TTSL so that deaf persons can make informed decisions about their health. This is a valuable resource that goes beyond individual access to health information and can impact wider public health concerns in the medium to long term, by giving deaf persons access to information that can improve deaf persons' decision-making about health issues and their overall sense of autonomy.

It is important to point out that in comparison with the previous embedded case study, RDI Fund Project B went beyond knowledge management in terms of the knowledge brokerage strategies employed to include capacity building of key stakeholders as part of the process that enhanced knowledge flows between the research team and the knowledge beneficiaries. For example, with additional funding from the US Embassy and working in collaboration with the Deaf Empowerment and Advancement Foundation of T&T, the Project Team arranged training by internationally certified interpreter trainers from the USA to 20 deaf and 20 hearing interpreters in T&T. This was historic because it was the first time that deaf people in T&T had received training in sign language interpreting and also because it paved the way for a landmark moment for one of the deaf project team members who became the first deaf interpreter to interpret the national budget of T&T in 2014, thereby enabling the deaf community to

follow the live delivery of the national budget in Parliament. This was cited as a major breakthrough and a significant impact (albeit unanticipated) of the TTEL project. Since the inclusion of TTSL interpretation of the national budget, there has been an increase in sign language interpretation for national events and communications in T&T, with prime time news on some local channels now having sign language interpretation of news reports every night. Irrespective of whether these advancements would be attributed to this RDI Fund project, they nonetheless represent important breakthrough opportunities for the deaf community in T&T.

Prior to the execution of this RDI Fund project, the Faculty had limited teaching materials on these three languages. Not only has the project led to new teaching materials and new research projects, but there has been an increased demand for training courses in Patois and TTSL and more persons than ever before signed up for these classes (RDI Fund Project Completion Report). Coming out of this small project, one of UWI's Linguistics graduates won a fully-funded PhD scholarship at the University of Connecticut to work on T&T Sign Language using some of the materials collected, which could open doors to more international research collaborations in this area.

This project is an example of a development issue that affects a numerically small population in T&T but may be considered by some stakeholders to have had a major societal impact in terms of its ability to generate much-needed data, useful research products and positive outcomes for disadvantaged groups through increased access to information, equity, dignity and respect for human rights. At the macro level, it points to the crucial need for dedicated national research funding because if such a project were solely dependent on international funding (which is guided by external priorities and evaluation criteria that do not necessarily prioritize the value added of projects in their local context), this would put a critical aspect of our T&T cultural heritage at risk. Table 4 presents a matrix that integrates the main elements of my conceptual framework, highlighting the salient knowledge actors, knowledge brokerage strategies,

the micropolitics of research and research outputs and intermediate societal impacts of this RDI Fund project.

Table 4: Matrix of Core Elements of My Conceptual Framework: Integrating Knowledge Flows, Knowledge Brokerage, Micropolitics of the Research Community and Intermediate Impacts in RDI Fund Project B

RDI Fund Project Short Name	Knowledge Actors or Agents	Strategies to support flows of knowledge	Contextual challenges at micro, meso and macro levels that are countercurrents to knowledge flows	Outputs, Intermediate Impacts or Occasions of Influence
Project B **Documentation of Endangered Languages in T&T**	▪ UWI Researchers ▪ Deaf Empowerment & Advancement Foundation of T&T (DEAF) ▪ TTSL and the deaf community ▪ Patois-speaking community	Knowledge Management ▪ Meetings ▪ Academic publications ▪ Presentations at academic conferences ▪ Presentations to non-specialist audiences ▪ Researcher's Blog (online) ▪ Films and public screenings of films ▪ Media articles	Macro ▪ Inadequate support and financial resources from government for persons with disabilities and other excluded groups; ▪ Lack of organization and cohesiveness among NGOs working with deaf community;	▪ Increased awareness of endangered languages; ▪ Resources for development of new courses and further research; ▪ Greater access to vital information by a marginalized community; ▪ Increased UWI enrolment in existing classes on

	▪ Bhojpuri-speaking community	▪ Interviews on local television ▪ You Tube channel for Patois and TTSL ▪ Podcasts ▪ Multiple websites and Facebook pages. Capacity Building ▪ Training of deaf and hearing interpreters in TTSL. ▪ New teaching courses – TTSL and patois.	▪ Aging community of Bhojpuri and Patois speakers and effect of research participants dying during project execution; ▪ Shortage of sign language interpreters in T&T; Meso ▪ UWI Institutional challenges – bureaucracy, research management support, lack of interest of other Departments in Linguistics research; ▪ Inadequate project funding to cover real costs for community engagement in multiple locations;	TTSL and French Creole; ▪ Increased interest in and demand for courses outside of UWI; ▪ Potential for new income from courses for university and tutors (privately); ▪ Better TTSL interpreting skills for both deaf and hearing interpreters; ▪ Decision to have a deaf interpreter for the National Budget of T&T (2014); ▪ Increased use of sign language interpreters for events in T&T; ▪ Continuous sign language interpretation for

			▪ Tension and mistrust among institutional partners (NGOs representing deaf community) because of history of mismanagement, alleged corruption and divisiveness; Micro ▪ Limited researcher skill and experience; ▪ Limited understanding of the micropolitics of these research communities; ▪ Non-national researchers not sufficiently networked/connected to local research	prime time news on TV6 (still in place in 2018); ▪ Influence of project experience on researchers - learnt ways to improve project management, to manage relations with stakeholders and research participants and how to think about the research process in a broader way than before.

			intermediaries to influence policy.	

4.3.4 Vignette C

Project C: Development Issue and RDI Fund Response

Agricultural development and agri-business have been promoted as an important strategy for economic growth, increased food security and foreign exchange revenue generation in T&T. A premium is placed on the fine-flavoured cocoa produced by T&T. However, challenges with farm management, the inability of local cocoa entrepreneurs to move up the value chain and high cadmium content in cocoa beans, threaten the viability and international competitiveness of the cocoa industry. The STA Campus is the custodian of the International Cocoa Genebank, Trinidad (ICG-T), which is considered to have the most genetically diverse cocoa collection in the world.

In 2012, the RDI Fund approved TT$1.5million (US$238,000 or £173, 264) for a 3-year project focused on capitalizing on genotyping and genome sequencing research as well as the diversity of the International Cocoa Genebank -T&T. The objective of the project was to improve cocoa yield, cocoa resistance to diseases (through genomic selection) and the quality of niche cocoa, thus allowing for new product development, greater market capture of the value chain and increased revenue from niche products.

4.3.4 (a) Knowledge flows at the project level

From the onset, the research team prioritized collaborations between academia and the public and private sectors as a means of ensuring that the research project was closely aligned with the needs, interests and priorities of key stakeholders. The guiding philosophy of the Jade Research Centre (JRC) as a research centre is that it cannot divorce itself as a research entity from cocoa development and the cocoa industry in the wider context of T&T 'because its reputation is reflected by the performance of the industry. If the industry is not growing and building, then it means we are not doing a good job' (John, experienced researcher, non-national). The project team had prior experience working closely with industry partners on plant genetics and breeding and applied this prior experience and proactive approach to stakeholder engagement to this RDI Fund project. One of the researchers underscored the importance of the research team embedding its research in a partner company in order to achieve impact:

> Breeding is a long term process to evaluate. That is one of the reasons why when I started working, I wanted to work in association with the farm…so they knew every time you do anything they were marketing it. So if there was any problem you immediately knew. The feedback link was very, very tight in that everything we did, we knew at the end whether it's going to be commercially a successful product. (John, experienced researcher, non-national)

This RDI Fund project established diverse avenues for knowledge flows and knowledge exchange. These were facilitated through frequent meetings and discussions with a wide range of project partners: researchers (national, regional and international), the Ministry of Food Production, Cocoa Development Company of T&T and other government officials, cocoa farmers, chocolate entrepreneurs, the media, international corporations (such as Swiss, Mars, Cadbury, Mondelez, CAOBISCO etc.), multilateral development agencies (EU, UNDP and others), civil society organizations, students etc. The JRC also hosted several international conferences bringing together academics and practitioners from different regions. Research outputs included eight publications in peer-reviewed journals (including Acta Horticulturae, Journal of Food Research and

Journal of Agricultural and Food Chemistry), five book chapters, five postgraduate theses and over sixteen presentations at international conferences were produced linked to the research of the RDI Fund project.

Knowledge brokerage strategies incorporating all 3 models namely, knowledge management, capacity building and linkage and exchange activities, were applied to assist with research translation and knowledge diffusion. The researchers participated in various international conferences and produced a range of knowledge products including articles in national and regional newspapers, electronic blogs and other social media posts on Facebook, Twitter, Instagram and Tumblr and internet websites. Television and radio interviews were also used to reach more traditional audiences. Additionally, the JRC hosted a range of workshops, symposia, seminars and conferences as well as its annual World Cocoa and Chocolate Day Expo. It participated in externally hosted knowledge fairs, food festivals and business/ trade fora as well as the UWI STA Campus' Research Expo.

These activities enabled a simultaneous two-way flow of knowledge to multiple stakeholder groups, particularly students, researchers, policymakers, practitioners, chocolate entrepreneurs, funders, media personnel and the general public. The researchers stayed in close contact with their main knowledge users and this helped to maintain continuity in knowledge flows as opposed to other projects where knowledge flows were observed to occur in spurts. One researcher elaborated:

> I was talking to a lot of these gourmet chocolatiers and enquired why they are not buying directly from us…why are they going to the brokers? They said it's because we don't have a certificate system….so JRC decided we'll put a certification system in place so that farmers can directly export. (John, experienced researcher, non-national)

Targeted knowledge transfer sessions were also organized to build capacity of cocoa farmers and chocolate entrepreneurs in T&T as well as the wider LAC region. Furthermore, the JRC's training workshops on sensory training, quality management, genetic improvement of cacao planning material, cocoa disease management, improving post-harvest processing, DNA fingerprinting, certification, chocolate-making, marketing and branding support draw on the studies conducted for the RDI Fund project and have served the dual purpose of building capacity and generating income for the Centre.

With regard to developing research collaborations and partnerships with key stakeholders in academia, government, industry and civil society, the JRC has pursued the triple helix approach. A researcher explained:

> Now, here is a model we are building based on the research and innovations coming out of RDI Fund project and this model has to be in a triple helix model where you have the government, private sector and the University partnering and if you can build one model that is successful in an industry, you could build similar models in any other thing. (John, experienced researcher, non-national)

Although operating in a wider research environment with weak linkages and inadequate supporting structures (as mentioned in Chapter 1), the JRC sought to leverage its research and partnerships to channel new knowledge to address existing gaps. This is another clear example of knowledge flows from high-energy nodes to low-energy nodes (Zhuge 2006), which in turn stimulates additional demand for new knowledge. For instance, a researcher asserted:

> Under the RDI Fund with limited funding, I started a project to get information to support investor foreign direct investment…So we developed a map called the agro-ecological map to look at the cocoa producing areas, how much land is in different parts and what is the rainfall patterns, temperatures, etc….the Minister

> was really excited about it…he said that's something he would like to support.' (John, experienced researcher, non-national)

The JRC's resourcefulness with leveraging its research outputs enabled it to attract additional research grants from the EU/ACP, Mars, Mondelez, and World Cocoa Foundation, as well as consultancies with farmer associations and cooperatives. The JRC maintained close working relationships with the Ministry of Agriculture, the Economic Development Advisory Board (EDAB)[5] and the Cocoa Development Company of Trinidad and Tobago, which has helped ensure that the development of the cocoa sector remains a policy priority in support of Trinidad and Tobago's economic diversification strategy (Richards-Kennedy and St. Brice, in press). A researcher explained:

> We have been working very closely with the EDAB…We have been able to get them excited enough so that they have placed cocoa as one of their main areas for diversification. (John, experienced researcher, non-national)

By establishing stakeholder networks, the JRC has helped to strengthen the organizational capacity of key actors in the cocoa value chain and to connect stakeholders to each other. Some of these networks include the Partnership in Conservation Network (a network of 57 farmers representing all the cocoa producing regions of Trinidad and Tobago); the Chocolate Guild (a network of chocolatiers, bakers and chefs who use local cocoa in their product development); and CocoaNext (a network of regional cocoa stakeholders, comprising nationals, NGOs and other groups). Furthermore, by participating in international networks such as Cacaonet (a global body committed to the conservation of cacao genetic resources) and the Caribbean Cocoa Breeders Network, the JRC has been able to facilitate more expansive knowledge flows and increase its visibility and recognition as a thought leader on cocoa development,

[5] The Economic Development Advisory Board of Trinidad and Tobago was disbanded in 2018.

which in turn, has helped to generate new opportunities for collaboration and funding, regionally and internationally.

The flows of knowledge and expertise emanating from the work on the RDI Fund project also led to greater teamwork among staff. Prior to this, the different functional areas of the JRC (such as conservation, genomics, pathology, quality, agronomy, form and function and value addition) worked separately (the silo approach). A research participant described this as 'every section had a Head….but no interdisciplinary work being done…no teams working together' (John, experienced researcher, non-national). However, this changed when the JRC won the RDI Fund grant and the project 'brought in a lot of team spirit…a lot of dynamism and forced them to think cohesively' (John, experienced researcher, non-national). The multidisciplinary approach to research promoted by the RDI Fund thus helped to strengthen the JRC's research culture and capacity to work in teams, allowing for the cross-fertilization of ideas and preparation of joint scholarly papers and organization of outreach activities. Beyond the scholarship and public engagement activities, however, was the positive effect not only on the JRC's academic reputation through its research output and collaborations but also on its internal cohesion and renewed sense of institutional pride as a UWI research centre.

4.3.4 (b) Countercurrent forces at play during project design and execution

This RDI Fund project had a number of factors that were favourable to facilitating increased research use and translation, which, based on my analysis, placed it at a more advanced stage of readiness to lead to societal impact. At the same time, however, it was not immune to negative forces in the wider external environment that may have inhibited or reduced the effectiveness of its societal impact. Some of these included the economic downturn experienced by T&T and the subsequent reduction in or withdrawal of funding for cocoa development, the JRC's International Fine Cocoa Innovation Centre project, R&D and business incubation initiatives. This, coupled with a relatively high level of risk aversion of the national and regional private sector regarding

investment in R&D meant reduced funding for research projects and less private sector appetite for research partnerships with the UWI.

At the meso level, the JRC operates within the UWI system as a predominantly self-funded entity, which puts added financial pressure on JRC researchers who must both conduct research and ensure financial sustainability of the Centre. The bureaucratic nature of many UWI departments was also cited by research participants as a countercurrent as it causes protracted delays for approvals and can demotivate staff members, which creates additional pressure which can indirectly affect researchers' knowledge energy and knowledge flows. One researcher lamented that 'it is a lack of trust in the system…it can become really excruciating in the end…and as a researcher that kind of feeling can demoralize you' (John, experienced researcher, non-national).

The pressures exerted by institutional bureaucracy on individual researchers seeking to execute projects with societal impact, can be onerous, particularly given the RDI Fund's small research teams and limited budgets. Consequently, the ripple effect of this administrative burden at the micro level negatively affects individual researcher's time and energy for research and public engagement activities to support knowledge flows. This is an important countercurrent at the meso and micro levels that works against the fundamental principles of the RDI Fund to support knowledge utilization and translation and lead to societal impact. In the case of this RDI Fund project, a researcher commented that the JRC team is very small relative to the scale of research undertaken and the range of business partners and other stakeholders with whom the researchers need to interact. The researcher added:

> We have no help at all…the proposal writing, the administrative work, the execution of the research, the preparation of reports, the training and engagement of project partners, all of this has to be done by a small staff…. If the university does not integrate people into systems that are functional systems that can ease the burden on researchers, then a lot of persons will be sitting down doing

> nothing meaningful to the university's core research enterprise. (John, experienced researcher, non-national)

Despite the efforts of the JRC team to bring key players (researchers, policy makers, funders, private investors, etc) together for increased cocoa export opportunities, weak demand for data by local policy-making agencies and other entities, lack of coordination and unhealthy competition among local actors as well as underdeveloped linkages in the national research environment, exerted oppositional forces on the knowledge flows. Researchers in general expressed concern surrounding the availability of reliable data from public institutions as well as their unwillingness to share data or invest in data collection and analysis. One of the researchers expressed this frustration as follows:

> At the moment, all the policies are just 'by vaps' [i.e. without thought or analysis] ….no data…nobody is using any data….so that is why we [the UWI] need to produce the data. We need to produce the data and give it to them and say this is what the data shows. This is how we need to build policies. (John, experienced researcher, non-national)

In Figure 6, my conceptual framework is applied to map the flows of knowledge in this RDI Fund project. The knowledge producers included not only UWI researchers but also graduate students, the cocoa farmers and chocolate entrepreneurs with whom the researchers worked closely. This expanded research team is represented by the dotted lines around sub-groups of knowledge producers working closely together and forming a type of central knowledge hub with two-way knowledge flows between them and also with other entities/ actors in the knowledge system. In contrast to the other mini-case studies outlined earlier, the research community is not depicted by a circle between the researchers and the wider public. Instead, since this RDI Fund project co-opted the main knowledge producers in the research community as part of its expanded research team (thus bringing cocoa farmers and chocolate entrepreneurs *into* their research enterprise in a very intimate way from the start), these knowledge actors are co-

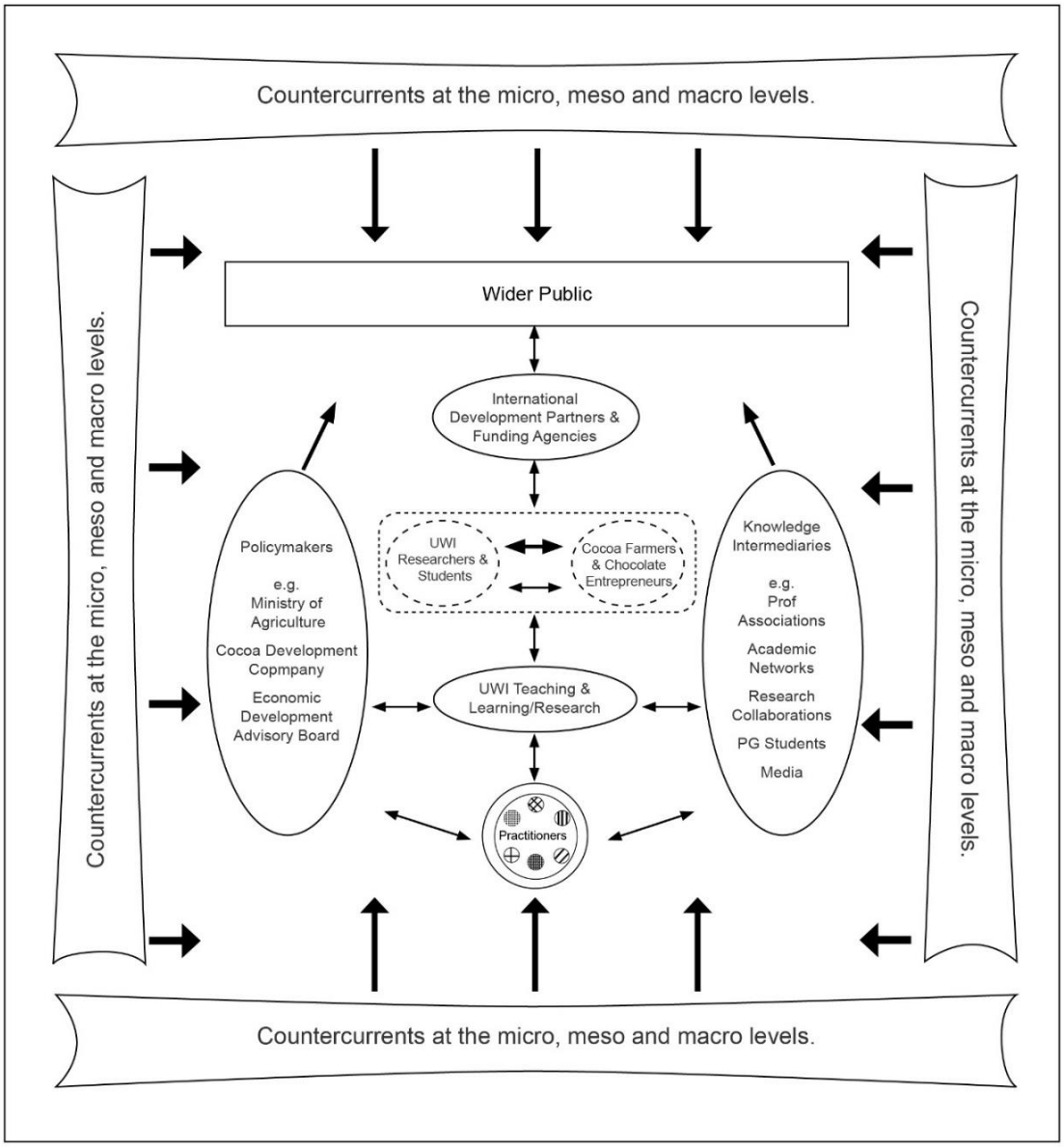
producing knowledge with the UWI researchers, which gets tested and re-calibrated almost immediately within that inner knowledge hub.

