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Examining the Management Processes and Practices of Health Research Capacity Strengthening Consortia

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BSc. (Hons), MSc.

Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

Open University, UK

Development Policy and Practice

Sponsoring Institution:

KEMRI Wellcome Trust Research Programme, Kenya

Collaborating Institution:

Liverpool School of Tropical Medicine, UK

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ABSTRACT

Health research plays a critical role in the development of low- and middle-income countries (LMICs). Accordingly, global efforts to strengthen health research capacity in LMICs have intensified in the past few decades, increasingly through consortia. Reports on health research capacity strengthening (HRCS) consortia have primarily focused on programme outputs and outcomes. Implementation processes and their implications for consortia goals have rarely been studied in depth.

In this thesis, I examined how management processes and practices used by LMIC-led HRCS consortia influence the realization of broader research capacity outcomes. In the exploratory phase of the study, I used a qualitative approach to identify consortium management processes and factors influencing these processes. This was followed by a multiple case study design in which I examined in more depth the decision-making considerations in consortium management, factors that influenced consortia's strategy choices, and how those strategies enabled or hindered capacity strengthening.

Similar management structures and processes were used by the consortia studied, but consortia adopted different strategies in executing management processes. The findings demonstrate that decision-making in consortium management can be highly complex, as it involves tensions between compelling alternatives. Resulting trade-offs do not always align with capacity strengthening principles. Perceptions of research capacity and its strengthening, funder expectations, and both perceived and stated programme success indicators significantly influenced management decisions. Although consortium management processes are capacity strengthening mechanisms in their own right, this was not fully appreciated, planned for, or leveraged in the consortia studied.

Drawing on these findings, I have presented a conceptual framework which lays out factors to consider in determining consortium management strategies that promote capacity strengthening. Considering the increasing investment in HRCS consortia, highlighting how consortium processes influence capacity strengthening is instructive for enhancing policy and practice, and optimizing returns on HRCS investments.

DEDICATION

To my Dad,
Emmanuel Amartey Tagoe
for always believing in me!

To my Mum,
Gertrude Millicent Odarley Lamptey
I know you would have been proud of me!

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LIST OF ABBREVIATIONS

AAS	African Academy of Sciences
AESA	Alliance for Accelerating Excellence in Science in Africa
CAS	Complex Adaptive Systems
COHRED	Commission on Health Research for Development
DELTAS	Developing Excellence in Leadership, Training and Science
DFID	Department for International Development
ECDPM	European Centre for Development Policy Management
EDCTP	European & Developing Countries Clinical Trials Partnership
HIC	High-Income Country
HRCS	Health Research Capacity Strengthening
IDeAL	Initiative to Develop African Research Leaders
KEMRI	Kenya Medical Research Institute
KII	Key Informant Interview
KWTRP	KEMRI Wellcome Trust Research Programme
LMIC	Low and Middle-Income Country
LRP	Learning Research Programme
LSTM	Liverpool School of Tropical Medicine
M & E	Monitoring and Evaluation
MEPI	Medical Education Partnership Initiative
MMAT	Mixed Methods Appraisal Tool
MOPAN	Multilateral Organisation Performance Assessment Network
OECD	Organisation for Economic Co-operation and Development
PI	Principal Investigator
RCS	Research Capacity Strengthening
SERU	Scientific and Ethics Review Unit
SSA	Sub-Saharan Africa
TOC	Theory of Change
UK	United Kingdom
UNDP	United Nations Development Programme
USA	United States of America

CHAPTER 1: INTRODUCTION AND OVERVIEW OF THE THESIS

1.1 Introduction

Strengthening health research capacity in low- and middle-income countries (LMICs) has been recognised as one of the most effective ways of advancing health and development¹. If the health challenges of these countries are to be addressed in the most sustainable way, it is clear that LMICs need the capacity to be framers, producers and users of their own research^{2,3}. Several calls for action have been made over the last three decades³⁻⁶, resulting in increasing investments in health research capacity strengthening (HRCS) initiatives⁷⁻⁹.

The use of consortia has become a leading approach for facilitating HRCS in LMICs^{10,11}. Consortia typically consist of individuals and organisations from both high and low- and middle-income countries, with variable resources, expertise and experiences, working together to achieve collective gains^{12,13}. Although there has been steady progress in strengthening health research capacity in LMICs, the gap between high-income countries (HICs) and LMICs is still vast, and inequities and power imbalances persist in consortia which are often led by HIC partners¹⁴. Indeed, the research and capacity strengthening agenda of these consortia are often set by HIC funders and partners². To help address these challenges, there has been a rising trend of LMIC-led HRCS consortia implementing programmes such as The Wellcome Trust's African Institutions Initiative and its successive Developing Excellence in Leadership, Training and Science (DELTAS) Africa Initiative; the USA National Institute of Health's Medical Education Partnership Initiative (MEPI); and the European and Developing Countries Clinical Trials Partnership (EDCTP) Programmes. This approach is intended to enhance local RCS agenda setting, mitigate partner asymmetries and increase research capacity benefits to the local settings. Hence, it is essential to assess such LMIC-led initiatives to ascertain the effect of this approach on capacity strengthening efforts.

The literature on HRCS consortia in general has focused on programme activities and outputs¹⁵⁻¹⁷. Evaluation indicators mainly reflect outputs such as trained researchers, publications, and grant awards¹⁸⁻²¹. However, more recently, evaluation thinking has begun to highlight the value of both outcome and process evaluations²². Whereas outcome evaluations assess whether an intervention worked, process evaluations examine how and why the various outcomes were realized²³. Consortium processes involve a

series of steps and actions to establish and manage consortium activities and ultimately deliver the specified outputs, outcomes and goals. This thesis explores these processes in LMIC-led HRCS consortia to ascertain their role in the capacity strengthening efforts.

1.2 Research Aim and Objectives

The aim of this study is to critically examine the management processes and practices within health research capacity strengthening (HRCS) consortia, and the ways in which these activities feature in and contribute to broader capacity goals.

The specific objectives are:

1. To describe HRCS consortium management processes and factors that influence them
2. To examine key HRCS consortium management processes and practices using a capacity development lens
3. To explore how consortium management features in research capacity strengthening goals and mechanisms
4. To identify and recommend strategies for managing HRCS consortia and the implications for their evaluation

To address these objectives, I focus my study on consortia participating in the DELTAS Africa initiative. I employ a qualitative research strategy and conduct the study in two phases. I first take an exploratory research approach to gain a better understanding of management practices across all the DELTAS consortia and identify the most critical managerial issues. I then examine the highlighted issues in more depth using a case study approach involving three selected consortia.

1.3 Research Justification

The rationale for this study was informed by multiple factors. From a personal point of view, and as an African, I have long had a passion for the development of individual, institutional and systemic capacity in LMICs. With a background in international development and project management, my career began with implementing community-

based development projects in low-income settings. I then transitioned into an academic setting where I focused on managing capacity strengthening programmes for health research, human resource for health, and broader research systems. Throughout the years in these roles, I was aware of the little attention given to the managerial component of research and capacity strengthening programmes, particularly in the LMIC setting. Thus, I was interested in exploring the role of the management function and its value in research capacity and the capacity development process.

From the policy and practice perspective, continuous assessment of HRCS programmes by funders and practitioners is essential to enable programme improvement. This is especially important considering the increasing investments in these initiatives to ensure optimized impact and continued relevance. After three decades of HRCS investments, there is still little consensus on the best ways of designing and evaluating these programmes²⁴. The evidence base on what works under what conditions, and the means of assessing the effectiveness of HRCS programmes barely exists^{14, 21}. Major HRCS programme funders continue to express the need for quality data on existing health research capacities, the gaps at various levels, and effective evaluation frameworks and metrics^{25, 26}. It has become clear that in addition to identifying what works, it is vital to understand how and why specific outcomes are achieved, and the components of interventions that contributed to those outcomes, including managerial elements²⁷. This is even more crucial when assessing complex interventions like HRCS programmes, which often involve multiple actors and components operating at multiple levels over extended time periods^{10, 23}.

From the theoretical perspective, very little has been published on consortia approaches to management processes. An essential element of HRCS consortia is their management, including how management processes and practices are enacted and feed into broader capacity strengthening goals. There are increasing efforts to improve consortium management practices in general such as one funder's requirement to explicitly state consortium management outputs in the programme theory of change²⁸, and the publication of practice guides²⁹⁻³¹. However, initial exploration of this topic indicated that very little attention has been paid to empirical interrogation of consortium management processes, and how they contribute to achieving consortia outcomes. Additionally, there is little evidence of the conceptual basis for consortium management practice. Consortium management involves the coordination of multiple individual and

institutional partners, as well as scientific and administrative activities ^{32, 33}. These activities are usually led by consortia leaders who are often primarily researchers ³³. Empirical and conceptual understanding of consortium management practice is needed to provide direction and support to leaders navigating this multi-faceted function.

To contribute to the HRCS evidence base, it is necessary to identify what consortium management and capacity strengthening entail, and then ascertain the role of management processes in the capacity strengthening process. This study empirically explores these issues.

1.4 Capacity and Collaboration Terminology

Different terms have been used to indicate capacity strengthening processes including ‘building’ and ‘development’, and these terms are generally used interchangeably in the literature and in practice ^{21, 34}. I discuss these terminologies in more detail in the next chapter. In this thesis, I have used both ‘strengthening’ and ‘development’ for a specific reason. The term ‘strengthening’ appears to be the preferred term in the health research domain, almost making ‘health research capacity strengthening’ (HRCS) a domain-specific term. On the other hand, the term ‘capacity development’ has been used in the broader capacity literature to represent the mechanisms through which capacity change occurs; giving it a more technical meaning. I have therefore endeavoured to use these two terms in the specified contexts. As will be described in the next chapter, these two terms represent a similar concept and can be used interchangeably.

Similarly, collaborations have been labelled with different names in the literature and in practice, including consortia, partnerships, cooperation, and networks ^{35, 36}. There appears to be no standardised or widely accepted typology for this labelling and what they represent, and the terms are often used interchangeably. I have used the term ‘consortium’ throughout this thesis to represent collaborations that espouse common goals and shared responsibility and authority ³⁷.

1.5 Structure of the Thesis

This thesis has eight chapters. In this first chapter, I have given an overview of the thesis including the research aim and specific objectives, and the broad justification for the

study. Following this introduction, I present two chapters which cover the literature review that has informed this study. Chapter Two presents an overview of the evolution of the global HRCS agenda. I then explicate the concept of capacity and the capacity development paradigms used in practice. The chapter also introduces consortium management phases and processes. In Chapter Three, I present the current published evidence on HRCS consortium management, identifying the key emerging issues and highlighting the gaps. Chapter Four focuses on the study design and methodology. I describe the two phases of my study and the approaches used for each phase.

I present the empirical findings of the study in Chapters Five to Seven. In Chapter Five, I describe the management processes used by the consortia studied and factors that informed those processes. These formed the basis for a more in-depth examination of the highlighted management processes and strategies of three selected consortia in a case study. I present these findings in Chapter Six, where I explore the tensions that arise in consortium management practice and the underlying influences in consortium decision-making. In Chapter Seven, I consider the effect of these management processes on participating individuals and institutions and discuss the role of consortium management in strengthening research capacity. Finally, Chapter Eight presents a discussion of the findings in relation to the wider literature, and recommendations for policy, practice and future research.

CHAPTER 2: APPROACHES TO HEALTH RESEARCH CAPACITY STRENGTHENING AND THE CONSORTIUM MODEL

2.1 Introduction

In this chapter, I present an overview of the approaches to the HRCS agenda with a focus on the consortium model. The chapter is structured into three main sections. I begin by highlighting the global HRCS efforts made over the years, particularly in LMICs. To provide the basis for applying a capacity development lens in assessing consortium management processes, I unpack the concept of capacity and its development in broader terms as well as within the research context. This is followed by an introduction to consortia as one of the main mechanisms for implementing HRCS initiatives. Finally, I discuss the nature of consortia and the processes involved in their establishment and management.

2.2 Health Research Capacity Strengthening in LMICs

Health research plays a critical role in the development of LMICs^{9,38,39}. However, there are huge research capacity gaps coupled with high disease burdens in many of these countries⁶. These research capacity gaps, including low levels of expertise and infrastructure and a lack of enabling environments, continue to limit research outputs and use in LMICs^{12,40,41}. This situation is compounded by inadequate investments in research and development in these countries by national and global stakeholders^{6,42}. The need to strengthen health research capacity has therefore been recognised as one of the most effective ways of advancing development in LMICs^{1,43}.

One of the key drivers of the HRCS agenda was the 1990 landmark report of the Commission on Health Research for Development (COHRED) which pointed out the need to build and sustain local research capacity to improve health and development in developing countries⁴. Since this call for action, several global actors have continued to increase investments in HRCS initiatives⁷⁻⁹. Funders have supported various HRCS mechanisms, including provision of technical assistance, overseas training of individuals, institutional capacity building, and collaborative research and training^{33,44}. A 2015

mapping of the research capacity priorities of international funders documented 303 HRCS programmes executed between 2004 and 2009 alone ⁴⁵.

Research capacity has been observed to operate at multiple levels - individual, institutional and environmental ⁴⁶. The capability of researchers demonstrates individual level capacity; the organisational ability to conduct and administer research demonstrates institutional level capacity; and the broader context within which individuals and institutions operate demonstrates environmental level capacity (described further in subsequent sub-sections). Health research capacity strengthening initiatives often focus on formal short-term and degree training programmes ^{18, 20, 47} and joint research projects which are expected to enhance the skills of participants ⁴⁸⁻⁵⁰. The goal of these programmes is to produce individuals who can conduct and disseminate research, demonstrate research leadership, train others and collaborate with peers in the wider global health arena ^{12, 51}. In some cases, these individual-level training programmes are complemented with institutional-level capacity strengthening efforts, especially enhancing research infrastructure such as laboratories, and other research support systems ^{18, 52}. Most initiatives tend to focus on individual training efforts or institutional levels as opposed to the environmental ^{14, 46, 53}. While there have been calls to pay attention to all the three levels to ensure effective and sustained research capacity, the “capacity-as-training” approach is still the most prevalent means adopted for many HRCS programmes ^{54, 55}. Thus, capacity strengthening efforts have primarily focused on the skills and resources required for research production, and little attention has been paid to other elements of the research ecosystem such as research prioritisation, financing and use ^{46, 54, 56}.

Generally, HRCS programme implementers have reported on outputs such as trained researchers, joint publications and conference presentations, single or joint applications for research funding (some of which have resulted in grant awards), new training resources, new or enhanced networks with access to member expertise and resources, and enhanced research dissemination ^{16, 18-20, 57}. Programme and institutional actors have reported that enhanced capacities of individuals and institutions resulting from HRCS programmes have contributed to health and research systems and the ability to meet pertinent health needs in many LMICs ^{58, 59}. The initiatives have also faced some challenges. These include uneven attention to capacity strengthening across diseases, specialities, and countries ^{60, 61}; lack of long-term funding for sustaining HRCS models

^{32, 62}; little funding support and ownership by LMIC stakeholders ^{32, 63, 64}; lack of mentors ^{62, 65}; and challenges related to programmes involving several partners such as differences in interests and capacities ^{19, 66, 67}.

The experiences and lessons learnt by some HRCS practitioners have been shared to help improve the design and implementation of HRCS initiatives ^{9, 14, 40, 58}. However, the global HRCS effort has neither been well mapped out nor coordinated, and much of the evidence is based on specific programmes ^{25, 42}. Moreover, many of the HRCS programme reports and experiences have been output-oriented and very little has been done in terms of formal and systemic evaluations, particularly at the outcome and impact levels ^{26, 54}. Hence, the actual picture of the collective HRCS effort and its effectiveness is not well understood. There have been some reflections on the modes and mechanisms adopted for HRCS programmes and their influences on capacity outcomes, and this has highlighted the limitation of inordinately focusing on individuals and research production ^{8, 14, 54}. However, there is still little consensus on how research capacity strengthening (RCS) is understood, what capacities are important, and the best approaches to strengthening these capacities ⁵⁴. The paucity of empirical evidence on the practice of RCS means that its effectiveness has not been fully established. To form a basis for determining the meaning of RCS and examining approaches to RCS, I explore the concept of capacity and its development next.

2.3 The Concept of Capacity

2.3.1 Defining capacity

There is no single globally accepted definition of capacity ^{21, 68}. While capacity and its development are applied beyond the international development domain, the sector appears to be a major contributor to the existing body of work on the subject. Even within this domain, the definitions, approaches, models and frameworks are numerous and diverse, demonstrating the multiple perspectives that currently exist. To illustrate, I present three varied definitions of capacity below:

“The emergent combination of individual competencies, collective capabilities, assets and relationships that enables a human system to create value.” ⁶⁹

“The ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner.” ⁷⁰

*“The ability of a human system to perform, sustain itself and self-renew.”*⁷¹

An examination of the multiple definitions and perspectives on the concept of capacity reveals key characteristics of capacity which have been highlighted over time. I discuss these next.

2.3.2 Capacity operates at multiple levels

One of the most widely accepted characteristics of capacity is its presence and requirement at multiple levels (Figure 2.1). As indicated earlier, these are made up of the individual, organisational (institutional), and environmental (societal or systemic) levels.^{69, 72, 73} The recognition of capacity at these three levels is largely consistent across authors and practitioners. Individual capacity refers to the knowledge, skills and competencies of the people within a system; organisational or institutional capacity refers to the collective capability of an organised group of people and demonstrated through its structures, resources and functions; and environmental capacity refers to the context within which the individuals and organisations operate including political, legal, social and economic frameworks^{53, 74, 75}. The levels are interrelated, each level relies on or is enabled by the others to thrive, and capacity must exist at all three levels to ensure that the objectives of any system are met^{73, 76, 77}.



Figure 2.1: Three levels of capacity⁷⁴

2.3.3 Capacity is multi-dimensional

Capacity is a multi-faceted phenomenon⁷¹, and is only fully constituted when all its dimensions are at play. Capacity has been sectioned in various ways: tangible and

intangible^{72, 78} hard and soft^{79, 80}, technical and managerial⁸¹, or cognitive and practical⁸². These framings cast a more operational light on the phenomenon, making it easier to understand, develop and assess⁸³⁻⁸⁵.

In this thesis, I will highlight three frameworks from diverse viewpoints to demonstrate the multi-dimensional and complex nature of capacity and ways of framing and configuring capacity for practice. These three were selected based on their emergence from empirical evidence and practice and wide application in directing and assessing capacity strengthening efforts. These frameworks, as commonly observed with many capacity frameworks, interpret capacity at the organisational level, and act as bases from which the capacity requirements of the other levels are extracted.

The first framework, presented by Kaplan⁸⁶ in his seminal paper “The developing of capacity”, posits that for capacity to exist in an organisation, a series of seven elements need to be present and interact with each other (Table 2.1). These interrelated elements, which are ordered in terms of priority and sequence, are context and conceptual framework, vision, strategy, culture, structure, skills, and material resources. Kaplan⁸⁶ argues that an organisation must first understand its context, conceptualise its location and role within that context, and position itself to act in order to be effective and make an impact. It is only with this understanding and sense of responsibility will it be able to develop a vision, plan its programme of action, and translate this vision into an operational strategy. The organisation will then need to develop norms and values based on which organisational roles, functions and procedures will be clearly defined. Individual skills and abilities can then be developed, and the required material resources garnered to implement the organisational strategy. While acknowledging that these elements are rarely gained sequentially, Kaplan⁸⁶ noted that the intangible elements at the top of the hierarchy form the base on which the more tangible elements are built, and an organisation’s capacity arises out of the relationship between all the elements. It was observed that although the intangible aspects of an organisation’s capacity largely determine its functioning, organisations tend to focus on the more tangible aspects. This is emphasized in the quote below:

“Redesigning structures, building skills or securing resources are secondary to conceptual clarity, focused vision, coherent strategy and enabling culture; and organisational thinking which begins with structure, skills or resources will leave the organisation confused and incapacitated”^{86 p.27}.

Table 2.1: Elements of capacity ⁸⁶

Elements of capacity	Description
Context and conceptual framework	Having a frame of reference and a set of concepts which allows the organisation to make sense of the world around it, to locate itself within that world, and to make decisions in relation to it. Understanding one's context and having sufficient information regarding that context
Vision	Developing an organisational vision and a sense of purpose based on which the organisation plans and implements a programme of action
Strategy	Translating the organisational vision into an operational strategy which entails the development of specific methodologies of practice
Culture	Norms and values which are practised in an organisation: the way of life, the way things are done, habits, routines, and mindsets
Structure	Structuring the organisation and clearly defining roles, functions, lines of communication and accountability, and decision-making procedures
Skills	Growth and extension of individual skills, abilities and competencies
Material resources	Material resources such as finances, equipment and office space

The second framework is the European Centre for Development Policy Management's (ECDPM) 5Cs framework (Table 2.2). This framework was based on an in-depth study of 16 cases across different sectors, objectives, geographic locations and organisational histories which aimed to understand capacity development and performance ⁸⁷. Five dimensions of capacity termed 'core capabilities' were determined to contribute to the overall capacity of a system or an organisation: the capabilities to commit and engage; to carry out technical, service delivery and logistical tasks; to relate and attract resources and support; to adapt and self-renew; and to balance coherence and diversity ^{69, 88}. These capabilities were separate but interdependent and were considered to collectively produce capacity.

Table 2.2: Five core capabilities for systems and organisational capacity performance ⁶⁹,

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Core capability	Description
To commit and engage	<ul style="list-style-type: none"> • To be conscious and aware of one’s place in the world • To configure and create space for one’s self • To take ownership and be determined • To have motivation and commitment • To demonstrate agency; to choose and to act
To carry out technical, service delivery and logistical tasks	<ul style="list-style-type: none"> • To formulate policies and regulate activities • To carry out functions, deliver service and generate outputs • To sustain production over time
To relate and attract resources and support	<ul style="list-style-type: none"> • To relate and survive within the context • To develop, manage and sustain key relationships to leverage resources and actions • To build legitimacy in the eyes of key stakeholders • To deal effectively with competition, politics, and power differentials
To adapt and self-renew	<ul style="list-style-type: none"> • To cope with changing contexts and develop resilience • To reposition and reconfigure the organisation • To adapt and modify plans and operations as needed • To pursue continuous learning and growth
To balance coherence and diversity	<ul style="list-style-type: none"> • To develop clear vision and strategies • To manage diversity, paradox and tension • To achieve a balance between conflicting options • To integrate and harmonize plans and actions in complex multi-actor settings

The third framework, though presented by Elloker et al. ⁸⁹, was incrementally developed and based on the work of multiple authors ^{69, 72, 77}. This framework (Figure 2.2) advances that organisational capacity requires a combination of ‘hard’ capacities such as infrastructure, technology and finances; tangible ‘soft’ capacities such as management knowledge and skills and organisational systems and procedures, and intangible ‘soft’ capacities such as capabilities to commit, engage, adapt, self-renew and relate. This framework highlights the role of elements such as power dynamics, values, norms, and communication as components of the required capacities.

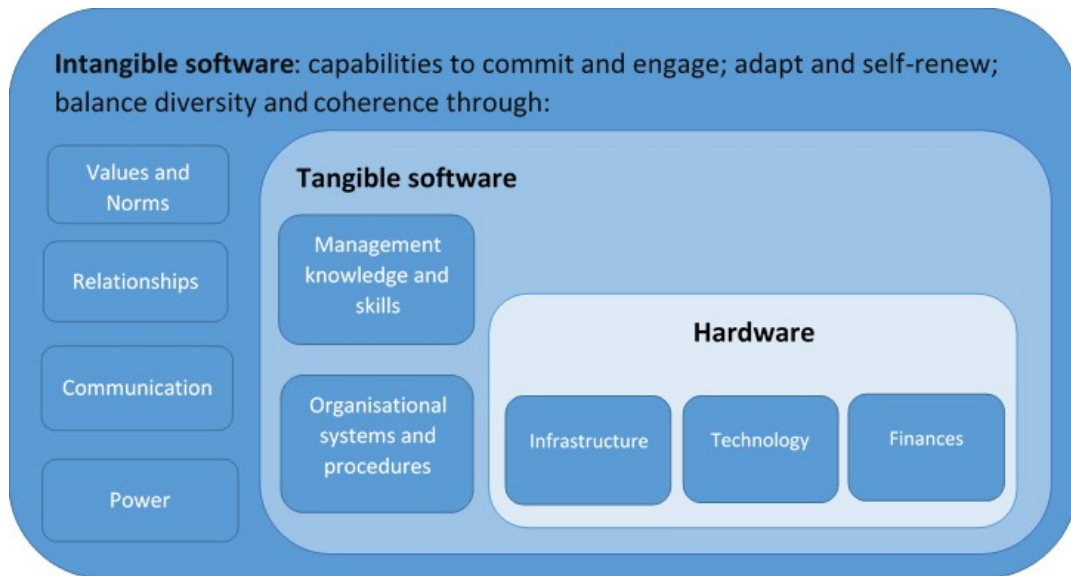


Figure 2.2: Framework for capacity ⁸⁹

The three frameworks, while presenting different sets of dimensions, collectively and consistently point out the key features of capacity: 1) capacity is made up of multiple elements; 2) capacity emerges out of an interaction between all the elements; and 3) there are tangible and intangible dimensions of capacity, and the tangible is largely driven by the intangible.

2.3.4 Capacity is a systems phenomenon

A system is “any group of interacting, interrelated, or interdependent parts that form a complex and unified whole that has a specific purpose” ⁹⁰. Therefore, systems thinking denotes a holistic perspective which recognises that the different parts of a system and its broader context are interconnected and synthesized into an integrated whole ^{90, 91}. Capacity is inherently a systems phenomenon ⁶⁹. Its reliance on the interaction between its multiple components reveals that the essence of capacity is not in its parts but in the whole. Capacity dimensions such as the crucial role of context, and the ability to engage, relate, and adapt to changes, point out the relational nature and systemic perspective of capacity ^{71, 80, 92}. Moreover, the interrelatedness and interdependence of individual, organisational and environmental capacities (Figure 2.1) reinforce this systemic characteristic. Individual competencies and the collective capabilities of an organisation need to interact with the environment to generate the required capacity to function ⁸⁷.

2.3.5 Capacity is latent and dynamic

Capacity is primarily a latent phenomenon which only becomes manifest when used to achieve results^{69, 88}. Van Deuren⁹² theorises that this invisibility has contributed to the elusive nature of capacity and resulted in the multiplicity of perspectives. As a result, capacity is hard to induce, manage, track and measure⁶⁹. In addition, capacity has been recognised as a living and dynamic phenomenon^{80, 82}. It continuously evolves at all the levels as a result of both internal and external interactions⁷¹.

With these characteristics of capacity in mind, I discuss the meaning and approaches to capacity development in the next section.

2.4 Capacity Development

2.4.1 Understanding capacity development

Similar to capacity, there is no widely accepted definition nor interpretation of capacity development⁹³⁻⁹⁵. In this thesis, I adopt the OECD definition of capacity development due to its acknowledgement of the multiple levels and dimensions of capacity. This definition states that capacity development is:

"the process by which individuals, groups, organizations, institutions and societies increase their abilities to: (i) perform core functions, solve problems, define and achieve objectives; and (ii) understand and deal with their development needs in a broad context and in a sustainable manner"^{96 p.2}

The variety of definitions is exacerbated by the lack of consistency in the terminology used⁹⁷. Different terms for capacity changes (building, development and strengthening) have been used interchangeably in literature and in practice^{21, 34, 82, 98}. However, it has been pointed out by practitioners in the development and health fields that the differences between these terms are not just linguistic but conceptual, with each term representing a different development approach^{14, 20, 73, 77, 92, 99}. 'Capacity building' is seen as an erstwhile development paradigm characterised by a focus on external interventions, little recognition of existing capacities, carefully planned activities and predetermined outputs, enhancement of technical skills and capabilities, and a short-term outlook^{73, 77, 92, 99}. The concept of 'capacity development' has emerged more recently and focuses on the improvement of already existing capacities, internally driven capacity changes, local

ownership, broader systems-thinking approaches to individual and organisational learning, experimentation and learning, and an organic growth process towards long-term sustainability^{73, 77, 92, 99}. The term ‘capacity strengthening’ has been largely used in the same vein as ‘capacity development’, and emphasizes the enhancement of extant capacity and local participation in the process^{14, 20, 21, 100-102}. The conceptual differences in the terminology and the shift in thinking have not been consistently adhered to. A recent content analysis of capacity terms and definitions used in the literature found very little association between a used term and the content of its definition²¹. The terms are still used interchangeably^{73, 100}, and so far, the distinctions have limited meaning in practice.

2.4.2 Capacity development approaches

Capacity development is an abstract and multi-dimensional concept^{94, 103}, and this has given rise to a wide range of interpretations and approaches^{87, 88, 104}. As a result, numerous theories, models and frameworks have been adopted in capacity development efforts. A review by Bergeron et al.⁸⁴ identified twenty-eight (28) theories, models and frameworks that had been used in public health capacity development interventions. One thing that has become clear is that there is no single formula for developing capacity^{69, 77}. However, irrespective of the approach used, the philosophy underpinning the approaches and the pathways through which the expected capacity changes occur have been categorised into three capacity development paradigms: planned, emergent, and incremental^{68, 69, 105}. The thinking associated with each paradigm serves as the strategy that informs capacity development interventions. I discuss each paradigm in turn.

Planned paradigm

The planned paradigm of capacity development is based on planning and control, and advances linear ‘cause and effect’ connections between inputs of an intervention and the resulting outputs, outcomes and impact^{68, 69}. There is an a priori assumption of what capacity is and what capacities are required, and thus capacity changes are planned and produced by pre-designed programme activities and the application of results-based management tools such as the logical framework analysis^{69, 105}. This strategy is based on the assumption that capacity development is driven by exogenous factors, and the process can be directly managed and externally controlled^{69, 92}. The paradigm also presupposes that the complexities of capacity can be reduced into constituent capacity components,

and the whole is equal to the sum of its parts^{92, 105}. The planned paradigm has thus been termed as ‘technocratic’ and ‘reductionist’⁶⁸. This strategy has been observed to be more appropriate for situations where there is a shared consensus on the intervention’s direction, and the objectives are more tangible and technical in nature⁶⁹.

Emergent paradigm

The emergent paradigm of capacity development is predicated on the complex nature of capacity and systems thinking^{69, 73, 105}. Capacity is perceived to emerge over time from multiple inter-dependencies and interactions among actors within the system, and allows for self-organisation and learning⁸⁸. Thus, capacity development is dependent on endogenous factors, and is a primarily ‘inside-out’ process which is often unpredictable^{69, 71, 95}. Capacity changes are associated with multiple causes and effects, many of which are unplanned and unintended⁶⁸. Unlike the planned paradigm, this viewpoint emphasizes the less tangible and highly relational dimensions of capacity^{71, 92}.

Incremental paradigm

The incremental paradigm comes across as a middle ground between the planned and emergent paradigms as it reflects elements from both viewpoints. While this paradigm starts off with planned processes and predetermined capacity development objectives, it is open to changes and adjustments, and pursues what would work under different conditions⁶⁹. The strategy is based on the principles of learning, adaptiveness, and flexibility in implementation^{69, 88}. This paradigm has been observed to work best in unstable contexts where the capacity and performance needs and the prevailing constraints are difficult to predict, and the choice of strategy cannot easily be confirmed⁸⁸.

2.4.3 Capacity development in practice

The planned paradigm is the most widely used, mainly due to accountability concerns and the pressure on both implementers and funders to provide tangible evidence^{106, 107}. However, practitioners are increasingly acknowledging that reductionist approaches do not provide a sound basis for capacity development interventions due to the complexity of capacity and the need for interaction among its multiple elements,^{88, 107-109}. Capacity development has been observed to be considerably non-compliant to “linear and neat ‘if this, then that’ thinking”⁶⁸. Systems thinking thus offers a better characterisation of the

capacity development process, and emphasizes the role of multiple elements and actors, relationships, internally-driven dynamics and long-term outlooks^{80, 105}. There is an increasing recognition that capacity development cannot be ‘done’ by outsiders, although external change agents may act as triggers and facilitators of the process^{71, 77}.

While the systems approach is advocated as a better fit for capacity development, a blended approach incorporating elements of the different paradigms is recommended^{71, 73, 88}. No single approach has the ability to change a complex system; different paradigms have worked at different times for different things and in different ways, and need to be combined to attain effective capacity development⁶⁹. McEvoy et al.⁷³ note that although capacity development practitioners can make use of planned management tools, this needs to be subsumed within the broader emergent paradigm. In practice however, the systemic perspective and the recognition of intangible capacities remain a challenge, and the planned and result-based strategies still dominate capacity development efforts⁸⁸.

The multi-dimensional and systemic nature of capacity also reinforce the fact that no single element can constitute capacity, and it is only when individual competencies and organisational capabilities interact that capacity is created^{73, 110}. However, it has been recognised that, among the multiple levels and dimensions of capacity, neither the entry point nor the sequencing of capacity development interventions can be prescribed, as experiences differ^{69, 81, 111} and human systems are continuously evolving⁷¹. It has been considered more important to ensure adequate balance and interactions between the levels and dimensions for effective capacity development^{69, 111}.

In addition, there has been much deliberation on whether capacity development is a means to an end or an end in itself^{94, 112}. As a means, capacity development is a process by which other development goals such as health outcomes are reached; as an end, capacity development is recognised as a development outcome in itself. While some may still consider capacity development as a means to an end¹¹³, the thinking is shifting, and capacity development is widely considered as both a means and an end^{69, 73, 80, 92, 103}. This recognition is considered as fundamental to capacity development efforts^{80, 95}. When perceived as a means to an end, interventions focus on task achievements and performance results; whereas changes in capacity receive more focus when perceived as an end⁹².

The next section takes a more specific look at capacity development in the research context.

2.5 Research Capacity Development

2.5.1 Defining research capacity development

Although initiatives to strengthen research capacity have increased over the years, there appears to be little consensus on the definition of research capacity, what capacities are important and how best to strengthen them^{21, 54}. There are still multiple assumptions and complexities associated with the concept¹¹⁴, and there is a lack of consistent terminology¹¹⁵. The three capacity terms (building, development, or strengthening) are commonly used with respect to research; and in many cases, the conceptual differences described above (Section 2.4.1) are not acknowledged²¹. Consequently, the concept of research capacity development has been open to interpretation, and the varied definitions reflect the range of perspectives of what research capacity entails^{34, 75, 115}. While some focus on the ability to carry out research tasks, others draw out the multiple dimensions of capacity. In this thesis, I adopt a broad definition of research capacity development:

“The ongoing process of empowering individuals, institutions, organisations, and nations to: define and prioritise problems systematically; develop and scientifically evaluate appropriate solutions; and share and apply the knowledge generated.”^{39 p.764}

This definition takes into account the continuous nature of the capacity strengthening process, the multiple levels of capacity, and the multiple stages of the research process - strategic and operational.

Research capacity generally aligns with the characteristics of capacity discussed in Section 2.3. It exists at the individual, organisational and environmental levels, and constitutes multiple dimensions^{54, 115, 116}. These levels specifically refer to capable researchers (individual); institutional structures and processes with the ability to manage local research and retain researchers (organisational); and enabling political, resource and regulatory contexts at national or regional levels in which research is undertaken and used (environmental)^{46, 75}.

While the levels are largely similar across the board, there are some variations in the classification of research capacity dimensions. For example, Cooke¹¹⁶ and Kahwa et al.¹¹⁵ identified dimensions such as skills, infrastructure, linkages and collaborations, research applicability, and leadership in their research capacity evaluation framework. Dimensions identified by Zicker⁹⁸ included research systems and institutional frameworks, research leadership, management capacity, research skills, research

infrastructure, resource flow for research, and partnerships. Potter and Brough¹¹⁷ identified four main dimensions: structures, systems and roles; staff and infrastructure; skills; and tools. Many other authors frame their capacity components around the levels^{75, 118}. A common observation is that both tangible and intangible components have been incorporated in many of these frameworks.

For many years, research capacity development focused on strengthening the skills of individuals; and this was sometimes coupled with research infrastructure development¹¹⁵. However, the systems thinking approach to research capacity development is increasingly taking root^{34, 54, 75, 115, 116}. The systems approach recognises that research capacity is developed when multiple components at individual, organisational and environmental levels interact and act collectively; and no single component or level can deliver the required capacity^{54, 75, 116}. Hence, research capacity development is considered as a complex, holistic and long-term process^{75, 119}. It has become evident that interventions targeting one level or component require changes in the other levels and components to be effective and sustainable³⁴. The whole is greater than the sum of its parts^{71, 119}. While there appears to be no prescription of the sequence for the levels or components in interventions, multiple stakeholders have recommended a combination of strategies and concurrent capacity development at the different levels and in the different components to ensure a sustainable research system^{34, 115, 120}.

2.5.2 Research capacity development paradigms

There appears to be very little literature specifically detailing out the pathways through which research capacity is developed. However, the development of research capacity is not significantly different from the development of other kinds of capacity¹²¹. Thus, research capacity development strategies also fall within the three paradigms described above (Section 2.4.2). The planned approach is dominant in research capacity development initiatives^{34, 122-125}. The systemic nature of research capacity has been widely recognised, but this does not appear to have led to the adoption of the emergent paradigm in research capacity development programmes^{34, 125}. The prevalence of the planned approach, particularly the use of results-based management methods such as the logical framework analysis is predominantly funder-driven¹²². However, some funders are beginning to recognise that the research capacity development process is too complex to determine in advance the steps to be taken and the dynamics that would evolve^{34, 125}.

These funders have therefore recommended reflection, learning and continuous adaptation of interventions.

2.5.3 Research capacity development: a means or an end

Research capacity development has been recognised as both a means to an end and an end in itself^{114, 116}. As a means, it is a process through which “useful” research that informs policy and practice is produced as the output; as an end, the emphasis is on the development of skills, structures and the environment that will enable the conduct of research¹¹⁶. As pointed out by Gadsby⁵⁴, capacity includes both the ability and power to perform. As such, in addition to the expectation of research performance (when research capacity development is perceived as a means), possessing the ability and power to perform research by itself is a legitimate outcome of capacity development interventions. Frameworks for implementing and measuring research capacity development should therefore capture changes that reflect both the ‘means’ and the ‘end’ perspectives^{116, 125}.

In the next section, I focus on the consortium approach to research capacity development.

2.6 The Use of the Consortium Model for HRCS Initiatives

One of the main strategies proposed by COHRED for the ‘research for health’ agenda is the creation of international partnerships for research and capacity strengthening⁴. The establishment of consortia has thus become one of the main mechanisms for implementing HRCS initiatives^{10, 11}. Health research capacity strengthening consortia connect individuals and organisations with variable resources, expertise and experience to work together to achieve a common goal and collective gains in health research capacity (albeit the level and type of capacity gain may vary across partners). Over the years, the most common HRCS consortia have constituted partners from both HICs and LMICs.

Generally, the establishment of HRCS consortia has been deemed beneficial, and reports on their activities have highlighted several gains, including enhanced individual and institutional research capacity among partners, mentorship opportunities, increased research outputs, joint creation of teaching and research resources, and expanded networks^{49, 126-128}. Although experiences across consortia vary, many have also come

under considerable critique regarding issues of inequity and power imbalances, especially those involving HIC and LMIC partners^{14, 16, 129, 130}. Typically, HIC collaborators secure most of the funding for research and capacity building initiatives; thus, they determine the agenda and control the resources, leading to power imbalances^{12, 131, 132}. As a result, participation, especially at decision-making levels, tends to be unequal, favouring HIC partners, with priorities of international funders and HIC partners taking precedence over those of LMICs^{12, 14, 131}. Consequently, there have been increasing efforts to address these issues in consortia including the promotion of shared goals and ownership, mutual trust and respect, inclusion at all stages, and joint decision making^{47, 133-136}. Several practice documents and frameworks for partnership have been published to guide consortia and address some of the identified challenges^{29, 30, 137, 138}. In spite of these challenges, the use of consortia remains a favoured mechanism employed by funders and practitioners for strengthening research capacity in LMICs^{7, 139}. I discuss the nature and management of consortia next.

2.7 The Nature and Management of Consortia

2.7.1 The multi-dimensional nature of consortia

A consortium brings together individuals and institutions and functions as an independent entity to achieve a collective goal. Consortia portray a combination of characteristics from different types of entities in structure and function. While consortia are primarily collaborations, they also appear to depict features of organisations and projects.

Collaborative principles and practices are expected to be the mainstays of consortium operations. These include developing a shared purpose and common goals, promoting inclusivity and ownership, and ensuring mutuality and transparency¹⁴⁰⁻¹⁴². As such, it is valuable for consortia to use participatory approaches, consensus in decision-making, and collective problem-solving¹⁴³. To promote ownership and equitable benefits, consortia are expected to take partner needs, interests and unique contexts into account in setting their agenda¹⁴⁴.

In addition to its collaborative characteristics, a consortium takes on an organisational identity to enable it to achieve its goals¹⁴². For example, a consortium requires governance and management structures to ensure that it functions effectively^{138, 145, 146}. The design of an organisation mainly covers the organisational structure and coordination

¹⁴⁷. The organisational structure is the way the organisation is configured; it determines the governance and management systems, authority relations, roles and responsibilities, resource sharing, decision-making processes, rules, and lines of accountability ¹⁴⁷⁻¹⁵⁰. While there are different categorizations of the types of organisational structures in the literature ¹⁵¹, some of the common types include: the simple or flat structure which has few levels and the decision-making authority is typically held by a single individual; the bureaucratic structure which is framed around functional departments; the divisional structure which splits the organisation into semi-autonomous units; and the matrix structure which is a combination of the functional and divisional structures ¹⁵². An emerging organisational structure is the network structure which places emphasis on formal or informal relationships between teams or related organisations; and facilitates resource sharing, international expansion, learning synergies and the ability to handle complex situations which cannot be handled by a single organisation ¹⁵². Generally, organisational structures can be tall or flat in terms of hierarchy ¹⁴⁹, and centralised or decentralised ¹⁵¹. Once the organisational structure is established, coordination involves aligning the structures and bringing the constituent units together through leadership, communication, processes and practices to achieve the set goals ¹⁴⁷. Consortia require the appropriate structure and coordination to function efficiently and effectively. As pointed out by Wolff ¹⁴⁸, collaborations require organisational capacities to achieve their goals. In addition to these formal structures and processes, organisational management has been observed to have informal dimensions which – together with the formal dimensions – make up the organisational culture ¹⁵³. Organisational culture refers to shared and learned assumptions, values, beliefs, ideas, behaviour and practices ^{154, 155}. Consortia implementing HRCS initiatives are mostly made up of universities and other research institutions which have traditionally held a bureaucratic culture in terms of its administrative procedures and a collegiate culture in terms of the academic freedom exercised in knowledge production ^{155, 156}. However, these cultures (particularly the bureaucratic) are changing; they also differ or exist to varying extents across different institutions ¹⁵⁶. For example, universities and stand-alone research institutes are functionally different and often have different cultures ^{157, 158}. Since the consortium management processes and practices are often embedded in the participating institutions, consortia may adopt aspects of these different host institutional cultures. Additionally, due to increasing globalization and reliance on research grants from international funders, especially by institutions in LMICs, cultures of external stakeholders (funders and HIC

institutions) have been incorporated in some aspects of the operations of these institutions¹⁵⁵. Thus, when institutions participate in externally funded consortia, a research culture which is collaborative and creative but also focuses on quantitative measurement of research outputs, narrow concepts of ‘impact’ and intense pressure to deliver outputs, tends to dominate the management of consortia activities¹⁵⁹. As a result, consortia are likely to diverge from aspects of the host institutional culture and adopt management practices that align with the culture of the external stakeholders. All these multiple influences contribute to how consortia are managed.

Furthermore, because consortia often rely on the availability of funded projects or programmes, they assume project-oriented characteristics which significantly influence how they are managed¹⁴⁸. Indeed, many consortia are formed to implement specific projects and disbanded upon completion of these projects¹⁶⁰. As a result, consortia tend to follow the project life cycle and adopt project management processes and practices to ensure delivery of project expectations, particularly with respect to time, budget and specifications^{160, 161}. The project life cycle is generally made up of five phases: initiation, planning, executing, monitoring and controlling, and closing¹⁶²⁻¹⁶⁴. Project management processes are thus framed around these phases. Similarly, consortium phases and management processes are often organised using a similar structure^{31, 165}. Consortia which were established with a long-term outlook may close out projects but will usually continue the collaboration and transition into new projects³¹. Project performance management approaches such as logical framework analysis (LFA)^{166, 167}, and project management tools and techniques such as Gantt charts, performance reports, planned-to-actual comparisons, risk management tools, and monitoring and evaluation tools^{168, 169} are frequently adopted in consortium management.

Hence, management approaches from collaborations, organisations and projects are drawn on in the management of consortia.

2.7.2 Defining management

There have been several definitions of management with a wide variation in scope. Over the years, definitions have reflected the evolving theories of modern management¹⁷⁰⁻¹⁷³. Definitions of various management theorists have laid emphasis on different aspects of management including the setting of objectives, planning, division of work, coordination, control, efficiency, teamwork, shared power between management and workers, and

consideration of the interests and satisfaction of the wider society (Table 2.3). The emphases on different elements of management by different theorists and authors appear to be demonstrated in practice. While there are some commonalities across the board, different practitioners promote greater emphasis on some management elements over others. I focus on the management of consortia next.

Table 2.3: Definitions of management

Author	Definition	Key emphases
Frederick W. Taylor	Management is the art of knowing exactly what you want men to do, and then seeing that they do it in the best and cheapest way ¹⁷⁴	<ul style="list-style-type: none"> • Objectives • Efficiency
Henri Fayol	To manage is to forecast and to plan, to organize, to command, to coordinate and to control ¹⁷⁵	<ul style="list-style-type: none"> • Planning • Division of work • Coordination • Control
George R Terry	Management is a distinct process consisting of planning, organizing, actuating and controlling performed to determine and accomplish the objectives by the use of people and resources ¹⁷⁶	<ul style="list-style-type: none"> • Process towards objectives • Role of human and other resources
Mary P. Follett	Management is the art of getting things done through people ¹⁷⁷	<ul style="list-style-type: none"> • Role of people • Shared power between management and workers ('power with' not 'power over')
Koontz and Weihrich	Management is the process of designing and maintaining an environment in which individuals working together in groups, efficiently accomplish selected aims ¹⁷⁸	<ul style="list-style-type: none"> • Collective goals • Teamwork
Mary C. Niles	Good management or scientific management achieves a social objective with the best use of human and material energy and time and with satisfaction for the participants and the public ¹⁷⁹	<ul style="list-style-type: none"> • Consideration of the objectives and satisfaction of stakeholders and wider society

2.7.3 Consortium management processes

As a result of the multi-dimensional nature of consortia, the approaches to management draw on collaborative, organisational and project-oriented management structures and processes. Consortium management processes are broadly categorised in four phases: pre-inception, inception, planning and implementation, and closure^{31, 165, 180}. During the pre-inception phase, management processes involve consideration of factors existing prior to the establishment of the consortium such as motivation for the collaboration, broader contexts within which the initiator(s) of the collaboration are embedded, history of collaboration among potential partners, and pre-requisites for the collaboration^{142, 181}.

At the inception phase, management processes include deciding on and sharing the consortium's aim and objectives, determining its structure and composition, and selecting partners^{31, 165}. The planning and implementation phase involves instituting operational procedures and norms, assigning roles, planning and implementing collaborative work, allocating resources, coordinating members and resources, and monitoring of processes and results towards achieving set objectives^{182, 183}. There is no definite demarcation between the pre-inception, inception and the planning and implementation phases of a consortium. In some cases, partner selection occurs or begins at the pre-inception phase. Similarly, discussions on governance, resource sharing, financial and administrative procedures, and approaches to consortia programmes often begin at the inception phase and are developed in more detail or refined during the planning and implementation phase^{29, 31}. In the closure phase, programmatic, administrative and financial activities are wrapped up; and any contractual relationships are terminated³¹. These phases and processes informed the development of the conceptual framework for this study which is presented in Section 4.2.

2.8 Chapter Summary

This chapter began by discussing the evolution of the global HRCS agenda as one of the most effective means of advancing development in LMICs. The concept of capacity was found to be multi-level, multi-dimensional and dynamic, characteristics that also held true for research capacity. It became clear that the pathways through which capacity changes occur usually fall within a planned, emergent or incremental capacity development paradigm. The planned approach appeared to have dominated research capacity development initiatives. Furthermore, the consortium model was identified as one of the

main strategies used in implementing HRCS programmes. Consortia demonstrate collaborative, organisational and project-oriented characteristics; and hence their management processes and practices were drawn from multiple management approaches. Consortium management processes were broadly categorised into pre-inception, inception, planning and implementation, and closure phases. In the next chapter, I present the current published evidence on management processes and practices adopted by HRCS consortia, and the factors influencing their operations and outcomes.

CHAPTER 3: MANAGING HEALTH RESEARCH CAPACITY STRENGTHENING CONSORTIA: A SYSTEMATISED REVIEW OF THE LITERATURE

3.1 Introduction

In the previous chapter, I presented an overview of the global HRCS agenda and identified the consortium model as one of the main mechanisms for implementing HRCS initiatives. In this chapter, I present a literature review on HRCS consortium management processes. I ascertain the scope and quality of the published evidence on HRCS consortium management and identify the management processes adopted. I also identify the critical management-related issues emerging from the experiences of consortia actors and highlight the knowledge gaps in the current evidence. This review has already been published in *BMJ Global Health* ¹⁸⁴ (Appendix 1).

3.2 Review Methods

3.2.1 Type of review

A systematised review of the published literature was conducted. This type of review models the systematic review process without strict adherence to the standard article selection criteria such as limitation to studies and adherence to quality thresholds ^{185, 186}. This type of review was selected due to the dearth of HRCS research publications ²¹, as it enabled the inclusion of a wide range of peer-reviewed literature irrespective of publication type or quality. In addition, relevant data extracted from selected papers were not only limited to findings, reflections, opinions or perspectives, but included all management-related descriptions.

3.2.2 Search strategy and selection of papers

An electronic search for peer-reviewed articles on HRCS consortia was conducted using PubMed and Scopus. The search terms used were 1) health AND 2) research AND 3) capacity AND 4) strengthening AND 5) consortium AND 6) low- and middle-income countries, together with relevant variants (Appendix 2).

In addition to the term LMIC, I included four specific geographic regions with the highest concentration of LMICs namely Africa, Asia, Latin America and the Caribbean, and Pacific, to balance sensitivity and specificity¹⁸⁷ and optimize the search. Search results were saved in an Endnote X8 library. The inclusion criteria for article selection were: 1) a focus on consortium-based HRCS initiatives (stand-alone or embedded in a broader initiative); 2) involved LMICs; 3) included descriptions, study findings or reflections related to consortium management processes, practices and outcomes; and 4) papers published up to December 2018 with the full paper available in English. I first screened the titles and abstracts of identified papers using the inclusion criteria. This was followed by an assessment of the full text of each retained article based on which a final inclusion decision was made. I also identified additional papers through a manual search which included checking the references and supplementary lists of identified articles and citation searching¹⁸⁸.

3.2.3 Quality appraisal

Although article quality was not an inclusion criterion, I assessed the quality of the selected articles to ascertain the calibre of the available evidence on HRCS consortium management. I used the Mixed Methods Appraisal Tool (MMAT) due to its suitability for assessing multiple design studies: qualitative, quantitative (randomized, non-randomized or descriptive) and mixed methods¹⁸⁹. It is particularly suited to “context-dependent” and “process-oriented” complex interventions, and has been tested for reliability¹⁹⁰. The tool allows for initial screening to determine a paper’s eligibility for full appraisals. It constitutes a set of four assessment criteria per study design and metrics for scoring¹⁹¹. Only the empirical papers could be assessed for methodological quality. To enhance rigour, a second reviewer conducted an independent appraisal of all the papers, and a third reviewer facilitated deliberations on any divergences.

3.2.4 Data extraction and analysis

Two sets of data were extracted from the selected papers. First, I extracted the characteristics of the HRCS programmes reported in the papers such as goals, activities, and geographic focus; and consortium characteristics such as structure, size and composition. For the empirical papers, I identified the study objectives and design, methods used in data collection, sampling and analysis, and any framework or guideline

used. Second, I elicited the findings from each paper which were categorised into three broad areas: 1) descriptions of management processes and systems adopted during the consortium's establishment and implementation; (2) experiences and lessons learnt by consortium actors and (3) effect of the processes and experiences on the achievement of programme goals. I organised the data using the matrix method¹⁹². This method involves structuring the extracted data in tables to facilitate a systematic synthesis of the data. The various categories of data were captured in columns, and each row represented an included paper. I carried out a thematic synthesis of the extracted data by eliciting descriptive and analytical themes from each column of findings while drawing out commonalities, divergences and associations across themes and papers.

3.3 Review Results

3.3.1 Description of included papers

The electronic search resulted in 5378 papers, of which 1325 were duplicates (Figure 3.1). I screened the title and abstract of the remaining 4053 papers for initial eligibility, out of which 281 eligible papers were identified. Forty-six (46) papers were retained after a full-text review of the eligible papers, and an additional nine (9) papers were identified from the manual search, resulting in the inclusion of 55 papers (18 empirical and 37 commentaries) in the review (Appendix 3).

The papers were published between 1994 and 2018 (Figure 2.2). Majority of the papers (47 out of 55) were published between 2010 and 2018, indicating a six-fold increase compared with the period before 2010. Only one paper was published before 2000, and the highest number of papers published in a year was eight (8). There were twice as many commentaries as empirical research papers (Table 3.1). Most of the empirical papers (14 out of 18) were based on qualitative studies, and the rest (4) were based on mixed methods.

