

CRANFIELD UNIVERSITY

OLUSEGUN ADEOTI

**AN INSTITUTIONAL ANALYSIS OF THE IMPLEMENTATION OF  
INTEGRATED WATER RESOURCES MANAGEMENT IN NIGERIA**

SCHOOL OF APPLIED SCIENCES

DOCTOR OF PHILOSOPHY (Ph. D) THESIS  
Academic Year: 2013 - 2014

Supervisor: Prof. Paul Jeffrey  
April 2014



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the degree of Doctor of Philosophy

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## **ABSTRACT**

Many studies have investigated Nigeria's experiences of river basin management. Despite the acceptance of IWRM by the Nigerian Government, findings from the literature demonstrate that there remain significant water management challenges in Nigeria. However, reported research which exposes the forces influencing the implementation of Integrated Water Resources Management (IWRM) in Nigeria remains sparse. This thesis exposes these forces, and most importantly, the environments within which they are embedded by drawing upon theoretical and empirical evidence on the processes required to transfer IWRM from theory to practice. The retroductive logic of enquiry was adopted as a guide and a conceptual framework was developed to illustrate the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded. The conceptual framework formed the basis for the development of the research questions and also informed the choice of neo-institutional theory as a guide to proffer answers to the research questions. The research process employed a qualitative social science approach to provide answers to the research questions and realise the study's main aim. The study's theoretical framework followed a string of hermeneutics, phenomenology, and interpretivists philosophies and a case study research strategy to explore issues related to IWRM implementation in both Ogun-Oshun River Basin and Benin-Owena River Basin from different perspectives using multiple sources of evidence – documents, semi-structured interviews, and direct observations. Interviews were conducted with the staff of the River Basin Development Authorities (RBDAs) and other water-related national and international organisations in the selected case river basins in Nigeria. The data obtained were first analysed using textual approach and

then followed by variance institutional approach. Findings clearly illustrate that: (i) there were weaknesses in IWRM implementation in Nigeria, and (ii) both institutional (that is, regulative, normative, cognitive, and cultural) and technical (that is, water infrastructure) elements which are located within the macro and the operational environments were the forces that contributed to the weaknesses in IWRM implementation at the river basin level in Nigeria. Consistent with the institutional analysis perspective, to improve IWRM implementation in practice in Nigeria, the study proposed improvements to the regulative institutions to serve as a shock. This study contributes to IWRM and reinforces the importance of institutional and technical elements as potent forces that can enable or constrain the implementation of a water management approach, IWRM.

**Keywords:**

River basin management; IWRM; Institutional analysis; Nigeria

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# TABLE OF CONTENTS

Abstract	i
Acknowledgments	iii
Table of Contents	v
List of Figures	viii
List of Tables	ix
List of Equations	x
List of Abbreviations	xii
Chapter 1: Introduction	1
1.1 Driver of global water shortage	1
1.2 Water resources management in Nigeria	2
1.3 Research aim	5
1.4 Conceptual framework and research questions	5
1.5 Research objectives	11
1.6 Structure of the thesis	11
Chapter 2: Literature review	16
2.1 Introduction	16
2.2 Methodology for literature review	16
2.3 IWRM in theory and practice	17
2.4 Understanding Nigeria's experiences with the implementation of IWRM	39
2.5 Understanding the theories and approaches needed to analyse institutional frameworks	43
2.6 Implications for the remainder of the study	64
Chapter 3: Research process	67
3.1 Introduction	67
3.2 Research approach	67
3.3 Philosophical assumptions of the study	71
3.4 Research methodology	77
3.5 Data analysis	98
3.6 Validity, reliability, and triangulation	107
3.7 Generalisation	111
3.8 Ethics	112
3.9 Summary of the chapter	114
Chapter 4: Status and effects of the internal environment of the RBDAs on IWRM implementation	116
4.1 Introduction	116
4.2 The extent of IWRM implementation at the river basin in Nigeria	117
4.3 Internal challenges facing the RBDAs in the implementation of IWRM	121
4.4 Summary of key findings from this chapter	147

Chapter 5: Contributions of the external environment of the RBDAs to IWRM implementation	150
5.1 Introduction	150
5.2 Effects of national and international organisations on IWRM implementation	150
5.3 Societal culture and IWRM implementation	152
5.4 Political structure and water governance in Nigeria	155
5.5 Summary of key findings from this Chapter	160
Chapter 6: Institutional analysis	163
6.1 Introduction	163
6.2 The results of the variance institutional approach	163
Chapter 7: Discussion	172
7.1 The extent of IWRM implementation at the river basin level in Nigeria	172
7.2 The key forces influencing the implementation of IWRM at the river basin level in Nigeria	176
7.3 Revising the conceptual framework	194
7.4 Summary of this chapter	197
Chapter 8: Conclusions	199
8.1 Introduction	199
8.2 Filling the knowledge gaps	199
8.3 Contributions to knowledge	205
8.4 Limitations of this study	206
8.5 Implications for water management practices in Nigeria	208
8.6 Suggestions for future research	209
<b>REFERENCES</b>	212
<b>APPENDICES</b>	242
Appendix A: The various IWRM experiences in the water sector in Nigeria	242
Appendix B: Interview schedule for the RBDAs	246
Appendix C: Interview schedule for national and international actors (or organisations)	250
Appendix D: Interview schedule for users of basin water services	251
Appendix E: Cover letter for informal pretesting	252
Appendix F: An initial start list of codes	253
Appendix G: Information letter	254
Appendix H: The recommended organisational structure of the RBDAs	256



## LIST OF FIGURES

Figure 1-1 Forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded	6
Figure 1-2 Structure of the thesis	12
Figure 2-1 Global level of applications of IWRM to water resources management	24
Figure 2-2 Extent of applications of IWRM to water resources management in Africa	25
Figure 2-3 Components of, and framework for implementing, IWRM	38
Figure 2-4 Extent of IWRM implementation in the water resources sector in Nigeria	42
Figure 3-1 The logics of enquiry in social science research	70
Figure 3-2 The study's philosophical assumptions, theoretical perspective, methodology and methods	72
Figure 3-3 Sources of evidence used in this study	78
Figure 3-4 A multiple-case (embedded) design employed in this study	81
Figure 3-5 A map of Nigeria showing the 12 river basin areas including O-ORB and B-ORB	83
Figure 3-6 Sources of evidence	88
Figure 3-7 Process of field data collection and preliminary analysis	95
Figure 3-8 Structure of the research process from planning to post fieldwork data analysis and interpretation	106
Figure 3-9 The triangulated data sources employed in this study	110
Figure 4-1 Research questions, approaches to data analysis, and chapters presenting them	117
Figure 4-2 Classification of respondents based on the interview data	119
Figure 4-3 The extent of IWRM implementation in the O-ORB	119
Figure 4-4 The extent of IWRM implementation in the B-ORB	120
Figure 4-5 Summary of results of the extent of IWRM implementation in the surveyed river basins	120
Figure 4-6 The distribution of staff by qualification/function	135
Figure 4-7 Decision making structure according to the laws	138
Figure 4-8 Decision making structure in practice	138
Figure 5-1 Areas of political interference in river basin activities	158
Figure 6-1 Summary of findings of this study on the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded	170
Figure 7-1 The revised conceptual framework illustrating the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded	195
Figure B-1 Decision making line (according to the law)	249
Figure B-2 Decision making line (in practice)	249
Figure H-1 The recommended organisational structure of the RBDAs	256

## LIST OF TABLES

Table 1-1 Models/frameworks not adopted for this study and reason for not adopting them	7
Table 2-1 Examples of IWRM definitions	20
Table 2-2 Examples illustrating country-specific experiences with IWRM implementation in practice	26
Table 2-3 The thirteen key IWRM action areas	38
Table 2-4 Evaluating criteria	41
Table 2-5 Online search results for examples illustrating the application of neo-institutional theory in water/natural resources management research	45
Table 2-6 Online search results for examples illustrating the application of neo-institutional theory in water resources management (or IWRM implementation) investigations in Nigeria	46
Table 2-7 Examples of definitions of institutions	47
Table 2-8 Historical development of major institutional perspectives	50
Table 2-9 The differences between the two streams of institutional theory	52
Table 2-10 Summary of findings on the application of the institutional pillars	57
Table 2-11 Examples of studies that have used the variance institutional approach	60
Table 2-12 The IWRM elements to be investigated during fieldwork in Nigeria	65
Table 2-13 Research questions and the chapters addressing them	66
Table 3-1 Comparison of qualitative and quantitative research approaches	68
Table 3-2 Ontological positions	72
Table 3-3 Epistemological positions	73
Table 3-4 Research methodology	78
Table 3-5 Some important features of the case river basins	83
Table 3-6 Organisation sample size	85
Table 3-7 Number of respondents and the sampling techniques used	86
Table 3-8 List of organisations surveyed in Nigeria	87
Table 3-9 Respondent identification key	94
Table 3-10 Summary of the process of data analysis per subordinate research Question	105
Table 4-1 Summary data on average scores for the case river basins	118
Table 4-2 Legal and regulatory instruments and IWRM-related areas	124
Table 4-3 Organisations and nature of involvement in river basin activities	140
Table 4-4 Water infrastructure belonging to the RBDAs	146
Table 6-1 The results of the variance institutional approach	165
Table 8-1 Overview of the main aim and primary research questions	199
Table 8-2 The proposed measures that might improve IWRM implementation in Nigeria	202
Table A-1 The various IWRM experiences in the water sector in Nigeria	242
Table B-1 Integrated Water Resources Management (IWRM) prompt sheet	247
Table B-2 Level of political interference	248
Table B-3 Areas of interference	248
Table F-1 An initial start list of codes	253

# LIST OF EQUATIONS

(1-1)

41



## LIST OF ABBREVIATIONS

A/IRBDA	Anambra/Imo River Basin Development Authority
A/IRBRDA	Anambra/Imo River Basin and Rural Development Authority
B-ORB	Benin-Owena River Basin
B-ORBDA	Benin-Owena River Basin Development Authority
B-ORBRDA	Benin-Owena River Basin and Rural Development Authority
CRBDA	Cross River Basin Development Authority
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FMARD	Federal Ministry of Agriculture and Rural Development
FME	Federal Ministry of Environment
FMWR	Federal Ministry of Water Resources
GWP	Global Water Partnership
ICWE	International Conference on Water and the Environment
IIMI	International Irrigation Management Institute
INPIM	International Network on Participatory Irrigation Management
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
LGAs	Local Government Authorities
NIWRMC	Nigeria Integrated Water Resources Management Commission
O-ORB	Ogun-Oshun River Basin
O-ORBDA	Ogun-Oshun River Basin Development Authority
O-ORBRDA	Ogun-Oshun River Basin and Rural Development Authority
RBDAs	River Basin Development Authorities
TCPC	Technical Committee on Privatisation and Commercialisation
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WFD	Water Framework Directive
WSSD	World Summit on Sustainable Development
WWC	World Water Council
WWF	World Water Forum



# 1 INTRODUCTION

## 1.1 Driver of global water shortage

Water is a renewable resource. In the quest to ensure that water resources are available in sufficient quantity and quality to meet human and other needs, there is a growing recognition of the need to manage it in a sustainable manner. Because water is a resource of vital importance to development and the basis for ecological functioning, its use impacts the social, economic, political, natural, cultural, and technological environments (Braga, 2001). According to International Water Management Institute (IWMI) (2002), about 8 billion people are expected to populate the earth by 2025. Total global water withdrawal per year for human use is projected to reach 4772 km<sup>3</sup> (under the business as usual scenario), 5033 km<sup>3</sup> (under the water crisis scenario) or 4363 km<sup>3</sup> (under the sustainable water scenario) by 2025.

Despite the availability of roughly  $0.09 \times 10^6$  km<sup>3</sup> of renewable freshwater physically available for use per year (Saleth and Dinar, 2004), a global water shortage still exists. However, the nature and severity of the shortage vary from country to country and from basin to basin. For example, due to over-abstraction in certain parts of the world, some river systems no longer reach the sea (see Thelwall et al., 2006 on Aral Sea, and World Water Council (WWC), 2000 on Yellow River in China), while 50 per cent of the world's wetlands have disappeared (Gourbesville, 2008). To some scholars, the crisis is about shortage of water resource (Brown, 2003; Jury and Vaux, 2005; Manzoor, 2011; Postel, 1992), while to others, the crisis is largely about the inability to govern the available water resource wisely (Bucknall, 2006; Global Water Partnership (GWP), 2000a, 2002a; Ahmad, 2003; United Nations Development Programme (UNDP), 2006; Shen, 2003; Rockström, 2003; Savenije, 2000; Figuères et al., 2003; Butterworth et al., 2010). However, there is an increasing understanding that one of the significant drivers of global water shortage is not scarcity of the resource but rather poor governance (Saleth and Dinar, 2004; GWP, 2000b, 2003a; Jønch-Clausen and Fugl, 2001; United Nations Educational, Scientific and Cultural Organisation (UNESCO), 2011a, Alam et al., 2009; United Nations (UN)-UN-Water, 2006; Fischhendler, 2007).

To borrow from Allan (1996), it is certain that as the world economy grows and industrialises, the need for water will increase. This suggests that water needs careful husbandry in order to serve all the entities that depend, and will depend, on it sustainably. Therefore, to meet present and future water requirements, the resource has to be governed wisely. This thesis makes a contribution to the global debate on sustainable water management by exposing the forces (defined as institutional and/or technical elements) influencing (defined as either enabling or constraining) the

implementation of integrated water resources management (IWRM) as an approach to improve basin-based water resources development and management as well as the environments within which the forces are embedded in Nigeria, one of Africa's largest countries.

## **1.2 Water resources management in Nigeria**

While Nigeria cannot be isolated from the water crisis discourse, many studies have reviewed and criticised Nigeria's experiences of river basin management. The main criticisms are that: (i) basin activities have focussed more on water resources development especially on the construction of large-scale dams and formal irrigation projects (Carter, 1995), (ii) there is a significant functional overlap and a lack of co-ordination as well as co-operation in the Nigerian water sector (Akpabio et al., 2007; Akujieze et al., 2002), and (iii) there is a lack of stakeholder involvement especially the non-state actors in basin-based water resources development and management (Adeoti, 2007). The literature has also revealed that some functions relating to: (i) water allocation (Carter, 1995), (ii) pollution control (Jaji et al., 2007; Akujieze et al., 2002), (iii) wetland management (Uluocha and Okeke, 2004), (iv) irrigation system development and management (Akpabio et al., 2007; Adekalu and Ogunjimi, 2003), (v) integrated basin planning (Carter, 1995; Adams, 1985; Akpabio et al., 2007), (vi) groundwater development and management (Akujieze et al., 2002), (vii) cost recovery of irrigation water services (Akpabio et al., 2007), and (viii) data management (Akujieze et al., 2002) are insufficiently addressed in the river basins.

The occurrence of these problems has been linked to: (i) the presence of a plethora of organisations involved in water resource management in Nigeria (Carter, 1995; Akpabio et al., 2007), (ii) weak legal and administrative arrangements in the water sector (Akpabio et al., 2007; Akujieze et al., 2002), (iii) inadequate human capacity in groundwater development and management (Akujieze et al., 2002), (iv) inadequate funding of basin water projects (Akpabio et al., 2007; Okafor, 1985; Adekalu and Ogunjimi, 2003), (v) the poor attitudes and behaviour of basin managers to water resource management (Okafor, 1985), (vi) corruption (Akpabio et al., 2007), and (vii) political interference in river basin activities (Barrow, 1998; Adams, 1985; Akpabio et al., 2007). Some suggested solutions to these problems include: (i) moving water resources development and management from a basin-wide approach to a state-wide approach (Barrow, 1998), (ii) introducing best practices from other jurisdictions (Carter, 1995), (iii) evolving measures to check indiscriminate dumping of wastes into water bodies (Jaji et al., 2007), (iv) developing effective irrigation management systems (Adekalu and Ogunjimi, 2003), (v) putting in place the right legal and regulatory frameworks that aimed at improving basin managers' operational capacity (Akpabio et al., 2007; Uluocha and Okeke, 2004), and (vi) providing adequate legal instruments that

incorporate other water stakeholders, especially the non-state actors, in basin-based water resources development and management in Nigeria (Adeoti, 2007).

Despite the criticisms and the suggested interventions, and without neglecting the fact that the water-related organisations are structures through which to apply IWRM to improve water resources development and management in Nigeria, one of the major areas less addressed in the literature (as reviewed above; see also Subsection 2.5.1c) is looking at the forces influencing the implementation of IWRM as an approach to improve basin-based water resources management in Nigeria and the environments within which they are embedded. According to the Department for International Development (DFID) (2003), the behaviours and performance of organisations or social actors are controlled and guided by rules. This is the knowledge gap that this study makes a contribution to by drawing upon theoretical and empirical studies of processes required to transfer IWRM from theory to practice. It is this knowledge gap that has provided both the motivation and justification for this study. The study builds on the outcomes of the gap analyses conducted so far in the literature which have investigated some of the “what” issues, by examining the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded, or respond to the “why” questions that have emerged. However, to decipher and expose the forces influencing IWRM implementation as well as the environments within which they are rooted, this study adopts the retroductive logic of enquiry in social science research as a guide (see Chapter 3 for more details).

Although less explicitly applied to qualitative social science research unlike in the natural sciences (Blaikie, 2000), the logic is useful in addressing “why” questions. It focuses on identifying the underlying forces that are responsible for producing an observed event. Consistent with this logic, an analysis of the Nigerian water sector environment will be carried out to provide answers that address the knowledge gap from an institutional theory perspective. As Cortner and Marsh (1987) emphasize, institutional analysis attempts to objectively identify the causal factors influencing the implementation of plans and possible measures that can be applied to improve the situation. This, therefore, suggests that in order to explain the forces influencing IWRM implementation and the environments within which they are incorporated, one real task is to diagnose the water sector in Nigeria for institutional pressures influencing IWRM implementation. This becomes crucial since there is a need to improve basin-based water resources management in Nigeria, as inaction may further contribute to the inability of the country to meet its water targets; for example, the water related Millennium Development Goals (MDGs) and drinking water provision for all. At present, the consequences of the limited performance of the Nigerian water sector include: inadequate water

supply (Akorede, 1997; Akujieze et al., 2002; Uluocha and Okeke, 2004), wetland degradation (Uluocha and Okeke, 2004), and disappointing economic as well as social performance of river basin schemes (Adams, 1985). Of the estimated population of 150 million (in 2010 estimates), about 43% are reported to be without access to water that is safe to use (United Nations Children's Fund (UNICEF) Nigeria, 2010).

While the River Basin Development Authorities (RBDAs) are statutorily saddled with the primary responsibility of overseeing the river basins (see also Akpabio et al., 2007), the literature posits that since their inception in 1973, the operational mandates of the RBDAs have been amended several times (Olubode-Awosola et al., 2006; Medugu et al., 2008). At present, as contained in the active River Basins Development Authorities Decree (1987) (section 4), the RBDAs are required to:

- a) undertake comprehensive development of both surface and underground water resources for multipurpose use, provide irrigation infrastructure, control floods and erosion and manage the basin;
- b) control, operate and maintain dams, dykes, polders, wells, boreholes, irrigation and drainage systems, and other hydraulic works, and hand over all lands cultivated under the irrigation scheme to the farmers;
- c) supply water from the Authority's completed storage schemes to all users for a fee to be determined by the Authority concerned, with the approval of the Minister
- d) construct, operate and maintain approved infrastructural services such as roads and bridges linking project sites; and
- e) develop and keep-up-to-date comprehensive water resources master plan, identify all water resources requirements in the basin area, collect and collate adequate data on the water resource, water use, socio-economic and environmental data of the river basin.

As revealed in the functional mandates of the RBDAs above, it could be explained that the RBDAs are to implement some IWRM elements which are related to integrated planning and data collection. In addition to this, other legal and regulatory frameworks informing what the RBDAs are to do in the water sector are also examined in Chapter 4.

To conclude; it is important to highlight that the RBDAs are not the only actors present in the river basins, and the forces influencing IWRM implementation in Nigeria as well as the environments within which they are embedded is presently poorly understood. This study explores the water resources sector in Nigeria to identify the forces influencing IWRM implementation at the river basin level as well as the environments within which the forces are rooted. In order to realise this ambition, an understanding of Nigeria's experiences with IWRM implementation in practice will be needed. Thus, the research findings aim to provide a sound understanding of the extent of IWRM implementation in Nigeria, the forces influencing its implementation at the river basin level in Nigeria and the environments within which they are embedded, as well as insights into how

implementation might be improved. This study therefore makes a critical contribution to both IWRM and institutional theory, and informs water sector reforms in Nigeria, particularly as they affect river basin management. Besides this, the study is expected to be of benefit to all water and water-related stakeholders in Nigeria: the resource managers, the policy and decision-makers, the policy implementers, the national water-related organisations, the basin water services beneficiaries, and the international water-related organisations. It is likely that the problems facing basin-based water resources management organisations that are following the IWRM approach are not limited to Nigeria alone, but may be similar in other developing countries. To this end, the findings of this study will have relevance at national, regional and international levels.

### **1.3 Research aim**

In light of the discussions presented above, the main aim of this study is to make a sound contribution to knowledge by providing a better understanding of the forces influencing the implementation of Integrated Water Resources Management in Nigeria. More specifically, this research aims to:

“identify the forces influencing the implementation of Integrated Water Resources Management as an approach to improve basin-based water resources management in Nigeria and the environments within which they are embedded”.

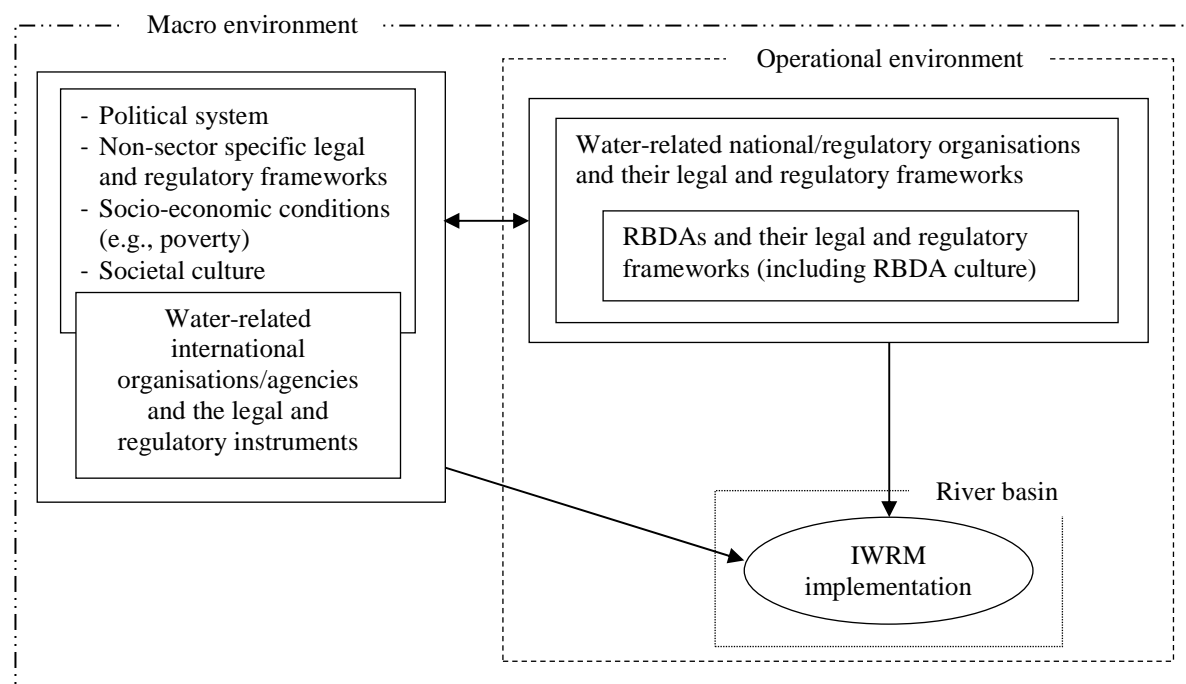
Additionally, and consistent with an institutional analysis perspective (Ingram et al., 1984; Cortner and Marsh, 1987), this study presents proposals on measures which might help to improve IWRM implementation at the river basin level in Nigeria. To realise the research aim, the next section presents a conceptual framework (defined by Robson (2002) as the theory about what is going on especially when expressed in diagrammatic form) to further guide the study in framing the research questions, the methodological approach for data generation and analysis, and the presentation of research findings. However, since IWRM is made up of guiding principles and tools/instruments which are needed to facilitate its implementation in practice, the elements making up IWRM are identified in Chapter 2 and the forces influencing the implementation of each of these elements in practice at the river basin level in Nigeria and the environments within which they are embedded exposed by this study.

## **1.4 Conceptual framework and research questions**

### **1.4.1 Conceptual framework**

Following the main aim of this study, and consistent with a retroductive logic approach, a conceptual framework has been developed (Figure 1-1). The essence of the framework is to help illustrate the governance environments within which IWRM function in order to identify the forces

influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded. In order to develop an appropriate conceptual framework, the literature including those of IWMI was investigated with regard to the availability of generic models illustrating the governance arrangement by which IWRM implementation in practice is influenced by environmental (not to be confused with “ecological”) forces. While the literature is thin in this area, it did provide some insights which have been used to develop a conceptual framework that forms the basis for the development of the research questions for this study. In addition to this, the framework also helps to guide the methodological approach for data generation and analysis, and the presentation of findings. Specifically, IWMI has conducted a number of studies related to institutional analysis for water resources management. The studies (e.g., Bandaragoda, 2000, 2006; Kurian, 2004) have shown that institutions matter in basin-based water resources management and have identified some institutional parameters which could influence water resources management in a river basin context with a view to developing effective water resources management institutions. While this focus is consistent with the ambition of this study, an understanding of the institutional environment of basin-based water resources management derived from these studies has helped in the development of a conceptual framework for this study.



Key:

→ Line of influence,      ↔ Line of interaction/influence,      □ The structure (or actor) and/or mechanisms (or statutes),      ○ Activity,      - - - - - Boundaries

Figure 1-1 Forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded

However, it is important to highlight that since this study is concerned with understanding and explaining the drivers of social actors/organisational behaviours and actions, the use of models/frameworks such as Driving forces-Pressures-State-Impacts-Responses (DPSIR), Sustainable Livelihoods Approach (SLA), as well as Integrated Model to Assess the Global Environment (IMAGE) is not considered appropriate for this study. Table 1-1 illustrates the reason why these models/frameworks are not adopted. Also ruled out is the use of Institutional Analysis and Development (IAD) framework developed by Ostrom and her colleagues as illustrated in Table 1-1.

Table 1-1 Models/frameworks not adopted for this study and reason for not adopting them

S/No.	Description	Reason
1	The Driving forces-Pressures-State-Impacts-Responses (DPSIR) framework, an extension of the Pressure-State-Response (PSR) model developed by the Organisation for Economic Cooperation and Development (OECD) in 1991	This framework is used to study the effects of human activities on the environment or the interactions between society and the environment (Gabrielsen and Bosch, 2003; Maxim et al., 2009; Rodríguez-Labajos et al., 2009).
2	The Sustainable Livelihoods Approach (SLA), developed to improve understanding of the livelihoods of poor people.	This approach is used to identify the main constraints and opportunities faced by poor people from their perspectives in order to enhance progress in poverty alleviation and people's livelihoods (Krantz, 2001; Norton and Foster, 2001; Ahmed et al., 2008).
3	The IMAGE model, an ecological – environmental framework	The framework is used to simulate the environmental impacts of human activities at the global level (Netherlands Environmental Assessment Agency, 2010).
4	The Institutional Analysis and Development (IAD) framework, which is largely based on rational choice theories	The framework is used to identify general relationships among institutional, situational, and environmental variables in explaining collective choice situations (Heikkila and Isett, 2004). Besides this, neo-institutionalism questions the assumption that every decision is derived from a conscious, rational decision-making process (March and Olsen, 1984).

However, drawing upon the insights derived from the literature (Kuruk, 2004; Goldface–Irokalibe, 2008; Commission of the European Communities, 2006; Adeoti, 2007) which give examples of organisations (or structures) and statutes present in the water sector in Nigeria as well as from IWMI literature and others which give examples of a representation of river basin water management institutional environment (Bandaragoda, 2000, 2006; Saleth and Dinar, 2004, 2005; Kurian, 2004) the management of water resources at the river basin level in Nigeria can be

conceptualised as occurring at two levels involving different actors and institutions. Based on this, the researcher therefore proposes that the forces influencing IWRM implementation can be considered from these two distinct but interrelated environments, namely: the nation's macro environment and the operational environment (Figure 1-1). It is envisaged that the management of water resources at the river basin level in Nigeria will also be influenced by the legal and regulatory instruments guiding the activities of the international organisations such as, the donor agencies. For this study, these international actors are classified as part of the nation's macro environment. Although no one institutional environment fits all cases, in the representation of water institutional environment governing river basin water management provided by Saleth and Dinar (2004, 2005) and Bandaragoda (2000, 2006), issues relating to organisational culture, the effects of international actors on basin-based water resources management, and the environments within which the forces which might influence river basin management are embedded are not explicitly considered. Besides this, Bandaragoda (2000, 2006) and to some extent Saleth and Dinar (2004, 2005) have illustrated the relationship between extraneous/external factors and institutions governing basin-based water resources management as mostly a one way affair. These observations amplify that of Bandaragoda (2000) who asserts that the institutional environment governing river basin water management can be country- specific.

As shown in Figure 1-1, starting from the national level, the first level of influence is the nation's macro-environment. This environment is conceptualised to reflect the broad conditions within which IWRM and the river basin operators (that is, the RBDAs) as well as other water-related organisations function. It is assumed that the macro-environment is beyond the ability of the RBDAs to alter directly. This environment comprises of the following major elements: legal and regulatory frameworks (laws, policies, etc.), socio-economic conditions, political, cultural, and international actors.

The operational environment is the second level of influence on IWRM and the activities of the RBDAs. This encompasses the internal activities of the RBDAs and those in the immediate outside environment of the RBDAs. This immediate outside environment is assumed, to a limited extent, to be accessible to the RBDAs to manipulate compared with the macro environment. In practical terms, the operational environment is defined in this study to be made up of the RBDAs, its water resource users and other national organisations involved in basin-based water resources management in Nigeria. While this may not be comprehensive, a list of water-related organisations and statutes in Nigeria is provided in the literature (see, e.g., Kuruk, 2004; Commission of the European Communities, 2006; Goldface–Irokalibe, 2008; Akpabio, 2007, 2012; Shagari, 2005). It



is envisaged that these statutes might also inform IWRM implementation and the organisations that operate under these statutes.

As illustrated in Figure 1-1, it is conceptualised that the nation's macro-environment will affect the operational environment and the subsequent implementation of IWRM, while activities within the operational environment will also cast a direct influence on IWRM implementation. Figure 1-1 also suggests that an understanding of the nation's macro environment, the operational environment, and the interaction between them is vital for uncovering the forces influencing IWRM implementation at the river basin level in Nigeria. Furthermore, since the RBDAs are entities or structures saddled with the responsibility of implementing policies, strategies and legislation alongside other water-related actors, the ability of the RBDAs to effectively apply IWRM to water resources management at river basin level will also be a function of the rules operating within the operational environment and the macro-environment.

By function, therefore, the macro-environment is to prescribe the “rules of the game” (borrowing from North, 1990) through clear and appropriate legal and regulatory frameworks as well as administrative arrangements for water resources management at the river basin level. It is also to allocate roles and responsibilities to all regulatory and resource management bodies and water services providers, as well as suggest appropriate water management techniques. Applying the rules of the game, the operational environment is expected to ensure that basin water services are provided in an efficient manner following the IWRM approach. This therefore implies that the proposed abstract representations of the environments within which the forces influencing IWRM are embedded are interconnected, complex and also dynamic. However, it could also be deduced from Figure 1-1 that once appropriate institutional frameworks from the nation's macro-environment and the operational environment are in place, they would provide the enabling environments for IWRM to function or be effectively applied.

#### **1.4.2 Research questions**

The conceptual framework and the foregoing discussion expose three research questions which guide the study and to achieve the main aim:

1. How effectively is IWRM being implemented at river basin level in Nigeria?
2. If there are weaknesses in the implementation of IWRM in Nigeria, why is this so?
3. How might the quality of IWRM implementation in Nigeria be improved?

The first research question will provide a description of the extent of implementation of each of the IWRM elements at the river basin level in Nigeria. The second research question, which addresses the “why” aspect of the problem set, suggests that part of the task of this research is to understand and explain the forces responsible for the weaknesses in IWRM implementation at the river basin level in Nigeria as well as the environments within which they are rooted. In the third research question, the “how” aspect implies that part of the task of this research is to suggest possible interventions, that is, to propose measures which might improve the influencing forces towards a greater IWRM implementation in Nigeria. This is consistent with an institutional analysis perspective as explained by various scholars (e.g., Ingram et al., 1984; Cortner and Marsh, 1987; Poirier and de Loë, 2010). To ensure a thorough analysis, answers to these primary research questions will be achieved by asking a number of subordinate questions after gaining more understanding about Nigeria’s experiences with the implementation of IWRM and institutional theory from the review of the literature (Chapter 2). However, it is highlighted here that the primary research questions are the key questions that will be answered, and they also serve to delimit the boundaries of this study.

Drawing on the above, and coupled with the understanding that IWRM and institutions are social constructs (fully discussed in Chapter 2), this thesis follows a qualitative orientation within the social science tradition which is grounded in the hermeneutics/phenomenology/interpretivists philosophies. While these philosophies are fully discussed in Chapter 3, phenomenological research, according to Bogdan and Taylor (1975), Robson (2002) and Mayoh and Onwuegbuzie (2013), is concerned with understanding human behaviours from the actor’s own frame of meanings. As emphasised by Mills and Murgatroyd (1991), socially constructed rules are phenomenologically grounded. In keeping with prescriptions of the social constructionist, which is anchored in the qualitative research perspective, an interpretive case study is undertaken to address the main aim of this research (the research process is fully discussed in Chapter 3). However, because of the depth of understanding needed, this study is designed to be iterative, which is consistent with the retroductive style of reasoning (Blaikie, 2007). It is envisaged that the conceptual framework (Figure 1-1) will be further refined according to what is learned from the various actors (and documents) to be studied. This will be done with a view to realising the study’s main aim. Thus, this study is based on constant dialogue between information grounded in actors’ constructs, the theoretical background and the researcher’s interpretation. The research questions, which guide the entire research endeavour, have dictated the shape of the research design, the tools to conduct the research, and the presentation of the research findings. Since this study is not concerned with testing or generating a theory, hypothesis development has not been considered

relevant. This study agrees with Layder (1993, p. 3) that not all research involves theory-testing or theory-building, and Blaikie (2000) that “hypotheses are only relevant when research is about theory testing” (p. 27). Instead, in the view of this study and as pointed out by Green (2008), it is the research questions that should guide the research project as a whole. Furthermore, since the main ambition of this study is to identify the forces influencing the implementation of IWRM in the case river basins to be studied as well as the environments within which they are rooted, a cross-case comparison (that is, between the selected case river basins to be investigated) has been ruled out. This is because the River Basin Development Authorities in Nigeria may frown at such comparison and disallow access. Besides this, as pointed out by Akpabio (2008), the River Basin Development Authorities in Nigeria work with uniform mandates and objectives which is consistent with the legal instrument setting them up – the River Basins Development Authorities Decree No. 35 of 1987. However, where important differences exist these will be highlighted in the study.