Knowledge also flowed between the research teams and policy makers to facilitate the uptake of the research emanating from this project by government entities to shape national policies on economic diversification and growth of the agricultural/agri-buisiness sector. It should be noted that the close collaboration with a wide range of knowledge intermediaries facilitated further knowledge exchange and research dissemination to wider audiences. Direct knowledge flows between UWI researchers and international chocolate corporations and local and regional chocolate entrepreneurs facilitated the quick application of JRC research to create new cocoa products and enhance chocolate production as well as the increased use of JRC services such as cocoa certification and cocoa fingerprinting. The new knowledge from the expanded research team was channeled back into academia to enhance teaching, learning and research as well as to inform new content for training courses targeting cocoa farmers, chocolate entrepreneurs and other researchers interested in the application of genomics and genome sequencing research to the International Cocoa Genebank and the cocoa industry of T&T.

The project also experienced powerful countercurrents such as the lack of funding for cocoa and agricultural development as a sector (including the non-release of government funds in support of the approved International Fine Cocoa Innovation Centre), weak inter-institutional linkages and lost time due to internal bureaucratic procedures. These oppositional forces, while not totally overcome, were mitigated through proactive strategies for engaging international partners and intense knowledge brokerage. Figure 6 also depicts the adjusted positioning of international development partners and funding agencies in my conceptual framework, as a priority set of knowledge users, demonstrating direct knowledge flows between this important group of knowledge intermediaries and the knowledge producers. This element of the project's knowledge

flow network distinguishes it further from other projects. The project team's approach to keep international development organizations apprised of its research work and research outputs enabled it to leverage significant additional funding and partnerships for follow on research projects; an essential element to the sustainability of research endeavours, particularly given the challenging local financial environment in which it was operating.

Figure 6: Knowledge Flows and Forces in RDI Fund Project C



4.3.4 (c) Outputs, Intermediate Impacts and Occasions of Influence

This project highlights a range of outputs, intermediate impacts and opportunities for the project to contribute to or influence development outcomes. For instance, the project supported molecular marker assisted breeding, which led to new screening methods, new sources of resistance and improved productivity and yields for farmers. The JRC's study of yield components allowed for the selection of genotypes based on genetic diversity, bean size and pod index for future breeding programmes and helped to reduce the cost of cocoa production through the development of high yielding cultivars. The improved assessment of fermentation progression led to new standards for fermentation of genetic groups, facilitated extraction of the best flavour potential and contributed to creating a scientifically-based quality management and monitoring system.
Traditionally, bean size and genetics were not taken into consideration when prescribing fermentation methods but this project has allowed for better optimization of genetic groups and better quality management during fermentation. It also influenced JRC's knowledge application and dissemination through the creation of training programmes for post-harvest quality management and the development of quality certification and traceability of cocoa.

With the identification of quality profiles for cocoa genetic groups, a genetics-based branding and niche marketing of cocoa was now possible and supported an expansion of the cocoa product line as well as new business opportunities for cocoa entrepreneurs. This project also helped develop a combination of genotype and soil remediation strategies to overcome cadmium accumulation in cocoa, which if not addressed, would hinder access to export markets in Europe. In January 2019, the EU legislation regulating the cadmium content in imported cocoa will come into effect and the JRC is now well placed to provide guidance on genotypes and soil amelioration strategies that minimize cadmium bio accumulation. The JRC's extensive genomics and DNA fingerprinting database is a critical knowledge repository that has allowed the JRC to become a recognized and internationally well-respected hub for gene mining and DNA fingerprinting services.

It is interesting to note the ways in which the JRC has leveraged its research in cocoa genomics to capitalize on new income-generating service offerings (e.g. training workshops for cocoa farmer and entrepreneurs, DNA fingerprinting, quality assessment and certification, marketing and branding, etc.), has helped to attract external funding and build its reputation. A researcher explained:

> We started the trainings with the RDI Fund chocolate training sessions. So we had about 110 alumni and many of them have gone on to become small chocolate entrepreneurs… We have trained people in Jamaica, Grenada, St. Lucia ….and we even had people come from USA for training because USA makes bulk chocolate and they were interested in knowing how to get the best flavour out of fine flavoured chocolate – that is why people come to us. It is what makes us unique because we know how to manipulate the fine flavours. (John, experienced researcher, non-national)

Through its research collaborations and the increased international recognition of its work, by 2015 upon completion of the RDI Fund project, the JRC was able to attract a further US$4 million (or £2.9 million) in funding from a variety of organizations such as USDA, MARS, Mondelez, World Cocoa Foundation, EU/ACP, Eurocham, CAOBISCO, ECA, FCC, Perez Guerrero Trust Fund, Christian Relief Services and the Ministry of Food Production of T&T (RDI Fund 2016). A remarkable achievement has also been receiving international donor support for the establishment of an International Fine Cocoa Innovation Centre in T&T[6], with a commitment by the government of T&T to contribute TT$6 million (US$884,000 or £631,000) from the government's Public Sector Investment Programme (PSIP). While the government commitment remains on the books, because of the economic downturn, to date this commitment, has unfortunately not been converted into an injection of cash resources into the setting up of the International Fine Cocoa Innovation Centre.

[6] See: http://ifcic.center/

The JRC's visibility and recognition increased significantly through the work carried out on the RDI Fund project as well as its other research collaborations. One of the researchers reinforced this point:

> We did an international conference last year. We are doing another one this year and most of the funding is coming from the private sector, the international chocolate companies, etc. Slowly but surely I think we are building ourselves as a hub for knowledge. (John, experienced researcher, non-national)

This has led to other achievements such as recognition by the World Cocoa Foundation of the contribution of the JRC at the WCF 16th Anniversary in Washington DC; an invitation to serve on the global sensory panel for the Cocoa of Excellence content at the Salon du Chocolat in Paris, France and an invitation to serve on the International Heirloom Cacao Preservation Fund Panel.

Table 5 presents a matrix integrating the main elements of the application of my conceptual framework to this RDI Fund project. It maps out the main factors, flows and forces linked to knowledge brokerage, the micropolitics of research and the intermediate societal impacts from this RDI Fund project. As opposed to the other embedded case studies examined in my research study, this RDI Fund project exemplifies the putting into practice of all three main types of knowledge brokerage models, namely: knowledge management, capacity building and linkage and exchange (Bornbaum et al. 2015; Chew et al 2013; Ward et al 2009a; 2009b), which strengthened stakeholder engagement at all levels, in turn not only supporting flows of knowledge but also lessening the effect of countercurrent forces in the external environment.

Table 5: Matrix of Core Elements of My Conceptual Framework: Integrating Knowledge Flows, Knowledge Brokerage, Micropolitics of the Research Community and Intermediate Impacts in RDI Fund Project C

RDI Fund Project Short Name	Knowledge Actors or Agents	Strategies to support flows of knowledge	Contextual challenges at micro, meso and macro levels that are countercurrents to knowledge flows	Outputs, Intermediate Impacts or Occasions of Influence
Project C **Improving Competitiveness of Cocoa Sector in T&T**	▪ UWI Researchers ▪ UWI graduate students ▪ Ministry of Agriculture ▪ Cocoa Dev't Company of T&T ▪ Private Sector companies (local and int'l) ▪ Cocoa farmers ▪ Chocolate entrepreneurs ▪ Int'l universities &	Knowledge Management ▪ Meetings with key stakeholders in T&T and Caribbean ▪ Hosting of int'l Conferences ▪ Presentations at national & int'l conferences ▪ Academic publications ▪ Newspaper articles ▪ Participation of graduate students in project ▪ New knowledge from graduate student theses	Macro ▪ Inadequate resources dedicated to cocoa development and agricultural sector in T&T; ▪ Lack of coordination, internal competition among local actors; ▪ Risk aversion of private sector and other investors; ▪ Weak linkages in R&D ecosystem in T&T;	▪ Academic publications, papers, etc; ▪ New knowledge and data from leveraging diverse cocoa varieties housed in Int'l Cocoa Genebank located in T&T, giving JRC a unique competitive advantage; ▪ Increased partnerships; ▪ New service offerings that place JRC at centre of

	research institutions ▪ International donors and development agencies	▪ Newspaper articles in national and regional media ▪ Television and radio interviews ▪ Various websites ▪ Blogs ▪ Strong social media presence – Facebook, Twitter, Instagram, Tumblr Capacity Building ▪ Training sessions for cocoa farmers (e.g. cocoa quality management, disease management, post-harvest processing, etc.) ▪ Training sessions for chocolate entrepreneurs	▪ Key players not using data to inform decision making; ▪ Current economic downturn in T&T posing challenges for gov't support for R&D and business incubation support; ▪ Gov't commitment to Int'l Fine Cocoa Innovation Centre project in principle but no funding being released; Meso ▪ Weaker demand for JRC data by local agencies relative to international agencies; ▪ Loss of influence/academic	R&D for cocoa production: ▪ e.g. Cocoa Certification System enabling local farmers to export directly to int'l chocolate companies; ▪ CIRAD/JRC Genetic Markers for Cocoa Fingerprinting (paid service already offered to other countries such as Jamaica, Haiti and Dominca) ▪ Income generation from training courses and service offerings; ▪ Increased external funding for additional projects with international partners;

		(e.g. chocolate-making, marketing and branding, etc) Linkage & Exchange ▪ Active involvement of academia, private sector, government, local micro-entrepreneurs, int'l collaborators and other stakeholders ▪ Hosting of targeted workshops, symposia, seminars, conferences, etc ▪ Organization of an annual World Cocoa and Chocolate Day Expo ▪ Participation in external knowledge fairs, food festivals, business expos and tradeshows ▪ Participation in UWI STA Campus Research Expo ▪ National and int'l research collaborations	recognition with decline of once prestigious Journal on Tropical Agriculture established in 1924 (under ICTA); ▪ Weak institutional capacity in national agencies; ▪ Too much bureaucracy and slow response by national agencies to potential int'l investors interested in T&T cocoa industry; ▪ UWI Institutional challenges (bureaucracy, lack of research management support, training of researchers, etc) ▪ Limited project staff and budgets for range of administration, research support and public engagement activities;	▪ More motivated research team and active research culture at JRC; ▪ Increased research productivity; ▪ Increased int'l recognition of JRC.

		and partnerships spanning over 25 countries.	Micro ▪ Researcher capacity to execute range of knowledge brokerage functions affected by additional pressures of project management and administrative burden.	

4.4 Embracing the invisible

An invisible element of any conceptual framework or model on knowledge flows is the effect that the research process has on the individual researcher, research user, research intermediary or research beneficiary, which includes any person who been exposed to the knowledge emanating from the research undertaken. While this study seeks to better understand and capture the flows of knowledge that enable the transmission, sharing and accumulation of knowledge as it goes from the sender to the receiver (Zhuge 2002), it recognizes the difficulty in depicting diagrammatically how the cognitive processing of new knowledge to an existing storage of tacit knowledge, influences an individual in terms of his or her way of thinking, understanding or behaving. Nevertheless, as mentioned in Chapter 2, the influence of tacit knowledge on policy and decision-making cannot be overlooked. It is widely recognized in the literature on knowledge utilization and knowledge management and has been aptly described by Weiss (1977) as the 'gradual sedimentation of insights, theories, concepts, and ways of looking at the world' (p. 535). This intra-personal knowledge flow is a fundamental aspect of the 'knowledge for enlightenment model' that tends to be invisible in knowledge flow analysis. Given the powerful oppositional forces (political, societal and cultural) that exist in the wider environment, tacit knowledge cannot afford to be overlooked or taken for granted. It is by unlocking human agency through the enlightenment that occurs from tacit understanding (whether at the individual, institutional or community level) that the terrain is prepared for decisions that bring about change in policy, practice, behavior and by extension, societal impact.

In my interviews with the RDI Fund researchers I was intrigued by this dimension of intra-personal knowledge flow and included in my interview protocol a question about the effect executing the RDI Fund project had on the STA researcher as an individual. While some responses centred around learnings drawn from the RDI Fund project experience that were more operational, such as insights about their approaches to project execution, leadership or team dynamics and what the researcher would do differently in

future projects, others touched on a more philosophical note, referring to better understanding the true purpose of research, about 'thinking of research in a much broader way'. One research participant stated that it brought into focus:

> …why it is I wanted to do research…. [to provide] services that are meaningful…to give back…. not in a way that is just about collecting data and publishing publications…. [but] connected with what is going on at a grassroots level…. the gratification of providing a service that otherwise would not have been available'. (Mary, mid-career researcher, non-national)

Though I was not able to represent this intra-personal knowledge flow to researchers in the Diagrams A, B and C that depicted the application of my conceptual framework to the embedded case studies, this tacit knowledge has not been neglected in my analysis. In my view, the main case study reflects a commitment to this purpose through the RDI Fund's emphasis on incorporating graduate students and other stakeholders (knowledge actors) as part of the research team from the start. Further, my interviews with the RDI Fund researchers seek to deepen my understanding of intra-personal knowledge flows by embracing the understanding that all explicit or codified knowledge contains what Polanyi (1962) refers to as a personal coefficient that anchors itself in action, commitment and involvement in a given context. What may be perceived as objective, theoretical knowledge is thus grounded in personal judgments and understandings (Tsoukas 2002). Further, as Polanyi (1962) explains, it is through the indwelling afforded by tacit knowing that 'we gain access to new meaning' (p. 246) and new knowledge is created.

This is consistent with my research paradigm and earlier assertion that phenomena cannot be counted but rather, must be understood. Though intra-personal knowledge flows may not be visible and the impact may not be tangible, my research study contends that inherent in tacit knowledge are facilitating driving forces, which emanate from the power of tacit knowledge to activate human agency, provoke change and

improve lives. This is a potent and enduring intra-personal dimension of knowledge flows that also helps to mitigate external countercurrents and create conditions that enable societal impact.

4.5 Analysis of Findings

The application of my conceptual framework to examine knowledge flows in selected RDI Fund projects served as a useful starting point to better understand the processes through which research helps to contribute to societal impact in T&T. My conceptual framework shifted the focus from research outputs (in a Caribbean university context where traditionally greater attention has been placed on knowledge production over knowledge utilization) to the *processes* that facilitate research utilization. It graphically depicted and mapped out the main knowledge actors, their roles and the likely flows of knowledge between them as a means of better understanding how knowledge is passed, absorbed and acted upon. Recalling my working definition of societal impact (from Section 1.2), which refers to the changes and benefits to society that occur as a result of the exchange of knowledge, the absorption and translation of research-informed ideas and the engagement of stakeholders, my findings in the previous section of this chapter underscored the importance of understanding the micropolitics of research and the need to take proactive steps to mitigate the countercurrent forces presented by political, societal and cultural forces at the micro, meso and macro levels.

By applying a more focused knowledge flow analysis across all RDI Fund projects, the following sections of this chapter highlight some of the primary differences (unique attributes, inconsistencies, gaps, silences and contextual factors) that were captured through the use of my conceptual framework. These are important dimensions that will need to be taken into account when seeking to 'operationalize impact' in T&T. Thus, it also identifies important considerations for providing a more enabling environment for research with societal impact and more specifically, some of the key issues to be

addressed by the STA Campus in order to enhance the societal impact of its research (corresponding to my Research Question #3).

4. 5.1 Knowledge Flow Analysis

Knowledge flow analysis refers to the examination of the processes through which knowledge flows between knowledge providers and seekers (Shin, Holden and Schmidt 2001). While detailed knowledge flow modelling was outside the scope of this study, my analysis of the actual processes whereby knowledge flowed from knowledge producer to knowledge user in the execution of RDI Fund projects enabled a better appreciation of the direction, energy and effectiveness of these knowledge flows. This section therefore entails a critical discussion of my research findings from my analysis of the knowledge flows that occurred during the execution of all ten RDI Fund projects in my study sample.

4.5.1 (i) Differences in Knowledge Flow Patterns

Meagher's (2008) Conceptual Framework presents a one-way, linear flow from the knowledge brokers and intermediaries to the knowledge users and knowledge beneficiaries (wider public) as well as two-way flows between the knowledge beneficiaries and the knowledge users (policy makers and practitioners). The outer frame for these knowledge flow processes, however, simply states 'societal issues, external influences and national and local research cultures' as neutral factors in the external environment. Greater weighting is given to the links between researchers, policymakers and practitioners indicating that Meagher et al (2008) contend that the strongest interactions exist between these groups of knowledge actors.

Conversely, based on my analysis of diverse RDI Fund projects, I was able to construct a more comprehensive conceptual framework which I applied to each of the selected embedded case studies (Diagrams 1, 2 & 3). In so doing, I was able to better capture and demonstrate the *circularity* of the flows of knowledge in RDI Fund projects. By

placing the circle for researchers at the centre and in some instances, expanding the research team to include research collaborators from outside academia, depicting their centrality in the knowledge process, my model places greater emphasis on the multi-directional flows between knowledge producers, knowledge intermediaries, knowledge users and knowledge beneficiaries, which occur simultaneously as opposed to sequentially. This is consistent with noted shifts in the literature away from the linear knowledge transfer approaches of the 1990s to embrace more knowledge exchange approaches (Lavis, Robertson et al 2003; Mitton et al 2007). In particular, it is more applicable to Mode 2 knowledge whereby knowledge translation and the application of research to address specific problems is the goal, as opposed the production of new knowledge.

My conceptual framework also recognizes that knowledge producers are often not only individual academics from various sub-disciplines within universities and research institutions. Rather, in the cases with more effective knowledge flows, key stakeholders from civil society and the private sector (respectively) worked so closely with academic researchers that they were members of *an expanded research team* from the start, thus knowledge producers themselves in addition to being knowledge collaborators or intermediaries. The literature on research impact also reflects this evolution in working relations between researchers and research collaborators, mentioning the term 'boundary partner', to refer to 'people or organisations that become direct working partners' (Young, Shaxson, Jones, Hearn, Datta and Cassidy (2014), p. 5). In the case of RDI Fund projects, it was the two-way flow of knowledge between these constituent groups that helped to co-produce new knowledge and my conceptual framework thus recognizes this close collaboration a wider box in the centre of Diagrams 2 & 3 to place greater emphasis on the cross-fertilization of ideas that takes place between research collaborators as an important pre-condition for the co-production of new knowledge. Papatsiba (2013, p. 443) highlights the importance of 'collaborative modes of knowledge production' and for research to have impact, I believe that these should be proactively nurtured. I view the role of these research partners as distinct from that of

research intermediaries and brokers who are instead more involved in facilitating the wider dissemination, uptake and translation of research.

The *shorter distance* between knowledge producers, knowledge users and knowledge beneficiaries in the small societies of Caribbean SIDS is another unique attribute of the RDI Fund research process, which is captured in my conceptual framework. With a more circular depiction of the knowledge flows, my conceptual framework is able to capture more accurately the spatial dimension of knowledge systems in Caribbean SIDS, reflecting a closer and more direct interaction as well as a higher degree of accessibility between researchers, knowledge users (policy makers and practitioners) and knowledge intermediaries as well as between knowledge producers and knowledge beneficiaries (wider public). As mentioned earlier, the small population size and proximity of access to power in the Caribbean (i.e. persons in influential positions) through familial, community or social relations, constitute a distinguishing feature of research to impact processes in our context, which represents a potential force for knowledge flows. In T&T, more specifically, the influence of race and ethnicity on researcher affiliations and access to power should not be overlooked. As Farrell (2017) points out, in T&T '…people construct networks of friendships, particularly within their ethnic groups, whose cooperation and support is likely to be more reliable' (p. 84). UWI researcher experiences from RDI Fund projects support the perspective that personal relations, friendships, ethnic affiliations and nationality can have a direct impact on the receptivity and level of collaboration achieved with other knowledge actors, thus indirectly affecting knowledge flows and countercurrent forces experienced.