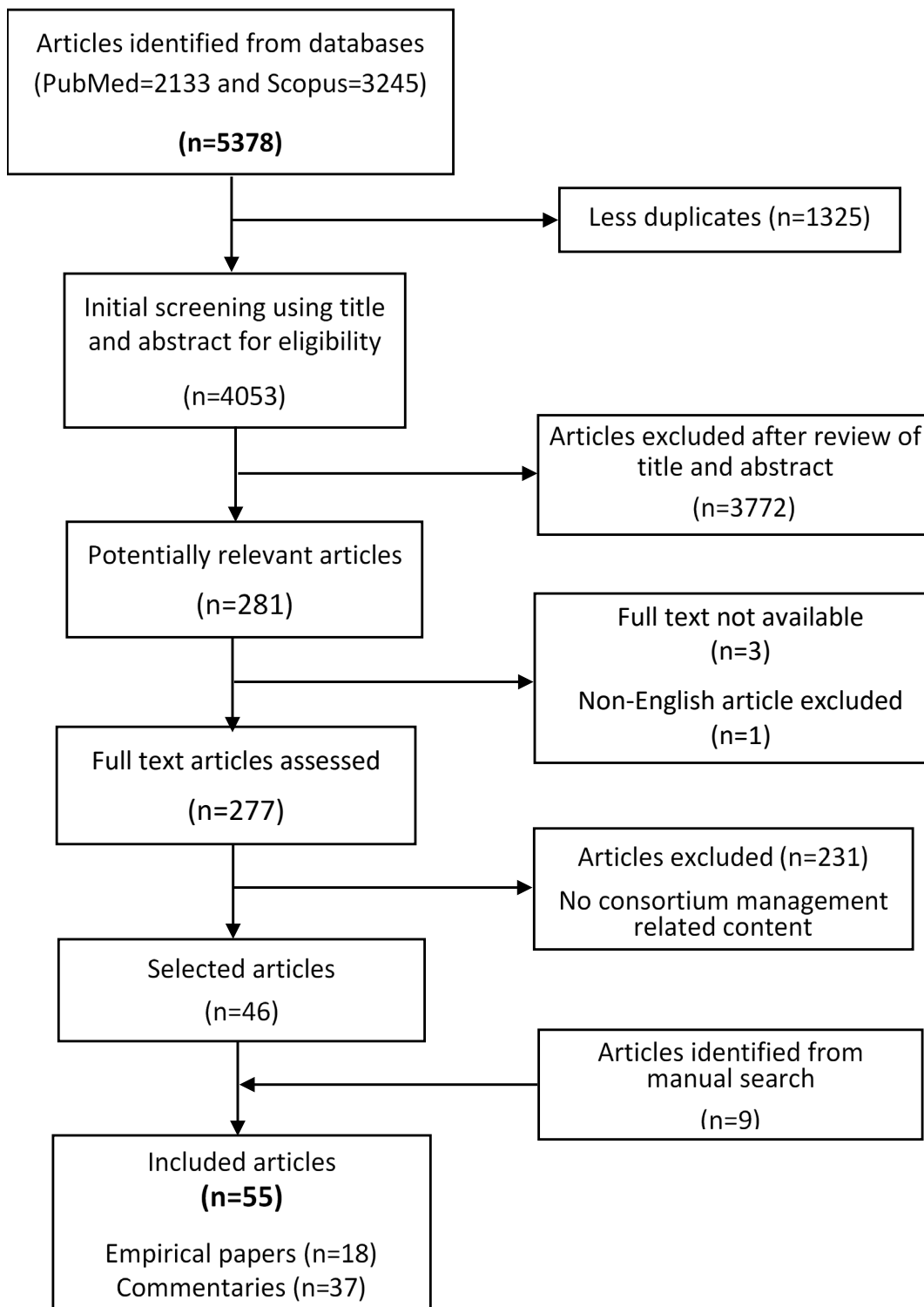


Figure 3.1: Paper screening and selection process

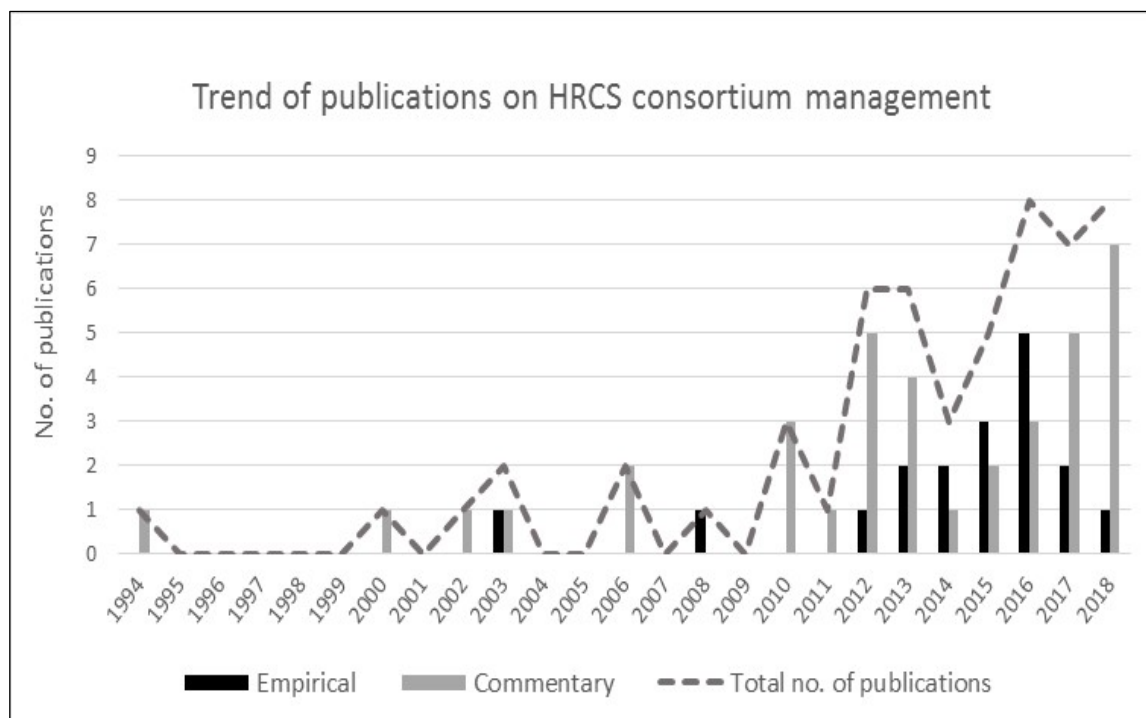


Figure 3.2: Number and type of publications per year

Half of the papers (n=28) had neither the first nor last authors affiliated to LMIC institutions, and in a fifth, there were no LMIC-affiliated authors at all (Table 3.1) Last authors (48 out of 55) were primarily affiliated to high- and upper-middle-income countries. Of the 18 empirical papers, only seven were scored in the top half of the MMAT quality range (Appendix 3) as they had clear research objectives, used data sources and analysis approaches relevant for addressing the research questions, and situated the findings within the study contexts.

Overall, the papers evaluated or reflected on consortia operations and experiences, particularly on the activities and outputs. Only a third of the papers focused on the partnership experience of the consortia actors or assessed the successes, challenges and lessons learnt. Only two papers purposefully evaluated the consortia’s management processes ^{127, 193}, one of which was the only paper reporting a failed consortium.

Table 3.1: Summary of publication and programme characteristics

Category	Characteristic	Description	No. and percentage of publications
Publication characteristics (N=55)	Type of publication	Empirical research	18 (33%)
		Commentary	37 (67%)
	First author affiliation	HIC	36 (66%)
		U-MIC	4 (7%)
		L-MIC	6 (11%)
		LIC	9 (16%)
	Last author affiliation	HIC	38 (69%)
		U-MIC	10 (18%)
		L-MIC	3 (6%)
		LIC	4 (7%)
Programme/ consortium characteristics (N=51)	Geographic focus*	Africa	37 (73%)
		Asia	12 (24%)
		Latin America and the Caribbean	7 (14%)
		Pacific	1 (2%)
	Consortium leadership	HIC	32 (63%)
		U-MIC	2 (4%)
		L-MIC	3 (6%)
		LIC	2 (4%)
		Led by both L-MIC and LIC partners	2 (4%)
		Not indicated	10 (19%)
	Capacity strengthening focus	Wholly or primarily RCS	23 (45%)
		RCS embedded in broader initiative	28 (55%)
	Subject focus	Disease or discipline focus	38 (74%)
		Generic	11 (22%)
		Not indicated	2 (4%)
	Main activities*	Training individuals	40 (78%)
		Collaborative research	25 (49%)
		Institutional capacity enhancement	11 (22%)
		Developing collaborations	9 (18%)
		Knowledge translation	9 (18%)
Infrastructure enhancement		4 (8%)	

HIC-High-income country, U-MIC-Upper middle-income country, L-MIC-Lower middle-income country, LIC-Low-income country; RCS-Research capacity strengthening

* Some programmes combined two or more categories

3.3.2 Description of reported consortia

The 55 included articles represented 51 distinct HRCS programmes, as three programmes were reported in multiple articles. There was inconsistent use of terms in describing the collaborations, with 39 papers using two or more terms interchangeably, and one paper using five. The most commonly used terms were partnership (n=22), network (n=11) and consortium (n=10), and fewer uses of collaboration (n=4), alliance (n=2) and community of practice (n=2). Only five papers provided definitions of their selected term, which varied considerably¹⁹⁴⁻¹⁹⁸. The sizes of the consortia ranged from 2 to 20 institutional partners from both LMICs and HICs. Africa was the geographical focus of most of the programmes (n=37). Of the 41 consortia that had reported on their leadership, 32 were led by HIC partners. Research capacity strengthening was the primary focus of almost half of the programmes (n=23), and an embedded component of broader research, educational or clinical care programmes in the rest (Table 3.1). The main capacity strengthening activities implemented by consortia were individual training (short term and degree awarding) and learning ‘on the job’ through conducting collaborative research.

3.3.3 Consortium management processes and practices

A range of management processes and practices representing both operational and relational aspects of consortium functioning were highlighted across papers (Table 3.2). The operational elements were related to the structures and procedures used in the pre-inception, inception, planning and implementation, and closure phases of the consortia. The relational elements covered consortia experiences regarding behaviour and practice across the phases. I discuss these in turn.

3.3.4 Operational aspects of consortium management

The consortium management structures and processes reported across the papers have been broadly organised according to the pre-inception, inception, planning and implementation, and closure phases of the consortium cycle. The reported processes were neither the primary focus of the publications nor examined in detail, but were brief descriptions introducing or providing context for studies and reflections.

Table 3.2: Summary of management issues raised across papers

Category	Description	No. of publications (%) (N=55)
Operational aspects of management	Partner selection criteria	22 (40%)
	Determinants of consortia leaders	8 (17%)
	Partnership development phase	11 (20%)
	Types of collaborative agreement used	7 (13%)
	Governance structures	19 (35%)
	Coordination of consortia activities	21 (38%)
	Monitoring and evaluation of consortia activities	22 (40%)
	Closure	3 (5%)
Relational aspects of management	Partner relationships	45 (81%)
	Equity and power	24 (44%)
	Role of leadership	20 (36%)
	Partner inclusion	16 (29%)

Pre-inception phase

Conditions in place prior to the inception of the consortia were only mentioned in passing. Pre-existing factors such as previous working relationships among consortia partners and cooperation at national and regional levels were reported to have facilitated consortia establishment. Similarly, the research strengths of potential partners that others sought to leverage¹⁹⁹ and common national challenges²⁰⁰ motivated the formation of consortia. The most significant catalyst for consortia formation appeared to be funding opportunities, as almost two-thirds of consortia reported implementing funded projects, and specific reference to its influence was made in some cases^{52, 201}. Other drivers included global health interests^{49, 66, 202}, mutual research interests^{134, 203-205}, access to specific expertise in a specific area of need^{200, 206} and a plan to establish a regional cooperation²⁰⁷. These conditions indicated the context out of which consortia emerged and factors which influenced collaboration decisions.

Inception Processes

Consortia formation was often initiated by the principal applicant for the grant, except in one case²⁰⁰ where an LMIC government representative initiated the process. The criteria for partner selection were discussed in 22 papers (Figure 3.3), and the most cited criteria

were previous individual and institutional working relationships (n=17), and expertise or experience in the research area (n=9). Many consortia (n=11) reported considering two or more criteria, but none reported any considerations for determining the number or type of partners. In 11 cases, consortia reported engaging in a partnership development process, also referred to as the ‘engagement phase’⁶⁶, ‘inception phase’^{127, 208} or ‘establishment process’²⁰⁹. This process was typically used to engage partners and other stakeholders, identify partner needs and expectations, and align partner goals; as well as initiate discussions on a plan of action, governance structures, and consortium guidelines and procedures. Consortia actors shared the benefits of this process, including promoting openness, trust and teamwork²⁰⁹, and helping partners acknowledge and deal with any assumptions held²⁰. The importance of involving institutional stakeholders beyond consortium actors was also pointed out in a few cases where consortia had experienced negative consequences due to non-alignment of consortium and institutional interests and plans^{19, 193}. Only three papers^{202, 205, 208} described the use of a framework or tool to guide this process, citing the Partnership Assessment Tool, the four-dimensional Appreciative Inquiry Framework and the International Participatory Research Framework, respectively.

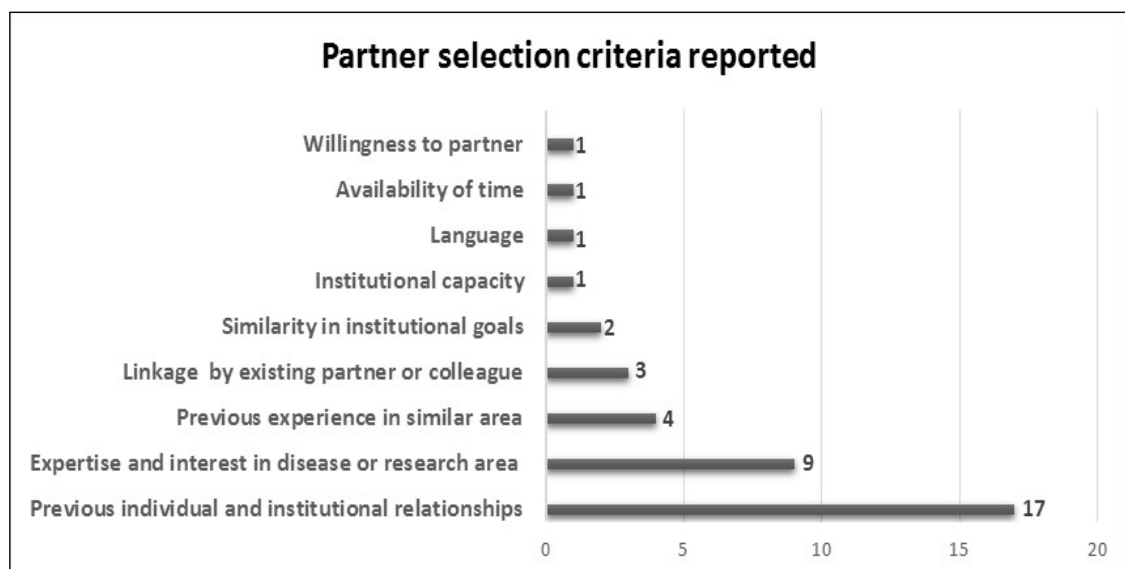


Figure 3.3: Partner selection criteria reported

Planning and Implementation Phase

Only a third of the papers reported on the governance structures adopted by consortia. Governing and management bodies were similar across consortia and generally fell into four categories: advisory bodies that provided strategic advice^{52, 134, 210}, steering committees that made both strategic and operational decisions^{193, 198, 210}, executive teams responsible for the day-to-day management^{19, 210, 211}, and implementation teams that executed consortium activities^{126, 134, 212}. These bodies often comprised representatives from partner institutions. However, there were no discussions on factors informing the choice of governance structures or the effectiveness of these structures. Consortia were often led by researchers who had initiated the collaboration, had the required resources or were selected to fulfil funder requirements^{52, 133, 195}. The role of a project manager or coordinator was reported in only two cases^{19, 210}. The consortium management capacities of leaders and managers were neither mentioned nor discussed, although two papers pointed out the value of having both management and technical expertise in leading consortia^{33, 200}.

In all, 21 papers described processes used in coordinating consortia activities, and 22 indicated the incorporation of monitoring and evaluation elements. Activity coordination and progress monitoring were mainly done through consortium-wide meetings, management meetings, partner visits, and telephone and electronic communication. Factors reported to foster coordination and monitoring included regular communication, jointly determined goals and processes, previous working relationships, and the use of codes of conduct and guidelines^{19, 213, 214}. Lack of clarity about roles and guidelines^{66, 193}, and difficulties in organising meetings due to physical distances, time differences, conflicting partner priorities, and poor internet connectivity were reported as barriers particularly in large-sized consortia^{19, 135, 215}.

Consortium evaluations, whether internally or externally conducted, were mostly programmatic in nature and focused on assessing training and research outputs. Of the 18 evaluations reported, only six involved the assessment of partnership successes and challenges. The use of frameworks in evaluations was reported in six cases. Frameworks used were the Swiss Commission for Research Partnerships with Developing Countries' Guide for Transboundary Research Partnerships^{16, 133}, Mercer et al.'s²¹⁶ Guidelines for Assessing Participatory Research Projects⁶⁶, the Capacity WORKS Model¹⁹³, Kernaghan's types of partnerships¹⁹⁴ and the realist methodology approach²⁰⁰. These

frameworks are orientated towards examining research partnerships more broadly, with only the Capacity WORKS model ²¹⁷ tailored specifically to capacity development programmes.

Closure phase

Activities related to consortia closure were barely reported. Only three papers made mention of how the consortia transitioned out of their current programmes. These included a consortium that was discontinued due to disagreements among the partners¹⁹³, a North-led consortium that transitioned into a South-led consortium ⁵², and a third case where partners kept activities going by availing their time, expertise and access to other grants in preparation for generating a new collaborative identity¹³³. There was very little detail on how these transitions were processed. As indicated earlier, most of the publications focused on consortia outputs and outcomes and not on the life cycle processes.

3.3.5 Relational aspects of consortium management

Four critical factors were identified from the range of consortia successes, challenges, enablers, barriers, and lessons learnt shared across papers. These were partner relationships, equity and power, leadership, and inclusion. Although interrelated, I present the data shared on these key factors in turn, returning to the potential interplays later in the chapter.

Partner relationships

The importance of fostering strong relationships among partners was reported as having the biggest influence on consortia success, with a majority of the papers (n=45) commenting on this. Consortia actors emphasized the value of informal networks and friendships among individual partners in consortium success ^{32, 127, 193, 215, 218}. In addition to their influence on the achievement of programme deliverables and consortium sustainability, effective relationships were in themselves seen as capacity outcomes ^{19, 32, 126, 197}.

“While these [courses and workshops] were the quantifiable outputs..., much of the experiences in capacity building are not measurable: these may focus on relationship dynamics, work and the learning experienced by the participants involved” ^{19 p.4}

“Many participants reported that new relationships developed during the project implementation were the most important outcomes” ^{19 p.5}

Partner relationships were fostered by principles such as openness, trust, mutual respect, transparency, shared commitment and recognition ^{127, 213, 219, 220}; and practices such as establishing guiding principles and norms, joint planning and implementation processes and regular communication ^{198, 200}. It was noted that recognising and leveraging the differences in partner needs, strengths, interests, objectives, expectations, contexts and culture was essential for nurturing partner relationships ^{200, 220-222}. Almost half of the papers (n=21) reported encountering challenges when partner differences were not acknowledged and monitored ^{32, 49, 135, 200, 219-222}. At the same time, the investment required (in time and other resources) and practical challenges of building relationships, particularly when partners were spread across continents, were recognised ^{49, 66, 100, 127, 199, 212, 215}. As demonstrated in one study, participants “found the process of establishing relationships and reaching consensus... laborious and at times, negotiation-intensive” ^{212 p.4}. One consortium shared their learning:

All collaborators should be aware of the fluid and the initially challenging processes that are normal for group development. Partners should allow sufficient time for complex and consultative decision making ^{127 p.15}

Equity and Power

Challenges with inequity and power imbalances among partners were discussed in 24 papers, particularly regarding the inequitable division of resources, control and benefits. These were noted to have stemmed from pre-existing asymmetries between partners, as well as consortium design factors ^{100, 199}. Pre-existing asymmetries were based on differences in partners’ resources, income levels and expertise, especially between North and South partners. These asymmetries predisposed consortia to power imbalances,

which were exacerbated by consortium arrangements such as access to funding, resource allocation and leadership ^{100, 199}. ‘Lopsided’ consortium arrangements were reported to result in more-resourced partners taking up the conceptual roles and being perceived as capacity providers, and less-resourced partners becoming implementers and capacity receivers ^{199, 208, 219, 223, 224}. Thus, unequal power relations were entrenched, and the ability of less-resourced partners to negotiate better terms were undermined.

When the Northern partner serves as the primary grant recipient (and the Southern partner is subcontracted) a level of inequality is created that is difficult to overcome, no matter what provisions are made to make decisions equitably ¹⁰⁰
p.4

...it is too often assumed that the more developed nation has more to offer. This erroneous perspective is a fatal flaw in the development and progress of such collaborative efforts and is usually accountable for a number of failed attempts at collaboration due to its skewed balance of power ^{196 p.101}

“partners with less funding (almost entirely LMIC partners) confirmed that they felt as though they had less influence in decisions ^{19 p.7}

Power imbalances were not limited to North-South collaborations, but also encountered among ‘bigger’ and ‘smaller’ Southern partners ^{135, 194, 199}. Openly acknowledging and discussing these issues were deemed necessary in addressing this challenge in several papers ^{20, 32, 127, 197, 208}:

There are interests at stake among Southern universities just as there are among Northern universities... therefore power and interest dynamics are at play in South-South partnerships just as they are in North-South and North-North partnerships ^{194 p.146}

Without honest exchange, and an acknowledgement of the differential power at work in seeking to resolve tensions in perspective, the notion of ‘equitable partnership’ was seen as illusory ^{32 p.4}

Other recommendations included negotiating and instituting consortium agreements and structures that promote power-sharing, equal division of resources and benefits, and decision-making capacity^{16, 100, 196, 212, 225}. However, it was noted that these were not guarantees and sustained partner commitment to equal partnerships, mutual respect, trust, and reciprocity were still required^{66, 100, 194, 205, 209, 219}.

Partner Inclusion

The lack of inclusion of all partners, especially during the early stages was raised as a concern, mostly by Southern consortium actors. In a Bangladesh–British partnership for instance, the project proposal was mainly developed by the Northern partner, resulting in implementation difficulties²²³. Another author noted:

Many participants described their partnership experiences as more 'incorporation' than 'collaboration', having been provided little to no opportunity to participate in priority-setting or in leadership roles^{208 p.142}

Even in an LMIC-led consortium, decisions regarding a component that was led by the HIC partners were described as ‘top-down’ leading to some tension within the partnership¹²⁷. Partner inclusion in all consortium processes, particularly in decision-making, was widely reported to engender ownership and commitment across both internal and external stakeholders^{11, 196, 209, 212}. It was also considered critical to include wider institutional actors and be cognisant of host institutional leadership and structures when determining and executing consortium processes^{19, 198}. In one consortium, the involvement of a wide range of stakeholders in conceptualising the HRCS project was seen to contribute to a “truly cooperative partnership based on trust and mutual respect”²¹⁹. In others however, the lack of alignment with institutional agenda was detrimental to the consortium’s success^{19, 193}.

Role of Leadership

Leadership emerged as a major determinant of consortium success or failure in over a third of the papers^{200, 226}. The critical role of leadership was demonstrated when leadership changes in some consortia resulted in operational challenges^{19, 100, 193}. As noted by an author,

A successful partnership requires strong leadership to make decisions, take appropriate risks, and solve problems ^{227 p.6}

Leadership was deemed essential for providing direction, overseeing performance, demonstrating diplomacy, and ensuring that partners are engaged throughout the consortium's lifecycle ^{126, 197, 212}. In one consortium, leaders' commitment to inclusive partnership was considered instrumental in overcoming initial reservations of less-resourced partners in joining the consortium at all ²²⁴.

3.3.6 Linkages between consortium management processes and programme outcomes

Linkages between consortium management processes and programme outcomes were not clearly articulated, and only alluded to in a few recommendations made. Some consortia actors observed that HRCS programmes that focused on a range of human and infrastructural capacities ^{33, 128, 228} across micro-, meso- and macro-levels ^{100, 200, 206, 219} produced synergistic interactions and more sustainable capacity. It was also noted that acknowledging existing capacities of each partner and according mutual respect promoted multidirectional capacity transfer ^{47, 49, 196, 200}. Additionally, tailoring partners' participation in consortia were noted to produce sustainable and contextually relevant outcomes ^{127, 222, 225, 226}.

The role and significance of consortium management in achieving HRCS outcomes are increasingly being acknowledged ^{33, 198, 219}. Efficient management was named as one of four outputs in one consortium's programme theory of change ¹²⁷. Another paper identified the lack of management skills as a risk factor for consortia, criticising the reliance on the 'learning-by-doing' means of acquiring those skills as it often happened late in consortia leaders' careers ²²⁵. The capacity strengthening role of management activities was recognised in a few cases as consortia actors noted that partner interactions at managerial levels generated the exchange of knowledge and skills ²¹⁵ and provided opportunities for mentoring and 'behaviour modelling' ²¹⁹. On the significance of management processes, one author pointed out:

What these [process] evaluation reports invariably facilitated was increased awareness of how underlying, often ignored or taken-for-granted processes influence project work and outcomes^{33 p.141}

3.4 The HRCS Consortium Management Publication Landscape and Emerging Issues

3.4.1 The HRCS consortium management evidence base

This review set out to assess the consortium management publication landscape, specifically in the HRCS domain. However, the findings presented may not represent the entirety of HRCS consortia experiences for a number of reasons. All but one paper reported successful collaborations, and discordant leader and partner perspectives were only reported in one case, indicating the possibility of publication and social desirability biases, respectively. Indeed, one participant disclosed their consortium's deliberate decision not to report their 'dirty laundry' in a peer-reviewed publication¹⁹⁴. Thus, experiences of unsuccessful consortia may exist but are unpublished, and authors and study participants of selected papers may have been cautious in their publications and responses to avoid potential tensions and maintain relationships. In addition, data from unpublished work or those published outside of peer-reviewed journals, or in languages other than English, or indexed in other databases, would have been excluded from this review. However, a systematic approach was used in carrying out the review to ensure a high level of rigour. Integrating diverse types of published literature also widened the range of included viewpoints.

Regarding the available evidence base, there is a gradual increase in the attention being given to HRCS consortium management-related issues in recent years. Yet, yearly publication outputs remain low, and the evidence is weak both in terms of quantity and quality. Consortium management was not the focus for most papers, and there was little coherence in its discussion across papers. Authors from LMICs were absent in a significant proportion of publications, raising questions about the level of meaningful LMIC involvement and leadership in the LMIC-focused HRCS consortium management literature. Possible contributors to this authorship pattern include the dominance of high-income partners in consortium leadership, and broader structural and contextual factors such as resource and expertise imbalances. The nascent nature of the management-specific evidence reflects a similar trend in the broader HRCS literature, except that there

is a better representation of LMIC authors in the latter ²¹. These imbalances and their contributing factors need to be addressed, with a particular emphasis on correcting the under-representation of LMIC perspectives in the available evidence.

Across the publications, terms for collaborations such as partnership, network and consortium are used inconsistently and interchangeably, a point also noted by others ^{198, 229}. Similarly, as noted in the previous chapter, the concept of ‘(health) research capacity strengthening’ has been inconsistently applied across the broader HRCS literature ²¹. Thus, it is not entirely clear how an HRCS consortium might differ from a traditional health research consortium or how a consortium might differ from a partnership or network. Although not discussed in the literature, the lack of standard definitions and delineation of terminologies could lead to challenges with multiple perceptions of the nature, level of engagement, and practices of a collaboration, as well as different partner expectations. Concerns about clarity in the use of terms contributed to efforts by Edwards et al. ²²⁹ to develop a typology of international health partnerships to facilitate evaluations by positing a classification according to the level of impact (individual or organisational), capacity strengthening approach and the type of relationship between partners. Beyond ensuring the use of appropriate comparators in evaluation ²²⁹, characterising collaborations and being explicit about the attributes of the collaboration and degree of involvement will promote consonance in partner thinking, approaches and expectations.

3.4.2 Associations between the operational and relational aspects of management

There appears to be a greater emphasis on the relational aspects of management in the reviewed literature than on operational factors. Relational aspects such as relationship building among partners, equity, power relations and leadership were identified as having the most influence on and requiring the greatest attention for successful HRCS consortium management. Although extensively mentioned, these elements were inadequately interrogated. Later in the thesis, I highlight the role of different approaches to leadership and power relations in the capacity strengthening context. The operational aspects of management, such as establishment processes, and governance structures and procedures, were given less attention in the reviewed papers. Given that the relational and operational aspects of collaborations have been identified as interdependent elements of consortium management ^{197, 230, 231}, it is unclear why the operational aspects are relatively neglected, and the interdependency and interplay between the two largely ignored. Only

three papers hinted at any linkages^{100, 197, 199}. Van der Veken et al.¹⁹⁹ pointed out that inequity and power imbalances are as determined by consortium structures as they are by pre-existing contextual factors, and Vasquez et al.¹⁰⁰ noted that formalised consortium structures are not sufficient in themselves in addressing power differentials and ensuring equity without commitment to the appropriate principles. The lack of correlation between relational and operational elements in the literature is further evidenced in the linear nature of the partnership frameworks applied in the reviewed papers, which rarely elicited the relational complexities inherent in consortium processes. The importance of this interdependency between the operational and relational mirrors the need for both tangible and intangible elements of management as illustrated in the capacity framework by Elloker and colleagues (Figure 2.2). As earlier indicated, this framework highlighted the need to equally pay attention to strengthening organisational hardware such as finances and technology, tangible software such as management systems and procedures, and intangible software such as relationships and power^{89, 232}. As will become more evident from the empirical findings, the interrelatedness between the tangible and intangible elements of management is crucial if consortia outcomes are to be achieved, particularly in the capacity strengthening context.

3.4.3 Role of management processes in research capacity strengthening

Very little association has been made between HRCS consortium processes and capacity outcomes in the literature. There was almost no discussion in the reviewed literature on the ‘position’ of management in the HRCS agenda and whether it merely supports a capacity development process or is a capacity development mechanism or target in its own right. This gap may be a result of the prevalent focus on HRCS activity outputs such as individuals trained and publications which are widely used as proxies for capacity⁸³, and the apparent prioritisation of technical research skills over managerial expertise. Though HRCS activities focus more on technical research tasks than non-technical relational skills, issues raised in the HRCS consortium management literature emphasizes the latter. This could be an indication that consortium processes may be segregated from the capacity strengthening process and only perceived as a means to an end. Although there is a growing recognition of the role of management in HRCS consortia, its handling in the available published literature is rudimentary. Even where management is explicitly named as an output, the focus remains on programme efficiency with management as a facilitator of other programmatic outputs rather than a valuable capacity building output

in itself ¹²⁷. Considering the philosophy underpinning HRCS consortia ⁴, capacity development needs to permeate both processes and deliverables, and it is essential that both technical and managerial components contribute to capacity strengthening outcomes. I empirically examine the role of management processes in RCS and will discuss the findings in Chapter 7.

3.4.4 Implications of the evidence base for consortium management research and practice

From this review, it is clear that although the consortium model has been widely adopted for strengthening health research capacity in LMICs, the evidence base to inform implementation is weak, and consortium actors lack the theoretical and empirical bases for framing their practice. Relational aspects of consortium management have been recognised as essential to HRCS programme success but have not been examined in depth. Operational processes have rarely been discussed, and it is unclear whether this is due to a lack of understanding or a lack of perceived importance. As a result, the interplay between operational and relational aspects of consortium management has not been well explored. The actual contribution of consortium management to HRCS outcomes is poorly documented, and the ‘position’ of management within the broader capacity strengthening agenda remains unclear. The gaps identified in the literature highlight the need to pay more attention to both theoretical and empirical investigation of consortium management processes, influencing factors, and their role in attaining the capacity strengthening aims of consortia. Such research needs to aim for more conceptual depth, making use of robust study designs and adherence to research reporting requirements to overcome the quality problems identified. Considering the growing investments in consortia implementing the LMIC-focused HRCS agenda, it is essential to advance evidence-based consortium management frameworks to underpin the effort.

3.5 Chapter Summary

This chapter presented a review of the published literature on HRCS consortium management processes. The review indicated that despite increasing efforts being made to publish HRCS consortia outcomes in recent years, there is a dearth of high-quality empirical research on consortium management. Relational elements of consortium management such as equity and power relations were considered essential for consortia

success but were not examined in depth. Also, operational management processes such as governance and coordination and their role in the achievement of capacity outcomes were rarely examined. These identified gaps highlight the need for increased empirical research that will strengthen the evidence base on the role and contribution of consortium management processes and practices to the HRCS initiatives. These review findings therefore informed my research questions and study methodology, which I present in the next chapter.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

In the previous chapter, I presented a systematised literature review which depicted the scope and quality of the published evidence on the management of HRCS consortia. It became clear that there is a dearth of high-quality research on consortium management. This finding further supported the case for conducting an empirical study on the management processes used by HRCS consortia and their influences on the achievement of consortia goals. In this chapter, I outline the approach and processes followed in conducting the study. I present the conceptual and theoretical frameworks, as well as the philosophical underpinning that guided the study. The study design and the methods used in data collection and analysis are also presented. I further discuss measures taken to enhance the study's rigour, my positionality, and how I ensured reflexivity during the research process. I also outline the ethical considerations made and the study's limitations.

4.2 Conceptual and Theoretical Frameworks

At the outset of a study, it is essential to set the study in a framework that clarifies its context and explains its structure and design²³³. This is done by determining the conceptual and theoretical frameworks of the study. A conceptual framework “lays out the key factors, constructs, or variables, and presumes relationships among them”^{234 p.440} in order to provide a complete understanding of the phenomenon. It is the researcher's conception of what is “out there” with regard to the phenomenon which they plan to investigate²³⁵. On the other hand, a theoretical framework “consists of the selected theory (or theories) that undergirds your thinking with regards to how you understand and plan to research your topic”^{236 p.13}. It presents the relevant theory underpinning the research and provides the lens through which the phenomenon of interest is examined^{237, 238}.

To give direction to the study and facilitate a systematic and holistic investigation, I adopted both conceptual and theoretical frameworks. The conceptual framework (Figure 4.1) was informed by the consortium phases and processes identified during the literature review and other related frameworks in the broader literature. I drew from frameworks on partnership processes and outcomes¹⁴², dimensions of goals in collaborations²³⁹,

organisational management elements²³¹, and dimensions of organisational capacity^{72, 89}. This initial framework therefore incorporates various elements of management processes of consortia, drawn from the collaborative, organisational and project-related processes, and and posits their interaction and influence on the achievement of multiple capacity goals.

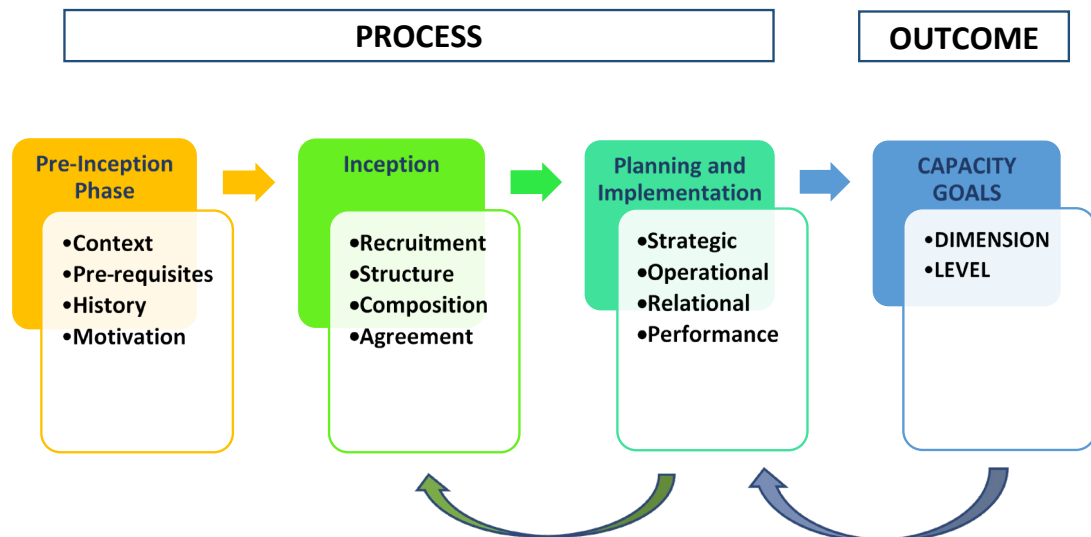


Figure 4.1: Conceptual framework for examining consortium management processes

The conceptual framework focuses on management processes across the three consortium phases: pre-inception, inception, and planning and implementation (Figure 4.1). These phases and processes, drawn from the literature and presented in the conceptual framework, serve as a starting point for empirically examining the relevant management processes in HRCS consortia. At the pre-inception phase, factors that inform consortium establishment that need to be explored include the motivation for formation, the contexts within which the HRCS programme and participating institutions exist, partnership history and any programme pre-requisites^{142, 181}. At the inception phase, the processes and drivers for recruiting partners and establishing consortium structures need to be explored. For the planning and implementation phase, I have drawn out diverse dimensions of management deemed essential to collaborations and organisational effectiveness from the literature. These are strategic, operational, relational and performance management^{197, 231}. Strategic management of consortia involves processes such as goal setting, determining governance and partner management structures, and

resource allocation. Operational management involves processes such as planning of activities, assignment of roles and responsibilities, budgeting, coordination and activity implementation. Relationship management considers partner engagement, power relations, inclusivity, and equity. Performance management considers the development and implementation of monitoring and evaluation systems. As noted in the literature review, there is no clear-cut demarcation between consortium phases. For example, discussions on management structures and processes often begin at the inception phase and are developed further during the planning and implementation phase. Also, consortium processes continuously evolve as a result of feedback from phases and processes. The approach of each consortium to these management processes at each phase was investigated in the study, drawing out the factors influencing the different approaches. I also considered the influence of each management element on the different research capacity dimensions (tangible or intangible) and levels (individual, institutional or environment). This conceptual framework informed the study's data collection and analysis.

I applied the capacity development lens in examining each of the elements elicited by the conceptual framework (presented in Section 8.3.2). Applying a lens to a study makes explicit the viewpoint from which the researcher examines the phenomenon of interest and focuses the researcher's attention to specific elements of the data being collected²⁴⁰. Theories provide researchers with different lenses through which they could look at complicated problems, focus their attention on the relevant data and provide the framework within which to conduct analysis^{238, 241}. Due to the centrality of capacity development in HRCS consortia goals, it was crucial to assess consortia's management processes from the capacity development perspective. The capacity development lens was therefore informed by the theories underlying capacity and its development. The literature review pointed out the various features of research capacity such as its multi-dimensional and systemic nature, and its development was shown to occur through fundamental mechanisms such as systems thinking and emergence (Sections 2.3 and 2.4). It is clear that capacity development is grounded in systems theories. I particularly drew on the complex adaptive systems (CAS) theory and the developmental systems theory to shape and inform this research due to their emphasis on the capacity and ability of a system to change through learning²⁴². The CAS theory advances that systems are made up of diverse components whose multiple interactions (between components and levels) produce emergent change towards self-organisation^{69, 243, 244}. The developmental systems

theory posits that human development occurs through a series of transformations produced by the interaction between individuals and their multi-level contexts²⁴⁵⁻²⁴⁷. The common tenets across these systems theories include the interconnectedness of the units, the relation between individual units and their contexts, the integration of all levels of organisation, and the production of change as a result of the interactions; all of which are essential for the development of systems. The explication of these tenets shaped the perspective with which I examined the data and conducted my analysis, and enabled me to explain the relationships between consortium management processes and research capacity development.

4.3 Philosophical Underpinning Guiding the Study

Every research study is implicitly or explicitly underpinned by philosophical assumptions which shape the way the research is carried out²⁴⁸. Identifying and articulating how a study's philosophical underpinning aligns with its research question(s) and approach is a prerequisite for rigorous research²⁴⁹. These philosophical assumptions, also referred to as research paradigms, represent the researcher's perspective of the nature of what is to be known and how that knowledge can be gained²⁵⁰. Several classical and contemporary research paradigms have been identified in the literature; the most common paradigms include positivism, post-positivism, critical theory and interpretivism (often combined or used interchangeably with constructivism)²⁵¹⁻²⁵³. In selecting the philosophical stance from which to approach this study, I considered the type of research questions I was seeking to answer and the potential means of generating the knowledge that would answer these questions^{254, 255}. My study sought to understand the consortium management actions, behaviour and experiences from the perspectives of the key actors, as well as their interpretations of the influence of their management processes and practices on research capacity strengthening^{256, 257}. Thus, this study is underpinned by the interpretivist philosophical assumption which asserts that multiple realities exist, each of which is socially constructed, and therefore individuals develop subjective meanings of their experiences^{249, 258}. The interpretive paradigm was therefore adopted due to the purpose of the study and the research questions.

This philosophy was applied to my research at various stages. I selected a research strategy that would help draw out study participants' views on what consortium management involved and their experiences in implementing management processes. I

adopted a two-step approach which allowed participants to bring out management elements they perceived as critical in the first step, which then guided the subsequent research. I also included a range of participants from various consortium partners to ensure that varied interpretations of consortium management experiences are captured. I present the study design in more detail in the next section.

4.4 Study Design

I employed a qualitative research strategy for this study due to its appropriateness for examining processes and understanding the experiences and perspectives of research participants within a natural setting ^{259, 260}. The qualitative approach is also used in studying phenomena where little is known ²⁵⁹, making it the preferred strategy for this study.

I also employed a two-phase research design for the study. Due to the dearth of consortium management evidence in the literature, the phased approach was adopted to provide preliminary information that will guide an effective investigation. In the first phase, I took an exploratory-descriptive approach to the research to gain a better understanding of what consortium management entailed and to identify the most critical issues that were relevant for the study. Again, I used an exploratory approach due to its suitability for research where there is little or no scientific knowledge about the group, process, activity, or situation of interest, and yet there is reason to believe that the phenomenon has insights worth discovering ²⁶¹. This initial phase helped clarify the key research questions for the in-depth investigation in the subsequent phase.

For the second phase, I took a multiple case study approach which involved three purposively selected cases. Case study research has been defined as “a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audio-visual material, and documents and reports), and reports a case description and case-based themes” ^{262 p.73}. Diverse approaches to case study research have been presented in the literature. Of note are the approaches advanced by the three most prominent contributors to the methodology: Shahan Merriam ²⁶³, Robert Stakes ²⁶⁴, and Robert Yin ²⁶⁵. There are differences as well as commonalities in the approaches of these three seminal authors.

The key differences lay in their philosophical orientation (pragmatic constructivist, constructivist/interpretivist, and postpositivist respectively), which in turn led to differences in their approaches to the case study design, data collection, and analysis²⁶⁶⁻²⁶⁸. Irrespective of the varied orientations of the different methodologists, some fundamental case study characteristics are common across the board. For example, a case study is seen as a holistic and in-depth investigation of a complex issue (phenomena, event, situation, organisation, program individual or group) in its real-life context, and which primarily answers ‘how’ and ‘why’ research questions^{263, 265-267}.

I selected the case study methodology for several reasons. First, the complexity of ascertaining the effect of consortium management processes on capacity development required an in-depth investigation and multiple perspectives which are two key features of the case study methodology. Second, consortia are bounded and socially constructed organisations which provided the opportunity for a holistic examination of their organisational and managerial processes and practices^{263-265, 268}. Third, my study aimed to examine a contemporary phenomenon, specifically the interaction between the management of consortia in an active HRCS initiative and their research capacity outcomes in real-life contexts²⁶⁵. Consortia are nested in real-life settings within wider institutional, regional and global contexts, which provided the opportunity to investigate the behaviour and decisions of participants without manipulating the consortia or their contexts²⁶⁹. Fourth, this study sought to determine ‘why’ consortia adopted their specific management approaches and ‘how’ those approaches influenced the development of research capacity in those consortia. Finally, although case study research could be oriented from positivist through to constructivist/interpretivist perspectives, the latter commonly permeates its implementation due to its fundamental goal of understanding phenomena from the perspective of participants through in-depth and contextualised analyses²⁶⁷. Considering the interpretivist underpinning of this study (Section 4.3), the case study methodology was considered as a suitable approach. I still drew on some of the methodology’s postpositivist elements such as measures for validating data²⁶⁵, to further strengthen the study’s trustworthiness (discussed in more detail in Section 4.8).

4.5 Study Population

The Africa-led DELTAS Africa HRCS initiative was selected as the sampling frame for this study. This initiative is administered by the Alliance for Accelerating Excellence in

Science in Africa (AESAs) platform of the African Academy of Sciences (AAS). The AAS acts as the funding agency, with funding support from the Wellcome Trust and the UK Agency for International Development. The initiative seeks to support Africa-led development of world-class research leaders in Africa. To achieve this goal, eleven programmes are implementing various HRCS activities across Africa (Figure 4.2). Of the eleven, one is not consortium-based and hence was excluded from the study. The remaining ten are consortia made up of lead and partner institutions from across Africa, Europe and North America. This study is nested within a Learning Research Programme (LRP) of the DELTAS Africa Initiative, led by the Centre for Capacity Research at the Liverpool School of Tropical Medicine (LSTM). The LRP constitutes four themes and involves working with all the DELTAS consortia to produce research-based learning on how to train and develop world-class researchers, foster their careers and collaborations and promote research uptake. This study, which is one of the four themes, was conceptualised to generate evidence using the DELTAS Africa initiative to address a recognised gap in HRCS practice. The DELTAS Africa initiative was also of particular interest as it represented new thinking regarding LMIC-led consortia, was going to be operational throughout the study, and is made up of a heterogeneous group of consortia with varying characteristics such as number of partners, level of consortium maturity, institution type (e.g. university vs research institution), geographical and research foci, and leadership experiences. This provided adequate diversity within this population and the opportunity to make use of varying contexts in examining the HRCS consortia processes. The study was conducted in the fourth year of the five-year DELTAS programme.

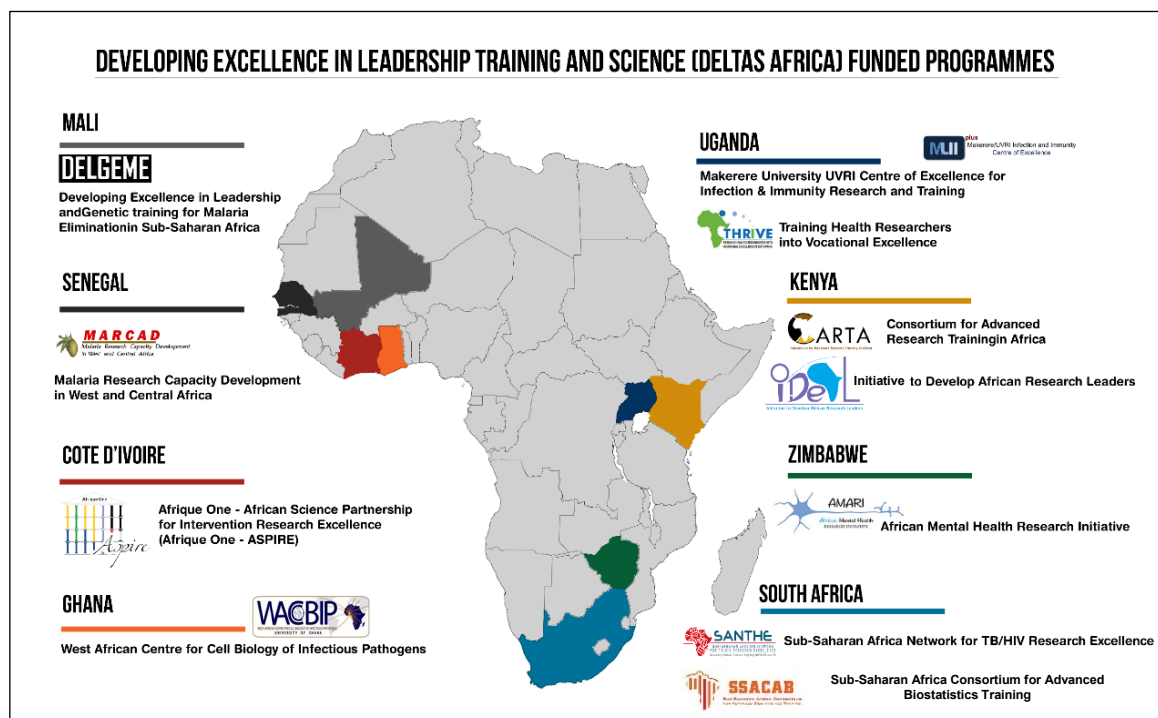


Figure 4.2: Eleven (11) DELTAS Africa Programmes

4.6 Study Phases, Sampling and Data Collection

The data collection methods, participants and expected outputs of the exploratory and case study phases are presented in Figure 4.3. I describe these phases next.

4.6.1 Phase 1 – Exploratory research

The aim of this initial phase was to enable familiarity with the study context, and identify consortia’s characteristics, management processes and emerging management-related issues. The study context here refers to the environment within which consortia activities are implemented including the organisational settings and culture in participating institutions, policy frameworks at both institutional and initiative (DELTAS) levels, and existing research capacity in participating institutions²⁷⁰. The data collection methods employed for this phase were document reviews and key informant interviews. The DELTAS team at the AAS acted as both gatekeepers and key informants for the study²⁵⁶. Gatekeepers provide formal and informal access to targeted research participants²⁷¹ I first engaged and provided details of the study to the AAS team. The team then facilitated

access to all the consortia by introducing me, as the researcher, and the study to the Consortium Directors. I recognised the implications of the gatekeeping role of the AAS, which is the funding agency, and took appropriate measures to minimize any potential effect on the research process (discussed in Section 4.9).

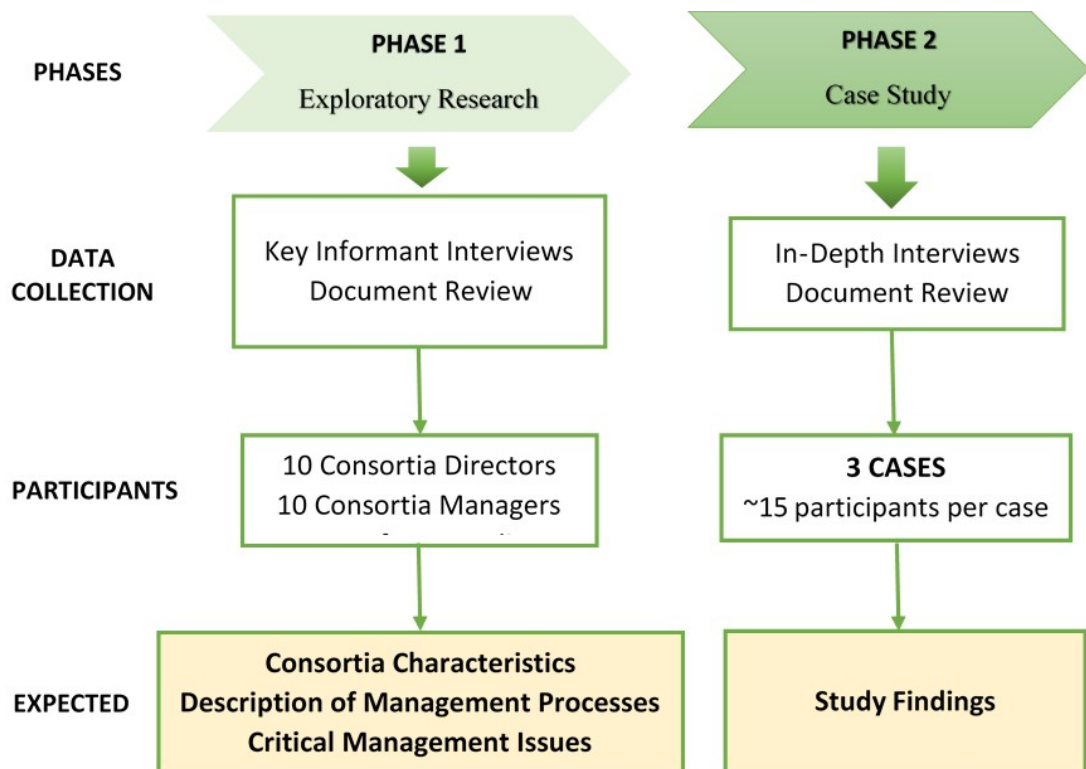


Figure 4.3: Study phases

The Phase 1 data collection process began with a review of the relevant consortium-related documents. The document review preceded the interviews so that the textual data would help identify potential questions and improve the efficiency of the interviews. The documents were collected in two phases. Documents from the AAS, including the call for DELTAS proposals, funder terms and conditions, submitted proposals, consortia set-up, notices of award, and annual reports, were reviewed using a checklist (Appendix 4). Next, each consortium was given a template (Appendix 5) to provide relevant consortium data including composition, goals, governance and management structures and teams, functions, and activities.