## **1.5 Research objectives**

The specific objectives of the study, required to answer the research questions and realise the main aim of this study, are to:

- a. conduct a critical review of the literature on the theories underpinning IWRM which identifies the principles of, and conditions for, good practice in IWRM
- b. conduct a thorough review of Nigeria’s experiences with the implementation of IWRM at the river basin level and the forces influencing implementation
- c. conduct a review of the literature on the theories and methods for analysing institutional frameworks in order to identify a candidate analytical approach for this research
- d. execute a critical analysis of the institutional framework for IWRM implementation in Nigeria
- e. identify the key forces influencing the implementation of IWRM at the river basin level in Nigeria, and
- f. offer proposals on measures which might improve the influencing forces towards a better IWRM implementation in Nigeria

The objectives of this research have also helped to guide the development of the thesis structure and actions presented next.

## **1.6 Structure of the thesis**

As shown in Figure 1-2, this thesis is structured into eight chapters as follows:

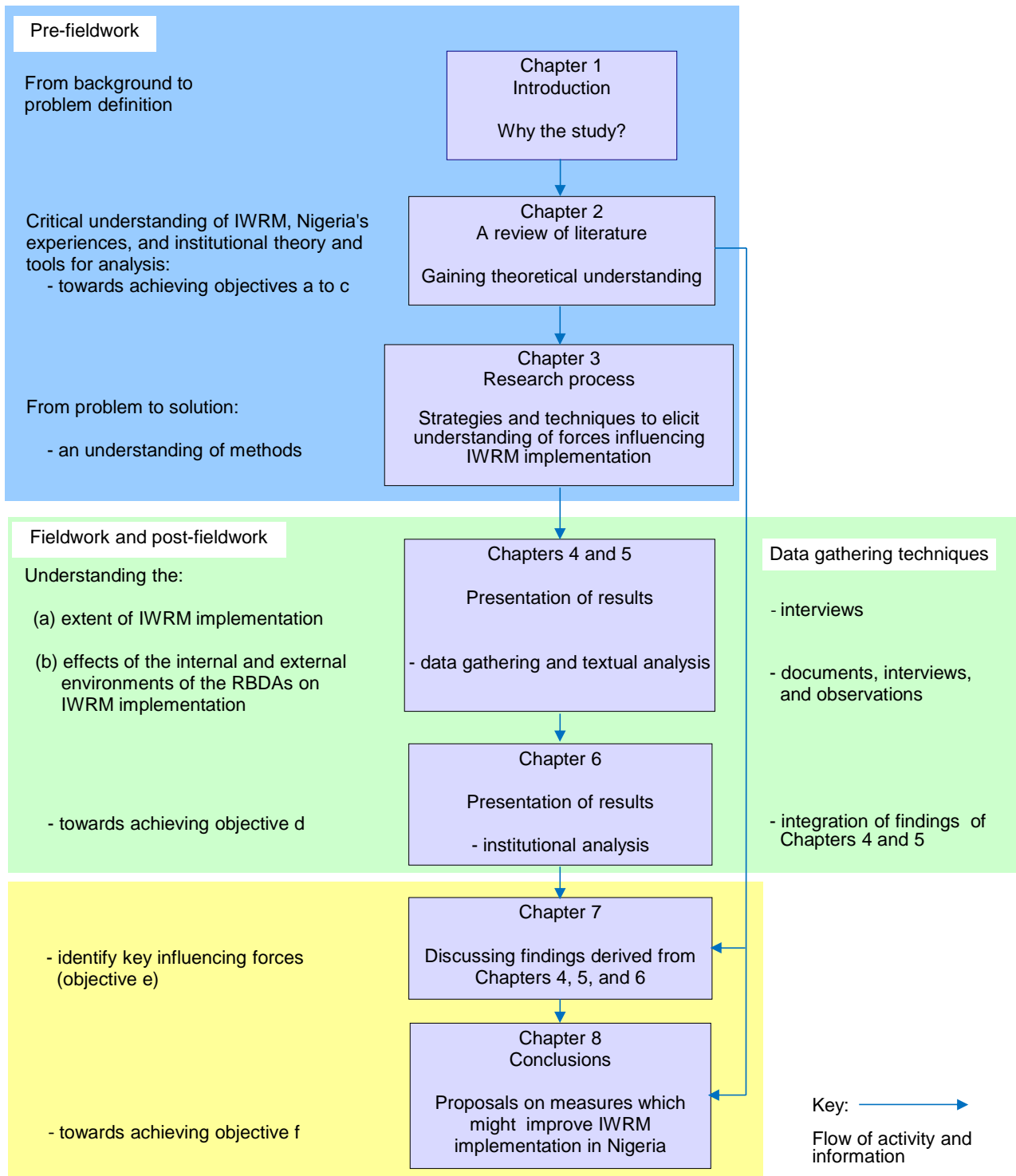


Figure 1-2 Structure of the thesis

## Chapter 2 – Literature review

This chapter, which addresses the first three research objectives, is divided into five sections after the introductory remarks (Section 2.1). Section 2.2 describes the methodology used for the literature review. Section 2.3 reviews the IWRM literature to provide a better understanding of the principles of, and conditions for, good practice, in IWRM. Section 2.4, through a critical literature review and

analysis, examines Nigeria's experiences with the implementation of IWRM. Section 2.5 reviews theories and methods for analysing institutional frameworks to identify a candidate analytical approach for this study. Lastly, Section 2.6 describes how the findings of the literature review are used to inform the rest of the study.

### Chapter 3 – Research process

This chapter, which outlines the research process used to answer the research questions, is divided into eight sections after the introductory remarks (Section 3.1). Section 3.2 addresses the research approach, and the philosophical assumptions that informed the choice of the research methodology and methods adopted by this study in Section 3.3. Discussions on the research methodology are presented in Section 3.4. Section 3.5 addresses in detail the methods used to make sense of the collected data and to reveal the extent of IWRM implementation in Nigeria as well as the forces influencing implementation. Section 3.6 looks at issues related to validity, reliability, triangulation, and generalisation in Section 3.7. Section 3.8 reports on the ethical issues that guided the study. And, lastly, Section 3.9 provides a summary of this chapter.

### Chapter 4 - Status and effects of the internal environment of the RBDAs on IWRM implementation

This chapter examines the extent of IWRM implementation at the river basin level in Nigeria and the effects of the internal environment of the RBDAs on IWRM implementation. This chapter is divided into four sections. Section 4.1 presents the introductory remarks. Wining data from the interview transcripts, Section 4.2 examines the extent of implementation of each of the IWRM elements at the river basin level. Closely following, Section 4.3 investigates the internal environment of the RBDAs for factors influencing the implementation of each of the IWRM elements by distilling evidence from interviews, documents and observational data. Lastly, Section 4.4 presents a summary of key findings from this chapter.

### Chapter 5 – Contributions of the external environment of the RBDAs to IWRM implementation

After the introductory remarks (Section 5.1), this chapter is divided into four sections. Distilling evidence from documents and interview data, Section 5.2 explores the effects of the water-related national and international organisations on IWRM implementation at the river basin level. This is followed by Section 5.3 which investigates societal culture and its effects on IWRM implementation. Next to this, Section 5.4 examines the political structure or water governance arrangements in Nigeria and its impact on the implementation of IWRM. This chapter closes with a summary of key findings in Section 5.5.

## Chapter 6 – Institutional analysis

This chapter reveals the forces influencing the implementation of each of the IWRM elements investigated in the case river basins in Nigeria. The chapter is divided into two sections. The introductory remarks are presented in Section 6.1. Due to the depth of data presented, Section 6.2 commences with a summary of the key findings derived from the first-order data in Chapters 4 and 5. It then proceeds to use the contemporary institutional pillars as a lens to expose the forces influencing the implementation of each of the IWRM elements.

## Chapter 7 - Discussion

This chapter revisits relevant literature to discuss the findings of this study and revises the conceptual framework in light of the study's findings. The chapter is divided into three sections. Section 7.1 discusses the findings obtained from Chapters 4, 5, and 6 in light of relevant literature. Next to this, and in line with the retroductive logic of enquiry adopted, Section 7.2 provides a revision of the conceptual framework developed in Chapter 1. The revised framework illustrates the forces influencing IWRM implementation and the environments within which they are embedded. This chapter closes in Section 7.3 with a summary.

## Chapter 8 – Conclusions

This chapter concludes the thesis by summarising its main findings and highlighting its implications. After the introductory remarks (Section 8.1), the chapter is divided into five sections. Section 8.2 begins by examining the main findings to illustrate how the knowledge gaps were filled by means of this study and realise the main aim. The contributions to knowledge which arise from this study are described in Section 8.3. The limitations of the study are presented in Section 8.4, while the implications of the findings of this study for water management practices in Nigeria are highlighted in Section 8.5. Suggestions for future research are made in Section 8.6.

### **Note on terminologies:**

- a. As discussed in Chapter 2, there is still a lack of a universally agreed definition of an institution (see, e.g., Holm, 1995; Luttrell, 2001; Kingston and Caballero, 2009 for the same emphasis). However, some authors (e.g., Hodgson, 2006; Mantzavinos et al., 2004; Poirier and de Loë, 2010) have suggested the need to provide an explanation from the onset of what institutions are in the light of what is being studied. To this end, this thesis defines institutions as the “rules-in-use that influence social actors or organisational behaviours and actions”. These rules may include international treaties or conventions, norms and values, laws and regulations, agreements, guidelines and standards, policies, basic assumptions,

taboos, beliefs, informal doctrines, cultural resources, customs and traditions, as well as shared practices. For this study, this definition has two important implications: one, it means that not all laws and regulations (formal and informal) are rules (e.g., a law becomes a rule once it guides social actors/organisational behaviours and performance), and two, it views institutions as distinct from organisations. This thesis agrees that organisations, entities socially constructed to meet a specified goal, are structures which can be bound by, and can also formulate, rules, while certain structures, styles, practices or processes of an organisation can be institutionalised (e.g., the metaphor “manager”). These distinctions are used throughout this thesis. However, in the review of the literature (e.g., in Chapter 2), this requires paying a closer attention to when author(s) is/are referring to “institutions as organisations” or “institutions as rules” or both (e.g., Grey and Sadoff, 2007; Chereni, 2007).

- b. By IWRM implementation, this study refers to the implementation of each of the IWRM elements as captured by the Dublin-Rio four guiding principles and the various tools/instruments (referred to in this study as the approaches) needed to implement the four guiding principles as illustrated in the IWRM literature (see, e.g., Chapter 2). Referring to IWRM elements, these encompass the four guiding Dublin-Rio principles and approaches identified in this study
  
- c. This study defines water infrastructures to consist of man-made structures and facilities to abstract, store, transport, treat (if necessary) and deliver water to users. They can also include infrastructures that serve to collect, transport, treat and dispose of wastewater. Typical water infrastructures include: groundwater well-fields, water supply schemes (including rainwater harvesting systems), sewers and sewage treatment facilities, dams, river water abstraction works, structures and facilities for inter-basin transfers (or bulk transfers), and canals. It can also include irrigation schemes to distribute water to crops, water supply schemes to provide potable water to users, as well as water drainage structures and facilities. These water infrastructures could range from large schemes, characterised by complicated distribution networks, to smaller, simpler schemes. Besides this, water infrastructures may also include those for land/soil management and well as pollution control/management.

## **2 LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents the review of literature relevant to this study. Its main ambition is to address Objectives a, b, and c of this study and provide background information that establishes the existence of the problem to be investigated. It also aims to provide a link between the research and the current state of knowledge on IWRM and institutional theory, and identify the theoretical frameworks to be used. After the introductory remarks (Section 2.1), this chapter is divided into five main sections: Section 2.2 describes the methodology used for the literature review to address the first objective. Section 2.3 discusses the concept of IWRM both in theory and in practice. Section 2.4 reviews and provides a critical analysis of Nigeria's experiences with the implementation of IWRM. Section 2.5 presents an in-depth review of the theories and approaches for analysing institutional frameworks. It also provides a summary of the theoretical framework adopted to serve as a guide and explain the key forces influencing IWRM implementation in the context of this study. Lastly, Section 2.6 describes how the findings of the literature review are used to inform the rest of the study.

### **2.2 Methodology for literature review**

To address the first research objective (see Section 1.5), SearchPoint, Scopus, and Google Scholar, consisting of peer-reviewed journal articles and grey literature, were the main database sources used in this literature review. The literature was retrieved for review and analysis between May and September 2011 and the time period analysed spans all years available in the databases up to 2011. To identify those publications addressing the first research objective of this study (on IWRM principles), a first search was carried out using the syntax 'integrated' AND 'water' AND 'resources\*' AND 'management'. A total of 14,001 publications (including peer-reviewed articles, books, etc.) was obtained using this query from SearchPoint, 5,154 from Scopus, and 519,000 from Google Scholar. Considering time constraints, and given the multitude of potential publications to be analysed, the selection was refined using a second set of queries, for which the syntax used was 'integrated water resources\* management' OR 'IWRM' OR 'integrated water management'. This search identified a total of 6,966 publications from SearchPoint, 5,152 from Scopus, and 32,700 from Google Scholar. Although the literature has no specific guidance on how much searching is acceptable, in the medical literature the first 50 results are considered adequate (Centre for Evidence-Based Conservation, 2010). Other authors (Knox et al., 2011) have also considered a maximum of 50 returned results per search. However, for the purpose of this study, bearing in mind time constraints, where large results were returned, the first 150 hits per search were considered.



Due to the use of multiple search engines, duplications were noticed. This was sorted out using the publication title and author(s) names as a guide. After eliminating duplications, and following a quick review (e.g., looking at the title/abstract, making a quick scan through the main text), 102 publications were identified and reviewed. Others were eliminated from the sample because they did not match the requirements of this objective, some publications were not written in English, and access could not be obtained to the main text of some publications (e.g., peer-reviewed journal articles). The final sample of publications reviewed consists of 55 peer-reviewed articles, one book chapter, and 46 grey literature. In some cases where soft copies were not available online, hard copies were obtained from the Cranfield University library. Literature updates made after 2011 are also reported.

## **2.3 IWRM in theory and practice**

In order to have a greater understanding of IWRM which is relevant to the study objectives discussed in Section 1.5, this section takes a look at the evolution of IWRM (Subsection 2.3.1), the IWRM principles (Subsection 2.3.2), as well as an overview of the general experience of countries that are parties to IWRM in practice, some of the operational challenges, and conditions (or frameworks) needed to implement IWRM in practice (Subsection 2.3.3).

### **2.3.1 Evolution of the concept – IWRM**

The idea of water resources management dates back centuries (Rahaman and Varis, 2005), but in a less articulated form (Shively and Mueller, 2010). Rahman and Varis (2005) suggest that Spain was probably the first country to manage water resources along hydrological boundaries in 1926. However, some scholars see the Tennessee Valley Authority (TVA) as the oldest comprehensive river basin management agency in the world (e.g., Miller and Reidinger, 1998) and an early example of IWRM established as a corporate public agency by an Act of the U.S. Congress in May 1933 (Rahaman and Varis, 2005; Rowntree, 1990; Molle, 2008). Its purpose was to integrate the functions of navigation, flood control and power production, while addressing the issues of erosion control, recreation, public health and welfare (Snellen and Schrevel, 2004). The modern concept of IWRM was primarily conceived for the purpose of promoting sustainable water resources management (Snellen and Schrevel, 2004). Its origin can be traced to the United Nations Water Conference in Mar del Plata between 14 and 25 March 1977, where the need for coordination in the water sector was emphasised, arising from the international concern for the poor state of water resources management (Independent Evaluation Group, 2010). The conference noted that:

“institutional arrangements adopted by each country should ensure that the development and management of water resources take place in the context of national planning and that there is real coordination among all bodies responsible for the investigation, development and management of water resources” (Snellen and Schrevel, 2004, p.5).

The adoption of IWRM as an aspirational goal was agreed to as a part of the Mar del Plata Conference Action Plan (Biswas, 2004; Rahaman and Varis, 2005).

At the time of Mar del Plata, coordination within the water sector was largely the responsibility of national governments without much concern for organisational capacity building (Snellen and Schrevel, 2004). Advocating integrated water resources management, while at the same time there being a lack of progress in water resources management contributed to the Brundtland Commission of 1987. Entitled ‘Our common future’, the report concluded that the world was threatened by serious environmental problems largely caused by development strategies that were leaving many more people poor (Snellen and Schrevel, 2004). It drew attention to the urgent need to make progress towards economic development that could be sustained without harming the environment (Food and Agriculture Organisation of the United Nations (FAO), 2006). Unfortunately, the Brundtland report of 1987 did not consider water resources as a primary issue (Walmsley and Pearce, 2010), and was criticised for being water blind (Vajpeyi, 1998). However, to tackle the problem of environmental degradation and meet the need for sustainable development were part of the objectives of the United Nations Conference on Environment and Development (UNCED) in 1992 in Rio de Janeiro (i.e., Mar del Plata + 15). As a preparatory meeting to UNCED, an International Conference on Water and the Environment (ICWE) was held in Dublin in January 1992 (Salman and Bradlow, 2006). The purpose of the Dublin conference was to identify priority issues related to freshwater and to recommend actions to address them (Mitchell, 2005). It was the Dublin Conference that gave birth to four guiding IWRM principles:

- “**Principle No. 1** - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment
- Principle No. 2** - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels,
- Principle No. 3** - Women play a central part in the provision, management and safeguarding of water, and
- Principle No. 4** - Water has an economic value in all its competing uses and should be recognized as an economic good”

(ICWE, 1992; World Meteorological Organisation, 2011; Independent Evaluation Group, 2010; World Bank, 1993; International Network on Participatory Irrigation Management (INPIM), 2011; Cawater, 2011; Jolk et al., 2010).

The 2<sup>nd</sup> World Water Forum in The Hague in March 2000 further reinforced some of the Dublin guiding principles. Its key messages included involving all stakeholders in integrated management, moving to full-cost pricing of water services, increasing public funding for research and innovation, increasing cooperation in international river basins and investments in water (World Water Council (WWC), 2010; Savenije and van der Zaag, 2008). Also, the International Conference on Freshwater in Bonn 2001 agreed that to meet sustainable development, the application of IWRM is key (Rahaman and Varis, 2005). The 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg also concluded on the need to apply integrated water resources management (UN-Water, 2006). In addition, it provided specific targets and guidelines for implementing IWRM (Rahaman and Varis, 2005). The Ministerial Declarations of the 3<sup>rd</sup> World Water Forum (WWF) in Japan in 2003 (see - UNESCO, 2011b), that of the 4<sup>th</sup> WWF in Mexico in 2006 (see - UNESCO, 2011a), that of the 5<sup>th</sup> WWF in Istanbul in 2009 (WWC, 2009), and that of the 6<sup>th</sup> WWF in Marseille in 2012 (WWC, 2012) further reaffirmed the need to apply IWRM as an approach to achieve sustainability in water resources management.

The European Union (EU) response to the Dublin-Rio statement was encapsulated in legislation i.e. the Water Framework Directive (WFD), which is a framework for Community action in the field of water policy. Before then, reinforced by emerging consensus on IWRM, in 1998, a European Commission guideline entitled “Towards sustainable water resources management: a strategic approach” was published. This was intended to translate IWRM theory into practice in the EU (Walmsley and Pearce, 2010). The subsequent WFD, adopted by the European Parliament on 23 October 2000, also draws on the principles of IWRM and emphasised the need to manage water quantity and quality for surface and groundwater along the hydrological boundaries. It also treats water as having an economic value, and calls for enhance stakeholder participation (Hirji and Davis, 2009; EU WFD, 2000). In essence, the water policy, which entrenched the concept of river basin approach for water resources management in the EU (Molle, 2009; Teodosiu et al., 2009), is directed at improving the EU water environment (Hannerz et al., 2005; European Commission, 2010) and at achieving good ecological status in all EU waters by 2015 (EU WFD, 2000; Collins and Ison, 2010). As argued by de Stefano (2010), the WFD specifically focuses on the establishment of IWRM in Europe.

Summarising the intent of IWRM, Akpabio et al. (2007, p. 691) highlight that “equitable resource allocation, efficient and balanced resource use, participation of stakeholders in decision making and recognition of linkages and interactions among human and physical systems are key principles upon which integrated water resources management is based”. On the other hand, Hooper (2010)

contends that IWRM is an approach that employs an adaptive, coordinated approach to improve water resources management. Its objective, according to Petit and Baron (2009), is to make sustainable collaborative water resource management possible within the framework of a river basin management. The Water Supply and Sanitation Collaborative Council (2011) also comments that IWRM seeks sustainable solutions to water resources by balancing social and economic needs with the protection of environmental integrity. Today, IWRM, with the ‘m’ now referring to both ‘development and management’ (Jønch-Clausen and Fugl, 2001), is defined in many, not always consistent, ways (Table 2-1):

Table 2-1 Examples of IWRM definitions

Definition	Author(s)
a “process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”	GWP (2000b, p. 22)
a “framework that guides thinking about and management of water resources, which will vary according to geography, climate, and institutions”	Independent Evaluation Group (2010, p. 3)
a “facilitated stakeholder process to promote coordinated activities in pursuit of common goals for multiple objective development and management of water aligned with the sustainable water resource system criteria”	Davis (2007, p. 428)
a “framework for planning, organising and controlling water systems to balance all relevant views and goals of stakeholders”	Grigg (1999, p. 528) - (see also Grigg, 2008, p. 282).
a “philosophy that offers a guiding conceptual framework rather than a concrete blueprint”.	CAP-Net (2009)
a “systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives”	Owen et al. (2010, p. 10)
a “framework within which to manage people’s activities in such a manner that it improves their livelihoods without disrupting the water cycle”	Jonker (2007, p. 1262)
the “promotion of human welfare, especially the reduction of poverty and encouragement of better livelihoods and balanced economic growth, through effective, democratic development, and management of water and other natural resources at community and national levels, in a framework that is equitable, sustainable, transparent, and as far as possible conserves vital ecosystems”	Merrey et al. (2005, p. 203)
the “process of managing water resources holistically and of promoting coordinated consideration of water, land and related natural resources during developmental activity”	Foster and Ait-kadi (2012, p. 415)

Although there seems to be a common focus in the various definitions, there is little agreement on specifics. This suggests that no universal definition exists for IWRM. However, as illustrated in Table 2-1, the various definitions are based upon different conceptions of how water resources are to be governed. However, because of changes and variations in countries water profiles, many scholars agree that there is no blueprint for implementing IWRM that will fit all cases (Owen et al., 2010; Muller, 2010; GWP, 2003a; Jønch-Clausen and Fugl, 2001). Nonetheless, GWP (2000b) and Durham et al. (2002) argue that the Dublin-Rio statements have found support among the international community as the guiding principles underpinning IWRM. Other authors also emphasised that IWRM has been accepted as a way forward for efficient and sustainable development and management of water resources (UN-Water, 2008; Hirji and Davis, 2009; de

Stefano, 2010; Boutkan and Stikker, 2004; Ortiz-Zayas and Scatena, 2004). This suggests that the Dublin-Rio principles have come to stay as a general framework for implementing IWRM, which could be seen as an approach to improve water resources management. Consequently, this study agrees and shares the belief that IWRM was designed as a governance approach that could be used to improve the use, development and management of water resources at river basin level. It therefore defines IWRM as a social construct to guide human interactions with water towards a sustainable use. For analytical purposes (in subsequent sections), these guiding principles are now looked at in more detail next.

### **2.3.2 The IWRM principles**

The Dublin-Rio principles and the elaborations that have followed at major international water conferences in Harare and Paris in 1998, and by the UN Commission on Sustainable Commission (CSD) at its “Rio +5” follow-up meeting in 1998 have helped to shape the IWRM principles (GWP, 2000b). From the following literature (ICWE, 1992; GWP, 1999, 2000b; Salman and Bradlow, 2006; Jaspers, 2003; Nyambod and Nazmul, 2010; Hirji and Davis, 2009), these principles will now be examined in more detail to form the basis for a critical analysis needed to understand Nigeria’s experiences with the implementation of IWRM in practice. This understanding will help to provide insights into the IWRM elements (elements are defined here as the IWRM principles and approaches (or tools/instruments)) being implemented in practice in Nigeria, the extent of their implementation, and the forces which might influence implementation.

**Principle I** argues that freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment, and as such should be managed in a holistic approach. The principle also recognises that resource yield has natural limits which imposes effects on human activities. It therefore calls for the recognition of the various linkages between land and water management, green water and blue water, surface water and groundwater management, quantity and quality (including water and wastewater), upstream and downstream users, freshwater and coastal zone management, and the need for a holistic management approach (Jønch-Clausen and Fugl, 2001; Kidd and Shaw, 2007; Grigg, 2008). In addition, Agyenim and Gupta (2011) have suggested the need to integrate water supply and water demand, as well as urban water supply and rural water supply. This first principle has been referred to as a call for integrated water resource management (Mitchell, 2005), while Jønch-Clausen and Fugl (2001) have decomposed integration into two basic categories: the natural system, and the human system. They argue that integration has to occur both within and between these two categories.

**Principle II** emphasises that water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels. The principle argues further that real participation occurs when stakeholders are part of the decision-making process, and participation is achieved at a level more than consultation. It encourages achievement of a long-lasting consensus and common agreement. It also calls on governments to create room for a participatory approach to work by putting in place necessary participatory mechanisms and to enhance capacity for women and other marginalised groups to participate. These are to be done whilst ensuring that water management decisions under a participatory approach are taken at the lowest appropriate level. According to FAO (1995), both institutional and organisational arrangements must be reformed so that stakeholders are involved in all aspects of policy formulation and implementation, with enhanced roles for private sector and other community groups.

**Principle III** stresses that women play a central part in the provision, management and safeguarding of water. It argues that special efforts should be put in place to ensure women's participation in water resources management at all organisational levels. It recognises women as water users that should be given increased access to decision-making and increased participation in water resources management. The principle also calls for the water sector to be gender sensitive.

**Principle IV** argues that water has an economic value in all its competing uses and should be recognised as an economic good. In a subsequent revision, Section 2, Chapter 18, paragraph 18.17 of Agenda 21 of Rio added that water should also be considered as a social good (UN Department of Economic and Social Affairs, 2009). Principle IV emphasises the need to recognise that water has a value as an economic good and to recognise the opportunity costs involved in allocating water. It also calls for the need to (a) value water as a means for rational allocation and to charge for water as a means to create incentives for efficient use; (b) place full value on water which should consist of its use (or economic) value and the intrinsic value; (c) apply the full cost of providing water, which should consist of its full economic cost and other associated externalities; (d) apply the concept of cost recovery, manage water demand and supply through the use of economic instruments that treat water as an economic good; and (e) recognise the need for water resources management agencies and utilities to be financially self-sufficient without jeopardising the need to treat water as a social good whilst at the same time guaranteeing access to the disadvantaged groups in a transparent manner. As summarised by Blanco (2008), water use charges should function as an economic instrument to achieve an efficient allocation of the resource among the designated uses and to continuously serve as an incentive to users to manage their consumption of water. That water is

seen as an economic good is consistent with the definition of economics (International Irrigation Management Institute (IIMI), 1997; Savenije, 2002). Details of the economic tools that can be used to assess the economic value of water and the costs associated with its provision are provided by GWP (1998). However, there is that recognition in the literature that water is both a private and a public good (IIMI, 1997).

Drawing on the discussions made above, four IWRM indicators (or elements) can be identified. The need to (a) manage water resources in an integrated manner, (b) implement participatory approach, with the formation of stakeholder platforms that allow all different stakeholders to work together, (c) include women in water resources development and management, and (d) create appropriate mechanisms to recover cost without jeopardising the social goodness of water. However, the various international water fora (e.g., The Hague 2000, Bonn 2001, Johannesburg 2002, Kyoto 2003, Mexico 2006, Istanbul 2009, and Marseille 2012) have attracted attention to put in place arrangements for water governance following the IWRM approach. The next subsection presents an overview of the general experience of countries that are parties to IWRM in practice, the operational challenges of IWRM in practice, and conditions needed to facilitate its implementation in practice.

### **2.3.3 General experience of countries parties to IWRM in practice, operational challenges, and conditions needed to implement IWRM in practice**

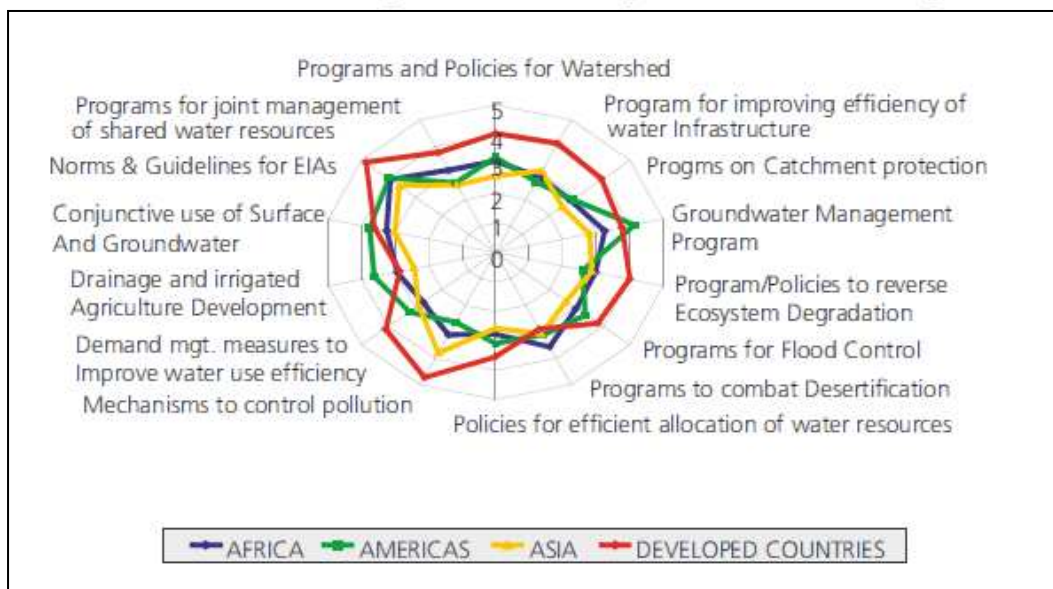
#### **a General experience of countries parties to IWRM in practice**

There is a consensus in the literature that IWRM is capable of ensuring equitable, economically sound and environmentally sustainable management of water resources and the provision of water services (GWP, 2003a; Luzi, 2010; Nyambod and Nazmul, 2010; Durham et al., 2002). Although Merrey et al. (2005) argue that there is no disagreement on the IWRM philosophy, Hassing et al. (2009) give a detailed example of how IWRM links to some key development issues (such as, the MDGs, etc.) and examples relating to the adoption of IWRM as an approach to address developmental issues in some countries of the world. Nyambod and Nazmul (2010) capture some of the benefits that could accrue from the application of IWRM principles to include environmental benefits, agricultural benefits (e.g., more crops per drop), water supply and sanitation benefits. To Charnay (2011), IWRM is capable of stemming conflict arising between competing water uses and degradation of freshwater resource. According to Anderson et al. (2008), the benefits to be derived from IWRM implementation include increased access to water services, socio-economic empowerment, protection of the ecosystems, improvement in water quality and overall poverty reduction. Similarly, Fischhendler and Heikkila (2010) enumerate IWRM implementation benefits

to include that management decisions among resources or users of water supplies can be made more efficiently and effectively, and because IWRM brings diverse stakeholders into decision-making processes it can create more equitable water management choices as well as prevent conflicts.

Globally, there is reasonable evidence that suggests that countries are adopting IWRM principles (see Hirji and Davis, 2009; UN-Water, 2008). By the end of 2005, in a report presented at the 4<sup>th</sup> World Water Forum in 2006, “25% of the 90 countries surveyed had made “good progress”, while 50% had made “some progress” and 25% had made limited or no progress towards the IWRM target” (UN-Water, 2007, p. 1) (for more details on the progresses and targets, see UN-Water, 2007). As of 2009, about forty countries were reported to have found IWRM a useful framework for the management of water resources, and have included the concept in key government documents that guide and regulate the use, conservation and protection of water resources and implemented IWRM at the local level (see Hassing et al., 2009). To illustrate, Figure 2-1 presents an example of a global picture of the extent of applications of IWRM to water resources management issues. In the 2000s, examples of African countries that have incorporated IWRM principles to their national policies are given by GWP (2009a). In another document, GWP (2010) declares that:

“IWRM has been integrated into national development plans and poverty reduction strategies in Benin, Malawi, Mali and Zambia; while Benin, Eritrea, Swaziland and Zambia have drafted and updated their water policies. In addition, Benin has drafted improved water legislation, Cape Verde has developed a new legal framework for the administration of water resources, and Eritrea has introduced water quality guidelines and water-use regulations” (p. 2).