Given the weak linkages in the wider research environment in T&T (as mentioned in Chapters 1 and 2), adjustments were made to the placement of knowledge brokers and intermediaries in my conceptual framework. Whereas Meagher's (2008) model has a dominant knowledge flow (reflected in the thickness of the line weighting) from researchers to knowledge brokers and individual knowledge intermediaries, in my

conceptual framework, I chose to remove knowledge brokers because of the lack of institutions in T&T that are formally recognized as playing this role (Guinet 2014). Instead, more emphasis was placed on individuals as well as institutions that served as *de facto knowledge intermediaries* and these were positioned as equidistant actors to knowledge users in the research process, with equal line weightings for all. The RDI Fund researchers did not indicate any pre-dominance of research flows to any specific groups of actors in the research process but attempted to distribute their time, energy and attention across all stakeholder groups, hence the use of a single line weighting for all knowledge flows in my diagrams.

4.5.1 (ii) Intra-personal knowledge flows

As mentioned earlier, although the intra-personal flows of knowledge cannot be reflected diagrammatically in my conceptual framework, they are built into the methodological construct of my research study through my interview protocol. This has enabled a recognition of the driving force produced when intra-personal flows activate human agency and emancipatory potential of knowledge and in turn intensify the knowledge energy (Zhuge 2006) of key knowledge actors. Though not visible, it is a force that runs in the same direction (as opposed to running counter to) as the knowledge flows, from a position of high potential energy to one of low potential energy.

Tacit knowledge has received significant attention in the literature on research utilization. As mentioned earlier, it is considered to be rooted in action, commitment, and involvement in a specific context (Nonaka 1994) and plays an important role in knowledge transfer, knowledge utilization and knowledge brokerage processes. Schön (1983) asserts that 'our knowing is in our action' and that 'tacit knowledge is a form of 'knowing', and this is inseparable from action because it is constituted through such action' (p. 49). My incorporation of intra-personal flows, though not visible in my conceptual framework diagram, is a key aspect of the continued relevance of *the*

developmental role of the university, with tertiary education contributing to development through the three major pathways of teaching, research and innovation and service (Oketch, McCowan and Schendel 2014). However, in the context of the Caribbean, the UWI has an enduring responsibility to help achieve greater societal impact by also advancing the region's unfinished nation-building agenda.

4.5.1 (iii) Countercurrent Forces

A notable contribution of my conceptual framework to the analysis of research processes and knowledge flows in the context of T&T is the prominence given to historical, societal (e.g. political, economic, institutional) and cultural factors in the external research environment in T&T. As opposed to Meagher et al's (2008) more general acceptance of the 'societal issues, external influences and national and local research cultures', which the authors admit shape the context for research impact but do not go further to state how, my conceptual framework recognizes these *environmental factors as powerful forces* that play such an integral inhibiting role in research to impact processes in the Caribbean. These factors link back to my earlier statement about the Caribbean's 'conditions of initial disadvantage' (World Bank 2000, p. 94) and the countercurrent forces that are present at the micro, meso and macro levels.

In my conceptual framework, I chose to depict the strength and multi-layered nature of these forces by using thick, bold arrows at various levels (individual, institutional and environmental) and from all four directions of the outer frame that represents the external research environment. It is important to point out that, though it was not possible to map out all countercurrent forces in my diagrams, these forces stem from historical, political and cultural factors and at the same time, manifest themselves at the micro, meso and macro levels. The pressures exerted by these forces coming from multiple directions, at multiple levels and occurring simultaneously, have the potential to generate oppositional drag forces, which slow down or obstruct knowledge flows and thwart researchers' efforts to achieve greater societal impact. The fact that many of

these forces are driven by T&T's history and culture make them even more difficult to detect and even more pernicious, especially for less experienced/early career researchers and researchers who are non-nationals. Akin to Lewin's (1947) force field analysis model, which maps out the driving and restraining forces that are present when examining social management and social change, my conceptual framework shows that there are driving and countercurrent forces present in my knowledge flow analysis of RDI Fund projects.

4.5.2 Knowledge brokerage approaches used

Each RDI project was also analyzed against the three dominant approaches to knowledge management (researcher-push, user-pull and interactive or exchange) and the three models of knowledge brokerage (knowledge management, capacity building and linkage and exchange), based on the flows of knowledge and levels of engagement and interaction with stakeholder groups during the research process.

In some RDI Fund projects, which tended towards more natural science research disciplines, a more traditional researcher-push approach was noted, particularly in the early stages of project execution. For example, in the embedded case study for Project A, my corresponding Diagram 1 (section 4.3.1(d)) reflects the researchers as the main knowledge producers at the centre of the diagram, transferring knowledge out to the knowledge users, intermediaries and beneficiaries. Given the impact orientation of the RDI Fund, specific mechanisms for engaging stakeholders are incorporated into the project design and thus, over time, as project execution advanced, more public engagement activities were rolled out and the model shifted more towards greater interaction and exchange, thereby facilitating increased multidirectional knowledge flows.

Interestingly, as noted in Table 3, the main knowledge brokerage model used in Project A was knowledge management which focuses primarily on research dissemination and diverse mechanisms to support research communication, for example presentations at conferences, formal and informal meetings, newspaper articles, academic publications, etc. While each of these helped to facilitate the flow of knowledge, in reality they would have had to confront the oppositional forces at the micro, meso and macro levels also listed in Table 3. The potency of these countercurrents could easily overpower the facilitating forces at play in the research to impact process, particularly given the limited capacity and experience of the early career researchers in the project team. In fact, when asked specifically about efforts to try to influence policy makers and decision makers, one of the researchers seemed overwhelmed by what that process would entail, commenting 'I don't know that I have thought about that too much…there is so much work involved...I don't know if we can take it much further' [Gina, early-career researcher, national]. This demonstrates that the net effect of the interplay of flows and forces in specific RDI Fund cases, if not analyzed and built into deliberate strategies for effective knowledge flows during project execution, could be antithetical to the desired goal of societal change, owing to a lack of understanding of the micropolitics of the research community.

In other instances, the knowledge management model employed was more of a hybrid researcher-push/user-pull approach. This is reflected in RDI Fund Project B, which in the initial phase, the researchers had specific knowledge about linguistics that was applied to (or pushed out towards) the preservation of the heritage languages and TTSL. At the same time, the native speakers were so embedded in the process of recording the languages with the researchers and their own sense of identity threatened by the possibility of the languages becoming extinct, that this served as a strong 'pull factor'. One researcher described the work done by the research participants in the TTSL, Bhojpuri and Patois communities during the execution of the project as 'research that only they could do as insiders in the community, as the people who know how the

community worked, how the languages worked and had the language skills' (Owen, early-career researcher, non-national).

In this project, there was a shared understanding of the value of and need for documenting these endangered languages on both the part of the researchers and the native speakers which served to create an inner hub of research activity between the researchers and native speakers as they co-produced knowledge. Over time, this model also shifted more towards the exchange model, whereby the engagement of stakeholders became more frequent and power distances became much shorter, allowing for more dynamic interaction among research actors from the university, the endangered language communities, civil society, public sector and international development community. From a knowledge brokerage perspective, this project employed both knowledge management and capacity building mechanisms as ways of moving beyond knowledge capture and knowledge dissemination to greater knowledge utilization. In so doing, UWI researchers were able to achieve some meaningful intermediate impacts and occasions of influence such as the development of new courses, increased demand for training in TTSL and French Creole (Patois), increased recognition of the need for sign language interpretation and use of sign language interpreters at events in T&T and increased external funding for related projects. One of the researchers commented that:

> We've got two or three sets of money from the US Embassy during the course of the RDI project…..and I've found an interesting audience in schools, the English teachers and the students….You never know what's going to lead to what but you do get a snowball. I gave a talk in one school and then sometime later someone came back to me and said: "we'd really like a sign language class". So I put them in touch with someone. They had the sign language class and then they did a special assembly at school…and all the kids who had seen their assembly were coming up afterwards so excited. I feel like you never quite know who you will impact or when …but I'm still optimistic that things can filter out especially if you can get to people when they are young'. (Owen, early-career researcher, non-national)

In the case of a small minority of RDI Fund projects, the exchange model was pursued from the start. For example, in RDI Fund Project C, the research team's experience working on plant genomics with direct private sector involvement and stakeholder engagement in the past informed the knowledge management approach used during the implementation of the RDI Fund project. The exchange model (which corresponds closely with the knowledge brokerage 'linkage and exchange' model) was thus used from the start, with multiple activities geared towards supporting two-way flows of knowledge to diverse stakeholder groups, including academic conferences, training workshops for cocoa farmers and entrepreneurs, meetings with policy makers, potential investors, multilateral funding agencies, international corporations, government agencies, etc., the hosting of research days and research expos and the use of a wide range of research dissemination channels (print, electronic and social media). There was constant co-creation of knowledge and consistent efforts to ensure the utilization of this new knowledge through training workshops for cocoa farmers and chocolate entrepreneurs, targeted seminars, participation in business expos and trade shows and outreach to international development partners and funding agencies. This enabled the research team to exploit more fully the range of opportunities (networks, new research collaborations, additional funding, enhanced research productivity and international recognition) that emerged from the execution of the RDI Fund project. In spite of the many countercurrents in the research environment, this project was able to generate a range of research outputs, including achieving increased recognition for high quality academic outputs, and to demonstrate a range of preliminary societal impacts.

Beyond my three embedded case studies, however, and across the range of RDI projects analyzed, varying hybrids of knowledge management and knowledge brokerage models were observed and these helped to facilitate knowledge flows. Some researchers emphasized that it was not simply about the quality of the research outputs, the number of dissemination channels, the range of research outputs or the tools used to engage with key stakeholders. To progress along the pathway to societal impact in T&T required

UWI researchers to re-think what was the purpose of their research undertaking, what knowledge exchange meant in practice and how exactly knowledge absorption and knowledge uptake could be facilitated across different communities of research users. One researcher explained:

> To produce new knowledge that actually advanced the way we thought about [subject area] in Caribbean society…it is knowledge that has an impact on knowledge…it creates another stepping stone in knowledge making…it influences the way in which the UWI produces a body of work that would then have an impact on where diasporic studies latched onto ours… (Lisa, experienced researcher and senior research administrator, national)

Another researcher commented:

> When you have to break down things and you are talking to the 'man on the street' you learn a language that communicates more, you learn a different language of communication; not just policy communication or academic communication but communication to a wider audience. So you really learn a lot of different skills of transmitting knowledge to convince people to take on the product of that knowledge. [Mary, mid-career researcher, non-national]

A third researcher emphasized:

> The important thing was to recognize your audience…the graphs used were simple and very clear…and we tried to summarize it using a colour scheme so the information was what they could use in a compact visual form. And answering their questions was very useful for us to understand how this research was affecting their lives. (Gina, early-career researcher, national)

Based on RDI Fund researcher experiences, knowledge flow processes that are supported by appropriate and culturally-relevant mechanisms for knowledge brokerage and knowledge translation have the potential to produce useful research outputs, which can both enlighten and contribute to change. But this is only one side of the equation –

the facilitating or driving forces. The following section discusses the oppositional forces as experienced by my wider group of research participants. These are unique to the context and culture of T&T and thus, represent the countercurrents, which my conceptual framework has been able to bring more clearly into focus.

4.5.3 Macro-level factors

As mentioned in Chapter 1, T&T's political, societal and cultural factors as well as its unique SIDS vulnerabilities not only shape the wider research context, but present oppositional forces that can undermine the dedicated efforts of researchers seeking to implement research projects with societal impact. Since these forces are omni present, invisible yet powerful enough to obstruct the flow of knowledge at the heart of knowledge exchange and knowledge translation processes, it is important that the dynamics at play in research and community engagement processes be mapped out and made more explicit during project design and execution.

Based on evaluations of several IDRC research projects in developing countries, Carden (2009) asserts that many of these disabling environmental factors are distinctive features of developing countries, pointing to issues such as precarious democratic institutions and customs, a lack of intermediary institutions, major challenges with implementation, policymakers' lack of confidence in local researchers, the lack of data and reluctance to share research, high staff turnover and the absence of a demand for research. Carden (2009) goes further to dismiss several assumptions of Western 'research to policy' models as 'overly optimistic when applied to developing countries that often lack a tradition of analyzing the consequences of research' (p. xii). This, therefore, underscores the point that a dedicated research funding facility to support research for societal impact (such as the RDI Fund) is *a necessary but not sufficient mechanism*. To achieve the objective of societal impact, the university would need to go beyond providing a financial incentive for researchers to engage in action-oriented development research and examine the corresponding policies, procedures and research

culture to provide a more enabling institutional framework for effective knowledge flows at the micro, meso and macro levels.

Based on the experiences of researchers who executed early cohort RDI Fund projects, the macro research environment, which inevitably frames and influences the micropolitics of research communities in T&T, currently reflects a potent mix of oppositional forces that can be attributed to a range of issues, as outlined below:

4.5.3 (i) Historical

Many of the historical factors outlined in Chapter 1 manifest themselves as vestiges of colonialism that have shaped the psychological, cultural, institutional and structural macro-economic dimensions of T&T society. Others have developed alongside the evolution of T&T from British colony to a multi-ethnic, multi-religion independent state that continues to suffer from the 'paradox of plenty' and the Dutch disease. A country that boasts of one of the strongest macro economic performances in the Caribbean yet has extremely high rates of poverty, crime and violence, T&T is as enigmatic as it is complex, even for nationals. These factors in turn have contributed to varying expressions and degrees of dissonance and 'ambivalent nationalism' (Farrell 2017, p. 58) often reflected in the way we think, our approach to work, the way we interact with each other, an apathetic stance towards societal issues and development challenges and a lingering acceptance of Western values, products and lifestyles as superior. These oppositional macro forces were broadly experienced by all researchers to varying degrees and manifested in different ways, nonetheless impinging on the execution of RDI Fund projects. One of the researchers lamented:

> We do still have a perception that what comes from outside is better than what comes from inside. We cannot do things as well as other people. That's very much part of our psyche and it also plays into this role of lack of trust, lack of confidence between the private sector here and the university…and sometimes I feel like our researchers lack enough self-confidence…to put their own ideas on

> the table. (Randy, experienced researcher and senior research administrator, national)

Another researcher explained:

> So these Ministries in Trinidad are extremely difficult to work with. They don't want to do anything by the book. They don't want to report the [issue], they don't want researchers looking into it so that was a major challenge. The industries as well…they were extremely closed, especially the big industries – they use private consultants and their data is closed [not shared]. (Jim, experienced researcher, non-national)

Yet another researcher expressed the difficulties encountered in the practical execution of the project:

> Some people are fed up with the international organizations because they are sometimes very pushy. They have a work agenda, they have things that they need to do and it does not fit in with the agenda of the country. Sometimes they go in 'like a bull in china shop'. They have interviewed or taken samples and have given nothing back. They have not respected what the country wants and this makes it difficult for the other researchers. (Tom, experienced researcher, non-national)

The reality faced by STA researchers is that the wider research context in which they function is uneven at best; while in some segments of T&T, it may even be perceived as hostile to research, presenting real oppositional forces, which, even though invisible, inhibit effective knowledge flows.

4.5.3 (ii) Macro-economic

The paradoxical situation of T&T being classified by the World Bank as a High Middle Income Country (HMIC) yet challenged by the vulnerabilities it experiences as a SIDS country and the social ramifications of deep, persistent pockets of poverty and inequality, exacerbates its limited access to research funding. This relates to my earlier

point in Chapter 2 where I highlighted the extent to which 'ideas follow funding' in Caribbean SIDS and that international research funding continues to exert disproportionate pressure on the production and societal impact of knowledge produced by developing countries.

STA researchers lamented the effect of the international development classification of T&T, the limited access to research funding and the funding restrictions that often accompany research grants, stating that 'it is extremely difficult to get money to buy equipment…you cannot buy it because the money is not there…' (Rachel, experienced researcher, national). Another researcher commented:

> If I went to a developed country, I would be given a lab and I would probably be able to take some people, a post-doc or someone with me; I would be given seed funding to start projects off and there would be a lot of opportunities through institutional networks to get funding in… From a Trinidad and Tobago perspective, because of the nature of the oil-based economy and the GDP being near the UN's middle to higher income status, that is enormously challenging because many of the grants you could apply for exclude Trinidad and Tobago. (Jim, experienced researcher, non-national)

Overall, T&T's macro-economic challenges, its dissonance between the national vision and low prioritization of R&D (estimated at 0.08% of national GDP (World Bank, n.d), as mentioned earlier) and the resulting paltry budget allocations to universities (complicated by even smaller actual financial transfers) create a research environment that is both anemic and demotivating for researchers.

4.5.3 (iii) Political

The political dimension of the macro environment exerts additional countercurrents to knowledge flows. RDI Fund researcher experiences highlighted political issues surrounding the tendency of governments of Caribbean SIDS to link national

development planning to electoral cycles and the lack of coherence in policy positions across different government administrations, reflecting a lack of inter-generational thinking and planning (Farrell 2017). Various researchers expressed their frustration with 'politicians putting political people on Boards and their political agendas stifling any vision you may have [for that sector]'; with 'policies that are made by 'vaps'…no data'; with the fact that when there is a change in government, projects are abandoned because 'that was their project [referring to the past administration]'; and with 'the lack of coherence in the policies that the government generates…and a clearly articulated research agenda [for the sector]' (extracted from my interviews with RDI Fund researchers).

Moreover, researchers criticized the use of race, ethnicity and party politics to propagate 'short-termism', tokenistic support to party supporters (for example, through 'make work' employment relief programmes) and the general lack of accountability and creeping permissiveness of various forms of corruption in T&T society. As Farrell (2017) emphasizes, this has further negative ripple effects in that it reduces trust in national institutions, creates multiple inefficiencies and diverts public resources.

4.5.3 (iv) Cultural

There are also cultural and attitudinal factors that are unique to T&T, which affect the flows of knowledge. Countercurrents to knowledge flows are exacerbated by the tendency towards a 'carnival mentality' and a celebration of amusement and entertainment often in excess, at the expense of national and individual productivity and progress. A work ethic which tends to default to inertia or a slow pace in many segments of the public and private sectors affects the implementation rate of RDI Fund research projects and in turn, the efficiency of knowledge flows. This links directly to the broader implementation deficit that characterizes development project execution in the Caribbean (Ram, Kaidou-Jeffrey, Hope, Peters and Durant 2017). Many STA

researchers cited this as a challenge encountered in the execution of RDI Fund projects. One researcher complained that:

> Nobody follows up. People talk in meetings, go away and nobody follows up …the action part is where we stumble, in everything. Lovely words, lots of enthusiasm but the action part is abysmal. (Randy, experienced researcher and senior research administrator)

These environmental factors are deep-seated and very complex. Moreover, they tend to manifest themselves differently and unevenly across local community areas (counties, boroughs, parishes, etc.) in the country, making it even more difficult for researchers to anticipate their effect on the flows of knowledge when 'strategizing for impact' during RDI Fund project execution. Without formal distillation and mapping of these factors and their influence on the project, as part of a systematic exercise that incorporates the 'micropolitics of research' into project design and execution, the potential of any RDI Fund project to generate societal impact will be compromised. This will need to be integrated into the RDI Fund's process of 'strategizing for impact' and future plans for researcher skills development to bolster RDI Fund project execution and achievement of broader project outcomes.

4.5.3 (v) Weak research demand and weak capacity for research utilization

Mentioned in Chapter 2, two important contextual factors in T&T worth highlighting given their direct effect on the flow of knowledge are the weak demand for research and an underdeveloped culture of research utilization leading to weak user capacity to support the absorption, distillation and translation of knowledge. One of the critical assumptions Zhuge (2006) makes in modelling the potential energy of knowledge flow is people's ability to generate, use and store knowledge (p. 2068). In tertiary institutions, there is an inherent commitment to the production and dissemination of knowledge; it is considered part of its raison d'etre. However, even within the university, there are different perspectives on how effectively knowledge is managed

and disseminated for research application, translation and general public awareness. Mansingh et al (2009) assert that in the Caribbean, 'there is no formal system of capturing knowledge from different actors and integrating it with existing knowledge even though knowledge sharing forums exist' (p. 2854). Yet, the knowledge recipient (and his or her capacity) is considered one of the four most influential factors for effective knowledge flows (Shin et al 2001). In T&T, the colonial legacy of simply accepting knowledge without interrogation and without an intention to use it to inform actions or decisions, sadly still persists in many quarters. Instead, there tends to be an apathetic stance and expectation that 'someone else will fix the problem'.