I conducted twenty-four (24) key informant interviews involving the Directors and Programme Managers of all ten consortia, and four key AAS stakeholders. These individuals were identified as having first-hand knowledge of consortia's establishment and management experiences and best placed to provide insights on the most critical management issues that had arisen over the period ^{272, 273}. Each participant provided written informed consent (Appendix 6) after the study details and the interview process had been explained to them. I conducted four face-to-face interviews with the AAS participants, and twenty Skype and telephone interviews with the 10 Consortium Directors and 10 Programme Managers. All the interviews were conducted in English. The interviews were semi-structured, and I employed topic guides which were tailored for each type of participant (Appendix 7). I did not draw on any previously developed tools. The topic guides were informed by the conceptual framework and the literature review. The conceptual framework informed consortium management phases and processes to explore. The literature review highlighted the knowledge gaps in the consortium management literature which informed the areas of consortium practice to focus on for the empirical work. The interviews therefore focused on collecting data related to consortia history, management structures, overview of management processes, preliminary thoughts on how and why some of the processes were undertaken, and management successes and challenges. Each interview was audio-recorded and lasted for an average of one hour. I developed an interview summary after each interview. These summaries presented key information from the interviews, any emerging insights, and issues worth exploring in subsequent interviews. The summaries were also shared with my supervisory team to provide them with the key emerging data and to obtain additional insights to feed back into the data collection process.

I then analysed the data from this phase (method described in Section 4.7). In addition to generating essential research evidence, the findings from this phase also facilitated case selection and prioritisation of emerging issues for in-depth investigation in the second phase.

4.6.2 Phase 2 – Multiple case study

The aim of this phase was to conduct an in-depth investigation into issues emerging from Phase 1 which were relevant to the study aim. Three (3) consortia were purposively selected as cases for this phase. Purposive sampling is widely used in qualitative research

to identify and select information-rich cases in relation to the study aim ²⁷⁴. Participant selection was done in three stages to select consortia, institutions within the selected consortia, and individual participants within the selected institutions (Figure 4.4). Elements of both theoretical and maximum variation sampling strategies were adopted in the selection of cases. Theoretical sampling is mostly used in the grounded theory approach and relies on the analysis of the initial data to guide decisions on “who to talk to” and “what to ask” ²⁷⁵. The maximum variation sampling strategy places emphasis on breadth and variation and seeks to capture different conditions in order to identify commonalities and differences across these variations ²⁷⁶. Hence, based on the Phase 1 findings, I selected cases that would explore emerging concepts in more depth and capture diverse perspectives and contexts. For example, I sought to include consortia with different approaches to management processes such as resource allocation and partner management. Additionally, consortium characteristics including the size of consortia with respect to the number of partners, length of the relationship between partners, types of stated goals, geographical location, and language diversity, were considered in this process. Thus, I included consortia of different sizes, with both narrow and broad research foci, with partners from different regions of the continent, and a Francophone-led consortium. A more detailed description of the Phase 1 findings which informed case selection will be presented in Chapter 5. In addition to the above-mentioned criteria, there was a pragmatic element to the case selection process. Each of the four themes of the LRP involved case studies, and therefore the theme leaders were mindful of the potential to overburden consortia. As such, we (theme leaders) discussed our preliminary case choices, and when there was an overlap, the theme which had alternative consortia meeting their selection criteria made the required change. During my case selection process, I had identified more than three consortia that met my selection criteria. Therefore, although one of my potential cases was also selected by another theme, I had additional options and still identified three consortia that met all my criteria. Thus, the case levelling measures did not affect my selection of the type of cases I required to answer my research questions. After the selection of the cases, I selected institutional and individual participants within each consortium using the maximum variation strategy. For each case, I selected the lead and three partner institutions within the consortium to capture multiple perspectives. To facilitate the process, I consulted with the Programme Managers of each of the selected consortia to clarify the characteristics of all partner institutions. I focused on recruiting co-applicant institutions for this study, as generally,

it appeared they were more actively engaged in consortia activities compared to collaborators and would have more insight into the workings of the consortium. Moreover, considering that the roles and engagement levels of collaborators varied across the consortia, focusing on co-applicants was aimed at enabling the comparison of findings across consortia. I aimed for maximum variation among the co-applicant institutions and hence selected one each of the African partner institutions with relatively higher and lower levels of research capacity, and one HIC partner for each case. This selection stage also provided an opportunity to expand the overall geographical diversity of participants by increasing the number of represented countries and regions across the continent. The key criterion for the individual participant selection was participation in managerial and administrative roles in the consortium.

I conducted individual in-depth interviews for this phase. Again, each participant provided written informed consent after being taken through the consent process. I interviewed forty-four (44) participants including Consortium Directors, Programme Managers, Partner Leads (leaders of consortia activities at the partner institutions), Finance Officers, and M&E Officers across the three cases (Table 4.1). Semi-structured guides were used during the interviews (Appendix 8). These guides were informed by the Phase 1 findings and the study's conceptual and theoretical frameworks. Considering that Phase 1 was more exploratory, and Phase 2 was more explanatory, I used these in-depth interviews to dig deeper into some of the emerging Phase 1 findings. For example, Phase 1 highlighted the management processes and approaches used by consortia. During this second phase I investigated in more depth the thinking behind and factors influencing these management decisions. The Phase 1 data also indicated the roles of various consortia stakeholders during management processes. This granted me the opportunity to explore different managerial elements with a wider range of consortium management stakeholders and to tailor my interrogation based on each participant's role in the consortium. In addition, I explored the perceptions of participants of some of the concepts emerging from the literature and first study phase.

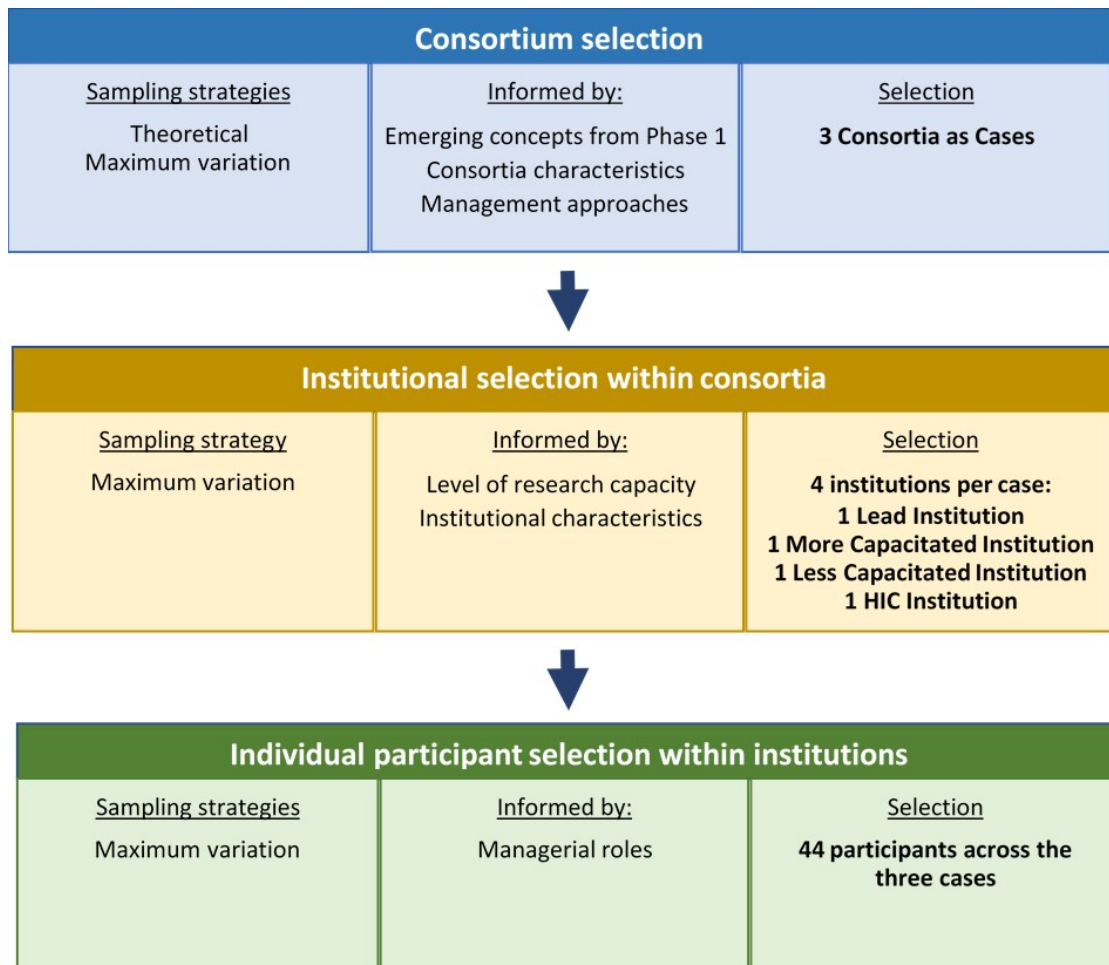


Figure 4.4: Three-stage participant selection process for case study

As the sole interviewer for the study, I conducted visits to all the participating institutions over five (5) months to facilitate data collection. Thus, interviews were held at times and venues that were convenient for participants. I conducted face-to-face interviews with all participants during this phase. Each interview took between 60-100 minutes, and all interviews were audio-recorded after participant consent for recording had been granted. All participants granted consent for audio recording. Topics explored during the in-depth interviews included participants' perspectives and experiences on what research capacity strengthening entailed, factors influencing management decisions regarding key management processes, implications of management decisions, and the effect of management processes on capacity development. Being the sole interviewer for the study granted me the opportunity to observe and capture both verbal and non-verbal communication from participants which facilitated more nuanced analysis of the data. Non-verbal means of communication used by participants included hesitations, facial

expressions, and hand gestures (for example, air quotes). These complemented the verbal data and were valuable for meaning making during data analysis. All but two of the interviews were conducted in English. The two interviews were conducted in French with the assistance of an interpreter. Prior to the interviews, I shared the interview guides with the interpreter, who is also a qualitative research assistant, and had a meeting to discuss the objectives of the study, the interview questions, the thinking behind the questions, the background of the participants and their contexts, and the expectations for the interview such as the need for both literal translation and conceptual accuracy ²⁷⁷. During the interview, sentence-by-sentence translations were done to enhance verbatim translations and limit potential compromises in the validity of the data. Additionally, I have basic knowledge in French, and so together with my observation of the non-verbal communication cues and behaviours of the participants, I was able to assess the translation to some extent in real time. I developed interview summaries after each interview.

Table 4.1: Participant distribution across cases

Type of Participant	Case A	Case B	Case C	Total
Consortia Directors	1	1	1	3
Partner Leads	3	2	4	9
Programme Managers	2	2	1	5
Finance Officers	2	4	4	10
M&E Officers	1	3	1	5
Other consortium support staff	2	1	1	4
Graduates, supervisors, institutional staff	6	0	0	6
HIC Partner Leads	1	1	0*	2
Total	18	14	12	44

* One of the LMIC Partner Leads was also affiliated to and represented the HIC partner institution

4.7 Data Management and Analysis

The audio recordings of all the interviews were transcribed into MS Word documents. The transcriptions for the first phase were done by a professional service provider, and those for the second phase (except for the two French interviews) were done by an in-house data processing team. These decisions were based on the teams' availability to ensure quick turnaround times for the transcriptions. Both the external and in-house transcribers have several years' experience in transcribing similar qualitative research interviews. I transcribed the two French interviews due to the cross-language uniqueness of those interviews in order to reduce potential errors and misinterpretations and enhance the quality of the data. As part of the data cleaning process, I listened to all the audio recordings to check on transcription quality, make any corrections, and incorporate any missed data. This was a valuable process as it significantly contributed to my familiarity with the data. The transcriptions captured both verbal and non-verbal elements such as pauses, truncation of sentences, repetitions, and laughs. All consortium and participant identifiers were removed during transcription and data cleaning and replaced with descriptor codes (Table 4.2). I presented the data extracted from the document review in MS Excel spreadsheets to facilitate ease of reference and comparison across consortia.

Table 4.2: Sample descriptor codes for study participants used in quotations

Descriptor code	Meaning
<i>Exploratory Research</i>	
Director 1	Consortium Director in Consortium 1
Manager 5	Programme Manager in Consortium 5
<i>Case Study</i>	
Consortium A, Lead Institution, R1	A researcher based in Consortium A lead institution
Consortium A, Lead Institution, M2	A manager* based in Consortium A lead institution
Consortium B, Partner Institution, R3	A researcher based in a Consortium B partner institution
Consortium B, Partner Institution, M4	A manager* based in a Consortium B partner institution

*Managers include all non-academic study participants

In analysing the data, I used the thematic content analysis approach²⁷⁸ and the framework analysis approach²⁷⁹ in Phases 1 and 2 respectively. The selection of these methods was informed by the type of research conducted at each phase. The thematic content analysis method is appropriate for exploratory work as it involves a systematic categorisation of textual data to identify salient issues and recurrent themes emerging from respondents' accounts²⁷⁸. This method was therefore suitable for analysing the Phase 1 data. After reading through the transcripts and interview summaries to obtain a good sense of the data, I identified variables of interest from the data, a process described as coding²⁸⁰. I adopted the 'directed approach' to content analysis, which incorporates some structured elements to the process²⁸¹. This involved starting off the analysis process with a few initial coding categories drawn from the study's conceptual framework. Thus, both deductive and inductive approaches to the analysis were employed²⁸². The data from the document review supplemented the data from the interviews during this process. Next, I created broad categories to group the coded data. The coding and categorisation were informed by both the emerging codes and the conceptual framework. This was an iterative process as I repeatedly went back and forth between the raw data, identified codes, and categories in order to refine the outputs of the analysis. To make it easier to see all the distilled data in one location, I presented my categories and codes in an MS Excel spreadsheet²³⁴. I also presented the data by consortia and type of participant to identify any patterns and facilitate comparison (see Appendix 9 for excerpts of the Phase 1 analysis categorization). Finally, I identified the main themes emerging from the data.

For the second phase of the study, I adopted the framework analysis approach²⁷⁹. This is a matrix-based analytic method which involves summarising and classifying data within a thematic framework^{278, 283}. The framework approach was adopted for this phase for a number of reasons: 1) it is suited to policy- and practice-oriented research; 2) it is more appropriate in studies where a priori issues exist to serve as a starting point for the thematic framework (the Phase 1 findings served this purpose); 3) it enables associations within and comparisons between cases; and 4) it is comprehensive and systematic and helps maintain a transparent audit trail^{279, 283}. The NVivo 11 software produced by QSR International was used to organise and manage the data to facilitate the analysis. The framework approach involves five steps: familiarisation, development of a thematic framework, indexing (coding), charting, and mapping and interpretation²⁷⁹. As a first step, I read the interview transcripts and summaries and the collated consortia documents to familiarise myself with the range, depth, and diversity of information gathered. During

this process, I took note of any initial coding ideas, meanings, recurring issues and emerging patterns. Next, I developed a thematic framework made up of themes and sub-themes grouped into relevant categories (Appendix 10). This process involved identifying key issues and themes using both deductive and inductive approaches. Thus, both a priori themes from the research questions and Phase 1 findings and emerging themes from the data set informed the development of the framework. At this stage of the analysis, the themes are largely descriptive and literal. Next, I coded the data by systematically applying the thematic framework to each transcript using the NVivo software. This involved labelling sections of texts to the corresponding node (theme or sub-theme). The next step, charting, involved reading and summarising the data into thematic matrices. The summarised data were kept as close to the verbatim text as possible, and were also linked to the associated raw data in NVivo to enable referencing and facilitate an audit trail. A chart was then created for each category of themes, and the data was presented according to respondents and clustered into cases (see excerpts of summary charts in Appendix 11). The charts facilitated focused reviews of each category of themes as well as comparison between respondents and cases. The next stage of the process involved a closer examination of the themes and categories to enable more interpretive abstraction and association of emerging findings. This involved identifying concepts, eliciting meanings, and finding patterns and connections within and between themes. This process also involved identifying linkages between the findings and the research questions, existing literature and current practice.

4.8 Enhancing Research Rigour

Ensuring rigour in research is important for demonstrating the quality of the study, which includes the soundness of the methods used, the accuracy of the findings, and the integrity of the conclusions made ²⁸⁴. Lincoln and Guba ²⁸⁵ advanced four criteria that need to be met to demonstrate the trustworthiness of a qualitative study. These are credibility (whether findings represent participants' original views), dependability (unvarying treatment of the data to arrive at the findings and interpretations), confirmability (whether findings and interpretations are grounded in the data), and transferability (the extent to which findings can be applied to other settings). To enhance this study's rigour and address these criteria, I employed multiple strategies throughout the research process.

First, I utilised different types of triangulation to facilitate confirmation and completion of the data to enhance the credibility of the findings²⁸⁶. I selected a wide range of study participants to obtain multiple perspectives on the topics of interest. This involved ensuring diversity among the types of participating institutions and selecting individuals at different levels who play different roles in the consortium. This was further strengthened by the use of a multiple case study design which facilitated an in-depth investigation of three different consortia. The combination of interviews and document review also made it possible to triangulate collected data between the two methods. Additionally, the two-phased study design and the fact that all the selected consortia for the case study participated in the exploratory phase, enabled me to validate some of the data collected in Phase 1 with participants during the subsequent phase. Furthermore, I consistently engaged with my supervisory team made up of experienced researchers who acted as ‘peer debriefers’²⁸⁷ throughout the entire research process. The team reviewed the interview summaries and provided feedback for subsequent interviews, as well as a range of the full transcripts when they became available. During the data analysis process, regular team meetings were held to discuss and refine the thematic framework and emerging findings. I also shared the preliminary findings and received inputs from social science researchers at a departmental seminar, as well as from a broader group of researchers working in multiple disciplines at an institution-wide seminar. All these measures contributed to maximising the credibility of the research process and findings.

Second, to maximise the dependability of the study findings, I endeavoured to conduct the research systematically in line with widely accepted standards for the selected study designs, and data collection and analysis methods²⁸⁸. I have thus provided the philosophical orientation and theoretical and conceptual frameworks guiding the inquiry, detailed documentation of each study process used, the rationale for methodological decisions, and how the findings were developed, to ensure a clear audit trail is maintained^{286, 289}. The use of NVivo further enhanced the trail across the steps taken during the analysis as it enabled linkages to the raw data. Third, the audit trail and the peer debriefing were also meant to enhance and demonstrate the grounding of the findings in the data to maximise the study’s confirmability.

Finally, I employed a number of measures to enhance the potential for transferability of the findings. It is worth noting that the responsibility of determining transferability of a study’s findings lies more with the person wanting to make the application in their setting

than with the original researcher²⁸⁵. The researcher only facilitates the transferability judgment by providing sufficient descriptions of the participants and their settings and the research process^{285, 288}. Thus, to enhance this study's transferability, I have provided detailed descriptions of the participating consortia and their contexts, as well as the study processes. In addition, I opted to use a multiple case study design representing three consortia with varying characteristics, and adopted a maximum variation strategy in sample selection within cases. These measures widened the contextual diversity represented in the findings and provide opportunities to explore replication of emerging findings from one case to the other²⁹⁰.

4.9 My Positionality and Reflexivity During the Research Process

The researcher is the main data collection and analysis instrument in qualitative research²⁹¹. Therefore, the positionality of the researcher, which encapsulates the different dimensions of their identity, such as background, biases, values, and beliefs, can affect the research process^{287, 291}. To ensure that these influences are minimised, and research findings are considered with these potential influences in mind, researchers are urged to exercise reflexivity²⁹². According to Sultana²⁹³, reflexivity in research involves:

“reflection on self, process, and representation, and critically examining power relations and politics in the research process, and researcher accountability in data collection and interpretation” (p. 376)

Reflexivity has been noted to be crucial in ensuring that research is both rigorous^{288, 292} and ethical^{293, 294}. This therefore requires researchers to be consistently sensitive to and explicit about their positionality and its effect on the research process and outcome^{292, 294}. Accordingly, I endeavoured to unpack my positionality in order to increase my awareness of the different types of influences that I could exert on the research process.

I recognised that my affiliation with one of the DELTAS Africa programmes, Initiative to Develop African Research Leaders (IDeAL), and the inclusion of IDeAL's Director in my supervisory team could have influenced how I was perceived by participants (for example, one programme in the same initiative assessing the others). To start with, IDeAL was excluded from the study as it did not use a consortium model. Also, the research team was very mindful of this position and discussed ways to mitigate its effect on data collection and interpretation processes. Furthermore, the inclusion of this study in the

DELTAS LRP played a significant role. Therefore, as a researcher, I took on and projected an LRP identity, and consistently shared the aims of the LRP with participants to highlight the purpose of the study and my positioning in a neutral learning programme.

In addition, considering that I was introduced to the Consortia Directors by the funding agency, and then to partner institutions by Consortia Directors, I was conscious of the perceived power relations that could result from these dynamics. My study could have been perceived as a consortium or partner evaluation exercise by participants. To mitigate these, I constantly reassured Consortia Directors and participants that the LRP neither represented the AAS nor any of the supporting funders, and the aim of the study was not to evaluate performance. I emphasized that the study sought to examine consortia processes and their perceived effect on capacity strengthening to generate learning and inform current and future initiatives. When introducing the study to Consortia Directors, the AAS had pointed out that participation was entirely voluntary without any consequences for decisions taken. I reiterated this throughout the data collection process. Consequently, I took a co-learning stance (and expressed this intention to participants) throughout the research process. This was aimed at minimising any perceived power or other disparity between myself and participants that may exist and facilitate active participation by consortium actors.

Further, as a member of the DELTAS community, my regular participation in DELTAS activities accorded me the opportunity to engage with the directors and other members of the consortia, and this contributed to increasing cordiality and openness during the data collection process. This may have helped in reducing the 'outsider' distance that may have existed between myself and participants. Similarly, the two-phased approach used in this study turned out to be beneficial in this regard. During the Phase 2 interviews, consortia participants, particularly those I had interviewed during the first phase, were willing to share more in-depth information. Moreover, because I visited each participating institution to conduct the Phase 2 interviews, communication with consortia actors before my visits and the time spent on site helped in creating some level of naturalness during the interviews.

Prior to the study, I had no relationship with the DELTAS Initiative or IDEAL. However, I had several years' experience in managing HRCS programmes and consortia. In fact, I had previously engaged with two Consortia Directors, one Programme Manager, and one Finance Officer in other HRCS initiatives, a fact which further enhanced the level of

acceptability with those participants. Additionally, my experience from working with consortia and universities gave me some understanding of consortia activities and issues such as collaboration culture and formal and informal power relations. Therefore, as an African researcher who has been a practitioner in the HRCS field, I was aware that, to a certain extent, I shared a common identity and experiences with the study participants which gave me an insider status for this study ²⁹⁵. This status may have enhanced my understanding of participants' experiences and granted me some unique insights into the research topic. Participants may also have been less 'guarded' in their interactions with me. On the other hand, I acknowledge that my background and the associated biases and assumptions from prior knowledge and experiences could have provided some personal and professional lenses with which I considered the data ²⁹⁶, and could have influenced the research process in general. The insider versus outsider debate in qualitative research continues to highlight the advantages and disadvantages of each status and the need for researchers to be aware of and take the appropriate measures to ensure research rigour ^{297, 298}. Thus, to limit any potential biases as a result of my positionality, I regularly shared and discussed the data and my preliminary ideas and interpretations with my supervisory team through the interview summaries and team meetings. For instance, the team always reiterated the need to ensure that interview questions and presentation of the data were value-neutral, and to consistently interrogate the different sides of any management orientation adopted by consortia. Further, considering that women occupy less than a third of leadership and management positions in global health ²⁹⁹⁻³⁰¹, my positionality as a female researcher in the field may have resulted in a marginalized stance which could have influenced my approach to study participants and the data. The continuous involvement of my supervisory team (made up of two males and one female with different backgrounds) in the entire research process helped to ensure that any potential gendered/marginalised influences on the research process contributed to a deeper and broader understanding of the topic, rather than a blocking of ideas.

Throughout the data collection process, I recognised that the different aspects of my positionality, and differences in study participants' perception of me at different times, gave me a shifting insider-outsider status ^{302, 303}. Hence, not only did I need to constantly negotiate these statuses in each situation, I needed to make efforts to maximise their advantages while minimising their disadvantages through some of the measures described above ^{298, 302, 303}. I continuously noted the different ways in which my positionality was

likely to influence the study outcomes in order to ensure top-of-mind awareness of these influences and the timely adoption of appropriate mitigating measures.

In addition to being aware of my own positionality, it was essential to be cognizant of the positionality of my supervisory team and the implications on the research process. The team was made up of an African biomedical researcher who is also a Consortium Director, an HRCS researcher with extensive experience in the African research context, and an Africa-based health systems and ethics researcher. As noted above, the team constituted two males and one female. The diversity of gender, backgrounds and research foci strengthened their collective role as peer debriefers due to the varied and complementary perspectives involved.

4.10 Ethical Considerations

This study was taken through an ethical review process prior to the data collection stage. Approval was sought and obtained from the Kenya Medical Research Institute's Scientific and Ethics Review Unit (SERU), due to my affiliation with the KEMRI Wellcome Trust Research Programme (Appendix 12). This was appropriate as the AAS, host of the DELTAS Africa Initiative, is also based in Kenya. In addition, permission to engage with DELTAS participants was sought from the AAS, and approval for data collection was given (Appendix 13).

Once all approvals had been received, the AAS provided an overview of the study to all the consortia leaders, and an invitation to participate. As noted earlier, it was particularly emphasized that participation was voluntary, and there were no consequences for any consortium or individual decision to participate or not. Subsequently, I communicated with each Consortium Director and provided further details of the study. I also enquired of their willingness to participate in the study, reiterating that participation was voluntary. Once a consortium agreed to participate in the study, I provided information on the data collection process and sought written consent from each individual participant before each interview (both for participation in the study and audio recording). The consent process included providing an explanation of the study aim and processes, and clarifying that participation was voluntary, and so participants were free to withdraw their participation at any time without consequences. An informed consent form (Appendix 6) was used for this process, and participants signed to indicate consent. All collected data

were kept confidential, and any identifiers have been excluded to protect participants and their respective institutions and consortia. Thus, in the transcripts, analysis, and presentation of study findings, participants have been identified by descriptor codes. The transcripts and audio recordings are securely stored in password-protected computers, and accessibility is limited to the study team.

I am mindful of the fact that some of the information collected for this study presents the risk of potentially causing disagreements between partners. I also acknowledge that providing detailed descriptions of cases and their contexts to enhance research rigour, coupled with the limited number of participants playing specific roles (for example, there is only one Director per consortium) present the risk of potential case and participant identification, particularly by members of the DELTAS community. To minimise these risks, I carefully considered the details of consortia descriptions presented, and sought to attain a balance between providing adequate contextual depictions and protecting consortia's identities. I have also shared some preliminary feedback and study findings with the DELTAS community through the DELTAS Annual Meetings and periodic LRP bulletins and reports, and these have been positively received. Through the feedback processes, participants were afforded the opportunity to raise any concerns regarding the findings or their identities. Participant feedback on reported findings was generally positive, and no objections were raised.

4.11 Study Limitations

There were some limitations of this study. First, only consortia from the DELTAS Africa initiative were recruited for this study. Considering the significant influence of initiative design and funder stipulations on how consortia are managed, the findings could have been framed by the peculiarities of the DELTAS Africa initiative. An investigation of consortia from other HRCS initiatives might identify different management processes and practices and throw more light on other influences on how consortia are managed. Second, study participants were limited to co-applicants. Inclusion of collaborators in the study may have drawn out management-related issues unique to this group of partners.

A third limitation is the potential influence of social desirability biases on the findings. Social desirability bias is the tendency to present one's self in a manner perceived to be socially acceptable even though it may not reflect one's reality^{304, 305}. This is a limitation

in most qualitative research, and participants could have provided socially desirable answers for a number of reasons. As noted earlier, participants may have perceived the study to be an evaluation exercise aimed at assessing consortia performance. Also, participants may have been conscious of the need to avoid potential tensions within consortia and maintain existing relationships. To minimise this bias, participants were assured of measures being taken to enhance confidentiality and anonymity with regard to their data. I also ensured that interviews were private and conducted at venues that granted participants the space to communicate freely. A fourth limitation is the language barrier encountered in two of the interviews. Although measures were taken to reduce its effect on the quality of the data, the translation process could have compromised the fidelity of the data from those interviews. However, considering that these related to two out of sixty-eight (68) interviews, any effect was minimal.

Fifth, an often-cited limitation of qualitative research is that the findings cannot be generalised to other populations and settings^{306, 307}. This concern is usually raised in reference to statistical generalisation, which refers to the inference of results from a randomly selected and representative sample to a wider population³⁰⁸. As has been pointed out by many authors, statistical generalisation is not a goal of qualitative research, and other types of generalisations could be made from such studies^{290, 309, 310}. Accordingly, the goal of this study was not to attain statistical generalisability but rather to enhance transferability and analytical generalisability^{309, 310}. As discussed in Section 4.8, detailed descriptions of participating consortia and their context have been provided to enhance the potential for transferability of the study findings. Analytic generalisability refers to the “extraction of a more abstract level of ideas from a set of case study findings - ideas that nevertheless can pertain to newer situations other than the case(s) in the original case study”^{311 p.325}. To attain this, higher-level concepts of the processes and experiences that are not unique to the cases being investigated are developed³¹⁰. I sought to enhance the potential for analytical generalisability of this study’s findings by taking several measures. I defined the research question in broader terms beyond the specific cases (how does consortium management influence capacity outcomes?)³¹². Also, I aimed for replication through a multiple case study design to facilitate the investigation of consortium management in different contexts³¹⁰. Furthermore, I adopted theoretical sampling strategies in selecting the study cases as a means of further developing the themes that emerged from the Phase 1 analysis; and to enable the development of more conceptual ideas from the findings^{311, 313}. Lastly, the comparison of the emergent

concepts with existing literature and the application of a theoretical lens to the emerging themes enabled the conceptualisation process, which will further enhance the analytic generalisability of the findings^{311, 314}. Thus, the conceptual insights that have emerged from this study could potentially be applied to similar cases and contexts.

4.12 Chapter Summary

In this chapter, I discussed the approach taken in conducting this study. The study was underpinned by the interpretivist paradigm, which led to the selection of a qualitative strategy due to the purpose of the study. I also presented the conceptual and theoretical frameworks that guided the study. Further, I described the two-phase design I adopted for this study which involved an exploratory phase followed by a case study phase which involved three consortia as cases. Key informant and in-depth interviews were the main data collection methods in the first and second phases respectively, and were augmented by document review. I described the use of the thematic content analysis and framework methods used in analysing the data in the two phases. I also discussed the steps I took throughout the research process to enhance rigour, and described my positionality and the measures taken to mitigate its effect. Lastly, I discussed the ethical considerations I made and the study's limitations. In the next three chapters, I present the findings from the two phases of the study.

CHAPTER 5: OVERVIEW OF CONSORTIUM MANAGEMENT STRUCTURES AND PROCESSES

5.1 Introduction

The findings of this study are presented in three chapters. In this first results chapter, I present the findings from Phase 1 of my study, which gives an overview of the management structures and processes used by the ten DELTAS consortia. The findings in this chapter are largely descriptive, providing a backdrop for the next two chapters, which are more explanatory and focused on the three selected consortia cases. I present the Phase 2 findings in Chapters 6 and 7. Chapter 6 examines the emerging tensions in consortium decision-making processes and the factors informing management decisions. Chapter 7 explores the role of consortium management processes and experiences in RCS.

In this chapter, I provide an overview of the structures and processes involved in establishing and maintaining consortia and factors informing the choice of processes used. I highlight the similarities and differences in management practices among the consortia and identify some of the cross-cutting influences on consortium management practices. I also draw out the critical issues in consortium management which were explored further in the multiple case study.

5.2 Consortia Characteristics

Each of the ten DELTAS Africa consortia constitutes an African lead institution and other African and international partner institutions. Lead institutions are based in several countries across sub-Saharan Africa (SSA): three in Eastern Africa (one in Kenya and two in Uganda), four in Western Africa (one each in Cote d'Ivoire, Ghana, Mali, Senegal), and three in Southern Africa (two in South Africa and one in Zimbabwe). Led by seven universities and three research institutions, consortia sizes range from four to fourteen core institutions. Three consortia are led by francophone institutions with both anglophone and francophone partners, while only one of the anglophone-led consortia has a francophone partner. A summary of consortia details is presented in Table 5.1.

Table 5.1: DELTAS Africa Consortia

Consortium*	Type of Lead Institution(s)	No. of co-applicants (including lead institution)	No. of collaborators	Focus
1	Research Institute	13	2	Research Area
2	University	7	0	Research Area
3	Research Institute and University	14	6	Broad
4	University	6	7	Research Area
5	Research Institute	4	0	Research Area
6	University	9	0	Research Area
7	University	5	14	Subject Area
8	Research Institute	4	18	Research Area
9	University	8	2	Broad
10	University	9	20	Research Area

*These consortium numbers do not correspond with the numbering used in the participant codes

5.3 DELTAS Africa Programme Strategies

The DELTAS Africa initiative aims to support African-led development of research leaders. The initiative is hinged on four strategic areas which were recognised as essential for strengthening and sustaining health research capacity in Africa. These are scientific quality, research training, scientific citizenship, and research management and environment. Scientific quality and research training focus on prioritising quality in the selection of candidates, type of training programmes in place and scientific oversight provided throughout the process. Scientific citizenship focuses on developing researchers who take on leadership roles in scientific programmes, participate in regional and international collaborations, and engage with public and policy stakeholders. Finally, research management and environment focus on strengthening research management structures and physical infrastructure to support scientific research. The objectives of the initiative (Box 5.1) are therefore aligned to these four strategic areas.

Box 5.1: DELTAS Africa Programme Objectives



Scientific Quality

Produce world-class scientific research that addresses African health and research priorities through scientific discourse and collaborative supervision



Research Training

strengthen scientific research training and build career pathways for scientific researchers



Scientific Citizenship

Foster mentorship, leadership and equitable collaboration in science, and engagement with public and policy stakeholders



Research Management and Environment

Cultivate professional environments to manage and support scientific research

The DELTAS programmes are driven by a Theory of Change (TOC) which maps out the interventions and expected outcomes as well as indicators for measuring these outcomes (Appendix 14). These form the basis for the monitoring and evaluation (M&E) of all the programmes, and each consortium's performance is assessed by the funders and the consortia themselves using these indicators. Each consortium developed a programme-specific M&E plan, taking into consideration the initiative-wide indicators as well as their unique goals and strategies.

5.4 Consortium management phases and processes

I have categorised the management processes used by consortia studied into the pre-inception, inception, and planning and implementation phases (Figure 5.1). This was informed by the study's conceptual framework (Section 4.2).

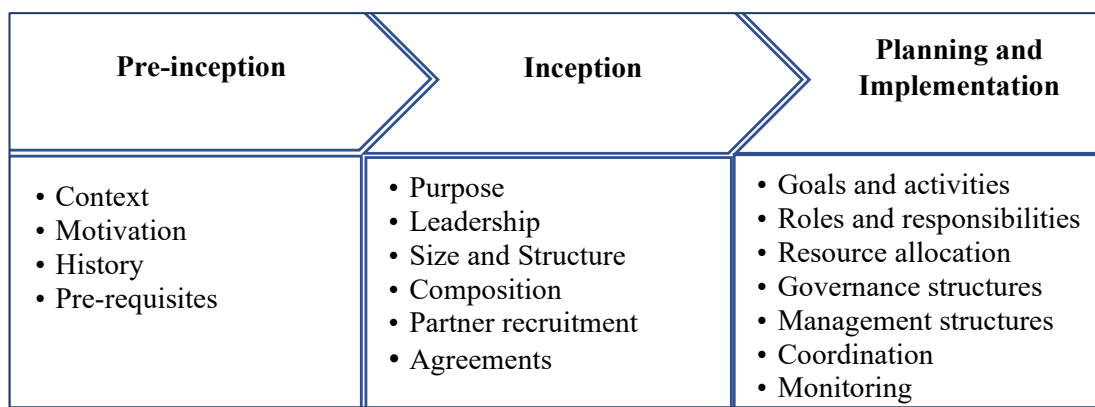


Figure 5.1: Consortium management phases and processes

As noted earlier in the thesis, the demarcation between the inception and the planning and implementation phases of a consortium is often blurred. In the DELTAS consortia, the planning process began at the inception phase, where major consortium management elements were broadly considered but were developed in more detail during the planning and implementation phase. To inform funding applications, consortia undertook high-level planning for management elements such as goals and activities, partner roles, management structures and budgets. These provisional decisions were reconsidered once funding was obtained and programmes moved into the planning and implementation phase. The detailed planning was informed by greater certainty of partners and programme resources and greater clarity on funder expectations.

Sometimes you write things when you are writing the proposal, and when you get the money, things change... when we were awarded the grant, we then had a theory of change workshop again, to then say “right, this is what we agreed we wanted to do when we were writing this proposal, are we still all on the same page?” (Director 2)

Although the blurred distinction between the phases is recognised, I will describe the management processes used by the consortia for each phase.

5.4.1 Pre-inception phase

The period prior to the inception of consortia had an important bearing on management choices and experiences. Discussions on a potential consortium began at this stage and usually involved one or more consortium initiators. Considerations made during this

phase included the purpose and pre-requisites for consortium formation either from the consortia themselves or the funder. Motivations for using the consortium model, pre-existing relationships existing among partners, and consortium leadership were also considered at this stage. These are discussed in turn.

Purpose and pre-requisites for consortium formation

The purpose of the DELTAS Africa initiative is to strengthen health research capacity on the continent. This was articulated in funder documents, and consortia leaders reported that the capacity strengthening purpose considerably informed consortium formation deliberations. Although the consortium model was not a pre-requisite for programmes, it was encouraged in the call for funding applications, and one of the four strategic areas of the DELTAS initiative focuses on fostering networking and collaborations with different stakeholders. Ten out of the eleven awarded programmes used the consortium model.

The DELTAS application process involved two stages. At the first stage, preliminary applications were reviewed, and shortlisted applicants were asked to submit full proposals. After reviewing the full proposals at the second stage, qualifying applicants were selected for face-to-face interviews. During the interviews, applicants received recommendations for refining their programmes based on comments from the reviewers, and also provided any required explanations and clarifications. Reviewers made recommendations on issues such as the size and structure of consortia and partner responsibilities. These will be discussed in more detail later in the chapter.

Motivation for formation of consortia

The choice by consortia leaders to use the consortium model was motivated by several factors (Box 5.2). The presence of common challenges among partners, such as low levels of research capacity and similar epidemiological profiles, was one of the foremost factors which motivated decisions to form consortia. A consortium provided an opportunity to synergize, creating a platform for pooling individual resources and consolidating efforts to address common challenges.

Box 5.2: Factors that motivated consortia formation

- Common challenges among partners
- Synergy (ability to pool individual resources and consolidating efforts)
- Complementary capacities
- Sharing of experiences and learning
- Positive experiences in previous consortia
- Strengthening regional and continental (South-South) collaborations

For example, some consortia were formed to address diseases that were endemic across their respective countries (for example, malaria). Some consortia leaders noted that it may be futile to seek to address the problem on national bases as such diseases are transboundary, and many institutions in Africa lack the level of resources required to tackle these health challenges on their own. This made the consortium model the best approach if the burdens were to be tackled effectively.

When you are dealing with a high priority issue that is affecting many countries or many locations, it makes sense to form a consortium... Joining forces for us makes sense, particularly in our environment in low and middle-income countries, because it is clear that none of the countries or the institutions has enough resources. (Director 5)

Consortia formation were also motivated by the opportunity to share experiences and learning in research and capacity development. Shared learning expedited the ability to tackle health challenges at regional, continental or global levels. Additionally, the opportunity to capitalise on the diverse strengths brought on board by multiple partners was perceived as an advantage.

Our institutions have worked on [Disease] for several years, but now we see that elimination is possible in some countries... so there is a real need to put all our strengths together, working together, sharing experiences... (Director 8)

It was the recognition that they have complementary strengths. So, at the research institute, people are doing research all the time... and there are pretty good facilities... and then at the university, there are lots of bright young people... (Director 1)

For most consortia, the aim was for partners to learn from each other through multi-directional sharing of experiences and lessons. However, this was not always the case as sometimes leaders were motivated to be givers or receivers of capacities. In one consortium, the lead institution's primary motivation for establishing a consortium was to gain assistance for their institutional goals, while another's motivation was to provide capacity for the less capacitated partners.

We had some capacity for [Research Area] whereas [Partner University] had very little capacity... so, the idea was to use the capacity available... and work with the university to put capacity there. (Director 1)

As shown later in the chapter, these different stances influenced the management approach adopted by consortia.

Additionally, some leaders adopted the consortium model due to positive experiences in previous consortia. The lessons learnt and first-hand experience of the benefits of the approach influenced the decision to take that route.

It [previous collaboration] had been a very rich experience... and I thought that it was a really good model to sort of adopt for developing partnerships within sub-Saharan Africa. (Director 4)

Furthermore, there was a general desire to promote and strengthen regional and continent-wide (South-South) collaborations. The opportunity to strengthen regional capacity, particularly for challenged institutions and the opportunity to break down language divides were additional motivations.

We have very strong institutions in each country and really, we want to work together, having the same scientific objective... we have the same epidemiology in many of these countries. We also want to work in the trans-borders... We would also really like to collaborate more with our anglophone countries. (Director 8)

History of working together

Most of the consortia were already collaborating prior to the DELTAS Africa initiative, while the rest took advantage of the funding opportunity to establish a consortium. In the case of the former, consortia had either previously implemented other programmes or existed as a form of network. In the case of the latter, partners had pre-existing linkages through individual and institutional relationships. These relationships were seen to have provided amenable contexts for the formation of the DELTAS consortia.

Determining Consortium Leadership

The initiators of most of the consortia and funding application processes became the leaders, and their institutions became the host institutions. Initiators were research leaders who pulled together potential partners, usually from their existing networks, to form a consortium. In only two of the consortia, the initiative was taken by a group who then nominated leaders based on their individual and institutional capacities.

*So, from those two meetings... we recognised that because the capacity was so limited, what we needed was to come together as partner institutions so that you are pooling together resources... So, that was the background of how we formed our consortium. And from that, I was made to lead the consortium because of how well-placed my institution is in terms of resources and leadership in that discipline.
(Director 6)*

These leaders then steered the funding application processes and subsequently became the Consortia Directors. All the Consortia Directors are established health researchers, mainly with biosciences and public health backgrounds.

5.4.2 Inception phase

Once the decisions to form consortia were made, leaders took the necessary steps to set up these consortia. These included determining the nature, size (referring to the number of partners), and geographical coverage. Leaders then identified and selected partners, and also determined the structure of the consortia. Although I discuss these steps in

sequence, in practice, leaders made multiple decisions concurrently, and different elements influenced each other as the establishment process unfolded. For example, decisions on geographical coverage influenced partners selected and vice versa.

Determining the Nature of the Consortia

Across all consortia, leaders mentioned that they did not deliberate on the type of collaboration being established. For many, the term ‘consortium’ was adopted because the funder had used that terminology and it did not connote any specific characteristics beyond representing a group of people working together.

I think the consortium came out of the way the initial call came out... Because that's what the funder wants, so you need to somehow fit into it. I really do not think that there is something really important that somebody should look at when considering that word consortium, because I think it was just a funder's terminology. (Manager 5)

To be honest, we use those terms interchangeably. Sometimes we call it consortium; sometimes we call it a network; so, there's no real value to any of those terms from our perspective. (Director 4)

I think that's just semantics really... I think the first word I would look for wouldn't be consortium. Partnership is probably a better word. (Director 1)

For the few who thought a consortium was a unique type of collaboration, definitions varied, and there were no specific characteristics that differentiated the terms.

But consortium fits very well because it's beyond collaboration, it's beyond just networking. It's not just working together. We also build the capacity of each other. We have common interests. (Director 10)

It was evident that for most consortium actors, the label of the group did not matter, and there were no mentions of discussions regarding the type of collaborations being set up and its implications for partner expectations and management processes.

Determining the Size of Consortia

With the exception of one consortium, leaders did not pre-determine the number of partners. The number of partners appeared to be organically derived in most cases. Even in the single case where the consortium had a pre-determined number of partners, the leaders noted that there was room for subsequent additions if deemed strategically beneficial. A number of factors influenced consortium sizes. First, existing networks wanted to maintain their membership and hence tended to include all interested existing partners. In such cases, new partners were added where gaps existed, or additional expertise or demographics were desired. Second, some consortia were not as limited by size consideration as they were by other factors such as the expertise needed to deliver project goals and geographical spread.

We thought a big consortium was better than a small consortium, and we wanted to have a spread across Africa... We wanted a mix of institutions, some are more-resourced, and some are less-resourced, and we thought that that would be a good opportunity for south-south sharing. (Director 9)

We basically looked at the partners we needed, and we brought them on board. So, our number was on the higher side. We got criticized a bit by the reviewers for that, but we thought that we needed all the partners bringing different things to the table, so that's why we had that number. Basically, we had those we needed to deliver the project. (Director 3)

On the other hand, some leaders purposed to develop smaller-sized consortia. The leaders in these consortia cited the desire to maintain close-knit and manageable collaborations. There were no specific definitions for 'small', 'manageable' or 'big'; or the number of partners associated with those terms.

There are still many people wanting to join, but beyond that, it becomes difficult to manage, so we decided to stop there. (Director 7)

We're trying now to focus on our ability to have a close-linked community of people working together. (Director 1)

The sizes of the consortia were assessed as part of the application review process and were therefore influenced by the funding agency. Funders recommended that some

consortia reduce the number of proposed partners to avoid becoming unwieldy, and to enhance management and budget efficiency.

But for the programme to cover all twelve members as co-applicants, the budget was too big. So, during the review process, the review committee told us to decrease the budget and to focus on a limited number of countries. (Director 7)

One of the things that we knew was that the funder had always thought we were too big... we thought strategically that we should take into account what we'd heard from the funder. (Director 9)

Deciding on Geographical Coverage

Though all consortia had a primary focus on Sub-Saharan African countries, the geographical coverage of consortia varied. Some consortia were deliberate in their decisions on geographical coverage, while the coverage for others emerged as a result of other partner selection criteria. One consortium focused on a single country, and others focused on single or multiple sub-regions. Reasons given by consortia with specific geographical choices included leveraging regional commonalities or diversities such as language and epidemiology.

We wanted them to be [Region] institutions... we thought we should start small in a way by having a Consortium within [Region] because we knew this region better than other places; that there was commonality of language which would make it easy... and the fact that countries were part of the regional community... (Director 5)

Selecting Partners

Partner selection was one of the most critical activities during this phase and was initiated by consortia leaders once the decision to establish a consortium had been made. Several criteria were considered in selecting partners (Box 5.3).

Box 5.3: Partner selection criteria

- Pre- existing formal and informal working relationships
- Similar interests
- Level of scientific and managerial capacities
- Past performance in previous programmes
- Geographical coverage
- Language considerations

Consortia leaders often fell on their existing formal and informal networks when establishing a consortium. Even when new members were included, the foundation members were often known to the leaders, and the networks of the known members became the source for further partner recruitment. Generally, leaders reached out to potential partners with similar interests or initiated consortium discussions at relevant meetings.

Basically two-fold, first is that they are existing partners of the centre already, and then two, we got in one or two others whom we needed to bring in for their expertise. (Director 3)

So, it was really a snowball. So, you know this person, and we get those contacts from the various people who were in the initial contacts, and then we used those contacts to be able to make contacts with partners institutions. (Director 6)

Consortia leaders also considered the level of the scientific and managerial capacities of potential partner institutions. Some consortia strategically chose institutions with strong or complementary research and management capacities, while others chose to work with a mix of institutions with varying levels of capacity. Partners with higher levels of capacity were selected for delivery of programme outputs and for mentoring while less-capacitated partners were primarily brought on board for capacity strengthening opportunities.

We thought about research infrastructure because what we wanted was partners who can make a contribution, and then we also thought that we have different strengths as sites. (Director 4)

For consortia which existed before the DELTAS initiative or partners who had previously worked together, past performance often influenced recruitment decisions. Partner performance in preceding programmes was used as an indicator of programme management capability.

We definitely had to think through how we have been performing and which institution had issues. "If we leave out this one, can we survive?" And [Partner] was dropped because it was very difficult to get information from them. (Manager 5)

Partner selection decisions were not always straightforward. Sometimes leaders had to decide between institutions with varying capacities in different areas. This was illustrated in one consortium where potential partner institutions had disparate scientific and managerial capacities, and leaders needed to decide which type of capacity to prioritise in their selection.

We tried to find the strongest PIs and the strongest centres also in terms of management. We had to look into this and find the right mix of science performance and management performance. It doesn't always match, science and management performance of certain centres, so we have to decide on what we want. (Manager 10)

Some consortia had more complicated situations as they tried to balance multiple factors which were not always aligned. The quotation below demonstrates a consortium's difficulty in trying to balance 'stronger' and 'weaker' institutions, previously known and newer partners, as well as geographical and language considerations.

So, we have decided... strong institutions, and then we also brought in other partners who we consider as weaker institutions and needed to strengthen their capacity... To have a long-standing partnership, we cannot start this with some institution we don't know. And, one of the criteria was that we wanted to breach or to fill the gap between geographical regions... and also to break the language barrier, so we wanted Anglophone and Francophone countries. (Director 10)

These challenges point to the dilemmas consortia leaders faced as they made management decisions, a phenomenon I explore further in the next chapter.

As noted earlier, considerations of geographical coverage also informed partner selection decisions. Some consortia aimed to either restrict or diversify the geographical coverage of the consortium. The motivation for geographical coverage varied among consortia. For some, the aim was to restrict or diversify the language for convenience and inclusivity respectively. For others, the aim was to leverage on existing wider regional structures such as country alliances. For others still, particularly consortia with a focus on a specific research area, the aim was more research-driven. Leaders sought to attain research synergies with partners with similar or diverse research contexts.

We wanted to cover much of the diversity of the continent, so we purposely wanted to have a representation of the different parts of the continent that is interested in [Research Area]. We know that the epidemiology is changing; not only is it changing, but it's different. The transmission is different, and people are different. So, we went and looked for collaborators that can add more diversity to what we are doing.
(Director 7)

These considerations highlight the fact that though these are HRCS consortia, research-oriented motivations affected partner selection decisions in some cases. This brings to the fore some of the underlying drivers of management decisions and how consortia perceive HRCS programmes, issues I discuss in more detail in the next chapter.

Determining the Consortium Structure

All consortia had two-tier structures, a practice which was largely influenced by the funding agency. As mentioned above, funders recommended the formation of smaller consortia during the funding application review process to promote management efficiency. This resulted in the categorisation of partners and the development of two-tier consortia structures. Consortia were made up of 'institutional partners' or 'co-applicants' in the first tier and 'collaborating partners' or 'collaborators' in the second tier. These terms and the functional differences between the two categories were also mainly determined by the funding agency. Co-applicants had part-ownership of the programme, made strategic contributions and significant intellectual inputs, were allocated some of

the awarded funds or received sub-awards, and had programmatic responsibilities towards delivering the outputs of the grant. The collaborators added intellectual and scientific value to the programme but played a minor role in delivering programme outputs. They did not typically receive grant funds, but costs related to activities undertaken by individuals from these institutions were covered by the lead institution. Consortia had to categorise their partners into these two groupings to adhere to the funder's recommendations while retaining all their members, albeit with different statuses.

We decided that the group was important, and we put a lot of work into keeping the group together... so, we used those agreed criteria to say, "okay we don't want anyone to leave... we went with the institutions who met the criteria that the partners themselves had defined. The others stayed on as collaborating partners... And that's the way that we tried to get two ends to meet. The one end was the expectations expressed by the funders, and the other was our commitment to the consortium as a whole. (Director 9)

In categorizing partners, consortia leaders recognised the funder's emphasis on excellence and its potential role in funding decisions and used that as a key criterion for determining the core partners.

The review committee told us to decrease the budget and to focus on a limited number of countries that are more likely to deliver because the issue of excellence was already part of the criteria. They wanted us to focus on the places which are already capable of delivering. So, we had to take that advice and resize the programme. (Director 7)

Thus, in structuring many of the consortia, 'stronger' partners were made co-applicants while 'weaker' ones became collaborators in response to the funder recommendations. Co-applicants had programmatic and budgetary responsibilities and were required to have the necessary resources and systems to manage and deliver on these responsibilities. Experience and past performance in previous programmes were used as indicators of partner capacity.

These sites were the ones that were considered to be very strong in terms of having strong environments for research and for grant management, and that would help the other sites. So, that was the main consideration. (Director 4)

So, it's more of the level of engagement and the level of productivity and performance by the respective institutions. That was the best in distinguishing between collaborators and partners [co-applicants]. (Manager 9)

For our first phase... we put all the institutions at the same level, but reporting, administrative issues and the deliverables were very difficult for some of the institutions. So, we have decided this time to take such strong institutions as the co-applicants... and the collaborators are the institutions that have a researcher involved in one of the topics or the institution where a fellow will be registered or be working at. (Director 10)

One consortium even instituted an application process where partners applied to become co-applicants, and selections were made in a transparent manner based on criteria pre-determined by the whole group.

So, there were criteria on how to select the co-PIs, and it was sent to all partners and those who wanted to, applied to be a sort of partner institution... We looked at the resources of that particular institution... human resources for the discipline, whether they have established programmes that can be used to enhance the other partners within the network... and then the past experiences in terms of capacity building and research. (Director 6)

All consortia adopted a hub-and-spoke management model, where the lead institution functioned as the hub of all consortia activities. All other partners were then connected to this central point. There were two variants of this model due to the two-tiered structures, the single and multiple hub models (Figure 5.2). In the single-hub model, all partners related directly with the lead institution irrespective of their tier. All partners received resources from and reported to the lead institution. In the multiple-hub model, the lead institution related mainly with co-applicants, who in turn related with the collaborating institutions. Co-applicants functioned as second-level hubs and thus received resources from and reported to the lead institution on behalf of their assigned collaborating institutions.