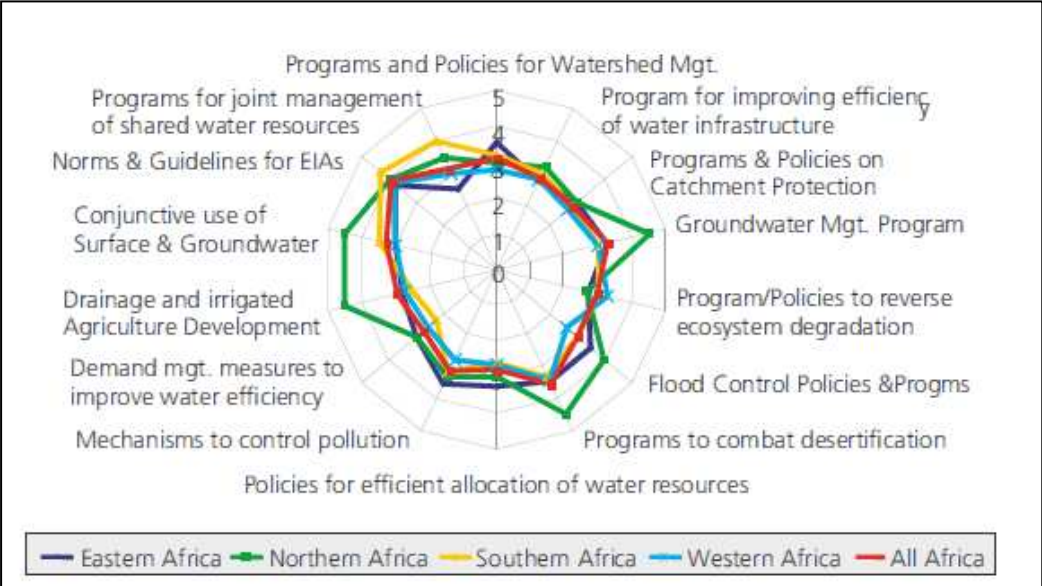


Key: 1 = Not relevant, 2 = Under consideration, 3 = In place but not yet implemented, 4 = In place and partially implemented, 5 = Fully implemented

Figure 2-1 Global level of applications of IWRM to water resources management (Source: UN-Water, 2008, p. 35)



A list of developing countries that have adopted and incorporated IWRM approach at different levels into their water management framework is presented by UN-Water (2008), while Figure 2-2 illustrates an example of a regional picture of the extent of IWRM application to water resources management issues. In the global context (Figure 2-1), the sampled African countries are also not lagging behind in the application of IWRM to water resources management. However, as shown in Figure 2-2, the countries sampled in the northern part of Africa seem to be taking a lead in the application of IWRM to water resources management compared to others. Also in a 2011 UN-Water survey, it was found that countries are making changes to their water policies, water laws and the development of water resources management plans based on the IWRM framework (for more details, see United Nations Environment Programme (UNEP), 2012). While the nature of implementation of IWRM may differ from country to country, in specific terms, Table 2-2 illustrates, based on a literature review, the IWRM implementation experiences of some countries, namely Ghana, Cameroon, South Africa, Mozambique, Zimbabwe, Tanzania, Madagascar, and Zambia (from Africa), Malaysia and Mongolia (from Asia), Mexico (from Latin America), and Romania (from Europe). It is worth pointing out that the availability of literature informed the selection of the countries reviewed.



Key: 1 = Not relevant, 2 = Under consideration, 3 = In place but not yet implemented, 4 = In place and partially implemented, 5 = Fully implemented

Figure 2-2 Extent of applications of IWRM to water resources management in Africa (Source: UN-Water, 2008, p. 40)

Table 2-2 Examples illustrating country-specific experiences with IWRM implementation in practice<sup>1</sup>

S/No.	Country	Legal and regulatory instruments incorporating IWRM	Experiences with IWRM implementation in practice	Influencing factor
a.	Ghana	National Water Policy of 2007 (Agyenim and Gupta, 2011; UN-Water, 2008; Anokye and Gupta, 2011)	<ul style="list-style-type: none"> <li>- IWRM implementation is based on a basin-scale approach</li> <li>- In terms of priority of water allocation, domestic water supply takes precedence</li> <li>- Stakeholder participation is government organisations/agencies biased with limited non-governmental stakeholder involvement</li> <li>- Full-cost pricing principle is applicable to some extent only in urban water supply, but not in rural water supply</li> <li>- Very limited women inclusion in basin water management activities</li> <li>- Integrated basin planning not fully implemented</li> <li>- Accepted the idea of water as social, economic and environmental good, but implementation has been limited</li> <li>- A lack of human capacity to implement IWRM</li> </ul> <p>(Agyenim and Gupta, 2011; Anokye and Gupta, 2011)</p>	<ul style="list-style-type: none"> <li>- IWRM implementation is donor driven translating into a lack of domestic ownership and leadership of the concept</li> <li>- Inadequate financial resources due to budget constraints</li> <li>- Conflicting water sector legal and regulatory instruments</li> </ul> <p>(Agyenim and Gupta, 2011; Anokye and Gupta, 2011)</p>
b.	Cameroon	Water Law of 1998, National IWRM Plan of 2007, 1996 Law on the Environment (Ako et al., 2009)	<ul style="list-style-type: none"> <li>- Limited involvement of non-government stakeholders in river basin activities</li> <li>- A lack of legal provision for women involvement in water resources management activities</li> <li>- A legal recognition for economic value of water, but the law does not prescribe full cost recovery</li> <li>- The polluter-pays principle not well applied due to the absence of trained personnel who can put the principle into practice</li> <li>- Users do not pay full cost for water</li> <li>- The water law is not enforced</li> <li>- A lack of integrated basin planning and sectoral collaboration for water resources management</li> <li>- The enabling environment for IWRM implementation is weak</li> <li>- A lack of a particular organisational structure governing water resources (that is, water resources are being managed by a multitude of organisations)</li> <li>- Inadequate information/data on the quality and quantity of water resources</li> </ul> <p>(Ako et al., 2009, 2010)</p>	<ul style="list-style-type: none"> <li>- Weak institutional/inadequate legal and regulatory frameworks</li> </ul> <p>(Ako et al., 2009, 2010)</p>
c.	South Africa	National Water Act of 1998, Water Policy of 1997, National Water Resources Strategy of 2005 (Anderson et al., 2008; GWP,	<ul style="list-style-type: none"> <li>- Water resources management along the hydrological boundaries</li> <li>- Low human resource capacity in the water resources sector</li> <li>- Top-down approaches to water resources planning, development and management, with moderate success in terms of various stakeholder and water users involvement in</li> </ul>	

		2009b)	<p>water resources decision-making</p> <ul style="list-style-type: none"> <li>- Few tangible improvements in water quality and ecosystem protection</li> <li>- The environment is often neglected when it comes to the implementation of water allocation</li> <li>- Catchment Management Agencies yet to be fully functional in some catchments</li> <li>- Poor implementation and monitoring of ecological reserve</li> <li>- Well develop water infrastructure systems</li> <li>- Limited participation of some stakeholders in the rural areas in the decision-making process due to a lack of capacity to participate in the consultation process</li> <li>- IWRM is yet to be officially accepted by water managers in practice</li> <li>- Ineffective implementation of legal and regulatory frameworks</li> <li>- Inadequate data management</li> </ul> <p>(Anderson et al., 2008; GWP, 2009; Funke et al., 2007)</p>	<ul style="list-style-type: none"> <li>- Institutional challenges (Funke et al., 2007; GWP, 2009b)</li> </ul>
d.	Mozambique	<p>Water Law of 1991, the National Water Policy of 1995 (updated 2007), Water Tariff Policy of 1998, the National Irrigation Policy of 2001, Regulation on Water Licenses and Concessions of 2008, National Irrigation Strategy of 2010, National Water Resources Management Strategy of 2007</p> <p>(Gallego-Ayala and Juízo, 2011; GWP, 2009b)</p>	<ul style="list-style-type: none"> <li>- The water pricing policy is being implemented</li> <li>- There is an existence of river basin committees</li> <li>- The existence of adequate organisational arrangement to gather data</li> <li>- Fragmented management of water resources</li> <li>- Low human resource capacity in the water resources sector</li> <li>- A lack of water resources management plans at the river basin level</li> <li>- A lack of non-government stakeholder participation in water resources management activities</li> <li>- A lack of sectoral coordination</li> <li>- IWRM is not widely understood outside the water sector</li> <li>- Functional overlaps in the water sector</li> <li>- Limited water infrastructure development</li> <li>- Poor availability of reliable water data and information</li> <li>- Inadequate human resource capacity for IWRM implementation</li> </ul> <p>(Gallego-Ayala and Juízo, 2011; GWP, 2009b)</p>	<ul style="list-style-type: none"> <li>- Weak legal frameworks</li> <li>- Inadequate financial resources to support IWRM implementation</li> </ul> <p>(Gallego-Ayala and Juízo, 2011; GWP, 2009b)</p>
e.	Zimbabwe	<p>Water Act of 1998, National Water Authority Act of 2001, Water Resources Management Strategy of 2000</p> <p>(Chereni, 2007; GWP, 2009b)</p>	<ul style="list-style-type: none"> <li>- Water resources management organised along the hydrological boundaries</li> <li>- A lack of inter-sectoral coordination</li> <li>- Associational relationship among the various organisations involved in water resources management are not defined by legal frameworks</li> <li>- The implementation of participatory approach is met with non-participating behaviours by non-government stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>- Inadequate legal and</li> </ul>

			<ul style="list-style-type: none"> <li>- The lack of integrated approach to water resources management</li> <li>- Limited data availability, particularly on groundwater</li> <li>- Limited human resource capacity</li> <li>- A lack of comprehensive monitoring and evaluation system</li> <li>- A lack of effective coordination and consultation in catchment planning process due to inadequate legal instruments</li> <li>- Functional overlaps</li> <li>- Very low women inclusion in water-related decision-making and planning</li> </ul> <p>(Chereni, 2007; Tapela, 2002; GWP, 2009b)</p>	<p>regulatory instruments</p> <ul style="list-style-type: none"> <li>- Socio-political challenges</li> </ul> <p>(Chereni, 2007; GWP, 2009b)</p>
f.	Tanzania	IWRM Strategy and Action Plan of 2004, National Water Policy of 2002, National Water Sector Development Programme (2006-2025) of 2006 (UN-Water, 2008; GWP, 2009b)	<ul style="list-style-type: none"> <li>- Poor involvement of women in water resources management activities due to low status of women and poor capacity</li> <li>- Limited stakeholder involvement in water resources management</li> <li>- Cost recovery not fully implemented especially in rural areas</li> <li>- Low investment in physical, human and technical resources</li> <li>- Low level of IWRM awareness among key decision makers</li> <li>- Inadequate human resource capacity in the water resources sector</li> <li>- Inadequate investment in water infrastructure development</li> <li>- Many water use conflicts</li> <li>- A lack of basin management approach</li> <li>- Overlapping responsibilities</li> <li>- Fragmented water legislation</li> </ul> <p>(Dungumaro, 2006; Sokile et al., 2003; GWP, 2009b)</p>	<ul style="list-style-type: none"> <li>- Inadequate political and legal environment to support IWRM implementation</li> </ul> <p>(Sokile et al., 2003; GWP, 2009b)</p>
g.	Madagascar	Water Act of 1998 (GWP, 2009b)	<ul style="list-style-type: none"> <li>- The management of water resources is curbed by poor data</li> <li>- A lack of coordination among the various organisations responsible for monitoring</li> <li>- A lack of clarity on the roles and responsibilities of the various organisations in the water sector</li> <li>- Inadequate water infrastructure</li> <li>- Inadequate management of water quantity and water quality</li> <li>- Inadequate monitoring and enforcement of legislation and regulations</li> <li>- While the Water Act of 1998 makes provision for authorisation of water use, this is not implemented in practice</li> <li>- Inadequate human resource capacity in the water sector</li> </ul> <p>(GWP, 2009b)</p>	<ul style="list-style-type: none"> <li>- Inadequate legal and regulatory frameworks and financial resources to support IWRM implementation</li> </ul> <p>(GWP, 2009b)</p>

h.	Zambia	National Water Policy of 2010, IWRM and Water Efficiency Plan of 2006, National Development Plan of 2007 (Uhlendahl et al., 2011; UN-Water, 2008)	<ul style="list-style-type: none"> <li>- Limited approaches to the development of a comprehensive strategy for water resources management</li> <li>- A lack of an integrated approach to water resources management</li> <li>- Inadequate organisational and legal frameworks (for monitoring, regulation, and sanctioning)</li> <li>- A lack of commitment by key stakeholders and staff in key organisations</li> <li>- A lack of decentralised structure which provides for stakeholder participation</li> <li>- Inadequate human resource for water resources management</li> <li>- Weak inter-sectoral collaboration</li> <li>- A lack of reliable information systems to provide accurate hydrological data</li> <li>- Overlapping competencies</li> <li>- Limited stakeholder participation</li> <li>- Limited water infrastructure</li> <li>- Governance structure is highly centralised</li> </ul> <p>(Uhlendahl et al., 2011)</p>	<ul style="list-style-type: none"> <li>- Inadequate legal and regulatory frameworks and financial resources to support IWRM implementation</li> </ul> <p>(Uhlendahl et al., 2011)</p>
i.	Malaysia	9th Malaysia Plan of 2006, National Study for the Effective Implementation of IWRM in Malaysia of 2006, Our Vision for Water in the 21st Century of 2000 (UN-Water, 2008)	<ul style="list-style-type: none"> <li>- Cost recovery not fully implemented in the water resources sector</li> <li>- A lack of participation by non-government stakeholders</li> <li>- Political interference in river basin activities</li> <li>- Low level of IWRM awareness among decision makers</li> <li>- A lack of legal provision that recognises the role of local communities in water resources development and management</li> <li>- Existing financial structure supports water resources development, but lacks financial support to increase the capacity of enforcement agencies</li> <li>- Existence of human capacity building activities that are related to IWRM, but there is a low level of capacity in enforcement agencies</li> <li>- Functional overlaps, especially in the area of enforcement</li> <li>- A lack of comprehensive policy on water resources development and planning</li> <li>- A lack of legal provision that allows for active and effective participation of local communities and other non-government stakeholders in the management of water resources</li> </ul> <p>(Tan and Mokhtar, 2007, 2009)</p>	<ul style="list-style-type: none"> <li>- Inadequate legal and regulatory frameworks on water resources development and management</li> <li>- Political challenges</li> </ul> <p>(Tan and Mokhtar, 2007, 2009)</p>
j.	Mongolia	Law on Water of 2004 (Horlemann and Dombrowsky, 2011)	<ul style="list-style-type: none"> <li>- Highly fragmented water resources management</li> <li>- Inadequate/low human resource capacity in the water sector</li> <li>- A lack of clearly defined procedures for organisational cooperation</li> </ul>	<ul style="list-style-type: none"> <li>- Inadequate legal and</li> </ul>

			<ul style="list-style-type: none"> <li>- Information and data on water resources are withheld by various organisations (or difficulties with information exchange for water resources management)</li> <li>- Cost recovery not implemented in the agricultural sector</li> <li>- A lack of sectoral cooperation</li> <li>- Weak monitoring of water resources use</li> <li>- A lack of clear allocation of competencies in the water sector (or overlapping responsibilities)</li> <li>- Limited water law enforcement</li> <li>- A lack of fiscal decentralisation to support IWRM implementation</li> </ul> <p>(Horlemann and Dombrowsky, 2011)</p>	<ul style="list-style-type: none"> <li>- regulatory instruments to support IWRM implementation</li> <li>- Inadequate financial resources</li> <li>- Political challenges</li> </ul> <p>(Horlemann and Dombrowsky, 2011)</p>
k.	Mexico	The National Water Law of 2004 (National Water Commission, 2011; Sosa-Rodríguez et al., 2014)	<ul style="list-style-type: none"> <li>- Mechanisms for capacity building in place</li> <li>- Weak law enforcement</li> <li>- The polluter-pays principle not fully implemented</li> <li>- Insufficient data collection</li> <li>- No clear guidelines to manage water resources in an integrated manner with an active participation of all stakeholders</li> <li>- IWRM priorities and strategies vary greatly among place, lacking universal measures</li> <li>- Water resources restoration, the spiritual and cultural dimensions, and the carrying capacity of natural ecosystems are not considered</li> <li>- Cost recovery not fully implemented</li> <li>- Presence of water pollution</li> <li>- Low human resource capacity</li> <li>- Inadequate water infrastructure</li> </ul> <p>(National Water Commission, 2011; Sosa-Rodríguez et al., 2014)</p>	<ul style="list-style-type: none"> <li>- Inadequate legal framework</li> <li>- Insufficient financial resources in the water sector</li> </ul> <p>(Sosa-Rodríguez et al., 2014)</p>
l.	Romania	Water Law (Legea 107/1996) and its subsequent updates, Order Ministry of Environment and Water Management (MAPM) number 913/2001, Order MAPM number 281/1997, Order MAPM number 282/1997 (Teodosiu, 2007)	<ul style="list-style-type: none"> <li>- A lack of legislative frameworks enabling the functioning of an organisation dealing with IWRM</li> <li>- The lack of a legislative framework enabling integrated approach at both operational and decision-making levels</li> <li>- The lack of a true participatory approach of the stakeholders involved in water resources management</li> <li>- The existing regulatory frameworks are hardly adopted by industries and municipalities</li> <li>- The lack of national and regional enabling mechanisms promoting cooperation and stakeholder participation</li> <li>- Low human resource capacity to implement IWRM</li> </ul>	<ul style="list-style-type: none"> <li>- Inadequate legal and regulatory frameworks</li> <li>- Political and financial constraints</li> </ul> <p>(Teodosiu, 2007; Teodosiu et al., 2009)</p>

			<ul style="list-style-type: none"> <li>- The lack of coordination between government organisations</li> <li>- A lack of communication and cooperation at the level of stakeholders involved in water resources management</li> </ul> <p>(Teodosiu, 2007; Teodosiu et al., 2009)</p>	
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<sup>1</sup> In some cases, it is not clear which factor(s) influenced the implementation of each of the IWRM elements identified in practice

Table 2-2 has helped to understand where some of the countries parties to IWRM stand in regard to implementing IWRM as an approach to improve water resources development and management. While some progress has been made (Table 2-2), there are still a number of implementation challenges to be overcome which vary from country to country. The literature (see, e.g., GWP, 2009b) argues that for IWRM to be adopted as a mode of water resources management, an enabling environment of appropriate policy and legislation has to be in place. However, as shown in Table 2-2, not all the countries reviewed (e.g., Malaysia) have policy and/or legislation in place to support IWRM implementation. For those that have policy and/or legislation in place (e.g., Cameroon, Zimbabwe, Mongolia, Romania), these legal frameworks do not fully incorporate the main elements (that is, Principles 1 to IV – see Subsection 2.3.2) of IWRM. Aside from this, almost all of the countries reviewed (except Malaysia) show significant progress in putting in place policy and/or legislation to support IWRM implementation. While water infrastructure development is also one of the enabling environment needed to support IWRM in practice (see, e.g., GWP, 2009b), aside from South Africa that has a well-developed water infrastructure system (Table 2-2), this remains a major challenge in some of the countries reviewed (e.g., Mozambique, Madagascar, Zambia, Mexico). Although these countries have policy and/or legislation in place to support IWRM implementation, there is a paucity of data to suggest whether the extant legal frameworks support water infrastructure development.

On the field-level implementation of IWRM, little progress has been made than in the development of policy and/or legislation. This is to be expected, since the implementation of IWRM begins with policy and legislative reform, and progresses to its field-level implementation. However, that little progress has been made in practice suggests that there is a long way to go in the countries reviewed to successfully implement the elements (see, e.g., Subsection 2.3.3c) that make up IWRM. Notwithstanding this, some progress has been made in the areas of integrated planning (e.g., Ghana, South Africa), stakeholder involvement (e.g., Ghana, South Africa), and cost recovery (e.g., Ghana, Mozambique, Tanzania, Malaysia, Mexico). These are being achieved by countries that have policy and/or legislation in place (except Malaysia as said earlier). This suggests that to implement IWRM in practice, apart from policy and legislation though important, country level commitment can be very important. Although Mozambique has some achievements in the area of organisational structure for data gathering, other management tools are weakly implemented in all of the countries reviewed. It worth adding that the field-level implementation of the elements of IWRM has not progressed equally across the reviewed countries nor are there regional commonalities. Part of the variability in IWRM implementation experiences may be explained by difference in implementing mechanisms. However, in almost all of the countries reviewed (Table 2-2), inadequate human capacity to implement IWRM seems to be common. Lastly, while political will remains a reason



behind weak implementation in practice in some countries (Table 2-2), lack of financial resources and inadequate legal and regulatory instruments remain the biggest challenge to IWRM implementation in many of the countries reviewed.

However, from the foregoing, without making a sweeping statement, there are indications that countries are forging ahead in the implementation of IWRM, and also putting in place the necessary enabling legal environment to facilitate IWRM implementation in practice. Notwithstanding this, IWRM is still met with various implementation challenges. Besides the review of country-level experiences, the IWRM literature also reveals that IWRM is beset with other operational challenges which have limited its transfer from theory to practice. Examples of such other challenges are discussed next.

## **b Operational challenges**

Besides the benefits and experiences enumerated above, there are criticisms against IWRM as highlighted by a number of authors. For example, Mitchell (2005, p.1335) queries the GWP definition of IWRM by asking that:

“First, if IWRM promotes the coordination of management initiatives for water, land, and related resources, how are the connections among these resources to be made? Particularly, how are water and land-based systems to be integrated for management purposes? At an operational level, how should or could water management and land use planning be interrelated? Second, what are the implications for the design of institutional arrangements related to public agencies responsible for water and land management, as well as other resources? What framework or approaches can be used to overcome the predisposition of resource-based agencies not to connect with other organizations with shared interests and overlapping responsibilities?”.

Mitchell argues that the intent of these challenges/questions is to alert researchers interested in the application of IWRM to consider how institutional arrangements can be designed to facilitate IWRM. Biswas (2004, p. 249) also expresses concerns, arguing that, with regard to IWRM, “no one has a clear idea as to what exactly this concept means in operational terms, ...”. Similar to Mitchell, Biswas queries the GWP definition of IWRM, saying that its “lofty phrases have little practical resonance on the present, or on the future water management practices” (p. 249). Grigg (2008) as well as Braga and Lotufo (2008) also express concerns over the definition of IWRM. To Braga and Lotufo (2008) the GWP definition of IWRM is too general. They argue that it needs to be decoded in some more practical terms in order to facilitate its implementation in real life. Considering the definitional problem besieging IWRM, Biswas concluded that IWRM “really is unusable, or un-implementable, in operational terms” (p. 250) and “is not holistic” (p. 253). To ameliorate these concerns, Biswas has suggested that in terms of management, close collaboration,

cooperation, and coordination among organisations could offer a way out rather than integration. The concerns raised by Medema et al. (2008) are somewhat similar to that of Biswas's. They argue that a lack of a sufficiently unambiguous meaning poses a problem for IWRM implementation, and that:

“IWRM must state what kind of coordination and integration in knowledge production and use, undertaken by what kind of institutions [organisations], when, and for what purpose should take place. It must be able to say something about the governance configurations and processes that are most suitable for integrated knowledge production and use, and therefore, the most beneficial for water management” (para. 19).

Medema et al. added that the integrationist agenda underlying IWRM should rather be viewed more sceptically. They concluded that the underlying problem could be that of inability to translate IWRM into practice. To implement IWRM, they suggested would require first putting in place a clear case for reform. Although Grigg (1999) agrees that integration will enable each actor to achieve its own goal in a more efficient way, the author still contends that a lack of congruence between political and basin boundaries, disincentives to cooperative, and low perceived need for integration may hinder the implementation of integration in practice.

Molle (2008, p. 132) refers to IWRM as a “nirvana concept” which can scarcely be implemented in practice, while Merrey et al. (2005) argue that IWRM has two weaknesses making the approach anti poor. First, according to Merrey et al., it is blind to improving the livelihoods of people, and second, it does not recognise the integration of forest resources and biodiversity. To address these weaknesses, Merrey et al. (2005) canvassed for an IWRM that promotes human welfare and the integrated management of water and other natural resources in a sustainable manner. To Jeffrey and Gearey (2006, p.4), they argue that “[e]mpirical evidence which unambiguously demonstrates the benefits of IWRM is either missing or very poorly reported”. However, Muller (2010) expresses a different concern with regard to IWRM, arguing that the disappearance of “development” from the IWRM lexicon of Dublin statements has stifled infrastructural investments in developing countries thereby curbing its practical relevance, compared to those countries following the IWRM Rio approach. Muller therefore canvassed for a return to the UNCED agreement (the IWRM Rio approach) in order to effectively address the challenges facing water resources management. Rahaman and Varis (2005) agree with others that the main challenge facing IWRM remains its effective transition into practice. Rahaman and Varis argue that to effect a successful IWRM implementation, the following issues have to be considered:

1. approach privatization of the water sector with caution especially for the developing world where basic infrastructure is not yet complete.
2. exercise restraint in the application of the principle of full cost recovery in developing nations when it comes to domestic use of water for very basic needs.
3. address the mechanism of river restoration.
4. IWRM should sufficiently address fisheries and aquaculture as well as marine and inland water ecosystems.
5. IWRM should focus on integrating lessons from past initiatives which have the potential to contribute to the implementation of IWRM in practice.
6. IWRM should recognise water's spiritual and cultural values.

Rahaman and Varis (2005) concluded that without paying recognition to these issues, efforts at applying IWRM in practice may be ephemeral. In turn, Lankford and Hepworth (2010) argue that a “lack of policy fit – rather than its implementation – might explain why IWRM has not overcome (or perhaps has even led to) inertia in basin management” (p. 83). As an alternative to the integrated version of IWRM, they suggested the application of a polycentric model, which signifies the division of the basin into a group of nested sub-units, to water resources management at the river basin level. Watson (2004) in turn argues that the limited capacity of organisations to deal effectively with increasing complexity and uncertainty in water management at river basin level suggests the need to re-examine the concept of IWRM. Watson argued for a collaborative institutional approach to IWRM rather than coordination strategies.

Although Butterworth et al. (2010) argue that most of the opponents of IWRM have failed to recognise water politics as a reality, they emphasise that two major issues are central in the criticisms against IWRM: (1) the issue of integration, which many authors felt was poorly defined, and (2) the idea of treating water as purely economic, whilst the value of water should reflect some elements of social goodness especially to encourage its application in developing countries. In rectifying the integration aspect, consensus centres on the need to put in place a reform-based organisational collaboration framework that takes into consideration the local situation. It is argued that factoring-in this consideration will make the transition of IWRM from theory to practice less cumbersome. In the response of GWP to (a) the impracticality of IWRM in practice due to the challenges of integration as some critics argued, (b) the original expression of IWRM as adopted at the Rio Earth Summit, and (c) successful examples of IWRM in practice: GWP (2009a) argues that IWRM should be seen as a means to an end, and that it is the goals to be accomplished and the context that should determine what elements of integration are important, and when they are needed. Other authors consent to the fact that an integrated approach is most appropriate when water problems are defined as complex and uncertain (e.g., Hooper et al., 1999). Reacting to (b),

GWP (2009c) argues that infrastructural development is also a key factor needed to facilitate IWRM implementation at the river basin level. Responding to (c), GWP (2009a) agrees that there are pitfalls in transferring IWRM from theory to practice (for more discussion, see GWP, 2009a). However, according to Anderson et al. (2008), the IWRM concept has been adopted by many international bodies as an approach to water resources management and is being increasingly accepted internationally.

### **c Conditions needed to implement IWRM**

Besides the identified concerns and suggested remedies raised above, a critical literature review and analysis indicates that to implement IWRM in practice will require three conditions (or frameworks) (Hassing et al., 2009; FAO, 2006; GWP, 2001, 2003b, 2009c; Owen et al., 2010):

1. an enabling environment of appropriate policies, strategies, regulations and legislation with IWRM principles and approaches embedded;
2. organisational structure (with clearly stated roles, responsibilities, and functions) through which the policies, strategies and legislation can be implemented, and
3. sound management tools required by these organisations to do their job.

Although the implementation of IWRM is considered to be iterative (GWP, 2002b), this three-dimensional framework is considered in the literature to be essential for implementing IWRM and also capable of driving country level reforms at all stages in the water planning and management system (Owen et al., 2010). While this study follows Medema et al. (2008) to argue that the three conditions constitute a generic statement of the necessary governance frameworks for implementing any natural resource management approach, the GWP (2004) elaborates further on the implementation process which is often viewed as a cyclic or adaptive implementation process (see - UNESCO, 2009a, 2009c) or a “learning-by-doing management cycle” (see GWP, 2009c). This cycle has been described in detail by GWP (2004) and UNESCO (2009a, 2009c), but summarised by Medema et al. (2008, paragraph 15) as follows:

- “1. recognising the need to change by establishing the status of water resources and building commitment to reform current management practices, then;
2. assessing the gaps between current management practices and those needed to resolve water resource issues, then;
3. preparing a management strategy and action plan that completes the three pillars for successful IWRM implementation, and building commitment to actions, then;
4. implementing the plan and monitoring and evaluating progress towards achieving goals”.

As argued by Medema et al. (2008), this cycle-model is a standard decision-making process of - problem definition – alternative generation and selection – implementation – monitoring and evaluation, but tailored to suit the IWRM approach. As such, the cycle represents a developmental process [although considered iterative, see, e.g., GWP (2009c)] in which countries that are parties to the IWRM approach can find themselves at different implementation stages (GWP, 2000b; 2009c).

However, in terms of specification of stages required to transfer IWRM from theory to practice, the literature argues that the implementation process should begin with a water policy to reflect the principles and approaches (or implementation tools/instruments) of integrated water resources management, and to put the policy into practice would require the reform of water law and water organisations (Owen et al., 2010; Nyambod and Nazmul, 2010). Hassing et al. (2009) suggest that some elements of IWRM that should be embedded in the water law include private sector involvement, public hearings by law, participation of stakeholders in water management, management of water along the hydrological boundaries, management at the lowest appropriate level, financial contribution by users to water management, polluter pays principle, user pays principle, inclusion of women in water management, separation of water management and service provision (that is, functional decentralisation), and water use efficiency. However, as part of the tools needed to implement IWRM in practice, the GWP (2009c) has suggested the need to have conflict management platforms and provisions for human/organisational capacity building. Also, various authors (e.g., Ako et al., 2009; Donkor and Wolde, 2011; McDonnell, 2008; Anderson et al., 2008) have stressed the importance of data collection and capacity building (Leidel et al., 2011; Mkandawire and Mulwafu, 2006; Jembere, 2009) to support IWRM implementation. Consistent with the three-dimensional frameworks, the key action areas which are relevant to implementing IWRM in practice according to Owen et al. (2010) are summarised in Table 2-3. While the Dublin four guiding IWRM principles overlooked the importance of water infrastructure development (see also Muller, 2010 for the same emphasis), to implement IWRM in practice, in addition to the three-dimensional frameworks, the literature has also agreed that water infrastructure development is vital (African Development Bank, 2000; GWP, 2009c, 2012). According to Muller (2010), a lack of water infrastructure could curb the practical application of IWRM. Drawing on the review made above, Figure 2-3 summarises the components of, and framework for, IWRM application.

Table 2-3 The thirteen key IWRM action areas (Adapted from Owen et al., 2010)

**THE ENABLING INSTITUTIONAL ENVIRONMENT**

1. Policies – setting goals for water use, protection and conservation.
2. Legislative framework – the rules to enforce to achieve policies and goals.
3. Financing and incentive structures – allocating financial resources to meet water needs.

**ORGANISATIONAL ROLES**

4. Creating an organizational framework – forms and functions.
5. Organisational capacity building – developing human resources.

**MANAGEMENT TOOLS**

6. Water resources assessment – understanding resources and needs.
7. Plans for IWRM – combining development options, resource use and human interaction.
8. Demand management – using water more efficiently.
9. Social change instruments – encouraging a water-oriented civil society.
10. Conflict resolution – managing disputes, ensuring sharing of water.
11. Regulatory instruments – allocation and water use limits.
12. Economic instruments – using value and prices for efficiency and equity.
13. Information management and exchange – improving knowledge for better water management.

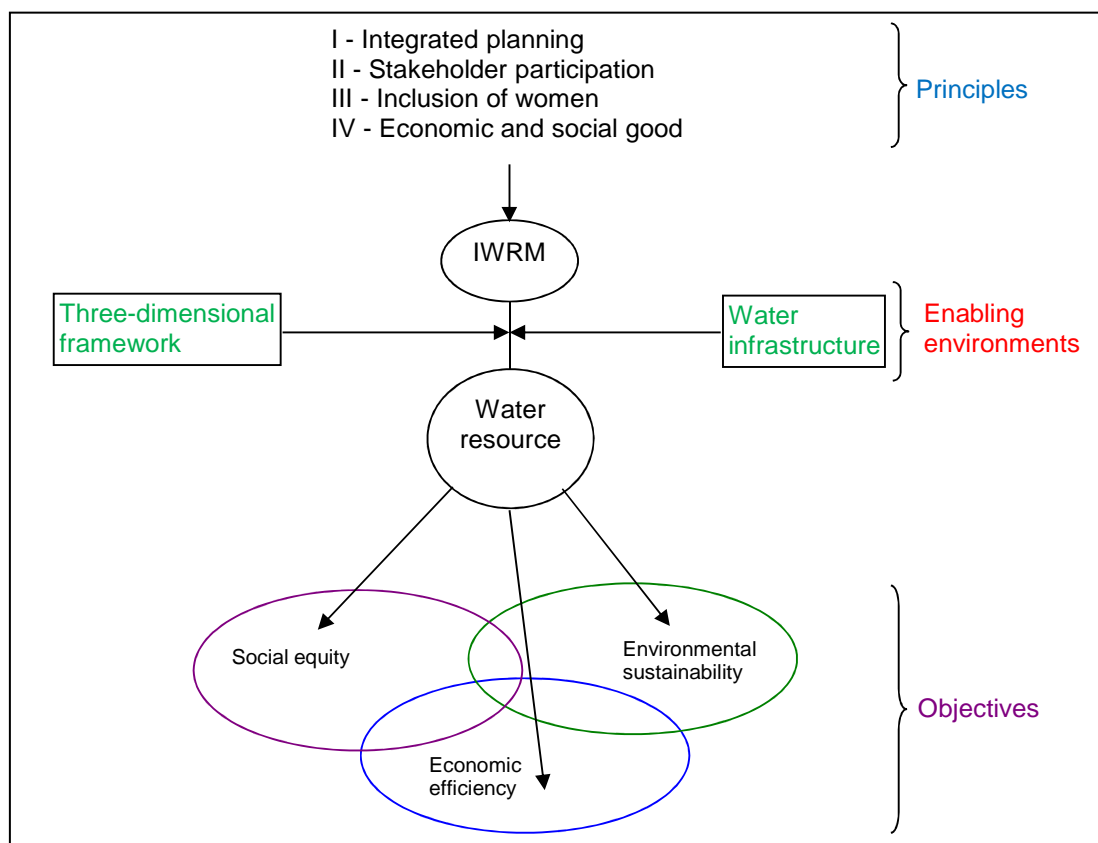


Figure 2-3 Components of, and framework for implementing, IWRM (Modified from African Development Bank, 2000)

To conclude, as illustrated in this review, IWRM is made up of four key principles, and there are tools/instruments (e.g., platforms for conflicts management, capacity building, water laws enforcement, etc.) which are essential to implementing IWRM guiding principles in practice as suggested by various authors (e.g., Hassing et al., 2009; Owen et al., 2010; GWP, 2009c). As exposed in the literature, to encourage IWRM implementation in practice will require a three

dimensional framework of enabling institutional environments (with IWRM principles and approaches embedded), organisational structures to facilitate implementation, and the presence of sound management tools to assist the organisations in the implementation of IWRM. This is in addition to water infrastructure development. Nonetheless, there are criticisms trailing IWRM. Drawing on these criticisms and the suggested measures in the literature will help in the process of suggesting measures which might improve application in the case of Nigeria (e.g., in Chapter 8). Next, a theoretical review of Nigeria's experiences with the implementation of IWRM is presented. An understanding of Nigeria's experiences will help to establish the existence of the problem to be researched and also inform the IWRM elements needed for investigation during the field survey.