Some general observations based on RDI Fund researcher experiences are that greater emphasis is still placed on research supply (than research demand). However, when reports (research outputs) are sent to technical officials in public and private institutions, they are often not read or not well understood as having direct implications for the national policy agenda. One researcher explained:

> There was not much interest in [sector] revitalization at the Ministry level…but we promoted the principle of yield per unit area per unit time, which was a new concept. (David, mid-career researcher, national)

Some researchers even attested to the tendency of persons in T&T to give priority to relationships and affiliation over research and data, highlighting that:

> We don't have a culture of evidence-based decision-making. That is not part of our culture. It's who I can trust or who is telling me what I would like to hear in support of something that I want to do. (Randy, experienced researcher and senior research administrator)

Another consideration is that, while some of the more developed countries like the Canada, USA and the UK, have made progress with dispelling the notion of the 'two communities theory' (Caplan 1979; Webber 1984), which emphasizes cultural

differences between researchers and research users as one of the main hindrances to knowledge transfer and knowledge utilization, academia in T&T is still perceived by many as remote and disconnected from the activities of the public and private sector. This, coupled with a lingering reluctance of some individuals to 'embrace knowledge which is not from traditional colonial sources' (Mansingh et al 2009, p. 2861), results in a relatively low demand for indigenous knowledge and low absorptive rate of potential users. One of the STA researchers emphasized that:

> It takes quite a long time for the industry to actually start listening and start wanting to work with people in Trinidad because they are used to working with people outside [overseas]. (Jim, experienced researcher, non-national)

4.5.4 Meso-level Factors

A host of challenges, which relate to the internal administrative structures and policies at the STA Campus, were also faced by the researchers executing RDI Fund projects. These will need to be adjusted and streamlined in order to create a more enabling environment for effective and efficient knowledge flows at the meso level.

Researchers expressed frustration with institutional bureaucracy and the time spent trying to get things approved internally. They stated that internal procedures and processes should be more supportive of research, research collaboration, intellectual property management and research commercialization. Moreover, researchers indicated that they would prefer to focus on conducting their research in partnership with their stakeholders and feel that they are supported by an efficient institution to facilitate the smooth execution of research projects.

In sharing their experiences executing their respective RDI Fund projects, researchers referred to 'too much paperwork', 'a lack of trust in the system', 'feeling like you are constantly pushing back…pushing to persuade people that what you do is important'.

They expressed the need for 'a culture of understanding the importance of research and the level of financial backup and support that is required to be able to carry out good research'. Specific challenges mentioned included procurement of materials and equipment, project management and financial reporting. The RDI Fund Secretariat was cited as helpful to researchers in navigating the wider UWI bureaucracy in order to facilitate RDI Fund project implementation. However, this Secretariat is now made up of only one staff member, which points to a host of capacity challenges with respect to the oversight of the Fund's portfolio of projects as well as the level of support that can be provided to researchers.

With regard to research commercialization and the flows of knowledge to lead more research translation and entrepreneurship, researchers expressed concern that there were insufficient support mechanisms at UWI and in other local institutions to facilitate greater linkages. One researcher emphasized that:

> We don't have well developed mechanisms for linking the product – whether it be a commercial product or a policy recommendation – to action thereafter. What you need are staff members who are not academic staff, not researchers, focused explicitly on taking this [research] output and running with it in a commercial context. (John, experienced researcher, non-national)

Moreover, traditional university performance assessment systems, like UWI's A&P process, were also thought to be too limiting. STA researchers shared that the university's current approach to performance assessment is too focused on publications, which produces an oppositional force that stymies individual creativity and the use of more culturally relevant and diverse knowledge products to support knowledge flows to multiple research user groups. One researcher underscored that:

> The rituals of academia seem to have been laid down in stone…and we haven't quite shifted from the notion of publishing…What we need to do is to show the

> demonstrated impact of other types of knowledge products. (Lisa, experienced researcher and senior research administrator, national)

The importance of more supportive research communications, public relations and marketing for RDI Fund projects was also highlighted. Researchers stated a preference for less of a 'straightjacket approach', more marketing support that is 'deliberately managed and designed around engaging with research and researchers' and staff who could serve as 'a liaison or street liaison to talk about the research and facilitate knowledge transfer on an ongoing basis'. As one researcher explained:

> They don't understand the importance of explaining themselves in language that the policy maker understands to induce the demand for more of what they do. In some respects, researchers are their own worst 'marketeers'…especially when you are operating in an environment where the people who make decisions about whether or not funding should be allocated to research operate in a very short time horizon. (John, experienced researcher, non-national)

Pushback from other institutions in the public sector primarily (though in a few cases the closed, proprietary approach of some private sector companies was also mentioned) was cited as a factor that generated oppositional forces given their reluctance to share data, their tendency to work in silos and the existence of some persistent pockets of distrust of university research and of researchers, in spite of general recognition of the important work done by academia. One researcher explained that:

> Each [entity] was working on its own…I think this is one of the major hurdles that we have to cross in terms of really getting research to have an impact on society. Because without that, we can't reach very far. (Cassie, mid-career researcher, national)

Another researcher lamented that:

> There is just not an understanding of the importance of research and the level of institutional and financial back-up support that is required to be able to carry out good research. (Jim, experienced researcher, non-national)

4.5.5 Micro-level Factors

Having to incorporate the various mechanisms promoted by the Fund for operationalizing impact through multi-directional flows of knowledge (such as public engagement, participatory research design, producing a range of research products for diverse audiences, using multiple communications platforms and non-specialist language), took many researchers beyond their traditional methodological approaches and outside their comfort zones. For instance, one researcher retorted:

> We are researchers…the marketing people are there. That is a different area and a whole different field. We use our brain and skills to develop something, but to market it, there must be an entity that sees the value in what we are doing and can drive a message about what we are doing and how it is good for the community and the country. (Tom, experienced researcher, non-national)

Based on my interviews with STA researchers, it was evident that researchers sometimes struggled with how to reconcile their public engagement and impact-oriented research work and their identity and self-perception as an academic, intimating that either consciously or unconsciously, these researchers perceive public engagement activities that lead to societal impact as ranking lower on their hierarchy of identities. Statements like ‘remember, we are scientists, first and foremost’ and ‘I am a researcher, a scientist at the end of the day’ attest to this. Even in Western countries where university research impact initiatives are more institutionalized, the literature reflects that this continues to be a challenge. Grand et al (2015) underscore that one of the challenges of incorporating public engagement with research is that researchers ‘may

well have spent many years developing their knowledge, skills and craft; being seen by peers and others as an expert is an important part of professional identity' (p.2). As a result, encouraging researchers to adopt a more open and participatory approach to research through public engagement at all stages of the research process, may lead to confidence and esteem issues if researchers do not feel sufficiently equipped, trained or competent in those areas, thereby generating countercurrent forces at the micro level.

Difficulty in understanding the culture and in navigating the micropolitics of research communities in T&T affected non-national researchers to a greater degree. This, in turn, posed challenges for their level of confidence, trust and perceived credibility when interfacing with knowledge beneficiaries; all critical aspects for effective knowledge exchange and knowledge utilization. One researcher stated:

> For me as a researcher…the biggest thing that I have learnt…is that there is a lot of cultural issues related to being a foreigner in Trinidad...There is so much culture and so much history that you have to think about and take into consideration, as a foreigner, when you are dealing with the way people think in a country like Trinidad or in the Caribbean....It has been a massive learning curve for me. (Jim, experienced researcher, non-national)

These factors, whether linked to researcher perception and self-identity, researcher cross-cultural understanding or researcher skill, credibility or competence to manage a complex research project, understand and navigate the micropolitics of the research community and put into practice effective knowledge brokerage strategies, contribute to the oppositional forces to knowledge flows at the micro level. They also inevitably impinge on the energy, which is infused in researcher knowledge flows based on their cognitive ability and creativity (Zhuge 2006). The mitigation of micro level forces for more effective knowledge flows is thus closely linked to the actualization of researcher skill through enabling mechanisms and researcher support at the meso level.

4.6 Areas for attention to enhance the societal impact of UWI research

The diverse experiences of the STA researchers who executed RDI Fund projects and were part of my study converge around specific issues which will need to be addressed by the STA Campus if it is to provide a more enabling environment for societal impact. These have been elucidated in my analysis of the embedded case studies and are summarized in this section.

Researchers emphasized the need to strengthen internal research management policies and procedures to make them more efficient, better aligned with the objectives of the RDI Fund and more agile to respond to the needs of researchers. In order to enhance the efficiency and effectiveness of knowledge flows, existing policies would need to be updated to include a focus on knowledge brokerage, knowledge utilization and knowledge translation and to provide guidance to researchers on processes for carrying out research geared towards societal impact. This also points to the need for researcher training and skills development to support knowledge brokerage components of research projects, targeting areas such as marketing, promotions, use of ICT for research communications, outcome mapping, stakeholder analysis, theory of change, storytelling, impact reporting, etc. Strengthening researcher capacity in project implementation and how to effectively navigate the micropolitics of research communities would help to build researcher confidence and support a more systematic approach to effectively channeling and sequencing knowledge flows. Vitae (2011) provides a useful programme for researcher development, which has been adapted and utilized by many universities internationally, and places emphasis on capacity development in four quadrants, namely knowledge and intellectual abilities; personal effectiveness; research governance and organization; and engagement, influence and impact. It would be useful for the UWI to review and adapt its researcher training and support mechanisms to become better aligned with the current needs, particularly as these relate to research and societal impact.

With respect to researcher performance assessments, researchers called for greater recognition and reward for their effort dedicated to knowledge brokerage and public engagement alongside their academic achievements. They acknowledged that a greater focus on inter-departmental research collaborations to support intra-university knowledge flows could facilitate more inter-disciplinary research collaborations that address the multi-dimensional development challenges facing T&T and the Caribbean. Support with the use of technology and research communications tools for increased dissemination of diverse research outputs (so that UWI researchers feel equipped to go beyond academic publications in international journals) was considered essential as this would also provide more effective and less costly means for engaging key stakeholders during the research process. The importance of exploring indigenous options for research communications and public engagement, in ways considered more culturally relevant, was also highlighted as some projects experimented with the use of local cultural artforms to disseminate research findings and this was thought to be well received by knowledge beneficiaries. It is an area for further investigation and analysis.

With regard to the RDI Fund itself as a mechanism for supporting research with societal impact, researchers underscored the need for second-phase funding, which would enable them to focus more intensely on maximizing opportunities for stakeholder engagement, targeted research translation and public advocacy in a much more systematic way. By seeking to better align funding access and disbursements with the timescale for impact to occur, researchers suggested that based on their experiences, access to second-phase funding would enable them to achieve more effective knowledge flows through diverse knowledge products and knowledge brokerage strategies, which would help bridge research to policy and practice gaps.

It is important to mention that some universities as well as research funding agencies in the UK, Canada, USA and Australia have already instituted these types of measures to

enhance the impact of research. My study provides evidence drawn from my embedded case studies, which can further inform and guide the STA Campus' decisions on the policies, mechanisms and resource allocation needed to enhance the societal impact of its research, thus responding to my third research question (RQ#3).

Summary

This Chapter presented a detailed case study of the RDI Fund and highlighted the main characteristics of impact that Fund seeks to achieve. It has responded to my Research Question #1 about the RDI Fund's main characteristics of research impact (as outlined in Section 1.2). It introduced some of the limitations and underlying assumptions of the RDI Fund's operational approach that affect the effectiveness of its operationalization in the context of a Caribbean small state like T&T. The Chapter also delved deeper into three embedded case studies, which served to put the spotlight on my research findings following an in-depth examination of the experiences of selected RDI Fund researchers and the specific strategies they employed to achieve societal impact in T&T. In applying my Conceptual Framework to the analysis of knowledge flows within these selected projects, the three embedded case studies revealed important factors, flows and forces as well as the interplay between them when carrying out research in communities in T&T, highlighting some of the countercurrent forces that work in opposition to researchers' quest for societal impact. While the university's respected position in society as well as the small size of the T&T society and relatively easier access to policy makers and decision makers (as compared to larger more developed country contexts) have been singled out as facilitating forces, the cumulative effect of the many countercurrent forces at the micro, meso and macro levels, points to the need for proactive strategies to mitigate countercurrent forces and support university researchers' efforts to undertake knowledge brokerage and public engagement. This responds to Research Questions 2 and 3 of my research study about RDI Fund researchers' strategies to facilitate knowledge flows and proposed ways of enhancing the societal impact of STA research (as outlined in Section 1.2). This Chapter, therefore, adds a critical dimension to my thesis by presenting my findings from the main case study and

the embedded case studies. It presented my analytical contributions to the discourse on research and societal impact in the Caribbean context, highlighting the usefulness of my conceptual framework, which integrates knowledge flow analysis, knowledge brokerage approaches and the micropolitics of research communities in T&T.

CHAPTER 5: CONCLUSION

5.1 Introduction

With universities across the globe feeling increasingly pressured to demonstrate what is the impact of public investment in research, my research study has set out to tell another type of impact story. It is a story of *how* knowledge flows among knowledge actors and between knowledge actors and knowledge beneficiaries. It is about better understanding how these flows can be made more effective and maximized to bring about benefits to communities; not in a developed, highly structured Western society, but in a small island developing state in the Caribbean. In this context, historical, political and cultural factors have been shown to present strong oppositional forces. This, together with weak linkages between key knowledge actors, research institutions and other knowledge intermediaries in the wider research environment, generate strong countercurrents that push back against flows of knowledge. This story has therefore sought to go beyond the indicators and evidence of research impact to shine light on the pathways and processes through which knowledge is exchanged and utilized with a view to producing benefits to society.

Drawing on Meagher's (2008) model, I have developed a conceptual framework that integrates knowledge flow analysis with knowledge brokerage strategies and the micropolitics of research, which brings into focus the oppositional forces or countercurrents experienced at the micro, meso and macro levels when executing RDI Fund projects in T&T. This study, therefore, extended the work of Meagher et al (2008) by putting the spotlight on the *circular flows of knowledge* among UWI researchers, policymakers, knowledge intermediaries, research collaborators/practitioners, UWI teaching and learning/research (staff and students) and the research community; the *shorter distance* between knowledge actors in the T&T context and as well as important *environmental forces* that impinge on the potential of research to contribute to societal development in T&T. The postcolonial perspective adopted throughout this study recognizes that the development stage of Caribbean SIDS is a result of their history and

that several structural vulnerabilities as well as complex political, social and cultural legacies of colonization have caused persistent societal challenges that are inimical to sustained progress and development. At the same time, however, this study prioritizes a functional approach to impact by recognizing the power of intra-personal knowledge flows and tacit knowledge to stimulate human agency and foster development as the progressive expansion of freedom (Sen 1999).

5.2 My Research Study in Brief

In a nutshell, my research study contends that:

- Knowledge from research does not automatically lead to societal impact.
- It is the flow of knowledge during research processes that helps to bring about changes and benefits to society. These occur as a result of the exchange of knowledge, the absorption and translation of research-informed ideas *as well as* the often–overlooked emulsification of intra-personal tacit knowledge together with the wider enlightenment effect brought about by the exposure of diverse groups of knowledge users to new knowledge.
- This is what enables research to contribute to societal impact, which in spite of numerous models attempting to capture and measure diverse types of impact, remains a complex phenomenon that is best understood rather than counted.
- To be effective and efficient, knowledge flows must be proactively managed among knowledge actors as these flows generate knowledge energy. Knowledge tends to flow from an area of high potential energy to an area of low potential energy (Zhuge 2006).
- However, in contrast with Meagher's (2008) linear representation of knowledge flows occurring in a static or neutral external environment, RDI Fund researcher experiences reveal a high degree of circularity in knowledge flows as well as strong oppositional forces (countercurrents) created by historical, political, cultural and other societal factors that exist at the micro, meso and macro levels in T&T.
- These countercurrents have the power to obstruct knowledge flows and reduce the contribution of research to societal impact, despite the best intentions and efforts of

researchers. The RDI Fund, an instrument for incentivizing research with societal impact is thus a necessary but not sufficient mechanism for supporting effective and efficient processes for exchanging knowledge and translating research-informed ideas into benefits for society.

- In addition to conducting high quality research, researchers must therefore also be equipped to understand the micropolitics of research communities and proactively navigate and mitigate against these countercurrents in order to achieve societal impact.

5.3 Contributions

This thesis has contributed to three fields of research. Firstly, with respect to research evaluation and the research impact agenda, the methodological orientation of the study establishes a departure from the predominant 'counting culture' to create a space for the inclusion of developing country perspectives on and experiences with operationalizing research impact. This contribution to the discourse on research and societal impact (based on research projects executed in T&T) not only serves to challenge the assumptions of Western research impact models, but also to infuse other ways of knowing into Western knowledge production systems (Okolie 2003), thus, paving the way for 'new epistemic frames that are more accommodating of Caribbean modes of thought' (Lewis and Simmons 2010, p. 339). Moreover, by asserting that the intrinsic meaning of phenomena must be understood, this study re-affirms the relevance of a process-oriented focus on strategizing for impact (over output-focused definitions with quantifiable indicators of impact).

By confronting the issues surrounding the problematique of research impact, particularly as these are experienced in and by Caribbean SIDS, this study dispels the notion that only research whose impact can be evidenced is valuable. It goes further to underscore the continued relevance of tacit knowledge and 'knowledge for enlightenment' (Weiss 1977) in contemporary debates about knowledge utilization and knowledge

management, as a central element in the recursive processes for knowledge creation, absorption, transfer and utilization. Just as researchers cannot assume that knowledge would find its way into policy and practice on its own, so too should they not overlook the potency of enlightenment as a precondition for societal impact, particularly in Caribbean countries grappling with the residual, negative effects of colonialism, the vulnerabilities of small island states and nation-building processes still in a relative state of infancy.

Secondly, with regard to theories on knowledge utilization and knowledge brokerage, my case study of the RDI Fund has outlined that, through its procedures, evaluation criteria and reporting requirements, the RDI Fund has in effect established an operational framework that has built into its procedures for operationalizing projects, the characteristics of impact the Fund seeks to achieve (RQ#1) and in so doing, has initiated an impact-oriented culture shift among UWI researchers at the STA Campus across a range of disciplines. Moreover, my embedded case studies test the applicability of theories on knowledge utilization and knowledge brokerage in the context of strategies employed by UWI researchers to facilitate knowledge flows (RQ#2) in specific RDI Fund projects. This exposes the powerful countercurrents in the macro environment of T&T that negatively affect the ease with which knowledge can flow between knowledge actors in developing country contexts. While more structured, Western societies have established linkages with knowledge intermediaries and a more enabling environment for research and knowledge exchange and translation, this study highlights the fact that historical, political and cultural factors in Caribbean SIDS present strong oppositional forces, which can undermine researchers' activities to promote knowledge utilization and knowledge brokerage. It therefore calls into question the applicability of models such as Meagher's (2008) Conceptual Framework to Caribbean SIDS, if not adjusted to cater to contextual realities. Even with my expanded conceptual framework, this study revealed the need to adapt and adjust my own model when analyzing the knowledge flows and countercurrent forces at play across projects A, B and C, underscoring the

point that conceptual frameworks should be treated as living concepts, which must be adaptable to the contexts and cultures of different research communities.

Thirdly, in re-examining the sociology of knowledge – the relationship between knowledge and its influence on Caribbean people and societies – this study established a clear link between the complex and contested field of research impact and the field of development management. By integrating the micropolitics of research into the knowledge flow analysis conducted for the selected RDI Fund projects, specific issues emerge surrounding how politics and power dynamics are manifested at the local level; dissonance, ambivalence and other cultural idiosyncrasies; inadequate research demand, linkages and capacity for research utilization; and researchers' inner tensions caused by conflicting notions of self-identity and relevant skills to engage in research with societal impact; all of which need to be understood and addressed at the micro, meso and macro levels. In so doing, this study extends the discussion on the policy and practice of research impact and underscores the value of drawing on tools from the development management field (such as outcome mapping, stakeholder analysis and force field analysis) to strengthen researchers' understanding of social change and theories of change as well as researchers' skills for implementing research projects geared towards societal impact (RQ#3).

From a methodological perspective, this study is among the forerunners to draw on Meagher's (2008) Conceptual Framework to construct a new conceptual framework to analyze flows of knowledge as manifested in research projects executed in the Caribbean. Beyond testing the utility as well as limitations of Meagher's (2008) Conceptual Framework, the diagrams and matrices in Chapter 4, which correspond to the application of my conceptual framework to RDI Fund projects, present a more accurate depiction of the processes that take place in T&T when STA researchers operationalize RDI Fund research projects. These diagrams provide a visual mapping of the specific, project-related knowledge actors/agents, knowledge flows, outputs,

intermediate outcomes and occasions of influence as well as the range of contextual challenges that can serve as countercurrents in the T&T context. My conceptual framework may therefore also be a useful point of departure to deepen understandings of knowledge flow analysis in other Caribbean SIDS as well as developing countries in other regions.