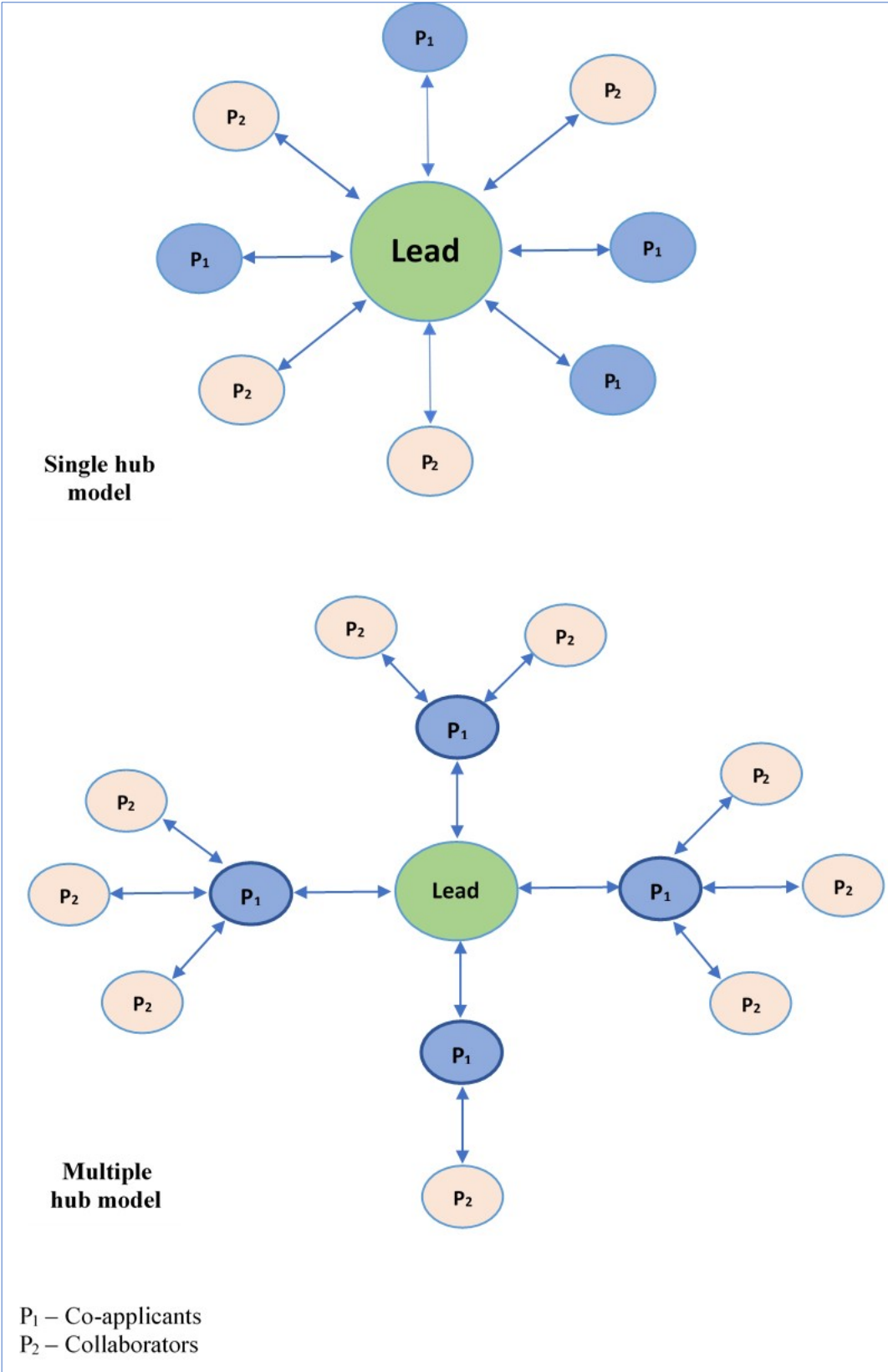


Figure 5.2: Hub-and-spoke models adopted by consortia

The single-hub model was the most commonly used structure with only one consortium employing the multiple-hub model. The hub-and-spoke model was prescribed by the funder. In this way, the funder related to and held only the lead institutions accountable for the consortia's resources and deliverables.

We deal mostly with the lead institution. Now that was a very deliberate decision we made. So, what we're promoting is a hub-and-spoke model of consortium management... As the lead institution, you're the hub. You take charge and responsibility for the resources that we give you on behalf of the entire consortium. You're responsible for accounting for every dollar that goes to the consortium. You will provide leadership not just for the science but also for managing the people, managing your partners, managing the resources... so our expectation is that we are not directly managing the sub-grantees who are their partners. (Funder Representative 3)

5.4.3 Planning and Implementation Phase

The main processes undertaken by consortia in the planning and implementation phase included developing goals and activities, assigning roles and responsibilities, instituting governance and management structures, allocating resources, establishing partner management structures, and coordinating and monitoring. These are discussed in turn.

Developing Goals and Activities

Consortia goals and activities were mainly based on the DELTAS Africa strategic areas as well as partner priorities. Processes for developing consortia goals were reported to be mostly participatory, either through a bottom-up or top-down approach. In the bottom-up approach, partners considered their strengths and needs and proposed their goals and activities. These partner-level goals and activities were discussed in line with the strategic areas, and the consortium goals were then formed. In the top-down approach, consortia leaders started the development process and proposed consortium goals and activities to partners for wider discussions and partner level inputs.

When we were writing the proposal, we sat down, and we said, right, what are the needs for [Partner A]?... [Partner B] has the greatest needs in the whole consortium. How can we support? (Director 2)

Goals for the consortium are negotiated. We've agreed on zeroing in on three main strategic classes... The thing is that the needs across the African universities are very similar... All these things are mooted at the secretariat, then in the partners' forum, they are presented and critiqued, and then we come up with a final product. (Manager 9)

In some cases, consortia emanated from existing networks and hence their goals were based on common research interests or previously determined research objectives.

We knew what the problem was. Actually, before we applied to this, we had a position paper which was published... where we really went into much depth to think about what we want to do and actually put it down on paper and to publish it. So, we already had a road map. (Director 9)

In other cases, goals were informed by partner strengths as consortia leaders perceived that leveraging partners' strengths would ensure a more competitive application and better delivery of grant outputs.

We asked ourselves, "what would be the strengths of our network in applying for this grant". Part of it was informed by what we thought were the most important scientific questions... and what was the strengths of the sites in terms of being able to deliver on those goals. (Director 4)

Assigning Roles and Responsibilities

The lead institution had oversight responsibility for all consortium activities. Even when that responsibility was delegated in the multiple-hub structure, the lead institution was still ultimately responsible to the funder. Roles within consortia were primarily determined by partner strengths and gaps at both individual and institutional levels. For example, a partner institution with the capacity (human and infrastructural) to host and lead training sessions was assigned that role. Similarly, partners with institution-specific

gaps took up the responsibility for driving those components of the programme. Roles were mostly assigned through discussions among partners.

There are people who train... so they already know who has the capacity to teach... We sort of know that for the MPhil, [Partner X] already has an MPhil programme running, so they're sort of in charge of the MPhil programme. And then for the PhD programme only [Partner Y] had a PhD programme already running, so they sort of give guidance to everybody else. (Manager 2)

We actually came together to discuss these issues and we sort of laid down who is most likely to be able to do what. So, we took the strength and weaknesses of the various institutions and the various PIs, and then we took into consideration issues like gender balance and things like that. (Director 7)

Co-applicants and collaborators were differentiated by their roles and responsibilities. However, there were similarities as well as differences across consortia in the roles assigned to the different categories. Whereas only co-applicants participated in governing boards in some consortia, this role was open to both categories in others.

Those co-PIs form part of the Executive Committee of the consortium, while others are simply partner institutions where our programmes are being executed. So, the co-PIs also have programmes being executed, but on top of that, they are also members of the Executive Committee. (Director 6)

The collaborators are stakeholders that contribute to the overall running of the programme, and there are places where they can contribute students. So, their students are eligible for applying to the programme, and they are part of the management of the programme, but they don't receive a budget. (Director 7)

In all but one consortium, only co-applicants had programmatic and fiscal responsibilities and had budgets while collaborators had only scientific responsibilities. This was because co-applicants were generally seen as jointly accountable for the funding together with the lead institution, whereas collaborators were not.

For the co-applicants, their institutions have specific institutional budgets, but for the collaborators, they basically do not have any budgets allocated to them, that's basically the difference. (Manager 5)

The co-applicants are responsible for everything with the funder... with the deliverables. (Director 10)

Instituting Governance and Management Structures

Though each consortium determined its own governance and management structures, all consortia aligned to similar levels, with only slight naming variations. Four main levels of governance and management were established across most consortia: advisory, steering, executive, and technical; though a few consortia make use of only the first three levels (Figure 5.3). Advisory level bodies provide high-level strategic oversight and constitute individuals with the requisite expertise and a wealth of experience. The steering bodies were generally made up of partner representatives and provide strategic direction for the programme. This included developing policies and processes, allocating resources and monitoring the progress of the consortium. The executive teams are responsible for overall programme management and day-to-day coordination of consortia activities. The executive teams operated from a Secretariat at the lead institutions and were made up of Programme Directors, Programme Managers and other support staff such as administrative, finance, M&E and communication personnel. The technical level groups were responsible for coordinating components of the programme, such as training or M&E.

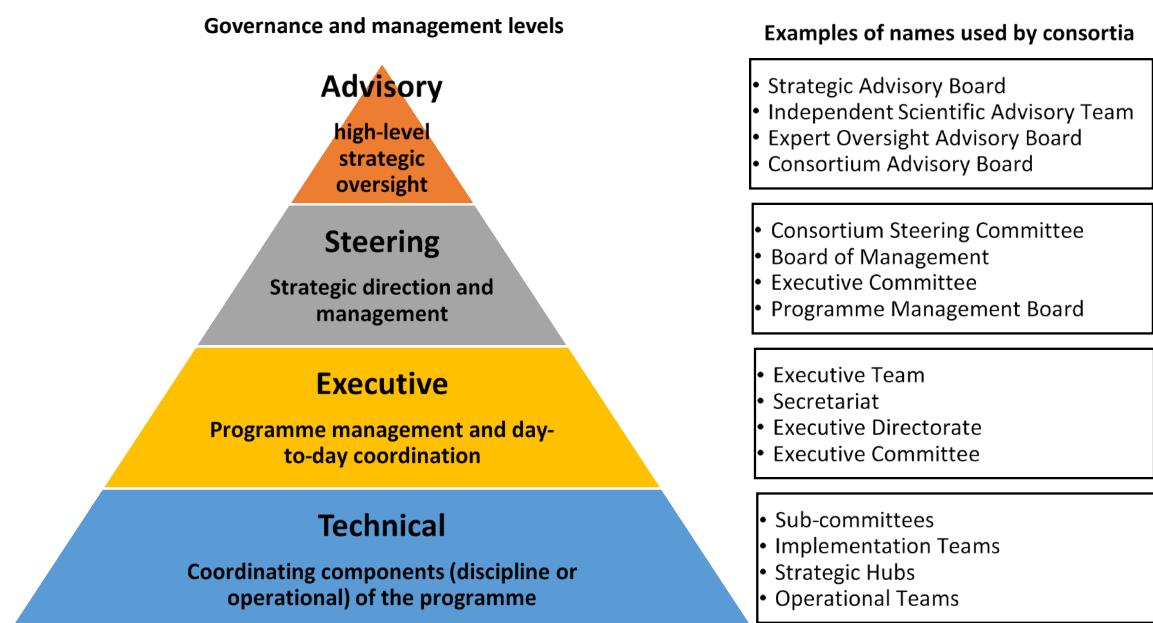


Figure 5.3: Governance and management structures and designations

The funding agency required each consortium to have an external and independent advisory board. The decisions to use the other levels were made by the consortia themselves. These decisions were influenced by the desire to ensure transparent and inclusive decision-making, and facilitate coordination, monitoring and accountability. Previous experience of consortia leaders and lessons from other consortia also informed these structures.

*I think even at the beginning the funders said we should have an advisory board.
(Director 1)*

We have always argued that there should be a representation from each partner institution on whatever committee so that the partners are in the know with what is going on, and then they participate in the decision-making. Governance will then be open, transparent and inclusive. (Director 5)

I think previous experience; having participated in a large consortium like that, you know you need to have governing bodies, you need to have counsel so that when you start getting lost, they can put you on the right path. (Director 7)

Consortia were also learning as they went along, and some of these governance and management bodies became necessary as consortia grew and learned lessons from their experiences. Thus, leaders adapted and introduced different levels based on the need.

*I guess again it's an evolution type of thing... we started off with four PhD fellows and two postdocs... it gradually mushroomed, and we got more money, and there were more things to do... The implementation teams sort of budded out of the executive because it was too much for one committee to just manage everything.
(Director 1)*

Allocating Resources

Budgets were developed at the funding application stage based on planned activities. Consortia mostly maintained their budgets after the grant was awarded, although any activity changes were reflected in a post-award budget. Fund allocations to partners were done in two ways. First, because training was central to the DELTAS initiative, most of the funds were allocated to various training levels and were apportioned based on the targeted number of graduates. What differed among consortia was the mode of

distribution of training fellowships among partners. Most consortia followed a merit-based system where potential trainees applied for fellowship opportunities and awards were centrally made to the most competitive applicants. A few consortia used a quota system where each partner was given a pre-determined number of fellowships. The merit system was based on open competition, and the quota system was based on equal distribution or partner capacity. For both the merit-based system, which was centrally managed and the quota-based system, which was managed at the partner level, the selection was competitive. The difference was the level of competition each system created. Consortia leaders admitted that the decision on which approach to adopt was challenging as each option had its pros and cons.

Regarding other consortia activities, fund allocations were based on budgets submitted by partners either for institution-specific activities or assigned consortium-wide tasks. For example, in one consortium, partners had to go through an application process to receive funds for institution-based activities.

What we do is we decide as a group, i.e. the partners together, on which functions will be managed centrally, and so we put money into that central pool... we know we are going to be training PhDs and postdocs, but the selection is going to be a competitive process... The core budget does not belong to the lead or any partner institution; it's in the central pool. Then we have allocations that are institutional in nature. In the beginning, we decide on how much will go to this institution and the other institution depending on their needs to some extent but also the kind of plans that they have. (Director 5)

Naturally, partners with bigger roles and responsibilities who were usually co-applicants ended up getting more resources than collaborators.

They [co-applicants] get a bigger budget compared to collaborators, and that is linked to their involvement. For example, [Co-applicant X] was hosting a training activity... we supported them to build... So, partners [co-applicants], as I've indicated, receive a bigger share because they also give back at a higher level. (Manager 9)

Establishing Partner Management Structures

Partner management was done at three levels. At the strategic level, each partner was represented on the steering committee, creating a 'peer-management' system, and ensuring multi-directional accountability among both lead and partner institution. As noted in Section 5.3.3, one of the factors that influenced this type of structure was a desire for transparency within consortia.

At the operational level, partner management mainly covered programmatic and financial oversight. Programmatic management involved monitoring the implementation of activities at both consortium and institutional levels. Financial management involved monitoring partner expenditure and reporting on allocated funds. While some consortia took a primarily centralised approach to partner management others took a more decentralised approach. For the primarily centralised approach, partners were directly managed by the secretariat. For instance, all fellowship funds were managed at the secretariat; and the expenditure for activities executed by partners was either directly made by the secretariat where possible, or partners received funds for specific activities for local payments. They subsequently submitted reports on the activity and the disbursed funds. One reason given for this approach was the need to avoid bureaucracies in partner institution that tended to slow down consortium operations. Another reason was trainee affiliation to multiple institutions in some cases which created complicated institutional arrangements, making it easier for the lead institution to manage all expenditure.

It's mainly bureaucracy, and bureaucracy can have a very serious impact on facilitating a fellow... slowness in processing and long procedures of procurement, where procurement is involved, kind of complicates the whole scenario. Yet here in the secretariat, this is the job we are employed to do... So, it's not a matter of controlling others, but it's more of facilitating the fellows. (Manager 9)

If you see the way fellows are recruited, you will see that there is a problem of funds allocation. They can be in one institution doing research and registered to another institution; you see how the money flow will be complex... we have decided that the co-ordination centre should handle the fellowships. (Director 10)

For the primarily decentralised approach, partners received annual sub-awards based on their work plans and budgets. Quarterly disbursements of budgeted funds were made

based on the work plans, and corresponding reports were submitted to the secretariat. Consortia adopting this approach cited the need for partner involvement in management as part of capacity strengthening, and to facilitate partner-level activities.

The money comes to us, and then we have to disburse the money to our various partner institutions. So, to do that, we need to go into sub-contract with these partner institutions. They have to sign the contract, and then after everything is agreed upon, we send the funds. (Director 6)

Once again, leaders needed to work through these different options and determine bases for their partner management strategy decisions. Finally, at the technical level, many of the consortia formed various committees with representatives from each partner institution to coordinate specific portions of consortia activities. For example, a finance committee was made up of finance personnel from all partner institutions. Hence, the 'peer-management' system was replicated at this level.

Coordinating and Monitoring Activities

The executive team based at the secretariat led the coordination and monitoring of consortia activities. Partner Leads were responsible for all activities at their respective institutions. Annual reports from all partners were consolidated into a consortium report for onward submission to the funder. Coordination and monitoring were facilitated through multiple channels, including e-mails, telephone, and online and face-to-face meetings. Consortium-wide annual general meetings (AGM) were also organised by all consortia, providing a platform for leaders, partners, and trainees to meet and offer feedback on both scientific and managerial activities. Advisory and steering committee meetings were usually held alongside the AGM. Additionally, the executive team periodically visited partner sites for monitoring, learning and partner engagement purposes. The monitoring of consortium activities and outputs was based on the DELTAS Theory of Change indicators, the 'standard' by which consortia performance were assessed.

5.5 Similarities and Differences Across Consortia

There were some similarities as well as differences in management practices across the consortia studied (Table 5.2). Generally, there were similarities in the consortium structures made up of co-applicants and collaborators, the hub-and-spoke model, governance and management structures and processes, and coordination and monitoring processes.

Table 5.2: Similarities and differences in management practices across consortia

Similarities	
Management Structure/Process	Description
Consortium structure	Hub-and-spoke models
Partner categories	Co-applicants and collaborators
Governance and management structures	Advisory, steering, executive and technical levels
Coordinating and monitoring	Reports, meetings, and site visits
Differences	
Management Strategy for:	Range of strategies
Selecting partners	<ul style="list-style-type: none"> • Prioritising partners with different levels of capacity • Focusing on different research and/or geographical areas
Determining goals and activities	<ul style="list-style-type: none"> • Top-down or bottom-up approaches • Focusing on partner strengths or gaps
Assigning roles and responsibilities	<ul style="list-style-type: none"> • Based on partner strengths or gaps • Different roles for co-applicants and collaborators
Allocating resources	<ul style="list-style-type: none"> • Merit-based or quota-based
Managing partners	<ul style="list-style-type: none"> • Centralised or decentralised systems

The similarities across consortia appear to be unplanned. As indicated earlier, although the consortium structures were influenced by the funder, the governance and management structures and coordination and monitoring processes were mainly determined by the consortia themselves. The only exception was the requirement from the funder for all consortia to have an independent advisory committee. Therefore, the use of similar

structures and processes could have been because those had been frequently used by collaborations over the years and were the most known. Consortia leaders acknowledged that they applied learning acquired from experiences with other consortia.

Differences in consortia approaches included strategies used for the various processes, including when determining goals and activities, assigning roles and responsibilities, allocating resources, and managing partners. For instance, some consortia used a top-down approach in determining goals and activities, while others used a bottom-up approach. In the same way, consortia had two categories of partners, co-applicants and collaborators, but the levels of participation accorded the latter varied among consortia. While the categories were clearly differentiated in some consortia in terms of the roles and access to resources, there was very little distinction between the two in others. As noted earlier, resource allocation (particularly in awarding fellowships) and partner management approaches also differed.

Due to the unique ways in which consortia approached their management processes, there were no obvious ways of categorizing consortia in clear groups. Even when consortia appeared to use a similar approach, such as the merit-based resource allocation approach, this was operationalised differently among consortia. For example, elements of the quota-based systems were incorporated into merit-based resource allocation approaches in different ways, making it too complex to place consortia in distinct categories. Any such categorization may fail to depict the true picture of each consortium's management approach as it will miss the intricate distinctions across consortia. This highlights the unique, contextualized, and nuanced nature of management approaches and demonstrates that consortium management approaches cannot easily be formularized.

5.6 Cross-cutting Influences on Consortium Management Processes

Exploring the management processes of consortia highlighted some key factors that influenced the different consortia practices. I present these factors next, which include funder expectations, perceptions of RCS, motivation for formation of consortia, previous partner relationships and consortia experiences, and intentionality and emergence.

5.6.1 Funder recommendations

The role of the funder in consortium management decisions seemed paramount, as their preferences, advanced through recommendations and instructions, were often taken up by consortia. The funders' influence in many of the management decisions, including size and structure of consortia, criteria for partner selection and categorisation, and governance structure was demonstrated across consortia. As noted above, funders recommended the formation of smaller consortia during the funding application review process to promote management efficiency. Additionally, the funder's emphasis on excellence and preference for supporting stronger institutions was inculcated in consortia, which shaped their decision-making procedures. Thus, institutions with strong research and programme management capacity were prioritised in the selection of core partners, almost making existing capacity a pre-requisite for participation in the initiative.

DELTA is kind of unashamedly an elitist concept... We made a decision that we're going to base the development of DELTA around excellent science, and so we don't see it as one of our roles to support very early stage and weak environments (Funder Representative 1)

This raises questions about the capacity strengthening aim of the DELTA programme and how that is manifested in the programme requirements and consortia processes. These questions will be discussed later in the thesis.

5.6.2 Perceptions of research capacity

Although the focus of all consortia was RCS, it became apparent that research interests, compared to strengthening research capacity, were a driving factor for many management decisions including partner selection and development of goals and activities. While it may be argued that there is substantial overlap between conducting research and strengthening research capacity, it appeared that often, consortia actors equated the two. Hence in many cases, management decisions appeared to be more research-oriented than capacity-strengthening-oriented. Additionally, there was more emphasis on technical research capacity than the managerial aspects of research capacity. As will become clearer in the next chapter, several factors influenced these orientations, which in turn had implications for management practices and capacity outcomes.

5.6.3 Motivation for Consortium Formation

The motivations for establishing the consortia appeared to influence the management structures and processes that were eventually adopted. For example, consortia that were motivated by opportunities to conduct research were more research-oriented in their decision-making, such as when prioritising goals and activities. In one of the consortia, the Director noted that the main motivation for establishing the consortium was to provide capacity for the other partners. This consortium's governance and management structures and processes were strongly built around lead institutional stakeholders, with few formal opportunities for the participation of the other partners. This approach suggests possible influences: 1) the consortium subscribed to a centralised approach to management, 2) the other partners were perceived to have little managerial capacity, or 3) the capacity strengthening goals of the consortium and process for achieving them were limited to technical research capacity and excluded managerial capacity. Again, this points to consortia actors' perception of research capacity and its influence on management processes. A second consortium was motivated by the host institution's quest for assistance in strengthening its research capacity. Hence, the main role of the partners that were brought on board was to help the lead institution achieve its goals. The management structures for this consortium were also strongly built around lead institutional stakeholders.

We have an implementation committee that's made up of representatives from the lead institution... We do not necessarily have a steering committee... we have a partner representative on our Advisory Board and a partner representative on our implementation committee. (Manager 3)

It appears that the strengthening of partners' capacity was not a primary goal for this consortium, and this appeared to reflect in the type of management structure used. Thus, the motivations that drove consortia formation appeared to consequently drive how leaders approached the management of the consortia.

5.6.4 Previous partner relationships and consortia experiences

It became clear that previous experiences played a huge role in management decisions throughout consortia processes. Consortia mostly opted for 'the known' such as previous

partners, new partners recommended by previous partners, and geographical areas which existing networks represented. It was noted that many of the management processes and practices were considerably informed by consortia actors' previous experiences in various consortia; thus, these processes and practices appeared to be replicated from consortium to consortium.

5.6.5 Intentionality and emergence

Many of the adopted management structures, processes and practices were continuously refined as consortia went through the inception and planning and implementation phases. Although consortia proposed initial ideas on their management in the applications, these planned management frameworks were refined at the various stages as inputs were made by various stakeholders. Funder recommendations during the application review process, programme requirements, and partner inputs informed this refinement process. In many of the consortia, steering committees established during the planning stage deliberated on and agreed on the management processes. The degree of intentionality or emergence with regards to management processes varied across consortia. Some consortia were intentional about some elements such as geographical coverage and having inclusive steering committees which were upheld throughout consortia processes. Decisions on who took up the role of Consortium Director, which were made at the inception phase also remained unchanged across the board. On the other hand, the number of partners, consortium structure, and governance and management levels were some of the management-related elements that changed for some consortia during the application and award process. Generally, management processes and practices continued to be refined throughout all the consortium phases as even feedback from the implementation stage informed this process.

5.7 Chapter Summary

This chapter has presented a description of the consortia's management structures and processes at the pre-inception, inception, and planning and implementation phases. The findings indicate that similar management structures and processes were used across all the consortia. However, differences were observed in the approaches adopted by consortia in executing each management process.

Factors that influenced the choice of approach included leaders' motivation for establishing the consortia, funder recommendations, and consortium actors' perception of research capacity. Other strategic reasons such as maintaining existing networks and diversifying geographical and language reach also informed consortia decisions. It emerged that decision-making regarding management processes was not always a straightforward process as it involved navigating different options and balancing multiple influences on the process. There were indications of various dilemmas that consortia leaders faced in the process. For example, consortia leaders needed to consider whether to select partners with higher levels of research capacity or those with the greatest need for the opportunities that consortia sought to offer. Leaders also needed to make decisions between options such as decentralized and centralised partner management, and between quota-based and merit-based resource allocation approaches. These reveal the complex nature of decision-making in consortium management and the tensions that leaders have to negotiate in the process. It was evident that these tensions and the factors that influenced management strategy choices were critical to consortium management and merited a closer examination. These findings formed the basis for Phase 2 of the study where I conducted a more in-depth examination of the highlighted issues in a case study with three selected consortia. In exploring the management practices of the ten consortia, the different institutional, historical and programmatic contexts within which the consortia operated, their characteristics such as size and diversity, and the various management approaches used were highlighted. Hence, the three study cases were selected based on these factors, with the aim of leveraging the variations among consortia. The case study focused on examining in more depth the factors that emerged as critical in consortia management and outcomes. Thus, the cases enabled a closer interrogation of the processes and considerations in determining consortium management strategies and the effect of selected strategies on consortia operations and capacity strengthening. In the next two chapters, I present the findings from Phase 2.

CHAPTER 6: CONSORTIUM MANAGEMENT TENSIONS AND STRATEGIES

6.1 Introduction

In the previous chapter, I described the management processes used by ten DELTAS consortia. I highlighted the similarities and differences among consortia and some of the key factors that affected their management processes. It became evident that differences among consortia lay in the management strategies used and consortia leaders encountered tensions in their decision-making processes as they were often faced with dilemmas when determining the management approaches to use. Tensions were revealed right from consortia's inception stages, and the emerging tensions revealed the complex nature of managing consortia. Hence, it was important to unpack the processes involved in determining management strategies to uncover the nuances and drivers of consortium management practices. To further understand consortium management processes and approaches, and their determinants, I examined the decision-making considerations and influences in more detail in three case study consortia. In this chapter, I present the tensions encountered as these case consortia planned for and executed key management processes. I discuss the considerations made by leaders as they made choices between different potential strategies to adopt, factors which influenced their decisions, and the management outcomes when these strategies were implemented.

6.2 Study Cases

As indicated in the previous chapters, the three consortia were purposefully selected based on the following criteria: 1) consortium characteristics and contexts such as size, range of subject focus, and geographical and language diversity; 2) management approaches such as the use of centralised or decentralised partner management systems; and 3) type of lead institution such as university or research institute.

Consortium A is hosted by a research institute and made up of fourteen (14) co-applicants. These constitute universities and research institutes from Africa and HIC. The African co-applicants are based in anglophone countries spread across three Sub-Sahara African regions. The consortium had previously implemented a capacity strengthening programme before the DELTAS initiative. Consortium B constitutes eight (8) co-

applicants, is hosted by a University, and has both African and HIC partners. The consortium was established as a regional consortium, and hence all the African partners are based in a single sub-region and from anglophone countries. Consortium B has both universities and research institutes as partners. This consortium had also implemented a capacity strengthening programme prior to the DELTAS initiative. Consortium C is made up of eight (8) co-applicants. The consortium is hosted by a university and has both university and research institute partners, mostly from Africa. This consortium emanated from an existing network, though new members were added for the DELTAS programme. Partners are based in all four Sub-Saharan African regions and have different primary languages though communication in the consortium is in English.

6.3 Tensions Encountered and Mitigating Strategies Adopted for Key Management Processes

There were similarities in the tensions faced by all three consortia. However, the management strategies adopted across the cases differed, either by type of strategy or in how the strategy was implemented. I discuss the main tensions encountered by consortia, strategies adopted, factors that influenced those decisions, and how selected strategies worked out.

6.3.1 Addressing individual or collective interests

Consortia leaders had to deal with diverse interests of individual partners as well as any collective interests. Partners differed in capacities, interests, priorities and expectations, and consortium goals were not a simple amalgamation of the diverse partner goals. These inclinations were influenced by each partner's level of research capacity, perceived capacity needs, and the value placed on the different capacity components. Budgetary and time limitations also meant that consortia needed to develop an acceptable set of goals and activities for their DELTAS programme. These goals had to be based on both partner and shared interests to ensure that the collaborative ethos was maintained.

You are dealing with different people, different backgrounds with different resources and you always have this fine line to find between the interest of the group and each one's interest... that's where the leadership role of the leader comes in. If you are not careful, you will break the group. (Consortium C, Lead Institution, R1)

What I recall is the dilemma... given the breadth of interpretation [of research capacity] and the resources available. Of course, it's difficult to cover the entire breadth with the resources available. And so, whereas ideally, you'll like the capacity development to extend and cover all these different aspects, we had, in the application, to limit it. (Consortium B, Lead Institution, R2)

A very dramatic example... We said, "what level of training should we focus on for researchers, postdoc, PhD, Masters, interns?" And of course, different people seated around the table, representatives of different institutions, had their views... One of those would even bang the table to say, "we are not interested in postdocs first of all, because we don't have PhDs... that's not our priority. If our institution is to move forward, we want Master's training", with a bang on the table. And you can see that was an interest driven by the peculiarities of the institution. (Consortium B, Lead Institution, R2)

Although each consortium experienced and addressed this tension slightly differently, consortia's interpretation of RCS and their respective foci served as the foundation and mould which shaped their decisions on goals and activities. Consortium A largely worked within its existing framework of individual-level training of researchers which had been established prior to the DELTAS programme.

We must remember that a lot of the consortium ethos and thinking was already there. So, we took that thinking which was already aligned with a lot of our institutional goals (Consortium A, Partner Institution, R5)

Similarly, because Consortium C had emerged from a research network, it had an existing road map for strengthening capacity in their research area of focus. Consortium C therefore tackled this tension by incorporating a wide range of goals in this road map, which provided each partner with the opportunity to work towards goals that were tailored to their needs. Their goals ranged from the training of individuals to building a continental network of research infrastructure.

The consortium goals have been built to take into account the breadth of those needs... some have just MScs, because that's where their needs are, and others have MScs and PhDs, and others have MScs, PhDs and postdocs, and others have a bit of all of that and also require sophisticated infrastructure... so we have been sort of providing for the whole array of needs. (Consortium C, Lead Institution, R1)

Consortium B had to juggle several interests and hence experienced more tension in this area. Consortium leaders were committed to identifying and addressing research capacity needs of the region as a whole. In addition, leaders were committed to a broad approach to research capacity strengthening that aimed to tackle both individual and institutional as well as technical and managerial capacities. Partner institutions also had their own priorities:

There was a difference in the way our individual institutions looked at the need, which in some ways is not surprising... because you define your need based on where you are and what level you are at. You say, "I want to go there" while the one which is at a higher level at the beginning will say, "but that is too low a level, we want to go much higher". (Consortium B, Lead Institution, R2)

As a result of these considerations, it was essential for Consortium B leaders to address both individual and collective needs. In addressing this tension, two sets of goals were developed: consortium-wide and partner-specific. The former incorporated the consortium's collective capacity strengthening goals, while the latter advanced partner institution's capacity strengthening goals. Consortium leaders reasoned that:

If institutions are going to be very interested in being part of the consortium, they must see benefits that relate to their own institutions... We also want to function as a consortium, and we have to strengthen the consortium (Consortium B, Lead Institution, R2)

Hence, each consortium adopted a different approach in addressing this tension which I have termed as the 'common goal' (A), 'two-level-goal' (B), and 'goal menu' (C) approaches respectively. The two latter approaches appeared to provide opportunities for incorporating partner-level needs in consortia's stated goals for the imminent programme. The former approach appeared to work with a common focus which is in line with a pre-determined consortium direction.

6.3.2 Prioritising efficient programme delivery or effective capacity strengthening

Another major tension that consortia faced was between prioritising efficient programme delivery or effective strengthening of partners' capacity needs. This tension was experienced during several management processes starting from partner selection through

the determination of consortia goals and activities, resource allocation, and partner management.

Selecting Partners

As indicated in the previous chapter, leaders were torn between selecting partners who had the capacity to perform or those who needed their capacity strengthened. Leaders were aware of the need to demonstrate competitiveness by partnering with ‘stronger’ institutions in order to successfully win the grant. Leaders reasoned that ‘stronger’ partners would result in high-performing consortia which would then be more competitive in future funding applications. On the other hand, consortia were aware of the programme’s capacity strengthening aim and the need to build up less capacitated partners on the continent. Leaders described deliberating on this dilemma considerably.

Should we go for second-tier, third-tier, or first-tier universities? Should we go for universities that have a lot of funding and resources or should we go for universities which have nothing? We spent a lot of time in identifying our partners (Consortium A, Lead Institution, R2)

It is a tricky situation because you want to present a proposal that is competitive against others and so you are debating... if you want a very competitive application, take the best institutions. Of course, everything else remaining equal, those are likely to be winners over a worst-case scenario where you’ve got just the not-so-strong institutions as a consortium. But when you start bringing in other considerations, you want to bring the weaker ones; you want to all move together; then the situation becomes a little tricky (Consortium B, Lead Institution, R2)

Consortia took different approaches. While recognising the capacity needs of ‘weaker’ potential partners, Consortium A prioritised partner performance in their selection of partners. Consortium leaders reckoned that by selecting partners with adequate resources and capacity, the consortium would produce significant results:

We are only dealing with first-tier universities... We were very deliberate about that because we don’t want to start from 100 kilometres. At least they were already running so let’s run with those... If you started with [University X], where do we even start? Do they even have fellows? Do they have faculty to train, maybe they

don't? ...and it's not that [University X] doesn't have gaps, but they don't have the resources and infrastructure yet... So, it was strategic... if you want results, you have to pick and choose. Where do you want to invest your time? Sometimes you can push the mountain and move it one inch, but you would rather go for this mountain and move it one metre. So, it was deliberate. (Consortium A, Lead Institution, R2)

Consortia B and C aimed for a balance by involving partners with varying levels of capacity. Both consortia had specific capacity strengthening goals. Consortium B leaders aimed to raise the level of the region's collective research capacity through networking institutions across the region. Consortium C leaders aimed to address capacity gaps in their research area on the continent through linkages between institutions with existing research capacity and those with lower levels of capacity. Both leaders thus established consortia made up of a mix of 'stronger' and 'weaker' partners with the expectation that they would have the ability to both win and implement the grant and also strengthen the less capacitated partners.

The Director said, 'okay this is the map of Africa... we need to be wide and to cover the different regions of Africa and also the different languages, to bring everybody together' ...We started with people who were interested in [Research Area] and already working on that topic, and then the second layer, also a bit. But the third layer was more from countries that were not doing much research (Consortium C, Partner Institution, R3)

Opting for a mix of institutions with different levels of capacity was not without its challenges, and Consortium B leaders acknowledged that it involved the risk of delivering suboptimal results. However, the leaders reasoned that it was worth taking that risk in order to achieve the consortium's primary aim of strengthening capacity.

We wanted a mix of 'stronger' institutions and some which were not so strong in research... Without that consideration, we would have gone for just the strongest institutions. We would go with that because we know they'll deliver, and capacity will be enhanced to a much higher level, and so to the viewers or observers, we will have a great output. But we took the risk and said, "let's have the less-strong in order to build their capacity". Our interest as a network was to pull everybody up as we move. So those were very important considerations. (Consortium B, Lead Institution, R2)

It is clear that across the three cases, consortia leaders selected partners in alignment with their unique prioritised aims for the programme.

Determining Goals and Allocating Resources

As noted in their partner selection approach, Consortium A's primary aim was to deliver programme outputs. Therefore, in determining goals, leaders focused on what one participant termed as "low-hanging fruits" and concentrated on activities that would quickly produce measurable outputs as stipulated by the programme's evaluation indicators. Consortium leaders argued for investing more in individual fellowships than in institutional systems, reasoning that the former produced more results with less investment. Thus, in addressing the tension between efficient delivery of outputs and more effective capacity strengthening of partners, Consortium A prioritised the former and focused efforts and resources on training individual researchers.

It's easy to start with fellows... I don't like low-hanging fruits, but maybe it's a low-hanging fruit. It's easy; you can easily organize something and count. Data systems, for instance, are hard to count, but what is a good data system, how many can you set up, maybe 10? For the same amount that you can use to train 500 fellows, maybe you can set up 10 data systems. (Consortium A, Lead Institution, R2)

Although Consortia B and C paid slightly more attention to strengthening institutional-level capacity, all three consortia allocated most of their resources to individual researcher training. The effect was that other RCS activities such as the strengthening of institutional training programmes or infrastructure that may have benefitted less capacitated partners were allocated minimal or no resources. The emphasis on trainees appeared to have been influenced by perceived funder expectations. Although the DELTAS programme covered four strategic areas, evaluation indicators appeared to prioritise the training of researchers, which significantly influenced consortia decisions. The emphasis on quantified indicators was reported to have influenced consortia priorities.

DELTAS has got those pillars of the theory of change... Of course, there's a lot of emphasis on numbers; you know publications, amount of funding, and so forth... I think the capacities depends on how you interpret those four. (Consortium B, Lead Institution, R2)

Determining Partner Management Systems

The tension between efficient output delivery and effective capacity development processes was also very evident as consortia determined strategies for managing partners. As was identified in the previous chapter, partner management systems were either primarily centralised or decentralised. Consortium A chose a primarily centralised partner management system, while Consortia B and C used decentralised approaches. These decisions were influenced by multiple factors. Consortium A leaders noted that an assessment of the partner institutions conducted during inception phase indicated gaps in institutional management systems and varying capacities across partners. Leaders argued that attempting to deal with these grant management gaps in partner institutions would adversely affect the consortium's ability to deliver on its primary aim of training fellows.

We knew that the financial systems were really problematic, and we didn't want to be dealing with financial issues as opposed to dealing with the primary functions of the consortium. So, we said, let's first push and get out the fellows... that process alone is capacitating to the partner institutions... We didn't feel like at that point it would be wise. Otherwise, we would spend 50 percent of the time chasing money... because you know the bureaucracy of the Universities... can be problematic, so we wanted to remove that. We didn't want people to say, "I can't finish my PhD".
(Consortium A, Lead Institution, R2)

Regarding the decentralised systems used by Consortia B and C, leaders noted that the main factor that influenced the choice was its value in capacity strengthening. Consortia leaders pointed out that establishing consortium management processes at the partner levels would strengthen additional capacities at these levels. Consortium B leaders noted that the consortium had a wide-range approach to RCS and subscribed to strengthening both scientific and managerial capacity at individual and institutional levels. Leaders noted that the decentralized system was employed because it was in line with that approach.

We used that strategy because... we are interested in building capacity of individual researchers, individual research administrators and also capacity of institutions. And we think that if you decentralise, you give opportunity to institutions, because they are managing those funds, to build their own capacity in the process.
(Consortium B, Lead Institution, R2)

The tension inherent in this decision was demonstrated when Consortium B leaders had to justify the choice of the decentralised system to actors within their own institution to allay fears of potential inefficiencies at partner institutions and the effect on consortium performance.

The process included getting people to understand how the decentralised approach is going to work... explaining to some of my colleagues why you need to take that long approach... On the one hand, because of the bureaucracy, it kind of delays how fast you want to do things, but on the other hand sometimes that's the price you'll have to pay if you are going to build capacity. You'll have to be patient with the systems. (Consortium B, Lead Institution, M2)

Similarly, Consortium C leaders maintained that sharing management responsibilities with partners was not only a way of improving coordination but an effective way of sharing the capacity strengthening benefits of management with partners.

We decided to share the responsibility, to share the workload and to share the resources so that the project runs better because it will be too much for just the lead institution... And it's also a way of improving the capacity in these places... they have to be involved not just as participants, but playing a more active role in running an aspect of the programme, and in that process, it also improves their own capacity... in the specific deliverables that they have and also in project management... So, having this decentralised system, sort of spreads or... contributes to the overall lifting of the research environment in these places. (Consortium C, Lead Institution, R1)

There were many reactions to the centralised and decentralised partner management strategies from both consortia leaders and partners. Regarding the centralised system, Consortium A actors noted that there were fewer challenges with reporting requirements as leaders did not have to deal with systemic challenges in partner institutions. The lead institution had greater control of operations which averted risks and maintained the consortium's reputation with funders.

Centralising consortium funds is great, simply because different universities have different bureaucracies; and from experience and what I have seen, bureaucracies in different universities have delayed certain systems. Therefore, when you put it here [at the partner institution], you are likely to have mismanagement of those funds, not because they are mismanaged, or they are not doing the work, but quality control is missing (Consortium A, Partner Institution, R3)

Both leaders and partners acknowledged that the main disadvantage of the centralised strategy is the missed opportunities for strengthening partners' capacity.

We have noted that the disadvantage of the centralised system is that the partners do not really grow. They are dependent on the capacity of the lead institution... The capacity is still at minimal levels. (Consortium A, Partner Institution, M2)

When we think about the next phase of the consortium, we think about how to strengthen this. We are sort of trying to see how to replicate the secretariat in all the partner institutions so that they do most of the work themselves. Because after ten years, maybe 15 years... we should have strengthened the institutions themselves to keep this thing moving (Consortium A, Lead Institution, R2)

Consortium A partners also felt quite detached from the management of the consortium, engendering a diminished sense of ownership of the consortium's activities and limited institutional embeddedness.

We are not seriously looking at the consortium as a programme... That's the main disadvantage... You seem like you are just supporting other than being a main player... because it's centralised (Consortium A, Partner Institution, M2)

When it comes to activities you want them to participate in that are not really financially tied, then you do a lot of lobbying... It's more of a lot of negotiation that has to take place, and so one has to be very patient when dealing with the partner institutions... When it comes to other aspects that touch on finances, then there is a greater commitment, and it's a more manageable way of dealing with the consortium. (Consortium A, Lead Institution, M1)

The tension between efficiency and effectiveness was not only faced by consortium leaders but also by partners who were still torn between the two options.

There will be some partners that will be weak, and some will be strong. It's good to build that capacity within the institutions so one can argue that. But I know after I've managed programmes where you sub-contract to people, it's usually a nightmare sometimes to report. So, there are pros and cons of having a centralised system. (Consortium A, Partner Institution, R5)

Similarly, the decentralised approach also had its advantages and disadvantages. Delegating managerial responsibilities through sub-awards gave partners the power to make decisions and control the grant at their levels. Partners were empowered to tailor their processes and plans to suit the local context, a process which facilitated capacity strengthening. This practice promoted partner ownership of the consortium's goals and activities and helped sustain the built capacity.

It helps when you give institutions some sort of power... you are building a system that will last other than having everything run from the lead institution... I think that also brings in some bit of ownership because the institution feels like oh, there is some money that comes here. (Consortium B, Lead Institution, M3)

We're building their capacity to move on beyond the current consortium grant... There are partners who've actually come back to us and said, "We are getting less money from the consortium, but we've actually learned a lot which has enabled us to go on to bigger grants". (Consortium B, Lead Institution, M2)

In addition, there is multi-directional peer learning as lead institutions also learnt from partners and partners learnt from each other. Lead and partner institutions learnt more about the unique contexts within which others operated.

It's good because this gives us a new experience to manage money, and it is a good experience... we are discovering new procedures, we are discovering new things... that is the benefit of the management of co-applicants. (Consortium C, Lead Institution, M2)

On the other hand, consortia leaders were faced with delayed reporting and responses to information requests from partners which led to delays in the drawdown of funds from the funder and onward transfer from lead to partner institutions. Reporting delays resulted

from differences in institutional management systems, lack of clarity on what is required from partners, and bureaucracies inherent in partners' institutional systems.

Sometimes, the co-applicants are very late to send the report... if we have a big delay... we can't have the money on time to do our activities. Sometimes, the bank is very slow to send the money to co-applicants... and sometimes the co-applicants and lead have different management procedures... it's difficult to harmonize because a lot of countries are anglophone and we are French, and sometimes we have differences between the national procedures. (Consortium C, Lead Institution, M2)

When the money has been released to the institution, it has to go through another process of the internal accounting system. That takes another period of time, and therefore we actually lose time... But that's mainly the bureaucratic system within our own institution. (Consortium B, Partner Institution, M6)

Generally, the orientation of some consortia actors towards efficiency over effectiveness reinforced the primacy of performance and competitiveness in consortia decision-making. Another key observation was that tensions between efficiency and effectiveness existed because of the perceptions and means of evaluating capacity strengthening outputs. Outputs such as persons trained were recognised as valuable deliverables, whereas efforts to enhance institutional systems were considered encumbrances to delivering these other outputs. Attention is thus drawn to how consortia perception of research capacity influenced the management strategies adopted.

6.3.3 Focusing on excellence or equity

Tensions between attaining excellence or equity were encountered during partner selection and resource allocation processes. As was observed in the previous chapter, when determining which partners to include, consortia leaders had to consider choosing institutions with higher levels of capacity or equitable representation of institutions from across existing networks or region(s) of focus. More significantly, equity also meant that leaders had to consider involving potential partners with lower capacity levels who needed the RCS opportunities the most.

The DELTAS always talk about excellence, and even at the onset, they wanted to start with institutions that were excellent. So, if we were to form the consortium in the spirit of DELTAS, then we probably would have a smaller consortium where we would just bring those who are already high up there. In our situation, we didn't want to leave people behind because they were not excellent. (Consortium C, Lead Institution, R1)

The conflict between excellence and equity was most evident in resource allocation decisions. As was highlighted in the previous chapter, leaders employed either a primarily merit-based or quota-based approach for allocating consortia resources. Leaders of all three consortia acknowledged the tensions they encountered as they deliberated on, selected and implemented strategies for allocating resources, particularly in awarding training fellowships. Consortia leaders were torn between the pursuit of excellence which prescribed the merit-based system and the desire for equity within consortia which supported the quota-based or balanced distribution among partners such as allocating more resources to partners with the greatest need. DELTAS Africa funders had emphasized the need for excellence in the initiative which consortia aimed to adhere to. Leaders were also keenly aware of the importance of equity not only to ensure that those who needed the capacity most received it, but to ensure good collaborative practice within the consortia.

I have seen the scientists have a similar problem even when it comes to recruiting fellows into the program. And that question keeps coming up, is it merit or is it equity. It's one that never gets answered. (Consortium B, Lead Institution, M2)

For capacity building, there is a tendency to say we know the people we want in our institutions and so we can select them at the institutional level to meet our needs. And yet at the consortium level, you are saying no, in order to have a product which is the same high quality, let's select them centrally using the same criteria... and that creates a tension. (Consortium B, Lead Institution, R2)

All three consortia studied adopted the merit-based approach. This was influenced by the consortia's prioritization of programme performance and positive funder evaluations. Some leaders also argued that although 'weaker' partners had greater needs, they often could not deliver training outputs even when given the opportunity due to their limited capacities such as limited pools for recruiting fellows and supervisors.

Allocation of resources is one where you know that at the end of the grant period you must deliver quality and show that you used the grant to deliver... It's clear that if you put too much in the weaker institutions, it's not going to be absorbed easily. So, in the governance discussions... should we allocate equal opportunities finance-wise... should we say equal number of PhDs for different institutions? And arguments can go either way. The weaker institution will say we have a greater need therefore we should have more PhDs... it's a valid argument... and remember we are looking at the finishing line, that we are going to be judged by whether we have achieved. (Consortium B, Lead Institution, R2)

To address any imbalances in allocated resources that the merit-based system often created, each consortium incorporated various measures to promote a level of fairness among partners and minimise potential conflict. Consortium A capped the number of fellowship awards that a partner could receive, while Consortium B ring-fenced resources for partner-specific needs such as Masters training. Consortium C incorporated a system for levelling out geographical and gender disparities during the latter stages of the selection process.

So, what we've done is put lots of specific guidelines... we don't want one partner to have ten fellows... so that some universities don't end up without anyone and then all the places are hogged by the ones which are already far ahead in terms of capacity (Consortium A, Lead Institution, R2)

The procedure was well laid out... they look at the data and decide the cut-off point. But there is also the need for affirmative action for gender... So sometimes when we have just one or two female Africans, we definitely just push them once the applications are standard enough. Then there is also the need for having regional representation... you can't give everything to one country. You have to still find a way of balancing things out and ensure there is a regional spread and the gender issues are taken care of. (Consortium C, Partner Institution, R4)

Beyond the training awards, funds were allocated to other partner specific activities to attain some level of equity among partners, though this formed a small percentage of the consortia's funds. In Consortium A, partners could apply for small grants from the secretariat for institutionalising some of the training initiatives to address local needs.

Consortium B allocated funds to partner-specific goals in line with its ‘two-level-goal’ approach.

The excellence-equity tension manifested whenever issues of benefits to partners arose. Naturally, resource allocation to partners corresponded with assigned activities and responsibilities. While partners agreed with the principle of matching resources with roles and responsibilities, partners noted that it was crucial to ensure equitable distribution of benefits across the consortium.

You would want people to move almost at the same level, you would want the benefits to be close, may not be exactly the same but it should be close... I don't think that the consortium just wants to fund some universities better than the others. But I would think some universities have been more active, so that needs to be taken note of and then the gaps need to be closed (Consortium A, Partner Institution, R4)

If you want to keep the group together and make it sustainable, then bear in mind that everybody wants something out of it, and the whole group wants to move. Everybody wants to move. You need to always be aware of that and take that into your decision-making and in how you orient resources and participation (Consortium C, Lead Institution, R1)

Most partner reactions to the realities of the merit-based resource allocation strategy reinforced this concern. Generally, a partner's satisfaction depended on the extent of benefits received.

I think we have probably the second or third largest cohort... so, the merit-based system has worked for us... some member institutions are starting to propose a different way when they see that things may not work well for them in the current system. (Consortium A, Partner Institution, R6)

It has worked pretty well. Because the procedure was well laid out... but you have this silent incommunicado type of communication that should let you know that things didn't go right for this person... I remember a couple of people who said that there are too many candidates from [Country]... and that's why I said it works fairly well. Notwithstanding that, there has been no cause for a row... Everything was acceptable. (Consortium C, Partner Institution, R4)

Some partners still expressed support for the merit-based system irrespective of the awards received. For example, one partner institution had received no fellowships, but still supported the approach and advocated for maintaining standards irrespective of the inequities.

There are standards, because if you start to implement, you are all bound by the same standard. Unfortunately, we have missed out in some of those because we couldn't meet those standards. We didn't get postdocs; we didn't get PhDs. (Consortium B, Partner Institution, M1)

Everything should be competitive. I know the disadvantages, yes, but in our days, we were all equal, and we competed very well, and I believe they can still do it (Consortium B, Partner Institution, R1)

Generally, partners were not opposed to the principle of using merit to recruit trainees but recognised the need for implementing the strategy more equitably. Some argued that merit requirements appeared to favour trainees from some disciplines and backgrounds more than others.

We decided that we would go for merit... It so happened that the criteria, that was the metrics we used to measure merit... turned out to be favourable to people who were in the medical sciences. (Consortium B, Partner Institution, R2)

The other sites or members are already involved in [Discipline], so the profile of their students was more suitable to the requirements of the fellowship application... It was not the selection process, which for me I find simple, but it was the application requirements or the kind of students... it's like the requirement for application were designed for those already trained (Consortium C, Partner Institution, R1)

It is clear that perceived funder expectations and consortia's pursuit for competitiveness propelled consortia to lean towards excellence. While appreciating merit-based trainee selection and the levelling measures in place, partners emphasized that it was necessary to ensure a more equitable distribution of benefits among partners even within the excellence framework.

6.3.4 Prioritising shared power or greater control

Consortia leaders faced tensions between sharing power among consortia partners or aiming for greater control as they established and operationalised governance and management systems. Sharing power within the consortia meant promoting inclusive decision-making and good collaborative practice; while greater control meant opting for the most efficient decision-making processes. These two approaches were not always aligned. While acknowledging the essence of shared power in consortia, the pressure of accountability heightened leaders' need to have greater control over decisions. It is worth noting that there were basic levels of both shared power and control inherent in consortia's governance and management structures. The participation of partners in decision-making boards ensured that some levels of power-sharing existed in consortia. Simultaneously, the Consortium Director positions, with the responsibility of leading day-to-day operations, ensured that consortia leaders had some level of control. In some cases, Consortium Directors also chaired the steering committees.

The degree of power-sharing varied across the three consortia. Consortium B actors reported that leaders made significant effort to ensure equal partner representation in governance structures and execution. Participants agreed that more than just having representative structures, substantial efforts were made to ensure that governance was inclusive in function, with negotiation and consensus-building as crucial elements. This ensured everyone was heard, promoting ownership of the consortium and its goals.