## **2.4 Understanding Nigeria's experiences with the implementation of IWRM**

### **2.4.1 Introduction**

In order to understand Nigeria's experiences with the implementation of IWRM at the river basin level (Objective b, see also Section 1.5), the three-dimensional framework (as revealed above) has been applied as a theoretical lens to undertake an analysis of the literature to determine the extent of IWRM implementation at the river basin level in Nigeria. The review has also employed the four key principles for water management as captured by the Dublin-Rio statements (see Subsections 2.3.1 and 2.3.2) as well as the key IWRM action areas (see Table 2-3) as a guide. Since river basins in Nigeria have organisational structures in place, in the form of River Basin Development Authorities; two important areas, which invariably coincide with the rest of the three-dimensional framework, were focussed on in the review: literature evidence on the inclusion of IWRM principles and approaches (or IWRM elements) in the legal and regulatory frameworks, and also on their application in practice. Also, based on evidence derived from the reviewed literature in Section 1.2, an assumption is made that the RBDA's have water infrastructures in place. Hence, this component is not considered in the review and analysis.

### **2.4.2 Methodology for literature review, approach to data collection and analysis**

The secondary data used for this review were derived from qualitative information available in the literature. The literature was retrieved for review and analysis between May and September 2011 from SearchPoint, Scopus, and Google Scholar. The time period searched spans all years available in the databases up to 2011. To identify those publications needed to address the second research objective (understanding Nigeria's experiences with the implementation of IWRM at the river basin level), a first search was carried out using the query 'integrated' AND 'water' AND 'resources\*'

AND 'management' AND 'Nigeria'. A total of 57 publications consisting of peer-reviewed and grey literature was obtained using this query from SearchPoint, 25 publications from Scopus, and 23,200 from Google Scholar. Following the approach adopted for objective one (see Section 2.2), those that did not match the requirements of this objective were eliminated or where access to the full text was denied. The final sample of publications reviewed consists of 22 peer-reviewed journal articles and 2 grey literatures. However, the interpretations presented in this section are based on a secondary analysis of the qualitative data obtained.

The process of obtaining evidence from the publications obtained followed the inductive-deductive approach (see Subsection 3.2.2 for full details). The analysis and interpretation are grounded in the hermeneutics paradigm of qualitative research (see Section 3.3.3a for full details). Following the hermeneutics philosophy, the texts in the publications obtained were reviewed to understand what the extant legal and regulatory (including informal) frameworks in Nigeria say on IWRM implementation, the IWRM elements being implemented in practice, and the extent of their implementation. Although the publications have been collected from various international sources, they primarily come from Nigerian context. Hence, the analysis undertaken in this section may be considered as a secondary data analysis. The qualitative data obtained from the literature reviewed are presented as Appendix A. The list of authors reviewed for this analysis is also provided in the same Appendix in column 9.

In distilling the extent of IWRM implementation (with respect to each of the IWRM elements) in Nigeria from the literature, this study has focused on findings rather than on author(s) suggestions. In the processing, the "statements" obtained (see Appendix A) were translated into quantitative data via a 4-point Likert scale by comparing and classifying the collected qualitative data of each performance description with a set of evaluating criteria as illustrated in Table 2-4. In the analysis, the "qualifying word/phrase" obtained was as used by the author(s) of the literature reviewed (or reworded to obtain a clearer phrase where necessary). For example, if the author(s) state(s) a "lack of groundwater data", the qualifying word here is "lack". To translate "lack of groundwater data" into quantitative data, the word "lack" was compared with the set of evaluating criteria in Table 2-4; and as shown in that table has a score of "0". In the same way, a performance description described as "inadequate ..." when compared (see Table 2-4), has a score of "1". This procedure was followed for all the qualitative data obtained from the reviewed literature. After scoring, all the identified IWRM issues that are related were given the same code. For example, all issues relating to integrated planning, the first IWRM principle, were coded as "a". All issues relating to non-government stakeholder participation were coded as "b", and so on.



Table 2-4 Evaluating criteria (Modified from Hassing et al., 2009)

S/No.	Description	Score
a.	Issue not addressed (with the use of phrases like; lack of, absence of, non-existence of, or not available or followed)	0
b.	Issue poorly addressed, that is, the issue has many gaps in quality and coverage (with the use of words like; insufficient, poor, inadequate, little, or weak)	1
c.	Issue moderately addressed, that is, the issue has some gaps in quality and coverage (with the use of words like; some, moderate, reasonable)	2
d.	Issue largely addressed, that is, the issue operates at realistic goal levels (with the use of words/phrases like; presence or existence of, adequate, available or followed)	3

To determine the total average quantitative score of each IWRM element or category derived from the data, the total score of each IWRM element was first obtained and then divided by the total number of IWRM performance descriptions obtained from the data. For example, the total average quantitative score of integrated planning (say, X) was obtained by summing all the specific scores (as represented by the code “a”) for any IWRM issues relating to integrated planning (say, i) divided by the total number of integrated planning-related performance descriptions, or by the total number of “a” codes (= n). This is mathematically expressed as:

$$X = \frac{\sum_{i=1}^n a_i}{n} \quad (\text{Eq. 1-1})$$

The total average score obtained was plotted on a radar chart to provide a graphical illustration of the relative extent of implementation of each of the IWRM elements. An octagram is obtained in this case because eight IWRM elements or categories were derived from the results of the qualitative data analysis carried out. A radar chart is justified for providing this illustration, because it does not serve as a basis for comparing one performance indicator with another (Wisker, 2001), but simply illustrates the extent of application on a 4-point scale. The lowest score, (0), suggests that the IWRM element or indicator under consideration is not addressed, while the highest score, (3), indicates that the IWRM element (or indicator) is largely addressed or applied.

### 2.4.3 Results and findings

Figure 2-4 presents the results of the secondary data analysis carried out. Although the reviewed literature presented both empirical and perceived evidence, both have provided a useful insight into understanding Nigeria’s experiences with the implementation of IWRM. As shown in Figure 2-4,

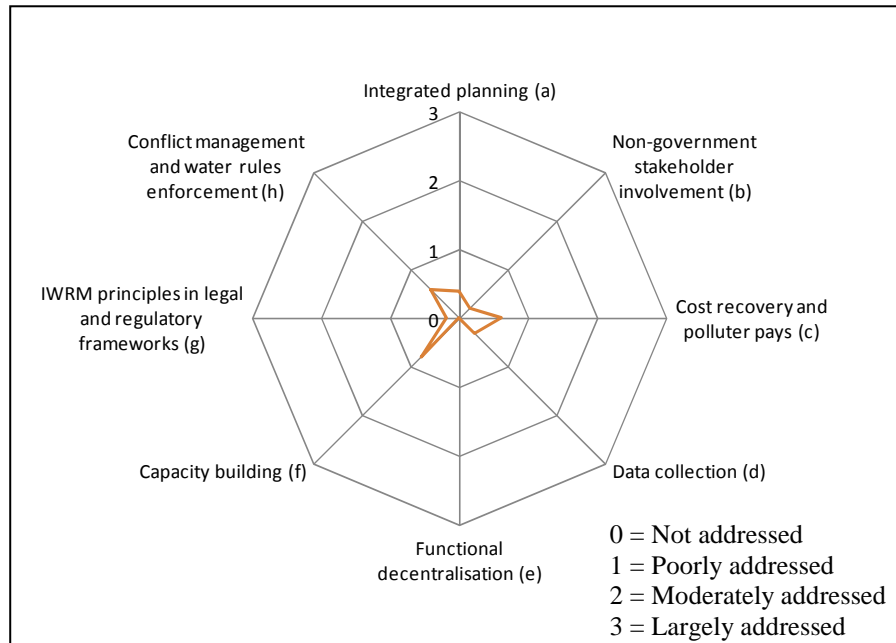


Figure 2-4 Extent of IWRM implementations in the water resources sector in Nigeria

IWRM is reflected in a limited way in water resources management in Nigeria. If roughly nested on the African regional averages in Figure 2-2 (although this has different categories), the insufficient application of IWRM to water resources management in Nigeria becomes more apparent. This comparison should be considered as rough. A better approach would have been to compare the Nigerian situation with other countries that have different levels of IWRM implementation, but literature on such examples is rather thin. However, taking a look at Figure 2-4, aside from human capacity building which seems to be fairly implemented, other categories (or IWRM elements), except functional decentralisation which is not addressed, are poorly addressed. A practical implication of this finding is that the water sector in Nigeria may have difficulty responding to the expectations around water functions. This submission is consistent with the views of some Nigerian authors (e.g., Akorede, 1997; Akujieze et al., 2002; Ulocha and Okeke, 2004). However, drawing on the data obtained from the reviewed literature (see Appendix A) indicates that the extent of application of IWRM to improve water resources management in Nigeria is constrained by inadequacies in the legal and regulatory instruments. The evidence suggests that the IWRM elements are not fully embedded in the legal and regulatory frameworks in Nigeria (see also Figure 2-4, item g). However, according to Lankford and Hepworth (2010), IWRM will require appropriate policies and legislative instruments for its practical implementation. Sharma et al. (1996) also maintain that appropriate and enforceable water resource legislation is a pre-requisite for the effective application of IWRM to water resources management. This is consistent with the view of others (e.g., Hassing et al. (2009) and Durham et al. (2002)) who assert that IWRM should be

embedded in the appropriate legal and regulatory frameworks in order to encourage its implementation.

While it is somehow difficult from the data obtained to attribute the effect to the nation's macro environment, there is ample evidence to suggest that the influencing legal and regulatory instruments are located within the operational environment. Therefore, a finding of this review and analysis is that the provisions of the legal and regulatory instruments in Nigeria needed to support the transfer of IWRM from theory to practice are inadequate, and these instruments are located within the operational environments of the RBDAs. This finding supports others (Yamakawa et al., 2008; Ellison, 2007; Greenwood and Holt, 2008, Grigg, 2008; Hukka et al., 2007) who assert that institutional issues are the greatest challenges in water management. This is because institutions not only specify actors and their roles, they also create frameworks that enable or constrain actions.

Although the RBDAs do not act in isolation, there is a paucity of data in the reviewed literature illustrating the effects of informal rules on IWRM implementation and also the impact of other water-related organisations (national and international) on IWRM implementation. Thus, the question of why the IWRM elements identified in this review and analysis is not fully applied at the river basin level in Nigeria has only been partially answered. The literature has only revealed the presence of the regulative institutional element as a constraining force. This suggests that an in-depth understanding of the forces influencing IWRM implementation would first be needed, before following it up with suggestions which might help to improve implementation. In order to realise this, the finding derived from the review of Nigeria's experiences with the implementation of IWRM at the river basin level will also serve as a useful guide to: identify the theoretical framework needed to explain the forces influencing IWRM implementation, and frame the study's data gathering tools (e.g., the questionnaires) needed to elicit information that addresses the research questions and realise the study's main aim. The following section identifies the theoretical framework and approach needed to explore the forces influencing IWRM implementation at the river basin level in Nigeria.

## **2.5 Understanding the theories and approaches needed to analyse institutional frameworks**

Following an understanding of the theoretical framework needed to implement IWRM in practice and Nigeria's experiences with IWRM implementation in previous sections, the main ambition of this section is to identify suitable institutional theory and approaches that could be employed to

elicit an understanding of the forces influencing IWRM implementation at the river basin level in Nigeria. In order to realise this ambition, after presenting the methodology for literature review (Subsection 2.5.1), the section starts with an understanding of what is an institution (Subsection 2.5.2), reviews the various institutional theories in order to identify a candidate analytical approach for this research (Subsection 2.5.3), discusses the elements of neo-institutional theory identified (Subsection 2.5.4), looks at the analytical (ir)relevance of the identified neo-institutional theory (Subsection 2.5.5), provides examples illustrating the application of neo-institutional theory (Subsection 2.5.6), presents the reasons for adopting neo-institutional (Subsection 2.5.7), and discusses the various approaches to analyse institutions within the neo-institutional framework (Subsection 2.5.8).

### **2.5.1 Methodology for literature review**

- a. To identify the publications needed to address the third research objective (see Section 1.5), searches were conducted. All years were searched up to 2011. A first search was carried out using the syntax ‘institutional’ AND ‘theory’. A total of 52,372 publications was obtained using this query from SearchPoint, 10,270 from Scopus, and 1,370,000 from Google Scholar. Following the results of the initial review, this selection was refined using a second set of queries, for which the syntax used was ‘neo-institutional theory’. This search identified a total of 507 from SearchPoint, 181 from Scopus, and 8,170 from Google Scholar. Following the approach described earlier (see Section 2.2), 125 publications were obtained that did match the requirements of this objective. The final sample of publications reviewed consists of 104 peer-reviewed journal articles, 11 books, 6 book chapters, and 4 grey literatures.
  
- b. However, in order to review examples illustrating the application of neo-institutional theory in water resources management research, a first search was carried out using the syntax ‘institutional theory’ AND ‘integrated’ AND ‘water’ AND ‘resources\*’ AND ‘management’. A total of 8 publications was obtained using this query from SearchPoint, 20 from Scopus, and 16,900 from Google Scholar. This selection was refined using a second set of queries, for which the syntax used was ‘neo-institutional theory’ AND ‘integrated’ AND ‘water’ AND ‘resources\*’ AND ‘management’. This search identified a total of 2 publications from SearchPoint, no results from Scopus, and 1,260 from Google Scholar. Other syntax used includes (i) ‘neo-institutional theory’ AND ‘water’ AND ‘resources\*’ AND ‘management’. This search identified a total of 4 publications from SearchPoint, no

results from Scopus, and 1,540 from Google Scholar; and (ii) ‘neo-institutional theory’ AND ‘natural’ AND ‘resources\*’ AND ‘management’. This search identified a total of 4 publications from SearchPoint, no results from Scopus, and 3,630 from Google Scholar. Since Google Scholar returned the largest hits (with some results repeated), following the approach illustrated in Section 2.2, those reviewed were limited to the first 150 results. After sorting out duplications, and following a quick review (looking at the title/abstract, making a quick scan through the main text). None of the publications reviewed match the requirements of this search on examples illustrating the application of neo-institutional theory in water resources management research and IWRM in specific. However, 3 peer-reviewed journal articles and two grey literatures on water-related institutional studies were identified. The results of the review are presented in Subsection 2.5.6.

Since the Department of Water Affairs and Forestry (DWAF) in South Africa and the International Water Management Institute (IWMI) in Colombo, Sri Lanka are also involved in water/natural resources management activities, the database of these organisations was searched for examples illustrating the application of neo-institutional theory in water resources management investigations. The syntax used and the search results obtained are shown in Table 2-5. However, none of the reviewed publications match the requirements of this search. However, speaking within the boundaries of the literature searched, the paucity of literature illustrating the application of neo-institutionalism in water/natural resources management (or IWRM) investigations suggests a domain that remains relatively understudied.

Table 2-5 Online search results for examples illustrating the application of neo-institutional theory in water/natural resources management research

S/No.	Search syntax	IWMI	DWAF
1	‘institutional theory’ AND ‘integrated’ AND ‘water’ AND ‘resources*’ AND ‘management’	0	84
	‘neo-institutional theory’ AND ‘integrated’ AND ‘water’ AND ‘resources*’ AND ‘management’	0	1
3	‘neo-institutional theory’ AND ‘water’ AND ‘resources*’ AND ‘management’	0	1
4	‘neo-institutional theory’ AND ‘natural’ AND ‘resources*’ AND ‘management’	0	1

- d. To understand whether neo-institutional theory has been applied to the case of Nigeria, searches were carried out using various syntax and the results obtained are illustrated in

Table 2-6. Since Google Scholar returned the largest hits (with some results repeated), following the approach described in Section 2.2, those reviewed were limited to the first 150 results. None of the reviewed publications match the requirements of this search on examples illustrating the application of neo-institutional theory in water resources management or IWRM implementation investigations in Nigeria.

Table 2-6 Online search results for examples illustrating the application of neo-institutional theory in water resources management (or IWRM implementation) investigations in Nigeria

S/No.	Search syntax	SearchPoint	Scopus	Google Scholar
1	'institutional' AND 'theory' AND 'integrated' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	1	0	61,500
2	'neo-institutional' AND 'theory' AND 'integrated' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	0	0	88
3	'institutional' AND 'theory' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	3	1	17,400
4	'neo-institutional' AND 'theory' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	0	0	101
5	'institutional' AND 'theory' AND 'natural' AND 'resources' AND 'management' AND 'Nigeria'	2	0	20,300
6	'neo-institutional' AND 'theory' AND 'natural' AND 'resources' AND 'management' AND 'Nigeria'	0	0	160
7	'neo-institutional analysis' AND 'integrated' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	0	0	88
8	'institutional analysis' AND 'integrated' AND 'water' AND 'resources' AND 'management' AND 'Nigeria'	0	1	16,400

It is important to highlight that the availability of examples illustrating the application of neo-institutional theory in water resources management (or IWRM) was checked after returning from the fieldwork in Nigeria in February 2013 and also during the period of in-depth data analysis (with the assistance of officers in the Library) with no documents found relevant to the objective of this search. Some of the literature obtained treat institutions as organisations which differ from its use in, or the focus of, this study as explained in Subsection 2.5.2 (see also notes on terminologies at the end of Chapter 1).

## 2.5.2 Concept definition

Despite the fact that the term “institution”, derived from the Latin word “institutum” (de Pina-Cabral, 2011, p. 481), surfaces in social science research in 1725 (Hodgson, 2006), there is still a lack of a universally agreed definition of an institution (Scott, 1987; Buanes and Jentoft, 2009; Holm, 1995; King et al, 1994; Luttrell, 2001; Hollingsworth, 2000; Kingston and Caballero, 2009;

Ostrom, 1986; Burns and Scapens, 2000). Although there seems to be an underlying similarity in the various definitions, there is little agreement on specifics (Scott, 1987). Various definitions are based upon different conceptions of the nature of social reality as shown in Table 2-7.

Table 2-7 Examples of definitions of institutions

Author (s)	Definition
Hearne (2007) defines institutions	as the rules and norms that guide societal behaviour, which can be formal or informal, and
Saleth and Dinar (2008)	as a set of interrelated and linked rules that guide individual and collective decisions
North (1990)	as the “rules of the game in a society” (p. 3)
Aoki (2001, cited in Williams, 2007, p. 250)	as a “self-sustaining system of shared beliefs about how the game is played”
Furubotn and Richter (2008)	as “rules of the game” (p. 18)
Berk and Galvan (2009)	as “syncretic, that is, they are composed of an indeterminate number of features, which are decomposable and recombinable in unpredictable ways” (p. 543)
Stein (1997)	as “a socially constructed belief system about the way things are and the way things should be that organises human thought and action” (p. 730)
Crawford and Ostrom (1995)	as “enduring regularities of human action in situations structured by rules, norms, and shared strategies, as well as by the physical world” (p. 582)
King et al. (1994)	as “any standing social entity that exerts influence and regulation over other social entities” (p. 148)
Hodgson (2002)	as “durable systems of established and embedded social rules that structure social interactions” (p. 113)
Barley and Tolbert (1997)	as shared rules and typifications that identify categories of actors and their appropriate functions or relationships
Saleth and Dinar (2004)	as “a constellation of rules linked and structured in such a way as to achieve a human purpose or to address a going concern” (p. 26)
Hatch (1997)	as “repeated actions and shared conceptions of reality” (p. 84)
Veblen (1919, cited in Scott, 1995)	as “settled habits of thought common to the generality of man” (p. 3)
Jepperson (1991)	as an “organised, established, procedure” (p. 143)

Although Jepperson (1991) argues that what institution means “depends upon what we are considering to be our analytical problem” (p. 146), one contribution found to effectively integrate several important elements from other definitions is that of Scott (1995, p. 33) who defines institutions to “consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour”. As argued by Scott, these elements are the building blocks of institutional structures, and provide the concept of institutions. This view is also shared by Yamakawa et al. (2008). In the literature, institution is considered not only as an objective physical phenomenon, but also as a human social construct (DiMaggio and Powell, 1983; Stein, 1997; Barley and Tolbert, 1997; Berk and Galvan, 2009; Williams, 2007; Saleth and Dinar, 2008; North, 1991). Also, to some scholars, institutions can be formal or informal (Williams, 2007; North, 1990; Cortner et al., 1998). However, consistent with the suggestion of various authors (Hodgson, 2006;

Mantzavinos et al., 2004; Poirier and de Loë, 2010) on the need to clarify what one refers to as institutions, this study defines institutions as the “rules-in-use that influence social actors or organisational behaviours and actions”. These rules may include international treaties or conventions, norms and values, laws and regulations, agreements, court resolutions, guidelines and standards, policies, basic assumptions, taboos, beliefs, informal doctrines, cultural resources, customs and traditions, as well as shared practices. This definition has two important implications: one, it means that not all laws and regulations (formal or informal) are rules, and two, the thesis views institutions as distinct from organisations. However, it agrees that organisations, entities socially constructed to meet a specified goal, can be bound by, and can also formulate, rules, while certain structures, styles, practices or processes of an organisation can be institutionalised (e.g., the metaphor “manager”).

Based on this definition, and to be consistent with dominant traditions in the literature, this thesis decomposes institutions into formal and informal, and refers to these as the “software” that drives human/organisational behaviours and actions. In turn, it refers to organisations as the “hardware” or “structure” that acts (or executes). Following the position of Saleth and Dinar (2004) and others, rules can also be taken as the institutional environment and organisations as the institutional structure/arrangement. Both institutional environment and institutional arrangement are referred to in this study as the institutional framework. Consistent with the suggestion of others (e.g., Saleth and Dinar, 2004, 2008; Bandaragoda, 2000; Livingston, 2005), this study decomposes water institutions into three main components: water law, water policy, and water administration (or administrative rules). It recognises the RBDAs as a structure socially constructed to coordinate people, tasks, technologies and management practices at the river basin level in Nigeria to achieve basin water services provision in a sustainable manner. The features described here are relevant to this study in view of their theoretical significance and analytical implications. While this study is not alone, other authors (e.g., Easter and McCann, 2010; Goodman and Jinks, 2003; Scott, 1995; North, 1990; Hatch and Cunliffe, 2006; Horlemann and Dombrowsky, 2011; DFID, 2003; Kemper, 2003) also take organisations and institutions as two separate entities.



### **2.5.3 Institutional theories**

The emergence and application of various institutional theories have been described by Scott (1993, 2004), Ostrom (1991, 2011), and Ananda et al. (2006). As summarised in Table 2-8, there are two broad streams of institutional perspectives. The first is the political science and economic perspective (or institutions-as-rules) and the second is the sociology and organizational perspective (or institutions-as-norms). The two streams, which Bruton and Ahlstrom (2002) described as complimentary, share the notion that humans are limited in their cognitive and informational processing abilities, hence the need for institutions (Bruton et al., 2010), but they also have their differences (as shown in Table 2-9). Building on the work of others (e.g., DiMaggio and Powell, 1983, 1991; Meyer and Rowan, 1991; North, 1990), Scott (1995, 2003) integrated these two streams or institutions - formal and informal - into regulative, normative, and cognitive institutions (see also Hoffman et al., 2002; Bruton et al., 2010; Hoffman, 1999; Dahl and Nesheim, 1998; Li et al., 2007; Ahlstrom et al., 2003; Jentoft, 2003 for the same emphasis). According to Kshetri (2007), “Scott's pillar model is an umbrella concept and integrates various institutional theories and approaches from a wide variety of research disciplines such as economics, sociology and anthropology” (p. 41). However, the literature argues that the institutional environment of an organisation comprises all three aspects, although in varying degrees (Boon et al., 2009; Hoffman, 1999). This study therefore adopts the neo-institutional theory as a lens to expose the forces influencing the implementation of IWRM at the river basin level in Nigeria (the reasons for adopting this model are discussed in Subsection 2.5.7). The three elements of neo-institutional theory are discussed next.

Table 2-8 Historical development<sup>1</sup> of major institutional perspectives

	Earliest approach-engineering orientation <sup>2</sup>	Early institutional theories		Neo-institutional theories - open system models	Contemporary institutional theory
	<p>- Characterised by era of industrialisation and bureaucratisation</p> <p>- Work system focussing on improving technical efficiencies and managerial competencies</p> <p>For example, Adam Smith (1776) focussed on efficiencies inherent in division of labour in the workplace; Frederick Winslow Taylor (1911) reformed the work system from bottom up, sequencing tasks and arranging jobs into departments; Henri Fayol (1919/available in English in 1949) proceeded top down, devised principles for subdividing (e.g., into specialisations) and coordinating complex work systems (e.g., unity of command), and specified managerial responsibilities; Emile Durkheim (1893), Max Weber (1924), and Karl Marx (1867) focussed on the changing shapes and roles of formal organisations and the influences of industrialisation on the nature of work and its consequences for workers</p>	<p>See workplace as a system of informal patterns of cooperation and shared norms that regulate the relations of individuals to each other and define what the relations of individuals ought to be.</p> <p>Except some analysts, such as, Chester Barnard (1938) and Philip Selznick (1948) that viewed organisations not only as technical production systems but also as social systems attempting to survive in their environment</p>	<p><b>Closed system Ideas<sup>3</sup></b></p> <p>About three schools of thought:</p> <p>A: attention was focussed on decisions and decision makers</p> <p>e.g., the regulative/formal institutional systems</p> <p>B: attention was focussed on cognitive and social constraints resisting rational action</p> <p>C: the socio-technical model (from closed to open)</p>	<p><b>Political scientists/economists approaches</b></p> <ul style="list-style-type: none"> <li>- Contingency theory – looks at why organisational structures differ (e.g., as a function of their environments), that is, contingent upon their internal and external environments. It dictates the appropriate form of organisation and the best way to manage it.</li> <li>- Transaction cost – examines the economic insights of transactions (e.g., the exchanges of goods and services) towards minimising transaction costs, specifying the need for governance</li> <li>- Resource dependence theory – assumes that organisations are controlled by their environments, and looks at how organisations can reduce their dependences on resources (e.g., raw materials, labour, technology, outlets for products and services, etc) and gain power advantages</li> <li>- Historical institutional theory – seeks to evaluate policy and political life over time</li> <li>- Rational choice theory – looks at how organisations make choices under the influence of their internal and external environments (variants are - agency model, game theory)</li> </ul> <p><b>Sociologists/organisationists approaches</b></p> <ul style="list-style-type: none"> <li>- Network theory – examines interpersonal relations and relations among organisations with a view to understanding how they influence the organisation</li> <li>- Organisational ecology – focuses on organisational change and the patterns of success and failure by looking at a population of organisations of the same type that compete within a resource pool (synonymous with Darwin’s survival of the fittest principle)</li> <li>- Institutional theory – stresses the importance of social and cultural influences of the environment on organisations</li> </ul>	<p><b>Regulative assumption</b></p> <p><b>Integrated model of institutional theories, decomposed into pillars of institutions:</b></p> <ul style="list-style-type: none"> <li>- regulative</li> <li>- normative</li> <li>- cognitive</li> </ul> <p><b>Normative and cognitive assumptions</b></p>

Timeframe <sup>4</sup>	- from late eighteenth century till date	- starting from the 1930s to 1940s	- from 1950s up to 1980s	- from 1980s to the present	- from 1995 to the present
Focus	Technical and managerial forces shaping workplace	Workplace, such as, industrial design, management, employee psychology, or work groups	Focus on the determinants of organisational structure, e.g., workplace actors (such as, employees, managers, etc.) and processes (such as, motivation, control, etc.)	Focus attention on both the internal and external environments and organisations themselves did become the subject of investigation, or viewed as actors	Multiple levels – from world system to subunit of organisation
Limitation/assumptions	Social forces were weakly accounted for	Organisations were less viewed as social actors	Scant attention was given to the environment within which the organisations operated	Different theories focussing on different aspects of the complex situation, ranging from world system to societal, organisational field, organisational population, organisation, and organisational subsystem	Each pillar has its own underlying assumptions and emphases (e.g., regulative – actions are driven by formal and informal rules, normative – actions are driven by values and norms; cognitive – actions are driven by shared beliefs and common logics), and varying levels of institutional pillars are present in a social phenomenon.
Sources	Pugh (1971), Hrebiniak (1978), Scott (1995, 2004), Dale (1959), Hatch (1997), Kakabadse et al. (1987), Jackson and Morgan (1978)	Scott (1995, 2004), Hatch (1997)	Scott (2004), Huczynski and Buchanan (2007)	Scott (1995, 2004), Tosi (1984), Hatch (1997), Hrebiniak (1978), Thoening (2007), Oliver (1991)	Scott (1995, 2003, 2004), Bruton et al. (2010), Hoffman (1999)

<sup>1</sup> The difference between closed system perspective and open systems perspective is that the former assumes influencing factors are internal, while the latter assumes they are affected by environmental factors

<sup>2</sup> Factories were introduced in the late eighteenth century (Hatch, 1997)

<sup>3</sup> Organisations were treated as if their internal operations were the sole concern of management

<sup>4</sup> The dates indicate the period when the perspective became noticeable

Table 2-9 The differences between the two streams of institutional theory (Adapted from Bruton et al., 2010)

Characteristics	Institutions-as-rules	Institutions-as-norms
Assumptions	People make decisions based on the convenience and standardisation of rules and agreements	People make decisions based on heuristics because of cognitive limitations and take action based on conventions and preconscious behaviour
Drivers of human behaviours	Rules and procedures, formal control	Social norms, shared cultures, cognitive scripts and schemas
Basis of legitimacy	Formal rules, procedures, and agreements	Morally governed and socially bound beliefs
Relationship between institutions and organisations	External institutions create structures for organisations	Organisations adjust and conform to values and limits prescribed by society's institutions

#### 2.5.4 The elements of institutions (or neo-institutional theory)

Regulative institutions represent frameworks provided by formal and informal rules. The formal institutions include frameworks provided by laws, regulations, government policies, guidelines and standards and other instruments that attempt to influence organisational action, and ultimately how they must behave. On the other hand, the informal institutions consist of traditional laws, customs and traditions guiding social interactions which may not have been codified but are generally held by the people to influence action and performance. The regulative process involves the setting of laws and regulations as well as their enforcement (Ahlstrom and Bruton, 2002). Organisations accede to these regulative frameworks for reasons of avoiding penalty for noncompliance (Hoffman, 1999; Edelman and Suchman, 1997). In the context of this study, the regulative institutions consist of extant legal and regulatory frameworks in Nigeria that guide the operations of basin-based water resources management organizations as well as informal rules relating to water and/or social interactions. In Nigeria, the RBDAs are public organisations (or structures) established by law and whose operations are guided by legal and regulatory instruments (see also Section 1.2). By law, the RBDAs are saddled with the responsibility of developing and managing water resources as well as providing water services at the river basin level. Besides the RBDAs, there are regulatory bodies (e.g., the Federal Ministry of Water Resources (FMWR)) and other water-related national and international organisations in basin-based water resources management in Nigeria (as conceptualised in Section 1.4). The regulative instruments suggesting the involvement of these bodies in the water resources sector in Nigeria are also seen as part of the regulative institutions that can influence these organisations to behave in certain ways and its subsequent effect on the implementation of IWRM at the river basin level.

Normative institutions are less formal or codified. They define the roles or actions that are expected of individuals (Scott, 1995). Normative institutions are composed of values and norms (Bruton et al., 2010). Organisations often conform to these because they dictate social values, ethics and role

expectations which organisations then internalise (Edelman and Suchman, 1997). The basis of conformance is thus derived from social obligations, rooted in social necessity or in what an organization should be doing (Bruton et al., 2010). A non-conformance can result in societal and professional sanctions (Kshetri and Dholakia, 2005). The carriers of normative institutions include the public, news media, customers, organisations within the same field, departments within the same organisation, donor organisations, trade and professional bodies that can use social requirements to induce certain organisational behaviour or curb the implementation of others. For the purpose of this study, the normative component focuses on values and norms (which specify things that are acceptable, how things should be done, and appropriate ways to pursue them) including role expectations held by the RBDAs, other water-related organisations, users of basin water resources, and the society which can influence the implementation of IWRM at the river basin level in Nigeria.

Cognitive institutions are the most informal, and are most closely associated with, but not limited to, culturally supported habits that influence performance and actions. They consist of shared conceptions that constitute social actors and actions as well as the nature of social reality and create the frame through which meaning is made (Scott, 1995). As a consequence, the internal interpretative processes of social actors are shaped by taken-for-granted rules, cultural rules and frameworks, as well as beliefs that are established among individuals through social interactions (Scott, 1995). Organisations conform to cognitive institution because it makes certain forms of action seem more natural, credible, and appropriate than others. Although carried by individual members, conformance to cognitive institutions is due to habits, and organisations/individuals may not even be aware that they are conforming. In the context of this paper, the cognitive institutions include widely held or shared beliefs, cognitive scripts and moral templates, as well as taken-for-granted assumptions and common logics/practices which may influence the implementation of IWRM at the river basin level in Nigeria.

According to Bruton and Ahlstrom (2002), culture is a principal means by which cognitive and normative institutions operate and influence behaviours. While cognitive institution is resistant to change, regulative and normative institutions are more prone to change. These three elements of institutions form a continuum, moving from the legally enforced (regulative) to the taken for granted (cognitive), and from the conscious to the unconscious intention of actions (Hoffman, 1999). However, according to Edelman and Suchman (1997), organisations also look up to the extant legal and regulatory frameworks for both normative and cognitive guidance.