Additionally, the triple coding method of data analysis, drawing on themes from interviews, literature review/documentary analysis and the Conceptual Framework, facilitate a broader thematic analysis, disentangling issues at multiple levels and integrating findings across the different methods. This has contributed to enhancing the robustness of the methodology of my study by enabling the disaggregation and teasing out of unique traits and cultural factors at the micro, meso and macro levels, which could have been overlooked had another method been used.

5.4 Limitations of My Research Study and Insights for New Areas of Research

While this study has presented a unique perspective on research and societal impact in T&T, admittedly, it does not go as far as some may wish for in specific areas. For instance, my study explains how knowledge flowed from selected RDI Fund projects (which created pathways), who exchanged knowledge (actors/agents), what format the knowledge took (artifacts) and what political and cultural factors may have affected project execution (countercurrents). It does not separate or examine in a distinct manner flows of knowledge versus expertise versus influence but rather subsumes these into flows of knowledge. Save some examples of research outputs, intermediate impacts and occasions of influence, it does not go further to evaluate the extent to which knowledge flows led to knowledge utilization and knowledge translation into policy, practice, new products or changed behavior. Neither does it attempt to assess the effectiveness of the researchers' efforts or skills at knowledge mobilization and public engagement. Beyond acknowledging that user capacity plays an important role in the utilization of knowledge, this study also does not pretend to assess the capacity of the research users, which is another important factor along the pathway to societal impact. The gaps in the

wider institutional research support structure and the extent to which these may have negatively affected researcher motivation, actual knowledge flows or the rate of project execution, thereby influencing the ability to achieve societal impact, are also not addressed. The modelling of knowledge as it flows across the system to knowledge intermediaries, users and beneficiaries is also outside the scope of this study.

While my study proposes important adaptations to Meagher's (2008) Conceptual Framework, because of the specific, localized nature of the countercurrent forces in T&T's external environment, my conceptual framework cannot go further to offer specific guidance or recommendations on exactly how to mitigate against countercurrent forces. The value of my model thus resides in its precautionary power, alerting researchers to anticipate and prepare for countercurrent forces during research project implementation in T&T. It also strengthens the case to be made by researchers, universities and other research institutions, for additional funding for researcher skills development, researcher support (public relations, marketing, communications, public engagement) if research is to make greater and more sustained contributions to national and regional development in the Caribbean.

From a methodological perspective, I do recognize additional limitations with regard to my role as the former manager of the RDI Fund and the effect that this may have had on my ability to distance myself from the data, in spite of my recognition of my positionality, my practice of reflexivity and the steps I would have taken to build rigour in my analysis (as outlined in Chapter 3). Conducting research as an insider always presents challenges with researcher bias, for example, in the selection of cases for the embedded case studies as well as in the analysis of the data and presentation of the research findings (which I acknowledged in Chapter 3). Thus, my interaction with my research participants and the data emerging from my interviews could have been coloured by internal UWI organizational dynamics, perceived hierarchy and reporting relationships and perceived power differentials. Thus, some critics may assert that my

proximity to the head of the STA Campus and the researchers' perception of my power to influence decisions about research funding from UWI or UNDP (during my secondment) could have influenced the degree of candour and the nature of their responses. While these effects of conducting insider research are difficult to control, mitigate or eliminate, as outlined in Chapter 3, particularly when examining my positionality and reflexivity, I was mindful of these limitations and understood the ways in which they, in turn, shaped my own interpretation and analysis.

While the use of other qualitative methods such surveys of research collaborators and research users was considered, I was keen to respect the aim and scope of the study, focusing on the *processes* employed by and *experiences* of STA *researchers*, not losing sight of my three overarching research questions, which centered on the characteristics of societal impact of the RDI Fund, the strategies employed by the RDI Fund researchers to facilitate knowledge flows and suggestions for enhancing the societal impact of UWI research. Furthermore, based on my review of the literature, too often studies conducted on the societal impact of university research tended to be evaluative in nature – preoccupied with assessing and quantifying the value of specific contributions of new knowledge to society – and not conceptual or aimed at better understanding the nature of knowledge processes that lead to societal impact.

Complementing my interviews with elements of ethnographic research could have added additional perspectives and insights to my study as ethnography is a method that draws the researcher into the environment of the phenomenon that is being studied. However, I was mindful that an ethnographic dimension to my research study could make it difficult to maintain a balance between the main case study (the RDI Fund) and the embedded case studies (vignettes of specific RDI Fund projects). As highlighted in Chapter 3, Yin (2003) cautions against allowing embedded case studies to shift the orientation of the case study away from the main case study. Conducting interviews with my various research participants instead enabled me to simultaneously understand

the inner dynamics of each RDI Fund project that was being examined and also draw connections among them as well as between these sub-units and the overarching case study focused on the RDI Fund. This entailed dissecting the disciplinary, contextual, political, social and cultural elements surrounding each project at the micro, meso and macro levels, examining the various strategies used to promote knowledge brokerage and then adding another layer that maps out the knowledge flows as well as the countercurrent forces. However, I was cautious as a researcher not to allow the rich data from the embedded cases to overshadow the main case study, thereby ensuring that my research strategy remained fit for purpose and that the methods chosen indeed aligned with my study and enabled me to answer my research questions.

All of the topics mentioned above point towards areas for further research and analysis. Another related area, which I find particularly interesting for future research, is the integration and mapping of knowledge flow analysis with force field analysis (Lewin 1947) at the project level, as a means of teasing out the factors and forces inherent in the micropolitics of research. Rowlands' (1997) four powers model – power within, power with, power to and power over – could also provide additional insight into how to distribute flows of knowledge during research processes. In additional to indicating directional flows of knowledge, an integrated knowledge flow/force field mapping could prove useful in attempting to gauge the strength of the countercurrent forces at the micro, meso and macro levels, thus allowing for better prioritization, sequencing and budgeting of knowledge brokerage activities during the execution of research projects.

For researchers wishing to adopt a more quantitative lens, I also see scope for quantitative modelling that could inform the derivation of a societal impact factor that seeks to estimate the potential of a research project to achieve societal impact by identifying appropriate indicators and proxy indicators that could facilitate quantifying and testing a mathematical relationship between research quality and knowledge brokerage activities, then discounted by a countercurrent quotient that expresses the

cumulative strength of all identified oppositional forces in a specific research community. Developing a deeper understanding of how knowledge and power dynamics clash or coalesce and influence the ability of research to contribute to societal impact could therefore present useful intellectual scaffolding for further research on the societal impact of research.

5.5 Policy Implications

This study highlighted some critical gaps in the *macro* research environment in T&T, which require urgent policy intervention to provide a more enabling research environment for research, innovation and research commercialization endeavours in T&T. These include:

- Increased budget allocations for research funding for infrastructure, equipment, materials, etc. as well as dedicated funding (through the RDI Fund and other funding instruments) for research projects.
- Modernization of legislative frameworks to enable ease of inter-institutional access to data, the streamlining of ICT, business intelligence and big data into the administrative processes in public institutions would have a ripple effect across the research environment.
- Better resourcing and strengthening of existing research institutions to play a greater knowledge intermediary and knowledge brokerage role and also serve to build vital linkages that would cultivate greater research demand and user capacity for knowledge absorption and translation.

At the institutional *meso* level, the following are some important policy implications for institutional strengthening:

- Application of the tenets of UWI's 'Agility' and 'Alignment' pillars of its 2017-2022 Strategic Plan to its internal operations to support more seamless and efficient research management processes;

- Review and updating of UWI Research Policy to place increased emphasis on knowledge brokerage, knowledge utilization and knowledge translation to provide clearer guidance and support to researchers who are working on research projects geared towards societal impact;
- Provision of relevant researcher training and support for knowledge brokerage functions in areas such as marketing, promotions, use of ICT for research communications, outcome mapping, stakeholder analysis, theory of change, storytelling, impact reporting, etc. would help researchers feel more confident and better equipped when executing RDI Fund projects in the future;
- Alignment of the UWI A&P process with the proposed update to the Research Policy to adequately recognize and reward knowledge brokerage and public engagement efforts that underpin research for societal impact;
- Institutionalization of policies on research mentorship so that UWI researchers receive greater guidance and institutional support for professional development and career progression. This connects directly to the motivation levels of researchers to actively contribute to scholarly activity and to develop the skills needed to understand and navigate the micropolitics of research while at the same time recognizing that knowledge energy (Zhuge 2006) can be a driving force for flows of knowledge emanating from the university;
- Increased incentives for inter-Departmental research collaborations and intra-university knowledge flows so that researchers are more aware of the research being conducted by their peers and can draw on each other's strengths when developing project proposals to address inter-sectoral and multidimensional development issues. This is central to the university's ability to deepen its support to regional governments as they work towards the Sustainable Development Goals (SDGs).
- Greater use of technology and research communications tools to support the dissemination of diverse research outputs so that UWI researchers are not limited to academic publications in international journals but can explore indigenous options for engaging stakeholders in more culturally relevant ways, while still

increasing the research footprint of the UWI and achieving a 'virtual' critical mass of research outputs.

- The provision of second-phase funding to RDI Fund researchers to enable them to focus more intensely on maximizing opportunities for wide public engagement (thereby increasing opportunities for public enlightenment), targeted research translation and advocacy that could bridge research to policy/practice gaps. In an environment with scarce government resources, this would more likely entail enlisting the support of the private sector or international funding agencies to provide dedicated funding, though this may run the risk of narrow conditionalities and donor priorities taking precedence; a grave reality often faced by Caribbean SIDS, as mentioned earlier in this study.

At the micro level, it would be important to institute policy measures that support:

- Researcher access to training programmes that strengthen their capacity to conceptualize, execute, monitor and report on projects geared towards societal impact as well as deepen their understanding of how to navigate and mitigate micropolitics in research communities would be extremely beneficial to increase researcher confidence and success. Vitae (2011) outlines a useful programme for researcher development, which emphasizes capacity development in four quadrants: knowledge and intellectual abilities; personal effectiveness; research governance and organization; and engagement, influence and impact. Such a framework could inform the suite of training programmes the UWI could develop in order to equip researchers for greater success and move university research further along the pathway to societal impact.

5.6 Professional Practice Implications

Beyond policy implications, there are important lessons for the management of university research and also for my role as UWI Director of Development. By sharing

the findings of my research more widely with UWI researchers, administrators and members of the UWI executive management team, I believe that it will allow for a re-positioning of knowledge brokerage as a fundamental component of the university's core functions of teaching, research and service. This is essential for the university to more effectively carry out its mission of contributing to revitalizing Caribbean development. My research also enables me to build the case for additional budgetary allocations for research communication, knowledge brokerage and knowledge exchange functions within the university, which will need to be complemented by researcher skills development for greater public engagement as well as the identification of new talent specializing in knowledge brokerage, research communications, storytelling and strengthening the interface between scientists and the creative arts.

By encouraging UWI researchers to focus on the processes involved in effective knowledge flows, I am optimistic that researchers will place greater attention on strategies for knowledge dissemination and knowledge exchange from the design phase of research projects in the Caribbean, with a view to working with their research collaborators on incorporating indigenous cultural artforms in public engagement sessions and research expo events. As mentioned in Chapter 4, local cultural artforms are useful means of drawing attention to the relevance of university research to local contexts and also a creative way to communicate research findings to non-specialist audiences. A proposal has already been submitted to one of our regional development partners requesting technical and financial support in this area and there is agreement in principle that both our organizations will collaborate to enhance the effectiveness of research communications, knowledge exchange and stakeholder engagement around pressing Caribbean development issues such as climate change, masculinity and gender equality as well as economic diversification through innovation and entrepreneurship.

With regard to UWI's research management systems, one of the most important insights from my research study, is the need to re-think how project budgets are structured.

Staggering research project funding over time takes into account the time lag needed for research to evidence impact. By giving researchers access to second phase funding or allowing them to build impact consolidation time into their proposals from the onset, provides a more realistic and supportive framework for research teams working towards achieving societal impact. This is helpful not only for researchers' approaches to proposal writing but also to re-frame discussions about research impact with Caribbean policy-makers, industry partners, civil society organizations and multilateral donors. Better informed dialogues between key stakeholders on the issue of the societal impact of university research can serve to provide clarity on objectives and outcomes, to manage expectations and to strengthen collaborative efforts.

A deeper understanding of knowledge brokerage through my examination of RDI Fund researcher experiences has also underscored the importance of incorporating a more networked approach to UWI researcher collaboration both within and across Faculties if the UWI is to facilitate greater knowledge flows. Knowing what other researchers and Departments are doing and being aware of the synergies that can be leveraged or the joint opportunities that can be pursued, is fundamental to the university's ability to strengthen the internal alignment and agility needed to enhance the contribution of its research to providing solutions to development issues. I am currently testing new approaches to researcher collaboration and communication through the activation of the regional UWI research cluster on climate change involving researchers from across our 3 landed Campuses in Jamaica, Barbados and Trinidad and Tobago as well as researchers from specialized research centres on sustainable development, disaster risk reduction and resilience. As Director of Development, I serve as the interface and connector for our regional UWI research cluster to a global cluster of researchers working on SDG-13 (Climate Action) with universities from all geographic regions that are active members of the International Association of Universities' network of higher education and research institutions for sustainable development.

The findings of my research study have thus served to infuse new insights and energy into the practice of research management at the UWI and also into the work programme of my office, the UWI Office of Development. It has re-defined the traditional notion of university offices of development as offices that deal primarily with resource mobilization for capital projects by better aligning the mandate of the UWI Office of Development with the role of the UWI as a developmental university in the 21st century phase of the evolution of Caribbean societies, placing increased emphasis on partnership building, thought leadership, knowledge brokerage and strengthening the knowledge-to-policy and knowledge-to-practice interface in national and regional development processes.

Concluding Thoughts

This meta-research study integrates three key disciplines to offer new insight into the relationships, processes and knowledge pathways that facilitate the societal impact of research in Caribbean SIDS. As with all research, it is situated and political. It lays bare the experiences of UWI researchers' efforts at implementing RDI Fund projects geared towards societal impact, using limited resources in a complex environment. It answers back to more traditional Western approaches to research impact, by dismissing the need to measure impact as a pressing concern for T&T and instead, focusing on the multiple flows of knowledge that lead to diverse contributions and benefits to society, both visible and invisible, intended and unintended, measurable and immeasurable.

My conceptual framework provides an integrated approach to knowledge flow analysis, knowledge brokerage and the micropolitics of research to support more effective and efficient knowledge flows and better utilization and translation of university research. In so doing, it helps to position the UWI to play an even stronger role in ensuring that indigenous research is fully utilized and contributes to the advancement of national and regional development processes in the Caribbean, thus reaffirming the role of the university as a developmental force. As Caribbean SIDS pursue an ambitious 2030

development agenda and seek to strengthen their resilience, the power of effective knowledge flows to stimulate enlightenment, creativity, innovation and change must be harnessed. After all, knowledge, by itself, does not cause change. Not only must it be understood, mobilized, absorbed and translated into action, it must also be infused with sufficient energy to overcome environmental countercurrents and generate its intended benefits to society.

BIBLIOGRAPHY

Aberbach, J. D. & Rockman, B. A. (2002) Conducting and coding elite interviews. *PS: Political Science & Politics, 35*(4), 673-676.

Alavi, M. & Leidner, D. E. (2001) Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.

Al-Hindi, K. F. & Kawabata, H. (2002) Toward a more fully reflexive feminist geography *In*: P. Moss (ed) *Feminist geography in practice: Research and methods*. Malden, MA: Wiley-Blackwell. p. 103-116.

Alvesson, M. (1993) Organizations as rhetoric: knowledge intensive firms and the struggle with ambiguity. *Journal of Management Studies, 30*(6), 997-1015.

Appadurai, A. (2000) Grassroots globalization and the research imagination. *Public Culture,* 12(1), 1-19. Duke University Press. Retrieved 4 September 2017 from: http://crossroads-asia.de/fileadmin/user_upload/Literatur/Area_Studies/Appadurai2000_Grassroots_globalization_and_the_Research_Imagination.pdf

Archer, M. (2010) Critical Realism and Relational Sociology: Complementarity and synergy. *Journal of Critical Realism, 9*(2), 199-207.

Armour, M., Rivaux, S. L. & Bell, H. (2009) Using context to build rigor: Application to two hermeneutic phenomenological studies. *Qualitative Social Work, 8*(1), 101-122.

Armstrong, R., Waters, E., Roberts, H., Oliver, S. & Popay, J. (2006) The role and theoretical evolution of knowledge translation and exchange in public health. *Journal of Public Health*, 28(4), 384-389.

Arrow, K. J. (2000, April) *Knowledge as a factor of production*. Keynote address delivered at the Annual World Bank Conference on Development Economics. Washington, DC: World Bank.

Bacchus, M. K. (1994) *Education as and for legitimacy: Developments in West Indian Education between 1846 and 1895.* Ontario: Wilfrid Laurier Univ. Press.

Badat, S. (2009) *The role of higher education in society: Valuing higher education. In*: HERS-SA Academy 2009, 13-19 Sept 2009, University of Cape Town, Graduate School of Business, Cape Town, South Africa.

Banerjee, P. A. (2013) Research design creating robust approaches for the social sciences. *International Journal of Research and Method in Education*, 36(4), 440-442.

Barbour, R. S. (2001) Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *BMJ: British Medical Journal,* 322(7294), 1115-1117.

Bassey, M., (2012) Case studies. *In:* A. R. J. Briggs et al. (eds), *Research methods in educational leadership and management* (3rd ed). London: Sage Publications. p. 155-169.

Bastow, S., Dunleavy, P. & Tinkler, J. (2014, April) *Measuring the impact of social science research in UK central government policy making.* Paper presented at the Political Studies Association Annual Conference, Manchester, UK. retrived 16 March 2017 from: https://www.psa.ac.uk/sites/default/files/conference/papers/2014/Final%20PSA%202014%20Impact%20paper%2014%20April%202014%20version%206f.pdf

Baxter, P. & Jack, S. (2008) Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report,* 13(4), 544-559.

Beckford, G. L. (1999) *Persistent poverty: underdevelopment in plantation economies of the third world*. Kingston: University of West Indies Press.

Beckles, H. M. (2013) *Britain's black debt: reparations for Caribbean slavery and native genocide.* Kingston: University of West Indies Press.

Bell, D. (1999) The axial age of technology foreword: 1999. *In:* The coming of the Post-Industrial Society, Special Anniversary Edition. New York, NY: Basic Books, ix–lxxxv.

Berry, J. M. (2002) Validity and reliability issues in elite interviewing. *PS: Political Science & Politics, 35*(4), 679-682.

Best, L. (1997) Independent thought and Caribbean freedom: thirty years later. *Caribbean quarterly, 43*(1-2), 16-24.

Bhaskar, R. (1975) *Realist theory of science.* London: Routledge.

Bhaskar, R. (1978) On the possibility of social scientific knowledge and the limits of naturalism. *Journal for the Theory of Social Behaviour, 8*(1), 1-28.

Bhaskar, R. (1989) *Reclaiming reality: A critical introduction to contempory philosophy.* London: Verso.

Boaden, R. J. & Cilliers, J. J. (2001) Quality and the research assessment exercise: just one aspect of performance? *Quality Assurance in Education, 9*(1), 5-13.

Bornbaum, C. C., Kornas, K., Peirson, L. & Rosella, L. C. (2015) Exploring the function and effectiveness of knowledge brokers as facilitators of knowledge translation in health related settings: A systematic review and thematic analysis. *Implementation Science*. 10(1), 162.

Bornmann, L. (2012) Measuring the societal impact of research. *EMBO Reports, 13*(8), 673-676.

Bourguignon, F. & Sundberg, M. (2007) Aid effectiveness: Opening the black box. *The American Economic Review, 97*(2), 316-321.

Braithwaite, L. (1958) The development of higher education in the British West Indies. *Social and Economic Studies*, 7(1) -64.

Bray, M. (2011) The small states paradigm and its evolution. *In:* M. Martin & M. Bray (eds) *Tertiary Education in Small States: Planning in the context of globalization.* Paris: IIEP/UNESCO. p. 37-72.

Brereton, B. (2011) *From Imperial College to University of the West Indies: A history of the St. Augustine Campus.* Trinidad & Tobago: Ian Randle.

Brewer, J. D. (2011) The impact of impact. *Research Evaluation, 20*(3), 255-256.