There is a lot of consensus-building within the steering committee, and virtually every institution is represented whenever we have a call... The secretariat puts in a lot of effort to make sure that although it's virtual, we have the right tools for it to function well. (Consortium B, Partner Institution, R2)

We see it as a participatory approach to governance as opposed to a talk-down directive. There is a kind of negotiation-based governance, in that at any given time nobody is completely so wrong to be rubbished out. People would have to listen and then will still give good feedback... so that kind of negotiation, building the team, and building partnerships. (Consortium B, Partner Institution, M6)

Consortium B leaders however, noted that this approach had risks and was not always easy to pursue. Leaders could only advocate for courses of action and had to accept partner decisions even if it could potentially lead to sub-optimal consortium results. This

is demonstrated in the quote below, which presents the Consortium Director's response to partners as they deliberated on goals and activities.

If the institution feels strongly that they should delay getting involved with scientific citizenship, I'll respect their decision. But on the day of judgment, they may have nothing to show. (Consortium B, Lead Institution, R2)

Consortium B's experiences draw out the risks and sacrifices associated with good collaboration practice which is sometimes achieved at the expense of consortium performance. Again, it also illustrates the efficiency-effectiveness tension faced by leaders.

Consortium A leaders reported that they sought to attain a balance between shared power and control. The realities of their governance and management structures and processes appeared to prioritise control and efficient decision-making more than shared power and inclusion. The leaders reasoned that including all the partners at the steering level would result in a large body which will adversely affect decision-making efficiency. The consortium therefore established a smaller management board and created another forum which was open to all partners. The management board which met quarterly included members of the executive team and a few partners who represented all the partners. This pre-determined number of partner representatives were elected to sit on the board for a fixed term of office after which newly elected representatives took their place. All partners, however, participated in the wider forum which was held annually. Propositions are tabled by the executive team and first discussed at the wider forum before being forwarded to the management board where the final decisions are made.

Consortium A partners expressed concerns about this system, noting that they still felt removed from decision-making processes and less like partners.

I'm a co-applicant for the DELTAS, but I basically don't have any serious influence in decision making... I can go into the parliament, i.e. the partners' forum and say my views but I'm not on the management board... So, it's like you are a co-applicant on that, but you don't have a voice in it, that's where the dilemma comes in. (Consortium A, Partner Institution, R5)

One of the few things that I have seen is, as partners, you are not much embedded. You don't feel the grant as a partner; I don't think the university feels the consortium. The only way you feel it is in the training of the students. But for the management bit and decision-making and who selects what, I think the university as a partner is not seen as much. (Consortium A, Partner Institution, M2)

While pointing out concerns with the established management systems, partners continued to grapple with the tension between shared power and control as demonstrated in the quote below.

There are some sort of influential people, and I suppose... they are doing it in the right capacity; these are the Directors. So, they are quite influential in terms of making decisions, although they have to justify them very well... There are sometimes a bit of, what can I say, executive decisions being made. But again, you know when you think of any organization, if it's completely 100% democratic, decisions are made very slowly, and sometimes there is not a lot of accountability for them. So, you need some bit of executive decision-making where the buck stops, and I've seen that happen in the management board. (Consortium A, Partner Institution, R5)

In the case of Consortium C, all partners were included in the management board. The board was made up of representatives of both co-applicants and collaborators and chaired by a representative from a collaborating institution. Yet, Consortia C actors reported greater control by the lead institution in practice. Partners recognised that although shared power among partners was essential, the Director had the ultimate responsibility to deliver on the consortium's obligations and so required some control.

The thing is, everything relies on the PI [Director]. He can take or not take advice. There is no written rule that in all this thing, we [management board] must enforce them, no... I think it's meant to guide. It's meant to make sure that things are going well. So, he still has some room to manoeuvre, which for me is good, it's not bad. We cannot have more than one person being 'responsible' for stuff; then things will never get done. (Consortium C, Partner Institution, R4)

Indeed, partners trusted the Director's leadership and recognised it as mentorship and training, particularly by the early and mid-career stakeholders. This was also because the Director was seen to demonstrate inclusivity and consensus-building during decision-making processes.

The leadership of the Director is well-known and well recognised. Because people trust his leadership, they are on board and want to follow. He always ensures things are mostly done equitably... The Director listens to everybody. He has his mind set on some ways he wants to go, but he is able to change it, and this is very good. (Consortium C, Partner Institution, R3)

The Consortium leaders also pointed out that power-sharing is inherently built into the governance structure, which puts some power into the hands of the partners.

The leader is there to lead [laughs], so we sort of are responsible for executing what we said in the grant we are going to do. But we have a way of balancing that power by having the partners being members of the governing board... so, they actually, in reality, are the ones that set the pace of what the lead does... So, we as a lead tell them, “do this”... But what we are telling them to do has actually been dictated by them through the board, and if we don’t do it well, they feedback to us through the board. (Consortium C, Lead Institution, R1)

6.3.5 Relying on tangible or intangible aspects of management

The pull between reliance on the tangible or intangible aspects of management surfaced in consortia. This was not a tension that was explicitly considered by consortia, and decisions for one or the other were not expressly made. However, it appeared that there was greater reliance on tangible management elements such as structures and processes than on the intangible elements such as power dynamics, to produce the desired consortia outcomes. For example, although the right governance and management structures had been established in consortia to ensure inclusive decision-making, the level of partner participation in management was not always as expected. In Consortium A, leaders had envisaged that management structures that promoted participatory decision-making would result in enhanced partner engagement and proactiveness in driving local activities. However, this did not materialise. Partner engagement was not ideal, and Partner Leads needed constant prodding and pushing to get tasks accomplished.

We have tried really hard to accommodate partners to feel like it’s a partnership... we’ve tried to put so many mechanisms to have participation in decision-making... but in the end, we still do the heavy lifting... Even things we expect the partners to take up, they don’t (Consortium A, Lead Institution, R2)

It appeared that a lack of incentive for active participation contributed to this situation in Consortium A. Partner Leads maintained that the over-emphasis on individual capacity strengthening activities produced minimal benefits for them and their institution. Additionally, they had very little control of consortium activities as they lacked proper sub-awards and did not directly manage their trainees.

One Consortium A participant also pointed out that intangible elements such as individual agency were responsible for the varied influences in decision-making and not necessarily the structures put in place.

I think that when it comes to influences in the board of management, there is no real inequity issue there apart from that related to the individual characteristics of the representatives on the board. I don't know how well you know them, but some of the representatives are very powerful, and that's not a system question it's an individual person question. (Consortium A, Partner Institution, R9)

Consortium C had established the most inclusive management board among the three consortia and had a partner management manual which laid out some of the required processes. However, several limitations affected some partners' participation in decision-making and partner engagement in general. First, partners with less research capacity and experience felt it was appropriate to defer to those with more capacity and experience during discussions:

Some people are more influential because first they have more experience in certain areas, so it's mostly because of that. I think it's based on the experience and also what they bring on board... So, for me, I totally understand that their voice is louder than mine (Consortium C, Partner Institution, R3)

Second, partners with little or no expertise in the sub-speciality that the consortium was focusing on felt inhibited and inadequate, thus hindering the full participation of these partners in decision-making.

For example, I am not a [Discipline] researcher... it was not of interest for me to be involved in the practical training of the students... It depends on the subject. Some may not be interested in some subjects, and they do not participate even if they are supposed to participate (Consortium C, Partner Institution, R1)

Third, partners who joined the consortium in the latter stages perceived themselves as fringe partners and hence participated less in decision-making. This was because the older partners were already involved with the consortium's activities or in the pre-existing network and had built working relationships which newer partners were now easing into.

I think when the network started, there were only four, five people and then they invited more. So, there is a first layer, second layer and the third one. So, I would say the core and the second layer are always hands-on and always available. But maybe the third layer... it's a bit more complicated to get them involved. (Consortium C, Partner Institution, R3)

Fourth, the language diversity in Consortium C meant that not everyone was fluent in the consortium's lingua franca which is English, a factor that was pointed out as a major hindrance to participation in management deliberations. Even for the non-anglophone partners who could generally communicate in English, holding consortium discussions in English was still a significant challenge and this limitation induced a feeling of exclusion. This was raised by both anglophone and non-anglophone participants.

It's a disadvantage for individuals who are not fluent in English... Most of the time during meetings, you can speak, or you can give your opinion, but you can't make major inputs... you are never sure that you will give your true opinion... Sometimes I lose some words, so I can't really participate in the discussion... When it's time to give my opinion, I cannot give it because, for example, I did not really understand what those sentences or words meant... In the way of improving the English, it's good, but in the way of communication, this is not really good... it is not efficient, and some individuals find themselves excluded. (Consortium C, Partner Institution, R1)

The management board, I think it's been good... people are willing to contribute, but the main sticky point is the French-English thing... where people want to talk but... particularly the French, articulating yourself in the meeting becomes difficult (Consortium C, Partner Institution, R4)

The situation became more complicated when a partner was faced with two or more of these limitations. The compounded effect made it even more difficult to overcome the constraints. For example, partners with less research capacity and language challenges who joined the consortium at a later stage found it extremely challenging to fully

participate in consortium discussions. Although partners believed that it was possible to exercise agency and overcome such limitations, it rarely happened. For instance, the same constraints made it difficult for such partners to request for special considerations such as language translations that could have helped them overcome some of the challenges.

If you take [Partner X] for instance... if their interaction isn't that massive, you don't hold them responsible, because they are not a mainline [Discipline] person... that's why it has to have that link with your career... So, your individual motivation, your passion for what we are doing, your language barriers, your institutional capacity and strengths... all these things affect your full participation. (Consortium C, Partner Institution, R4)

You are not a specialist in the main research... But you are also not fluent, so it's a disadvantage. Though this disadvantage should not stop you, it's true that it's a disadvantage. And it's true that you accepted to be part of this network. Of course, you will not ask the PI and everybody to improve or to translate everything for you, so you also have to make some efforts. (Consortium C, Partner Institution, R1)

The interaction between the tangible and intangible was again demonstrated in the assignment of roles and responsibilities and resource allocation. Stronger partners were assigned more responsibilities and received more resources to fulfil these responsibilities, which naturally, resulted in their receiving disproportionate benefits from the consortium. However, it was pointed out that the proactiveness of less-capacitated partners could prompt some changes in some of these consortia structures.

And I have even realized that [Partner X] seem to have benefited much more from the consortium. I am not saying there has been a foul play, but you need to be active or proactive (Consortium A, Partner Institution, R4)

The partners also feel that the secretariat does a lot of heavy lifting, but in a way, it's also disadvantageous because you don't build capacity for certain things. So, there was a lot of... I would say, demand and pressure for devolving some of these things. (Consortium A, Lead Institution, R2)

These experiences draw attention to the roles and varying reliance on tangible and intangible elements of consortium management. In many cases, although the tangible structures were in place, their proper functioning was limited by factors that were less

tangible such as perceived lack of power-sharing and feeling of inadequacy. Equally, intangible measures such as communication and agency were required to adequately identify and address these limitations. In some cases, the functioning of these structures also generated various responses which included feelings of dissatisfaction and inequity. Some consortia leaders noted that the intangible aspects of consortium management are even more critical than the tangible.

It's one thing to agree on how to move forward. When the reality comes and when the rubber hits the road as they say, then people start developing all sorts of feelings, "No, we should change that", "But we agreed at the beginning" ... these are all governance issues. So, the challenge is not so much the structure of governance but the real issues and the functionality. The structure can be discussed and agreed on fairly easily. (Consortium B, Lead Institution, R2)

Intangible elements such as leadership styles played an enabling role when Consortia Directors consistently made efforts to ensure partners felt included in management and in the consortia more broadly. The consortia experiences point out the essence of both tangible and intangible elements in consortium management.

6.4 Approaches to Management Decisions and Implementation

The strategies used in addressing emerging tensions across the management processes and the cases appeared to fall in seven categories (Table 6.1).

The identified categories of management strategies were not mutually exclusive in practice. Often, a single management strategy was multi-dimensional and exhibited characteristics of multiple categories. For instance, the decentralised partner management strategy made use of structural systems, was a means of aligning with the consortium's vision of strengthening management capacity at institutional levels, and had a long-term focus.

Table 6.1: Categories of consortium management strategies

No.	Category	Examples of how this was applied in consortia
1	Balancing options	<p>Balancing the merit-based approach to resource allocation with measures such as capped awards and gender and geographical levelling to mitigate its effect</p> <p>Combining consortium-wide and partner-specific goals as a means of addressing both individual and collective interests</p>
2	Output-driven decision-making	<p>Choice of stronger partners and a focus on individual levels in order to deliver the most outputs</p> <p>Use of a centralised partner management system to avoid the effect of partners' institutional challenges on consortia performance</p>
3	Structural systems	<p>Establishing the roles of Consortium Director and Lead Institutions in consortia structure provided clarity on who was accountable to the funder</p> <p>Instituting management boards with representation from partners was intended to enhance inclusive decision-making</p>
4	Combining the tangible and intangible	<p>Supporting representative management boards with individual agency from both leaders and partners to enhance inclusive participation in decision-making</p>
5	Aligning with consortia philosophy	<p>Consortia leaders' commitment to collaborative principles such as inclusion and equity informed the use of representative decision-making bodies</p> <p>Leaders' commitment to capacity strengthening resulted in strategies such as decentralised partner management despite the risks to consortium performance</p>
6	Strength-based strategies	<p>A decision to focus on individual researcher training based on the consortium's existing training strengths</p> <p>Allocating most of a consortium's resources to the strongest partners</p>
7	Short- or long-term strategies	<p>Selecting the shorter-term strategy of training individual researchers only compared to the longer-term strategy of strengthening institutional-level capacities</p>

Consortia leaders did not always explicitly lay out all the available options when tensions were encountered or provide the principles or drivers behind the decisions they made. Additionally, it became apparent that tensions were not only tackled during inception and planning but needed to be continuously considered during implementation. Deepening understanding and changing needs continued to shape the preferences of consortium actors. Consortia were thus confronted with shifting stances on strategy decisions taken of both leaders and partners as realities unfolded, particularly when faced with unfavourable situations.

Initially, we had said we were just going to rank people based on performance. Then we realized that some partners might get no one... so those were the very first things we confronted and then we said, ok we are going to put some checks and balances to make sure there is some kind of equity (Consortium A, Lead Institution, R2)

Adaptability therefore became essential, and the value of dynamic management was highlighted as leaders continued to reassess and revise strategies as activities unfolded. This approach required continuous engagement and consensus-building throughout the implementation phase.

6.5 Tensions and Emerging Consortium Management Issues

The emergence of tensions and how they were handled highlighted some of the more relational aspects of management such as power relations, inclusion, equity, and leadership.

Each emerging tension highlighted some of the ways that power dynamics in consortia materialise. For example, tensions related to the adoption of centralised or decentralised partner management systems demonstrated power dynamics related to the control of resources. Several sources of power were brought to the fore across the consortia including existing capacity, position and responsibility (consortia leaders), access to and control of consortia resources, ownership of goals, expertise, English language capability, and research and grant leadership experience. Partners who had less of these indicated that they felt they had less power within the consortia. Further, having less of multiple sources of power compounded partners' feeling of inadequacy and further deepened the power imbalance. It also became clear that although some tangible measures to address

power imbalances such as instituting inclusive management boards, these power dynamics still persisted due to differentials in some of the intangible sources of power indicated above which were often not identified, explicitly acknowledged or purposefully addressed.

Tensions and decision-making considerations also highlighted issues of inequity in HRCS consortium management. Identification of the different sources of power demonstrated the range of inequities in consortia. Capacity, geographical, language, disciplinary, and gender inequities were most highlighted within the consortia. Some of these inequities were not only drivers of tensions (for example efficiency vs effectiveness and shared power or greater control) but also influenced the strategies that were adopted (for example using decentralised systems and balancing measures in merit-based approaches). Capacity and gender inequities were more acknowledged by consortia, seen as important HRCS goals, and featured in consortia decision-making considerations. Capacity inequities were visible in both consortium management processes and capacity strengthening decisions, and so played a significant role in consortia decisions such as adopting varying partner management strategies and taking measures that promote less-capacitated partners. Gender inequities in research capacity influenced some of the management strategies such as promoting gender equality in the award of training fellowships. Regarding leadership, only two out of the ten DELTAS consortia were led by women. Within consortia, measures such as promoting consortia roles taken up by women (such as partner and programme component leadership roles) were adopted to help address the prevalent gender inequity.

It is worth noting that some areas of inequity and power imbalance received more attention than others. This was often due to funder stipulations. For example, gender inequity was highlighted by funders and hence received more attention in consortia decisions. On the other hand, the funders' emphasis on excellence led to a preference for partners who could perform (in delivering programme outputs) more than less-capacitated partners, and more resources were directed to the former. In effect, less attention was given to addressing the capacity inequities within consortia. This demonstrated the role of the funder in both highlighting equity and power issues and influencing which issues are prioritised.

6.6 Perceptions of Research Capacity as a Key Influence on Management Strategies

Tension management processes and the management strategies adopted by consortia revealed the different perceptions and priorities of consortium actors regarding research capacity. These perceptions appeared to be both a source of tensions and a significant influence on management decisions. I discuss these perceptions and their drivers next.

6.6.1 Conceptualisation and prioritisation of research capacity

Research capacity meant different things to different consortia actors. As a result, the way research capacity was conceptualised and the research capacity components that were prioritised varied across individuals, institutions and consortia. The influences of these different perceptions were evident as tensions emerged and decisions on various management processes were made. For example, during the development of consortia goals and activities, varying interests within consortia originated from actors' perception of what research capacity entailed. While some actors interpreted research capacity narrowly, focusing on the training of researchers, others had a broader perception which encompassed both researchers and their environments. Even regarding individual training, many focused on the technical training, but some advocated for a more holistic researcher training, including aspects such as management and grant writing. Perceptions of what constituted the environment also differed. Some consortia members focused mainly on physical research infrastructure such as laboratories and internet facilities; others expanded their interpretation to include support functions such as librarians, research administrators and accountants, and research management systems such as policies, processes and software. Second, emphases were placed on different research capacity components by different actors. Priorities differed among partners, and sometimes between partners and consortia leaders. Some partners preferred to focus on individual-level capacity strengthening over an institutional-level focus and vice versa. Some partners also preferred some of the DELTAS strategic areas over others.

The tendency of attraction is more to the first two and less to the last two [of the DELTAS strategic areas]. The last two being where there's capacity development of research administration and then the one on scientific citizenship. But the other two [scientific quality and research training], that's where the, call it natural drift is... I do recall one of the partners, who in the first year put it bluntly, it is waste of time to

spend on scientific citizenship...maybe waste of time is putting it too strongly but not so valuable place to put emphasis. (Consortium B, Lead Institution, R2)

I will speak as a scientist ... what we prioritize more is to build research focused laboratories. Because for all my postdocs, and even for my PhDs, I had to go out and look for a very strong lab because we don't have laboratory capacity here to do some of the experiments. So, I believe that in my university, we can strengthen the capacity of early scientists by building more research focused laboratories. (Consortium A, Partner Institution, R2)

Additionally, there appeared to be different perceptions of how research capacity was strengthened. It seemed, for some consortia members, that conducting research was equivalent to research capacity strengthening. Indeed, the production of research outputs appeared to be ranked higher than other capacity strengthening activities and outputs by some consortia actors. This was evident when consortia had to address tensions between excellence and equity. Excellence in capacity strengthening was often likened to excellent research, a reasoning which sometimes led to preferences for research-oriented decisions over capacity-strengthening-oriented ones.

So, I run a consortium that we've also got PhD students, but it's around a research area... We've got students who are embedded in that research program, and what I see from there is that it's much more directed towards a goal. So, the research students, we're not only interested in them and how they are doing, but we're also interested in their output. It's like those outputs are also part of us a senior researcher, our deliverables, so it's like we have a stake in this. We are more committed to ensuring that the deliverables are actually attained. If there are papers, our focus is usually around, "when is the data going to be ready" ... "we must put them together we are going to present them to WHO or ERG. While Consortium A does not have that pipeline or that goal... not really interested in what's been published or whether it's in a high-impact journal... It's more of have they completed that milestone (Consortium A, Partner Institution, R5)

Irrespective of the different research capacity interpretations and priorities, each consortium appeared to have worked out their RCS philosophy, which then shaped their management focus. For example, Consortium A focused on training of individual

researchers, while Consortia B and C opted for a broader scope which focused on both individual and institutional capacity. Consortium A's approach to RCS was underlain by the ideology that individuals are key drivers of research excellence and agents of institutional capacity development. Consortium B however, subscribed to the philosophy that the best approach to RCS was to simultaneously tackle individual and institutional capacities. For Consortium C, individual capacity strengthening was only possible within strong institutional environments, and thus the programme focused on strengthening the technical research capacity of stronger partner institutions to serve as platforms for training individuals from across the consortium.

For me, it's strengthening people, and people will strengthen systems. That's the first thing... you give skills to the person, that person will look for funds, will look for grants, will do a, b, c, d, and will strengthen and bring in all the other capacities around research. (Consortium A, Partner Institution, R5)

It's a broad spectrum. I know there are organizations that just focus on PhDs, "that's the training we are offering, and that's the research that we want to strengthen". You go there, get your thesis and get your award. But for [Consortium B], it's really broad, so it spans from the administrators being trained, the finance people being trained... (Consortium B, Partner Institution, M4)

There is the strengthening of the research environment... and that environment when created needs people with a certain level of capacity to take advantage. So, you then go on to the individual capacity... It's a kind of pyramid... beginning to deal with the research environment and making sure that this capacity is built at the individual level (Consortium C, Partner Institution, R4)

These leanings, to a large extent, informed consortia's management strategy decisions. To illustrate, Consortium A's decision to focus on training individuals while holding off on institutional enhancements, and Consortium B's broad-range interpretation and decision to address both levels simultaneously aligned with the choice of their respective centralised and decentralised partner management approaches. The quote below evinces the thinking behind Consortium B's decision.

Resources are limited, so you have to prioritise. But you prioritise at a risk because when there are pieces which are vital to research and they remain unattended to, the strengths or the degree to which you build your research capacity would be very much influenced by the weakest link, so to speak. And if the weakest link is concerning item X which you are not paying attention to, it might very much influence what else is happening. (Consortium B, Lead Institution, R2)

Various factors informed individual and consortia perceptions of research capacity and the thinking behind the RCS philosophies. These are presented in the next section.

6.6.2 Drivers of research capacity perceptions

Across all the consortia, several factors influenced actors' interpretation of research capacity and determined their priorities. These included the DELTAS objectives and evaluation requirements from the funder, the value individuals and institutions assigned to the different research capacity components, and the level of research capacity of partner institutions. I discuss these in turn.

The objectives of the DELTAS initiative and the evaluation indicators stipulated by the funder significantly influenced how consortia interpreted RCS and the research capacity areas that were prioritised. For example, indicators such as the number of students completing their training and the number of research publications produced directed consortia's focus towards achieving those outputs. Evaluation indicators appeared to have had the most influence on consortia's approach to RCS and their decisions to allocate substantial resources to the training of researchers. As realized earlier, the desire to be competitive, considerably shaped consortia decisions. Thus, in defining and prioritising research capacity components, consortia were extremely mindful of impending evaluations and how their performance would be assessed by funders.

DELTAS has got those pillars of theory of change... Of course, there's a lot of emphasis on numbers; you know publications, amount of funding, and so forth... I think the capacities depends on how you interpret those four. (Consortium B, Lead Institution, R2)

Some consortia leaders admitted that the focus on evaluation indicators was sometimes maintained at the expense of other capacity needs.

There's pressure sometimes to move things from skills-building to real research work and publications... There's a lot of pressure on the whole system; the students and the PIs alike, to make sure that certain boxes are ticked. Because you know that these are the evaluation pillars and the milestones that they are expecting us to achieve. (Consortium C, Partner Institution, R4)

Another factor which influenced RCS perceptions was the ranking of research capacity components. Consortia actors seemed to assign values to the different components, and these perceived values determined the level of attention given to each component. The weightings appeared to have two bases. Components that were considered valuable to funders were prioritised, as these were expected to increase consortia's competitiveness for donor funding. Evaluation indicators were used as markers of funder priorities. This value system also appeared to be influenced by what was valuable to Consortia Directors and Partner Leads, who were primarily researchers and hence appeared to prioritise RCS components with a relatively higher academic value. For example, publications in high impact journals were generally ranked higher than other research outputs.

I think when you talk to some of the partners, they are even less interested in the scientific citizenship because their interpretational thinking is that, it is not going to buy you a lot of mileage if you focus on that goal or on that aspect. It is not going to buy you a lot of mileage in terms of being competitive. But if you focus on the quality of science, quality of training, and again quality defined as the technical professional skills then oh yes, that's going to be very competitive. (Consortium B, Lead Institution, R2)

Consortium actors' level of research capacity also influenced their approach to RCS. Each actor's perception of research capacity and their own capacity needs were shaped by the maturity of the research enterprise in their contexts. These perceptions consequently informed partners' and consortia's RCS focus areas. Stronger institutions tended to advocate for strengthening a broader range of individual training and institutional capacity strengthening while less capacitated institutions focused more on individual technical training.

Five to ten years ago, there would be no research support per se. The scientist would basically do everything... I think it was out of the infancy of the research culture on the continent. Now we are increasingly realizing that there should be proper research support for the activities that we do which means admin support; it means financial support; it means ethics regulatory and... legal support to properly run a research enterprise. (Consortium C, Lead Institution, R1)

If you come to this institution, you will find that almost 80% of staff now have PhDs. So, more PhD funding from consortia doesn't help. We have reached critical mass... So, I think these consortia should now bring in refresher courses, not necessarily PhD training. Because for the staff here, there are some skills that we need (Consortium A, Partner Institution, R2)

As prevalent capacity needs were met, research environments became more advanced, and understanding of research capacity was expanded, other needs were brought to light, and new priorities emerged.

6.7 Chapter Summary

This chapter examined the tensions consortia leaders encountered as they determined and implemented strategies for key management processes. I identified factors that influenced those decisions and the perspective of different consortia members on the outcomes as decisions were implemented. A summary of the tensions encountered by the three consortia and the management strategies adopted is presented in Table 6.2.

In some cases, consortia leaders sought to balance the options rather than choosing one extreme or the other. In others, consortia made distinct decisions, accepting the risks and sacrifices associated with those decisions. Multiple categories of measures were adopted in determining management strategies, and a strategy could be formed from merging multiple measures from the different categories. It also became clear that consortia actors' varying interpretations of research capacity and pathways to its strengthening contributed to the emergence of management tensions and the type of adopted strategies. This chapter has drawn out the intricacies involved in consortium management and the complex

decision-making processes required. In the next chapter, I discuss the role and effect of these management processes on the RCS aim of consortia.

Table 6.2: Tensions encountered by consortia and strategies adopted

Tensions	Consortia Strategies		
	Consortium A	Consortium B	Consortium C
Individual or collective interests	Common goal <ul style="list-style-type: none"> • Individual training of researchers 	Two-level goals <ul style="list-style-type: none"> • Collective + Partner-specific • Individual + Institutional 	Goal menu <ul style="list-style-type: none"> • Range of goals for tailoring by partners • Individual + Infrastructure
Efficiency or effectiveness	Selection of partners with higher levels of capacity Focus on one research capacity component - training individual researchers Centralised partner management system	Selection of partners with varying levels of capacity Focus on multiple research capacity levels and components - Individual and institutional (technical and managerial capacities) Decentralised partner management system	Selection of partners with varying levels of capacity Focus on multiple research capacity levels - Individual and institutional (technical and infrastructural capacities) Decentralised partner management system
Excellence or equity	Merit-based fellow selection with a cap	Merit-based fellow selection	Merit-based fellow selection with regional and gender balancing
Shared power or greater control	Two-tier governance: Steering board and annual general meeting Centralised management	All-inclusive steering board Decentralised management	All-inclusive steering board Decentralised management
Tangible or intangible aspects of management	Combination of both aspects but more reliance on tangible than intangible	Combination of tangible and intangible aspects	Combination of both aspects but more reliance on tangible than intangible

CHAPTER 7: THE ROLE OF MANAGEMENT IN RESEARCH CAPACITY STRENGTHENING

7.1 Introduction

In the previous chapter, I presented the intricacies of decision-making processes in consortium management. In this chapter, I consider the position and role of these management processes in the RCS agenda based on the findings from the case study. I examine how management features in research capacity strengthening efforts. To do this, I draw out the mechanisms through which management experiences translate into individual and institutional research-related capacities and the factors that facilitate these mechanisms. I also outline some of the capacity gains consortia members derived from these management processes.

7.2 The Position and Role of Management in RCS Programmes

One of the four strategic areas of the DELTAS programme centred on research management and environment, which indicates a recognition of the managerial aspects of RCS by the funder. According to funder documentation, this strategic area covered securing sustainable funding, physical infrastructure to support research, and functional consortium governance and management structures. These were expected to inform programme components and consortia activities. However, the interpretation of the strategic area varied across consortia. Consortium A appeared to interpret it as the provision of infrastructural and management support for the consortium's activities. Consortium B and C participants interpreted it as the strengthening of research infrastructure and management support for the consortium and participating institutions. Consortium B focused more on enhancing research management capacity, and Consortium C focused more on enhancing research infrastructure.

When it comes to research environment... we are dealing with aspects that touch on the environment provided for the fellows for them to be able to excel as doctoral fellows, and not in terms of the environment that we have provided for them to carry out research. (Consortium A, Lead Institution, M1)

We don't want to stop at training researchers, but we also want to build systems for these health researchers in the different locations that they are in... so it is a very good idea to build not only the research aspects, the science, but also the environment within which the researcher is working... we are not thinking short term but long term (Consortium B, Lead Institution, M2)

For the research management objective, we hold some workshops on writing, ethics, and others. The building permits us to improve research capacity for DELTAS and for all the university because some other people can come and do research in our laboratory if there is no workshop. (Consortium C, Lead Institution, M1)

Regarding the role of consortium management, it emerged from participants' descriptions of management functions that management played two roles across consortia: coordinating and capacity strengthening. The aims of the two roles differed. The former focused on running the consortium while the latter focused on enhancing the managerial capacity of individuals and institutions. There appeared to be more references to management in a coordinating role than in a capacity strengthening role. I discuss these roles next.

7.2.1 Management in a coordinating role

Management processes were described as essential for facilitating the implementation of consortia programmes and the delivery of expected outputs. Through these processes, consortia decisions on strategic direction and programmes of action were taken, implemented and monitored. Established management structures such as consortium management boards were considered instrumental in attaining buy-in from individual and institutional stakeholders, ensuring representativeness during decision-making, and garnering feedback from partners.

They [management processes] play an important role... The processes that I have been involved in included curriculum development, the development of the DELTAS proposals... decision-making about fellows, strategic direction... Even in this last meeting, we spent a lot of time talking about... "What's the new direction?", "Is it enough just training PhDs?", "What else do we need to do?" (Consortium A, Partner Institution, R1)

We need it [management] for decision-making. We need it for coming to a consensus. We need it for transparency (Consortium B, Partner Institution, R3)

Consortium management processes also enabled the monitoring and measurement of programme results and helped demonstrate capacity changes in consortia. Monitoring processes helped leaders and managers to keep a close eye on risks and ensured that consortia stayed on track.

The management processes have a very key role. In fact, I think if it is not for the strong processes, then we would lose a lot in terms of the capacity strengthening and being able to monitor what every fellow is doing... Putting a structure where they have to report has kept them on their toes. (Consortium A, Lead Institution, M1)

Additionally, some participants pointed out that a management set-up ensured that consortia leaders, who were mainly researchers, received adequate support from the right management personnel. Leaders could then focus on the strategic and scientific aspects of the consortia's activities.

It's very effective if you have those lower units being strengthened. It reduces the pressure, and you are able to sit and think about more ideas and plans... more developmental ideas rather than spending time on operations and routine work (Consortium B, Partner Institution, M1)

Research capacity begins with... building a management team and executing the project so the science doesn't break down (Consortium C, Partner Institution, R4)

A few consortia actors also recognised the role of management processes in linking consortia to institutional resources without which programme implementation would have been greatly challenged. Inputs from institutional units such as research offices, finance, procurement, and legal units were coordinated through consortium management processes to ensure that programmes were adequately supported in both lead and partner institutions.

As these management processes were deemed essential for programmes to thrive, leaders ensured that the processes required for consortia performance and grant accountability were duly executed. Consortium A supported partners who received activity funds to prepare and submit accurate reports. Consortia B and C, as part of their sub-award

monitoring processes, also conducted series of training for researchers and managers in partner institutions to ensure accurate reporting.

We have had a chance to attend one or two financial management workshops, which were okay. It helped us to get a sense of how AESA wants things done (Consortium C, Partner Institution, R4)

We carry out training on what we need them to work on like finances. The DELTAS report is a really complicated report, so you have to take them through what is needed and how to go about it. So, we've been able to build their capacity... they've been able to improve the way they do the reports, account to us, and make requests and approvals. (Consortium A, Lead Institution, M5)

Generally, management processes appeared to be perceived only as a means to an end. As long as programme outputs were being delivered, little attention was given to these processes.

If I look at the steering committee, they are mainly very technical; the management thing doesn't seem to be part of that... They do not look at how the thing is going but what quality is coming out. When the PI is talking about scientific citizenship for instance, he asks, "how many community public engagements have we had" and "what impact has it had"? So, he doesn't say, "Was there a problem with organizing it" or things like that; it's not part of that. So, we are sort of looking at the output bit of things (Consortium B, Partner Institution, R1)

I know there are some things which can be improved... I understand why some of the things do not go as fast or as well as it is supposed to be. But if students are trained and the annual objectives according to the student training are achieved, it's ok. (Consortium C, Partner Institution, R1)

I am not sure they are part of that [RCS processes]. I think... the primary role is that the grant is administered and therefore we need to have those sort of processes (Consortium A, Partner Institution, R6)

Although the value of management was generally recognised, some Partner Leads were reported to have found the processes extraneous. This periodically caused difficulties for the Secretariat in ensuring compliance with the required managerial tasks.

We can put in place tools, and people will not work with them. Because they are scientists, they think that some tools are not important. They have a lot of work; they don't see the importance of some tools. But for management, it's necessary to put in place some tools... but for them, it's not necessary (Consortium C, Lead Institution, MI)

Overall, management was considered necessary for coordinating consortia activities and ensuring programmatic and fiscal accountability to funders. The primary aim of management processes such as recruitment and training of managerial staff and provision of administrative support to participating institutions was to facilitate the delivery of consortia outputs and not necessarily to strengthen participating institutions. Focusing on the consortium's management needs and not those of the participating institutions was the basis for setting up parallel managerial processes which sidestepped and compensated for institutional weaknesses. This approach was intended to minimise any adverse effect of institutional challenges on the consortium's performance. Such an approach also meant that little attention was paid to the capacity strengthening implications for partner institutions. Thus, in its coordinating role, management appeared to be directed towards the short-term performance of consortia and not on the longer-term capacity of members.

7.2.2 Management in a capacity strengthening role

Management was rarely recognised as a capacity strengthening component of consortia's programmes. Only Consortium B had a stated objective pertaining to strengthening the research management capacity in participating institutions. This involved training research administrators and strengthening institutional grant management systems. Although some management content was included in the training of fellows and administrative staff, it appeared the primary aim was to enhance fellow and consortium performance respectively. These efforts were neither designed nor recognised as capacity strengthening components.

Consortium A leaders acknowledged that current efforts were inadequate, and a more purposeful effort would be required to build substantial management capacity.

Training financial managers for two or three days, and exposing them to different things is not enough to elevate the system if it is already terrible. In the next phase, we are thinking about being a bit more deliberate (Consortium A, Lead Institution, R2)

Also, capacity strengthening activities mainly focused on the training of scientists. Very little investments were made in enhancing the capacity of other stakeholders involved in the research enterprise. Some managers shared their concerns about this disparity:

In terms of actually acquiring skills and building capacity for support staff, not much... we have just attended one workshop for faculty and administrators because I think it's like we are not serious partners I may say that; so not really much. The capacity is still at minimal levels (Consortium A, Partner Institution, M2)

For capacity building, at least the financial management staff should be sponsored for, let's say a master programme. If not the entire programme, let's say you can cover a percentage of the cost... or get them to go to institutions with a lot of experience in research; to go and learn from their financial management processes... I believe when we start working on these programmes, it's not always the researchers; financial management is also important, so they should remember us (Consortium C, Partner Institution, M3)

Even for the scientists, a greater emphasis was placed on technical research training and very little on management training. As noted in the previous chapter, the concept of RCS for many consortia actors prioritised the technical aspects over the managerial, and this was demonstrated in consortia's programmes.

Maybe the management doesn't really influence it [RCS] that much, but it's more of I think the technical people, the experts, the partners that you have, I think that what's drives that bit. (Consortium A, Partner Institution, R5)

The significance of research management and institutional level research capacity was largely under-appreciated. Besides, most Consortia and Partner Leads are researchers and naturally emphasized the technical aspects of research over the managerial. While many of these leaders admitted to gaps in their managerial knowledge and skills, strengthening of their managerial capacity was not prioritised in consortia programming. There were no reports of any careful considerations of what consortium management entailed, or the

gaps in leaders' managerial capacities, or the knowledge and skills they would require in their roles. One Partner Lead noted:

When these consortia are being formed, and you propose in applications that we'll have these levels of management... there is no follow up to see, "what is the management skillset of these people", 'can anything be done to improve their skill set'; because we are scientists, we are not managers. (Consortium C, Partner Institution, R4)

Also, the evaluation indicators for the DELTAS management objective may have influenced the marginal inclusion of management capacity strengthening activities at the programme level. Stated indicators included the amount of additional funding secured, existence of research facilities and the number of consortia management meetings. Consortia therefore appeared to focus their efforts on these stated areas to meet the expectations of funders. As a result, many management elements were left unaddressed, and very little investment was made in strengthening institutional research management and consortium management capacities across consortia.

7.2.3 Management in both coordinating and capacity strengthening roles

While the coordinating and capacity strengthening roles of management were considered separate, they were not mutually exclusive. Some consortia leaders broadly considered that participating in management processes such as consortium-level meetings and sub-award processes would strengthen consortia actors' management skills. This was especially evident in Consortia B and C, where the decentralised partner management system had been adopted. Yet, this thinking was neither documented as part of consortia's planned programmes nor actively tracked. Upon reflection and in hindsight, consortia members acknowledged that participation in management processes had resulted in several capacity gains, even when management was not explicitly put forward or recognised as a capacity strengthening avenue.

To throw more light on the less-considered capacity strengthening role of management processes, I examined how learning occurred during management processes and how individuals' and institutions' capacities were strengthened in the process. I discuss these learning mechanisms next.

7.3 Mechanisms of Learning Inherent in Management Processes

As consortia actors participated in management processes, learning and capacity strengthening occurred. Six mechanisms through which individual and institutional managerial learning occurred were distilled from the data (Figure 7.1). I discuss these in turn and how each one was operationalised in the case consortia. Although each of these mechanisms is singled out to demonstrate how they work, it is important to note that they often occur concurrently, are interrelated and interact with each other to produce the resultant learning and enhanced capacity.



Figure 7.1: Managerial learning mechanisms emerging from the data

7.3.1 Interaction and peer learning (through exposure, observation and learning from differences)

Consortium management boards brought together people with different expertise and experiences. For some members of these boards, the experience of such high-level decision-making platforms was new; while for others, the current contexts differed from

their previous experiences. Consortium actors learnt from each other through observing deliberation processes and exposure to different perspectives brought to bear during interactions. Members acquired competencies, including communication skills such as negotiation and advancing one's arguments, decision-making intricacies, behavioural and collaborative skills, and conflict resolution and problem-solving skills.

It was an opportunity for learning, because if you are sitting on a management board, then you learn how a board operates and how the decisions are reached, and how the follow-up of these decisions is being done or not. So, that in itself is an important skill (Consortium C, Lead Institution, R1)

I would cite the exposure itself, which obviously is at a high level for somebody who is quite junior trying to gain experience in terms of how those meetings would actually go, and how you should behave or communicate, and see to it that your voice is also heard. It's a learning experience. (Consortium A, Partner Institution, R7)

Learning sometimes is by observing or when a query comes, and it's pointed out that we should have done this (Consortium A, Partner Institution, M2)

...through those interactions, you can see people really growing. You know people who could not make decisions, you can see them making decisions that they wouldn't have made because they have seen other people making decisions... So, the interaction is very important in capacity building... they learn a lot because some of them you can see that they are not really exposed, but then they meet these kinds of people who are making all these decisions... It's an important component. (Consortium B, Lead Institution, M3)

Learning through these means was reported by both scientists and managers. Scientists and managers gained primarily from participating in managerial and general meetings, and managers gained primarily from interactions with the staff at the secretariat.

In addition, much of the learning from interactions emerged from the different experiences. Partner diversity in consortia implied differences in country and institutional contexts, levels of expertise, disciplines, and personal dispositions. Dealing with differences in outlooks, systems and procedures generated learning as partners were confronted with the need to consider new ways of thinking and operating.

Different learning environments are also important. Visiting different institutions which have got different areas of strengths I think is good because it adds value to the programme. It enhances the exchange of knowledge and exposure (Consortium A, Partner Institution, R7)

The centre can say, “ok these guys did it this way so let’s do it this way, take what they’ve learnt and improve it” ...You’ve learned your lessons, and you know what works and what doesn’t work in different contexts. (Consortium A, Lead Institution, M4)

You usually look at... challenges we have faced, and then we are able to get recommendations on how we can resolve some of those difficulties. This is discussed at the higher level where different institutions are participating. So, you are able to learn from how other colleagues are solving theirs... it helps in building your systems. (Consortium B, Partner Institution, M1)

Learning from differences was a key element of peer learning. Constructive comparison challenged the status quo and fuelled growth. As part of monitoring processes, consortia leaders visited partner sites to familiarise themselves with their operations and provide needed support. This practice provided a platform for learning from varying contexts. For instance, in Consortium B, leaders regularly invited one or two other partners to join the team from the secretariat on the scheduled partner visits for learning purposes. Visiting partners and secretariat teams were exposed to management approaches and resources in different contexts. These differences facilitated the exchange of ideas, experiences and best practice, and stimulated out-of-the-box thinking and growth.

These are all people in institutions that have their ways of doing things and can actually teach you things. So, I personally learn each time I visit some of these institutions. (Consortium C, Lead Institution, R1)

Beyond the differences within each consortium, opportunities to engage with a variety of consortia across the wider DELTAS Africa network existed. During annual initiative-wide meetings, consortia shared experiences and started or strengthened relationships, all of which promoted learning across different consortia. Although both researchers and managers gained from this learning mechanism, researchers appeared to have had more opportunities to engage with peers than managers. In Consortium B, where managers such as Finance Officers/Accountants and M&E Officers across the partner institutions held

regular meetings, there were increased opportunities for peer learning. Such opportunities appeared to have been limited in other consortia. Researchers, on the other hand, had more opportunities to participate in management meetings, general meetings, partner visits and DELTAS initiative-wide meetings.

7.3.2 Experiential learning

One of the main mechanisms by which consortia actors gained research and consortium management knowledge and skills was through their own management experience. Learning occurred as actors participated in decision-making processes, worked in teams, coordinated activities and resolved challenges encountered. Researchers and managers alike enhanced their capacity through hands-on experiences and ‘learning by doing’. For example, in Consortium A, trainees were expected to gain management skills by being accountable for their fellowships through regular reporting to the secretariat. The decentralised partner management approach adopted by Consortia B and C was aimed at getting partner institutions to participate in management at their levels to build competencies in managing grants.

They have to be involved not just as participants, but actually playing a more active role in running an aspect of the program. In that process, it improves their own capacity in various aspects; in the specific deliverables that they have to do but also in project management (Consortium C, Lead Institution, R1)

The experience for the administrative staff, accountants, and focal persons involved in grants management, especially in the institutions where activities happen, builds their skills and capacity that are transferable to their research management situations. (Consortium A, Lead Institution, M2)

When you get into consortium level type of management, you get to learn a lot of things... If I am going to request for anything to be bought... those days, I remember I didn't really bother about certain details. But now I need to make sure that the line that I'm asking that something be bought from, I'm not exceeding that line by a certain amount; and I'm ensuring that the line has cash in it; and that the charge cannot be placed in any other line just arbitrarily by the accountants or the finance people. (Consortium C, Partner Institution, R4)

As noted earlier, consortium and partner leaders are mainly researchers, many of whom acknowledged limitations in management expertise. Though leaders drew on previous experiences, the unique characteristics of the consortia studied such as being an HRCS instead of a research consortium, or South-led instead of North-led, meant that leaders needed to ‘learn on the job’. Consortia actors built up management proficiency as processes unfolded, as challenges and unanticipated situations forced innovations, and mistakes were made and corrected. Learning occurred through the ‘growing pains’. Some participants pointed out that:

These opportunities should be used to build our institutions, and you can only do that if you throw the institutions into the deep end and they learn to swim... When you give the resources to the prime institution, it will develop its capacity in managing others; but what are the others getting out of it as far as that capacity. So, to me, decentralize. (Consortium B, Lead Institution, R2)

It's good for me to be involved in such a programme, and the management, even the design, planning and implementation of a training project... I have learnt many things, and for me as an academic researcher, it's important. It has improved my financial management of projects... The queries which have been raised allowed me to improve the financial report and financial management of the research project. (Consortium C, Partner Institution, R1)

7.3.3 Training sessions

The use of training sessions was the most evident learning mechanism used by consortia. Through workshops, didactic methods were used to introduce or build upon consortium actors' management knowledge in specific areas. For instance, all the case consortia conducted financial reporting workshops for Partner Leads and Finance Officers. The PhD curriculum used by Consortium A included some research management topics, and Consortium B conducted workshops on research administration for the relevant institutional staff. Training workshops were used to address identified knowledge or skills gaps.

We also have regular training as a consortium. As we interact with the different partner sites, we tend to realize where there are common problems, and if the budget allows, we see where we can organize training to assist in those weak areas. (Consortium B, Lead Institution, M2)

We have had huge delays... Eventually, we met for the financial training, and I realized that I didn't quite understand how to manage that part of it... I now understand that this is completely different, and also some of the justifications that I have to do. Now I think we have streamlined things (Consortium C, Partner Institution, R2)

Many of the training sessions were reported to have focused on financial reporting processes. Moreover, whether the training was meant to address programme-level needs or broader, it still resulted in capacities that were useful for participants beyond the consortium.

I have learnt quite a lot, and it has also had an impact on my centre... I handle grants, projects, and partnerships, and I have had an opportunity to be trained in [Consortium B]. They have the research administration network where they take us and train us on specific things; financial management, research management. (Consortium B, Partner Institution, M4)

Knowledge has been acquired from the training in diverse ways. I can't speak for others but for me, yes. Because in any case you have learnt something new, and that helps you in the future. Even if you are not doing [Consortium C] work, there could be another project (Consortium C, Partner Institution, M4)

Although researchers participated in these types of training, these were mostly targeted at managerial staff. There were no reports on management training for Consortium and Partner Leads.

7.3.4 Coaching and mentoring

An important role of the lead institutions was to provide continuous support to partner institutions as they implemented their tasks. This was done through the secretariats and

was especially crucial for partners with sub-awards as they navigated their implementation and reporting processes. Partners consulted the secretariat for support in working through challenges and devising appropriate solutions. A combination of e-mails, telephone calls, meetings and site visits facilitated regular communication between the secretariat and partners. Coaching did not occur in a single direction; partners also coached lead institutions and other partners where a partner had more experience in a specific issue. During these interactions, it was considered essential to strike a balance between meeting funder requirements and using locally relevant solutions. This process resulted in learning for both lead and partner institutions. Consortia actors, particularly the Secretariat, also received managerial support from the funding agency including training and troubleshooting.

In addition, informal mentoring relationships were formed between individuals and institutions in some cases which were expected to continue beyond the consortium's activities.

I have gained a lot by participating in the management of the consortium... it has been a very well-structured mentorship programme... You can now play a part in managing other projects as well with the knowledge you have. So, it's a kind of a growth process; people have grown over the period of time in the management of projects... When the director executes the site visits, that's another level where you learn. Actually, we call it a learning visit, where we say we have been doing this and that, and you have time to reflect on how you did it... They also learn from us when they come to visit us, whether we have done things either the wrong way or the right way. So, I call it a kind of nice mentorship programme for both researchers and for research administrators and grants managers. (Consortium B, Partner Institution, M6)

Activity and financial reporting processes appeared to be the main learning points around which coaching occurred. While these coaching processes were mainly informal, they provided valuable learning opportunities for both researchers and managers.

7.3.5 Evaluation

Monitoring and evaluation processes were built into consortia's programmes and were conducted internally by consortia leaders and externally by the funding agency. Annual

reporting requirements compelled consortia to assess their performance and employ corrective measures where necessary. These formal assessments provided the opportunity for consortia to review their processes, an exercise which generated learning as actors reflected on what worked and what did not.

When we write the annual report, we do a summary of our activities: what were the difficulties; what were the outcomes; and then we take some decisions to change. Every six months, I do an evaluation of our activities. (Consortium C, Lead Institution, M1)

Often, evaluation processes were perceived as necessary to fulfil funder requirements, and more for appraisal than for learning. Evaluations were thus viewed as grading exercises, and consortia tended to only put their best foot forward. However, this appeared to be changing, and some consortia leaders are recognising the role of evaluation processes and results in capacity strengthening.

People hate audits; when they hear about an audit, they start shivering. I said, for me, I would like to have that audit as long as my mistakes were not intentional because I didn't know, and I commit to learning from that, and next time I'll do better. For me, find whatever you'll find that I've done wrong, but I'll use that as a springboard. And so, some colleagues started also appreciating that audits are not bad, they are good... you learn from them. (Consortium B, Lead Institution, R2)

They came for an audit, and they said well, where is your policy for doing this, where is your policy for doing that. We hadn't written anything down. So, I think that has been helpful actually. We have written down things and sharing with everybody... these policies are actually being reviewed. (Consortium C, Lead Institution, R1)

7.3.6 Translating and contextualising learning

Consortium members had accrued knowledge and skills in management processes over time from various sources. Previous and ongoing experiences from other collaborations were continuously drawn on to fulfil current roles.

There is no school for that [managing a consortium]. I learnt that through sitting on previous boards and seeing how those boards operated, and then bringing that previous knowledge to bear in this consortium. (Consortium C, Lead Institution, R1)

The recall and translation of previous learning into current contexts became a learning mechanism as it required selecting, transposing, tailoring and putting into practice the knowledge in a new context. These processes constantly occurred when consortia actors received recommendations or support from other members as they required contextualization to be effective. This involved innovation and new learning, although often implicit and unacknowledged. Consortia actors reported that they were continuously transferring and adapting learning derived from their management roles to other programme and institutional roles and vice versa.

Sometimes you get stuck, and you don't know what to do, but when you present it, the proposals come. It may not be a directive because what I have learnt is that they normally want you to find solutions which are consistent with your institutional guidelines... you are also learning how to come up with solutions in complex situations. (Consortium B, Partner Institution, M1)

We learn a lot from our experiences in different consortia and different activities during our career. So, I think in terms of learning how to even run a network... How do you manage them? How do you make sure that it's inclusive? You learn all these subtle skills when you are in these different consortia... So, I would like to think that that has shaped the way I think of running a consortium or the way I run my research centre... I do appreciate and hopefully, bring some of the principles of consortia and how they run them to the university and also sometimes what happens at the university level to the consortium. (Consortium A, Partner Institution, R5)

Leaders and partners also needed to contextualize management processes by determining how existing institutional processes could be used to achieve consortia requirements, particularly for institutions with nascent research management systems. For example, sub-award management required inputs from legal, finance and research administration stakeholders or appropriate proxies within the institutions. Coordinating these efforts engendered learning for both researchers and managers. In addition to individuals, the process strengthened the capacity of the institutions as intra-institutional interactions were

enhanced and readied for future activities. Previous learning was also validated and reinforced in the process.

Some of the member universities have started adopting some of the practices and the policies that we have in the consortium. But what happens is that they go back, look at what is happening at their home universities and say, “I think this might be difficult to apply in our case because of how we operate locally, or the rules, or our procedures and regulations. So, what is it that we need to change in our case?” (Consortium A, Lead Institution, M3)

Apart from managing the [technical group], I deal with the accounting people, administration, and we have a research support department. You have to liaise everything. I am managing all these because I’m the PI of this grant here. (Consortium C, Partner Institution, R2)

Establishing a consortium is quite a complex thing. It involves various offices. In our institution for example, it would involve developing MoUs, agreements; now that’s legal. It has to go through the Director General’s office. We have to look at whether being part of a certain consortium is beneficial... And those processes get strengthened even within the institution (Consortium B, Partner Institution, R2)

7.4 Factors Facilitating Learning

Across the case consortia, a number of factors emerged as facilitators of the learning processes described above. Factors such as the burden of responsibility, the process of time and intentionality set some of the learning mechanisms into action and promoted individual and institutional capacity enhancement. I discuss these in turn.

7.4.1 Burden of responsibility

The level of accountability required of lead and partner institutions put pressure on them to master the required management processes and deliver on expected outputs. The burden of responsibility forced learning as consortia leaders needed to effectively manage diverse partners and consortium activities in order to be accountable to the funders. For Partner Leads, the responsibility associated with being jointly accountable for consortia

performance necessitated learning and helped strengthen leaders' management capacity. As a result of sub-awards, partner institutions learnt to manage local teams as well as activities and budgets, and took the initiative for troubleshooting when challenges arose. Partners ensured that they were accountable to both the lead and their own institutions. Partner Leads therefore learnt to engage other stakeholders within their institutions such as research, finance and regulatory offices to ensure that activities were implemented, and programme outputs were produced.