Although the harmonisation of institutions is not without controversy (Hirsch and Lounsbury, 1997; Scott, 2004), it has been widely used in the literature and has proved helpful for institutional analytical purposes (Bruton and Ahlstrom, 2002). In order to be meaningful, Judge et al. (2008) suggest that all the three elements of institutions must be considered together to obtain a comprehensive understanding of a social phenomenon. Hatch (1997) on the other hand, asserts that institutional perspectives do accumulate rather than newer perspectives replacing older ones, thereby adding further to the umbrella nature of the three pillars of institutions. Also in the words of Mills and Murgatroyd (1991), rules are cumulative. However, on how institutions work, there is a consensus in the literature that institutions construct social actors as well as constrain and enable action (Ghosh, 2008; Hatch and Cunliffe, 2006; Judge et al., 2008; Oskarsson et al., 2009; Scott, 1995; Kibaroglu and Ünver, 2000).

### **2.5.5 Analytical (ir)relevance of the institutional elements**

As explained above (see also Table 2-8, last column), neo-institutional theory rests on three pillars: a regulative, a cognitive, and a normative pillar. Buanes and Jentoft (2009) argue that every institutional analysis should focus on the substance and function of these pillars. However, the literature asserts that neo-institutional theory is increasingly being employed as a conceptual lens (or theoretical framework) for studying the interaction between organisations and their environments (Bada et al, 2004; Dahl and Nesheim, 1998; Hu et al., 2007). As noted by various scholars (Boon et al., 2009; Covaleski et al., 1993; Beck and Walgenbach, 2003; DiMaggio and Powell, 1983; Bada et al. 2004), organisations are embedded in institutional environments and as a result many organisational activities (e.g., structures and behaviours) are expected to respond to rules and structures that hold in these environments. Additionally, a number of other authors (DiMaggio and Powell, 1983; Zucker, 1977; Boon et al., 2009) assert that organisational practices are influenced by internal and external institutional environments, which compel organisations to be aware of and adapt to the environment in order to gain support and legitimacy. This view is in agreement with others (Burns and Scapen, 2000; Dacin, 1997; Peters and Pierre, 1998) who note that both external and internal forces can press an organisation to change their routines. In the view of Ahlstrom et al. (2003) and Dahl and Nesheim (1998), the three different sources of institutional influence on organizations could exert pressure through different carriers, which may be related to culture, social structure or routine. However, neo-institutionalism has limits as well. For example, Kraatz and Zajac (1996) assert that neo-institutionalism may be limited in providing explanations

on organisational inertia and institutional isomorphism (organisations becoming similar) in highly institutionalized organizational fields. Hasselbladh and Kallinikos (2000) also comment that questions relating to how some techniques or ideas achieve a remarkable recognition while others are not, or why some administrative activities diffuse relatively unchanged while others are renegotiated cannot be answered by neo-institutionalism.

### **2.5.6 Examples illustrating the application of neo-institutional theory**

Unlike emerging countries such as China and India that have been subject to the application of neo-institutional theory, there is a paucity of theoretical and empirical focus on Nigeria (Ijose, 2009). Despite the recognition of the need to consider institutional factors in water resources management research (Cortner and March, 1987), Poirier and de Loe (2010) and Blomquist et al. (2004) argue that institutional theory has not been widely applied in the field of water resource management investigations. Drawing on the search made (see Subsection 2.5.1b), existing literature on water-related institutional studies largely falls into three categories: (a) studies that provide general guidelines and evaluation criteria in the form of checklists for conducting institutional analysis without much attention to procedure for data gathering, analysis, and interpretation (e.g., Ingram et al., 1984; Minton et al., 1980; Bandaragoda, 2000), (b) studies that provide an example of analytic framework to explore linkages between physical and social systems and their influence on water policy formulation, water utilisation and sustainable rural livelihoods (Kurian, 2004), and (c) literature that provides example of the benefits and drawbacks of a participatory approach to institutional analysis (e.g., Cortner and Marsh, 1987). However, some of these authors have folded together their notions of organisations and institutions (e.g., Ingram et al., 1984; Minton et al., 1980; Cortner and Marsh, 1987).

However, research on water/natural resources management has utilised a wide variety of analytical perspectives. For example, Luzi (2010) has used a combination of rational choice model, organisational process model and governmental politics model to analyse actors, institutions, and decision-making processes in the Egyptian water sector and explore implications for the design and implementation of water policies. Other authors (Olubode-Awosola, et al., 2006; Akpabio et al., 2007; Okafor, 1985; Adams, 1985; Rowntree, 1990) have employed a gap analysis to look at functional performance gap of organisational roles and activities in the water sector. Clement (2009) used the institutional analysis and development (IDA) framework (which is based on the rational choice theories) to analyse state afforestation policies shortcomings in Vietnam. Clement

et al. (2007) have used the IDA framework to explore the impact of government policies on land use in Northern Vietnam to understand farmers' decisions, and Devi and Sawad (2008) also used the framework to explore the gaps between formal rules and informal rules in the Hyderabad Metro Water Supply and Sewerage Board in India. Similarly, Hardy and Koontz (2009) used the IDA framework to determine how rules at varying levels of action affect the formation and implementation of informal rules at different levels. Prager et al. (2011) have explored the institutional settings surrounding agricultural soil management in ten European countries using Institutions of Sustainability (IoS) framework. Medugu et al. (2008) have evaluated current government policies in combating desertification and mitigating the effects of drought in Nigeria using policy analysis. In the case of Bernauer and Siegfried (2008), policy performance metric was used to explore success/failure in international water governance in the Naryn/Syr Darya basin in Central Asia, while cultural theory was used by Gyawali (1999) to examine the situation behind single-mission policies and the costly surprises and impasse they are prone to. Others (e.g., Saleth and Dinar, 2008) have employed a quantitative approach to look at institution – performance interaction based on an institutional decomposition and analysis (IDA) framework.

Drawing upon the reviewed literature (see also Subsections 2.5.1b and 2.5.1c), there is a paucity of application of neo-institutional theory to water resources management investigations. A reason could be that the procedure for conducting neo-institutional analysis has not been made sufficiently explicit in water resources management research. This proposition agrees with Cortner and Marsh (1987) and Minton et al. (1980) who stress that the field of institutional analysis has evaluative criteria that are much less readily defined, in part because many of the criteria are not quantifiable and in part because the area of the study is new. The proposition also agrees with Araral (2010) who asserts that “there are still numerous methodological challenges in studying water institutions” (p. 7). Nonetheless, there is ample research illustrating the application of neoinstitutional theory in other fields of learning which has provided useful lessons for this study. Table 2-10 summarises a number of such studies.



Table 2-10 Summary of findings on the application of the institutional pillars

Author (s)	The field author(s) is/are writing about	Findings
Kshetri and Dholakia (2005)	E-commerce	Regulatory, normative, and cognitive institutions, such as laws, relationships, culture, and habit shaped the diffusion patterns of the Internet and e-commerce in South Asia.
Li et al. (2007)	Organisation corruption	The interactions among the three institutional pillars had a limiting effect on organisational corruption and that institutional pillars should never be ignored in the struggle against organizational corruption at societal level.
Amine and Staub (2009)	Social marketing	Local regulatory, normative, and cognitive systems were sources of barriers that placed additional burdens on women who desired to become entrepreneurs or expand their entrepreneurial business.
Kshetri (2007)	Business and information technology	The nature of regulative, normative and cognitive institutions in origin and destination countries influenced the amount and types of jobs that are outsourced.
Trevino et al. (2007)	Organisation management	Cognitive and normative pillars were better indicators of inward foreign direct investment than those that were legitimized primarily through the regulative pillar.
Leaptrott (2005)	Family business	The presence of heterogeneity in family businesses resulting from differences in their structure and symbolic nature could be explained by the three pillars of institutions.
Muthuri and Gilbert (2010)	Organisation studies	Institutional forces – regulatory, normative and cognitive – influenced the focus and form of corporate social responsibility practice in Kenya.
Ijose (2009)	Organisation studies	Regulative, cognitive and normative had significant bearing on successful transfer of quality management and customer focus practices of an integrated global oil and gas multinational corporation to a developing country subsidiary.
Tang (2009)	Entrepreneurship	The relationships between individual characteristics (such as human capital, social capital, and social skills) and opportunity recognition were influenced by the institutional environment in which those opportunities were discovered.
Currie and Finnegan (2011)	Public health	Institutional forces (culturally embedded norms and values) acted as a driver and an inhibitor to introducing enabling technologies in the health-care environment in the UK National Health Scheme
Dirsmith et al. (2000)	Organisation studies - auditing	Institutional pressures (public interest, Congressional interest, media interest) had a direct significant influence on the bureaucratic form of coordination
Teo et al. (2003)	Organisation studies	All three institutional pressures - mimetic, coercive, and normative – had a significant influence on organizational intention to adopt financial electronic data interchange

### 2.5.7 Why adopting neo-institutional theory for framing the analysis of this study

Although the choice of theory to guide analysis is subjective as argued by Walsham (2006), contemporary institutional theory as distilled by Scott is adopted for framing the data collection and analysis of this study for three reasons:

- (a) the finding derived from the critical literature review and analysis (see Section 2.4) has strongly suggested that institutional (regulative) forces are constraining IWRM implementation in Nigeria. While this may not be the only force acting, neo-institutional theory has suggested that

other institutional elements may be impinging on an organisation to influence performance and actions. This suggests the need for further investigation using the neo-institutional theory as a guide

- (b) the RBDAs are viewed as open systems (e.g., looking at their functional mandates; see Section 1.2) which are capable of being affected by internal and external environmental forces. According to the literature, an organization is embedded in both its own internal institutional environment and in an external institutional environment (Chizema and Buck, 2006) and forces within both environments can shape organisational performance (Greening and Gray, 1994; Hu et al., 2007). The literature also maintains that organisations develop internal rules (formal and informal) and their own cultures (Mills and Murgatroyd, 1991), while organisational culture may be formed by influences from both inside and outside the organisation (Meyerson and Martin, 1987). Neo-institutional theory, therefore, maintains that organisational performance can be shaped by the pressures in the institutional environments. As Mignerat and Rivard (2009) put it, neo-institutional theory has the potential to help researchers understand how institutions influence organisational activities and their ability to apply management techniques. (e. g., in the case of this study, IWRM). However, there is an understanding that the three pillars of institutions are particularly suitable in the context of deciphering the impact of internal and external influences on organisational behaviours operating based on the open systems model (Weerakkody et al., 2009; Fogarty, 1996; Hoffman, 1999; Zucker, 1987; Trevino et al., 2007).
- (c) as identified in Subsection 2.3.3c, part of the framework implementing IWRM in practice - water policies, water laws, and water administration - coincide with the theoretical framework of the three pillars of neo-institutional theory. According to Bandaragoda (2000), laws, policies and administration are the three pillars of the institutional framework for implementing IWRM in a river-basin context. As the literature maintains (see also Subsection 2.5.3), at the centre of the three pillars of neo-institutional theory are three forces that drive organisational performance - regulatory, cognitive, and normative (DiMaggio and Powell, 1983; Scott, 2008; Ahlstrom et al., 2003). These forces aim at explaining how organisational behaviours and actions are influenced by the political, cultural, and social forces surrounding it.

Notwithstanding the above, Walsham (2006) argues that the choice of theory must be informed by the level of insights it has to offer and the extent to which it enables the researcher to gain good

insights from the field data. Once selected, according to Silverman (2001), the theory should provide a framework for critically understanding a particular phenomenon. Since this study is both diagnostic (that is, it aims to identify the forces influencing IWRM implementation and the environments within which they are embedded) and strategic (that is, it aims to suggest measures which might improve implementation) in nature, it will employ the three institutional pillars to reach these targets by looking at the responses of the RBDAs to their internal and external environments in the implementation of IWRM. This study will achieve this by exposing the forces (e.g., regulative, social and cultural) exerted by the environments on the RBDAs and other organisations involved in water activities at the river basin level in Nigeria. Since the main aim of this study is to identify the forces influencing IWRM implementation and the environments within which they are embedded, this suggests that the more appropriate analytical view of the institutional pillars does not correspond to the classification of institutions into process but, instead, into types (or entities) (this argument is further pursued and illustrated in Subsection 2.5.8). The classification of institutions into types focusses analytic attention on dependent and independent variables, also referred to as the variance approach (Scott, 1995), or causal and outcome variables (Huczynski and Buchanan, 2007). This approach attempts to establish a causal relation with all the three pillars, often simultaneously, although not necessarily equally, and the IWRM elements.

### **2.5.8 Approaches to institutional analysis**

According to the literature (Scott, 1994, 1995; Morris, 2005; Mohr, 1982), there are two approaches to institutional analysis: the process and the variance. As Scott (1994) emphasized, variance approaches “attempt to determine what factors influence the outcomes observed” (p. 83), resting on the assumption that causes and outcome are related in unchanging ways (Huczynski and Buchanan, 2007; Mohr, 1982). Illustrating further, Scott (1995) argues that variance approaches address the question “why did the observed effect happen?” (p. 64), while by contrast, the process approaches address the question “how did the observed effect happen?” (p. 65). In the process approaches, time ordering is of importance, while in the variance approaches, time ordering is viewed as immaterial to the observed effect (Scott, 1995; Mohr, 1982). Variance institutional approaches offer definitive explanations unlike process approaches that offer probabilistic explanations (Huczynski and Buchanan, 2007). Table 2-11 provides examples of studies that have used the variance institutional approach. Although these examples are not water resources or IWRM related, they have provided useful analytical insights for this study which can be deployed to water resources management research that has adopted the variance approach as an analytical tool. The variables expected to explain change in the dependent variable (IWRM elements) are referred to as the independent

Table 2-11 Examples of studies<sup>1</sup> that have used the variance institutional approach

Author(s)	Independent variable(s)	Dependent variable(s)	Unit of analysis	Focus of the study	Form of data/Tool used
Amine and Staub (2009)	Local regulatory, normative, and cognitive elements	Women's desire to become entrepreneurs or to expand an entrepreneurial business	Societal level	Investigates the institutional forces that persistently constrain the activities of actual and potential women entrepreneurs in sub-Saharan Africa	Qualitative/Interpretive
Kshetri and Dholakia (2005)	The three institutional pillars – regulative, normative, and cognitive	The diffusion pattern of Internet and e-commerce	Societal level	Examines the drivers and inhibitors of the Internet and e-commerce in South Asian countries	Qualitative/Interpretive
Kshetri (2007)	The three pillars of institutions – regulative, normative, and cognitive	The amount and types of jobs that are outsourced	Organisation field	Explores the drivers of offshore business process and information technology outsourcing	Qualitative/Interpretive
Dahl and Nesheim (1998)	Regulative and normative elements of institutions	The extent of the downsizing and the strategies employed.	Firm level	Investigates the impact of regulative and normative elements in the societal environment on downsizing strategies in Norwegian firms	Qualitative/Interpretive
Hu et al. (2007)	Regulative, normative, and cognitive elements	The implementation of security practices and protocols	Firm level	Investigates the effect of external and internal organizational influences that shape organizational actions for improving information systems security	Qualitative/Interpretive
Bruton and Ahlstrom (2002)	Regulative, normative, and cognitive elements	Venture capital actions in China	Firm level	Explores the effect of the institutional environment on China's venture capital industry	Qualitative/Interpretive
Braunscheidel et al. (2011)	The three elements of neo-institutional theory	Motivation for the adoption and implementation of Six Sigma	Organisation field	Explores the forces motivating the adoption and implementation of Six Sigma	Qualitative/Interpretive – explanation building
Bada et al. (2004)	The three elements of neo-institutional theory	Business process reengineering implementation	Firm level	Investigates the forces influencing a Nigerian Bank in the implementation of a radical information technology and organisational change programme	Qualitative/Interpretive
Ayyagari et al. (2008)	Legal origin, endowments, culture, and ethnic	Property rights and firm variables (- size, ownership,	Organisation field	Examines the effects of several institutional and firm level factors	Quantitative/Regression-based simultaneous analysis of

	fractionalisation	legal organisation, and industry sector)		on firms' perceptions of property rights protection	variance approach
Heikkila (2004)	Legislatively authorized institutional arrangement (or AB3030 plans), County ordinance, special groundwater management district, and adjudicated groundwater basin	Conjunctive water management projects	Organisation field	Assesses the institutional factors that can facilitate conjunctive management	Quantitative/Logit regression model supplemented with Boolean comparative logic
Edelman (1990)	Legal environment (- proximity to the public sector, size of the organisation, and presence of personnel offices)	The creation of non-union grievance procedures	Organisation field	Looks at the effect of legal environment on the expansion of due process in organisational governance	Quantitative/Event-history analysis using constant-rate, Gompertz and time-period models
Meyer et al. (1994)	Institutional environment – Federal, State, and Local funds	Administrative and teaching positions, and administrative and teaching expenditures	Organisation field	Examines the effects of the institutional environment on the administrative component of American public school districts	Quantitative/Multivariate regression analyses
Zucker (1977)	The degree of institutionalization	Cultural transmission, cultural maintenance, and cultural resistance to change	Intraorganisational	Investigates the effects of the degree of institutionalization on three aspects of cultural persistence: generational uniformity of cultural understandings, maintenance of these understandings, and resistance of these cultural understandings to change	Quantitative/Analysis of variance
Li et al. (2007)	The institutional pillars of regulative, normative, and cognitive	Organizational corruption at the societal level	Societal level	Studies the effects of institutional elements on organizational corruption at the societal level	Quantitative/Cox regression (or proportional hazards regression)
Muthuri and Gilbert (2010)	The three elements of institutions – regulatory, normative and cognitive	The focus and form of corporate social responsibility practice in Kenya	Organisation field	Explores the extent to which institutions influence the corporate social responsibility orientation of companies operating in Kenya	Quantitative/ descriptive statistics and Chi-squared tests
Mezias (1990)	Institutional environment – economic variables, the designated accounting principles standard setting agency, and the professionals	the method of financial reporting practices used by firms	Organisation field	Looks at the institutional factors that explain the financial reporting practices used by large for-profit organisations	Quantitative <sup>2</sup> /Descriptive statistics and maximum-likelihood logistic regression
Heikkilä (2013)	Regulative, cognitive and normative institutional dimensions	e-Human Resources Management's (HRM's) practices and e-HRM's strategic potential	Firm level	Explores the effects of institutional factors on western-based e-HRM practices in multinational corporations' subsidiaries in China	Qualitative/Interpretive

				and the consequences these have for e-HRM realising its strategic potential	
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<sup>1</sup> Some of the qualitative analysts are not particularly clear about the dependent variable(s), the unit of analysis, and the analytical tool(s) used

<sup>2</sup> Data were also collected through interviews

variables. In this study, these independent variables are the contemporary pillars of institutions (or the elements of neo-institutional theory). The independent variables are the explanatory variable, which this study holds as the presumed cause of changes in the attributes of the dependent variables. This means that the contemporary pillars of institutions are the precursor variables that exert effects which describe the extent of IWRM implementation (the outcome). Thus, an assumption of this study is that the dependent variable is contingent on the independent variables. This assumption has analytical relevance in this study.

The variance approach, which can be undertaken deductively (that is, one deduces from theory the cause(s) of event(s) (Morris, 2005; Perdicoulis and Glasson, 2006), views institutions as entities, and focuses attention on abstract variables, independent and dependent, and attempts to establish their causal relations (Scott, 1995). A causal relationship exists between independent and dependent variables (Walizer and Wienir, 1978; Neuman, 2003; Shadish et al., 2000) if: (a) the cause preceded the effect, (b) they are associated, and (c) no other plausible explanations for the effect other than the cause. This research is in compliance with the first two, while the third factor has been taken into consideration in this study. For instance, institutions were already in place in Nigeria before the introduction of the Dublin-Rio (or IWRM) principles in 1992 and its subsequent adoption in Nigeria. In the literature (Ananda et al., 2006; Trevino et al., 2007; Lowndes, 2001), it is generally believed that a strong positive correlation exists between institutions and their ability to constrain or empower action. To ensure that the relationship between the dependent variables and the independent variables is non-spurious (thereby eliminating threats to internal validity), other variables which could influence the implementation of IWRM in practice will have to be considered in the analysis, and assumed to vary along with other independent variables. The literature refers to these other variables as the confounding variables (Bordens and Abbott, 1988; Yin, 2009). However, as deduced from Subsection 2.3.3c, water infrastructure is explained as a candidate that could influence IWRM implementation in practice apart from the institutional frameworks (see also Figure 2-3). Thus, water infrastructure is selected in this study to serve as a confounding variable and tested for. This approach aligns with the open systems model adopted by this study. As the literature (Scott, 1994; Kirby and Sebastian, 1998; Fogarty and Dirsmith, 2001) asserts, besides the neo-institutional elements, the technical environment can also influence organisational performance. This study considers water infrastructure development as one of those elements in the technical environments that is relevant to this research.

In summary, this study has identified neo-institutional theory and variance approach as a useful analytical tool for this research. Examining the Nigerian water sector profile through their cognitive, normative, and regulative effects offers a useful framework to provide a better understanding of the forces influencing the implementation of IWRM at the river basin level in

Nigeria as well as the environments within which they are rooted, and what measures might be suggested to improve implementation. Consistent with the suggestion of Eisenhardt (1989), this theoretical framework will help to guide the study design and the process of data collection (e.g., in the design of the questionnaire instruments) and analysis. While all theories have limits, following Walsham (1995), “the scaffolding [i.e., the theoretical framework] is removed once it has served its purpose” (p. 76). During the field process, this study will look at what the rules say on IWRM implementation, and what the actors do in practice to explain the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded. However, a causal link will be established based on the central assumption of this study that rules are socially constructed to specify actors, drive action and/or inaction. Similar to the observation of Kirby and Sebastin (1998), this study sees neo-institutional theory as a toolbox of institutional theories (see also Table 2-8). However, consistent with the suggestion of Walsham (1995, 2006), the role of neo-institutional theory in this study followed three key distinct applications: (a) as a guide to the study design, (b) as part of the process of data collection and analysis; and (c) as a guide to the presentation of findings. How the findings of previous sections inform the remainder of this study is presented next.

## **2.6 Implications for the remainder of the study**

A critical review of the literature and analysis of Nigeria’s experiences with the implementation of IWRM at the river basin level (Section 2.4) has strongly suggested that (i) there are weaknesses in IWRM implementation in Nigeria, and (ii) the institutional element responsible for the weaknesses in implementation can be traced to the regulative forces. This preliminary or exploratory investigation has provided some evidence that reinforces the existence of the problem that this study set out to research. The presence of other institutional elements (e.g., normative, cognitive) was not detected in the reviewed data, and also the impact of the RBDAs’ culture on IWRM implementation is yet to be known. However, the non-detection does not suggest that these forces are absent in the case of Nigeria. Since the RBDAs do not act in isolation, other issues poorly understood from the review include the contributions of organisations and institutions in the external environment of the RBDAs to IWRM implementation, and the position of the informal water laws and socio-economic factors on IWRM implementation. To expose these other forces, this study has identified neo-institutional theory/variance approach as a useful analytical tool. The process followed in the use of variance institutional approach for data analysis is discussed in Subsection 3.5.2.



Furthermore, since the literature is limited in the amount of information it can offer, the IWRM elements (or categories) obtained from the literature review and analysis (see Figure 2-4) are expanded (see Table 2-12) based on insights derived from the IWRM literature (in Section 2.3) for the field investigation. This helps to ensure that the IWRM elements (or indicators) used in this study are literature based. In order to have a thorough analysis and better understanding, the extent of IWRM implementation and the forces influencing each of the IWRM elements will be investigated based on this template (Table 2-12).

Table 2-12 The IWRM elements to be investigated during fieldwork in Nigeria

S/No.	Main theme (or indicator)
a.	Integrated planning
b.	Non-government stakeholder participation
c.	Government stakeholder participation
d.	Inclusion of women
e.	Cost recovery
f.	Water as a social good
g.	Polluter pays principle
h.	Data collection
i.	Functional decentralisation (that is, between the Federal Ministry of Water Resources (FMWR) and the RBDAs)
j.	Human capacity building
k.	IWRM principles and approaches embedded in legal and regulatory frameworks
l.	Conflict management
m.	Water laws enforcement

Since the RBDAs are the focal organisations for this study, coupled with insights derived from Sections 2.3 and 2.4 as well as from the open systems perspective (which situates an organisation within the wider external environment) that this study has adopted, Table 2-13 presents the primary (carried forward from Chapter 1) and the subordinate research questions and the chapters addressing them. It was explained in Subsection 1.4.2 that a number of subordinate questions will be asked after gaining a better understanding of Nigeria's experiences with the implementation of IWRM and the institutional (analytical) framework relevant to this research from the review of the literature in Chapter 2. The subordinate research questions have an added advantage of assisting in the formulation of the study design, data gathering and analysis, as well as in the presentation of research findings.

Table 2-13 Research questions and the chapters addressing them

Primary research questions	Subordinate research questions	Chapter
1. How effectively is IWRM being implemented at river basin level in Nigeria?	1a. What is the extent of implementation of IWRM at the river basin level in Nigeria?	4
2. If there are weaknesses in the implementation of IWRM in Nigeria, why is this so?	2a. What are the effects of the internal environment of the RBDAs on the implementation of IWRM in Nigeria?	4
	2b. What are the contributions of the external environment of the RBDAs to IWRM implementation at the river basin level in Nigeria?	5
3. How might the quality of IWRM implementation in Nigeria be improved?	3a. What are the key forces influencing IWRM implementation at the river basin level in Nigeria?	6, 7
	3b. Looking at those key forces, in which ways can the quality of implementation of IWRM in basin-based water resources management in Nigeria be improved?	8

As illustrated in Table 2-13, the external environment refers to activities outside the RBDAs, while the internal environment refers to activities directly performed by the RBDAs. However, since this partitioning also gives way for analytical convenience, in the discussion of findings (in Chapter 7), forces within the external environment of the RBDAs will be illustrated along the operational and the macro environment; thus becoming consistent with the initial conceptual framework (Figure 1-1). To expose the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded, this study has adopted the contemporary institutional theory as a guide. In specific terms, the variance institutional approach will be used to uncover the forces influencing the implementation of IWRM at the river basin level in Nigeria with a view to suggesting measures which might help to improve implementation. The task set now is to develop a research process to be used to realise the study's main aim, that is: to identify the forces influencing the implementation of IWRM as an approach to improve basin-based water resources management in Nigeria and the environments within which they are embedded.

## **3 RESEARCH PROCESS**

### **3.1 Introduction**

Chapter 1 has provided the background context of this research together with the conceptual framework and the research questions in Chapter 2 which form the basis of the research design. This chapter discusses the research process adopted in the study. It looks at the approach and the research methodology adopted to achieve Objectives d, e, and f (see Section 1.5). Case study was used as a research strategy to understand and explain issues related to IWRM implementation at the river basin level in Nigeria. The chapter explores two purposively selected cases [the Ogun-Oshun River Basin (O-ORB) and the Benin-Owena River Basin (B-ORB)] and rationalises the sampling strategies and the research methods used for data collection in each case. Data were collected using three qualitative research methods: documents, semi-structured interviews, and direct observations. Section 3.2 describes the research approach, and the philosophical assumptions adopted in this study in Section 3.3. The research methodology employed is illustrated in Section 3.4. The chapter then looks at the techniques which were used for analysing the data in Section 3.5. It discusses issues related to validity, reliability, and triangulation in Section 3.6, generalisation in Section 3.7, and ethics in Section 3.8. The chapter closes with a summary in Section 3.9.

### **3.2 Research approach**

#### **3.2.1 The distinction between qualitative and quantitative research approaches**

Both qualitative and quantitative approaches are two different social research strategies. Bryman (2001, p. 20) defines a research strategy as “a general orientation to the conduct of social research”. When comparing the two research strategies, Neuman (2006) highlights that qualitative and quantitative research use different ranges of techniques and have different roles. Other scholars describe qualitative research as one that collects data in the form of words and observations, as opposed to numbers (Neuman, 2006; Robson, 2002; Johnson and Harris, 2002; Miles and Huberman, 1994), while the analysis is based on the interpretation of these data as opposed to statistical manipulation (Leech and Onwuegbuzie, 2007; Marshall and Rossman, 1999; Strauss, 1987). Its intent, according to Creswell and Clark (2007) and Partington (2002), is to learn respondents’ views about a particular phenomenon. Conversely, quantitative research is referred to as a strategy that emphasises quantification in the collection and analysis of data (Bryman, 2001). However, Crotty (1998) asserts that the dichotomy between qualitative research and quantitative research only occurs at the level of methods.

While qualitative and quantitative research approaches share same basic principles of science, they also differ in some significant ways (Table 3-1). Commenting on the differences, Snape and Spencer (2003) argue that qualitative approach: provides a deeper understanding of the social world, is based on a small scale sample, uses in-depth data collection methods, and allows new issues and concepts to be explored. However, one major criticism against quantitative research strategy revolves around the view that a natural science model is inappropriate for studying social reality (Bryman, 2001).

Table 3-1 Comparison of qualitative and quantitative research approaches

	Qualitative	Quantitative
Ontological assumption	Idealism	Realism
Epistemological assumption	Constructionism	Objectivism
Claims	Reality is socially constructed and subjective  Observer is part of what is being observed  Value-mediated	Reality is external and objective  Observer is independent of the reality  Science is value free
Research strategies	Phenomenologies, narratives, ethnographies, case studies, grounded theories	Surveys, experimental designs
Research methods	Open-ended questions, interviews, observations, documents, and audio-visual data	Closed-ended questions, numeric data
Data format	Texts	Numbers
Data analysis	Text and image analysis	Statistical analysis

(Compiled from Creswell, 2009; Blaikie, 2007)

Although Snape and Spencer (2003) assert that the decision to choose a specific approach should be informed by its suitability to proffer answers to the research questions, the conceptual and theoretical frameworks of this study in addition to the research questions have guided the choice of qualitative research process to accomplish the main aim of this study. This process has helped to obtain a greater understanding of issues related to IWRM implementation in Nigeria and to explain the forces influencing implementation at the river basin level as well as the environments within which they are embedded. Creswell (1998) claims that the qualitative approach offers the potential of eliciting understanding and meaning, while its analysis, according to Ryan et al. (1992), represents the interpretations of social reality. Although both qualitative and quantitative approaches can be used to analyse institutions (see Table 2-11), the forces influencing IWRM implementation in Nigeria as well as the environments within which they are rooted are still poorly understood. This justifies the use of qualitative orientation. Leedy and Ormrod (2005) highlight that a qualitative approach offers the potential of learning about an unknown or poorly understood situation in their natural context and capable of offering an in-depth understanding of a social phenomenon (Robson,

2002; Casley and Lury, 1981). Ritchie (2003) also adds that qualitative research can be used to explore influences or investigate the root factors causing a phenomenon to occur.

### **3.2.2 The distinctions between inductive and deductive research approaches**

Although qualitative research is often regarded as an inductive approach (Snape and Spencer, 2003), it is also important to clarify the research approach adopted to elicit evidence from the data by this study in terms of whether it is inductive or deductive. A number of scholars have differentiated between the two approaches (Mossholder et al., 1995; Gephart, 1993; Ryan and Bernard, 2003; Carrera-Fernández et al., 2013). According to these scholars, the inductive approach seeks to identify theoretical constructs from the data, while the deductive approach seeks to understand the data in terms of pre-existing theoretical concepts. Although both approaches may be used for various purposes, inductive approach is more appropriate to studies where the researcher focuses on emergent meanings or themes, while deductive approach is better suited for developing data-based assessments of particular constructs. Although both induction and deduction have their weaknesses (Cohen and Manion, 1985), in the case of this study, both approaches are used in an integrated manner. The dominant approach followed is the deductive approach because of the theoretical frameworks (see Chapter 2) which this study has adopted to serve as a guide to answering the study's research questions and realise the main aim. A number of authors have argued that it is possible to combine these two approaches in a study, thereby capitalising on their strengths and minimising their weaknesses (Blaikie, 2007; Cohen and Manion, 1985; Carrera-Fernández et al., 2013). This study's research process explored and collected data from different organisations in the water sector in Nigeria using multiple sources of evidence: documents, semi-structured interviews, and direct observations. These sources provided the platforms for the use of both inductive and deductive approaches in extracting the evidence needed to understand and explain issues related to IWRM implementation at the river basin level in Nigeria.

### **3.2.3 The logic of enquiry adopted in this study**

As briefly illustrated in Chapter 1, this study adopted the retroductive logic of enquiry as a guide to answer the research questions and realise the main aim. Blaikie (2000) explains that the extent to which any logic of enquiry can be used to answer a particular research question partly depends on the form of the question, and maintains that there is no one ideal logic to gain knowledge of a social reality. Nonetheless, it is possible to argue their relative advantages. As shown in Figure 3-1, other logics of enquiry, which are ruled out in this study, include: inductive, deductive, and abductive. The difference between retroductive and deductive logics is that the latter tests for relationships between variables, while the former tries to establish the existence of a particular causal

Logic	Science or philosophy	Assumption		Procedure	Strenght
		Ontological	Epistemological		
Retroductive	Scientific realism (Structuralist/Social constructionist)	Real/Constructed	Subjective	<pre> graph LR     A([Observed event(s)]) --&gt; B([Develop conceptual model])     B --&gt; C([Collect data and analyse])     C --&gt; D([Establish the existence of the conceptual model])           </pre>	Useful to answer "why" questions
Deductive	Critical Rationalism	Real	Subjective	<pre> graph LR     A([Observed event(s)]) --&gt; B([Select/Construct theory])     B --&gt; C([Deduce hypotheses from theory])     C --&gt; D([Collect data and analyse])     D --&gt; E([Test hypotheses])           </pre>	Useful to answer "why" questions
Inductive	Positivism	Real	Objective	<pre> graph LR     A([Collect data and analyse]) --&gt; B([Develop generalisations])     B --&gt; C([Use the law-like generalisations to explain reality])           </pre>	Useful to answer "what" questions, weak in answering "why" questions
Abductive	Interpretivism/Hermeneutics	Constructed	Subjective	<pre> graph LR     A([Gather relevant knowlegde on the observed event(s)]) --&gt; B([Redescribe into scientific account])     B --&gt; C([Develop theory])     C --&gt; D([Test theory])           </pre>	Useful to answer both "what" and "why" questions

Figure 3-1 The logics of enquiry in social science research (Compiled from Blaikie, 1993, 2000, 2007, 2010; Neuman, 2003)

mechanism. In turn, inductive logic tries to establish universal generalisation to be used as pattern explanations and is weak in answering “why” questions, while abductive tries to understand and describe social life in terms of actors’ motives and accounts.