Bristol, L. S. (2012) *Plantation Pedagogy: A Postcolonial and Global Perspective. Global Studies in Education. Volume 16*. New York, NY: Peter Lang.

Burawoy, M. (1998) The extended case method. *Sociological Theory, 16*(1), 4-33.

Burton, D. & Bartlet, S. (2009) Key Issues for Education Researchers. London: Sage Publications.

Buxton, M. & Hanney, S. (1994) *Assessing payback from Department of Health Research and Development: Preliminary Report. HERG research report.* Uxbridge: HERG, Brunel University.

Cabinet Office. (1993) *Realizing our Potential: A strategy for Science, Engineering and Technology* Cm 2250. London: HMSO.

Campbell, L. K., Svendsen, E. S. & Roman, L. A. (2016) Knowledge co-production at the research–practice interface: embedded case studies from urban forestry. *Environmental management, 57*(6), 1262-1280.

Caplan, N. (1979) The two-communities theory and knowledge utilization. *American behavioral scientist, 22*(3), 459-470.

Carden, F. (2009) *Knowledge to policy: Making the most of development research*. Ottawa: IDRC.

Carlsson, S., El Sawy, O., Eriksson, I. & Raven, A. (1996) Gaining Competitive Advantage through shared Knowledge Creation: In search of a new design theory for Strategic Information Systems. *In: Proceedings of the Fourth European Conference on Information Systems*. Lisbon: IDRC. p. 1067-1075.

Case, J. M. & Light, G. (2011) Emerging research methodologies in engineering education research. *Journal of Engineering Education, 100*(1), 186-210.

Castells, M. (1993) The University System: Engine of development in the New World Economy. *In* A. Ransom et al. (eds), *Improving Higher Education in Developing Countries*. Washington, DC: World Bank. p. 65-77.

CDB. (2016) *2016 Economic Review: 2017 Forecast.* Bridgetown: CDB.

Chew, S., Armstrong, N. & Martin, G. (2013) Institutionalising knowledge brokering as a sustainable knowledge translation solution in healthcare: how can it work in practice? *Evidence & Policy: A Journal of Research, Debate and Practice,* 9(3), 335-351.

Chib, A. & Harris, R. (eds). (2012). Linking research to practice: Strengthening ICT for development research capacity in Asia. Singapore: Institute of Southeast Asian Studies.

Christians, C. (2005) Ethics And Politics In Qualitative Research. *In:* N. Denzin & Y. Lincoln, *The Sage Qualitative Handbook 3rd Edition*. London: Sage Publications. p. 139-164.

CHSRF. (2003) *The theory and practice of knowledge brokering in Canada's health system.* Ottawa: Canadian Health Services Research Foundation.

Clarke, J. & Newman, J. (1997) *The Managerial State: Power, Politics and Ideology in the remaking of Social Welfare.* London: Sage Publications.

Cobley, A. (2000) The historical development of higher education in the Anglophone Caribbean. In: G. Howe (ed) *Higher Education in the Caribbean: Past, present, and future directions*. Brigetown: University of the West Indies Press. p. 1-23.

Cochrane, A. (1998) Illusions of power: interviewing local elites. *Environment and Planning A: Economy and Spac, 30*(12), 2121-2132.

Colonial Office. (1945) *Report of the Commission on Higher Education in the Colonies* CMD.6647. London: HMSO.

Cousins, J. B. & Leithwood, K. A. (1986) Current empirical research on evaluation utilization. *Review of educational research, 56*(3), 331-364.

Creswell, J. (2003) *Research Design: Qualitative quantitative and mixed methods approaches (2nd ed.)*. Thousand Oaks, CA: Sage Publications.

Crossley, M. (2008) The advancement of educational research in small states. *Comparative Education, 44*(2), 247-254.

Crotty, M. (1998) *The foundations of social research: Meaning and perspective in the research process*. London: Sage Publications.

Daniels, A. K. (1983) Self-deception and self-discovery in fieldwork. *Qualitative Sociology, 6*(3), 195-214.

Darke, P., Shanks, G. & Broadbent, M. (1998) Successfully completing case study research: combining rigour, relevance and pragmatism. *Information Systems Journal, 8*(4), 273-289.

Davies, H., Nutley, S. & Walter, I. (2005) *Assessing the impact of social science research: conceptual, methodological and practical issues* (Discussion Paper for ESRC Symposium on Accessing Non-Academic Impact of Research May 2015). Retrieved 22 May 2017 from: https://www.odi.org/sites/odi.org.uk/files/odi-assets/events-documents/4381.pdf

Davis, C. & Carden, F. (1998) Research effectiveness and R&D evaluation in developing countries. *Knowledge, Technology & Policy,* 10(4), 7-30.

De Ferranti, D., Perry, G. E., Lederman, D. & Maloney, W. E. (2002) *From natural resources to the knowledge economy: trade and job quality*: Washington, DC: World Bank.

Deem, R., Hillyard, S. & Reed, M. (2007) *Knowledge, higher education, and the new managerialism: The changing management of UK universities*. Oxford: Oxford University Press.

Denzin, N. K. & Lincoln, Y. S. (2003) *Collecting and interpreting qualitative materials*. Los Angeles,CA: Sage Publications.

Denzin, N.K. & Lincoln, Y.S. (2013) *The landscape of qualitative research (4th ed.)*. Los Angeles, CA, Sage Publications.

Desmond, M. (2004) Methodological challenges posed in studying an elite in the field. *Area, 36*(3), 262-269.

Donovan, C. & Hanney, S. (2011) The 'payback framework' explained. *Research Evaluation, 20*(3), 181-183.

Douthwaite, B., Kuby, T., van de Fliert, E. & Schulz, S. (2003) Impact pathway evaluation: an approach for achieving and attributing impact in complex systems. *Agricultural systems, 78*(2), 243-265.

Dunn, W. N. (1983) Measuring knowledge use. *Knowledge, 5*(1), 120-133.

Dunn, W. N. (1986). Studying knowledge use: a profile of procedures and issues. *In:* George Beal et al. (eds) *Knowledge generation, exchange and utilization*. Boulder: Westview Press. p. 29-42.

Duryea, M., Hochman, M. & Parfitt, A. (2007, February) Measuring the impact of research. *Research Global,* 8-9 & 21.

Easton, G. (2010) Critical realism in case study research. *Industrial marketing management, 39*(1), 118-128.

Eisenhardt, K. M. (1991) Better stories and better constructs: The case for rigor and comparative logic. *Academy of management Review,* 16(3), 620-627.

Ellingson, L. L. (2009) *Engaging crystallization in qualitative research: An introduction*. Thousand Oaks, CA: Sage Publications.

Elton, L. (2000) The UK research assessment exercise: unintended consequences. *Higher Education Quarterly*, *54*(3), 274-283.

Epstein, M. J. & Yuthas, K. (2014) *Measuring and improving social impacts: A guide for nonprofits, companies, and impact investors*. San Fransico, CA: Berrett-Koehler Publishers.

Escobar, A. (1995) *Encountering development: The making and unmaking of the third world.* Princeton, NJ: Princeton University Press.

Etikan, I., Musa, S. A. & Alkassim, R. S. (2016) Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4.

Etzkowitz, H. (2002) *The triple helix of university-industry-government: Implications for policy and evaluation.* Stockholm: Swedish Institute for Studies in Education and Research.

Etzkowitz, H. (2003) Innovation in innovation: The triple helix of university-industry-government relations. *Social science information, 42*(3), 293-337.

Ezzy, D. (2010) Qualitative interviewing as an embodied emotional performance. *Qualitative inquiry, 16*(3), 163-170.

Farrell, T. (2012) The underachieving society: Development strategy and policy in Trinidad and Tobago 1958-2008. Kingston: University of the West Indies Press.

Farrell, T. (2017) We like it so? The cultural roots of Economic Underachievement in Trinidad and Tobago. Self published. Trinidad and Tobago: Terrence Farrell.

Ferguson, M. (2014) The research impact agenda: Defining, demonstrating and defending the value of the social sciences. Retrieved 6 March 2017 from: http://www.australianreview.net/digest/2014/08/ferguson.html

Few, R. (2001) Researching actor power: analyzing mechanisms of interaction in negotiations over space. *Area 34* (1), 29–38.

Garlick, S. C. & Pryor, G. (2004) *Benchmarking the university: learning about improvement. In:* Commonwealth of Australia report prepared for the Department of Education, Science and Training. Canberra: Dept. of Education, Science and Training.

Georghiou L. (2002) Impact and additionality of Innovation Policy. *In:* P. Boekholt (ed) *Innovation Policy and Sustainable Development: Can Innovation Incentives Make a Difference?*. Brussels: IWT-Observatory. p. 57-65.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, R. & Trow, M. (1994) *The new production of knowledge: The dynamics of science and research in contemporary societies.* London: Sage Publications.

Glasgow, R. E. & Emmons, K. M. (2007) How can we increase translation of research into practice? Types of evidence needed. *Annu. Rev. Public Health, 28*, 413-433.

Godin, B. & Dore, C. (2005) *Measuring the impacts of science; beyond the economic dimension, INRS Urbanisation, Culture et Socie´te´*. Paper presented at the HIST Lecture, Helsinki Institute for Science and Technology Studies, Helsinki, Finland. Retrieved 7 October 2016 from: http://www.csiic.ca/PDF/Godin_Dore_Impacts.pdf

Graham, G. (2005) *The institution of intellectual values: Realism and idealism in higher education.* Exeter: Imprint Academic.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W. & Robinson, N. (2006) Lost in knowledge translation: time for a map? *Journal of Continuing Education in the Health Professions,* 26(1), 13-24.

Grand, A., Davies, G., Holliman, R. & Adams, A. (2015) Mapping public engagement with research in a UK university. *PloS one, 10*(4), 1-19.

Grimshaw, J. M., Eccles, M. P., Lavis, J. N., Hill, S. J. & Squires, J. E. (2012) Knowledge translation of research findings. *Implementation Science, 7*(1), 50.

Grimson, J. (2014). Measuring research impact: not everything that can be counted counts, and not everything that counts can be counted. *Bibliometrics. Use and Abuse in the Review of Research Performance*, 4(1), 29-41.

Grogan, M. & Simmons, J. M. (2012) Taking a critical stance in research. *In*: A. R. J. Briggs et al. (Eds), *Research methods in educational leadership and management* (3rd ed.) London, Sage Publications. p. 29-45.

Grossberg, L. (1989) The context of audiences and the politics of difference. *Australian Journal of Communication, 16,* 13-35.

Guigale, M. (2014, March 7) Impact Evaluation: A woman's best friend [Blog post]. Retrieved 11 October 2016 from: https://www.huffingtonpost.com/marcelo-giugale/impact-evaluation-a-woman_b_4919225.html

Guinet, J. (2014) *Assessment of the National Innovation Ecosystem of Trinidad and Tobago. Final Report.* Washinghton DC: IDB.

Guba, E. (1990) *The paradigm dialog.* New Delhi: Sage Publications.

Guba, E. G. & Lincoln, Y. S. (1994) Competing paradigms in qualitative research. *In:* N. K. Denzin & Y. S. Lincoln (eds), *Handbook of qualitative research*. London: Sage Publications. p. 105-117.

Gupta, B., Iyer, L. S. & Aronson, J. E. (2000) Knowledge management: practices and challenges. *Industrial Management & Data Systems, 100*(1), 17-21.

Hannerz, U. (2002) Among the foreign correspondents: Reflection on anthropological styles and audiences. *Ethnos, 67*(1), 57–74.

HEFCE. (2011) *Research Excellence Framework (REF.02.2011). Assessment Framework and Guidance on Submissions.* Retrieved 11 June 2016 from: https://www.ref.ac.uk/2014/media/ref/content/pub/assessmentframeworkandguidanceonsubmissions/GOS%20including%20addendum.pdf

Henke, H. & Reno, F. (2003) *Modern political culture in the Caribbean.* Kingston: University of West Indies Press.

Hicks, D. (2011) Performance-based university research funding systems. *Research Policy, 41*(2), 251-261.

Huberman, M. (1990) Linkage between researcher and practioners: A qualitative study. *American Educational Research Journal,* 27(2), 363-391.

Huberman, M. (1994) Research utilization: The state of the art. *Knowledge and Policy, 7*(4), 13-33.

Hunter, A. (1993) Local knowledge and local power: Notes on the ethnography of local community elites. *Journal of Contemporary Ethnography, 22*(1), 36-58.

IDB. (2007) *Trinidad and Tobago: Economic Growth in a Dual Economy.* Washinghton DC: IDB.

IMF. (2017) *Data Mapper*. Retrieved 21 January 2018 from: http://www.imf.org/external/datamapper/NGDPDPC@WEO/OEMDC/ADVEC/WEOWORLD

Jacobson, N., Butterill, D. & Goering, P. (2003) Development of a framework for knowledge translation: understanding user context. *Journal of Health Services Research & Policy, 8*(2), 94-99.

Johnson, L. S. (2005) From knowledge transfer to knowledge translation: Applying research to practice. *Occupational Therapy Now, 7*(4), 11.

Karner, S., Rohracher, H., Bock, B., Hoekstra, F. & Moschitz, H. (2011) Knowledge Brokerage in Communities of Practice: synthesis report on literature review. Retrieved 11 May 2017 from: http://www.foodlinkscommunity.net/fileadmin/documents/Common-contents/publications/D2.1_Synthesis_report_DRAFT_uploadHP_March2012.pdf

Karunanayake, M. M. (2012, April 22) The developmental role of universities [Blog post]. Retrieved 11 October 2016 from: https://www.sjp.ac.lk/humanities-and-social-science/the-developmental-role-of-universities/

Kezar, A. (2003) Transformational elite interviews: Principles and problems. *Qualitative Inquiry, 9*(3), 395-415.

Kiefer, L., Frank, J., Di Ruggerio, E., Dobbins, M., Manuel, D., Gully, P. & Mowat, D. (2005) Fostering evidence-based decision-making in Canada: Examining the need for a Canadian population and public health evidence centre and research network. *Canadian Journal of Public Health,* 96(I), 1-19.

Kincheloe, J. L. (2008) *Knowledge and critical pedagogy: An introduction*. Dordrecht: Springer.

Kislov, R., Wilson, P. & Boaden, R. (2016) The 'dark side'of knowledge brokering. *Journal of Health Services Research & Policy,* 22(2), 107–112.

Kleinman, S. & Copp, M.A. (1993) *Emotions and fieldwork.* Newbury Park, CA: Sage Publications.

Kok, M. O. & Schuit, A. J. (2012) Contribution mapping: a method for mapping the contribution of research to enhance its impact. *Health Research Policy and Systems, 10*(1), 1-21.

Kulp, C. B. (1997) *Realism/antirealism and epistemology*. Lanham, MD: Rowman & Littlefield.

Kvale, S. (2006) Dominance through interviews and dialogues. *Qualitative Inquiry, 12*(3), 480-500.

Lamming, G. (2009) *Sovereignty of the imagination.* St. Martin: House of Nehesi.

Landry, R., Amara, N. & Laamary, M. (2001) Utilization of social science research knowledge in Canada. *Research Policy, 30*(2), 333-349.

Lavis, J. N., Posada, F. B., Haines, A. & Osei, E. (2004) Use of research to inform public policymaking. *The Lancet, 364*(9445), 1615-1621.

Lavis, J. N., Robertson, D., Woodside, J. M., McLeod, C. B. & Abelson, J. (2003) How can research organizations more effectively transfer research knowledge to decision makers? *The Milbank Quarterly, 81*(2), 221-248.

Lavis, J. N., Ross, S., McLeod, C. & Gildiner, A. (2003) Measuring the impact of health research. *Journal of Health Services Research & Policy, 8*(3), 165-170.

Levin, B. (2004) Making research matter more. *Education Policy Analysis Archives, 12*(56), 1-22.

Levin, B. (2008, May) *Thinking about knowledge mobilization.* Paper presented at an invitational symposium sponsored by the Canadian Council on Learning and the Social Sciences and Humanities Research Council of Canada, British Columbia, Canada. Retrieved 29 October 2017 from: http://en.copian.ca/library/research/ccl/knowledge_mobilization/knowledge_mobilization.pdf

Leviton, L. C. & Hughes, E. F. (1981) Research on the utilization of evaluations: A review and synthesis. *Evaluation Review, 5*(4), 525-548.

Lewin, K. (1947) Frontiers in group dynamics. *Human Relations*, 1, 5-41.

Lewis, T. & Simmons, L. (2010) Creating research culture in Caribbean universities. *International Journal of Educational Development, 30*(4), 337-344.

Leydesdorff, L. & Etzkowitz, H. (1996) Emergence of a Triple Helix of university—industry—government relations. *Science and Public Policy, 23*(5), 279-286.

Li, B., Millwater, J. & Hudson, P. B. (2008) Building research capacity: Changing roles of universities and academics. *In: Australian Association of Research in Education (AARE) Conference 200*8, 30 November 30 - December 4, 2008, Brisbane, Queensland, Australia. Retrieved 29 March 2017 from: https://epubs.scu.edu.au/educ_pubs/1702/

Lightowler, C. & Knight, C. (2013) Sustaining knowledge exchange and research impact in the social sciences and humanities: investing in knowledge broker roles in UK universities. *Evidence & Policy*: *A Journal of Research, Debate and Practice*, 9(3), 317-334.

Lincoln, Y. S. & Guba, E. G. (1985) *Naturalistic Inquiry* (Vol. 75). London: Sage Publications.

Lincoln, Y. S. & Guba, E. G. (2013) *The Constructivist Credo*. London: Routledge.

Lomas, J. (1993) Diffusion, dissemination, and implementation: Who should do what? *Annals of the New York Academy of Sciences*, 703(1), 226-237.

Lomas, J. (2007) The in-between world of knowledge brokering. *Bmj*, *334*(7585), 129-132.

LSE Public Policy Review. (2011) *Maximizing the Impacts of your research: A Handbook for Social Scientist.* Retrieved 29 March 2017 from:

http://blogs.lse.ac.uk/impactofsocialsciences/files/2018/06/Handbook-PDF-for-the-LSE-impact-blog-April-2011.pdf

Lynch, K. (2014) New managerialism: The impact on education. *Concept, 5*(3), 1-11.

Majchrzak, A. (1984) *Methods for policy research Applied social research methods study.* Beverley Hills, CA: Sage Publications.

Mansingh, G., Osei-Bryson, K.-M. & Reichgelt, H. (2009) Issues in knowledge access, retrieval and sharing–case studies in a Caribbean health sector. *Expert Systems with Applications, 36*(2), 2853-2863.

Marginson, S. (2006) Dynamics of national and global competition in higher education. *Higher Education*, *52*(1), 1-39.

Marginson, S. & Ordorika, I. (2011) El central volumen de la fuerza': Global hegemony in higher education and research. In: D. Rhoten & C. Calhoun (eds) *Knowledge Matters: The Public Mission of the Research University*. New York, NY: Columbia University Press. p. 67–129.

Maxwell, J. A. (1997) Designing a qualitative study. *In:* L. Bickman & D. J. Rog (eds) *Handbook of applied social research methods*. Thousand Oaks, CA: Sage Publications. p. 69-100.

Maxwell, J. A. (2004) Causal explanation, qualitative research, and scientific inquiry in education. *Educational Researcher, 33*(2), 3-11.

Maxwell, J. A. & Mittapalli, K. (2010) Realism as a stance for mixed methods research. *In:* A. Tashakkori & C. Teddie (eds) SAGE *Handbook of mixed methods in social & behavioral research* (2nd ed.). Thousand Oaks, CA: *Sage* Publications. p. 145-168.

Mayne, J. (1999) Addressing attribution through contribution analysis: Using performance measures sensibly (Discussion Paper). *Canadian Journal of Program Evaluation*, 16(1), 1-24.

Mays, N. & Pope, C. (2000) Qualitative research in health care: Assessing quality in qualitative research. *BMJ (320)*, 50-52.

McCowan, T. (2018). Five perils of the impact agenda in higher education. *London Review of Education.* 16(2), 279-295.

McDowell, L. (1992) Doing gender: feminism, feminists and research methods in human geography. *Transactions of the institute of British Geographers*, 17(4), 399-416.

McDowell, L. (1994) Polyphony and pedagogic authority. *Area*, 26(3), 241-248.

McDowell, L. (1998) Elites in the city of London: Some methodological considerations. *Environment and Planning A, 30*(12), 2133-2146.

McKinlay, A. (2002) The limits of knowledge management. *New technology, Work and Employment,* 17(2), 76-88.