By writing a contract with those institutions, you spell things out: this is what is going to happen, you are going to be responsible for that... that is already part of the capacity processes... That contract highlights the terms and conditions of the grant which otherwise the partners may not have fully appreciated... Putting them at their doorstep and saying these are the terms and conditions, and this is the piece of paper you'll refer to all the time as you manage the grant, that is contributing to capacity strengthening. Then you put the money at their doorstep and say, "well, if the money is misused, if it is misallocated, if it is misappropriated, you, institution X are responsible, and we expect accountability... the same accountability requirements that the funder expects from us". (Consortium B, Lead Institution, R2)

I have learnt a lot through my involvement in the processes. I have got to know how donors demand their reports, and sometimes I have to sit and take my time to read the conditions to also make sure I don't do anything contrary to the conditions. (Consortium C, Partner Institution, M3)

The advantage of this [decentralised] structure is that it's helping me as a leader or as an aspiring leader to learn how to manage my own grant. So here, I am called the PI, and I basically run this grant. It helps me to learn. (Consortium C, Partner Institution, R2)

7.4.2 Process of time

The passage of time played an essential role in many of the identified learning mechanisms as learning occurred and increased over time. Gaining experience, coaching and applying previous learning in current situations require time. Both consortia leaders and partners acknowledged that gaining the competence to play their respective roles

required time and their capacities grew as the consortia progressed. Though these times varied among partners, each individual and institution experienced their own learning curve.

After second and third quarters, co-applicants became very good with our procedure... if you take the start of the program and now, there is a good improvement. In the first quarter, there were a lot of questions... But now, there are just one or two questions on the checklist. (Consortium C, Lead Institution, M2)

By the time we end the five years of the programme, we will learn our lessons. The challenges can be corrected, and in the next phase or maybe in the future if there is any opportunity again from the funder, things will improve (Consortium C, Partner Institution, M3)

Research capacity building takes time, and you are not sure whether this is working or not working fully, because you've not given it adequate time. If you give it adequate time, then you can learn what worked and what did not work. (Consortium B, Lead Institution, R1)

Some consortia leaders acknowledged that the essence of time in enhancing capacity included flexibility, allowing for mistakes, and sometimes accepting less than ideal results both from themselves and from partners while learning occurred.

In terms of M&E, that has been challenging, but slowly we are getting there, starting with the lead. We're not used to this concept of M&E... so that has been a learning curve for us at the lead, and it's now trickling down to the co-applicants (Consortium C, Lead Institution, R1)

As we introduce new things, we first make sure that we have the blessing from the institutional management, and the institution as a whole appreciates what we are going to do. For the easier things, institutions have taken them on board. For others, we basically continue to persuade and make those small steps in the right direction, while appreciating that it doesn't happen overnight. (Consortium B, Lead Institution, M2)

The role of time also reinforced the advantage that longer standing consortia had with regard to management capacity, and the difference it made in their consortium management experiences.

7.4.3 Intentionality

Another factor that facilitated learning for some actors was intentionality. This refers to a purposive posture and actively analysing situations to generate learning. It required perceiving every aspect of one's experience as a learning opportunity and constantly drawing out lessons from each experience. Some members noted that such intent was essential for learning to occur.

As the youngest, sometimes I feel I'm not heard. But I keep going until it works. What I'm looking for is to learn, so I'm learning. Whatever it is, good or bad, I'm learning, and I'm able to sort out these things. (Consortium C, Partner Institution, R3)

The need to be intentional about learning was not only recognised as important at the individual level but also at the consortium level. Consortia needed to take deliberate steps in assessing management skills and organizing training for researchers to address the capacity gaps.

I think in the management of any consortium where PIs are involved, PIs shouldn't always assume that they have the necessary skills. They can look for ways of improving their skills that will at the end of the day, improve the overall delivery of the grants... I think just like they [leaders] always anticipate workshops to improve the skills of say, financial managers and program managers, they could incorporate training for the management board to give them management skills. (Consortium C, Partner Institution, R4)

I present how some of these learning mechanisms and facilitating factors were portrayed in practice next.

7.5 Learning Mechanisms in Action and Resulting Capacity Gains

As indicated earlier, the identified learning mechanisms were not mutually exclusive. Multiple mechanisms were often embedded in single scenarios, and several were usually combined in participants' learning experiences. For instance, gaining experience also involved exposure, observation, interactions, and practice. Training sessions also involved interactions among consortium actors and exposure to different experiences.

The interplay of multiple mechanisms and facilitators is illustrated in the following example from Consortium B:

Two members of a partner institution in Consortium B, the leader and the accountant, joined the team during the implementation phase. A sub-award was already in place. It took time for the team to grasp the intent of the work plans and budgets, overcome initial missteps, and effectively perform their roles.

At the beginning we didn't really understand... we came on board a year after it had started, so it took us time to pick up... In the first year of operation, I would say we spent most of the funds in some of the budget lines. We didn't know much about what the proposal intended. It was only after some time that we picked up: from the numerous training sessions we had, consultations with the secretariat and also from the field visits, and email communication. We came to know more about how these funds should be used. So, now we are ok, we are at par. (Consortium B, Partner Institution, M3)

Multiple learning mechanisms were at play in this process: experiential, interaction with and coaching by the secretariat, and training sessions. Learning was facilitated by the burden of responsibility (as the local team needed to deliver on their sub-award) and the process of time.

Across the case consortia, although mechanisms such as training sessions and evaluations were actively planned, the majority were not and appeared to be mostly unintended consequences of coordinating processes. Besides, learning was primarily aimed at ensuring programme performance more than institutional capacity strengthening, though capacity gains were expected to be useful beyond the programme period. Both researchers and managers reported having gained management capacity through these identified mechanisms, and capacity gains were produced at both individual and institutional levels. These include management expertise, professional growth, mentorship, and expanded networks. Participants reported improvement in various skills such as communication, people management, negotiation, seeking and gaining consensus, and identifying and addressing tensions.

You are able to know multiple systems... increasing my capacity in terms of working with multiple schemes. So, that is one area which I could say clarifies my being different from when I came. And then when you attend these meetings, you learn a lot from some of the senior personnel because you may not have them in your setting. So, the way you see them analysing things in a meeting and somebody is reasoning; there is a lot to learn from that. So, I think I am also able now to analyse in a satisfactory way and then also be able to come up with workable solutions. (Consortium B, Partner Institution, M1)

The partnership has opened doors... Through the training, we were able to become a direct grantee of the Wellcome Trust and a direct grantee of NIH... (Consortium B, Partner Institution, M4)

The knowledge and skills gained from consortia activities were transferable to other programmes and roles within participating institutions. Coupled with the strengthened infrastructural and managerial capacity, partners were able to source for funding and run research programmes of their own.

I recently put in an application for an EDCTP grant, and I got it... I put there what I learnt from this consortium... It's not magical. I have applied for other projects before for less funds, and I was not successful. But for this project, I knew exactly what the funders were expecting, and I was able to provide it because I have this experience... There is no way I can say that it's coming from myself; it's a result of this consortium and being in the management. (Consortium C, Partner Institution, R3)

Discussions among partners and sharing experiences also provided members with comparators and facilitated self-evaluation and identification of institutional gaps. Partners were consequently motivated to address identified gaps and strengthen their institutional research and management systems. Partners had a frame of reference when proposing initiatives and requesting for support from their institutional leaders.

The steering committee is a very useful platform because all the members contribute. And then as you sit and listen, you can also evaluate your performance, while learning from what other people are doing. And then from the PI, you get where the loopholes are and how you can try and plug them. (Consortium B, Partner Institution, R1)

The cross-fertilisation has allowed for consortium partners to look at different elements. When you look at research governance within universities, we are able to provide examples from different consortium partners, and this I think is something that enriches some of the universities especially the younger, less developed universities. (Consortium A, Lead Institution, R1)

Interactions between partner representatives on management boards and in partner forums forged closer individual and institutional working relationships that went beyond the consortium's activities. New collaborations sprung up; and partners continued to share research, training and funding opportunities among themselves. Engagement with other consortia and across the DELTAS Africa community widened the networking opportunities even further for consortia actors and institutions.

It's quite clear through the consortium meetings that networking is happening, and collaborations are being built... not only at the level of the fellows but the supervisors as well, and not only in Africa but including the northern partners. (Consortium A, Partner Institution, R7)

There were also opportunities for continuous learning even beyond the current DELTAS programmes as participants had formed networks within which other opportunities were shared and pursued.

7.6 Chapter Summary

In this chapter, I presented the findings on the role of consortium management processes in RCS. Across the three case consortia, consortium management activities were mainly perceived to facilitate rather than substantially contribute to RCS objectives. Activities for strengthening management capacity were not as deliberately planned for and tracked as those for strengthening technical research capacity. These programmatic choices indicated that management in RCS was rarely given its own space and attention, and only perceived as a means to an end. Irrespective of this status quo, it emerged that consortium management processes still resulted in individual and institutional gains in managerial capacity. These gains appeared to be knock-on effects of routine management processes as they were neither planned for nor reported on. I discussed the mechanisms through which learning and capacity strengthening occurred and the factors that facilitated these

learning processes. It is evident that management's role in RCS is understated and opportunities for developing essential research management capacity are underutilised. In the next chapter, I will discuss these findings in the light of established capacity development paradigms.

CHAPTER 8: DISCUSSION AND RECOMMENDATIONS

8.1 Introduction

This study aimed to critically examine how the management processes and practices of health research capacity strengthening (HRCS) consortia feature in and contribute to broader capacity goals. To achieve this aim, I set out to: 1) identify the management processes used by HRCS consortia and factors that influence these processes; 2) examine the key management processes with a capacity development lens; 3) explore how consortium management features in research capacity strengthening goals and mechanisms; and 4) recommend strategies for managing HRCS consortia and the implications for their evaluation. In the last three chapters, I presented the empirical findings from exploratory and case studies conducted with the DELTAS Africa consortia. This chapter presents a discussion of the findings in relation to the wider literature and recommendations. The chapter is divided into four main sections. Section 8.2 presents a summary of the main findings. This is followed by a discussion of the key emerging issues from the findings and their relevance, and how they relate to the wider literature in Section 8.3. Finally, I draw from the emerging issues and lessons learned to revise the initial conceptual framework in Section 8.4; and make recommendations for policy, practice, and further research in Section 8.5.

8.2 Summary of Findings

The findings of this study have been presented in Chapters Five to Seven. Chapter 5 laid the groundwork for the subsequent chapters by describing the consortium management processes used by the studied consortia and factors that influenced these processes. Three consortium management phases were examined: pre-inception, inception, and planning and implementation. The management structures and processes used in these phases were similar across the consortia studied. Processes included: determining the nature, size, focus and leadership of consortia; selecting partners; determining goals and activities; assigning roles and responsibilities; instituting governance and management structures; allocating resources; establishing partner management structures; and coordinating and monitoring activities. Generally, the consortium management phases, structures and processes identified in the studied consortia were similar to those identified in the

literature. However, these operational consortium management processes and their role in the capacity strengthening pathway had been rarely examined in the literature. Relational issues regarding power relations, equity, leadership, and inclusion emerged as important cross-cutting concerns both in the literature and the consortia studied. It also emerged that in determining the approaches for carrying out managerial processes, decision-making was often complex as consortia leaders encountered tensions between different options. The findings in this chapter addressed Objective 1 of this study and highlighted areas of interest for the in-depth case study presented in Chapters 6 and 7.

Chapter 6 presented findings from the in-depth investigation of the key management processes and approaches of three selected consortia. The key tensions between alternative management strategies that arise during decision-making processes across the different consortium phases were identified. Leaders often had to decide between individual or collective interests, efficient programme delivery or effective capacity strengthening, excellence or equity, and shared power or greater control. Underlying these tensions and consortia priorities were perceived definitions of research capacity and the capacity components that were deemed critical. These perceptions sometimes differed across consortia actors and were mostly shaped by programme evaluation requirements. Consortia leaders adopted a range of strategies in addressing these tensions. Although they often chose to maintain a balance between conflicting options, clear decisions were made in some cases. It was in the nuances of consortia's decision-making processes and how tensions were handled that priorities and perceptions of research capacity, as well as relational challenges regarding power relations, equity, inclusion, and leadership in consortia dealings were revealed. It also became clear that tangible management structures and processes that were not facilitated by intangible managerial 'software' such as communication and inclusion did not adequately achieve the intent of the management strategies adopted.

Chapter 7 explored how management processes featured in and contributed to individual and institutional capacity strengthening. Consortium management processes were observed to contribute to both programme coordination and capacity strengthening, although - importantly - their capacity strengthening opportunities and value were not actively recognised, planned for, resourced or tracked. Nevertheless, consortium actors' participation in management processes resulted in diverse learning experiences. Learning occurred through interacting with peers, playing respective management roles,

participating in training sessions, coaching and mentoring each other, learning from programme evaluations, and translating and contextualising learning for local use. Capacity gains made included strengthened operational and relational management skills, ability to determine appropriate management strategies, individual and institutional management of programmes, expanded professional networks, and opportunities for continuous learning. The findings in this chapter addressed Objective 3 of this study.

In the subsequent sections, I build upon these findings by drawing out the key emerging issues and their interrelatedness to determine implications of consortium management processes on the RCS agenda. Four critical issues with implications for capacity-oriented management of consortia have emerged from this study. The first relates to the emergence and handling of tensions during consortium management processes. The second examines if and how the strategies adopted by consortia in addressing tensions align with consortia's capacity strengthening aims. The third highlights the need to blend both tangible and intangible dimensions of selected management strategies to attain the desired results. These three interrelated issues address Objective 2 of this study. The fourth emerging issue considers how the three issues culminate in management-induced capacity gains, addressing Objective 3 of this study. I discuss each of these emerging issues next.

8.3 Key Emerging Issues

8.3.1 The existence and management of tensions in consortium management

It has become evident that the emergence and handling of tensions are central features of managing HRCS consortia. The existence of dilemmas and tensions in decision-making has also been discussed in the organisational management literature³¹⁵⁻³¹⁹, and more specifically regarding networks and inter-organisational transactions³²⁰⁻³²². Tensions similar to those experienced in the study cases have also been reported by management actors outside of the HRCS domain. Tensions between self and collective interests^{318, 323}, centralised and decentralised partner management models^{165, 322}, short-term and long-term interests^{324, 325}, and efficiency and effectiveness³²² have been found to be inherent in different types of collaborations including North-led consortia.

Tensions in decision-making often indicate misalignments between elements of consortia transactions, with the magnitude of the tension determined by the degree of divergence between these elements³¹⁹. It is evident from the literature and studied cases that tensions

reveal the underlying drivers of consortia challenges. For instance, Koelle and colleagues¹⁶⁵ pointed out that discussions on whether to use centralised or decentralised financial management models in consortia revealed power struggles. The study findings of this study suggest that the resulting management decisions do not only shed light on the underlying interests and priorities of consortium stakeholders, but also reveal the most influential factors and power sources in consortia decision-making. The findings indicate that challenges related to inequities and power imbalances continue to exist in consortia because leaders are forced to make compromises when faced with tensions between competing priorities. For example, sharing power and granting levels of autonomy to partners is inextricably linked with decreased control over consortium delivery and an increased risk of sub-par performance. In many instances, leaders prioritised consortium performance and thus retained enough control to ensure programme outputs are delivered. Relatedly, leaders sometimes had to sacrifice collaborative principles such as equity to ensure that the expected results were produced. The situation was exacerbated when partners perceived as weak were involved. In such cases, capacitated partners were responsible for more activities and were allocated more resources compared to less-capacitated partners to ensure consortia performance. Tensions and trade-offs have thus become inescapable features of consortium management. However, such tensions and trade-offs are (or should be) of particular significance in the RCS context as they reveal the perceptions of RCS, how different capacities are valued, who/what determines what is valued, and how all of these affect the overall capacity strengthening outcome. Compared to research consortia, whose primary goals are often the delivery of research outputs and hence can afford to be more programme-oriented, the goals of RCS consortia have broader and systemic implications. Therefore, closer attention needs to be paid to emerging tensions and the subsequent decisions and trade-offs in the RCS context to ensure that capacity aims are not undermined.

Although tension management is a crucial component of consortium management practice³²², this is not always consciously or explicitly recognised. Consortia leaders did not follow a prescribed set of strategies or framework for managing tensions, but the range of strategies observed throw light on factors that require consideration during decision-making by consortia. The identified tensions appear to be common across the study cases and even beyond the HRCS field; however, tensions have been observed to be contextually nuanced and must be interpreted within the specific contexts within which they occur^{315, 318}. As a result, tension management can “neither be formulaic nor

reductionist”³¹⁸. Nevertheless, highlighting potential tensions and providing clear HRCS-specific guidance for consortia leaders on where priorities should be placed will facilitate decision-making processes and ensure management decisions are weighted towards the overarching RCS goals.

Tension management has been extensively discussed in the wider organisational and management literature, particularly in relation to the pursuit of corporate sustainability³²⁶⁻³³⁰. Three common approaches to addressing tensions have been adopted by organisational actors: win-win, trade-off, and paradox approaches^{328, 329, 331}. The win-win approach avoids the tension by focusing on areas of alignment between the competing elements, the trade-off approach eliminates the tension by weighing the pros and cons of the competing elements and making a choice, and the paradox approach (also labelled as the integrative approach by some authors such as Hahn³²⁶ and Juniarti³²⁷) accepts the tensions by embracing the contradictory demands and making continuous efforts to resolve them^{328, 330}. These different approaches to addressing tensions were used across the consortia, albeit implicitly as opposed to explicitly. The win-win approach was observed in consortia’s primary focus on the common need for trained researchers across partners, the trade-off approach was observed in the choice of stronger partners over less capacitated ones, and the paradox approach was observed in the acknowledgement of the tension between excellence and equity and the incorporation of measures to balance out the effect of choosing one over the other. It has been noted that tensions can be contradictory and even mutually exclusive, or different but not in clear contrast, or form a continuum of different gradations of the elements in question^{315, 318}. Although different approaches may be suited to different types of tensions, there appears to be a convergence in the literature towards the fact that although the win-win and trade-off approaches have been dominant in practice over the years, the paradox approach offers more promise and appears to be better-suited for attaining sustainability^{326, 328, 329}. This is because the first two approaches have been reported to only work in the short-term and tensions resurface over time whereas the paradox approach pushes actors to continuously explore the tensions and come up with creative and sustainable solutions^{328, 330}. Thus, consortia appear to be better positioned if they accept and determine ways to resolve emerging tensions. Research capacity strengthening efforts will also be better served if the reality of tensions is proactively and explicitly raised, and some guidance, probably indicating boundaries, for resolving potential tensions are made available. As English³¹⁸ points out, one requires a strong sense of tensions to respond with the right action. Thus,

continuously raising and seeking ways to resolve tensions will increase actors' awareness of and ability to address tensions in HRCS consortia.

Specific capabilities at both individual and organisational levels have been identified as crucial when managing tensions^{329, 330, 332}. Individual capabilities include possessing the cognitive and behavioural ability to perceive, differentiate, connect, and act on the multiple dimensions of an issue^{329, 330, 332}. Organisational capabilities include dynamic abilities that enable effective responses to constantly shifting environments^{329, 330}. Further, the adoption of guiding principles or philosophy has been highlighted as essential in tension management^{326, 333}. This is because tension management has been shown to be more about underlying interests and values than just stakeholder positions³¹⁸. From the literature and this study, two sets of principles related to collaborations and capacity development respectively have been deemed crucial to the success of HRCS consortia and should guide decision-making in tension management. The first is the importance of adhering to collaborative principles such as equity and balanced power relations^{12, 131, 132}. The increasing number of LMIC-led initiatives are examples of efforts being made to operationalise these principles. It is worth noting that even for LMIC-led consortia, similar issues regarding inequity and power imbalances still emerged, highlighting the fact that these issues transcend HIC-LMIC collaborations and require close attention in every collaborative setting. The second set of principles crucial to the success of HRCS consortia pertain to capacity development. These include principles such as emergence and self-learning, although these have rarely been operationalised in RCS practice^{69, 125}. In the next section, I will focus on the latter and examine the key management strategies used in the studied cases from the capacity development perspective to give an indication of their suitability for consortia's HRCS aim.

8.3.2 HRCS consortium management: are the strategies fit for purpose?

The literature review in Chapter 3 indicated that very little connection is made between consortium management strategies adopted and capacity outcomes. While consortium management challenges such as power imbalances and inequity have been reported to undermine capacity benefits^{12, 14}, the extent to which each management process and adopted strategy enables or hinders capacity development is not well understood. To ascertain whether adopted consortium management strategies are fit for purpose, it is essential to establish what research capacity strengthening entails. The literature and

study findings indicate diverse interpretations of and approaches to research capacity strengthening in practice. However, the essence of capacity and the mechanism through which it is developed has been reasonably established in the literature^{69, 71, 73, 77, 86}. As discussed in Chapter 2, capacity is a systems phenomenon which relies on the interaction between its multiple dimensions and levels. Thus, strengthening research capacity is a complex, holistic and long-term process requiring interactions between individual, organisational and environmental levels as well as its multiple dimensions such as skills, leadership, infrastructure, management systems, collaborations, resource flow and applicability to be effective and sustainable^{98, 115, 116, 119}. The mechanism through which capacity is developed has been pointed out to be more emergent than planned, more of an “inside-out” process than an “outside-in” one, more long-term than short-term, and more systemic and synergistic than compartmentalised.

In addition, this study has established consortium management processes as capacity strengthening mechanisms in their own right. For HRCS consortia, decisions on management processes and strategies need to be made in the light of their capacity strengthening aims. Although it may be impractical to propose normative management strategies due to the varying contexts involved, assessing the strategies identified in this study with a capacity development lens will indicate the extent to which the strategies engender or hinder capacity development. I therefore assess the four main tension areas and the selected strategies in those areas – prioritisation of interests, efficiency and effectiveness, excellence and equity, and power – in turn.

First, the extent to which consortia prioritisation, whether in determining goals or allocating resources, aligns with capacity development principles significantly influences the degree and strength of the resulting capacity changes. When tensions between individual and collective interests are encountered during goal development for instance, strategies that place greater emphasis on each institutional partner’s needs and on a broader range of research capacity components are likely to serve capacity development aims more effectively. This is because partners vary, and sustainable research capacity is contextual and reliant on interactions between multiple capacity dimensions within local systems. To illustrate, if a partner institution needs both technical and managerial capacities, addressing both needs will produce more sustainable local research capacity as the interaction between the two is essential for research performance. Focusing on only technical capacities as a collective consortium interest is likely to have less impact on the

overall local research capacity. Additionally, prioritising some capacity dimensions such as training researchers (due to their tangibility for instance) will produce partial capacities if not embedded in broader and more holistic institutional capacity development plans. Consequently, due to the gaps in other parts of the local system, even the strengthened capacities may not be as fully expressed as expected.

Second, management efficiency seeks to attain the most outputs with the least inputs³³⁴. Due to scarce resources, managers are required to be both effective (doing the right things) and efficient (doing things right)³³⁵. This holds true in consortium management as well. However, there are tensions between efficiency and effectiveness, and consortia's placement along the efficiency-effectiveness spectrum reflects their capacity development value. An emphasis on efficient programme delivery to the detriment of effectiveness defeats the purpose of holistic capacity development. Efficiency is predicated on the reductionist approach to capacity development which has led to the compartmentalization of research capacity components such as focusing on the training of individuals. This reductionist approach takes little account of the complexity of RCS, although it is evident that research capacity is systemic, and its development is neither an amalgam of its components or a simple input-output process. For example, when a consortium focuses on only the consortium's management needs and not the needs of the participating institutions by creating parallel processes to facilitate efficient consortium performance, capacity strengthening within the local system is undermined. On the other hand, partners significantly appreciated capacity gains that resulted from increased management responsibilities, use of local management systems, and the intra-institutional interactions associated with the decentralised partner management approach. While the latter approach may appear to be less efficient due to the risks to performance, it aligns with the internally driven self-organisation that drives effective and sustainable capacity development. Indeed, a similar argument could be made for the selection of partners with greater or less capacity for research or grant performance, as well as choosing goals that are easier or more challenging to deliver, produce short-term or long-term and tangible or intangible outputs. Capacity strengthening calls for options that promote research capacities that will be more holistic, relevant, and self-sustaining in the local contexts, even in the face of short-term risks.

Third, excellence has been widely used as a key criterion for granting funding support to enable high-performing researchers to undertake high-quality research, and this has

permeated HRCS practice³³⁶. As reinforced by the study findings, consortia often opted for high-performance strategies in almost all management processes including partner selection, assignment of roles and responsibilities, resource allocation and partner management. The hinging of HRCS decisions solely or heavily on excellence as currently conceptualised connotes a results-based ideology more than the need-based and relevance-driven thinking that undergirds research capacity development. Indeed, some funders have raised the need to consider equity without necessarily sacrificing excellence in HRCS decision-making, and to revisit what ‘excellence’ means and how it is measured^{336, 337}. However, unless such calls are backed by explicit statements in funder policies or programme strategies and guidelines, and subsequently operationalised in funding application review processes, the status quo is likely to remain. Consortia leaders will be inclined to maximising programme performance based on the planned paradigm, and capacity strengthening will continue to be undermined. Similarly, if RCS initiatives explicitly or implicitly advance excellent science as a goal, tensions will emerge, and trade-offs will continue to occur. Clear policies and guidance will facilitate how these are managed and what needs to be prioritised.

Fourth, issues regarding power relations in research and capacity strengthening collaborations have consistently been raised^{197, 199, 338, 339}. Shared power engenders ownership, and both the positive and negative effects of different ownership levels on partner engagement and capacity development were demonstrated in the cases studied. The significance of self-organisation and adaptation in capacity development requires that all partners possess the power to self-organise and adapt RCS activities to their own contexts. For instance, greater responsibility in the decentralised systems was established as a key learning mechanism for partners at both individual and institutional levels. This was due to the opportunity it gave partner actors to self-organise. However, the reality that all stakeholders may have to accept is that the more distributed the power across the consortium, the greater the risk to accountability. As demonstrated by the study findings, consortia leaders frequently contended with reporting challenges such as timeliness and accuracy, particularly when less-capacitated partners were involved. Such challenges often inform decisions by some consortia to centralise power and maintain greater control. However, considering that time facilitates capacity strengthening, these risks and challenges can be expected to diminish over time. It is important to note that at the heart of capacity development is empowerment⁷⁰, and centralising power means that those that these initiatives aim to empower, receive little power and less capacity. The increasing

number of LMIC-led HRCS initiatives point to some recognition of the interaction between power and capacity development. DELTAS Africa demonstrates this recognition at the highest level as HIC funders have handed over substantial control of the initiative to the AAS due to the capacity strengthening intent. However, the same principle is not necessarily demonstrated within all consortia. The interaction between power and capacity is often not apparent or explicitly laid bare in consortium management. Promoting shared power in consortia as a vehicle for capacity development, similar to other more accepted mechanisms such as training, will contribute to the consideration of power as a mainstream tool in HRCS initiatives.

As indicated earlier, all these tensions described above and how they are addressed are significantly influenced by consortia actors' interpretation of research capacity and its development. The centrality of research capacity conceptualisation in consortium goals and practices has strongly emerged throughout this study. It is also evident that a holistic definition and characterisation of research capacity, and the mechanisms by which it is developed, have not been fully incorporated into HRCS practice. The thinking and management processes of research-oriented programmes appear to have been largely reproduced for RCS programmes. Thus, a research and grant culture which promotes delivery of outputs such as publications in high impact journals has increasingly dominated consortia operations and appears to drive the adoption of management strategies that enhance competitiveness. Relatedly, consortia strategies such as sidestepping bureaucratic institutional structures and creating consortium-specific management structures in order to expedite the delivery of outputs are driven by the research culture. As noted above, this approach tends to be results-driven and reductionist and does not fully align with the systemic and emergent nature of RCS. A recent survey of researchers by Wellcome Trust raised concerns about the effect of such a culture, pointing out that although competition is a necessary component of research, it is becoming aggressive and harmful and resulting in a loss of quality and impact due to the narrow set of priorities ¹⁵⁹. This call to streamline the research field to enhance the quality and impact of research indicates the need to evaluate and enhance RCS approaches. Taking a step back to redefine research capacity and explicitly delineate its dimensions and development pathways is likely to result in more effective and sustainable capacity changes. It is important to point out that a holistic HRCS agenda does not entirely exclude performance goals (such as publications). Performance is an indication that the required capacity exists, and capacity development is expected to eventually result in performance

¹²⁵. Thus, RCS without any consideration of performance could result in losing track of the need to produce results or engagement in endless re-organisation without tailoring the capacity development to the needed performance ⁶⁹. Nonetheless, it is important to note that although performance indicates the presence of capacity, it does not necessarily indicate capacity changes and should be cautiously used as a metric for RCS ⁶⁹. Health research capacity strengthening consortia will require dialectical thinking in shaping their practice while still being guided by fundamental capacity development aims. In doing this, a shared understanding of performance within the RCS context among all stakeholders is critical. Additionally, consideration of different evaluation timelines for capacity and performance outcomes, appropriate indicators, and seeking a balance between capacity changes and performance will be essential elements of a more holistic capacity-oriented practice.

Consequently, balancing options such as complementing the emergent capacity development approach with elements of the planned approach or complementing capacity changes with performance elements may be necessary for developing pragmatic programme and management strategies. Capacity gains can still be optimized if funders and practitioners are equipped with knowledge of the capacity development benefits and opportunity costs of various options. Admittedly, programmatic limitations of RCS initiatives (such as funding and time) may necessitate prioritisation of some capacity dimensions over others. However, embedding the selected area(s) of focus within wider RCS plans particularly at institutional and continental levels, and an awareness of the interconnectedness with other parts of the targeted systems will better address the overall capacity needs of participating stakeholders²⁶. From the findings, prevailing RCS thinking drives consortium management practice; thus, HRCS management practices that are fit for their capacity development purpose will require a consensus on the definition, approaches to and evaluation of RCS.

8.3.3 Blending tangible and intangible elements of management

It emerged from the literature review and empirical findings that a fusion of tangible and intangible elements is essential in consortium management. It was also observed that the connection between these two management elements is not always taken into account. Integrating tangible elements such as management structures and operational processes, and intangible elements such as actor agency and relationships is crucial. Although efforts

by funders and practitioners such as the use of LMIC-led consortium structures to balance power relations have been made, the significance of the tangible-intangible interaction and its influence on capacity outcomes have not fully suffused management practice. For example, consortia commonly use representative governance structures to ensure inclusion and power-sharing; but without addressing intangible barriers such as feelings of inadequacy which disempower some partners, and lack of ownership which disincentivize others, full inclusion and power balance are not achieved. This management outcome undermines the capacity strengthening process. Equally, having representative governance structures or decentralised partner management structures without a proactive and explicit commitment to values such as openness and learning is likely to result in missed capacity strengthening opportunities. Another area where combination of tangible and intangible measures is required is in promoting gender equity in HRCS consortia efforts. In addition to measures that will increase women trainees and leaders in research and in consortia, it is essential to be mindful of and take measures to address some of the inadequacies that may be felt by women consortia actors as a result of long-standing gender inequities such as limited experience in global health and research leadership^{340, 341}. Overall, it is imperative that tangible structures and processes are combined with intangible aspects of management to fully achieve the capacity development intent of consortia. Indeed, the importance of this interdependency has been recognised in business partnerships where emphasis is placed on going beyond formal governance structures to fostering collaborative relationships and behaviour in order to attain the desired goals^{342, 343}.

Ensuring that these dual dimensions are appropriately tackled will require the relevant set of skills. Many of the requisite skills relevant to the more tangible functions such as instituting systems and executing processes have been commonly labelled as ‘management skills’ while those relevant for the more intangible functions such as the ability to empower have been commonly labelled as ‘leadership skills’³⁴⁴⁻³⁴⁶. There are many overlaps between leadership and management, and the terms and associated skills are commonly used interchangeably³⁴⁷. Several authors have advanced that high-performing organisations require leader-managers who demonstrate both sets of skills, each of which are exercised based on the specific activity or situation^{346, 348, 349}. Different roles warrant different degrees of leadership and management skills³⁴⁶. The exigencies of HRCS require leadership styles such as distributed and transformational leadership which prioritise shared power and stakeholder development respectively, as opposed to

styles such as transactional leadership which focus on execution of management tasks³⁵⁰⁻³⁵². A distributed perspective on leadership acknowledges that all individuals and organisations within the system contribute to leadership irrespective of those formally designated as leaders^{350, 353}. Transformational leadership treats each individual as unique and needed in achieving the collective results while empowering and helping individuals achieve their fullest potential^{351, 352, 354}. The principles underlying these two leadership styles align with capacity development thinking, and their practice in HRCS consortia would be expected to be valuable for their capacity outcomes. Attention to developing the appropriate leadership skills will enhance leaders' crucial skills such as emotional intelligence which enables picking up partners' unvoiced feedback, and empowering skills that reinforce partners' self-expression and active participation in consortia and their local systems. It is clear that not only are high levels of both management and leadership skills required for effective consortium management, they are crucial components of research capacity and their incorporation as capacity strengthening goals in consortia programmes would be beneficial.

8.3.4 Management-induced research capacity outcomes

The literature review and study findings indicate that the conceptualisation of research capacity by HRCS consortia has often been too narrow. Indeed, this narrow perception is also prevalent in the broader RCS arena³⁵⁵. Research capacity strengthening has been widely perceived as synonymous with research skills training for individuals for many years, and this perception appears to still hold in many cases. The exploration into the essence of research capacity in Chapter 2 demonstrated the range of capacity dimensions spanning the tangible and intangible, technical and managerial, and strategic and operational required to work together for research capacity to fully exist. Hence, it is essential to make use of all opportunities to strengthen the full range of capacities. As discussed in Chapter 7, consortium management processes and practices lead to multiple individual and institutional capacity gains that are essential for the research system. Unpacking the mechanisms through which learning occurred in consortia increases consortia actors' awareness of the multiple and often overlooked ways through which capacity is strengthened, which can in turn inform managerial strategy decisions. For example, consortia leaders become increasingly conscious of the fact that participating in consortia-level deliberations, hands-on consortium management experience, and higher

levels of responsibility are crucial for research capacity strengthening. Similarly, an awareness that translating knowledge from one context into another is essential for sustainable capacity strengthening and self-reliance highlights the importance of allowing partners to contextualise management processes instead of creating ‘ideal’ parallel structures to manage grants.

Many of the management-induced capacity gains reported by participants in the cases studied strengthened both individual and institutional capabilities. They also strengthened many of the less-considered research capacity dimensions, particularly the strategic, managerial and intangible dimensions. For example, new and strengthened relationships with consortium partners and other DELTAS stakeholders provide platforms for new research collaborations and access to research resources. Indeed, some consortia cases reported that they had already leveraged and experienced these benefits. Consortium coordinating and reporting requirements strengthened local research management systems and workflows as well as intra-institutional relationships that are expected to continue supporting local research. Leadership skills gained by consortia actors in areas such as goal and strategy development, negotiation, and communication feed into capacity dimensions such as the ability to develop local research aims, translate these into strategic and operational goals, and relate with internal and external stakeholders to attract resources and deliver on goals. Flexibility and dynamic management skills gained from managerial experiences have been found to be essential in managing constantly changing local contexts and stakeholders. For example, the COVID-19 pandemic clearly demonstrated the need for such leadership and management skills. In such emergencies, prompt mobilisation of the multiple actors and elements of research systems is a crucial part of the required multi-level response efforts; making management processes and skills an integral part of health emergency preparedness ⁵⁹. Hence, identifying and working towards capacity gains such as those discussed above, and linking them to research capacity dimensions, will ensure that research capacity developed is not limited to technical research skills but aims for strengthened contextual and strategic bases on which local research enterprises thrive. Thus, incorporating management-induced capacity goals into consortia plans will contribute to developing research leaders and advancing the capacity of entire research systems.

8.4 Revised Conceptual Framework

In Chapter 4, I presented a conceptual framework based on the literature reviewed, which elicited the consortium management phases and activities and served as a guide for the study (Figure 4.1). Here I present a restructured conceptual framework (Figure 8.1) that takes into account the critical issues emerging from the empirical findings of this study as well as the literature I have shared throughout this thesis. This is a normative framework to support consortium management decision-making which promotes capacity strengthening. While the revised conceptual framework still presents the consortium management processes and outcomes, it places greater emphasis on: 1) the capacity strengthening purpose of consortia; 2) the need for stakeholder consensus on what RCS entails; 3) the centrality of taking the essence of capacity and its development into account when deciding on management strategies; 4) both tangible and intangible aspects of consortium management; 5) ‘how’ the management processes are executed and not just ‘what’ processes are to be followed; and 6) the capacity strengthening value of consortium management processes and practices as well as some of the resulting capacity outcomes.

The framework lays out the steps and factors that should be considered in managing HRCS consortia to promote their capacity strengthening aim. First, it is essential to clearly establish consortia’s capacity strengthening purpose which will then provide the fulcrum around which managerial decisions are made. This should be done through the collective formulation of programme goals based on a holistic definition of research capacity, and the framework that will be used to assess the performance on these goals. Thus, a consideration of the multiple levels (individual, institutional and environmental) and dimensions (tangible and intangible) of research capacity is crucial when determining consortia goals. Second, management decisions need to be guided by the collaborative and capacity development values that undergird HRCS consortia.

The RCS purpose can then be operationalised by vetting consortia’s management strategy options for alignment with these goals and values. For instance, consortia goals should be need-based and take into account ways in which equitable capacity benefits would be attained across partners. In determining management strategies, consortia need to consider both the tangible and intangible aspects to ensure that the intents of the strategies are achieved. While implementing the selected strategies, consortia will need to actively track the outcomes of the strategies and the effect on learning goals in order to maximise

the resulting management-driven capacity outcomes. Tracking both planned and unplanned as well as explicitly and implicitly communicated consequences of the implementation of the various strategies is essential during this process. Additionally, monitoring the outcomes of management strategies and feeding them back into decision-making will ensure that capacity opportunities are not missed.

This conceptual framework represents a ‘theory of change’ and maps out a fresh approach to consortium management to optimize the research capacity gains that are derived from management processes. It draws out issues underlying the tensions encountered in consortium management to facilitate their consideration throughout the consortia’s lifecycle. I acknowledge that while this framework puts forward an evidence-informed consortium management approach for effective capacity strengthening, its implementation would not be without challenges. The factors that have precipitated the need for such a framework such as the nature of some funder requirements may still dominate decision-making. Nevertheless, the aim of the framework is to continuously draw attention to managerial influences and their capacity implications as well as to highlight management-related gaps and areas that require greater attention for consideration in HRCS policymaking, practice and research. It is intended to promote transparent discussion of these issues, informed decision-making, and an awareness of the capacity implications of decisions made. Thus, the questions raised in the framework are not meant to promote dichotomous strategy choices but to provide a spectrum of options for consideration during decision-making in alignment with consortia’s capacity goals.

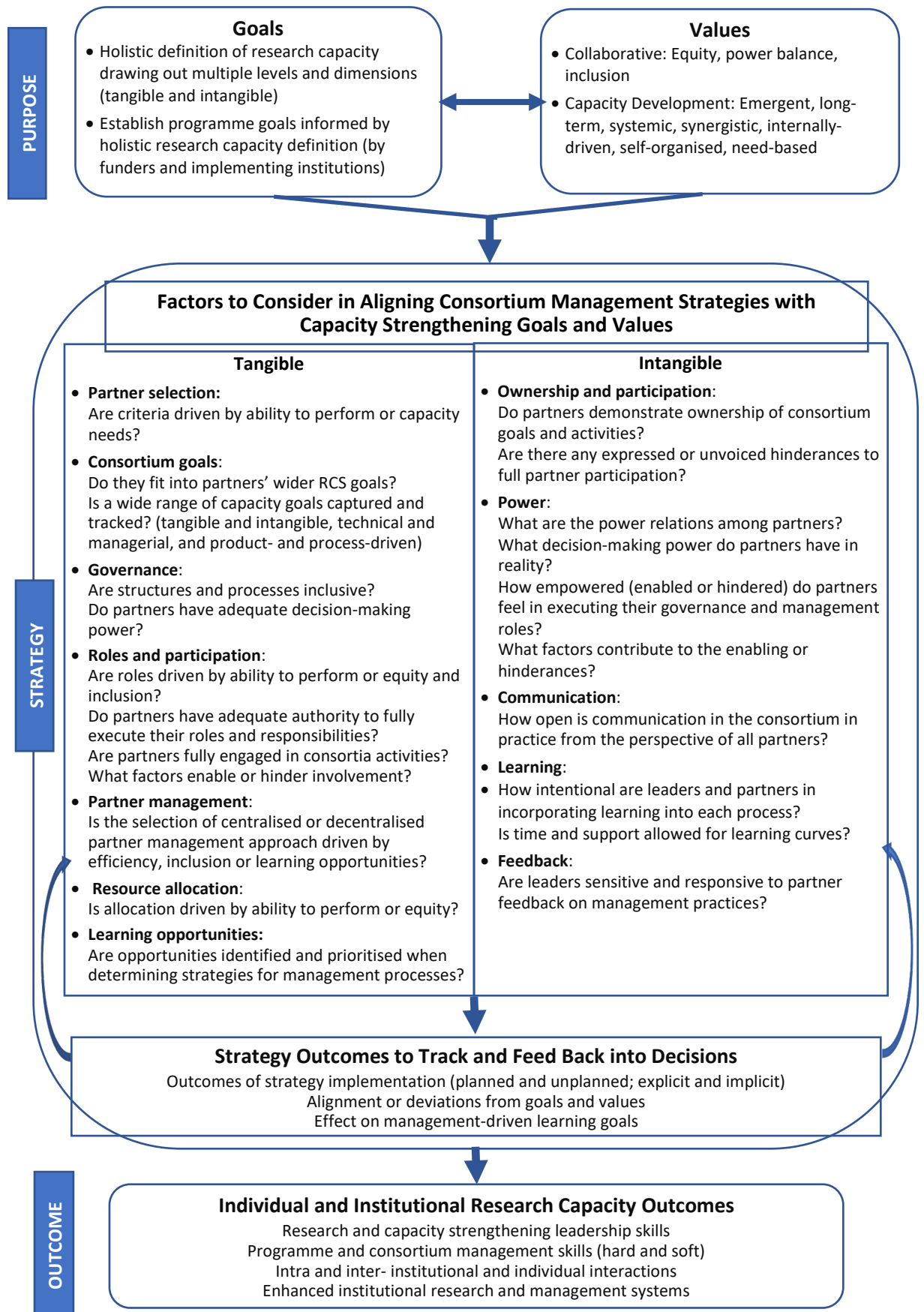


Figure 8.1: Steps and Factors that Should be Considered in Consortium Management to Promote Capacity Strengthening

8.5 Implications for Policy, Practice and Research

Drawing from the reported findings and emerging issues, I address the study's fourth objective by making recommendations for policy, practice, and further research specifically for HRCS consortia management and the broader HRCS agenda.

8.5.1 Policy implications

The policy context within which consortia operate, particularly concerning funders, significantly influences how capacity strengthening initiatives are shaped and consortia's latitude in management ¹²². A paradigm shift in the HRCS domain towards facilitating greater and more sustainable capacity gains from initiatives will require policy adjustments that reflect the emerging evidence. To begin with, it is crucial to reach a consensus on what research capacity and its development entail among HRCS stakeholders, including funders, consortia and institutions. Considering the pivotal role funders play in HRCS practice, it is essential for funders to not only clarify the primary capacity strengthening aim of initiatives, but to ensure that it permeates through programme design and reporting requirements. For instance, some funders could better recognise that consortium management is a capacity strengthening mechanism in its own right, and management processes that prioritise capacity development require adequate resources and time. This has been demonstrated by a UK funder's example of impelling the incorporation of consortium management into programme theories of change ²⁸. Funders can play a crucial role in driving the prioritisation of consortium management and ensuring it receives adequate support in its operationalisation and evaluation through their programme stipulations. In addition, it is important for funders to realize that management tensions are significantly heightened in capacity strengthening programmes, and consortia leaders often make trade-offs based on their perception of what the funder expects. As a result, strategy decisions that optimize capacity strengthening are often less favoured as they do not always optimize programme efficiency. Funders would have to be more willing to accept the performance risk inherent to processes that optimize capacity strengthening. Consequently, such commitments would have to be accompanied by specific guidelines with clear emphases on the capacity strengthening intent of programmes to give implementers the latitude to choose the appropriate consortium strategies. Considering that consortia leaders are usually research experts (as opposed to RCS experts), these guidelines will be both instructive and empowering for consortia in

their decision-making processes. Such guidance will also be useful for reviewers of funding applications for HRCS programmes, who will prioritise RCS principles and not just ‘good science’.

Relatedly, the performance evaluation of HRCS programmes requires further attention. This study highlighted the influence of current RCS evaluation requirements on consortium management decisions. Evaluation indicators were mainly research products such as publications and grants won by trainees. Funders’ focus on research product goals, as opposed to RCS goals, has consistently created tensions in RCS programmes^{15, 69}, and as demonstrated by this study, often led to compromises on both capacity strengthening and collaborative principles. Therefore, it is crucial that the research capacity that is mandated must match what is measured, and this intention needs to be accepted and advanced from the policy level. A shift towards more RCS-specific programme evaluations will be an important step in that direction. Such a shift will require acknowledging that capacity strengthening is not straightforward and does not always fit the input-output structure; it is contextual and emergent over time, and RCS results are often intangible and difficult to measure. Capacity changes must not only be measured in single research capacity components but in changes to system behaviour⁶⁹. Thus, in evaluating RCS programmes, it will be useful to assess changes in multiple capacity dimensions at all three levels (even when the interventions were focused on only some dimensions or levels); and if and how changes in one dimension or level affect broader local research systems. Evaluations should take cognizance of the fact that research capacity is both a means and an end, and should therefore reflect both the ‘means’ and ‘end’ assessments. These will require employing both quantitative and qualitative indicators and methodologies to capture both tangible outcomes such as research productivity changes and intangible outcomes such as behavioural and cultural changes²⁶. Additionally, the element of time in the capacity development process suggests that RCS programme evaluations will provide a better picture of outcomes and impact when conducted at time points beyond implementation. As Brinkerhoff and Morgan⁸⁸ pointed out, there are situations where what may initially appear to be a failed intervention could often contribute to subsequent successes. Similarly, unanticipated results or insights, in many cases, may prove more important to capacity development effectiveness than what was planned⁹². Thus, it will be valuable for funders and programme evaluators to consider a broader range of evaluation approaches such as outcome mapping, outcome harvesting, contribution analysis, and realist evaluation; and the use of methodologies

such as case studies and reflective practices^{68, 356, 357} in assessing programmes. These approaches may help unpack the capacity development process and draw out any causal or contributory links between different aspects of RCS interventions and capacity changes. Subsequently, such evidence would contribute to improved programme theories of change that are likely to lead to better capacity outcomes. Basically, it is imperative for RCS stakeholders to redefine performance and excellence and how these are measured. Excellence in RCS need to be considered more as excellence in developing the means to research performance than as excellence in research performance. Funders may be best placed to both initiate as well as be receptive to and support such discussions initiated by HRCS practitioners and researchers.

Furthermore, to promote effective and sustainable RCS, increased institutional leadership and ownership of RCS programmes is essential. While funders generally award grants for RCS programmes to institutions, the study findings indicated that programmes were led by individual researchers, and the levels of institutional embeddedness and ownership, as well as the resultant benefits, varied. Similar to research grants, consortium participation appeared to be more at the individual level than at the institutional level. Thus, it would be beneficial for RCS programmes to place greater emphasis on institutional consortium membership and closer alignment of consortia activities with institutional goals. It will be necessary for participating institutions to have RCS plans which are actively tracked, and which consortium programmes can fit into. Such an approach to developing consortia goals will also inform and facilitate tailored evaluation of consortia programmes.

Finally, capacity strengthening outcomes of HRCS initiatives can be optimized if more attention is paid to HRCS implementation science to inform policy and practice. Deliberate efforts to increase the generation and use of empirical evidence on HRCS practice will provide the learning required to consistently improve guidelines, design, and implementation of HRCS programmes and ensure the aims are achieved. While research in this area is emerging, it is still an under-developed area, and so the empirical bases for building the HRCS practice appears to be weak²¹. Currently, many health research funders demonstrate their commitment to capacity strengthening by requiring applicants to include their capacity strengthening strategies as part of funded programmes. This could be taken a step further by including HRCS research as an important scientific area in both research and HRCS programmes. The HRCS agenda will significantly benefit

from a well-supported research component that will drive more effective and sustainable RCS and ensure that returns on investments are optimized.

8.5.2 Recommendations for HRCS consortium management practice

The findings of this study form the basis for proposing some strategies for consortium management practice. First, as demonstrated in both the literature review and study findings, similar management processes were used by most HRCS consortia during their inception, planning, and implementation phases. The differences among consortia lay in the strategies adopted for each process. As such, there is no ‘one size fits all’ formula for the management strategies used as contexts vary. However, it is essential for the capacity development ethos of HRCS consortia to be at the forefront of management decisions. This would require deliberate discussions and a consensus among consortia stakeholders on what holistic research capacity comprises as well as programme priorities at both initiative and consortium levels. All partners would then assess their research capacity contexts and map out their respective strengths and gaps. Management decisions are then shaped by these agreements and factors unique to consortia stakeholders’ contexts. For example, goal development processes should recognise the short, medium and long-term capacity strengthening goals of participating institutions which have been determined by a holistic research capacity definition.

Second, the assessment of consortia’s performance, including the tools and indicators employed, must be suited to measuring the changes in the multiple dimensions of research capacity at the different levels (individual, institutional, environmental). The contextual baseline of different partners also needs to be taken into account when assessing capacity changes. Additionally, consortium evaluations need to cover a wide range of capacity changes: quantifiable and unquantifiable, tangible and intangible, technical and managerial, strategic and operational, programme-oriented and institution-oriented, short- and long-term, and whether wholly or partially attributable to the programme. The use of such a wide lens will increase the awareness and maximisation of capacity strengthening opportunities.

Third, capacity gains from management processes and practices need to be planned for, resourced, tracked and evaluated. As illustrated in the conceptual framework, a conscious, explicit and consistent detailing of management strategy options for each process and their implications on capacity development is required to ensure that management

practices are aligned to consortia's capacity aims. In doing so, it is crucial for consortia leaders and managers to recognise that management strategies are made up of both tangible and intangible dimensions, particularly when the aim is to capitalize on their capacity strengthening opportunities. Instituting the tangible management structures and processes alone do not always achieve their purposes unless they are powered by intangible elements such as proactiveness, perception of power dynamics, sensitivity to management outcomes, and responsiveness. The use of frameworks or guidance, such as the above conceptual framework (Fig 8.1) will help leaders draw out and consider both tangible and intangible strategies required to successfully manage HRCS consortia.

Fourth, this study's findings have highlighted the significance of monitoring, responsiveness and dynamism in consortium management to ensure that the desired results and capacity changes from those experiences occur. Continuous tracking of tensions, contextual influences, interactions between programme and institutional elements, and the effect of all these on capacity strengthening efforts is crucial. This will not only facilitate timely responses to any developments by leveraging opportunities and addressing hindrances but will ensure that the capacity being developed is more embedded in the local systems; thus, improving its sustainability.

Fifth, two important means of enabling consortia leaders in their leadership and management roles are training and mentorship. Leaders need to plan for and access training and other resources for themselves and other consortia actors to enhance their leadership and management skills and practice. It is crucial for HRCS consortia funders, designers and implementers to recognise that there is a science to capacity strengthening that should inform programme implementation including management practice. Training, particularly for consortia leaders, will increase the awareness of a broad range of tangible and intangible capacity strengthening and management elements, and enhance leaders' skills in managing HRCS consortia. For example, discussions on the cognitive and behavioural skills required for tension management during such training sessions will enhance awareness and increasing use of those skills. Such training will provide the opportunity to explicate and strengthen the required leadership and management skills. The need for deliberate training is even more crucial considering that management practices are often transferred from one consortium to the other, and in many cases, without the benefit of evaluation of these management practices and outcomes. Making deliberate efforts to strengthen the management skills of consortia leaders will therefore

promote the replication of knowledge-based management practices across consortia and in the broader RCS domain.

Finally, consortia leaders should endeavour to provide comprehensive feedback to funders, including elements that are not stipulated in reporting and evaluation requirements. For example, sharing the reality of management tensions and trade-offs and how different decisions enable or hinder capacity strengthening in their contexts will increase stakeholder awareness of a broad range of implementation outcomes. Consortia feedback will then serve as evidence and sources of learning for funders and designers of programmes.

8.5.3 Areas for further research

This study has led to insightful findings regarding the interaction between consortium management and capacity development. It has also highlighted a number of issues that warrant further investigation. First, this study focused on one Africa-based HRCS initiative (DELTAS Africa) and only examined consortia from this initiative. Conducting a similar study with consortia from other HRCS initiatives, geographical settings, and disciplines will contribute towards determining the transferability of these findings to different contexts. This study also focused on South-led consortia, and an examination of management processes and practices of North-led HRCS consortia may draw out different contextual influences and unique issues for consideration in such consortia.

Second, it would be worth examining the management processes and practices of research consortia to better understand how the experience differs when capacity strengthening is not a primary objective. Many research consortia may still have embedded capacity strengthening goals, and it would be insightful to ascertain if and how those goals influence their management processes and strategies.

Third, it would be valuable to examine the power relations among consortia members in greater depth, drawing out the different forms and sources of power and how they are channelled or expressed throughout the consortium lifecycle. This will increase the awareness of the power dynamics among consortia stakeholders and help improve our understanding of the underlying causes of inequity and power asymmetries. Also, it would be useful to consider a deliberate application of a gender lens in examining consortia operations to draw out any gendered influences and implications of current

management practices. Highlighting these factors will promote management strategies that address power challenges and promote more equitable capacity benefits across consortia.

Fourth, it will be necessary to validate and build upon the presented conceptual framework (Fig 8.1) through empirical testing with RCS consortia in similar and different contexts. This would involve applying the conceptual insights that have emerged from this study and captured in the conceptual framework to other cases and contexts. The framework can thus be used to understand and further examine the management processes and strategies of both similar and different RCS consortia and their influence on the capacity outcomes.