The retroductive research logic has two versions (Blaikie, 2007): the structuralist, which posits that social structures are external to social actors, and the social constructionist, which maintains that realities are socially constructed. Although both versions are not mutually exclusive (Blaikie, 2007), this study being a social inquiry adheres more closely to the social constructionist style of reasoning for the production of new knowledge. As shown in Figure 3-1, the social constructionist version shares same ontological and epistemological assumptions with the abductive logic. However, in social constructionist approach, Blaikie (2000) points out that the aim of the researcher is to identify the mechanism that is responsible for producing the observed event. In this study, the use of retroductive style is further justified on the ground that the study is not designed to generate or test a theory or concept, but to identify the forces influencing the implementation of IWRM at river basin level in Nigeria and the environments within which they are embedded. Thus, the existence of causal factors provides the explanation for the influence. The retroductive style of reasoning is based on a cyclic (or iterative) process, which has been advocated for use in both the natural and the social sciences (Blaikie, 2007, 2010).

### **3.3 Philosophical assumptions of the study**

In order to distinguish the research approach followed in this study further than quantitative and qualitative stance, Bryman (2001) argues that a research can also be distinguished with ontological and epistemology perspectives in which an investigator cannot claim to be both realist/objectivist and idealist/constructionist at the same time. Crotty (1998) asserts that a clear description of the research process of a study will help to ensure its soundness and make its findings convincing. Since the process of explaining the issues surrounding IWRM implementation in Nigeria requires an in-depth understanding, the philosophical and theoretical perspectives adopted in this study are illustrated in Figure 3-2. As shown in Figure 3-2, Crotty (1998) and Blaikie (2010) emphasise that ontology could sit alongside epistemology to inform the theoretical perspective that guides a study, the methodology, and the methods that were adopted. The choice and the rationale for selecting this approach are discussed next.

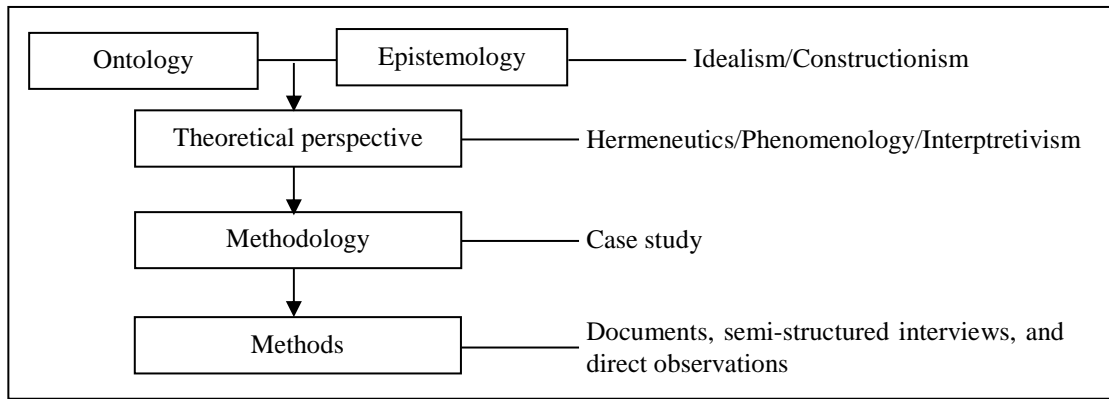


Figure 3-2 The study’s philosophical assumptions, theoretical perspective, methodology and methods (Compiled from Crotty, 1998; Yin, 2009; Blaikie, 2010)

### 3.3.1 Ontology

Blaikie (2007) asserts that ontology is concerned with the nature of what exists, while Crotty (1998, p. 10) refers to ontology as the “study of being”. Ontology seeks to answer three different questions: whether social reality exists independently of human conceptions and interpretations; whether there is a common, shared, social reality or multiple context-specific realities; and whether social behaviours are governed by invariant laws that are immutable or that can be generalised (Snape and Spencer, 2003). In general terms, there are three distinct ontological positions (Table 3-2).

Table 3-2 Ontological positions

	Claim
Realism	There is an external reality which exists independently of social observer’s beliefs and understanding of it
Materialism	There is a real world but only material features of that world hold reality. The observer’s values or beliefs do not shape the material world
Idealism	Reality is only knowable through the human minds and through socially constructed meanings

(Compiled from Snape and Spencer, 2003)

Although these three extreme positions (see Table 3-2) have been continually debated and modified in the literature, this study adheres most closely to what Guba and Lincoln (1994) and Snape and Spencer (2003) describe as the “relativist school” – a variant of idealism. This view accepts that reality is socially constructed and that there is no single reality. It rejects both the realist perspective of social reality (Bryman, 2001) and the materialist ontological assumptions (Guba and Lincoln, 1994). Following the relativist version, this study emphasises the importance of respondents’ interpretations and accepts that their different privileged positions will yield different types of knowledge. The underlying aim of the researcher is to capture and convey an in-depth understanding of the nature of that multifaceted reality derived from the subjective ideas and experiences of the social actors in the water sector in Nigeria on issues related to IWRM



implementation. The idealist orientation accepts that there are major differences between natural and social reality (Blaikie, 2007) and that reality is constructed by social actors interacting in social situations (Wisker, 2008; Blaikie, 2007).

### 3.3.2 Epistemology

Cresswell (1998, p. 76) highlights that epistemological assumption is concerned with “the relationship of the researcher to that being researched”. Epistemology provides “a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate” (Crotty, 1998, p. 8). It seeks to answer two different questions, namely: how can we know about the world? What is the relationship between the observer and what can be known? (Denzin and Lincoln, 1998; Snape and Spencer, 2003). In general terms, there are three distinct epistemological positions (Table 3-3).

Table 3-3 Epistemological positions

	Claim
Objectivism	That reality exists independent of the social observer
Subjectivism	That meanings, which are rather imposed on reality by the social observer, do not necessarily come out of interactions between reality and social observers
Constructionism	That reality is socially constructed and there are multiple meanings even in relation to the same phenomenon

(Compiled from Crotty, 1998)

Blaikie (2007) argues that the constructionist epistemological assumption, which rejects the subjectivist epistemological ideas, makes a logical combination with the idealist ontology. Cresswell (2009) on the other hand, asserts that constructionism is best suited to qualitative research. Therefore, the epistemology assumption of this study draws on the constructionists perspective, which indicates that reality is socially constructed (Blaikie, 2000) and the researcher is the vehicle by which this reality is revealed (Andrade, 2009). This epistemology rejects the objectivism perspective of understanding and explaining social reality, demonstrating that both the researcher and the researched are actively participating in the creation of meaning. The constructionists’ orientation, according to Blaikie (2007, p. 22), claims that “knowledge is neither discovered from an external reality nor produced by reason independently of such a reality. It is the outcome of people having to make sense of their encounters with the physical world and with other people”. The aim of the researcher is to understand and reconstruct people’s perspective about reality trying to reach a common agreement.

However, constructionism has two branches (Blaikie, 2007; Robson, 2011; Schwandt, 1994): constructivism (or radical constructivism), which refers to the meaning-giving activity of the

individual mind; and social constructionism, which refers to meaning-giving that is socially shaped rather than individual. Since this study is about social enquiry, which seeks the collective generation and transmission of meaning, the social constructionists' epistemological stance was adopted. This allowed the researcher to engage with the actors in the water sector in Nigeria in an attempt to understand their perspectives about issues around IWRM implementation in Nigeria. All the research subjects were purposively selected and probed in order to obtain a better understanding of: how effectively IWRM is being implemented in Nigeria; the forces influencing implementation as well the environments within which they are embedded; and how IWRM implementation might be improved. These understandings were achieved using effective methods of data analysis and interpretation – textual and variance institutional analytical approaches.

### **3.3.3 Theoretical perspective**

The theoretical perspective, which encapsulates the ontological and epistemological assumptions of a research, expounds the researcher's way of looking at the social world and making sense of it. Crotty (1998, p. 3) defines theoretical perspective as “the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria”.

There exist a number of theoretical perspectives that can inform the choice of a research methodology and its methods, including (Blaikie, 2007; Crotty, 1998): positivism, critical rationalism, hermeneutics, interpretivism, critical theory, phenomenology, social science realism, ethnomethodology, structuration theory, and feminism. The choice to select will largely be influenced by the nature of knowledge to be produced and the research questions to be answered since each perspective has its own way of proffering answers to research questions (Blaikie, 2007). In this study, the research questions to be answered and the main aim to be accomplished have informed the adoption of a string of theoretical perspectives shown in Figure 3-2. The adopted theoretical perspectives, which are discussed next, are in agreement with the philosophical assumptions of this study. For example, both constructionism and interpretivism share the goal of understanding social reality from the frame of reference of those who live it (Schwandt, 1994; Cresswell, 2009). The constructionism paradigm is also intertwined with phenomenology (Crotty, 1998) and hermeneutics (Robson, 2011).

#### **a Hermeneutics**

Hermeneutics, which rejects the application of the methods of the natural sciences to social sciences, is concerned with the interpretation of texts towards an understanding (Blaikie, 2007). May (2001) defines hermeneutics as “the theory and practice of interpretation”. Hermeneutics

provides a useful method for the analysis of texts and other documents to seek understanding of human actions (Robson, 2011). The main goal of hermeneutics is to understand the meaning of texts in reference to the whole sentence and to reconstruct the shared meaning. This implies that in hermeneutics, the researcher also draws on their own experiences to understand those constructs of others (Singh and Dickson, 2002; McQueen and Knussen, 2002).

Adopting the hermeneutics philosophy, the researcher entered the social world of social actors involved in water activities in Nigeria, collected relevant legal and regulatory documents as well as other publications and interview texts to understand: the extent of IWRM implementation in Nigeria; the forces influencing actors' behaviours in the implementation of IWRM and the environments within which they are embedded; and how implementation might be improved. Interpretations were enhanced through a critical review and analysis to provide answers to the research questions as well as realise the main aim of this study.

## **b Phenomenology**

Bryman (2001, p. 14) defines phenomenology as “a philosophy that is concerned with the question of how individuals make sense of the world around them and how in particular the philosopher should bracket out preconceptions in his or her grasp of that world”. Phenomenology explores the lived experiences and the ways social actors understand those experiences to develop a worldview (Marshall and Rossman, 1999). It focusses on exploring how actors experience social reality – how they perceive it, describe it, and make sense of it from their frame of reference (Holstein and Gubrium, 1994; Bogdan and Taylor, 1975; Robson, 2002; Mayoh and Onwuegbuzie, 2013). In this process, the researcher sets aside personal experiences in order to understand those constructs of the social actors (Cresswell, 2009; McQueen and Knussen, 2002), or tries to abide by the maxim “don't argue with the social actors”. There are two approaches that could be employed to look at a phenomenon: the direct approach, in which interviews can be used to harvest those meanings that guided social actors' actions and interactions; and the indirect approach, in which the social researcher becomes a participant. Although this study followed the interview approach due to the numbers of actors to be surveyed, Marshall and Rossman (1999) assert that interviews could focus on: past experience, present experience, or a combination of the two.

Adopting the phenomenology orientation, issues related to IWRM implementation were treated as a phenomenon and investigated from the different actors in a direct way using multiple-qualitative research methods (– semi-structured interviews, direct observations, and documents) to explore and

understand actors' lived experiences on the IWRM issues being investigated. The use of semi-structured interviews facilitated interactions between the researcher and the researched to obtain a greater understanding from different perspectives regarding IWRM implementation in Nigeria. Since the researcher had little experience about the workings of the RBDAs and other organisations involved in water activities at the river basin level in Nigeria, the interview technique was used to harvest both present and past lived experiences of the social actors coupled with document review. This study made sense of the collected data and drew a common consensus from which findings and conclusions as well as measures that might improve IWRM implementation were proposed in order to add a contribution to both IWRM and neo-institutional literature. However, objectivity in the interpretations of the data and findings was ensured because the researcher had no direct interests or stake in IWRM implementation nor affiliated with any of the RBDAs or organisations involved in basin-based water resources management in Nigeria.

### **c Interpretivism**

Interpretivism, which has its origins in hermeneutics and phenomenology, also rejects the methods of the natural sciences as appropriate for the social sciences (Blaikie, 2007; Bryman, 2001). Neuman (2006, p. 88) refers to interpretive approach as “the systematic analysis of socially meaningful action through the direct detailed observation of people in natural setting in order to arrive at understandings and interpretations of how people create and maintain their social worlds”. Interpretivism sees reality as being socially constructed and seeks to understand the meaning of social reality from the point of view of those who experiences it. The main goal of the interpretative philosophy is to enable the social researcher grasps the subjective meanings of social actions, and acknowledges that the researcher should be seen as presenting an interpretation of other peoples' interpretations (Bryman, 2001).

Adopting an interpretative stance, the researcher surveyed the operators of the river basins, national and international water-related actors and collected in-depth information from these actors (through the use of semi-structured questionnaires, documents and observations) on: how they perceived issues related to IWRM implementation in Nigeria; and the reasons why social actors acted in a particular way. This information is essential to proffer answers to the research questions and accomplish the main aim of this study.

### **3.4 Research methodology**

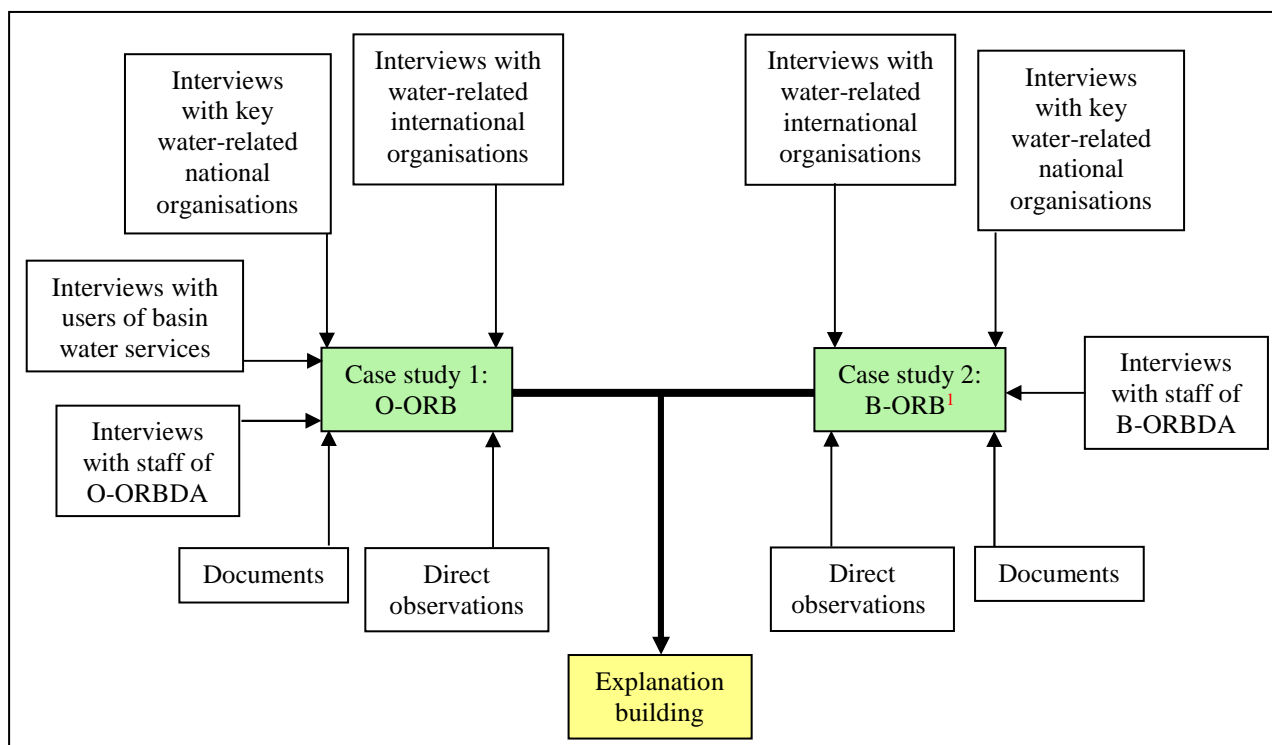
Following from the argument about reality (ontological assumption), to the nature of the relationship between the researcher and the researched (epistemological assumption), and the roles of theoretical perspective emerge the methodological assumption which describes how the researcher conceptualises the entire research process. Bogdan and Taylor (1975, p. 1) defines research methodology as “the process, principles and procedures by which we approach problems and seek answers”. Crotty (1998, p. 3) asserts that a research methodology is “the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes”. The research methodology addresses the question: how can the researcher go about uncovering social reality? (Guba and Lincoln, 1994). In qualitative research, Creswell and Clark (2007) point out that the researcher deliberately selects research strategies or approaches that best help in finding answers to the purpose of the study. In the case of this study, the choice of research methodology is influenced by the philosophical assumptions and the theoretical perspectives adopted and its ability to proffer answers to the research questions.

The research methodology explains the methods adopted and the rationale behind their selection. As emphasised by Wisker (2008), the research methodology “is the rationale supporting the choice of methods”. The case study approach was adopted as a research methodology to answer the research questions and accomplish the main aim of this study. The study took the river basin as the unit of analysis, also referred to as the “case” (Yin, 2009, p. 29), and two cases were selected to investigate issues related to IWRM implementation at the river basin level in Nigeria. The rationale behind the selection of case study methodology and research methods is explained in detail in the next subsections. However, the objectives of each case study, the procedures and methods used are summarised in Table 3-4 and Figure 3-3.

Table 3-4 Research methodology

Case study 1: O-ORB and Case study 2: B-ORB	
Aim	<ul style="list-style-type: none"> <li>To identify the forces influencing the implementation of Integrated Water Resources Management as an approach to improve basin-based water resources management in Nigeria and the environments within which they are embedded</li> </ul>
Objectives <sup>1</sup>	<ol style="list-style-type: none"> <li>Execute a critical analysis of the institutional framework for IWRM implementation in Nigeria</li> <li>Identify the key forces influencing the implementation of IWRM at the river basin level in Nigeria, and</li> <li>Offer proposals on measures which might improve IWRM implementation in Nigeria</li> </ol>
Procedure	<ol style="list-style-type: none"> <li>Identify the case river basins and the various actors (or organisations) involved in basin-based water resources management in Nigeria</li> <li>Undertake a series of in-depth interviews with the operators of each river basin to: understand how effectively IWRM is being implemented, identify the forces influencing implementation as well as the environments within which they are embedded, and understand measures that might be suggested to improve implementation</li> <li>Conduct a series of in-depth interviews with key water-related national and international actors to (i) understand how effectively IWRM is being implemented, and (ii) explore the nature as well as the effects of their involvement on IWRM implementation.</li> <li>Build explanations with the aim of: describing how effectively IWRM is being implemented, explaining the forces influencing its implementation as well as the environments within which they are embedded, and proposing measures which might help to improve implementation.</li> </ol>
Methods of data collection	<ul style="list-style-type: none"> <li>Semi-structured interviews</li> <li>Direct observations</li> <li>Documents</li> </ul>
Methods of data analysis	<ul style="list-style-type: none"> <li>Textual</li> <li>Variance institutional approach</li> </ul>

<sup>1</sup> The research objectives (brought forward for illustration purposes from Section 1.5) are nested (that is, the achievement of one will inform the other)



<sup>1</sup> As revealed in Chapter 4, there are no water users under the direct command of the B-ORBDA in the B-ORB

Figure 3-3 Sources of evidence used in this study

### **3.4.1 The research strategy - case study**

Yin (1994, p. 13) defines case study research as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. However, Walsham (1993) claims that the most appropriate method for conducting empirical research in the interpretive tradition is the case study. The method is described by Robson (2002) and Casley and Lury (1981) as capable of offering an in-depth understanding of a phenomenon and providing rich data (Gray and Starke, 1984). In the literature, the choice of a case study as a research strategy is being underpinned by a number of factors. Yin (2009) argues that case studies are preferred when (a) “why” and “how” questions are being asked, (b) the researcher has little control over events, and (c) the focus is on a contemporary event within a real-life situation. Hartley (2004) asserts that case study can be used to study organisational behaviours, and to understand issues relating to human behaviours. The use of a case study approach is important for this study to understand and explain: the extent of IWRM implementation in Nigeria; the forces influencing its implementation as well as the environments within which they are incorporated; and measures which might help to improve implementation.

The case study research strategy enabled the researcher to utilise multiple sources of data, which, in turn, helped encourage internal validity through triangulation (Leedy and Ormrod, 2005; Layder, 1993; Hartley, 2004). Siggelkow (2007) and Walsham (1995) posit that case study can richly describe the existence of a phenomenon. This has also supported the use of a case study as a research strategy for this study. However, there are various criticisms against case study as well. One of the most critical criticisms relates to the difficulty in generalising findings to a larger population (Yin, 2009; Blaikie, 2010; Punch, 1998).

In case study-based interpretive research, two different roles can be identified (Walsham, 1995): as an outside observer or as an involved researcher. An involved researcher can be through neutral participation or action research. Walsham (1995) argues that neither of these involvements should be viewed as objective, since the process of collection and analysis of data involves the researcher's own subjectivity. The merit of involved approach through neutral participation which this study adopted, according to Walsham (1995), is that the researcher may be seen as not having a direct personal stake in various interpretations and outcomes, and thus actors may be relatively free in expressing their views, provided a rapport of trust can be established. A disadvantage of this role is that the researcher may be limited in access to certain data which are regarded as too sensitive to be shared with outsiders. The reason for adopting a neutral participation is that the researcher does not

want to be seen as influencing the interpretations of those actors who are being researched, or violate ethical considerations. Besides this, river basin protocols in Nigeria may not even accept action research.

Since it is essential to delineate the unit of analysis around which the IWRM issues are to be explored, Yin (2009) suggests four types of case study designs based on a 2 x 2 matrix. These include: single-case (holistic) designs, single-case (embedded) designs, multiple-case (holistic) designs, and multiple-case (embedded) designs. A major distinction between single and multiple case designs lies in the number of cases to be investigated, while between holistic and embedded designs lies in the number of units of analysis (Yin, 2009).

While the conduct of a multiple-case design can be expensive and time consuming (Yin, 2009), this study adopted the multiple case (embedded) designs to explore IWRM implementation issues in two different cases and contexts in Nigeria (Figure 3-4). Although the literature posits that a single case study can provide an in-depth understanding of a phenomenon (Siggelkow, 2007; Walsham, 1995), despite this ability, single case study results are more difficult to generalize and therefore, transferability can only be suitable for cases with similar situations (van Gossom et al., 2011; Gilbert, 2008; Neuman, 2006). Multiple case studies on the other hand, typically provide a stronger base for understanding (Yin, 1994, 2009), and can enable comparisons that clarify whether an emerging finding is simply idiosyncratic to a single case (Eisenhardt, 1991). Also, due to the fact that many different actors and institutions are involved in water resources management at river basin level in Nigeria, there is a need to have sub-units of cases to cover relevant different actors and contexts. Miles and Huberman (1994) assert that the causal factors of any particular event are always multiple, hence the need to consider multiple units. However, while this study is not alone, Hu et al. (2007) have used a case study methodology to explore the role of external and internal influences on information systems security from the perspective of neo-institutional theory.



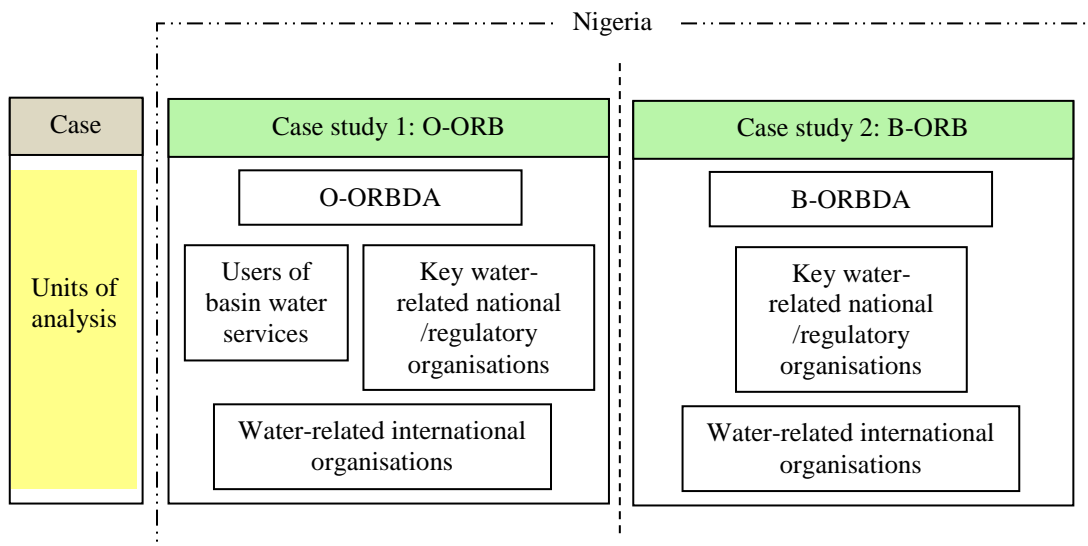


Figure 3-4 A multiple-case (embedded) design employed in this study

In order to characterize the purpose of this study, Blaikie (2000, 2010) identifies eight forms of research as exploratory, descriptive, understanding, explanatory, predictive, change, evaluative, and impact assessment. Robson (2002) and Neuman (2006) comment that social research may address multiple purposes, but one purpose is usually dominant. This suggests that a research project may subscribe to more than one purpose at the same time. Based on the research questions to be answered, the purposes of this study can be described as exploratory, explanatory, and change. According to Robson (2002), exploratory research explores what is happening and tries to seek new insights. Neuman (2006) and Yin (2009) assert that explanatory research answers the “why” question, while change research looks at the “how” question. Furthermore, Blaikie (2000) adds that “why [research] questions ask for the causes of, or the reason for, the existence of ...” (p. 61), while the “how [research] questions are concerned with bringing about change, with practical outcomes and interventions” (p. 61). Blaikie (2000) also supports the idea that “how” questions with respect to suggesting interventions are best answered by change research. Explanatory research, also referred to as causal research (Yin, 2009; Zikmund, 1991), builds on exploratory and descriptive research and goes on to identify the reason something occurs (Neuman, 2006; Blaikie, 2000).

This research is based on two case studies which set out to achieve three purposes: the first, exploratory, to discover the extent of IWRM implementation at the river basin level in Nigeria; the second, explanatory, to identify the forces influencing IWRM implementation and the environments within which they are embedded; and the third, change, to suggest measures which might improve implementation. Blaikie (2007, p. 28) argues that research questions form a sequence: “answers to

‘what’ questions normally precede ‘why’ questions, and answers to both of these types of questions precede ‘how’ questions”.

Also in terms of type, McIntyre (2005) categorises research into three types: basic (or pure), which focuses on the production of new knowledge; applied, which offers practical solutions to real-life problems; and evaluation, which addresses the monitoring of policies and programmes as well as assesses their outcomes. However, being a Federal Government funded research project designed to look at IWRM implementation issues in Nigeria, this study can be described as applied research. Its main ambition is to identify the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded, towards a solution.

### **a Case studies description**

The fieldwork of this research was undertaken in Nigeria in line with the study’s funding requirements. An interpretive case study of two river basins - the O-ORB and B-ORB – was purposively selected and surveyed to explore in-depth issues about IWRM implementation in Nigeria. The selection of the two river basins, which are located in the south-western part of Nigeria (see Figure 3-5), was guided by the following criteria: (a) time constraints, (b) possibility of gaining access, (c) familiarity with the culture of the people, (d) the insecurity situation in Nigeria, and (e) financial constraints. The two basins were selected with the aim of investigating the same phenomenon, but under different contexts – such as: basin water hydrology, socio-economic conditions, internal governance arrangements, which may account for dissimilarity in organisational practices (Gooderham et al., 1999), level of infrastructural development, and possible sub-cultural differences. In terms of what could be similar, both river basins are located within the same agro-ecological zone (see Figure 3-5 and Table 3-5 for more information about the study areas), and have the same regulatory body as well as legislative instrument setting them up (just like the other 10 RBDAs in Nigeria). Employing a case study strategy facilitated the use of multiple research methods: semi-structured interviews, direct observations, and documents to look at the IWRM issues from different perspectives. Furthermore, since the focal organisations (the RBDAs) do not act in isolation, in order to have a bigger picture of the issues surrounding IWRM implementation (as captured in Table 2-12), the study also explored the role of other water-related national and international organisations in the selected river basins including the users of basin water services and the effects of their involvement on IWRM implementation. Consistent with the observation of Hukka et al. (2007), the complexity inherent in water management means that there is no way a single approach could meet all the research needs, thus the need for a variety of approaches.

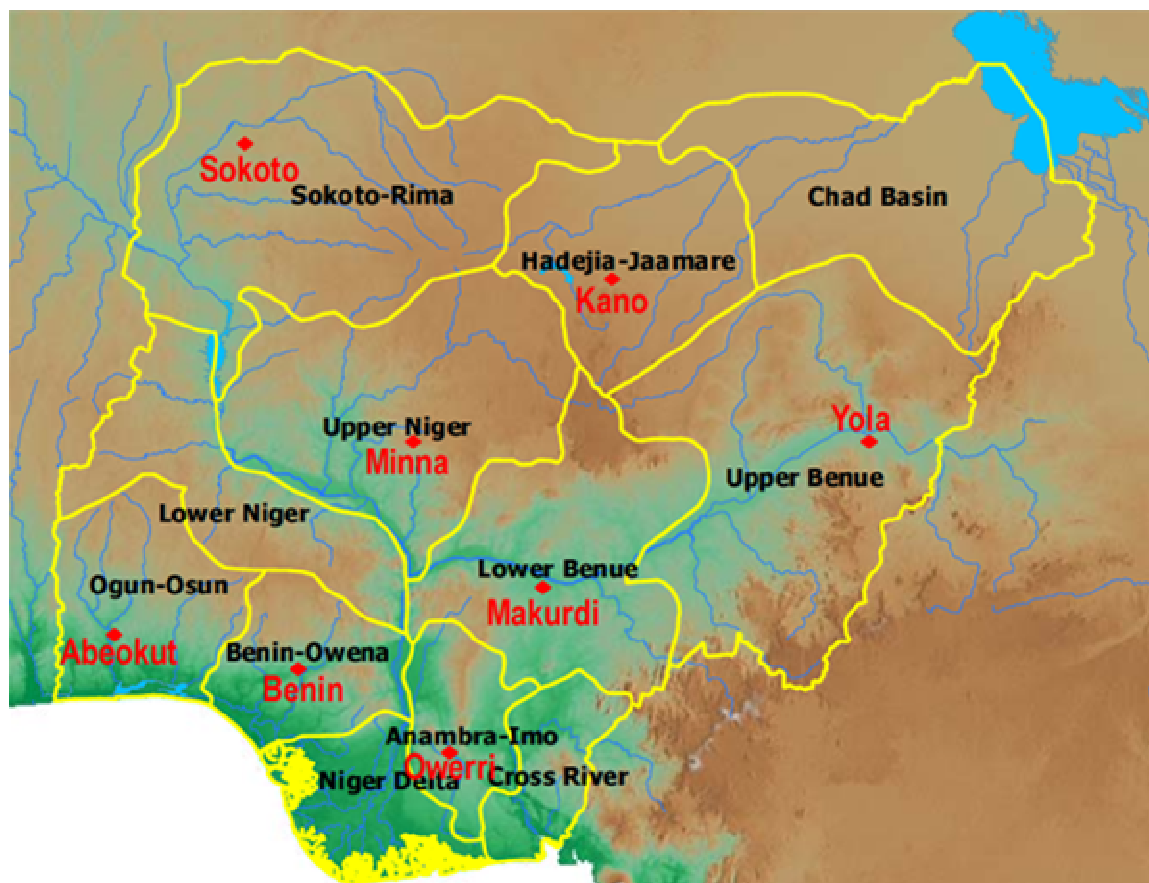


Figure 3-5 A map of Nigeria showing the 12 river basin areas including O-ORB and B-ORB (Source: FMWR, 2012a)

Table 3-5 Some important features of the case river basins

S/No.	Item	O-ORB	B-ORB	Source(s)
1.	Basin area (km <sup>2</sup> )	66,264	59,787.3 <sup>1</sup>	O-ORBDA <sup>2</sup> (2011a)/ B-ORBDA <sup>3</sup> (1981)
2.	Population (x 10 <sup>3</sup> , 2010 estimate)	24,526	10,201 <sup>4</sup>	FMWR (2012a)
3.	Average annual rainfall (mm)	1,565		FMWR (2012a)
4.	Mean annual air temperature (°C)	26.4		FMWR (2012a)
5.	Mean annual potential evapotranspiration (mm)	1,314		FMWR (2012b)
6.	Total annual runoff (estimated, in km <sup>3</sup> )	12.25 <sup>5</sup>		FMWR (2012b)
7.	Surface water potential (internally generated, estimated, in km <sup>3</sup> )	40.7 <sup>5</sup>		FMWR (2012b)
8.	Groundwater potential, estimated, in km <sup>3</sup> )	19.8 <sup>5</sup>		FMWR (2012b)
9.	GDP per capita in Nigeria (in 2010 estimate)	185,400 Naira (or US\$1,250)		FMWR (2012b)
10.	Water availability (km <sup>3</sup> )		n.a <sup>6</sup>	
11.	Arable land (ha)		n.a	

<sup>1</sup> When the B-ORB was for both old Ondo and Bendel States

<sup>2</sup> Ogun-Oshun River Basin Development Authority

<sup>3</sup> Benin-Owena River Basin Development Authority

<sup>4</sup> Excluding that part of Delta State in the B-ORB

<sup>5</sup> For western littoral hydrological area

<sup>6</sup> Not available

## **b Sampling methods**

Whether a quantitative or qualitative form of social research, it is vital to design and select samples from a population for a study. The literature has characterised sampling methods into two types (Ritchie et al., 2003a; Bryman, 2001; Blaikie, 2010): probability (e.g., simple random sampling, systematic random sampling, stratified random sampling, multi-stage sampling, cluster sampling) and non-probability (e.g., purposive (or criterion based) sampling, theoretical sampling, opportunistic sampling, accidental or convenience sampling, snowball (or chain) sampling, quota sampling). Probability sampling suggests that each potential sample within a population has an equal chance of being selected. The aim is to provide a statistically representative sample (Ritchie et al., 2003a). The non-probability sampling suggests that each of the potential samples has no equal chance of being selected. Samples, which are not intended to be statistically representative, are deliberately selected by the researcher to meet certain criteria. While qualitative research uses non-probability sampling strategies for selecting samples, Ritchie et al. (2003a) suggest that a purposive sampling approach is adequate for case study research and can offer the opportunity to select cases/units that best meet the main aim and research questions which the researcher wishes to study. While purposive sampling can be used to explore an issue in-depth (Law et al., 1998) and gather rich data (Morse, 1994), a disadvantage of this method is that respondent's construct may be unrepresentative (Zikmund, 1991). Also, the selection of sampling units is subjective (Guarte and Barrios, 2006; Tongco, 2007).