McQueen, R. (1998) Four views of knowledge and knowledge management. *In*: E. Hoadley & I. Benbasat (eds) *Proceedings of the Fourth Americas Conference on Information Systems,* August, 1998 Baltimore, MD. p. 609-611.

Meagher, L. R. (2009) *Impact evaluation of people at the centre of communication and information technologies (paccit) programme*. Swindon: ESRC.

Meagher, L. (2014, October) *Making impact evaluation useful: Capturing subtleties, ranges and dynamics.* Presentation at RURU Workshop on Evaluating Knowledge Mobilisation, London, UK. Retrieved 10 October 2016 from http://www.ruru.ac.uk/pdf/oct2014/Laura_Meagher_presentation.pdf

Meagher, L., Lyall, C. & Nutley, S. (2008) Flows of knowledge, expertise and influence: a method for assessing policy and practice impacts from social science research. *Research Evaluation, 17*(3), 163-173.

Mendez, E. (n.d.) *Evaluating Research Excellence: Main Debates*. Retrieved 10 October 2016 from: https://www.idrc.ca/sites/default/files/sp/Documents%20EN/Brief-Final-English.pdf

Merriam, S. B. (1998) *Qualitative research and case study applications in education. Revised and expanded from "Case Study Research in Education".* San Francisco: Jossey-Bass.

Merriam, S. B. & Tisdell, E. J. (2016) *Qualitative research: A guide to design and implemetation* (4th ed.). San Francisco CA: Jossey-Bass.

Mikecz, R. (2012) Interviewing elites: Addressing methodological issues. *Qualitative Inquiry, 18*(6), 482-493.

Ministry of Planning and Development. (2016a) *An assessment of Trinidad and Tobago's progressive and non-progressive cultural factors of development.* Port of Spain: Ministry of Planning and Development.

Ministry of Planning and Development. (2016b) *Vison 2030: The National Development Strategy of Trinidad and Tobago 2016-2030.* Trinidad and Tobago: Ministry of Planning and Development.

Minogue, K. R. (1973) *The concept of a university*. Berkeley, CA: University of California Press.

Mitton, C., Adair, C. E., McKenzie, E., Patten, S. B. & Perry, B. W. (2007) Knowledge transfer and exchange: review and synthesis of the literature. *The Milbank Quarterly, 85*(4), 729-768.

Molas-Gallart, J. & Tang, P. (2011) Tracing 'productive interactions' to identify social impacts: an example from the social sciences. *Research Evaluation, 20*(3), 219-226.

Molas-Gallart, J., Tang, P. & Morrow, S. (2000) Assessing the non-academic impact of grant-funded socio-economic research: results from a pilot study. *Research Evaluation, 9*(3), 171-182.

Morrison, M. (2012) Understanding methodology. *In:* A. R. J. Briggs et al. (eds) *Research methods in educational leadership and management* (3rd ed.). London: Sage Publications. p. 14-28).

Morton, S. (2015) Progressing research impact assessment: A 'contributions' approach. *Research Evaluation, 24*(4), 405-419.

Moss, P. (1995) Embeddedness in practice, numbers in context: the politics of knowing and doing. *Professional Geographer, 47*(4), 442-49.

Nader, L. (1974) Up the anthropologist—Perspectives gained from studying up. *In:* D. Hymes (ed), *Reinventing Anthropology.* New York, NY: Vintage. p. 284–311.

Newman, J. H. (1996) *The Idea of a University.* New Haven: Yale University Press.

Newman, B. D. & Conrad, K. W. (2000, October) *A framework for characterizing knowledge management methods, practices, and technologies.* Paper presented at the Practical Aspects of Knowledge Mangagement, Basel, Switzerland. Retrived 17 December 2016 from: http://ceur-ws.org/Vol-34/newman_conrad.pdf

NIHERST. (2012) *Survey on the public perception of science*. Port of Spain: NIHERST.

Nixon, J. (2004) Education for the good society: The Integrity of Academic Practice. *London Review of Education,* 2(3) 245-252.

Nonaka, I. (1994) A dynamic theory of organizational knowledge creation. *Organization Science,* 5(1), 14-37.

Nussbaum, M. (2006) Education and democratic citizenship. *Journal of Human Development,* 7(3), 385-395.

Nwauwa, A. O. (1997) *Imperialism, academe, and nationalism: Britain and university education for Africans, 1860-1960*. London: Frank Cass.

Oancea, A. (2013) Research impact and educational research. *European Educational Research Journal, 12*(2), 242-250.

OECD-DAC. (n.d.) *DAC criteria for evaluating development assistance.* Retrieved March 26 2017 from: http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

Oketch, M., McCowan, T. & Schendel, R. (2014). *The impact of tertiary education on development: A Rigorous literature review.* London: Department for International Development. *Retrieved 1 February 2017 from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/327901/Tertiary-education-2014-Oketch2.pdf*

Okolie, A. C. (2003) Producing knowledge for sustainable development in Africa: Implications for higher education. *Higher Education, 46*(2), 235-260.

Oldham, G. & McLean, R. (1997) Approaches to knowledge-brokering. Retrieved 16 April 2017 from: https://www.iisd.org/pdf/2001/networks_knowledge_brokering.pdf

Orlikowski, W. J. & Baroudi, J. J. (1991) Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research, 2*(1), 1-28.

Papatsiba, V. (2013) The idea of collaboration in the academy: its epistemic and social potentials and risks for knowledge generation. *Policy Futures in Education, 11*(4), 436-448.

Patton, M. Q. (2002) Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative Social Work, 1*(3), 261-283.

Pawson, R. & Tilley, N. (1997) *Realistic evaluation*. London: Sage Publications.

Pettigrew, A. M. (2011) Scholarship with impact. *British Journal of Management, 22*(3), 347-354.

Phillips, D. C. (1987) *Philosophy, science and social inquiry: Contemporary methodological controversies in social science and related applied fields of research.* Oxford: Pergamon Press.

Plesner, U. (2011) Studying sideways: displacing the problem of power in research interviews with socioligist and journalists. *Qualitative Inquiry*, 17(6), 471-482.

Plewhe, D., Walpen, B. & Neunhoffer, G. (eds) (2006) *Neoliberal hegemony: A global critique.* Milton Park: Routledge.

Poland, B. (1998) Reading between the lines: interpreting silcences in qualitative research. *Qualitative Inquiry*, 4(2), 293-312.

Polanyi, M. (1962) Tacit knowing. *Philosophy Today*, 6(4), 239-262.

Pring, R. (2000) *Philosophy of educational research*. London: Continuum.

Qin, J. (2010) Empirically assessing impact of scholarly research. *In:* M. Reilly (ed), *Abstracts of the Proceedings of the iConference,* February 3-6, 2010. Champaign, IL. *Retrieved 1 February 2017 from: https://www.ideals.illinois.edu/handle/2142/14900*

Ram, J., Kaidou-Jeffrey, D., Hope, K., Peters, A. & Durant, I. (2017) *Implementation: Delivering results to transform Caribbean society.* Bridgetown: Barbados.

Ramkissoon, H. & Kahwa, I. (2010) The CARICOM countries. *In*: *UNESCO Science Report 2010*. Paris: UNESCO. p. 133-146.

Ravitch, S. M. & Riggan, M. (2012) *Reason & rigor: How conceptual frameworks guide research*. Los Angeles: Sage Publications.

RDI Fund. (2013) P*rogress reports.* St Augustine, Trinidad and Tobago: The Office of the Campus Principal, The University of the West Indies.

RDI Fund. (2014) *Annual impact report template.* St. Augustine: UWI. St Augustine: The Office of the Campus Principal, The University of the West Indies.

RDI Fund. (2015) *RDI Fund completion reports.* St. Augustine: UWI. St Augustine: The Office of the Campus Principal, The University of the West Indies.

RDI Fund. (2016) *Knowledge mobilisation in service of development - On the path to impact: Impact highlights from completed RDI Fund projects.* St Augustine: The Office of the Campus Principal, The University of the West Indies.

Rich, R. F. (1977) Uses of social science information by federal bureaucrats: Knowledge for action versus knowledge for understanding. *In:* C. Weiss (ed) *Using social research in public policy making.* Lexington, MA: Lexington Books. p. 199-211.

Richards-Kennedy, S. & St. Brice, L. (in press). Knowledge brokerage, SDGs and the role of universities. *Journal of Social and Economic Studies*. Kingston: University of the West Indies.

Richardson, L. (1997) *Fields of Play: Constructing an academic life*. New Brunswick, NJ: Rutgers University Press.

Rist, G. (1997) *The history of development: from western origins to global faith*. London: Zed Books.

Rizvi, F., Lingard, B. & Lavia, J. (2006) Postcolonialism and education: Negotiating a contested terrain. *Pedagogy, Culture & Society, 14*(3), 249-262.

Rizvi, F. (2004) Debating globalization and education after September 11. *Comparative Education, 40*(2), 157-171.

Rodney, W. (1972) *How Europe underdeveloped Africa* (Vol. 239): London: Bogle L'Ouverture Publications.

Rogers, A., Bear, C., Hunt, M., Mills, S. & Sandover, R. (2014) Intervention: The impact agenda and human geography in UK higher education. *ACME: An International Journal for Critical Geographies, 13*(1), 1-9.

Rohlehr, G. (1992) *My strangled city and other essays.* Port of Spain: Longman.

Roper, S. & Hewitt-Dundas, N. (2015) Knowledge stocks, knowledge flows and innovation: Evidence from matched patents and innovation panel data. *Research Policy, 44*(7), 1327-1340.

Rose, D. J. (1974) New laboratories for old. *Daedalus*, 103(3), 143-155.

Rose, G. (1997) Situating knowledges: positionality, reflexivities and other tactics. *Progress in Human Geography, 21*(3), 305-320.

Rowlands, J. (1997) *Questioning empowerment*: Oxford: Oxfam.

Rowley, J. (2002) Using case studies in research. *Management Research News, 25*(1), 16-27.

Ryle, G. (2009) *The concept of mind*. London: Routledge.

Said, E. (1994) *Culture and imperialism.* New York, NY: Vintage.

Saiydain, K. G. (1965) *Universities and the life of the mind*. London: Asia Publishing House.

Salter, A. J. & Martin, B. R. (2001) The economic benefits of publicly funded basic research: A critical review. *Research Policy, 30*(3), 509-532.

Sandelowski, M. (1993) Rigor or rigor mortis: the problem of rigor in qualitative research revisited. *ANS. Advances in Nursing Science, 16*(2), 1-8.

Sankat, C. K. & Richards-Kennedy, S. (2012, November) *Benchmarking UWI research: Towards an impact evaluation framework* [PowerPoint Presentation]. Presentation at the ACU Conference of Executive Heads on University Rankings and Benchmarking: Do they really matter?, Kingston, Jamaica.

Sayer, A. (1992) *Method in social science (2nd ed.).* Oxon: Routledge.

Sayer, A. (2000) *Realism and social science*. London: Sage Publications.

Schatzman, L. & Strauss, A. L. (1973) *Field research: Strategies for a natural sociology*. Englewood Cliffs: Prentice-Hall.

Scholz, R. W. & Tietje, O. (2002) *Embedded case study methods: Integrating Quantitative and Qualitative Knowledge*. Thousand Oaks, CA: Sage Publications.

Schroeder, A. & Pauleen, D. (2007) KM governance: investigating the case of a knowledge intensive research organisation. J*ournal of Enterprise Information Management*, 20 (4), 414-431.

Schwab, K. (2015, December) The Fourth Industrial Revolution. What it means and how to respond. *Foreign Affairs*. Retrieved 24 November 2016 from: https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution

Schwandt, T. A. (1997) *Qualitative inquiry: A dictionary of terms.* Los Angeles, CA: Sage Publications.

Scott, R.A. (2003) The university as a Moral Force. *On The Horizon.* 11(2), 32-36.

Seebaran, D. (2012, January 28) Residents: We don't want the dump to close. *Trinidad and Tobago Guardian Newspaper*. Retrieved 21 August 2017 from: http://www.guardian.co.tt/news/2012-01-28/residents-we-don't-want-dump-close

Sen, A. (1999) *Development as Freedom.* New York, NY: Anchor Books.

Sheppard, E., Porter, P.W., Faust, D.R. & Nagar, R. (2009) *A world of difference: encountering and contesting development.* New York, NY: The Guilford Press.

Sherlock, P. M. & Nettleford, R. (1990) *The University of the West Indies: A Caribbean response to the challenge of change*. London: Macmillan Caribbean.

Shin, M., Holden, T. & Schmidt, R. A. (2001) From knowledge theory to management practice: towards an integrated approach. *Information Processing & Management, 37*(2), 335-355.

Sikes, P. (2004) *Doing educational research: A guide to first-time researchers.* London: Sage Publications.

Smith, K. (2010) Research, policy and funding–academic treadmills and the squeeze on intellectual spaces. *The British Journal of Sociology, 61*(1), 176-195.

Smith, K. E. (2006) Problematising power relations in 'elite'interviews. *Geoforum, 37*(4), 643-653.

Smith, L. T. (2012) *Decolonizing methodologies: Research and indigenous peoples*, London: Zed Books Ltd.

Smith, P. (1990) The use of performance indicators in the public sector. *Journal of the Royal Statistical Society. Series A (statistics in society)*, 153(1), 53-72.

Spaapen, J. & Van Drooge, L. (2011) Introducing 'productive interactions' in social impact assessment. *Research Evaluation, 20*(3), 211-218.

Stake, R. (1995) *The art of case study research*. Thousand Oaks, CA: Sage Publications.

Stephens, D. (2012) The role of culture in interpreting and conducting research. *In:* A. R. J. Briggs et al. (eds) *Research methods in educational leadership and management* (3rd ed.). London: Sage Publications. p. 46-60.

Stiglitz, J. E. (2003) *Globalization and its discontents.* New York, Ny: WW Norton & Company.

Sutz, J. (2005) The role of universities in knowledge production. *Himalayan Journal of Sciences*, 3(5), 53-56.

Swift, K. (2017, June) *The Trinidad and Tobago Innovation Ecosystem & overview of the National Innovation Policy: Reforming the National Innovation Ecosystem* [PowerPoint Presentation]. Presentation at the National Innovation Conference, UWI, St. Augustine, Trinidad.

Teddie, C. & Yu, F. (2007) Mixed methods sampling: A typology with examples. *Journal of mixed methods research*, *1*(1), 77-100.

Tetroe, J. M., Graham, I., Foy, R., Robinson, N., Eccles, M., Wensing, M., Duriex, P., Légaré, F., Palmhøj Nielson, C., Adily, A., Ward, J., Porter, C., Shea, B. & Grimshaw, J. (2008) Health research funding agencies' support and promotion of knowledge translation: an international study. *Milbank Quarterly,* 86 (1), 125-155.

Tijssen, R. J., Mouton, J., Van Leeuwen, T. N. & Boshoff, N. (2006) How relevant are local scholarly journals in global science? A case study of South Africa. *Research Evaluation, 15*(3), 163-174.

Tikly, L. (2003) Governmentality and the study of education policy in South Africa. *Journal of Education Policy, 18*(2), 161-174.

Tikly, L. (2004) Education and the new imperialism. *Comparative Education, 40*(2), 173-198.

Tsoukas, H. (2002, June) *Do we really understand tacit knowledge?* Paper presented at Knowledge Economy and Society Seminar, LSE Department of Information Systems, London, UK. Retrieved 10 October 2016 from: http://mba.eci.ufmg.br/downloads/dowereally.pdf

Tsoukas, H. & Vladimirou, E. (2001). What is organizational knowledge? *Journal of Management Studies*, *38*(7), 973-993.

UNDP. (2016) *Human develepment for everyone: Briefing note for countries on the 2016 Human Development Report. Trinidad and Tobago.* New York, NY: UNDP.

UNESCO. (2014) Regional report about education for all in Latin America and the Caribbean. *In: Global Education for All Meeting*, May 12–14, 2014, Muscat, Oman. Retrieved 16 September 2017 from: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ED_new/pdf/LAC-GEM-2014-ENG.pdf

UWI. (2012) *Research and Development Impact Fund operational guidelines.* St. Augustine: University of the West Indies.

UWI. (2015) *Higher education and statistical review: Issues and trends in higher education 2013.* St. Augustine: University Office of Planning and Development, University of the West Indies. Retrieved 15 May 2016 from: http://www.uwi.edu/uop/sites/uop/files/hesr2013--issues-and-trends-in-higher-education-march2015-for-univer-council.pdf

UWI. (2017a) *Statistical digest 2011/12 to 2015/16.* St. Augustine: University Office of Planning and Development, University of the West Indies. Retrieved 1 November 2017

from: http://www.uwi.edu/uop/sites/uop/files/Statistical%20Five-Year%20Review%20of%20Trends%20in%20Enrolment%20and%20Graduation.pdf

UWI. (2017b) *Continuing institutional accreditation self-study report.* St. Augustine: University of the West Indies.

UWI. (2017c) *Report of the Board of Graduate Studies and Research to University Finance and General Purposes Committee October 2017*. Kingston: University of the West Indies.

UWI. (2017d) *The UWI Triple A Strategy 2017-2022: Revitalizing Caribbean Development*. Kingston: University of the West Indies.

Van Kammen, J., de Savigny, D. & Sewankambo, N. (2006) Using knowledge brokering to promote evidence-based policy-making: the need for support structures. *Bulletin of the World Health Organization,* 84(8), 608-612.

Vitae. (2011) *Vitae reseacher development framework.* London: Vitae.

Ward, V., House, A. & Hamer, S. (2009a) Knowledge brokering: Exploring the process of transferring knowledge into action. *BMC Health Services Research,* 9(1), 12.

Ward, V., House, A. & Hamer, S. (2009b) Knowledge brokering: The missing link in the evidence to action chain? *Evidence & Policy: A Journal of Research, Debate and Practice,* 5(3), 267-279.

Warfield, J. N. & Perino Jr, G. H. (1999) The problematique: Evolution of an idea. Systems Research and Behavioral Science, 16(3), 221-226.

Watermeyer, R. (2011) Challenges for university engagement in the UK: Towards a public academe? *Higher Education Quaterly,* 65(4) 386-410.

Watermeyer, R. (2012) From engagement to impact? Articulating the public value of academic research. *Tertiary Education and Management, 18*(2), 115-130.

Watermeyer, R. (2014) Issues in the articulation of 'impact': the responses of UK academics to 'impact'as a new measure of research assessment. *Studies in Higher Education, 39*(2), 359-377.

Watermeyer, R. (2016) Impact in the REF: issues and obstacles. *Studies in Higher Education, 41*(2), 199-214.

Webber, D. J. (1984) Political conditions motivating legislators' use of policy information. *Review of Policy Research, 4*(1), 110-118.

Weiss, C. H. (1977) Research for policy's sake: The enlightenment function of social research. *Policy Analysis*, 531-545.

Weiss, C. H. (1979) The many meanings of research utilization. *Public administration Review, 39*(5), 426-431.

Weiss, C. H. (1998) Have we learned anything new about the use of evaluation? *The American Journal of Evaluation, 19*(1), 21-33.

White, H. (2005) *Challenges in evaluating development effectiveness.* IDS Working Paper, no. 242. Brighton: Institute of Development Studies.

Williams, E. (1946) The idea of a British West Indian University. *Phylon (1940-1956), 7*(2), 147-156.

Williams, E. (2012, October) *50 years of managing for development in an ever-changing economic environment: Lessons learnt and the way forward.* Keynote address delivered at UWI 6th Annual Conference on the Economy. Retrieved 13 June 2017 from: https://sta.uwi.edu/conferences/12/cote/documents/COTESpeech2012final.pdf

Williams, G. & Harvey, C. (1985) *Higher education in Trinidad and Tobago: A focus on organizational development and change.* Caracas: CRESALC-UNESCO.

Willmott, H.C. (2013) Organization theory and power: The significance of value orientations and a plea for pluralism. *Tamara-Journal for Critical Organization Theory, (11)* 2, 53-66.

Wingens, M. (1990) Toward a general utilization theory: A systems theory reformulation of the two-communities metaphor. *Knowledge, 12*(1), 27-42.

World Bank. (2000) *Higher education in developing countries: Peril and promise*. Washington, DC: The World Bank.

World Bank. (2007) *Building knowledge economies. Advanced strategies for development.* Washington, DC: World Bank.

World Bank. (n.d.) *Research and development expenditure (% of GDP)*. Retrieved 16 September 2016 from: https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=TT&view=chart

Yin, R. K. (1981) The case study crisis: Some answers. *Administrative Science Quarterly, 26*(1), 58-65.