Finally, several potential areas of research on RCS more broadly have been highlighted as a result of this study. The highlighted characteristics and dimensions of capacity provide a conceptual basis for empirically identifying the full range of research-specific capacity dimensions. The investigation of multiple RCS initiatives can contribute to an evidence-based and unified definition and characterisation of research capacity to guide RCS practice. Another key area for research is an institutional-level investigation to identify the different research capacity components, as well as the interfaces and interactions between RCS activities and other institutional structures and activities and their effects. Additionally, research that seeks to draw out RCS-specific evaluation strategies and indicators will contribute towards addressing this long-standing gap in the RCS field. Also, conducting impact evaluation of RCS programmes several years after completion to assess all the research capacity levels and dimensions will identify factors that influence the capacity development pathway. Impact evaluations will also draw out enablers and hindrances to the capacity development process and suggest more effective and sustainable approaches to capacity development.

8.6 Chapter Summary

In this final chapter, I presented a summary of the study findings and discussed the emerging issues, how they fit in the existing literature and their relevance to the HRCS field. I highlighted the reality of tensions in consortium management and ascertained how they are managed from the broader management literature. I advocated for the paradox

approach of tension management, which promotes confronting and resolving the conflicts underlying tensions, and which aligns with consortia's capacity strengthening aims. I then examined the management strategies adopted by the studied consortia using a capacity development lens to ascertain their fitness for the capacity development aim of HRCS consortia. It also emerged that it was essential to blend both tangible and intangible elements of management to ensure that the intended consortia outcomes are achieved. It became clear that there are several essential management-induced research capacity outcomes that require giving consortium management the necessary attention to ensure those capacities are realized. Finally, based on the study findings, I present a revised conceptual framework that can guide capacity-oriented consortium management, and recommendations for policy, practice and further research. Summaries of key recommendations for HRCS funders and consortia leaders and managers are presented in Box 8.1 and Box 8.2 respectively.

Box 8.1: Summary of Recommendations for HRCS Funders

- 1) Recognise that consortium management is a capacity strengthening mechanism in its own right, and management processes require adequate resources, time, and training
- 2) A holistic (multi-level and multi-dimensional) approach to research capacity strengthening is essential to maximise the capacity outcomes
- 3) Clarify the capacity strengthening aim of initiatives and ensure it permeates programme design and reporting requirements
- 4) Recognise the existence of tensions in consortium management and the capacity implications of the resulting compromises and trade-offs that are often made to meet funder requirements
- 5) Embrace the risks inherent in RCS and its management
- 6) Back capacity strengthening commitments with clear guidelines to give implementers the latitude to make appropriate management decisions even when it appears 'risky'
- 7) Redefine performance and excellence and how these are measured; and ensure evaluation indicators are RCS-specific to promote the prioritization of capacity strengthening in management decisions
- 8) Promote increased institutional leadership and ownership of RCS programmes as well as closer alignment of consortia activities with institutional goals to ensure more sustainable capacity outcomes
- 9) Appreciate that there is a science to capacity strengthening which should inform programme implementation; and endeavor to advance the generation and use of empirical evidence in HRCS practice to drive more effective and sustainable RCS

Box 8.2: Summary of Recommendations for HRCS Consortia

- 1) Establish a consensus on what holistic research capacity and its development entails among stakeholders including funders, consortia and partner institutions to guide consortia activities
- 2) There is no 'one size fits all' formula for consortium management strategies as contexts vary, but it is essential to ensure that decisions are guided by a holistic capacity development ethos
- 3) Recognise that consortium management is a capacity strengthening mechanism in its own right; leverage the RCS opportunities it presents, and assign the required resources, time and training
- 4) Identify the tensions that emerge when making consortium management decisions and ensure constant awareness of the capacity implications of the different strategy options
- 5) Align consortia activities with institutional goals of partners to ensure the attainment of more relevant and sustainable capacity outcomes
- 6) Continuously track tensions, how management decisions unfold during implementation, contextual influences, interactions between programme and institutional elements, and the effect of all these on capacity strengthening efforts; make adjustments where necessary, and share experiences as learning
- 7) Integrate tangible management structures and processes with intangible management 'software' such as perception of power dynamics, and sensitivity to both expressed and unvoiced feedback to help achieve the intended capacity outcomes
- 8) Employ programme evaluation approaches including tools and indicators that consider the contextual baseline of different partners and measure a wide range of research capacity changes (quantifiable and unquantifiable, tangible and intangible, technical and managerial, strategic and operational, programme-oriented and institution-oriented, short- and long-term) at the different levels (individual, institutional, and environmental)
- 9) Provide comprehensive feedback covering a broad range of implementation outcomes to funders including elements that are not stipulated in reporting and evaluation requirements to enhance policy and future programmes
- 10) Draw on and contribute to empirical evidence on HRCS practice and consortium management to promote knowledge-based practice and sustainable capacity outcomes

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Managing health research capacity strengthening consortia: a systematised review of the published literature

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ABSTRACT

Background Locally relevant research is considered critical for advancing health and development in low- and middle-income countries (LMICs). Accordingly, health research capacity strengthening (HRCS) efforts have intensified, increasingly through consortia. Yet, the knowledge base for managing such consortia is not well defined. This review aimed to ascertain the scope and quality of published literature on HRCS consortium management processes, management-related factors influencing consortium operations and outcomes, and the knowledge gaps.

Methods Given the paucity of published HRCS literature, a 'systematised review' as outlined by Grant and Booth was conducted, modelling the systematic review process without restriction to research-based publications. A systematic search in PubMed and Scopus was carried out coupled with a manual search for papers using reference checking and citation searching. A quality appraisal of eligible articles using the Mixed Method Appraisal Tool was undertaken. Thematic synthesis was used to analyse the extracted data.

Results The search identified 55 papers, made up of 18 empirical papers and 37 commentaries focusing on consortium-based HRCS initiatives involving LMICs and reporting management-related data. The review indicates increasing efforts being made in the HRCS field in reporting consortia outcomes. However, it highlights the dearth of high-quality empirical research on HRCS consortium management and the nascent nature of the field with most papers published after 2010. The available literature highlights the importance of relational management factors such as equity and power relations in influencing consortium success, though these factors were not explored in depth. Operational management processes and their role in the capacity strengthening pathway were rarely examined.

Conclusion Findings indicate a weak evidence base for HRCS consortium management both in terms of quantity and conceptual depth, demonstrating the need for an expanded research effort to inform HRCS practice.

INTRODUCTION

Health research has been recognised as an essential tool in addressing health and development challenges, yet the capacity of many low- and middle-income countries (LMICs) to conduct locally relevant research is still low.^{1,2} In the last three decades, several calls to

Key questions

What is already known?

► The recognition of the fundamental role of research in advancing health and development has resulted in substantial investments in health research capacity strengthening (HRCS) consortia in low- and middle-income country settings.

What are the new findings?

► Very little attention has been given to consortium management in the literature, and the current evidence is characterised by a lack of high-quality empirical research.
► The available evidence highlights the importance of relational elements of consortium management such as equity and power relations but does not explore these elements in depth. Operational management processes adopted and their role in the capacity strengthening pathway were rarely examined.

What do the new findings imply?

► There is a need to strengthen the evidence base on the role and contribution of consortium management processes to broader HRCS capacity development initiatives.

action have been made for sustainable health research capacity strengthening (HRCS) in LMICs,¹⁻⁴ resulting in substantial investments in a wide range of initiatives.⁵⁻⁷ Mechanisms for developing research capacity in LMICs have evolved over the years, progressing from the provision of technical assistance to individual-focused training, and more recently towards institutional and system-wide approaches.^{8,9} One of the main strategies adopted over the period has been the teaming up of institutions to implement these programmes.^{6,10} Though such groupings refer to themselves by various names such as partnership, consortium, and network,¹¹⁻¹³ we will use the term 'consortium' in this paper.

HRCS consortia typically consist of individuals and institutions from both high- and low- and

middle-income countries pooling their varying levels of resources, expertise and experience and working together towards collective gains in health research capacity.^{14 15} While these consortia are often led by high-income country partners,^{16 17} there is a rising trend of LMIC-led consortia such as those that were supported by the Wellcome Trust's African Institutions Initiative and its successor, the Developing Excellence in Leadership, Training and Science Africa Initiative, the USA National Institute of Health's Medical Education Partnership Initiative, and the European and Developing Countries Clinical Trials Partnership Programmes.

The increase in HRCS consortia has heightened the need to assess their activities and effectiveness. Accounts of HRCS consortia in the literature have generally focused on programme activities and outputs and associated successes and challenges.^{18–20} However, current evaluation thinking embraces the value of processes in addition to outcomes,^{21 22} recognising that assessing programme implementation processes to determine how and why specific outputs are realised is as important as assessing the outputs themselves.^{22 23} Integral to programme implementation processes are the management structures and activities employed throughout its lifecycle.²⁴ Managing a consortium is often a complex effort involving coordination of both activities and partners (individual and institutional) that are, in turn, embedded in additional structures and systems.^{25 26} Leaders of multimillion dollar HRCS consortia, who are often primarily researchers, are expected to deal with these managerial complexities.²⁵ The evidence base to support the navigation of this complex endeavour in the HRCS context is neither well defined nor sufficiently understood.^{27–29}

There are indicators of increasing attention to consortium management practices in HRCS initiatives. Examples include the requirement by some funding bodies for explicitly stated consortium management outputs in programme theories of change,³⁰ and the development of consortium management tools such as the research fairness initiative³¹ and guides for research partnerships.^{32 33} It is clear that consortium management is an integral part of the global HRCS effort, and a robust evidence base including understanding consortium management processes and practices and their effectiveness is essential. This review aims to ascertain the breadth, depth and quality of the published evidence on HRCS consortium management, and identify the management processes, experiences and key issues raised by consortium actors, and the knowledge gaps in the available evidence.

METHODS

Type of review

Due to the paucity of robust HRCS research publications,³⁴ conducting a standardised systematic review which requires high-quality research evidence^{35 36} was not feasible. We thus conducted a systematised review, which models the systematic review process without strict

adherence to study inclusion criteria.³⁵ We aimed to be widely inclusive to draw out the full range of HRCS consortium management-related data in the published literature, necessitating the inclusion of all types of peer-reviewed literature without limitation to publication type (research based or not) and quality.

Data sources, search strategy and selection of papers

A systematic electronic search of peer-reviewed articles using PubMed and Scopus was conducted without any date restrictions. The search was limited to peer-reviewed literature as the aim of this review is to identify the extent of and findings from existing scientific literature pertaining to HRCS consortium management. The search terms used were (1) health AND (2) research AND (3) capacity AND (4) strengthening AND (5) consortium AND (6) LMICs, together with variants of some of the terms (online supplementary table S1). LMIC is defined according to the current World Bank classifications.³⁷ Four geographical regions with the highest concentration of LMICs namely Africa, Asia, Latin America and the Caribbean, and Pacific were included to optimise the search. Results were saved in an Endnote X8 library.

Identified papers were first screened by the first author against the inclusion criteria using titles and abstract. An article was included if it (1) focused on one or more consortium-based HRCS initiatives; (2) involved LMICs and (3) included descriptions, processes, findings or reflections related to the establishment and ongoing management of consortia. Additional criteria were papers published up to December 2018 with both abstract and full paper available in English. The restriction to include only papers written in English was due to lack of resources for translation and time limitations. Articles were retained for full-text review if they met the criteria or more information was required to decide, after which the final selection was made. There was an agreed process for team consultations when it was unclear whether or not to include a paper. Additional papers were identified by a manual search which included checking the references and supplementary lists of identified articles and citation searching.³⁸

Quality appraisal

Though there was no quality threshold for inclusion, an appraisal of the selected articles was carried out to give an indication of the quality of the current evidence on HRCS consortium management. The Mixed Methods Appraisal Tool (MMAT) was used due to its suitability for appraising multiple design studies.³⁹ The tool includes screening questions which assess the eligibility of papers for full appraisal. It comprises sets of criteria for qualitative, quantitative and mixed studies, and metrics for determining the overall quality score for each study.⁴⁰ The empirical papers were screened and the qualifying papers assessed for methodological quality and scored. A second reviewer conducted an independent appraisal of all the papers. An initial discussion between the two

reviewers was held in advance to ensure a common understanding of the tool. A third reviewer facilitated the resolution of any divergences.

Data extraction and analysis

Data were extracted from the selected papers using the matrix method.⁴¹ This method provides a structured way of recording extracted information and findings from each publication using a table, facilitating a systematic synthesis process. Columns representing specific areas of interest were used to capture data. These included the following: publication authors and year; characteristics of the HRCS programme such as goals, main activities and geographical focus; and consortium characteristics such as structure, size and composition. Study objectives and design, methods used in data collection, sampling and analysis, and frameworks or guidelines applied were also obtained from empirical papers. Findings from each paper were categorised into three broad areas: (1) descriptions of management processes and systems adopted during the consortium's formation and implementation, (2) experiences and lessons learnt and (3) effect of the processes and experiences on the achievement of programme goals. A thematic synthesis of the extracted data was then carried out which involved inductively identifying any descriptive and analytical themes, as well as similarities, divergences and associations across papers. To strengthen the rigour of the process, each step and output was independently assessed by a second reviewer.

RESULTS

Study selection

The electronic search yielded 5378 papers of which 1325 duplicates were removed, retaining 4053 (figure 1). In all, 3772 articles were rejected based on a review of the title and abstract, and an additional four were excluded as the full texts were not accessible for three and the fourth was not available in English. Of the 277 potentially relevant articles, 46 were retained after a full-text review, and a manual search identified nine additional articles, resulting in 55 included papers made up of 18 empirical papers and 37 commentaries (table 1). A detailed summary of the papers is presented in online supplementary table S2 and S3.

Characteristics of included papers

Only one paper was published before 2000, with the majority (47 out of 55) published between 2010 and 2017, indicating a sixfold increase compared with the period preceding 2010 (figure 2). The highest number of papers published in a year was eight. Half of the papers (n=28) had neither the first nor last authors affiliated to LMIC institutions, and in a fifth, there were no LMIC-affiliated authors at all (table 1). Last authors (48 out of 55) were primarily affiliated to high- and upper middle-income countries.

There were twice as many commentaries as empirical research papers (table 1), with 14/18 empirical papers based on qualitative studies and four on mixed methods. Almost all empirical papers (n=17) had a learning and evaluation focus, 10 of which were conducted internally and the rest by external assessors. Only seven qualitative papers were scored in the top half of the MMAT quality range (online supplementary table S2) based on having clear research objectives, using data sources and analysis approaches relevant for addressing the research questions, and giving appropriate consideration to how the findings relate to the context while the other qualitative research papers presented very little data on these. The remaining papers had used mixed-method approaches without clearly indicating the rationale or data integration process or adhering to sampling and other quantitative methodological criteria.⁴⁰

Included papers sought to evaluate or reflect on the consortium's operations particularly on the activities and outputs, with only a third primarily focusing on the partnership experience, assessing the successes, challenges and lessons learnt from the perspective of consortium actors. Evaluation of consortium management processes was the sole or prominent aim of only two papers,^{42 43} one of which happened to be the only paper reporting a failed consortium.

Description of consortia

The 55 identified papers represented 51 distinct HRCS programmes, as three programmes were reported in several publications. There was an inconsistent use of terms in describing the collaborative set-ups, with 39 papers using two or more terms interchangeably, and one paper using five. The most commonly used terms were partnership (n=22), network (n=11) and consortium (n=10), and fewer uses of collaboration (n=4), alliance (n=2) and community of practice (n=2). Only five papers provided definitions of the used terms, which varied considerably.⁴⁴⁻⁴⁸

The 51 consortia varied widely in size, ranging from 2 to 20 institutional partners. The HRCS programmes included LMICs, mostly in Africa (n=38). Of the 41 consortia that had reported on leadership, 32 were led by high-income country partners (table 1). As shown in table 1, HRCS was either the primary focus of the programmes or a component of a broader research, educational or clinical care programme. Consortia sought to build capacity using a single or combination of activities, mostly training of individuals (short term and degree awarding) and learning 'on the job' through conducting collaborative research. None of the papers indicated the process used or factors that determined the selection of HRCS activities.

Operational aspects of consortium management

A range of management structures and processes adopted by consortia during their inception and implementation phases were reported across papers. These

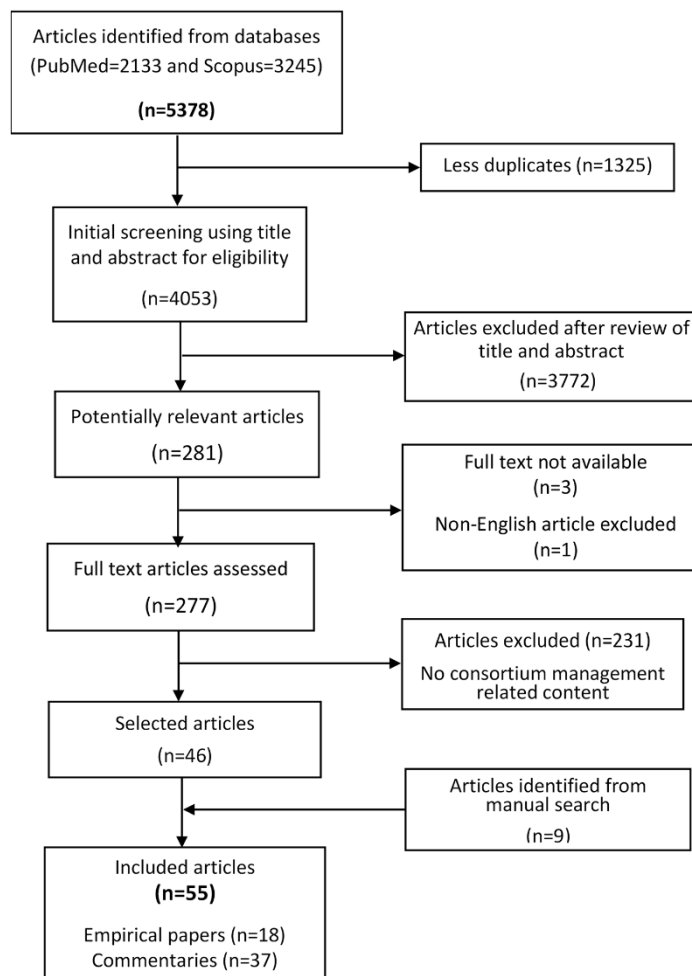


Figure 1 Paper screening and selection process.

included partner selection and partnership development during the inception phase, and management structures, coordination, and monitoring during the implementation phase. These were neither the primary focus of the publications nor examined in detail, but rather brief descriptions introducing or providing context for studies and reflections. Below, we present data on operational processes used in the HRCS inception and implementation phases as well as data on relational aspects of consortium functioning (table 2).

Inception processes

Most consortia were formed in response to an HRCS funding opportunity and were initiated by the primary grant holder or principal applicant. There was one

exception, where formation was the initiative of a government representative from the LMIC.⁴⁹ Criteria for partner selection were discussed in 22 papers (figure 3), with the most cited criteria being previous individual and institutional working relationships (n=17), and expertise or experience in the disease or research area (n=9). Many papers (n=11) reported considering two or more criteria. It was not indicated in any paper if there were any considerations for determining the number or type of partners.

In 11 cases, consortia reported engaging in a partnership development process also referred to as an 'engagement phase',⁵⁰ 'inception phase'^{42 51} or 'establishment process'.⁵² Typically, this process was used to facilitate partner and stakeholder engagement, identify partner

Table 1 Summary of publication and programme characteristics

Category	Characteristic	Description	No. and percentage of publications
Publication characteristics (N=55)	Type of publication	Empirical research	18 (33%)
		Commentary	37 (67%)
	First author affiliation	HIC	36 (66%)
		U-MIC	4 (7%)
		L-MIC	6 (11%)
		LIC	9 (16%)
	Last author affiliation	HIC	38 (69%)
		U-MIC	10 (18%)
		L-MIC	3 (6%)
		LIC	4 (7%)
Programme/ consortium characteristics (N=51)	Geographical focus	Africa	37 (73%)
		Asia	12 (24%)
		Latin America and the Caribbean	7 (14%)
		Pacific	1 (2%)
	Consortium leadership	HIC	32 (63%)
U-MIC	2 (4%)		
L-MIC	3 (6%)		
LIC	2 (4%)		
Led by both L-MIC and LIC partners	2 (4%)		
Not indicated	10 (19%)		
Capacity strengthening focus	Dedicated RCS initiatives	23 (45%)	
	Embedded RCS initiatives	28 (55%)	
Subject focus	Disease or discipline focus	38 (74%)	
	Generic	11 (22%)	
	Not indicated	2 (4%)	
	Main activities*	Training individuals	40 (78%)
Collaborative research	25 (49%)		
Institutional capacity enhancement	11 (22%)		
Developing collaborations	9 (18%)		
Knowledge translation	9 (18%)		
Infrastructure enhancement	4 (8%)		

*Some programmes combined two or more categories. HIC, high-income country; LIC, low-income country; L-MIC, lower middle-income country; RCS, research capacity strengthening; U-MIC, upper middle-income country.

needs and expectations, determine consortium goals, assign roles, establish governance structures, consortium guidelines and procedures, and develop a plan of action. This phase or process was reported to promote openness, trust and build team work,⁵² as well as help partners acknowledge and deal with any assumptions held.⁵³ Only three papers^{51 54 55} described the use of a framework or tool to guide this process, citing the Partnership Assessment Tool, the four-dimensional Appreciative Inquiry Framework and the International Participatory Research Framework, respectively.

Implementation processes

The governance structures adopted by consortia were reported in a third of the papers. Governing bodies were similar across consortia and generally fell into four categories: advisory bodies that provided strategic advice,^{56–58} steering committees that made strategic and operational decisions,^{43 58 59} executive teams responsible for the day-to-day management^{58 60 61} and implementation teams that executed consortium activities.^{57 62 63} These governing bodies were often made up of representatives from partner institutions. However, neither the factors informing the choice of management structure nor the effectiveness of the structures were discussed in any paper. One paper reported considering gender balance,⁵⁹ and three described the involvement of junior researchers (in one case stating the capacity strengthening intent of the decision).^{25 62 64} The leaders of the consortia tended to be those who initiated the collaboration, had the required resources or were selected to fulfil funder requirements.^{46 56 65} Researchers frequently took the lead management role in consortia. The role of a project manager or coordinator was reported in only two cases.^{58 60} One consortium employed trainees in management and administrative roles, and though this resulted in managerial capacity, it adversely affected their training progress due to the additional responsibilities.⁴² The consortium management capacities of leaders and managers were neither mentioned nor discussed, although two papers pointed out the value of both management and technical expertise in leading consortia.^{25 49}

In all, 21 papers mentioned activity coordination processes, and 22 indicated the incorporation of monitoring and evaluation elements. The most cited platforms for coordinating activities and monitoring progress were consortium meetings, management meetings and partner visits, as well as telephone and electronic communication. Factors reported to foster coordination and monitoring included regular communication, jointly determined goals and processes, previous working relationships, and the use of codes of conduct and guidelines.^{60 66 67} Lack of clarity about roles and guidelines,^{43 50} and difficulties in organising meetings due to physical distances, time differences, conflicting partner priorities, and poor internet connectivity were reported as barriers particularly in large-sized consortia.^{60 68 69} Most of the 18

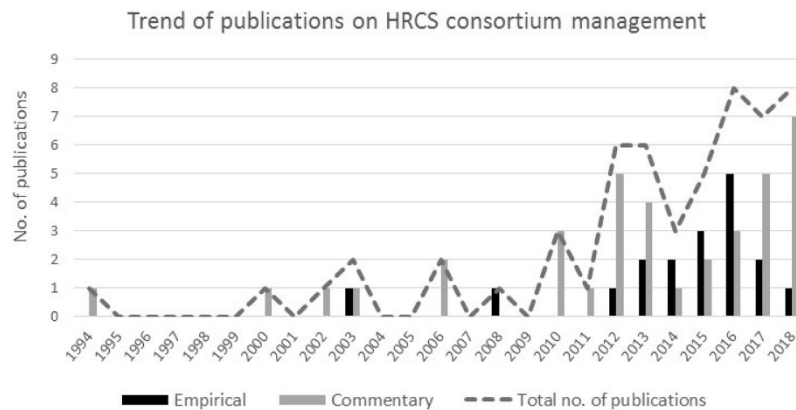


Figure 2 Number and type of publications per year. HRCS, health research capacity strengthening.

evaluations reported, whether internally or externally conducted, were programmatic in nature, focused on assessing training and research outputs, with only six reporting on partner relations and partnership successes and challenges. Frameworks used to guide these evaluations were reported in six cases. These included the Swiss Commission for Research Partnerships with Developing Countries' Guide for Transboundary Research Partnerships,^{19 65} Mercer *et al's*⁷⁰ Guidelines for Assessing Participatory Research Projects,⁵⁰ the Capacity WORKS Model,⁴³ Kernaghan's types of partnerships⁴⁸ and the realist methodology approach.⁴⁹ These frameworks are orientated towards examining research partnerships more broadly,

with only the Capacity WORKS model⁷¹ tailored specifically to capacity development programmes.

Relational aspects of consortium management

The four critical factors identified from the range of successes, challenges, enablers, barriers and lessons learnt shared across papers were relational in nature specifically building partner relationships, equity and power, leadership and inclusion. Although interrelated, we present the data shared on these key factors in turn, returning to the potential interplays in the discussion.

Partner relationships

The most discussed factor reported as influencing consortium success was the importance of fostering strong relationships between partners, with nearly all papers (n=45) commenting on this. The value of informal networks and friendships among individual partners in consortium success was emphasised.^{26 42 43 60 72} In addition to their influence on the achievement of programme deliverables and consortium sustainability, effective relationships were in themselves seen as capacity outcomes.^{26 45 60 62}

While these [courses and workshops] were the quantifiable outputs..., much of the experiences in capacity building are not measurable: these may focus on relationship dynamics, work and the learning experienced by the participants involved (p. 4)⁶⁰

Many participants reported that new relationships developed during the project implementation were the most important outcomes (p. 5)⁶⁰

Partner relationships were fostered by principles such as openness, trust, mutual respect, transparency, shared commitment and recognition^{42 66 73 74}, and practices such as establishing guiding principles and norms, joint planning and implementation processes and regular communication.^{49 59} The importance of recognising and leveraging on differences in partner needs, strengths, interests, objectives, expectations, contexts and culture

Table 2 Summary of management issues raised across papers

Category	Description	No. of publications (%) (N=55)
Operational elements of management	Partner selection criteria	22 (40%)
	Determinants of consortium leaders	8 (17%)
	Partnership development phase	11 (20%)
	Types of collaborative agreement used	7 (13%)
	Governance structures	19 (35%)
	Coordination of consortia activities	21 (38%)
	Monitoring and evaluation of consortia activities	22 (40%)
Relational elements of management	Relationship building	45 (81%)
	Equity and power	24 (44%)
	Role of leadership	20 (36%)
	Partner inclusion	16 (29%)

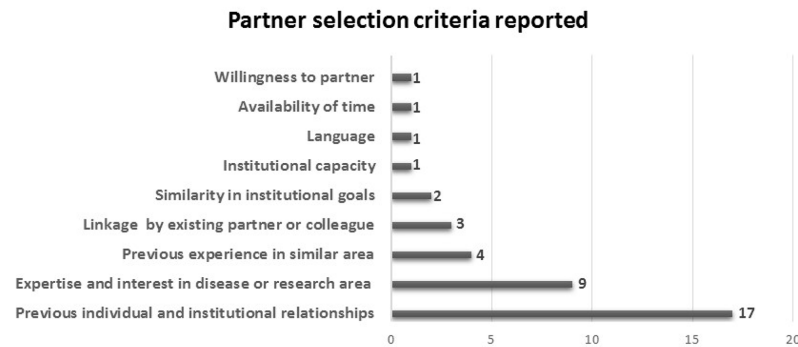


Figure 3 Partner selection criteria used and the number of publications that mention criteria.

to nurture effective relationships was also noted.^{49 74-76} Almost half of the papers (n=21) reported encountering challenges when partner differences were not acknowledged and monitored.^{26 29 49 68 73-76} At the same time, the investment required (in time and other resources) and practical challenges of building relationships were recognised, particularly when partners were spread across continents.^{29 42 50 63 69 77 78} As demonstrated in one study, participants ‘found the process of establishing relationships and reaching consensus... laborious and at times negotiation-intensive’ (p. 4).⁶³ One consortium shared their learning:

All collaborators should be aware of the fluid and the initially challenging processes that are normal for group development. Partners should allow sufficient time for complex and consultative decision making (p. 15)⁴²

Inequity and power imbalances

In all, 24 papers discussed inequity and power imbalances among partners, most often in terms of the inequitable division of resources, control and benefits. These were noted to have stemmed from pre-existing asymmetries between partners, as well as consortium design factors.^{77 78} Pre-existing asymmetries were reported to be based on differences in partners’ resources, income levels and expertise, with differences between North and South partners most often noted. These asymmetries predisposed consortia to power imbalances, exacerbated by consortium arrangements for access to funding, resource allocation and leadership.^{77 78} ‘Lopsided’ arrangements were reported to result in more-resourced partners taking up more conceptual roles and being perceived as capacity providers, and less-resourced partners becoming implementers and capacity receivers.^{51 73 78-80} Thus, unequal power relations are entrenched, and the ability of less-resourced partners to negotiate better terms undermined.

When the Northern partner serves as the primary grant recipient (and the Southern partner is subcontracted) a level of inequality is created that is difficult to overcome,

no matter what provisions are made to make decisions equitably (p. 4)⁷⁷

...it is too often assumed that the more developed nation has more to offer. This erroneous perspective is a fatal flaw in the development and progress of such collaborative efforts and is usually accountable for a number of failed attempts at collaboration due to its skewed balance of power (p. 101)⁸¹

‘partners with less funding (almost entirely LMIC partners) confirmed that they felt as though they had less influence in decisions (p. 7)⁶⁰

Power imbalances were not limited to North-South collaborations, but also encountered between ‘bigger’ and ‘smaller’ Southern partners.^{48 68 78} Openly acknowledging and discussing these issues were described as important in addressing this challenge in several papers^{26 42 45 51 53}.

There are interests at stake among Southern universities just as there are among Northern universities... therefore power and interest dynamics are at play in South-South partnerships just as they are in North-South and North-North partnerships (p. 146)

Without honest exchange, and an acknowledgment of the differential power at work in seeking to resolve tensions in perspective, the notion of ‘equitable partnership’ was seen as illusory (p. 4)²⁶

Others recommended negotiating and instituting consortium agreements and structures that promote power-sharing and equal division of resources, decision-making capacity and benefits,^{19 63 77 81 82} noting that these are not guarantees and sustained partner commitment to equal partnerships, mutual respect, trust, and reciprocity are still required.^{48 50 52 55 73 77}

Lack of inclusion

Lack of inclusion of all partners especially during the early stages was raised as a concern, particularly of Southern consortium actors. In a Bangladesh-British partnership for instance, the project proposal was

primarily developed by the Northern partner, resulting in implementation difficulties.⁷⁹ Another author noted the following:

Many participants described their partnership experiences as more 'incorporation' than 'collaboration', having been provided little to no opportunity to participate in priority-setting or in leadership roles (p. 142)⁵¹

It was interesting to note that even in an LMIC-led consortium, decisions regarding a component being led by the high-income country partners were described as 'top-down' leading to some tension within the partnership.⁴² Across several papers, partner inclusion in all consortium processes, particularly in decision-making, was reported to engender ownership and commitment across both internal and external stakeholders.^{10 52 63 81} Inclusion of wider institutional actors, and being cognisant of host institutional leadership and structures when determining and executing consortium processes, was considered critical to HRCS success.^{59 60} In one consortium, the involvement of a wide range of stakeholders in conceptualising the HRCS project was seen to contribute to a 'truly cooperative partnership based on trust and mutual respect',⁷³ while in others the lack of alignment with institutional agendas was considered detrimental.^{43 60}

Leadership

Leadership was identified as a key attribute of successful consortium management in over a third of papers. It was deemed a major determinant of consortium success or failure,^{49 83} and its pivotal role was also demonstrated when some consortia faced leadership changes.^{43 60 77} As noted by an author,

A successful partnership requires strong leadership to make decisions, take appropriate risks, and solve problems (p. 6)⁸⁴

In addition to providing direction and overseeing performance, vital aspects of leadership identified included demonstrating diplomacy and ensuring that partners are engaged throughout the consortium's lifecycle.^{45 62 63} In one consortium, leaders' commitment to inclusive partnership was considered instrumental in overcoming initial reservations of less-resourced partners in joining the consortium at all.⁸⁰

Effect of management processes and experiences on outcomes

Linkages between consortium management processes and programme outcomes were not clearly articulated, and only alluded to in a few recommendations made. Linkages made included observations that programme designs focusing on a wide range of human and infrastructural capacities^{25 85 86} across micro-, meso- and macro-levels^{49 73 77 87} produce more synergistic interactions and sustainable capacity. Acknowledging existing capacities of all partners and according mutual respect were noted to promote multidirectional capacity transfer,^{29 49 81 88} and correspondingly tailoring partners'

participation resulted in more contextually relevant and sustainable outcomes.^{42 76 82 83} The significance of consortium management in achieving research capacity strengthening outcomes is increasingly being acknowledged.^{25 59 73} Efficient management was named as one of four outputs in one consortium's programme theory of change.⁴² Another paper identified the lack of management skills as a risk factor for consortia, criticising the reliance on the 'learning-by-doing' means of acquiring those skills which tends to happen late in consortia leaders' careers.⁸² Some recognition of a more central capacity strengthening role of management activities was demonstrated in a few cases where partner interactions at both management and implementation levels were noted to generate exchange of knowledge and skills,⁶⁹ and provide opportunities for mentoring and 'behaviour modelling'.⁷³ On the significance of these processes, one author pointed out:

What these [process] evaluation reports invariably facilitated was increased awareness of how underlying, often ignored or taken-for-granted processes influence project work and outcomes (p. 141)²⁵

DISCUSSION

To the authors' knowledge, no previous reviews have been conducted to ascertain the state of the evidence base for HRCS consortium management. This review seeks to provide a first step in assessing the consortium management publication landscape specifically in the HRCS domain and to draw attention to the need for purposeful HRCS-specific management science. We note that findings presented may not represent the entirety of HRCS consortia experiences. All but one paper reported successful collaborations, and discordant leader or partner perspectives were only reported in one case, indicating the possibility of publication and social desirability biases, respectively. Indeed, one participant disclosed their consortium's deliberate decision not to report their 'dirty laundry' in a peer-reviewed publication.⁴⁸ Thus, experiences of unsuccessful consortia may exist but are unpublished, and authors and study participants of selected papers may have been cautious in their publications and responses to avoid potential tensions and maintain relationships. Data from unpublished work or those published outside of peer-reviewed journals, or in languages other than English, or indexed in other databases, would have been excluded from this review. However, we used a systematic approach in carrying out the review ensuring a high level of rigour, and integrated diverse types of published literature to widen the range of included viewpoints.

The review indicates an increase in attention being given to HRCS consortium management-related issues in recent years. Yet, yearly publication outputs remain low, and the available evidence is weak both in terms of quantity and quality. Consortium management was not a clearly defined focus for most papers, and there was little

coherence in its assessment across papers. The absence of LMIC authors in a significant proportion of publications also raises questions about the level of meaningful LMIC involvement and leadership in the LMIC-focused HRCS consortium management literature. Possible contributors to this authorship pattern include the dominance of high-income partners in consortium leadership, and broader structural and contextual factors which contribute to this imbalance such as resource and expertise constraints. Of note is that the nascent nature of the management-specific evidence reflects a similar trend in the broader HRCS literature, except that there is a better representation of LMIC authors in the latter.³⁴ These imbalances and the factors contributing to them need to be addressed, with a particular emphasis on correcting the under-representation of LMIC perspectives in the available evidence.

Across the available evidence base, terms used for collaborations such as partnership, network and consortium are used inconsistently and interchangeably, a point also noted by others.^{59–69} Similarly, the concept of '(health) research capacity strengthening' has been inconsistently applied across the broader HRCS literature.³⁴ Thus, it is not entirely clear how an HRCS consortium might differ from a traditional health research consortium or how a consortium might differ from a partnership or network. Although not discussed in the literature, the lack of standard definitions and delineation of terminologies could lead to challenges with multiple perceptions of the nature and practices of a collaboration, as well as different partner expectations. Concerns about clarity in the use of terms contributed to efforts by Edwards *et al.*⁶⁰ to develop a typology of international health partnerships to facilitate evaluations by positing a classification according to the level of impact (individual or organisational), capacity strengthening approach and the type of relationship between partners. Beyond ensuring the use of appropriate comparators in evaluation,⁸⁹ characterising collaborations and being explicit about the attributes of the collaboration and degree of involvement, for instance, should promote consonance in partner thinking, approaches and expectations.

Our findings indicate greater emphasis on the relational aspects of management in the reviewed literature than on operational factors. Relational aspects such as relationship building, equity, power relations and leadership were identified as having the most influence on and requiring the greatest attention for successful HRCS consortium management. Though extensively mentioned, these elements were inadequately interrogated. It would be valuable to examine in more depth, for example, the different approaches to leadership (in theory and practice) and the sources and influences of power and power relations in the context of HRCS consortia. Operational aspects of management such as establishment processes, and governance structures and procedures, were given less attention. Given that relational and operational aspects of collaborations have

been identified as interdependent elements of consortium management,^{45,90,91} it is unclear why the operational aspects are relatively neglected, and the interdependency and interplay between the two largely ignored. Only three papers hinted at any linkages.^{45,77,78} For example, Van der Veken *et al.*⁷⁸ pointed out that inequity and power imbalances are as determined by consortium structures as they are by pre-existing contextual factors, and Vasquez *et al.*⁷⁷ noted that formalised consortium structures are not sufficient in themselves in addressing power differentials and ensuring equity without commitment to the appropriate principles.

The lack of correlation between relational and operational elements in the literature is further evidenced in the linear nature of the partnership frameworks applied in the reviewed papers which rarely elicited the relational complexities inherent in consortium processes. Indeed, the importance of this interdependency is also recognised in business partnerships where emphasis is placed on going beyond formal governance structures to fostering collaborative relationships and behaviour.^{92,93} There is a growing recognition of the significance of this interplay in the health systems context where the need to equally pay attention to strengthening organisational hardware such as finances and technology, tangible software such as systems and procedures, and intangible software such as relationships and power has been emphasised.^{94,95} Thus, in future research, it will be worth examining how the relational and operational aspects enhance or hinder each other, and a first step will be to unpack and examine both the conceptual and practical content of each aspect particularly pertaining to the research capacity strengthening context. Exploring this interrelatedness will contribute to a more nuanced understanding of consortium management and contribute to the development of more holistic frameworks for guiding consortium operations and management.

Very little association has been made between HRCS consortium processes and capacity outcomes in the literature. There was almost no discussion in the reviewed literature on the 'position' of management in the HRCS effort and whether it merely supports a capacity development process or is a capacity development mechanism or target in its own right. This gap may be a result of the prevalent focus on HRCS activity outputs such as individuals trained and research conducted which are widely used as proxies for capacity,⁹⁶ and the apparent prioritisation of technical research skills over managerial expertise. Though HRCS activities focus more on technical research tasks than non-technical relational skills, the emphasis in the HRCS consortium management literature is on the latter. This could be an indication that consortium processes may be segregated from the capacity strengthening process and only perceived as a means to an end. Though there is a growing recognition of the role of management in HRCS consortia, its handling in the available published literature is rudimentary. Even where management is explicitly named as an

output, the focus remains on programme efficiency with management a facilitator of other programmatic outputs rather than a valuable capacity building output in itself.⁴² Besides, even programmes with explicit capacity strengthening strategies appear to be prioritising the 'research' over the 'capacity'.⁹ In addition to ensuring HRCS programme models have 'dedicated' capacity strengthening foci,⁹ it is our view that the recognition and utilisation of management processes as capacity strengthening mechanisms in their own right are essential if research capacity goals are to be met. Considering the philosophy underpinning HRCS consortia,¹ capacity development needs to permeate both processes and deliverables, and it is essential that both technical components and management approaches and processes adopted contribute to the capacity strengthening outcomes. As demonstrated by the UK Department for International Development's example of impelling the incorporation of consortium management into programme theories of change,³⁰ funders could play a key role in driving the prioritisation of consortium management and ensuring it receives adequate support (including funding) in its operationalisation and evaluation. This has been evidenced in the HRCS movement where funders such as the US National Institute of Health and the European Commission ensure that funding is committed to capacity building even in primarily research-oriented programmes.

CONCLUSIONS

The consortium model has been widely adopted for strengthening health research capacity in LMICs. Yet, the evidence base to inform HRCS implementation is weak, and HRCS consortium actors lack the theoretical and empirical bases for framing their practice. From the limited evidence published to date, relational aspects of consortium management have been recognised as essential to HRCS programme success but not examined in depth. Operational processes have rarely been discussed, and it is unclear whether this is due to a lack of understanding or a lack of perceived importance. As a result, the interplay between operational and relational aspects of consortium management has not been well explored. The actual contribution of consortium management to HRCS outcomes is poorly documented, and the 'position' of management within the broader capacity strengthening agenda remains unclear. Considering the growing investments in consortia implementing the LMIC-focused HRCS agenda, it is essential to advance a corresponding consortium management framework to underpin the effort.

The proliferation of HRCS consortia provides opportunities for further research towards broadening the evidence base. The gaps identified in the literature highlight the need to pay more attention to both theoretical and empirical investigation of consortium management processes, influencing factors, and their role in attaining the capacity strengthening aims of consortia. Such

research needs to aim for more conceptual depth, making use of robust study designs and adhering to research reporting requirements to overcome the quality problems identified. It is also essential to ensure definitional clarity and operational interpretation of key influencing factors such as equity, power and leadership particularly in the HRCS context, thus supporting appropriate translation into much-needed practical guidelines for funders and research practitioners. These may be useful initial steps in strengthening HRCS implementation science and boosting the evidence base needed for policy and practice.

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Appendix 2: Literature Review Search Terms and Variants Used

Goal	Intervention (variants combined by 'OR')	Mode (variants combined by 'OR')	Geographic location (variants combined by 'OR')
Health research capacity	Strengthening	Consorti*	LMIC
	Building	Collaborat*	Low* income
	Developing	Partner*	Low* and middle income
	Development	Network	South
			Alliance
			Global
			Africa
			Asia
			Latin America
			Caribbean
			South America
			Pacific

Appendix 3: Included Papers (55) in Systematised Literature Review

Empirical papers (18)

Paper Reference	Study Design	Objective of paper	LMIC Geographical coverage ¹	Programme Components	Programme Focus	Study conducted by	MMAT Score ²
Ager & Zarowsky 2015	Retrospective, summative, qualitative	Common challenges and their key drivers of HRCS	South, East & West Africa	RCS	Multiple	External	***
Anderson et al. 2014	Retrospective, formative, qualitative	Evaluating the initial effects of a charter for collaboration	Africa - Ghana	Education RCS	Health education and research	Internal	Not scored
Birch et al. 2013	Prospective, formative, qualitative	Self-evaluation of partnership using an identified assessment measure	Africa - Malawi	Clinical care Research	Nursing	Internal	**
Dean et al. 2015	Retrospective, summative mixed methods	Lessons for establishing and maintaining successful research collaborations	West and East Africa	RCS	Health, agriculture, water and sanitation, biodiversity, and energy	External	**
Elmusharaf et al. 2016	Retrospective, summative, qualitative	Achievements and outcomes of partnership	Africa - Sudan	RCS	Health systems	Internal and external	**
Farnman et al. 2016	Retrospective, summative, qualitative	Successes, challenges and lessons learned	Africa - Uganda, South Africa, Tanzania Malawi Asia - China, India, Oman, Vietnam	RCS	Health systems and services & Social determinants of health	Internal	***
Jentsch & Pilley 2003	Retrospective, summative, qualitative	Processes and dynamics within collaborations	Asia - Bangladesh & Thailand	Research RCS	Multiple	Internal	**
Larkan et al. 2016	Retrospective, qualitative	Characteristics of successful research partnerships	Africa & Asia	Research RCS	Multiple	Internal	***
Mafigiri et al. 2014	Prospective, formative, qualitative	Experiences, successes and challenges of collaboration	Africa - Uganda	Education RCS	Health education and research	External	**

Paper Reference	Study Design	Objective of paper	LMIC Geographical coverage ¹	Programme Components	Programme Focus	Study conducted by	MMAT Score ²
Marjanovic et al. 2013	Retrospective, formative, mixed methods	Experiences of consortia actors	Africa - East, West and South Africa	RCS	Multiple	External	Not scored
Mayhew et al. 2008	Retrospective, summative, mixed methods	Successes and challenges, and lessons learned	Africa - South Africa Asia - Thailand	RCS Research	Health Economics	External	*
Murphy et al. 2015	Retrospective, qualitative	Research partnership experiences of stakeholders	Asia, Latin America and Africa	Research RCS	Multiple	Internal	**
Neuhann & Barteit 2017	Retrospective, summative, mixed methods	Outputs and outcomes including project's eventual failure and lessons learnt	Africa - Malawi	Care Research RCS	Clinical care, health education & research	Internal	*
Redman-MacLaren et al. 2012	Retrospective, summative, qualitative	Mutuality of research capacity strengthening	Pacific - Solomon Islands,	RCS	Nursing	Internal	****
Van der Veken et al. 2017	Retrospective, formative, qualitative	Obstacles for southern institutions RCS & perceptions of southern researchers on capacity transfer	Africa - Burkina Faso, Benin, Senegal, Cote d'Ivoire, Guinea, Morocco, Tunisia, Algeria	RCS Research	Sexual and reproductive health	Internal	****
Varshney et al. 2016	Retrospective, formative, qualitative	Understand challenges of collaborations, whether collaboration result in capacity building, and requirements for sustainable collaborations	Africa - South Africa Asia - China, India, Oman, Vietnam	RCS	Social determinants of health	Not stated	***
Yarmoshuk et al. 2018	Retrospective, summative, mixed methods	Describe partnerships characterized as higher-value for building the capacity of four universities and identify why they are so considered	Africa - Kenya, Tanzania	Education Research Practice RCS	Multiple	External	**
Yassi et al. 2016	Retrospective, summative, qualitative	Determine the partnership model used, success factors and lessons learnt	Africa - South Africa	Practice Research RCS	Occupational health and infection control	Internal	****

(H)RCS – (Health) research capacity strengthening

¹Specific countries or regions are listed if named in the publication

²MMAT scoring metrics: * = one criteria met (25%) to **** = all criteria met (100%); Not scored= did not fulfil screening criteria, thus not eligible for full appraisal

Commentary papers (37)

Paper Reference	Commentary informed by	Objective of paper	LMIC Geographical coverage ¹	Programme Components	Programme Focus
Airhihenbuwa et al. 2011	Personal experience	Present partnership that led to training, and make recommendations for capacity building for health researchers in Africa	Africa - South Africa	RCS	HIV/AIDS
Ali et al. 2012	Personal experience	Report on implementation, outputs and challenges of partnership	Asia - India	Research RCS	Cancer
Asirwa et al. 2016	Personal experience	Describe programme content, outcome measures and challenges	Africa - Kenya	Clinical care Education Research RCS	Multiple health research areas
Atkins et al. 2016	Personal experience	Describe the activities of two consortia	Africa - Uganda, South Africa, Tanzania Malawi Asia - China, India, Oman, Vietnam)	RCS	Health systems and services & Social determinants of health
Breuer et al. 2018	Personal experience	Reflect on the history, formation, challenges and achievements of the partnership	Africa - Ethiopia, South Africa, Uganda Asia - India, Nepal	RCS Research	Mental health

Paper Reference	Commentary informed by	Objective of paper	LMIC Geographical coverage¹	Programme Components	Programme Focus
Cash-Gibson et al. 2015	Personal experience	Description of a collaborative RCS project	Africa - Kenya, South Africa, Tanzania Latin America & Caribbean - Brazil, Mexico, Colombia	RCS	Social determinants of health
Chandiwana & Ornbjerg 2003	Review	Discuss lessons in North-South and South-South cooperation	Zimbabwe, Southern Africa	RCS	Public health research
Dalmar et al. 2017	Personal experience	Outline reasons and motivations for re-launching research cooperation programme	Africa - Somalia	RCS	Health research
de-Graft Aikins et al. 2012	Personal experience	Review the partnership's achievements and challenges	Africa - Ghana, Burkina Faso, Nigeria, Kenya, Cameroun, South Africa Asia - Malaysia	Research RCS	Chronic diseases
Eckerle et al. 2017	Personal experience	Describe evolution of novel global health partnership	Africa - Malawi	Clinical care Education Research RCS	Paediatric emergencies
Ezeh et al. 2010	Personal experience	Describe the consortium	Africa - Kenya, South Africa, Tanzania, Uganda, Nigeria, Malawi, Rwanda	RCS	Population and public health
Fischer et al. 2017	Personal experience	Describe steps taken and key factors in establishing a successful collaborative consortium, and challenges	Africa - Nigeria	Research Clinical care RCS	Cancers

Paper Reference	Commentary informed by	Objective of paper	LMIC Geographical coverage¹	Programme Components	Programme Focus
Greenwood et al. 2012	Personal experience	Key lessons learnt	Africa - Malawi, Tanzania, Gambia, Ghana	RCS Research	Malaria
Greenwood et al. 2018	Personal experience	Describe programme activities and lessons learnt	Africa - Senegal, Malawi, Tanzania, Uganda, Ghana	RCS	Malaria
Gureje et al. 2018	Personal experience	Describe the partnership, programme components, and challenges	Africa - Nigeria, South Africa, Ghana, Kenya and Liberia	Research RCS	Mental health
Kaddumukasa et al. 2014	Personal experience	Describe partnership initiative	Africa - Uganda	RCS Education	Neurology
Kutcher et al. 2010	Personal experience	Describe the process and activities of a partnership	Cuba, Latin America & Caribbean	Research RCS	Mental health
MacLaren et al. 2015	Personal experience	Provide an example of an RCS model	Pacific - Solomon Islands	RCS	Nursing
Mathai et al. 2018	Personal experience	Describe a South-North collaboration	Africa - Kenya	RCS Research	Mental health
Miiro et al. 2013	Personal experience	Outline the initial experiences of the merits, outputs and lessons learnt in 4 networks	West, East, Central and Southern Africa	Research RCS	HIV/, TB, Malaria and NTDs
Miranda et al. 2018	Personal experience	Explore features of existing partnerships	Latin America & Caribbean	Research RCS	Non-communicable diseases
Nakabugo et al. 2010	Personal experience	Illustrate potential mutual benefits from partnerships, challenges and strategies for achieving a mutual and sustainable partnership	Africa - Malawi, Mozambique, Tanzania, Uganda	RCS	Health and education

Paper Reference	Commentary informed by	Objective of paper	LMIC Geographical coverage¹	Programme Components	Programme Focus
Noormahomed et al. 2017	Personal experience	To describe programme outcomes, compare main features with traditional collaboration models; and describe sustainability strategies	Africa - Mozambique	Education RCS	Health education and research
O'Connor et al. 2016	Personal experience	Present results and lessons learnt	Africa - Malawi	Education Research RCS	Nursing informatics
Ogden & Porter 2000	Personal experience	Recount the unfolding of two related international research collaborations	Asia - India	Research RCS	Tuberculosis
Onokerhoraye & Maticka-Tyndale 2012	Personal experience	Examine the experience of the partnership and outlining successes and challenges	Africa - Nigeria	Research RCS, Knowledge translation	HIV/AIDS
O'Sullivan et al. 2017	Personal experience	Describe the approach used to develop a collaborative and sustainable partnership, and initial project outcomes	Africa - Uganda	Education RCS	Physiotherapy
Pinto et al. 2012	Personal experience	Using the International Participatory Research Framework (IPRF) to build a partnership	Latin America & Caribbean - Brazil	Research RCS	HIV/AIDS
Reddy et al. 2002	Personal experience	Discussion of challenges and opportunities for capacity building and collaboration strategies	Africa - South Africa	RCS	HIV/AIDS
Sanchez et al. 2013	Personal experience	Describe the implementation, challenges, and lessons learned of an RCS project	Latin America & Caribbean - Honduras	RCS	Infectious diseases

Paper Reference	Commentary informed by	Objective of paper	LMIC Geographical coverage¹	Programme Components	Programme Focus
Semrau et al. 2018	Personal experience	Discuss programme approaches and outputs	Africa - Ethiopia, Nigeria, South Africa and Uganda Asia - India, Nepal	Clinical care RCS	Mental health
Silva et al. 1994	Personal experience	Review the results of the programme from the angle of cross-fertilization of disciplines through their collaboration	Asia – Sri Lanka	RCS Research	Health social science
Spiegel et al. 2006	Personal experience	Summarize how collaboration was pursued, identify outputs, and highlight mutual benefits gained	Latin America & Caribbean - Cuba	Education Research RCS	Environmental Health
Stillman et al. 2006	Personal experience	Describe the approach, main outcomes and challenges of a partnership	Asia - China, Latin America & Caribbean - Brazil, Mexico	RCS Research	Tobacco control
Tierney et al. 2013	Personal experience	Describe partnership, challenges and value created	Africa - Kenya	Clinical care Education Research RCS	Multiple health research areas
Van Teijlingen et al. 2018	Personal experience	Highlight reasons for, considerations, and procedures around development of partnerships and key challenges	Asia = Nepal	Education RCS Research	Not stated
Vasquez et al. 2013	Personal experience	Highlight major challenges to the HRCS enterprise and make recommendations	Asia - Vietnam	RCS	HIV/AIDS

(H)RCS - (Health) research capacity strengthening

¹Specific countries or regions are listed if named in the publication

Appendix 4: Document Review Checklist

Date:

Reviewer:

Inquiry	Source Document
Background to Consortia Formation	<ul style="list-style-type: none"> • Call for applications for DELTAS Africa programmes
Funder Influences	<ul style="list-style-type: none"> • Notice of Award • Funder Terms and Conditions • DELTAS Africa M&E Strategy • Consortium Reporting Templates
Consortia Characteristics	<ul style="list-style-type: none"> • List and Details of Consortia • Current Consortia Leadership and Management Team
Consortia Management Structures and Processes	<ul style="list-style-type: none"> • Proposals submitted by consortia • Annual progress reports submitted by consortia

Comments:

Appendix 5: Template for Collection of Consortia Data

Consortium Management Study - Learning Research Programme
Data from Participating Consortia

Consortium: _____

1. List of Partners

No.	Partner Institution	Designation of partner institution (lead, co-applicant, or collaborator)	Type of institution (university, research institution, etc.)	Official Language of partner	Estimated level of research capacity of institution (low, medium, high) <small>*includes infrastructure, HR, number of projects, research outputs</small>	How long (years) has this partner worked with lead institution? (including years before DELTAS)
1						
2						
3						

2. Period of existence of this consortium (in years)

3. Type of formalised agreement used (if applicable) e.g. MOU, contract, sub-award, etc.

Appendix 6: Informed Consent Forms for Participants in Consortia

KEMRI Wellcome Trust Research Programme: Information Sheet and Consent Forms for Consortia Directors and Managers

Study Title: Examining the process of establishing and managing health research capacity strengthening consortia

Lay Title: Understanding how health research capacity strengthening consortia are established and managed

Institution	Investigators
KEMRI Wellcome Trust Research Programme	Ms Nadia Tagoe, Prof. Sassy Molyneux, Dr Sam Kinyanjui
Liverpool School of Tropical Medicine	Dr Justin Pulford

Introduction for Participants:

This study is part of the Learning Research Programme (LRP), which is working alongside DELTAS Africa consortia to produce research-based learning about how to train and develop world-class researchers, foster their careers and collaborations, and promote research uptake. This study is being implemented through a collaboration involving the LRP, led by the Liverpool School of Tropical Medicine and IDEAL hosted by the KEMRI Wellcome Trust Research Programme with the support of the African Academy of Sciences (AAS).