In terms of sample size, Law et al. (1998) contend that the main indicator of sample size in purposive sampling is often the point at which redundancy, or theoretical saturation of data, is achieved. However, Andrade (2009) and Hodkinson (2008) argue against the notion of saturation as rather unclear or misleading (in theory, saturation is reached only when further data collection effort does not add any more information). Since qualitative research samples are small (Ritchie et al., 2003a), Diesing (1971, cited in Bruton and Ahlstrom, 2002, p. 240) emphasises that six respondents often provide such a data sufficiency. Besides the attempt for a reasonable justification for ending data collection, the literature is also thin on how saturation can be achieved in practice. However, to increase a study's sample size, the literature suggests the use of snowball technique (Ritchie et al., 2003a). Drever (1995, p. 36) describes snowball sampling techniques thus: "when you approach them [the key informants] or interview them, you ask them to suggest other people to whom you should speak to gain a full and balanced picture".

A sample is therefore formed as a chain in which the initial contact is asked to suggest other people who could contribute to the study. Although there are no rules about how many is enough (Partington, 2002), the snowball sampling technique can be used to ensure a comprehensive sampling (Muthuri and Gilbert, 2010; Andrade, 2009), when there is difficulty in identifying respondents from a given population (Robson, 2002), and can also be used to cross-check the different perceptions of different actors about the same issue (Pratt and Loizos, 1992). A drawback of snowball sampling is that samples may be unrepresentative of the population (Bryman, 2001)

However, purposive sampling can be applied to both the selection of the case to study and the sampling of respondents within the case (Cresswell, 1998). This study adopted the non-probability sampling strategies - purposive and snowball techniques – to select and investigate the cases/units to answer the research questions and realise the main aim of this study. For this study, Table 3-6 illustrates the sample size per organisation, while Table 3-7 presents the number of respondents and the sampling technique used per organisation.

Table 3-6 Organisational sample size

S/No.	Actor	Sample size (in terms of number of organisations selected or surveyed)	Remarks
1.	RBDAs	2	
2.	Users of basin services	2 per basin	Limited to those in the active part of the river basins <sup>1</sup> . For example, farmers were categorised as a user (or an organisation).
3.	National: - Federal Ministries - State Ministries - Local Governments	3 3 per basin 3 per basin	The Federal, State, and Local Government Ministries/Agencies responsible for water resources, agriculture, and the environment. In the case of States and Local Governments, these were limited to those in the active part of the river basins.
4.	International	2	Limited to those active at the operational level

<sup>1</sup> The active parts of the river basins represent those areas where the presence of the RBDAs is felt

Table 3-7 Number of respondents and the sampling techniques used

Level	Case study 1	No. of respondents	Case study 2	No. of respondents	Sampling techniques
Basin operator	O-ORBDA	33	B-ORBDA	27	Purposive and snowballing
National actors	Users of basin water services, Local Governments, State and Federal Ministries/Agencies responsible for agriculture, and environment	29	Local Governments, State and Federal Ministries/Agencies responsible for agriculture, environment, and water resources	52	Purposive and snowballing
FMWR and NIWRMC <sup>1</sup> = 15					
International actors <sup>2</sup>	State Coordinating Offices for the World Bank (Fadama III), UNICEF-assisted Rural Water Supply and Sanitation, and the World Bank-assisted Urban Water Supply Project	4	State Coordinating Offices for the World Bank (Fadama III), and UNICEF-assisted Rural Water Supply and Sanitation	5	Purposive and snowballing

<sup>1</sup> Nigeria Integrated Water Resources Management Commission

<sup>2</sup> The desk offices of these organisations (the World Bank and UNICEF) in the case river basins were visited. Several letters sent to their headquarters in Abuja/Lagos requesting for their participation in the research were not honoured; although the UN building in Abuja-Nigeria suffered from a bomb attack on Friday, 26 August 2011. Also, the Lagos State Water Corporation did not honour the request to participate in the research.

### c Sampling procedure

As indicated in Table 3-7, two key parameters were sampled: the organisations and the respondents. A purposive sampling strategy was used to identify samples from the river basins and the national water-related organisations, while the water-related international organisations active in the Nigerian water sector at the river basin level were obtained from the interview data of the national actors. To sample respondents within each organisation, both purposive and snowball sampling were followed. Employing the purposive sampling technique, key informants were contacted, defined by Morse (1994) and Merkens (2004) as one who has the knowledge and experience the researcher requires, the ability to reflect, the time to be interviewed, is articulate, and willing to participate in the study.

The national water-related organisations were purposively selected to represent those responsible for agriculture, water resources, and the environment (at the three levels of government in Nigeria – Local, State, and Federal), while the international organisations operating at the river basin level were identified from the interview data and limited to only two - the World Bank and UNICEF - due to time and financial constraints. Nonetheless, the purposive sampling approach gave the opportunity to as many organisations as possible to be involved in the research (see Table 3-8). To identify key respondents, the Chief Executive Officer of each organisation was first contacted to

both gain approval and to suggest initial respondent (s) (or key informants) that were most appropriate to the study. The suggested persons were contacted to set up an appointment and after the interaction to solicit for other person(s) who he/she thought could shed more light on the issue(s) under discussion, seek permission to return the transcribed manuscript for validation and authority to use, and request for opportunity to contact him/her again on email and/or telephone should there be a need to do so. Since the organisations sampled were formal organisations, the researcher had no opportunity to personally select respondents. However, with the use of snowball technique the researcher could reach many more respondents within an organisation.

Table 3-8 List of organisations surveyed in Nigeria

S/No.	Actor	Description
a. In Ogun-Oshun river basin		
i.	Basin operator	The O-ORBDA
ii.	National	The users of basin water services (Farmers, and the Ogun State Water Corporation)
		The Local Governments of Odeda, Abeokuta North, and Abeokuta South
		Ogun State Bureau of Water Resources and Rural Development, Ogun State Ministries of Environment, and Agriculture and Rural Development
		The Federal Ministries of Agriculture and Rural Development, and Environment
iii.	International	The State Coordinating Office for the World Bank (Fadama III), UNICEF-assisted Rural Water Supply and Sanitation Coordinating Office, and the World Bank-assisted Urban Water Supply Project Implementation Unit
b. In Benin-Owena river basin		
i.	Basin operator	The B-ORBDA
ii.	National	The users of basin water services (no users under the direct command of B-ORDA as revealed in Chapter 4)
		Edo State Urban Water Board, Ondo State Water Corporation, and Ekiti State Water Corporation
		The Local Governments of Ikpoba-Ekha, Ikere, and Akure North Local
		Ondo State Ministry of Agriculture, Ondo State Ministry of Environment and Mineral Resources, Edo State Ministry of Energy and Water Resources, and Edo State Ministry of Agriculture and Natural Resources
		The Federal Ministries of Agriculture and Rural Development, and Environment.
iii.	International	The State Coordinating Office for the World Bank (Fadama III), and UNICEF-assisted Rural Water Supply and Sanitation Coordinating Office
c. In Abuja		
i.	National	The Federal Ministries of Agriculture and Rural Development, Environment, and Water Resources; The Nigeria Integrated Water Resources Management Commission

Prior to field work in Nigeria, a list of organisations present in the water sector in Nigeria and statutes was compiled from the literature to give an initial familiarity. Among these organisations, the two RBDAs, the NIWRMC, and international organisations were contacted by means of an e-mail giving brief information about the researcher, the aim of the study, the benefits, and requesting for their participation. The majority of the national organisations could not be contacted online due to a lack of contact e-mail addresses and many of them had no web addresses (including the selected RBDAs). Of all the organisations contacted, only two responded: O-ORBDA and United Nations Educational, Scientific and Cultural Organisation (UNESCO). The O-ORBDA accepted to participate, while UNESCO directed the researcher to Kaduna Water Resources Institute. The Chief

Executive Officer, on behalf of the Institute, accepted to participate in the research. But the series of bombing by “terrorists” in Kaduna contributed to why the researcher could not visit the Institute. However, the presence of the researcher in Nigeria facilitated entry into many other organisations sampled for this study (see Table 3-8).

### 3.4.2 Research methods

Wisker (2008, p. 67) defines research methods as “the vehicles and processes used to gather the data”. Strauss and Cobin (1998, p. 3) on the other hand refers to research methods as “a set of procedures and techniques for gathering and analysing data”. Yin (2009) identifies six most commonly used sources of evidence in case studies (see Figure 3-6). Similar to Yin, other authors (Blaxter et al., 1996; Casley and Lury, 1981; Leedy and Ormrod, 2005) list: personal and participant observations, interviews, use of informants, documents and archival records, and physical artefacts as data gathering methods suited to case study approach. While these are similar to those of Yin, the first three methods illustrated in Figure 3-6 were used in this study. However, it should be noted that no single method has a complete advantage over others. The various methods are complementary, and a good study will therefore use as many as possible that best help to answer the research questions (Blaikie, 2000; Babbie, 1990; Yin, 2009). This also is in agreement with the view of others (Robson, 2002; Blaikie, 2000; Zikmund, 1991; Flyvberg, 2006; Bazeley, 2002; Layder, 1993; Wisker, 2008; Silverman, 2001; Bordens and Abbott, 1988) who assert that the selection of methods should be done to best help answer the research questions. Although water institutions are entities operating in the interface between law, policy, and administration, and their evaluation requiring multiple methods (Saleth and Dinar, 2004, 2008), Mills and Murgatroyd (1991) point out that organisational performance can be deciphered through document review, observations, and interviews. Each source of evidence (or data collection instrument) is discussed in detail next.

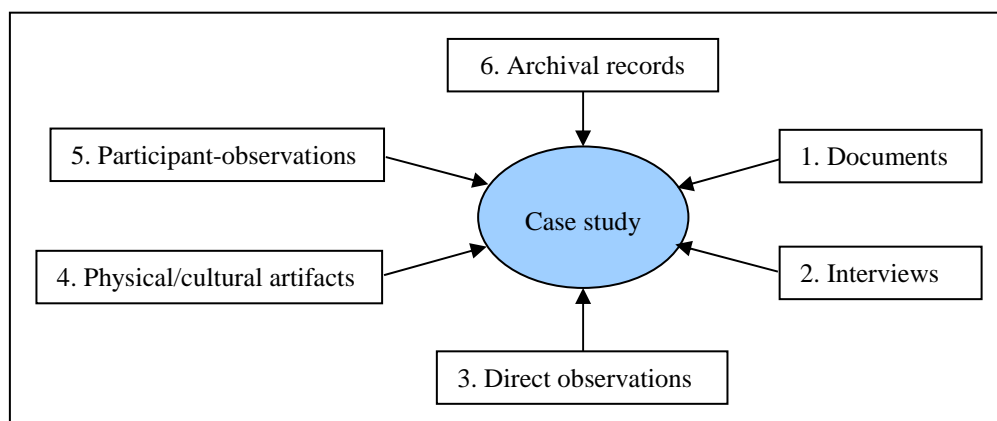


Figure 3-6 Sources of evidence (Adapted from Yin, 2009)



## **a Documents**

A document is a material that contains a written text. Yin (2009) asserts that documentary information is relevant to case studies. Bryman (2001, p. 370) refers to documents as materials that “can be read”, “have not been produced specifically for the purpose of social research”, “are preserved so that they become available for analysis”, and “are relevant to the concerns of the social researcher”. Hodder (1994) emphasises that documents can be used alongside other sources of evidence. For case studies, Yin (2009, p. 103) adds that “the most important use of documents is to corroborate and augment evidence from other sources”, and lists examples of documents to include: letters, reports, administrative documents, newspapers, and articles in mass media. The literature also identifies a number of advantages of the use of documents to include: the ability to yield valuable insights into social reality and provide information about the past (May, 1993; Hodder, 1994), an unobtrusive method which does not require the cooperation of the respondents, has the potential to facilitate validity checks and triangulations, and can provide specific information (Marshall and Rossman, 1999). According to Ritchie (2003), documents also offer the potential to present evidence about a phenomenon which cannot be obtained by direct observations or interviews. However, documents have some drawbacks as well. They may be selective or bias (May, 1993). For example, it is what is reported that one gets. Documentary data may also be open to multiple interpretations due to cultural differences (Marshall and Rossman, 1999), and they may not be specifically designed to meet the researcher’s needs (Zikmund, 1991).

In this study, a number of documents were analysed including: legal and regulatory instruments, organisational handbooks, annual reports, and other publications. The documents were of great relevance to investigate IWRM implementation issues from different perspectives. They enriched the researcher’s understanding of the forces influencing IWRM implementation as well as the environments within which they are embedded, and measures which might be suggested to improve implementation. In most cases, the legal and regulatory instruments were studied before conducting the interviews which offered the opportunity to highlight and resolve any contradictions in the evidence emerging from the interview data. Evidence drawn from documents was analysed to corroborate those obtained from the interviews. Data from these sources were also questioned and compared with interview and observational data to establish their validity. Apart from the international organisations, majority of the organisations did not have a website. The only exception was NIWRMC, while that of the Federal Ministry of Environment (FME) was under development. In order to ensure the quality of the evidence from the documentary sources, the legal and regulatory instruments were obtained directly from the organisations. Where not available, they

were obtained from the courts of law in Nigeria, or from reputable internet sources, such as, FAOLEX of the Food and Agriculture Organisation of the United Nations. Documents belonging to the World Bank and UNICEF were obtained from their websites. However, the researcher had difficulties of gaining access to internal documents (e.g., old annual reports and other publications) in the B-ORBDA.

## **b Semi-structured interviews**

Yin (2009) asserts that one of the most important sources of evidence in case studies is the interview. Brenner et al. (1985, p. 3) defines interview “as any interaction in which two or more people are brought into direct contact in order for at least one party to learn something from the other”. The purpose, according to Legard et al. (2003), is to understand the perspective of the respondents. It involves gathering data through direct verbal interactions between individuals (Cohen and Manion, 1985).

Fontana and Frey (1998) and Hague (1993) identify three different kinds of interviews: structured, semi-structured, or unstructured. A fourth kind is the focussed interview, where the interviewer has more control of the non-directive situation (Cohen and Manion, 1985). While semi-structured interview is commonly used in qualitative research, Neuman (2006) argues that the choice to adopt depends on the purpose and the expectation of the study. However, Drever (1995) asserts that in “semi-structured” interviews, the interviewer has to set up a general structure and decide in advance what themes will be addressed and what main questions will be asked. According to Bruton and Ahlstrom (2002) and Law et al. (1998), interviews are useful when a particular issue needs to be explored in-depth, and could allow respondents to raise additional themes, issues and concerns that they felt are important to the research study (Currie and Finnegan, 2011). Kim et al. (2008) therefore highlight that a semi-structured approach is more likely to encourage people to disclose information than a structured interview format. It achieves this by allowing respondents to answer at length in their own words (Drever, 1995). Hughes (1996) asserts that the essence of interviewing is to find out from the respondent those things the interviewer cannot directly observe. Since the aim of interviewing in this study is not to control the outcome, but rather to listen and allow the respondents to talk at length, the use of semi-structured interviews was considered most appropriate and adopted for this study.

Czaja and Blair (1996) maintain that the personal interview, though the most expensive, is best for open-ended questions which this study has adopted. Other advantages of interviews with open-ended questions include, the ability to: facilitate a two-way conversation (Robson, 2002; Easterby-

Smith et al., 2002), with the researcher learning from the respondents (Brenner et al, 1985; Johnson and Harris, 2002); offer the researcher the best way to access actors' views and interpretations of actions and events, thus allowing for spontaneous discussion of problems and possible solutions as they arose in the interview and, in turn for follow-up questions (van Gossum et al., 2011; Jones, 1985); and offer an effective way to elicit explanations (Brown and Canter, 1985). Although interviews with open questions allow both parties to explore the issues under discussion (Brenner, et al., 1985), a drawback of this technique is that it may elicit irrelevant responses if not guided (Sheatsley, 1983).

The adopted semi-structured interviews, which were administered in person, offered the researcher the opportunity to use visual aids and to supplement interviews with personal or direct observations in the case river basins. The semi-structured interview scripts were used to elicit information from the various national and international actors, the users of basin water services (or water users), and the RBDAs. The information requested is related to their involvement in basin-based water management with a view to understanding and explaining: the extent of IWRM implementation, the forces influencing implementation, and measures that might be proposed to improve implementation.

A list of open-ended questions, which addressed the research questions, was developed in advance (or prior to field survey) to elicit information from the: (i) RBDAs on (a) their legal and regulatory obligations, (b) what they do in practice, and (ii) national and international actors (including users of basin water services) on (a) how they perceive some of the operations of the RBDAs that are relevant to this study, and (b) their involvement in river basin operations with a view to understanding the impacts of their activities on IWRM implementation at river basin level in Nigeria. A copy of the semi-structured interview script for the RBDAs is provided as Appendix B, for the national and international actors is provided as Appendix C, and for the users of basin water services is provided as Appendix D. In this study, the people interviewed varied from Permanent Secretaries to Directors to Heads of Department/Unit and to other members of the organisation. The design of the interview schedules benefited from the suggestions of Robson (2002) and Oppenheim (1992) (e.g., on the need to keep the questions short, avoid jargons, leading, biased, double negatives, double-barrelled questions, as well as proverbs).

Prior to application, the interview instruments were tested (Brenner, 1985). This was done to remove what Berdie et al. (1986) and Pratt and Loizos (1992) refer to as sources of weakness and error, and to improve the relevancy or ability of the questions to elicit the information required.

Considering the multiple and diverse actors that were visited and time as well as financial constraints, rather than carry out pilot test which involves setting-up a small-scale version of the real study to try-out the feasibility of the questions, pretesting was followed instead. Pretests are trial runs, designed to look for ambiguous questions and respondent misunderstanding. A number of authors assert that pilot test differs from pretest (Yin, 2009; Thomas, 1996; Babbie, 1990; Czaja and Blair, 1996). Yin (2009) argues that the former takes more of the form of a “sub-case study”, while the latter is not. Czaja and Blair (1996) in turn posit that pretests are a necessary preliminary to pilot test, but concur that small-scale studies may skip pilot tests. For this study, pretesting was carried out to ensure that the questions were clear, simple, unambiguous, and addressed the meaning they were designed to elicit. However, pretesting was carried out at two levels following the suggestion of Robson (2002): (a) informally, sending the questionnaires to experts that are knowledgeable in the field of water resources management (similar to what Drever (1995, p. 31) refers to as “shredding”), and (b) formally, at the field level using some of the expected respondents. A letter of request to assist in an informal pretesting of interview schedules is provided as Appendix E. In the formal pretesting, “think aloud” or “one-on-one session” method was followed to ensure that respondents interpreted the questions as intended. Other approaches to pretesting include post-interview interviews, focus group, interaction coding, expert panel, telephone pretest (Czaja and Blair, 1996). These were ruled out in this study because of time and financial constraints. The informal screening entailed asking experts to look at the scope and level of clarity of questions and also for such things as difficulties with question wording, problems with leading questions, and bias due to order. Three experts from Cranfield University were contacted for the informal pretesting. On the number of respondents to be engaged in practice for pretesting in case-based studies, the literature is thin. Following the outcome of the informal pretesting, changes were made to the interview schedules in light of the feedback received from the experts. Also, comments received from formal pretesting were minor. These comments were about clarity, and improvements were made to the interview schedules as suggested.

However, it is important to point out here that in some organisations, valuable research time was lost in the process of getting entry permission. Although the researcher possessed little knowledge about the activities of the RBDAs and other organisations, the first days, especially in the RBDAs, were used to establish rapport through informal discussions. This assisted in gaining the confidence of subjects. At the beginning of interview, respondents were reminded of the interview protocols, and that they were free to select any questions they would like to respond to. Each interview, administered in person, was recorded using Olympus digital voice recorder (VN-713 PC) (where allowed and/or extensive notes taken), transcribed verbatim (expressions like “ah”, “em”, “um” etc

were exempted) by the researcher on the same day or as soon as possible after the interview. This prevented ambiguity that might arise from using a third party for transcription and allowed an initial cycle of analysis during transcription. Consistent with the suggestion of Walsham (1995) and Brenner (1985), voice-recording supplemented by note-taking was followed in order to minimise the weaknesses inherent in both approaches. The transcript (including where only notes were taken) was presented to the respondent for validation.

During validation, some respondents used the opportunity to alter or reconstruct some of their initial responses. In some cases, some respondents objected to recording, and the researcher was equally asked on one occasion to discontinue recording. In the beginning of the interview, respondents were generally aware of the recorder. However, their wariness disappeared after some minutes during interview. In all cases, following the suggestion of Robson (2002), the researcher first tried to establish some trust and to make the respondent feel at ease. During interview, a high degree of flexibility was put in place to facilitate conditions conducive to the respondent to open up and explore the issues under consideration. The use of semi-structured interviews allowed for non-directive interviewing in which respondent reply determined the course of the interview. The researcher was treated as “one of their own”, except on one occasion (in one of the RBDAs) where a respondent requested to decline further comment on a question relating to political interference in river basin activities saying that it was a sensitive area for a civil servant to entertain. On another occasion, in one of the State ministries, a respondent declined to participate due to a need to complete an urgent assignment. All interviews were carried out in a location suggested by the respondents. Interviews were scheduled to last one hour. They, however, varied between 4 and 75 minutes. In some cases, if time constraints were initially present in the mind of the respondent, they seemed to fade during the course of the interview. Body languages, posture, gestures, speed of speech, and flow in conversation revealed increasing involvement by respondents. During interviews, as suggested by a number of scholars (Brace, 2004; Robson, 2002; Oppenheim, 1992; Neuman, 2006; Fielding and Thomas, 2008; Zikmund, 1991; Drever, 1995), prompts and probes were used to enrich data collection by gaining more insight and/or clarification on certain issues under discussion and to go beyond the framework of the interview script where deemed necessary in addition to the use of a flexible questioning sequence. On the average, it took the researcher five hours to transcribe an hour of recorded interview.

As suggested in the literature (Eisenhardt, 1989; Harrison, 2002; Morse, 1994), the analysis of data began immediately after the data collection commenced and continued during data collection and thereafter. A number of authors asserts that the advantage of this data-collection-analysis approach

is that it can offer the possibility of collecting new data to fill in gaps (Miles and Huberman, 1994; Strauss, 1987; Dey, 1993). In this study, the concurrent process of data collection and analysis allowed the analysis to guide data collection, so that unnecessary data were not collected. In addition, the field (or early) data analysis also helped to organise the data for later, critical (or in-depth) analysis. Fieldwork, especially in the RBDAs, was kept moderate (about 3 months) to disallow the negative consequences of what Morse (1994, p. 231) refers to as being “a part of the setting”. Whenever questions arose from the data during the preliminary analysis, the same respondent or other qualified organisational members were asked for clarification. However, due to the nature of qualitative research, the researcher requested for the permission of respondents that during post fieldwork, where further clarification or data are needed, follow-up questions could be asked via telephone or email. To ensure the validity of interview data, the researcher compared the interview data with other data collected from observations and documents. Interview data can be biased in a systematic and unsystematic way. Respondents may decide to hide certain information or give a description of desirable rather than actual conditions. Triangulation was used to counter these threats and ensure internal validity of the data. At the end of each interview, respondents were thanked for their participation. The respondent identification key is provided in Table 3-9. Figure 3-7 summarises the process of interview data collection and preliminary analysis.

Table 3-9 Respondent identification key<sup>1</sup>

S/No.	Case study 1: O-ORB		Case study 2: B-ORB	
	Actor	Code	Actor	Code
1	O-ORBDA	A	B-ORBDA	B
2.	National	AN	National	BN
3.	International	AIA	International	BIA
4.	Others (e.g., FMWR, NIWRMC, Water users)	F, C, U		

<sup>1</sup> For example, the first person to be interviewed in the O-ORBDA was assigned the code A1, while the second person was assigned the code A2, and so on. This allowed quotes from individuals to be distinguished from one another yet maintained anonymity.

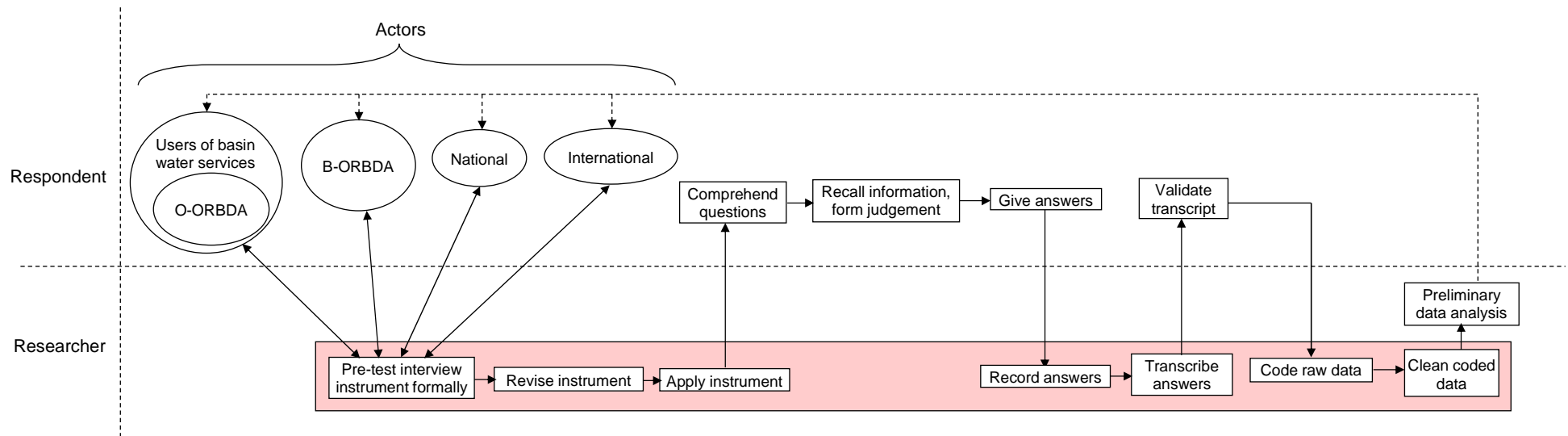


Figure 3-7 Process of field data collection and preliminary analysis

### **c Direct observations**

It is important to highlight that observation can be both a research strategy (e.g., in ethnography) and a method. However, observation was used in this study as a method of collecting data. Observation is the art of sensing a phenomenon. Centers for Disease Control and Prevention (2008, p. 1) defines observation as a “way of gathering data by watching behaviour, events, or noting physical characteristics in their natural setting”. However, observation consists of gathering data about a particular phenomenon through all relevant human faculties by watching, recording, and analysing events of interest (Blaxter et al., 1996). Yin (2009, p. 110) asserts that an observational evidence “is often useful in providing additional information about the topic being studied”. Adler and Adler (1994) contend that observation works well with other methods to enrich data.

There are two main types of observation (Layder, 1993; Bryman, 2001; Wisker, 2001, 2008; Cohen and Manion, 1985): participant, in which the researcher is a part of the subject they observe, and non-participant, in which the researcher is not a member of the group. Adler and Adler (1998) maintain that three main roles can be followed to observe a phenomenon: either as a complete-member-researcher, active-member-researcher, or peripheral-member-researcher. Besides this, the literature points out that observation can be structured, in which the researcher has a priori ideas to be investigated; and unstructured, in which there are no checklists of what to be observed (Coker et al., 2013). Although not bias free (Bordens and Abbott, 1988), observational method provides the opportunity to capture what people actually do rather than what they say they do (Wisker, 2008; Law et al., 1998; Hague, 1993; Coker et al., 2013) or between what the law says (de jure) and what actors do in practice (de facto) (de Stefano, 2010), and can reveal unconscious action (Abrams, 2000). Silverman (2001) and Walker (1985) also add that observation offers the advantage of gathering data from their natural environment, and can serve as an alternate source of data for enhancing cross-checking (Adler and Adler, 1998). Additionally, Umstot (1984) posits that observational method could provide insights into important issues that would not have been addressed using other research methods. Observational techniques include team observation, still camera and audio tape, video tape, or a combination of any of these (Abrams, 2000), as well as published reports (Bordens and Abbott, 1988). However, a limitation of observational method, according to Zikmund (1991), is that the researcher may add subjectivity to the observation, and that the technique may not be suitable to reveal those intangible states of mind.

Since the researcher is not a staff member at the RBDAs and other organisations surveyed, this study followed the peripheral-member-researcher role or non-participant observation. In this role,



the researcher primarily observed and interacted closely enough with field subjects to establish an insider identity without participating in their activities. Employing an interview technique enabled the use of direct observational method as a source of evidence to collect naturally occurring data for the study. During the observation of the physical environments and activities of the case river basins which followed a structured pattern, the researcher elicited important information on the natural geography, infrastructural facilities, and basin functional activities in practice relevant to this study. Other areas observed included behaviours at the workplace, interactions, and those events that were needed to decipher organisational culture. Schein (1992) and Brown (1995) suggest that cultures in organisations can be deciphered through observations and interviews, and through document review (Sackmann, 1991). Hofstede (1991) also used interviews with open-ended questions to study organisational culture. Field notes were recorded (no photographs) during or immediately after the observed event(s) using descriptive, not evaluative words. This helped to prevent data loss. The visual data recorded in field notes were used to validate and/or further explore information obtained from the interviews and documents in a process of constant questioning and comparing. The data obtained were both quantitative (e.g., on the numbers of dams and their capacities) and qualitative in nature.

Altogether, in each case river basin, data were collected over a four-month period, while about one month was spent in Abuja visiting the head offices of the FME, Federal Ministry of Agriculture and Rural Development (FMARD), FMWR, and NIWRMC. Following from the methods described above, this study collected data that helped understand and explain the:

- (a) Extent of IWRM implementation at the river basin level
- (b) Forces influencing the implementation of each of the IWRM elements (see Table 2-11) at the river basin level in Nigeria and the environments within which they are embedded, and
- (c) Measures that might help to improve IWRM implementation

However, due to time and financial constraints and the number of actors/subjects to be contacted, the time dimension for data collection at the field level was cross-sectional, that is, data were collected at a single point in time - between May 2012 and January 2013. A drawback of cross-sectional research is that it does not capture social processes or changes compared with longitudinal research (Neuman, 2006; Gilbert, 2008).

### **3.5 Data analysis**

Another aspect that needs to be specified in detail concerns the approach adopted to analyse the data and interpret them into relevant information to answer the study's research questions. Leech and Onwuegbuzie (2007) classify data analysis as one of the most important steps in a research process. It entails a systematic search for meaning that has been mediated through language and action (Dey, 1993), and there is no hard and fast rules or clear and accepted set of conventions governing qualitative data analysis (Leedy and Ormrod, 2005; Strauss, 1987). However, as noted by Dey (1993), what guides the tools/processes to use depend on the knowledge that the study intends to produce. While qualitative data can be messy (Bazeley, 2007), in this study, a two-stage process was adopted during both the preliminary (fieldwork) and the in-depth (post fieldwork) data analysis, as follows:

#### **3.5.1 Textual data analysis**

The first level of data analysis is the textual data analysis (which led to the production of the first-order data). Following member checking, textual data analytical approach was used as the main technique for analysing the data. Textual analysis, a complex process composed of several iterative steps, is a qualitative procedure whereby the researcher assesses meanings within a text. In this study, textual data analysis was done manually, because the basic tool of analysis in qualitative research is still the human brain. But, this is not to say that the researcher is unaware of computer-assisted qualitative data analysis software. As agreed with Yin (2009) the "software will not do any analysis for you" (p. 128). Apart from this, the manual approach allowed the researcher to have a one-on-one encounter with the data and facilitated a deeper understanding. The textual analytical approach, though an iterative process of moving between texts and theory (Gephart, 1993), involves the systematic selection, retrieval, and processing of textual data for the purposes of classification, summarisation, interpretation and understanding (Mossholder et al., 1995; Gephart, 1993). Textual data analysis involves coding and classifying data (Creswell and Clark, 2007; Neuman, 2006), while codes are tags or labels for assigning meaning to a chunk of raw data connected to a specific concept it is describing (Miles and Huberman, 1994; Dilevko and Gottlieb, 2009; Hodkinson, 2008, Basit, 2003; Punch, 1998). Originally developed for longitudinal research, coding, using constant comparative technique, has since been applied to analyse data collected in one round or cross-sectional research (Leech and Onwuegbuzie, 2007; Harrison, 2002). The basic idea of coding is to identify from the texts the extracts of data that are informative to the study at hand and to sort out

the important messages hidden in the mass of raw data through a systematic process of sifting of the raw data. Classifying the data, therefore, provides the basis for making connections between the different data bits (Dey, 1993).

Two approaches to analysing textual data have been noted in the literature (Mossholder et al., 1995; Gephart, 1993; Ryan and Bernard, 2003; Carrera-Fernández et al., 2013): the inductive and the deductive approach. In the case of this study, the dominant approach followed is the deductive approach because of the theoretical frameworks which this study has adopted to serve as a guide to answering the study's research questions, while the inductive approach is closely following. This idea was followed in order to capitalise on the strengths and minimise the weaknesses inherent in both approaches.

In deductive approach, the choice of initial codes is the responsibility of the researcher (Walsham, 2006). This is because they serve as retrieval and organising devices that allow for rapid recovery and clustering of all the segments relating to a particular research question, and can then be looked for in the data (Leech and Onwuegbuzie, 2007; Harrison, 2002). Miles and Huberman (1994) assert that coding is analysis, or an integral part of data analysis (Neuman, 2006; Creswell and Clark, 2007), and there is ample literature that illustrates the process of coding (see, e.g., Leech and Onwuegbuzie, 2007; Basit, 2003; Dey, 1993) and textual data analysis (see, e.g., Mossholder et al., 1995). However, coding, as described by Leech and Onwuegbuzie (2007), is a process whereby:

“the researcher chunks the data into smaller meaningful parts. Then, the researcher labels each chunk with a descriptive title or a “code.” The researcher takes pains to compare each new chunk of data with previous codes, so similar chunks will be labelled with the same code. After all the data have been coded, the codes are grouped by similarity ...” (p. 565).