Yin, R. K. (1994) Discovering the future of the case study. Method in evaluation research. *Evaluation Practice, 15*(3), 283-290.

Yin, R. K. (2003) *Case study research: Design and methods.* London: Sage Publications.

Young, J., Shaxson, L., Jones, H., Hearn, S., Datta, A. & Cassidy, C. (2014) *ROMA: A guide to policy engagement and influence.* London: ODI.

Zack, M. (1998) An architecture for managing explicated knowledge. *Sloan Management Review*, 39(4), 45-58.

Zakri, A. H. (2006, Novemeber - December) *Research Universities in the 21st century: Global Challenges and Local Implications.* Speech delivered at UNESCO Forum on Higher Education, Research and Knowledge: Colloquium on Research and Higher Education Policy, Paris.

Zhuge, H. (2002) A knowledge flow model for peer-to-peer team knowledge sharing and management. *Expert Systems with Applications, 23*(1), 23-30.

Zhuge, H. (2006) Knowledge flow network planning and simulation. *Science Direct,* 42(2), 571-592.

Zhuge, H., Guo, W. & Li, X. (2007) The potential energy of knowledge flow. *Concurrency and Computation: Practice and Experience, 19*(15), 2067-2090.

APPENDIX 1 LIST OF DOCUMENTS USED FOR DOCUMENTARY ANALYSIS

RDI Fund Documents

RDI Fund Operational Guidelines (2012)

RDI Fund Progress Reports (2013, 2014, 2015)

RDI Fund Completion Reports (2014, 2015, 2016)

RDI Fund Annual Reports (2013, 2014)

RDI Fund Stakeholder Engagement Plan Template

RDI Fund Impact Report Template

Regional UWI Documents

Higher Education and Statistical Review: Issues and Trends in Higher Education 2013.

Statistical Digest 2011/12 to 2015-16. University Office of Planning.

UWI Continuing Institutional Accreditation Self-Study Report.

UWI Vice Chancellor's Report to University Council 2015-16.

UWI Report of the Board of Graduate Studies and Research to University Finance and General Purposes Committee October 2017.

UWI Triple A Strategy 2017-2022: Revitalizing Caribbean Development.

Documents on the macro research environment in T&T and Caribbean

CDB 2016 Economic Review: 2017 Forecast.

IDB Trinidad and Tobago: Economic Growth in a Dual Economy (2007).

Assessment of the National Innovation Ecosystem of Trinidad and Tobago. Final Report by Jean Guinet. 2014.

NIHERST Survey on the Public Perception of Science (2012).

Ministry of Finance (2007). Vision 2020 Operational Plan 2007-2010 Report.

Vison 2030: The National Development Strategy of Trinidad and Tobago 2016-2030. Trinidad and Tobago: Ministry of Planning and Development.

An Assessment of Trinidad and Tobago's Progressive and Non-Progressive Cultural Factors of Development. Trinidad and Tobago: Ministry of Planning and Development.

UNESCO Science Report 2010.

UNESCO Regional Report about Education for All in Latin America and the Caribbean 2014.

APPENDIX 2 INFORMATION SHEET FOR RESEARCH PARTICIPANTS

Dear (insert name),

I am currently enrolled in the EdD programme at the University of Sheffield and one of the requirements of this doctoral programme is the completion of a thesis. The chosen research topic for my thesis is 'Research and Societal Impact in Trinidad and Tobago: A Case Study of the Research and Development Impact Fund of The UWI St. Augustine Campus' and this has already received ethics approval from the School of Education at the University of Sheffield.

Below is a brief outline to assist you in understanding why the research is being done and what it will involve.

Research Project Objective
The objective of this research project is **to better understand the perspectives and experiences of researchers seeking to achieve societal impact** through projects funded by the Research and Development Impact Fund (RDI Fund) of the UWI St. Augustine Campus (UWI-STA). The research will also consider factors in the wider research environment that may contribute to or inhibit the achievement of societal impact.

Selection:
You have been invited to participate in this study since you would have either (i) played a key role in the setting/implementation of policy on the RDI Fund; (ii) received an RDI Fund research grant and managed the execution of an RDI Fund project; or (iii) interacted with research team during the execution of the RDI research projects, thereby participating in the research process and/or benefitting from the knowledge generated by an RDI Fund project.
Your participation in this research is voluntary and if you do decide to take part, you will be given this information sheet to keep and be asked to sign a Consent Form. Should you wish to withdraw at any time, you are free to do so without it affecting any benefits to which you are normally entitled.

Form of Participation:
Your participation in this research study will take the form of an in-person, in-depth interview using a semi-structured format. This interview will last approximately 45 mins and will be carried out at your office or other agreed location that is mutually convenient. Additional face to face interviews are not anticipated but should the need arise to contact you for further information or clarification, this will be done via email, phone or Skype at your convenience.

It is important to note that while the RDI Fund and the research site (The UWI St. Augustine Campus) will be named, you will not be identified in the report. All information collected about you and your experiences during the course of the research will be kept strictly confidential and pseudonyms will be used in the write-up of this research.

Please note that the interview will be digitally recorded and the use of the content from this recording will be restricted to the corresponding analysis for this research project and for conference lectures/presentations related to this research project. No other use will be made of them without your written permission and no one outside the project will be allowed access to the original recordings. The use of a contracted professional transcriber will be governed by a signed confidentiality agreement. The recordings of the interviews will be destroyed once the research project has been completed and the thesis accepted by the University of Sheffield.

Risks & Benefits:
It is hoped that this work will enable researchers, research users and university management to better understand the processes involved in promoting university research using a societal/development impact framework so that appropriate decisions can be made regarding the policy and practice of university research and its contribution to advancing national development priorities in Trinidad and Tobago. There are no foreseeable risks or disadvantages that would result from your participation in this study.

Unforeseen Events
I am aiming to complete the interviews for this study by April 2016. In the unfortunate event that the research study is not completed or stops earlier than expected, all participants will be informed.

In the event of a concern or complaint regarding this research study, participants should not hesitate to contact me as the Principal Investigator or my research Supervisor in the School of Education, University of Sheffield whose contact information is listed below.

Thank you in advance for agreeing to take part in this important research study. A copy of this information sheet as well as your signed consent form will be provided for your records.

Contact Information
For further information, please contact:

Stacy Richards-Kennedy
Email: edr11sr@sheffield.ac.uk
Tel: 868-678-8980

Or
Dr. Vassiliki Papatsiba
School of Education
University of Sheffield
Email: v.papatsiba@sheffield.ac.uk

APPENDIX 3 PARTICIPANT CONSENT FORM

Research Project Title:
Research and Societal Impact in Trinidad and Tobago: A Case Study of the Research and Development Impact Fund of The UWI St. Augustine Campus

Name of Researcher:
Stacy Richards-Kennedy

Participant Identification Number for this Project:

Please initial box to the right

1. I confirm that I have read and understand the information sheet for the above project and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

3. I understand that my responses will be anonymized before analysis. I give permission for members of the research team to have access to my anonymized responses.

4. I agree to take part in the above research project.

Name of Participant (or legal representative)	Date	Signature
Name of person taking consent (if different from lead researcher)	Date	Signature
Lead Researcher	Date	Signature

APPENDIX 4 INTERVIEW PROTOCOL

Project: Research and Societal Impact in Trinidad and Tobago: A Case Study of the Research and Development Impact Fund (RDI Fund) of the UWI St. Augustine Campus

Overarching Research Questions

What are the characteristics of research impact that the RDI Fund seeks to achieve?

What strategies were used by RDI Fund researchers to facilitate knowledge flows among key stakeholders?

From the perspective of the RDI Fund researchers, how can the STA Campus enhance the societal impact of its research?

Date of Interview:

Time:

Place:

Name of Interviewee:

Position:

RDI Fund Project:

Begin by briefly outlining the project

Guiding Interview Questions

For RDI Fund Researchers

1. Let's begin by talking a bit about your work as a researcher and your experience over the years conducting research in T&T (or elsewhere)?

   [to understand uniqueness of area of specialization, experience with public engagement , any challenges linked to research ecosystem in T&T; comparison of experience in other countries]

2. Generally speaking, would you say that your research area has had some degree of societal impact in T&T? If so, can you share a few examples?

   [to understand challenges with conducting/disseminating research in T&T]

3. What has your personal experience been like seeking to influence public policy in T&T, more specifically? Have you intended to do this or was it accidental (i.e. a by-product of your research?)

   [to understand relations with research users; demand for research; value placed on indigenous knowledge]

4. Your RDI Fund project focused on [insert specific area]. Can you tell me some more about the experience you had executing this project?

5. What specific strategies did you use to share or exchange knowledge, foster public engagement and increase the utilization of your research? In what way were these different from what you would have done in a previous research project?

   [to understand approach to public engagement; challenges encountered; Try to get examples of what worked/did not work and why? What would you do differently?]

6. In what way would you say your RDI Fund project has helped to influence policy or other types of societal impact?

   [To understand contribution of research to development - new products/practices, ways of thinking, research applications, further research and/or knowledge exchange, etc.]

7. At a personal level, how did the experience of implementing your RDI project change or have an impact on you, the researcher?

   [To appreciate new personal insights; unexpected impact of the research; the enlightenment effect on personal agency for the researcher; connections between research, knowledge and life]

8. How do you view research and development/societal impact in the Trinidad and Tobago context? What should be put in place or done differently to improve chances of achieving societal impact in T&T?

   [To elicit ideas on other/environmental factors that need to be considered to enable university research to have greater societal impact]

Closing:

Thank the interviewee for the interview.

APPENDIX 5 SCHEMATIC OF CODING SEQUENCE

Step 1: Coding according to applicability to Research Questions

- RQ#1: What are the characteristics of research impact that the RDI Fund seeks to achieve?
- RQ#2: What strategies were used by RDI Fund researchers to facilitate knowledge flows among key stakeholders?
- RQ#3: From the perspective of the RDI Fund researchers, how can the STA Campus enhance the societal impact of its research?

Step 2: Coding according to relevance at micro, meso or macro level.

Step 3: Coding according to thematic mapping against main parameters for flows of knowledge (based on Meagher's (2008) Conceptual Framework).

APPENDIX 6 CODING STRUCTURE AND EMERGING THEMES FROM INTERVIEWS

Research Questions	Applicable Level (micro, meso or macro)	Themes emerging from Interviews that affect flows of knowledge, among knowledge producers, users and beneficiaries (Meagher et al 2008) in RDI Fund Projects in T&T
RQ#1: What are the characteristics of research impact that the RDI Fund seeks to achieve?	Meso	▪ Better understanding of public engagement and societal impact by UWI ▪ Need for recognition of public engagement in assessment and promotion of academic staff ▪ Limited institutional capacity and inadequate support for public engagement and knowledge translation activities ▪ Too much internal bureaucracy & need for more flexible procedures ▪ Need for marketing and communications support ▪ Need more grant management & financial reporting support ▪ UWI Institutional reputation and respect helpful to bring partners on board ▪ Internal UWI Coordination ▪ Need for institutional mechanism for mentorship of researchers
RQ#2: What strategies were used by RDI Fund researchers to facilitate	Micro	▪ Researcher skills/need to build capacity in areas such as: - Project management - Leading research teams

knowledge flows among key stakeholders?		- Public engagement - Knowledge brokerage ▪ Researcher identity issues ▪ Strategies for knowledge mobilization, public engagement, knowledge translation, etc. ▪ Unique learning opportunities for researchers through their respective projects
RQ#3: From the perspective of the RDI Fund researchers, how can the STA Campus enhance the societal impact of its research?	Macro Meso Micro	▪ Underdeveloped linkages in external research environment ▪ Challenges with stakeholder capacity for effective research utilization ▪ Lack of enabling environment for R&D ▪ T&T Cultural traits ▪ T&T Politics ▪ Weak institutional capacity ▪ Bureaucratic institutions ▪ Government institutions working in silos ▪ Lack of execution/implementation deficit ▪ Differential treatment of local vs foreign researchers ▪ Mistrust of researchers and of the university by some ▪ General ambivalence towards research

APPENDIX 7 EXAMPLE OF APPLICATION OF CODING STRUCTURE TO EXCERPTS FROM TRANSCRIPT ANALYSIS

Level	Theme	RP#	Quotes/Extracts from Interview Transcripts
MICRO	Researcher Skills	Gina	[the RDI project] was a lot of people; everyone had a lot of things to do so that management was a nightmare to get everything to work properly
(highlighted in pink in transcripts)		Gina	I have not really been involved in any post [research] use
		Gina	I learnt a lot about management of those people [project team members]
		Gina	When you have to delegate and your reputation is standing on what other people are doing, it is very difficult. I would say that was the challenge, it wasn't the research or the science, it was dealing with people.
		Cassie	This was a great project…it built the intellectual capital both for myself and my colleagues.
		Mary	Because there is just so much paperwork being done on all the things that we're doing and the admin person was really the person who drove the paperwork…
		Mary	It was an interesting experience…very rewarding…I can't count the hours that I put into this project…holding the team together was a big part of it. I enjoyed working with the students…I guess that's why I'm in the field working with the students over the summer and seeing their excitement and seeing something practical and really with the potential for impact.
		David	This is the one in which there was the biggest contact actually with students.... Which is stunning; absolutely stunning because we keep track of them and their studies, where they have gone to. So the RDI project had an influence on, not only Trinidad and Tobago, but also Belize, Fiji

			other – because…those students now - one from Belize has gotten a job in the Ministry that has a similar responsibility - is bringing that knowledge now, and similarly in the Pacific....to actually see it happening is really the thing that has caused me the greatest good feelings of actually creating students who have knowledge and who have early career and having influence in other places....That creates a very good feeling to say that, 'Yes', as their careers develop that it was a turning point that they actually got to do things that were actually of interest to somebody.
	Researcher Identity	Rachel	I am a researcher. I am a scientist...in order to get funding in for that kind of thing [equipment] it is a challenge. So the best way of doing it is to try to collaborate…because we have not got the facilities.
		Jim	For me as a researcher, I have learnt an enormous amount about working with, I would say, cultural areas….I think I have learnt a lot…about the importance of assessing the person that you are dealing with. The biggest thing that I have learnt…is that there is a lot of cultural issues related to being a foreigner in Trinidad...There is so much culture and so much history that you have to think about and take into consideration, as a foreigner, when you are dealing with the way people think in a country like Trinidad or in the Caribbean....It has been a massive learning curve for me. To understand that people feel like that...and to make sure you react in the best possible way and move forward.
		Jim	You need to know your audience….So you don't talk about more technical stuff …I turn it around and I talk about the [effects]…Try to make it interesting. Involve your stakeholders/partners in public engagement.

		Chris	…if you don't have the personal drive, you could do the best research but you won't tell anyone about it…
		Mary	So to me, intervention research has always been…the best way for me to define myself and my research focus has been more so to introduce and consider the solutions to and identify problems...I think this has allowed me to feel as if I'm making more of a significant contribution as opposed to just an academic exercise and for me that's where there is more benefit. Not just data that's collected, that will be published, that's in a journal that will be disseminated among other academics, but more so, research that's targeted towards a problem that will have an impact on the community, real lives, real people, real problems.
		Tom	[Re: research pathways for impacting on society] that is a tough question actually. Remember we are scientists, number one. Our aim is to serve the community. If there is a problem then we are the first whether you ask me or not, we'll jump in and then find a solution. Once we find a solution we don't just simply write a paper and then settle with that, we reach out and we call the people and we just propagate and also we disseminate and we share what we have done.
		Tom	We are researchers.... over the years, I learned to know how to present it attractively so I might know a little.... But there are people, the marketing people are there. That is a different area and a whole different field. We use our brain and skills to develop something, but to market it, there must be an entity that sees the value in what we are doing and can drive a message about what we are doing and how it is good for the community and the country.

APPENDIX 8 LIST OF APPROVED RDI FUND PROJECTS

1st Call for Proposals (2012)

Project Title	Approved Amount $TTD
Understanding Built and Cultural Heritage in East Port-of-Spain	800,000
Documentation and Digital Development of Heritage Languages in Trinidad and Tobago	249,768
Use of next generation molecular and evolutionary epidemiology to strengthen surveillance and develop models to predict and prevent the spread of Dengue	800,000
Identification of the reservoirs of animal influenza viruses in Trinidad and Tobago	800,000
The Impact of the contaminants produced by the Topaz Landfill on the surrounding environment	1,000,000
Towards Re-development of a Competitive Citrus Industry in Trinidad and Tobago and the Greater CARICOM Area	600,000
Evaluation of the Economic Value of Caroni Swamp: Implications of Climate Change using the UNEP TEEB protocol	954,854
AgriNett, An Agriculture Knowledge ePortal: Research on Intelligent Decision Support for enhancing Crop and Livestock Enterprise Management	800,000
Leveraging the International Cocoa Gene Bank to Improve Competitiveness of the Cocoa Sector in the Caribbean, using modern genomics	1,500,000.00
Analysis of Intervention and Counseling for At Risk Youth to Reduce Crime, Violence and to Improve Outcomes for the Individual, The Schools, and the Family	500,000
	999,396

A Multi-centre phase 3 cluster randomized controlled trial of a manualized anger management intervention for prisoners at risk for uncontrolled anger and aggression	
Total:	TT$9,004,018

2nd Call for Proposals (2013)

Project Title	**Approved Amount $TTD**
A Matter of Survival: A life course approach to understanding the decision-making and economic livelihoods of school dropouts in T&T	500,000
Crime Victimization and Fear of Crime Survey in Trinidad and Tobago	549,600
A New Volcanic Emissions Monitoring Network: Integrating Community Engagement and Public Health Hazard Management through the application and transfer of low-cost technology	298,610
Language and Competitiveness: Positioning T&T for Sustainable Development	500,000
Capacity Building and Research on Smart Grid Technology in the Caribbean Region	500,000
Mitigating the Dementia Tsunami in Trinidad and Tobago	550,000
Adult Sexual and Physical Intimate Partner Violence Survey & Public Health Intervention	547,000
An investigation into the Trajectory of Neuro-behavioural Development of Primary School Children in T&T	464,000
Surveillance, characterization and management of antibiotic resistance in common bacterial pathogens in Trinidad and Tobago	550,000

Noise Induced Hearing Loss in Various Occupations / Environments in T&T	330,000
Terrestrial Flood Risk and Climate Change in the Caroni river basin: Adaptation Measures for Vulnerable Communities	550,000
Development of competitive anthurium and hot pepper industries in Trinidad and Tobago	2,500,000
Total:	TT$7,839.210

3rd Call for Proposals (2014)

Project Title	**Approved Amount $TTD**
Society, turtles and environmental change in Grande Riviere Bay-towards sustainable management of a vulnerable community: an investigation into the interrelationships between terrestrial and coastal systems which impact the beach habitat of the endangered leatherback turtle.	300,000
Promoting Agriculturally Important Microorganisms To Address The Challenges In Food Safety And Food	600,000
Technological Solutions for improved Agro-environment and Sustainability of Agricultural	332,800
An Assessment of the Beach Erosion and the Coastal Flooding Hazards at selected sites along the Trinidad and Tobago coastline through correlation analyses of the short- to medium-term variations in the morphological, hydrodynamic and environmental	400,000
Situational Analysis of Children of Prisoners in Trinidad and Tobago	258,400
Pharmacovigilance Programme for Assuring Medication Safety in Trinidadian Population	198,000
	300,000

Work/Life Balance; Its Impact on the Productivity of Working Men and Women and on the Wellbeing of Ageing Populations in Trinidad	
Genetic Evaluation, Breeding and Propagation of Germplasm for the development of Dairy Goat Industry in Trinidad and Tobago	300,000
Development of advanced precision agriculture techniques for crop management and risk assessment in Trinidad and Tobago	400,000
Total:	TT$3,089,200

APPENDIX 9 LIST OF MAIN EVIDENCE OF IMPACT FOR RDI FUND REPORTING

The main types of evidence of impact listed in the Fund's Progress Report template, which serves as a guide for researchers on the various types of evidence of impact that should be documented, include:

- New or improved product(s), processes, and/or service(s); patents, licenses, etc.
- Use of project's output by a commercial or industrial enterprise or other stakeholder group
- Technical input to national or regional policy documents
- Evidence of change in government or industry policy and/or practice
- Generation of new knowledge for research and teaching (e.g. new courses, course materials)
- Strengthening communities of practice
- Increased sensitization/organization of stakeholder groups
- Contributing to intellectual discourse
- Attracting external funding and formation of new partnerships

Source: RDI Fund Progress Reports (2013)