Who is carrying out this study and what is this study about?

This study is being carried out by KEMRI in collaboration with the Liverpool School of Tropical Medicine (LSTM), UK, with the support of AAS.

The study seeks to draw on the collective experience of the DELTAS Africa initiative to generate and share evidence towards promoting collaborative health research capacity strengthening efforts. We want to learn more about:

- the processes used in establishing and managing health research capacity strengthening consortia and what influences these processes
- capacity strengthening goals from the perspectives of different actors within the consortia
- how processes used by consortia influence the achievement of their goals

We hope to do this by talking to and observing participants and stakeholders of the DELTAS consortia.

Why do you want to talk to me and what does it involve?

We feel that your experience as a leader or member of the DELTAS consortium, and your involvement in health research capacity strengthening initiatives can contribute to our understanding and knowledge of consortia processes. We would like to hold a discussion with you to listen to your experiences in the DELTAS consortia as well as other consortia-based programmes. We would also like to hear your ideas on consortia processes and achieving capacity strengthening goals.

- I would like to ask you a number of questions about how the consortium was established, what goals it intends to achieve, how the consortium is managed, what influences consortium processes, what successes have been achieved and what challenges have been encountered. If you do not want to answer any of the questions, you may say so, and I will move on to the next question. The discussion will take place at a location that is convenient for you, and no one else will be present unless you would like someone else there.
- The discussions will be audio recorded to assist later in fully writing up the information. No one will be identified by name in the recording.

Are there any risks or disadvantages of taking part?

- The discussions should take approximately one hour.

Are there any advantages of taking part?

The study is expected to contribute to new learning with respect to consortium management which can immediately be fed back to the DELTAS community. This can help strengthen management processes in the current and future consortia. This study will also contribute to knowledge that will help researchers, programme leaders, funders, policymakers and other stakeholders in improving collaborative initiatives for strengthening health research capacity in low and middle-income countries, especially in Africa.

Who will have access to the information I give?

- We will not share individual information about you or other participants with anyone apart from those closely involved in this study. The knowledge gained from this research will be shared in summary form, without revealing individuals' identities.
- All our documents and audio recordings are stored securely in locked cabinets and on password-protected computers.
- Audio recordings of interviews will be destroyed at the end of the study.
- Data collected during this study will not be shared with other researchers in the future.

Who has allowed this research to take place?

All research at KEMRI and collaborating centres have to be approved before commencement by several national committees who look carefully at planned work. They must agree that the

research is important, relevant to Kenya and follows nationally and internationally agreed research guidelines. This includes ensuring that all participants' safety and rights are respected.

What will happen if I refuse to participate?

All participation in research is voluntary. You are free to decide if you want to take part or not. If you do agree, you can change your mind at any time without any consequences.

What if I have any questions?

You are free to ask me any question about this research. If you have any further questions about the study, you are free to contact the research team using the contacts below:

Ms. Nadia Tagoe, KEMRI Wellcome Trust Research Programme, P.O. Box 230, Kilifi. Telephone: +254 791626310 or +254 722 203417, +254 733 522063, +254 41 7522063; Email address: ntagoe@kemri-wellcome.org

If you want to ask someone independent anything about this research, please contact:

Community Liaison Manager, KEMRI Wellcome Trust Research Programme, P.O. Box 230, Kilifi. Telephone: +254 41 7522 063; Mobile +254 723 342 780 or +254 705 154 386

The Secretary, KEMRI Scientific and Ethics Review Unit, P. O. Box 54840-00200, Nairobi; Telephone numbers: +254 20 272 2541; Mobile +254 722 205 901 or +254 733 400 003; Email address: seru@kemri.org

Consent Section

I have had the study explained to me. I have understood all that has been read/explained and had my questions answered satisfactorily.

Yes (please check) I agree to take part in this research

Yes (please check) I agree for the interview/discussion to be audio recorded

I understand that I can change my mind at any stage, and it will not affect me in any way.

Signature: _____ **Date:** _____

Participant Name: _____ **Time:** _____
(please print name)

Information/consent provided by: _____
(Print name) (Sign)

KEMRI Wellcome Trust Research Programme: Information Sheet and Consent Forms for AAS Participants

Study Title: Examining the process of establishing and managing health research capacity strengthening consortia

Lay Title: Understanding how health research capacity strengthening consortia are established and managed

Institution	Investigators
KEMRI Wellcome Trust Research Programme	Ms Nadia Tagoe, Prof. Sassy Molyneux, Dr Sam Kinyanjui
Liverpool School of Tropical Medicine	Dr Justin Pulford

Introduction for Participants:

This study is part of the Learning Research Programme (LRP), which is working alongside DELTAS Africa consortia to produce research-based learning about how to train and develop world-class researchers, foster their careers and collaborations, and promote research uptake. This study is being implemented through a collaboration involving the LRP, led by the Liverpool School of Tropical Medicine and IDEAL hosted by the KEMRI Wellcome Trust Research Programme with the support of Alliance for Accelerating Excellence in Science in Africa (AESAs).

Who is carrying out this study and what is this study about?

This study is being carried out by KEMRI in collaboration with the Liverpool School of Tropical Medicine (LSTM), UK, with the support of AESA.

The study seeks to draw on the collective experience of the DELTAS Africa initiative to generate and share evidence towards promoting collaborative health research capacity strengthening efforts. We want to learn more about:

- capacity strengthening goals from the perspectives of different actors within the consortia
- the processes used in establishing and managing health research capacity strengthening consortia and what influences these processes
- how processes used consortia influence the achievement of their goals.

We hope to do this by talking to and observing participants and stakeholders of the DELTAS consortia.

Why do you want to talk to me and what does it involve?

We feel that your role can contribute to our understanding and knowledge of the management and capacity building activities of the consortia. We would like to hold a discussion with you to listen to your views and experiences regarding the DELTAS consortia. We would also like to hear your ideas on consortia management and achieving capacity strengthening goals.

- I would like to ask you a number of questions about the background and goals of DELTAS, how it is strengthening capacity, what successes have been achieved and what challenges have been encountered. If you do not want to answer any of the questions, you may say so, and I will move on to the next question. The discussion will take place at a location that is convenient for you, and no one else will be present unless you would like someone else there.
- The discussions will be audio recorded to assist later in fully writing up the information. No one will be identified by name in the recording.
- In some cases, I may also silently observe your participation in a DELTAS related meeting or forum.

Are there any risks or disadvantages of taking part?

- The discussions should take approximately one hour.

Are there any advantages of taking part?

The study is expected to contribute to new learning with respect to consortia management which can immediately be fed back to the DELTAS community. This can help strengthen management processes in the current or future consortia. This study will also contribute to knowledge that will help researchers, programme leaders, funders, policymakers and other stakeholders in improving collaborative initiatives for strengthening health research capacity in low and middle-income countries, especially in Africa.

Who will have access to the information I give?

- We will not share individual information about you or other participants with anyone apart from those closely involved in this study. The knowledge gained from this research will be shared in summary form, without revealing individuals' identities.
- All our documents and audio recordings are stored securely in locked cabinets and on password-protected computers.
- Audio recordings of interviews will be destroyed at the end of the study.
- Data collected during this study will not be shared with other researchers in the future.

Who has allowed this research to take place?

All research at KEMRI and collaborating centres have to be approved before commencement by several national committees who look carefully at planned work. They must agree that the research is important, relevant to Kenya and follows nationally and internationally agreed research guidelines. This includes ensuring that all participants' safety and rights are respected.

What will happen if I refuse to participate?

All participation in research is voluntary. You are free to decide if you want to take part or not. If you do agree, you can change your mind at any time without any consequences.

What if I have any questions?

You are free to ask me any question about this research. If you have any further questions about the study, you are free to contact the research team using the contacts below:

Ms. Nadia Tagoe, KEMRI Wellcome Trust Research Programme, P.O. Box 230, Kilifi. Telephone: +254 791626310 or +254 722 203417, +254 733 522063, +254 41 7522063; Email address: ntagoe@kemri-wellcome.org

If you want to ask someone independent anything about this research, please contact:

Community Liaison Manager, KEMRI Wellcome Trust Research Programme, P.O. Box 230, Kilifi. Telephone: +254 41 7522 063; Mobile +254 723 342 780 or +254 705 154 386

The Secretary, KEMRI Scientific and Ethics Review Unit, P. O. Box 54840-00200, Nairobi; Telephone numbers: +254 20 272 2541; Mobile +254 722 205 901 or +254 733 400 003; Email address: seru@kemri.org

Consent Section

I have had the study explained to me. I have understood all that has been read/explained and had my questions answered satisfactorily.

Yes (please tick) I agree to take part in this research

Yes (please tick) I agree for the interview/discussion to be audio recorded

I understand that I can change my mind at any stage, and it will not affect me in any way.

Signature: _____ **Date:** _____

Participant Name: _____ **Time:** _____
(please print name)

Information/consent provided by: _____
(Print name) (Sign)

Appendix 7: Topic Guide Used in Key Informant Interviews

Consortia Directors

Inception

- 1) What is your role in the consortium?
 - When and how did you take it on?
 - What are your main responsibilities, and how have they changed over time?
- 2) What **motivated** the formation of the consortium (**why the consortium model**)?
 - How was it established? Who **initiated** and why?
 - What determined the **structure and size** of the consortium?
 - What makes it a ‘**consortium**’ rather than a **network/partnership**?
- 3) What **criteria** was used in **selecting the partners**?
 - Why stated criteria?
 - Previous relationship (and how long)? Funding? Topic/technical capacity?
 - Why these partners and not others who meet or may have met the same criteria?
- 4) What are the differences between **co-applicants and collaborators**?
 - How were partner **roles determined**?
- 5) How were the **goals, focus areas and partner responsibilities** determined?
 - Who was involved?
 - What influenced the selection?
 - Was it easy to agree across partners?
 - Have they changed over time? Why?
- 6) How was **resource allocation** done?
 - How is **trainee support awarded**?
- 7) Did your consortium have an establishment/inception/partnership development phase?
 - What were the easiest and hardest parts?
 - At what stage is the consortium now?

- At what point did you consider the **consortium established**? Why?
 - What **type of agreement** was used, and why?
- 8) What was your **experience** during the consortium start-up phase?

Implementation

- 9) How was the **leadership and/or management structure developed**?
- Do you **distinguish between leadership and management**? How?
 - What determined/influenced structure (requirements from funders, host institution)?
 - How do they **function in practice** (including planning, decision-making, coordinating, reporting)?
 - Differences between **instituted and how they function** in practice and why?
 - How do the different management levels/arms **relate to each other**?
 - What are the **enablers and challenges** of leadership/management functions across levels?
- 10) How do the **partners relate to each other**, and how has that developed **over time**?
- How are equity and inclusivity promoted?
 - Any **conflicts**? Competition? **How do you respond**?
 - What are the **differences between partners**?
 - How different are the **levels of engagement** among partners? Why?
- 11) What makes it a **research capacity strengthening (RCS)** consortium vs a research consortium?
- What are the **differences between managing an RCS** consortium such as this and a **research** consortium?
- 12) Have there been any **critical incidents** (e.g. unintended occurrences or changes, e.g. personnel), and how did the leadership respond?
- 13) How does the consortium relate to the **host institution**?
- Active institutional role?
 - Influence of institutional policies, procedures and practices
- 14) How does the consortium relate to the **funder (AAS/AESA)**?

- What has your experience been with requirements, influence, support?
- What will be helpful for funders to do in addition to and/or differently?

15) What has your **experience** been (including successes and challenges) in managing this consortium?

General

16) How have you **developed your expertise** in leading/managing a consortium?

- Any previous experience leading or participating in a research or RCS consortium?
- How does this experience compare to the previous one(s)?
- Do you draw on any training, resources (e.g. tools, frameworks) in managing the consortium?
 - What are they?
 - What training, resource or other support would you consider to be helpful/recommend?

17) How will you describe a **successful consortium? Enablers and barriers?**

18) How does **excellence** drive what the consortium does?

19) What aspects of **consortium management helps or challenges** the achievement of consortium **goals**?

20) If you have to do this again, what will you **do differently**?

21) As a consortium, what are some of the **overall successes and challenges** to date?

22) Any final comments about establishing and leading/managing a successful consortium?

Consortia Managers

Inception

- 1) What is your role in the consortium?
 - When and how did you take it on?
 - What are your main responsibilities, and how have they changed over time?
- 2) Tell me about how the consortium was set up (if applicable) and how it operates.
 - What makes it a “**consortium**” rather than a network/partnership?
 - What indicates that it is an established consortium?
 - What were the **criteria for inclusion**?
- 3) Tell me more about the partners
 - Type of institution, expertise, type of institution, size, level of research intensity, prior working relationship (if data not already provided)
- 4) What are the differences between **co-applicants and collaborators**?
 - How were partner **roles determined**?
- 5) How were the **goals, focus areas and partner responsibilities** determined?
 - Who was involved?
 - What influenced the selection?
 - Was it easy to agree across partners?
 - Have they changed over time? Why?
- 6) How was **resource allocation** done?
 - How is **trainee support awarded**?
- 7) What were the **experiences** (including successes and challenges) of the consortium start-up phase?

Implementation

- 8) How was the leadership and/or management structure developed?
 - How do they function in practice (including planning, decision-making, coordinating, reporting)?
 - Differences between **instituted and how they function** in practice and why?
 - How do the **different management levels/arms relate** to each other?

- What are the **enablers and challenges** of leadership/management functions across levels?
- 9) How do the **partners relate to each other**, and how has that developed **over time**?
- How are equity and inclusivity promoted?
 - Any **conflicts**? Competition? **How do you respond**?
 - What are the **differences between partners**?
 - How different are the **levels of engagement** among partners? Why?
- 10) What makes it a **research capacity strengthening (RCS)** consortium vs a research consortium?
- What are the **differences between managing an RCS** consortium such as this and a **research** consortium?
- 11) Have there been any **critical incidents** (e.g. unintended occurrences or changes, e.g. personnel), and how did the leadership respond?
- 12) How does the consortium relate to the **host institution**?
- Active institutional role?
 - Influence of institutional policies, procedures and practices
- 13) How does the consortium relate to the **funder (AAS/AESA)**?
- What has your experience been with requirements, influence, support?
 - What will be helpful for funders to do in addition to and/or differently?
- 14) What has your **experience** been (including successes and challenges) in managing this consortium?

General

- 15) How have you developed your expertise in consortium management?
- Path to project management?
 - Previous experience with a consortium?
 - How does this experience compare to the previous one(s)? Better/worse, and why?
 - Have you drawn on any training, resources or other support?
 - What are they?

- What training, resource or other support would you consider to be helpful/recommend?

16) How will you describe a **successful consortium**? **Enablers and barriers**?

17) How does **excellence** drive what the consortium does?

18) What aspects of **consortium management helps or challenges** the achievement of consortium **goals**?

19) As a consortium, what are some of the **overall successes and challenges** to date?

20) Any final comments about establishing and leading/managing a successful consortium?

AESA Director and AAS Advisor

- 1) What is AESA's current role (overall and with respect to DELTAS)?
 - How has that role with respect to DELTAS evolved over time?
- 2) Why was the DELTAS initiative developed, and what was the thinking behind it?
 - How has that evolved?
 - Which stakeholders were involved?
 - Role of previous initiatives?
- 3) What processes went into developing the initiative and what determined/informed the design requirements given in the call?
- 4) Why the preference for consortia/collaborations?
- 5) Did AESA (together with its funding partners) provide any support to applicants during the application process?
- 6) What are the challenges faced by AESA in administering DELTAS Africa?
- 7) What are your thoughts on how the DELTAS consortia were formed and how they are managed?
 - Any patterns, similarities, differences?
 - Examples of successes and challenges
 - What can be improved to better facilitate the achievement of DELTAS goals?
- 8) Which aspects of how consortia are established and managed are important to AESA?
 - Why?
 - What will be important to **follow-up** on during this study?
- 9) Having gone through the experience of establishing the DELTAS programme, what will you **do differently** in a subsequent initiative?

- In terms of supporting the formation and management of consortia
- Generally?

10) Generally, has the initiative unfolded in the way you expected?

- Any unexpected experiences or things that have naturally emerged?

11) What will you say are the main successes and challenges of the initiative so far?

12) What will a successful DELTAS look like for AESA?

- What do you expect consortia to achieve (in addition to research capacity) in the area of **research/consortium management**?

13) Any other comments?

DELTA Programme and M&E Managers at AAS

- 1) What is your current role, and what are your responsibilities?
 - When and how did you take this role on?
 - How have your responsibilities changed over time?
- 2) What is your understanding of the overall thinking behind the DELTAS initiative?
- 3) What are your thoughts on how the DELTAS consortia were formed and how they are managed?
 - Any patterns, similarities, differences?
 - Examples of successes and challenges
 - What can be improved to better facilitate the achievement of DELTAS goals?
- 4) What is the role of AESA with respect to DELTAS?
 - In general, and in how consortia are managed (across board + individual consortia)?
- 5) What are the challenges faced by AESA in administering DELTAS Africa?
- 6) What requirements are consortia expected to comply with regarding how they are established and managed?
 - Why?
 - How prescriptive is AESA in the following and why?
 - Formation of consortia
 - Management structures
 - Management procedures and operations
 - Coordination
 - Reporting
 - What has the experience been with consortia in complying with these requirements?
 - How has AESA responded?

- 7) What kind of support does AESA offer to the programmes to facilitate the management of the consortia?
- Proactive vs reactive?
- 8) Which aspects of how consortia are established and managed are important to AESA?
- Why?
 - What will be important to **follow-up** on during this study?
- 9) Having gone through the experience of establishing the DELTAS programme, what will you **do differently** in a subsequent initiative?
- In terms of supporting the formation and management of consortia
 - Generally?
- 10) Generally, has the initiative unfolded in the way you expected?
- Any unexpected experiences or things that have naturally emerged?
- 11) What will you say are the main successes and challenges of the initiative so far?
- 12) What will a successful DELTAS look like for AESA?
- What do you expect consortia to achieve (in addition to research capacity) in the area of **research/consortium management**?

Appendix 8: In-Depth Interview Guides

Consortia Directors

Understanding of HRCS

1. How would you **personally interpret** the term/concept ‘research capacity strengthening’? What comes to mind?
2. What are your institutional research capacity strengthening priorities?
 - Any tensions between them, e.g. does developing one type take away from the other?
3. To what extent does this thinking align with the DELTAS approach?
 - Activities? Expected outputs? Practices?
 - Are there other areas of capacity that require attention?

Influence of HRCS thinking on key management processes

4. Why did the consortium choose a centralised/decentralised approach?
5. Are there any differences in the way the consortium is managed because of the focus on HRCS?

Any dilemmas?

6. Are there any differences in the way the consortium is managed because of this specific initiative or funder or compared to any others you’ve managed? How? Why?

Effect of management processes on capacity development

7. What is your perception of the **theory of change/LFA approach** to measuring/evaluating capacity strengthening? How can it be **improved**?
8. Are there **other ways** that capacity strengthening happens that are not recognised? How are you able to **identify that capacity strengthening** is happening?
9. Do consortium management processes play any role in the capacity strengthening process?
10. What is the effect of consortium management processes on **individual and institutional capacity**?
 - Which **aspects enable** and which ones **hinder**?
 - Examples?
11. To what extent are consortium management processes embedded in the institution?

- Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

12. Based on your thinking and experience, what kind of HRCS programme design will you propose for an initiative like this if given the opportunity?
13. What kind of management approach will you propose that supports capacity development?
 - Partner selection and management
 - Programmatic
 - Financial
 - Reporting
 - Evaluation

Managers at Lead Institutions (Programme, M&E, Finance)

Programmatic management processes

1. When did you join the consortium, and what are your responsibilities?
2. What processes are used to manage the programmatic aspects of the consortium, i.e. activity planning, coordination and monitoring
 - What influenced the choice of these processes?
 - What benefits and challenges have you encountered in using these processes?

Understanding of HRCS

3. How would you **personally interpret** the term/concept ‘research capacity strengthening’? What comes to mind?
4. Which areas should your institution **prioritise** in strengthening its research capacity?
5. What do you think are the best ways by which these capacity areas can be developed?
 - Approaches? Activities? Practices? Types of resources?
6. How does your personal and/or institutional thinking align with the DELTAS approach?
 - Activities? Expected outputs? Practices?
 - Are there other areas of capacity that require attention?
7. What are some of the dilemmas that you have encountered due to your institutional thinking on HRCS and that of DELTAS, if divergent?

Influence of HRCS thinking on key management processes

8. How have adopted management strategies worked?
 - i) Governance structures and processes (Boards, committees, secretariat)
 - ii) Financial management
 - iii) Resource allocation/trainee award strategy
 - iv) Reporting and evaluation
9. Are there any differences in the way the consortium is managed because of the focus on HRCS?
 - v) **Selecting partners**
 - vi) **Deciding on consortium goals**
 - vii) Determining partner roles and responsibilities
 - viii) Establishing governance structures and practices
 - ix) **Allocating resources (funds) including trainee awards**
 - x) **Financial management structures and processes**

xi) Programmatic management structures and processes

Any dilemmas encountered?

10. Are there any differences in the way the consortium is managed because of this specific initiative or funder or compared to any others you've managed? How? Why?

Effect of management processes on capacity development

11. What is your perception of the **theory of change/LFA approach**? Is it **adequate**, and how can it be **improved**?
12. Are there **other ways** that capacity strengthening happens that are not recognised? How are you able to **identify that capacity strengthening** is happening?
13. Do consortium management processes play any role in the capacity strengthening process?
14. What role have the consortium management processes played in **individual and institutional capacity** development?
- Which aspects enable and which ones hinder?
 - Examples?
15. To what extent are consortium management processes embedded in the institution?
- Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

16. Based on your thinking and experience, what kind of programme design will you propose for an HRCS initiative if given the opportunity?
- Model, implementer, goals, activities?
17. What management approach will you propose?
- Partner management
 - Programmatic
 - Financial
 - Reporting
 - Evaluation

Leaders at Partner Institutions

Partner perception of consortium management processes

1. What are your responsibilities?
2. What motivated your institutions' participation in this consortium?
3. How were the consortium goals determined and agreed upon?
 - How are your institutional goals represented?
 - Are there others that you would have wanted to be represented?
4. I understand the consortium has/uses X (management structure and processes) ...
 - How has it functioned? How can they be improved? Can anything be done differently?
5. I understand consortium resources are allocated based on X (including trainee award strategy), how has this worked so far?
6. I learnt from my first phase of interviews that ... (financial management approach) ... what are the advantages and disadvantages of this approach?
7. What are your thoughts on partner relationships in the consortium?
 - How are equity, power balance, and inclusivity promoted?
8. What is your general perception of how the consortium is managed?
9. What **influences** are exerted by the **lead/partners** on consortium processes and interactions?
10. Are there any differences in the way the consortium is managed compared to others you've participated in?

Understanding of HRCS

11. How would you **personally interpret** the term/concept 'research capacity strengthening'? What comes to mind?
12. What are your institutional research capacity strengthening priorities?
13. How does this thinking align with the DELTAS approach/the consortium? Are there any divergences?
14. Were these needs and approaches brought up during DELTAS discussions, and how were they incorporated into the consortium's goals?
15. Are there other HRCS approaches or activities you would have proposed?

Effect of management processes on capacity development

16. Are there any differences in the way the consortium is managed because of the focus on RCS?

17. What is your perception of the **theory of change/LFA approach**? Is it **adequate**, and how can it be **improved**?
18. Are there **other ways** that capacity strengthening happens that are not recognised or reported?
19. Do consortium management processes play any role in the capacity strengthening process (i.e. contribute or a toll on)? **How does the way the consortium is managed affect capacity strengthening?**
20. What is the effect of consortium management processes on:
 - **Individual** capacity
 - **Institutional** capacity
21. To what extent are consortium management processes embedded in the institution?
 - Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

22. Based on your thinking and experience, what kind of programme design will you propose for an HRCS initiative if given the opportunity?
 - Model, goals, activities?
23. What will be the best way of approaching the following management processes for an HRCS consortium **and why**?
 - i) **Selecting partners**
 - ii) **Deciding on consortium goals**
 - iii) Determining partner roles and responsibilities
 - iv) Establishing governance structures and practices
 - v) **Allocating resources (funds) including trainee awards**
 - vi) **Financial management structures and processes?**
 - vii) Programmatic management structures and processes?
 - viii) Reporting and evaluation

Managers at Partner Institutions (Programme, M&E, Finance)

Partner perception of consortium management processes

1. What does your role entail?
2. I understand the consortium has/uses X (management structure and processes, including programmatic management) ...
 - How has it functioned?
 - What is your perception (has been your experience) with the management processes adopted?
 - How can they be improved?
3. I understand consortium resources are allocated based on X (including trainee award strategy), how has this worked so far?
4. I learnt from my first phase of interviews that ... (financial management approach) ... what are the strengths and challenges of this approach?
5. What are your thoughts on partner relationships in the consortium?
 - How are equity, power balance, and inclusivity promoted?
6. What is your general perception of how the consortium is managed?

Understanding of HRCS

7. How would **you personally interpret** the term/concept ‘research capacity strengthening’? What comes to mind?
8. Which areas should your institution **prioritise** in strengthening its research capacity?
9. What would you propose as the best ways of developing these capacities?
 - **Approaches?** Activities? Practices? Types of resources?
10. How does this thinking **compare to the DELTAS** approach? Are there any divergences?
 - Activities? Expected outputs? Practices?
11. Are these needs and approaches brought up during consortium discussions, and how are they incorporated into the consortium’s activities?

Effect of management processes on capacity development

12. Are there any differences in the way the consortium is managed because of the focus on HRCS?
13. What is your perception of the **theory of change/LFA approach**? Is it **adequate**, and how can it be **improved**?

14. Are there **other ways** that capacity strengthening happens that are not recognised?
How are you able to **identify that capacity strengthening** is happening?
15. Do consortium management processes play any role in the capacity strengthening process?
16. What role have the consortium management processes played in the development of **individual and institutional capacity**?
 - Which aspects enable and which ones hinder?
 - Examples?
17. To what extent are consortium management processes embedded in the institution?
 - Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

18. Based on your thinking and experience, what kind of HRCS programme design will you propose if given the opportunity?
 - Model, implementer, goals, activities?
19. What will be the best way of approaching the following management processes **and why**?
 - i) Selecting partners**
 - ii) Deciding on consortium goals**
 - iii) Determining partner roles and responsibilities
 - iv) Establishing governance structures and practices
 - v) Allocating resources (funds) including trainee awards**
 - vi) Financial management structures and processes?**
 - vii) Programmatic management structures and processes?
 - viii) Reporting and evaluation

Other Institutional Stakeholders at Lead and Partner Institutions

Participation and goals

1. What is your role in the consortium?
2. What motivated your institution's participation in this consortium?
3. To what extent are your institutional goals represented in the overall consortium goals?
 - Are there others that you would have wanted to be more represented?
4. What is your perception of partner relationships in the consortium?
 - How are equity, power balance, and inclusivity promoted?
5. Have there been any critical incidents (e.g. unintended occurrences or changes, e.g. personnel), and what was the effect and response?

Understanding of HRCS

6. How would you **personally interpret** the term/concept 'research capacity strengthening'? What comes to mind?
7. Which areas does your institution need to **prioritise** in its bid to strengthen its research capacity?
8. How does your personal and/or institutional thinking compare to the DELTAS approach?
 - Has it been explicitly discussed? Are there any divergences?
 - Are there other areas of capacity that require attention or being addressed but not recognised?
9. How does this thinking compare to the DELTAS approach?
 - Activities? Expected outputs? Practices?
 - Are there other areas of capacity that require attention, or being developed but not recognised/rewarded?

Influence of HRCS thinking on key management processes

10. Are there any differences in the way the consortium is managed because of the focus on HRCS?
 - i) **Selecting partners**
 - ii) **Deciding on consortium goals**
 - iii) Determining partner roles and responsibilities
 - iv) Establishing governance structures and practices
 - v) **Allocating resources (funds) including trainee awards**
 - vi) **Financial management structures and processes?**
 - vii) Programmatic management structures and processes?

Any dilemmas encountered?

Effect of management processes on capacity development

11. What is your general perception of consortium management processes?
12. What role have consortium management processes played in the development of **individual and institutional capacity**?
 - Which aspects enable and which ones hinder?
 - Examples?
13. What is your perception of the **theory of change/LFA approach**? Is it **adequate**, and how can it be **improved**?
14. Are there **other ways** that capacity strengthening happens that are not recognised? How are you able to **identify that capacity strengthening** is happening?
15. To what extent are consortium management processes embedded in the institution?
 - Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

16. Based on your thinking and experience, what kind of programme design will you propose for an HRCS initiative if given the opportunity?
 - Implementer, goals, activities?
17. What management approach will you propose?
 - Programmatic, financial, reporting, evaluation?

Leaders at High-Income Partner Institutions

Partner perception of consortium management processes

1. What is your role in the consortium, and what does it entail?
2. What motivated your participation in this consortium?
3. How were the consortium goals determined and agreed upon?
 - How are your institutional goals represented?
 - Are there others that you would have wanted to be represented?
4. What is your general perception of how the consortium is managed?
5. I understand the consortium has/uses X (management structure and processes) ...
 - How has it functioned so far?
 - What is your perception (has been your experience) with the management processes adopted?
 - How can they be improved?
6. I understand consortium resources are allocated based on X (including trainee award strategy), how has this worked so far?
7. What is your perception of partner relationships in the consortium?
 - How are equity, power balance, and inclusivity promoted?
8. Have there been any critical incidents (e.g. unintended occurrences or changes, e.g. personnel), and what was the effect and response?

Understanding of HRCS

9. How would you **personally interpret** the term ‘research capacity strengthening’? What comes to mind?
10. How does this thinking compare to the DELTAS approach? Are there any divergences?
 - Activities? Expected outputs (any intangible or unrecognised)? Practices?
11. Does participation in this consortium strengthen your institution’s research capacity? How?
12. Were these needs brought up during DELTAS discussions, and how were they incorporated into the consortium’s goals?
13. Did/do you encounter any dilemmas as this programme was being developed or implemented?

Effect of management processes on capacity development

14. What is your perception of the **theory of change/LFA approach** to measuring/evaluating capacity strengthening? How can it be **improved**?

15. Are there **other ways** that capacity strengthening happens that are not recognised?
How are you able to **identify that capacity strengthening** is happening?
16. Do consortium management processes play any role in the capacity strengthening process (i.e. contribute or a toll on)?
17. What is the effect of consortium management processes on **individual and institutional capacity**?
 - Which **aspects enable** and which ones **hinder**?
 - Examples?
18. To what extent are consortium management processes embedded in your institution?
 - Partner selection, goal development, governance, programme and financial management

Recommendations for HRCS models and management approaches

19. Based on your thinking and experience, what kind of HRCS programme design will you propose if given the opportunity?
 - Implementer, goals, activities?
20. What will be the best way of approaching the following management processes and **why**?
 - i) **Selecting partners**
 - ii) **Deciding on consortium goals**
 - iii) Determining partner roles and responsibilities
 - iv) Establishing governance structures and practices
 - v) **Allocating resources (funds) including trainee awards**
 - vi) **Financial management structures and processes?**
 - vii) Programmatic management structures and processes?
 - viii) Reporting and evaluation

Appendix 9: Excerpts of the Phase 1 Analysis Categorization

Consortium	Management structure and processes		Management experiences		External relationships and influences	
	Director	Programme Manager	Director	Programme Manager	Director	Programme Manager
C1	<p>Responsibilities of Director - programme oversight, financial oversight and accountability, team/partner welfare</p> <p>Governance structure: Advisory board - meets once a year Steering committee - Constituted by partner institutions, meets twice a year Executive committee - Headed by consortium Director made up of lead institutional stakeholders only. Undertakes day-to-day running of programme, and includes Director, Centre Manager, finance and admin officers, all from host institution Implementation teams - runs the technical components of the programme, reports to and are represented on the executive committee</p> <p>Evolutionary development of structures as consortium and scope grew</p> <p>Funding agency required advisory board, rest were self-determined</p>	<p>Responsibilities of PM - strategic mgt, resource mobilisation and mgt, M&E, capacity building, general mgt, public engagement</p> <p>Extended executive committee constituted to enable more frequent meetings with partner reps to complement the fewer steering committee meetings held due to busy Directors</p> <p>Members of steering and extended executive committees attend ISAB meetings as observers to enhance transparency and accountability among partners</p> <p>MOUs with partners spell out scope of work and allocated funds (determined at proposal stage).</p> <p>Centralized fund and procurement management makes coordination easier, helps with complex bureaucratic procedures and institutional financial reporting, and saves time. Partners happy with that. Only one partner received allocated funds in advance.</p>	<p>Challenges with tension between excellence and equity in selection of trainees. Process made transparent and inclusive</p> <p>Balancing researcher-director roles is challenging. Works well if good PM in place so can be less hands-on</p> <p>Consulted other consortia directors to determine best practice when addressing PM retention challenges</p>	<p>Challenges: Availability of busy members and conflicting calendars Management processes are time-consuming Members feel once consortium is running well, many meetings are unnecessary Lack of remuneration for consortium actors Delayed submission of reports by partners Push-back by partners towards mgt systems they were not used to</p> <p>Facilitators: Building rapport with partners Hands-on Director Weekly meetings</p> <p>Previous working relationships enhanced partner relations and facilitated discussions</p> <p>Some partners are more engaged than others. Partners with smaller roles are less engaged</p>	<p>Funding agency is supportive and open to inputs. We see them as partners</p>	<p>Programme operations follow host institutional policies with consideration for funding agency policies</p> <p>Funding agency deals with lead institution, ensures policies and financial mgt systems are in place, and grant conditions are being followed.</p> <p>Consortium consults funding agency for guidance and clarification when required.</p> <p>Consortium and funding agency are learning from each other</p>

Consortium	Management structure and processes		Management experiences		External relationships and influences	
	Director	Programme Manager	Director	Programme Manager	Director	Programme Manager
Key Learning Across Consortia	<p>Common governance structures - Advisory Boards, Steering Committee and Executive/Management Team</p> <p>Why gov structures? - Funding agency requirement (Independent advisory Board), transparent and inclusive governance and decision-making, keep partners connected and focused on common goals, facilitate coordination, monitoring and accountability</p> <p>Structures informed by - previous experience, other consortia, funding agency requirement</p> <p>Annual consortium meetings held to bring all partners together</p> <p>Consortia have co-applicants (core partners) and collaborators but with varying characteristics</p> <p>Different approach for trainee awards - merit or quota based strategies</p>	<p>Common governance structures - Advisory Boards, Steering Committee and Executive/Management Team</p> <p>Structures informed by - previous experience, mandate/oversight responsibility</p> <p>Changes made to enhance implementation e.g. changes in number of meetings, extended executive meeting to include partner reps, increase in technical committees</p> <p>Consortia have co-applicants (core partners) and collaborators but with varying characteristics</p> <p>Different approach for trainee awards - merit or quota based strategies</p> <p>Various approaches to fund management - central management of significant component of funds, a combination of central and partner-level management, or subgrants to all co-applicants</p>	<p>Partners have multiple differences at institutional and individual levels and perform at different levels, hence challenging to manage</p> <p>Tensions exist in managing consortia that need balancing e.g. equity vs merit and programme delivery and capacity strengthening (both in choice of partners and management approach)</p> <p>The lesser the resources given to the partner, the lesser the priority given to consortium</p> <p>Enablers: Partner commitment, common purpose and buy-in, transparency, communication, joint determination of governance structure and management processes, inclusive decision-making, equal treatment, previous working relationship, strong secretariat, institutional embeddedness and support, regular meetings</p> <p>Challenges: Large consortium, managing differences in partners, busy stakeholders, reporting challenges, problematic partner institutional processes, language differences</p>	<p>Partners have multiple differences - social, cultural, behavioural</p> <p>Partners are engaged at different levels, usually influenced by roles</p> <p>Tensions arise between equity and merit</p> <p>The lesser the resources given to the partner, the lesser their motivation and commitment</p> <p>Consortium management involves people management, requires soft skills</p> <p>Enablers: Transparency, communication, established policies and guidelines, inclusivity, partner opportunity to contribute, partner access to resources, previous working relationship, building rapport with partners, understanding and appreciating partner uniqueness, strong secretariat, institutional support, regular meetings, consistency</p> <p>Challenges: Large consortium, differences in partners, busy stakeholders, reporting challenges, time-consuming nature of consortium management, distances between partners, language differences, poor commitment, weak secretariat</p>	<p>Funding agency: Supportive, functions like a partner, responsive, not prescriptive, open to inputs, and differences are resolved by consensus</p> <p>Host institution: Participates in management and supportive</p> <p>Consortium operates within institutional structures and procedures</p> <p>Essential to engage institutional stakeholder at start and not just individuals</p> <p>Influence of other collaborators of partner institutions may not always align with consortium</p>	<p>Funding agency: Supportive, responsive, not prescriptive, provides constructive feedback, facilitative and shares learning from others</p> <p>Host institution: Participates in annual meetings, supportive and gives room for consortium to operate</p> <p>Consortium operates within institutional structures and procedures</p>

Appendix 10: Thematic Framework

Group	Nodes
RCS conceptualisation, prioritisation and evaluation	RCS conceptualisation and prioritisation <ul style="list-style-type: none"> a) Conceptualisation of RCS b) Factors influencing RCS priorities/focus c) Alignment in conceptualisation and prioritisation d) Challenges with conceptualisation and prioritisation e) Changes in RCS conceptualisation and prioritisation
	Monitoring and evaluating RCS progress and achievements <ul style="list-style-type: none"> a) Views on DELTAS Theory of Change <ul style="list-style-type: none"> o Value / What is measured o Limitations / What is not or cannot be measured b) Changes in RCS evaluation c) Recommendations
Setting up of consortia	Motivation for participation in consortium <ul style="list-style-type: none"> a) Individual b) Institutional
	Inception process
	Factors influencing management strategies <ul style="list-style-type: none"> a) Partner selection b) Determination of consortium activities and goals c) Determination of roles and responsibilities d) Governance structure e) Management processes used f) Partner management g) Resource allocation
Management processes	Management processes
Perceptions of management	Perceptions of management structures and approaches and experiences <ul style="list-style-type: none"> a) Enablers and benefits b) Challenges c) Centralised? d) Decentralised?
	Partner differences
	Partner relations

Group	Nodes
Differences	Differences in governance and management compared to other consortia
Role of management processes in RCS	Gains from participating in consortium <ul style="list-style-type: none"> a) Individuals <ul style="list-style-type: none"> ○ Researchers ○ Managers b) Institutional
	Learning about management processes
	Role of management processes in RCS
	Embedding management processes into the institution
Recommendations	Recommendations on RCS initiatives <ul style="list-style-type: none"> a) Programme design b) Management approach

Appendix 11: Excerpts of Data Analysis Summary Charts

‘Perceptions of Management’ Theme

	Perceptions of management structures, approaches and experiences	Challenges of Management	Enablers of Management	Centralised	Decentralised
Consortium B, Partner Institution, R2	Our institutional goals were perhaps not adequately represented because we agreed to a merit-based selection. It so happened that the criteria were favorable to people in medical sciences (no. of publications) which favoured some partners. That was the outcome of the choices we made. they were not bad choices, because the DELTAS focus is developing research leaders and some fellows from the first phase are leaders in their fields now		<p>We have a very good Director, and he runs a good secretariat. He is very perceptive, not domineering but won't let you get away with mediocrity, he is not afraid to say things as they are in a nice calm way, he is a good pilot.</p> <p>There is a lot of consensus building within the steering committee, and every institution is represented whenever we have a call. The secretariat puts in a lot of effort to make sure that, although its virtual that we have the right tools for it to function well.</p>	a centralized financial management system tends to slow things down considerably. a procurement system with procedures at the institution and parent institution, that will slow things down.	advantage of sub-contract is an assurance of the commitments so institution can pre-finance some things. We can make plans before receiving payment. That understanding increases efficiency
Consortium B, Partner Institution, R3	The governance structures have worked very well. there is a lot of bureaucracy involved so it can be frustrating but I think it's important.	AAS putting more pressure on reporting than Wellcome Trust did perhaps because they are new and need to prove that they have good management. consortia with previous phases are under a lot of pressure to keep up with the increased reporting	I think we benefited from five years' experience of management, managing finances, reporting, building up the management structure. So, we were already up and running and as efficient as programmes run from UK benefit from having five or six years of previous experience. Because these things take time		This consortium had different partners who needed good management processes for handling funds and reporting to the lead institution. this wasn't simple, and the fact that it's still running well shows an example of how financial management can be done.

‘Capacity Strengthening in Management’ Theme

	Individual gains - Researchers	Institutional gains	Learning about management processes	Role of management processes in RCS
Consortium A, Lead Institution, R2	some of the younger researchers are gaining skills on how to put together and evaluate a 4 week training	Through training/institutional capacity strengthening, some partners have strengthened their financial management systems, library management, and the interaction between different roles and how that creates an environment that is ideal for research . So, the feeling of a team with a singular aim has happened in a few institutions. Peoples’ eyes are opened to the fact that supervision is not a passive process, it’s something that can be measured, monitored, quantified, and have guidelines. Some institutions have adopted the supervision contract and used it successfully.	some of these partners are part of consortia so the final governance structure was influenced by inputs from them. we had not been part of any consortium for capacity strengthening but some partner institutions are already part of many other consortia so there is a lot of learning that came from there. Cross learning between partners happens especially with financial management systems. Some partners have very good systems and others learn from them. e.g. having a grant management office/grant support infrastructure, setting out parallel systems to get around bureaucracy	that process of investing in training for finance, IT and library managers is capacitating to the partner institutions. Some institutions have adopted new systems, others have strengthened the systems having it a bit more structured... training financial managers for 2 or 3 days and exposing them to different things is not enough to elevate the system if it is already terrible. in the next phase we are thinking about being a bit more deliberate
Consortium A, Partner Institution, R1	Changes in the pedagogical approach, by fellows and faculty level, to help lecturers move away from didactic teaching to more participatory approaches, making information more interesting, and making more use of technology	they have developed three or four courses drawn from the consortium model, the things that were very important to them which they identified as missing in the doctoral training at their institution. They have created a curriculum for four new cross cutting courses and will start piloting them.		the board of management engages in decision making about fellows, strategic direction, etc. there is a lot of consultations and requesting for feedback in making decisions.

Appendix 12: Annual Ethical Approvals for the Study



KENYA MEDICAL RESEARCH INSTITUTE

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KEMRI/RES/7/3/1

February 9, 2018

TO: **NADIA TAGOE,
PRINCIPAL INVESTIGATOR.**

THRO: **THE DIRECTOR, CGMR-C,
KILIFI.**

Dear Madam,

RE: **KEMRI/SERU/CGMR-C/109/3591 (RESUBMISSION OF INITIAL
SUBMISSION): EXAMINING THE PROCESS OF ESTABLISHING AND
MANAGING HEALTH RESEARCH CAPACITY STRENGTHENING (HRCS)
CONSORTIA.**

Forwarded
14 FEB 2018
DIRECTOR
CENTRE FOR GEOGRAPHIC MEDICINE
RESEARCH, COAST

Reference is made to your letter dated January 25, 2018. The KEMRI Scientific and Ethics Review Unit (SERU) acknowledges receipt of the following revised study documents on January 30, 2018;

1. Revised SERU initial Submission Form
2. Revised protocol version 1.3 dated 25/01/2018
3. Revised participant information and informed consent documents
4. Study tools
5. CVs of non-KEMRI investigators
6. Investigators ethics certificates
7. Letter from host university.

This is to inform you that the Committee determines that the issues raised at the 269th committee C Meeting of the KEMRI Scientific and Ethics Review Unit held on November 30, 2017 have been adequately addressed.

Consequently, the study is granted approval for implementation effective this day, **February 09, 2018** for a period of one year. Please note that authorization to conduct this study will automatically expire on **February 08, 2019**. If you plan to continue data collection or analysis beyond this date, please submit an application for continuation approval to SERU by **December 28, 2018**.

You are required to submit any proposed changes to this study to SERU for review and the changes should not be initiated until written approval from SERU is received. Please note that any unanticipated problems resulting from the implementation of this study should be brought to the attention of SERU and you should advise SERU when the study is completed or discontinued.

You may embark on your study.

Yours faithfully,

for 
**THE HEAD,
KEMRI SCIENTIFIC AND ETHICS REVIEW UNIT.**



In Search of Better Health



KENYA MEDICAL RESEARCH INSTITUTE

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KEMRI/RES/7/3/1

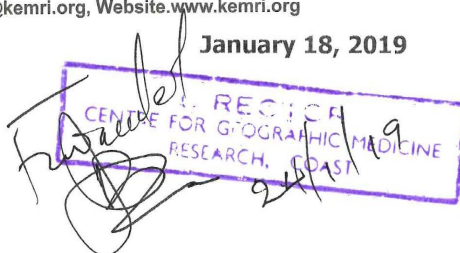
January 18, 2019

TO: **NADIA TAGOE,
PRINCIPAL INVESTIGATOR.**

THROUGH: **THE DIRECTOR, CGMR-C,
KILIFI.**

Dear Madam,

RE: **SERU PROTOCOL NO. 3591 (REQUEST FOR ANNUAL RENEWAL):
EXAMINING THE PROCESS OF ESTABLISHING AND MANAGING HEALTH
RESEARCH CAPACITY STRENGTHENING (HRCS) CONSORTIA**



Thank you for the continuing review report for period **February 09, 2018 to December 05, 2018.**

This is to inform you that the Expedited Review Team of the KEMRI Scientific and Ethics Review Unit (SERU) was of the informed opinion that the progress made during the reported period is satisfactory. The study has therefore been granted **approval**.

This approval is valid from **February 09, 2019** for a period of **one (1) year**. Please note that authorization to conduct this study will automatically expire on **February 08, 2020**. If you plan to continue data collection or analysis beyond this date, please submit an application for continuation approval by **December 28, 2019**.

You are required to submit any amendments to this protocol and any other information pertinent to human participation in this study to the SERU for review prior to initiation.

You may continue with the study.

Yours faithfully,

**ENOCK KEBENEI,
THE ACTING HEAD,
KEMRI SCIENTIFIC AND ETHICS REVIEW UNIT.**



In Search of Better Health



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KEMRI/RES/7/3/1

January 29, 2020

TO: **NADIA TAGOE**
PRINCIPAL INVESTIGATOR

THROUGH: **THE DIRECTOR, CGMR-C**
KILIFI

Dear Madam,

RE: **SERU PROTOCOL NO. 3591 (REQUEST FOR ANNUAL RENEWAL):**
EXAMINING THE PROCESS OF ESTABLISHING AND MANAGING HEALTH
RESEARCH CAPACITY STRENGTHENING (HRCS) CONSORTIA.


Thank you for the continuing review report for the period **December 6, 2018 to December 4, 2019.**

This is to inform you that the Expedited Review Team of the KEMRI Scientific and Ethics Review Unit (SERU) was of the informed opinion that the progress made during the reported period is satisfactory.

This approval is valid from **February 9, 2020** through to **February 8, 2021**. Please note that authorization to conduct this study will automatically expire on **February 8, 2021**. If you plan to continue with data collection or analysis beyond this date please submit an application for continuing approval to the SERU by **December 28, 2020**.

You are required to submit any amendments to this protocol and other information pertinent to human participation in this study to the SERU for review prior to initiation. You may continue with the study.

Yours faithfully,


for **ENOCK KEBENEI**
ACTING HEAD
KEMRI SCIENTIFIC AND ETHICS REVIEW UNIT



Appendix 13: Permission Letter from the African Academy of Sciences



Thursday, July 27, 2017

TO WHOM IT MAY CONCERN

Re: AESA approval for Learning Research Programme (LRP) data collection activities conducted in support of the DELTAS Africa initiative.

The Alliance for Accelerating Excellence in Science in Africa (AESA) is a funding platform established by the African Academy of Sciences and the New Partnership for Africa's Development (NEPAD) Agency with the aim of developing science strategies and funding research in Africa. The Developing Excellence in Leadership, Training and Science (DELTAS) Africa, a scheme initiated by the Wellcome Trust, is a flagship AESA programme. DELTAS Africa consists of eleven African-led health research consortia, spanning over 52 institutions from across 21 African countries, that collectively seek to: produce world-class scientific research that addresses African health and research priorities through scientific discourse and collaborative supervision; strengthen scientific research training and build career pathways for scientific researchers; foster mentorship, leadership and equitable collaboration in science, and engagement with public and policy stakeholders; and cultivate professional environments to manage and support scientific research.

The Capacity Research Unit (CRU), Liverpool School of Tropical Medicine (LSTM), has been funded by the Wellcome Trust and the UK Department for International Development to embed a 'Learning Research Programme' (LRP) within the DELTAS Africa initiative for the period 2016-2020. The LRP is designed to complement routine monitoring and evaluation activities and will inform programme implementation during the course of the DELTAS Africa initiative. In order to carry out the LRP, CRU research staff and PhD students (inclusive of Ms. Millicent Liani, Ms. Violet Murunga and Ms. Nadia Tagoe) will be required to occasionally collect programme-specific information from DELTAS staff, students and stakeholders in areas pertaining to research training, research careers, research uptake and consortia management. This information may be collected by questionnaire, interview, focus group discussion, observation or document review and, following appropriate analysis, will be reported to AESA and all relevant DELTAS consortia and stakeholders for the purpose of programme review.

As Director of AESA, I confirm our support for the LRP and associated activities as described above. AESA further supports the dissemination of LRP-derived DELTAS information through presentation at scientific conferences, technical reports, academic publication and (in the case of the PhD students) dissertations pending approval from a registered Kenyan medical ethics review board.

Sincerely,



Dr Thomas Kariuki
Director, AESA

President: Prof Felix D. Dakora; Secretary General: Prof Barthelemy Nyasse; Treasurer: Prof Dominic W. Makawiti;
Interim Executive Director: Dr Thomas Kariuki
The African Academy of Sciences
P.O. Box 24916 – 00502, Nairobi, Kenya | 8 Miotoni Lane, Karen, Nairobi
Tel: + 254 (20) 806 0674 | Mobile: +254 725 290 145
www.aasciences.or.ke

Appendix 14: DELTAS Theory of Change and Evaluation Indicators

Strategic Area	Expected Outcome	Indicator
Scientific Quality	High-quality scientific oversight is available	Number of scientific advisory board meetings held
	Increased capacity for Trainees to attract new funding	Number (and monetary value) of new grant awards won by researchers and fellows/students associated with programme
	Trainees / Researchers get appropriate supervision	Overall average primary supervisor/supervisee ratio in the programme
Research Training	Diversity of training courses offered by Programme	Number training courses (technical and soft skills) offered by the Programme
	High training completion rates	Proportion of students who completed their training successfully and on schedule
	Researchers publishing in high-quality Scientific journals	Number of high impact publications where the first author is based at an African Institution associated with programme (gender-disaggregated)
Scientific Citizenship	Researchers and programmes engage with and influence policymakers	Number of formal policy processes participated in (policy briefings and debates; advisory groups, etc.)
	Researchers collaborate with other institutions	Number of new and significant collaborations developed through the DELTAS Africa programme during the reporting period
	Researchers and programmes engage with the public to raise awareness and interest	Number (and type) of public engagement activities held during reporting period
	Programme disseminates research findings to the relevant stakeholders	Number of media communication and research dissemination activities held
Research Management & Environment	Sustainable funding is secured and harmonised	Amount of additional funding secured from other partners / non-DELTAS Africa sources for enhanced support to the programme activities
	Appropriate physical infrastructure is available to support Research	Existence of well-maintained supporting equipment including ICT, libraries, labs
	Functional management and governance support structures	Number of management board or consortium advisory group meetings held