Prior to fieldwork, a provisional start list of codes was generated for this study. Miles and Huberman (1994) assert that an initial start list of codes can come from the conceptual framework, the study problem areas, and/or from the key variables that the researcher brings to the study. In the case of this study, an initial start list of codes (see Appendix F) was generated from the research questions, because they have the IWRM elements embedded and the frameworks that support the transfer of IWRM from theory to practice. However, while a priori codes can serve as a useful tool (Hewitt-Taylor, 2001; Bazeley, 2007), they can also impede the emergent of new ideas if not carefully used.

In qualitative research, data analysis and interpretation are closely interwoven (Leedy and Ormrod, 2005), and the researcher bears the responsibility for the interpretation of the findings (Hartley, 2004; Ritchie et al., 2003b). Denzin (1994, p. 502) defines interpretation as “an art”. However, while no definitive model exists for carrying out qualitative (Snape and Spencer, 2003) or textual data analysis (Burnard, 1996; Strauss, 1987; Bazeley, 2007), the following (iterative) steps were followed in this study:

#### Step 1:

The text from documents (including legal and regulatory instruments), interviews, and observations was read through by the researcher and open coded. Open coding entails identifying and labelling useful concepts conveyed in fragments of data that appear in the text (Dilevko and Gottlieb, 2009). The researcher coded words, phrases, sentences and whole paragraphs that were of interest to answer the research questions in the raw data. The coded words, phrases, sentences or whole paragraphs were such that accounted for the areas of interest. According to Burnard (1996) and Dey (1993), reading textual data involves interpretation and making-sense of the data.

#### Step 2:

The coded data that have common elements were sorted into the pre-selected analytic categories they belong using constant comparative technique, while paying attention to those that emerged from the data. The constant comparative technique involves comparing segmented data bit to segmented data bit, looking for similarities and differences among their properties before classifying them (Dilevko and Gottlieb, 2009). Evidence sorted into the analytic categories was cleaned of coding errors as suggested by Czaja and Blair (1996) and Creswell and Clark (2007). Cleaning was done by reviewing the relevance and importance of the coded data through logical and intuitive thinking as well as through making judgements about their meaning.

#### Step 3:

The evidence obtained in Step 2 was clustered around each research question they were meant to answer. This was tagged the first-order data. For this study, the theoretical frameworks (- IWRM and neo-institutional theory) provided an initial source of categories for analysis.

To understand the extent of IWRM implementation at the river basin level in Nigeria from the first-order data, a “pluralistic” approach to data analysis was followed - the quantizing of qualitative data. Although Dey (1993) points out that once data have been categorised they can be quantified,

Krippendorff (2004) on the other hand, argues that “all reading of texts is qualitative, even when certain characteristics of a text are later converted to numbers” (p. 16). Whilst the mixing of methods is not without controversy in the literature (Venkatesh et al., 2013; Bazeley, 2004; Hoppe-Graff and Lamm-Hanel, 2006; Chamberlain et al., 2011; Dures et al., 2010), it is used in this study not as a way of “cross-checking” the different sets of results with each other but used in a sequence to increase the depth of clarity or to extract maximum interpretative value from the findings of the qualitative data. This is consistent with one of the useful uses of a pluralistic approach which acknowledges the need to use those methods that most adequately respond to the research questions (Coyle, 2010; Frost et al., 2011; Bazeley, 2004, 2009; Blaikie, 2010; Hoppe-Graff and Lamm-Hanel, 2006; Chamberlain et al., 2011). Bazeley (2004) adds that transforming qualitative data into quantitative data can provide “access to patterns, trends and underlying dimensions in the data not readily evident in the details of the qualitative analyses” (p. 5).

Following the approach described above, the qualitative data obtained from the first-order data were transformed into quantitative data via a 4-point Likert scale (as employed in Section 2.4). The end result of the transformation provides abundant evidence to establish how effectively IWRM was being implemented at the river basin level in Nigeria. A sign of weakness or constraint for any particular IWRM element is shown on the chart if the total score for that IWRM element is below 3.0. In this study, through the use of radar chart, the evidence to suggest whether there are weaknesses or not in the implementation of IWRM at the river basin level in Nigeria was obtained. The outcome of this analysis provided the basis for the second level analysis, which addressed the questions: if there are weaknesses in the implementation of IWRM, why is this so? And by extension, how might the quality of implementation in Nigeria be improved?

### **3.5.2 Variance institutional approach**

The second level of data analysis is the use of variance institutional approach (which led to the production of the second-order data). As explained in Subsection 2.5.8, there are two approaches to institutional analysis: the process and the variance. Consistent with the main aim of this study which is to identify the forces influencing the implementation of IWRM and the environments within which they are embedded, the variance approach was considered relevant and adopted. While the procedure for carrying out variance institutional approach using qualitative data is “cryptic” (or “hidden”) in the literature, the following intuitive and iterative steps were followed in this study:

#### Step 1:

Consistent with the variance institutional approach (Scott, 1995), an initial start list of independent variables, which in the case of this study coincided with the contemporary institutional (–regulative, normative, and cognitive) and technical (- water infrastructure) elements, was made. However, following from an initial review, a comprehensive list of independent variables was obtained, which contained both the pre-selected and those that emerged from the review of the first-order data.

#### Step 2:

The intermediate factors were identified through a review of the first-order data. The intermediate factors were taken as those that preceded the root factors (e.g., if it is reported by a respondent that the implementation of certain IWRM element is restricted by financial consideration (no monetary provision). Financial constraint will be seen as an intermediate factor, while the legal and/or regulatory framework (if applicable) that prohibits financial provisions to the social event will be taken as the root factor).

#### Step 3:

Using the comprehensive list of independent variables obtained in Step 1 as a lens, the forces (or root factors) influencing the implementation of each of the IWRM elements were identified through a review of the intermediate factors obtained in Step 2 and the first-order data. This was done by asking of the intermediate factors in Step 2 and the first-order data: “what causes this?” (although for some intermediate factors that emerged from the first-order data, their influencing forces were already noticeable). An inference was made to link each IWRM element to the influencing root factors. As pointed out by Hoffman (1999), for institutional elements, causal connections cannot be observed directly or proven but can only be inferred. Yin (2009) also asserts that an inference is drawn whenever a phenomenon (or causal connection) cannot be observed directly.

#### Step 4:

The forces identified in Step 3 were used as evidence to revise the conceptual framework formulated in Chapter 1, and were also used to build an explanation of the forces influencing the implementation of IWRM at the river basin level in Nigeria. The outcome of this step helped to understand measures which might be suggested to improve the quality of implementation - by reviewing the causes of the forces identified in the first-order data. Understanding the root causes provides a direct action to solving the problem, which is consistent with change research, as

suggested by Blaikie (2000, 2007). Therefore, a proposal was developed which entails a description of the desired state for the influencing forces, and the specification of stages and measures for getting from the current (or present) situation to the desired situation. The literature asserts that institutional analysis can also be used to identify improvements to be effected to an institutional framework (Mitchell and Pigram, 1989; Bandaragoda, 2000; Bruton and Ahlstrom, 2002; Judge et al., 2008; Scott, 1995).

To ensure internal validity for causal explanations calls for the need to justify that the association between dependent and independent variables is not better explained by some other forces. As explained earlier (in Chapter 2), water infrastructure was incorporated into the analysis as a suitable confounding variable. To minimise complexities in the analysis because institutional frameworks themselves can also actively constrain or enable the provision of water infrastructure, this study viewed water infrastructure as an entity that varied along with other independent variables. The following steps were followed to obtain evidence needed to understand the position of water infrastructure with respect to IWRM implementation at the river basin level in Nigeria:

Step 1:

The active water infrastructures belonging to the RBDAs in the surveyed river basins were identified through a review of the first-order data.

Step 2:

The formal mandates of the RBDAs, as obtained from the first-order data, were analysed to identify those water infrastructures that would be needed by the RBDAs to do their work (as illustrated in Section 4 of the River Basins Development Authorities Decree No. 35 of 1987). To assist in the identification, information on water infrastructures needed to implement IWRM at the river basin level was extracted from the literature reviewed in Chapter 2 (e.g., GWP, 2009c, 2012).

Step 3:

Gaps were identified by comparing the outcome of Step 1 with the outcome of Step 2, and

Step 4:

The findings derived from Step 3 provided the evidence needed to explain whether water infrastructure enabled or constrained IWRM implementation at the river basin level in Nigeria. Based on the findings, water infrastructure was added to the list of institutional elements identified

earlier to build an explanation of those forces influencing the implementation of IWRM at the river basin level in Nigeria, the environments within which they are embedded, and how implementation might be improved.

Since this study is not about comparing the selected case river basins (as emphasised in Chapter 1), in the analysis and interpretation of findings explanation building was adopted. Yin (2009) identifies five analytical techniques for case study analysis to include pattern matching, explanation building, time-series analysis, logic models, and cross-case synthesis. The use of other analytical techniques was ruled out in this study, because the main aim of this study is to identify the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded which has been justified earlier to be more of explanatory research. As part of the study's analysis, findings obtained from the literature review and analysis on the extent of IWRM implementation (in Chapter 2) were compared with those obtained from the analysis of the first-order data (in Chapter 4). No contradictory results occurred. In the second-order data, the researcher elicited an understanding of the key forces influencing IWRM implementation using the pillars of neo-institutional theory as a lens. However, an understanding of the source/extent of coverage (e.g., sector specific, or non-sector specific) of the influencing force(s) provided the necessary information needed to classify the environment within which they are embedded. For example, the River Basins Development Authorities Decree No. 35 of 1987 is a legal framework solely designed to regulate the activities of the RBDAs (sector specific), while the extent of coverage of the Constitution of the Federal Republic of Nigeria of 1999 is the whole country (non-sector specific); although both legal frameworks share the same source (that is, formulated at the federal level).

For reasons of objectivity in the analysis and interpretation of the data collected, the in-depth data analysis and interpretation commenced three months after returning from the field in February 2013. In between, the researcher used the opportunity to update Chapter 2 - institutional theory as well as Chapter 3 - data analysis strategy. No significant changes were noticed between the results of the preliminary data analysis and the in-depth data analysis. Table 3-10 presents a summary of the process of data analysis per subordinate research question, while Figure 3-8 illustrates the research process adopted from planning to post fieldwork including the timeline. Next, issues relating to validity, reliability, and triangulation are discussed.



Table 3-10 Summary of the process of data analysis per subordinate research question

S/No.	Subordinate research question	Process of data analysis
i.	What is the extent of implementation of IWRM at the river basin level in Nigeria?	The qualitative data obtained from interviews on IWRM elements (that is, from the IWRM prompt sheet) were translated into quantitative data via a 4-point Likert scale and the resulting data plotted on a radar chart to give a graphical illustration of the extent of IWRM implementation at the river basin level in Nigeria.
ii.	What are the effects of the internal environment of the RBDAs on the implementation of IWRM in Nigeria?	The data obtained from documentary reviews (including legal and regulatory instruments), interviews, and observations on the activities of the RBDAs were segmented using the textual data analytical approach to obtain an understanding of the IWRM elements that were supported/not supported for implementation at the river basin level in Nigeria. To expose the influencing forces, the variance approach to institutional analysis was used to review the segmented first-order data.
iii.	What are the contributions of the external environment of the RBDAs to IWRM implementation at the river basin level in Nigeria?	From the raw data obtained from documentary reviews (including legal and regulatory documents) and interviews on the activities of the national and international actors, the study used the textual data analytical approach to categorize or segment the raw data with the aim of reaching an understanding of the IWRM elements that were supported/not supported for implementation. This was followed with the use of variance approach to institutional analysis to identify those forces that enable/constrain their implementation through a review of the segmented data. Furthermore, the study also employed the textual data analytical approach to categorize the raw data obtained from documents and interview transcripts to reach an understanding of the political structure put in place to govern water resources, and their contributions to IWRM implementation at the river basin level in Nigeria. To expose the influencing forces, the variance institutional analytical approach was used to review the outcome of the textual data analysis.
iv.	What are the key forces influencing IWRM implementation at the river basin level in Nigeria?	At the end of the second level of data analysis, all the key forces influencing the implementation of IWRM at the river basin level were revealed through a review of the summary of findings of the variance institutional approach.
v.	Looking at those key forces, in which ways can the quality of implementation of IWRM in basin-based water resources management in Nigeria be improved?	This entailed a description of how to close the gap by looking at the deficiencies associated with the influencing forces and suggesting how they might be improved upon, including the specification of stages and procedures for getting to the desired situation from the present situation.

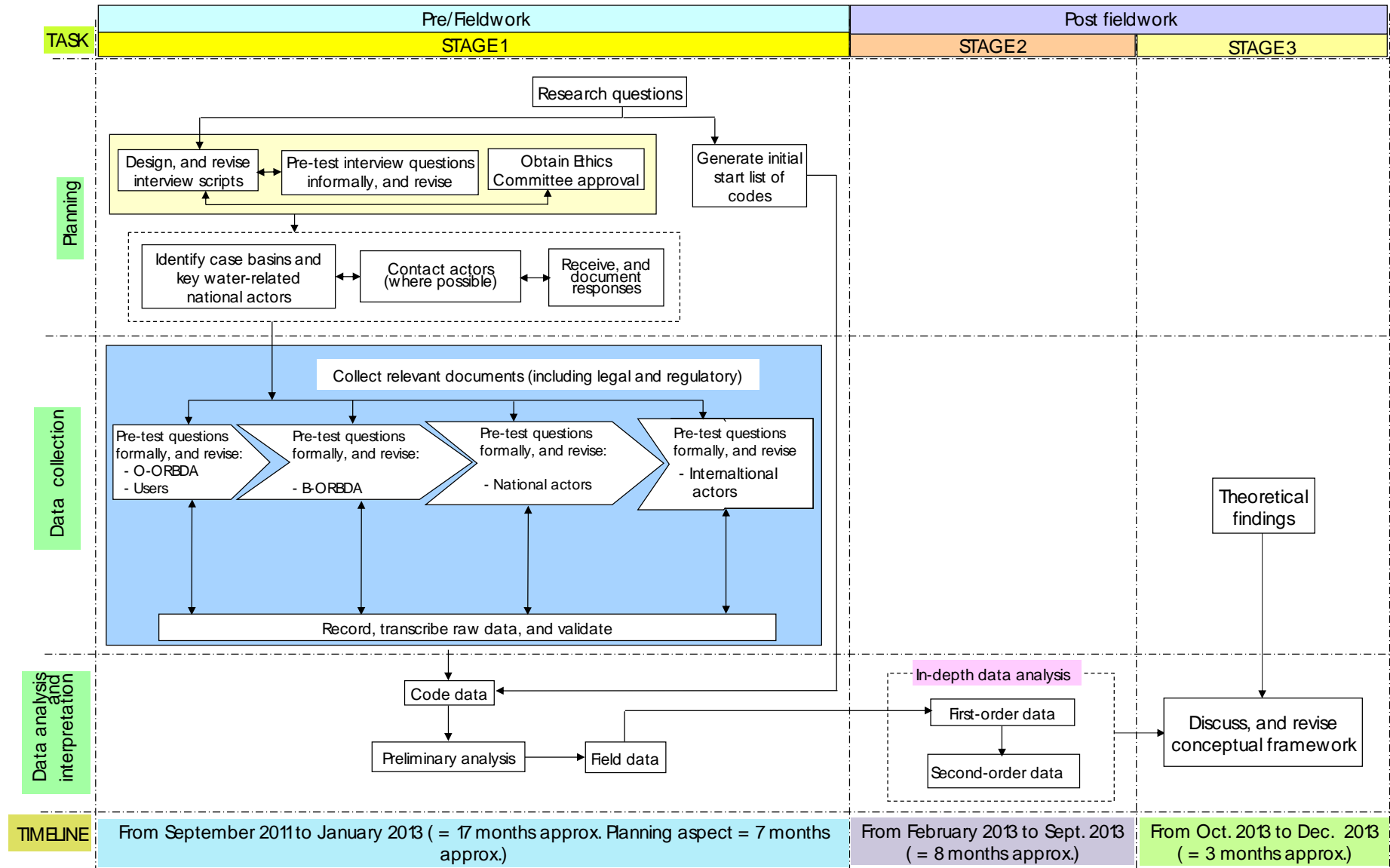


Figure 3-8 Structure of the research process from planning to post fieldwork data analysis and interpretation

## **3.6 Validity, reliability, and triangulation**

### **3.6.1 Validity**

Bryman (2001) asserts that validity refers “to the issue of whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept”. Nachmias and Nachmias (1981, p. 138) maintain that validity addresses the question: “is one measuring what one thinks one is measuring?” Or whether a measure measures what it is supposed to measure (Zikmund, 1991; Leedy and Ormrod, 2005). Creswell and Clark (2007, p. 134) indicate that “checking for qualitative validity means assessing whether the information obtained through the qualitative data collection is accurate”. Two distinct dimensions have been identified to be related to the concept of validity (Lewis and Ritchie, 2003): internal validity, which is concerned with whether the investigator investigates what it claims to investigate; and external validity, which is concerned with whether the research findings can be generalised to a larger population or to other settings. For explanatory studies, Yin (2009) argues that internal validity also seeks to address rival explanation. On rival explanations, Kidder and Judd (1986, p. 28) ask: “To what extent does the research design permit us to reach causal conclusions about the effect of the independent variable on the dependent variable?” However, Bordens and Abbott (1988) assert that the presence of a confounding or rival variable could damage explanations about the internal validity of a research. However, the literature posits that three tactics can be used to address validity in case studies (Yin, 2009): the use of multiple sources of evidence, establish a chain of evidence, or have the draft report reviewed by the subjects.

In this study, validity was achieved by utilising multiple data sources to explore issues related to IWRM implementation from different perspectives in Nigeria. The study also used multiple case studies to increase the probability of external validity. Additionally, all interview questions were directly linked to answer the research questions and accomplish the study’s main aim. The collected data were also validated: first, through triangulation in data analysis, which the literature asserts can improve internal validity (Leedy and Ormrod, 2005; Layder, 1993; Hartley, 2004); and second, through respondent or member validation. To enhance member checking, consistent with the suggestion of a number of authors (Bada et al., 2004; Boon et al., 2009; Robson, 2002; Bryman, 2001), interviews were taped and transcribed (or extensive notes taken), and the transcript made available to respondent. Since no one method is adequate to ensure data authenticity and legitimacy, in addition to respondent checking and data triangulation, the natural history validation approach (Neuman, 2006; Harrison, 2002) or audit trail (Robson, 2002; Harrison, 2002), was applied to serve as an additional measure. The natural history validation approach entails producing a full record of study information including raw data (transcripts of interviews, field notes), the journals consulted, and details of coding and data analysis. To maintain a chain of evidence, the study makes sufficient

citation to the sources of data used in addition to the audit trail. To build rival explanations, water infrastructure was selected as the confounding variable and tested for. This was done to ensure that causal arguments were non-spurious or accidental. Also, a draft report of the findings and proposed measures which might help to improve IWRM implementation in Nigeria was sent to some of the organisations surveyed in Nigeria (the two RBDAs and the NIWRMC) to ascertain whether the researcher has accurately portrayed and interpreted the collected data and the life experiences of the actors. The deadline for the receipt of feedback was initially put at 30th of November 2013, but was later extended to 14<sup>th</sup> January 2014 due to a lack of response from the RBDAs. Only the NIWRMC returned its feedback on the findings of this study. However, the Commission is yet to return its comments on the proposed measures which might help to improve IWRM implementation. The reason for the low response rate is not known to the researcher. In a mobile phone call made through to O-ORBDA, the researcher was informed that they were still working on the document. The B-ORBDA could not be reached. The feedback received from NIWRMC and the records of audit trail are available upon request for up to one month after the thesis defence.

### **3.6.2 Reliability**

Bryman (2001, p. 70) defines reliability as “the consistency of a measure of a concept”. Lewis and Ritchie (2003) emphasise that reliability is concerned with the extent research findings can be replicated using the same or similar methods. They argue that the reliability of the findings depends on the likely appearance of the original data and the way the data are interpreted. The reliability of field data addresses the question (Neuman, 2006): are the researcher findings about a social reality consistent? Yin (2009) views reliability as doing the same case over again to arrive at the same findings and conclusions, not on replicating. While the usefulness of reliability in qualitative research is heavily debated in the literature, Neuman (2006, p. 405) asserts that replicability “is not a criterion because field research is virtually impossible to replicate”. Robson (2002, p. 42) adds that “it is just not feasible to repeat a study exactly with the same people in the same situation” and Brinberg and McGrath (1985) maintain that an exact replication is not possible. Similar to the view of these authors, Pratt and Loizos (1992, p. 64) highlight that “social life cannot be repeated in the way a laboratory experiment with controlled variable can be repeated”, while Robson (2002) refers to the laboratory situation as a closed system and qualitative research as open systems where the researcher is dealing with uncertainties and probabilities. While the constructionist perspective rejects replication, Lewis and Ritchie (2003) and Yin (2009) suggest that a good practice in relation to reliability can be enhanced by showing the readers of research studies details of the procedures followed that have led to the research findings.

In this study, a host of measures was put in place to enhance its reliability, including: all interviews were recorded (where allowed) and/or extensive notes taken to obtain more reliable evidence, all interview questions were clearly worded, and a copy of the interview schedule was made available to respondents prior to interview to enable them understand what was being asked to avoid respondents' data contamination. All interviews were conducted in the place of choice of the respondents, and were allowed to explain their beliefs and life/lived experiences freely without interventions which might create any systematic or unsystematic bias in responses to the issues being discussed. Also, data sources were triangulated to ensure external consistency.

However, due to variations in actors and their views, this study asserts that the conditions prevalent when the data were gathered might be different when replicating this study in the selected case river basins. To increase the probability of replicating and reach similar findings, information about the research methodology and methods has clearly been made explicit. Additionally, detailed information about the study's main aim, the research questions and objectives has been provided, as well as a clear justification for the research strategy and methods adopted.

### **3.6.3 Triangulation**

Berg (1989, p. 4) defines triangulation as “the use of multiple lines of sight”. Bryman (2001, p. 274) asserts that triangulation entails “using more than one method or source of data in the study of social phenomena”. Robson (2011) refers to data triangulation as the use of more than one method of data collection – observations, interviews, and documents. Yin (2009) highlights that using multiple sources of evidence allows for the “development of converging lines of inquiry” (p. 115), while Neuman (2006) comments that looking at a phenomenon from multiple lines of view enhances its accuracy. In qualitative research, Cresswell (1998) maintains that the researcher triangulates to provide corroborating evidence. Similar to the argument of Porter (2007), Robson (2011) points out that any one way of gathering data is likely to have its shortcomings which necessitate the use of multiple methods of data collection. Although it has been observed in the literature that each method will reveal different aspects of a social phenomenon (Blaikie, 2000; Berg, 1989), triangulation purports to exploit the assets and neutralize, rather than compound, the liabilities of each method (Jick, 1979; Miles and Huberman, 1994; Brinberg and McGrath, 1985). The effectiveness of triangulation rests on the premise that the weaknesses or biases in each single method will be compensated by the counterbalancing strengths of another (Jick, 1979; Blaikie, 2000). The literature also argues that triangulation can help counter the threats to validity (Robson, 2011; Flick, 2004), secure an in-depth understanding of a phenomenon (Denzin and Lincoln, 2003; Berg, 1989), and can be used to strengthen the integrity of the research findings (Ritchie, 2003). It

can also offer the opportunity to corroborate findings and has the advantage of testing one source of data against another with a view to improving the quality of data and the accuracy of the research findings (Bazeley, 2002; Miles and Huberman, 1994; Jick, 1979; Law et al., 1998; Flick, 2004; Mingers, 2001; Morse and Chung, 2003; Morse, 1994; Law et al., 1998; Leech and Onwuegbuzie, 2007; Fetterman, 1989). A drawback of triangulation is that replication is exceedingly difficult (Jick, 1979), and as Klein and Myers (1999) put it “you cannot swim in the same river twice” (p. 73). The different methods can provide different evidence which can make their direct comparison problematic (Robson, 2002). However, four types of triangulation have been identified in the literature (Yin, 2009; Robson, 2011):

1. Data triangulation – the use of more than one method of data collection
2. Observer triangulation – the use of multiple observers to investigate a problem
3. Methodological triangulation – the use of multiple methods to collect data
4. Theory triangulation – the use of multiple theories or perspectives to research a phenomenon

In the case of this study, both respondents and data triangulations were accomplished through the collection of data from different subjects – the RBDAs, the national actors, and the international actors - and use of multiple methods – semi-structured interviews, direct observations, and documents (Figure 3-9). While no single method has a complete advantage over others, Yin (2009) suggests that the various methods are complementary and that a study will use as many data gathering techniques as much as possible. The use of multiple methods served as an effective way to overcome the weaknesses in each method and extend understanding by giving a fuller picture.

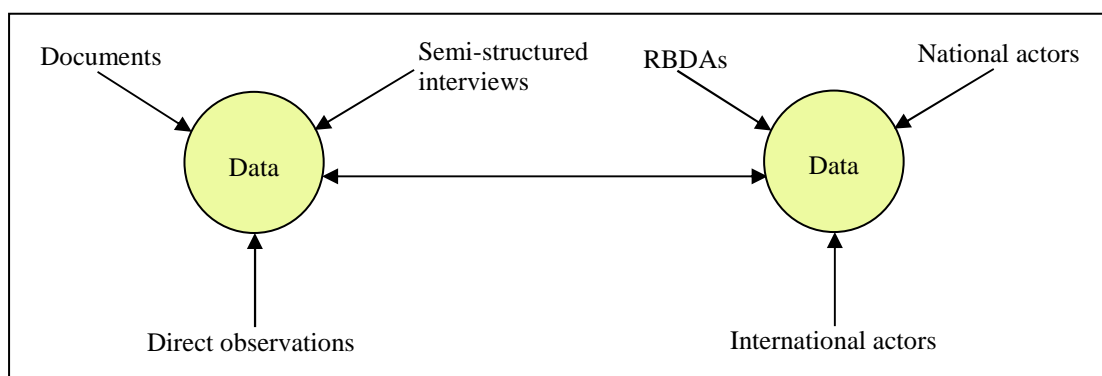


Figure 3-9 The triangulated data sources employed in this study

### 3.7 Generalisation

Generalisation, sometimes referred to as the external validity of research findings in qualitative research (Cohen and Manion, 1985; Ritchie and Lewis, 2003), is defined by Walizer and Wienir (1978, p. 430) as “the process of concluding that the results reached as a result of examining units in a sample are the same results that would have been reached if the population was examined”.

Dey (1993) points out that a researcher generalises on the basis of the available data, while Blaxter et al. (1996) assert that generalisation also relates to whether the research findings have wider applicability beyond the points where data were collected. While debates rage in the literature on the appropriateness of generalisation in qualitative research, Lewis and Ritchie (2003) maintain that qualitative research cannot be generalised on a statistical basis. In the same vein, Yin (2009) argues that case studies do not lend themselves to statistical generalisation.

However, since this study followed a case study approach, a number of authors (Hakim, 1987; Harrison, 2002; Yin, 2009; Blaikie, 2010) assert that case studies are not necessarily samples representing a population or are statistically significant. Flyvberg (2006) persuasively argues that it is often not desirable to generalize case studies. Taking a social constructionist viewpoint, Guba and Lincoln (1994) observe that all situations are unique and that findings cannot be generalised from one context to another. Also, Robson (2002) comments that generalisation may be limited because of elements that are particular to a given setting. In the case of this study, what makes generalisation even more difficult is that river basins seldom have same physical, developmental, and governing rules. In the case of Nigeria, some of these elements may include (a) sub-cultural differences, (b) differences in basin water hydrology, development, and use, (c) differences in basin bylaws, and (d) variations in actors and their views.

While case studies offer a poor basis for generalising (Stake, 1994; Yin, 2009), Walsham (1995, 2006) identifies four types of generalisation for interpretive case studies: (a) the development of concepts, (b) the generation of theory, (c) the drawing of specific implications, and (d) the contribution of rich insights. Lewis and Ritchie (2003) also decompose generalisation into three forms: representational generalisation, in which the research findings are generalised to the parent population from which the samples were drawn; inferential generalisation, in which the research findings from a particular study are generalised to other settings outside the sampled areas; and theoretical generalisation, in which the research findings contribute to wider social theory. Yin (2009) also adds that case studies, which rely on analytic generalisation, can be generalised to some

broader theory and not to populations. Since this study is not concerned with the development or testing of theories (also as explained in Chapter 1), the contribution of rich insights to theories is therefore the domain to which the research findings of this study can be generalised. The study is based on two case studies – the O-ORB and the B-ORB – and the resulting evidence from the two cases is more convincing than when data were harvested from a single case, thereby enhancing its generalisability. As noted by Blaikie (2010), multiple cases can strengthen the basis for generalising. However, this study makes important contributions to both IWRM and neo-institutional theories. Since the two case river basins cannot be explained as being representative (or drawn by probability methods) of all the twelve river basins in Nigeria, the transferability of the research findings and conclusions to other river basins in Nigeria and elsewhere is only possible if they can be judged to be similar.

### **3.8 Ethics**

Nachmias and Nachmias (1981) point out that informed consent and the right to privacy are the two common and important ethical issues in qualitative research. The risk to participants that might necessitate informed consent includes physical or psychological stress arising from the need to recall information and search for where information is kept. Those relating to privacy might include the sensitivity of information being given, the setting being observed, and matching information with the identity of the respondent. However, consideration for ethical requirements also has some important drawbacks. Bordens and Abbott (1988, p. 119) assert that ethical requirements can “act in direct opposition to the methodological requirements of good research”, while Rubin and Rubin (1995) comment that it can affect external validity or serve as a threat to iterative design models.

Consistent with the suggestions of a number of scholars on the need for researchers to engage in good ethical practices (Blaxter et al., 1996; Christians, 2000; Rubin and Rubin, 1995; Bulmer, 2008; Blaikie, 2000), this study obtained informed consent from respondents, provided anonymity and confidentiality assurance through the following approaches:

- (a) On informed consent; the study provided a synopsis of the nature and purpose of the research and the tasks expected from respondents. These were contained in the information letter requesting informed consent to participate in the research. With a copy of the interview script attached, these were mailed or hand-submitted to the actors in advance. It was anticipated that having a pre-knowledge of the tasks would help to reduce physical and



psychological stress associated with providing answers to interview questions. A copy of the information letter to actors seeking informed consent is provided as Appendix G.

- (b) On anonymity; this entailed separating the identity of respondents from the information they provide. To match information with the provider, codes were used instead and responses reported in group form only, and
- (c) On confidentiality; respondents were informed that the information they provide would be treated as confidential. A statement was also included in the information letter to say that a respondent was free to withdraw and to discontinue participation in the research at any time without prejudice to the respondent.

To reinforce the above and also legitimise the process of the fieldwork, the following measures were put in place:

- i. The Chief Executive Officer of each organisation was contacted to both gain approval for the interview and suggest initial subject(s) (or key informants) that would be most appropriate to help the study. It was therefore important that before proceeding to the field necessary ethical approvals should be obtained from the University Ethics Screening Committee. An ethics proposal was submitted to the Ethics Screening Committee of the University for review and approval. Fieldwork protocols were authorised by the Committee in February 2012. At the start of each interview, the researcher reminded the respondent of the purpose of the interview and reiterated the ethical and confidentiality protocols of the research. Respondents were also reminded that they would be given a copy of the interview transcript for validation. Before the start of the interview or after, each respondent was assigned a reference number (as illustrated in Table 3-9) in order to keep his/her identity confidential and anonymised, and in order to erase any form of deception. To assist the researcher, a description of respondent professional qualifications/functions, the length of service in the organisation, and the names of their respective organisation was maintained. However, in this thesis, listing job roles/functions is not possible as it would expose identities of roughly 20 per cent of respondents and breach the anonymity as well as the confidentiality assurance.
- ii. To further minimise physical and psychological stress and make it easier for subjects to understand what was being asked, a copy of the questions was handed over to the subject to follow along as the items were being read, or where possible, made available prior to the interview date. Consistent with the argument of Brown and Canter (1985), respondents were

not being asked anything new but rather were being placed in a special situation in which to recount their life/lived experiences.

- iii. As per the local farmers, before administering the semi-structured interviews, informed consent was also solicited from them, which was either oral or written, depending on the situation. In the case of this study, the farmers interviewed were knowledgeable in the use of English Language (mostly active/retired civil servants), hence there were no communication difficulties or any need for translators.
- iv. The use of direct observations, which formed part of the data gathering techniques of this study, also raises ethical concerns as well as highlighted by a number of authors (e.g., Kidder and Judd, 1986; Adler and Adler, 1998). This is because the actors had not permitted its use, as opposed to participant observation where the researcher is an integral part of the setting being observed. However, the use of this method was justified on the ground that there was no other means of identifying the differences between what actors say and what they do in practice or what actors do unconsciously. Nachmias and Nachmias (1981) also assert that informed consent may not be realistic, because it could have a destructive effect on the research outcome (e.g., reactivity effect). However, to minimise any negatives arising from the use of this method, the study limited its visual observations to the basin natural environment, the physical infrastructures, and the RBDAs' functional activities and interactions that are relevant to this study.
- v. Leedy and Ormrod (2005) suggest that necessary debriefing should follow immediately after respondents' participation. For this study, and as contained in the information letter (see Appendix G), respondents will be debriefed by offering their organisation a copy of the PhD thesis. Since this research is being funded by the Federal Government of Nigeria (through the Tertiary Education Trust Fund (TETFund)), this will offer an important opportunity to communicate its contributions to wider governmental and non-governmental audience in Nigeria.

### **3.9 Summary of this chapter**

This chapter has narrated the study's philosophical assumptions/approaches and justified the different decisions and processes adopted. A qualitative orientation was utilised to answer the research questions and realise the main aim of this research. The study's theoretical perspectives

that informed the research methodology and methods followed a string of hermeneutics, phenomenology, and interpretivists philosophies. A case study research strategy was used to explore IWRM implementation issues in both O-ORB and B-ORB from different perspectives using multiple sources of evidence – semi-structured interviews, direct observations, and documents. The data obtained were first analysed using textual approach and then followed with variance institutional approach. The chapter also looked at validity, reliability, triangulation, generalisation, and finally, ethical issues. The next chapter presents the results obtained from the cases studied.

## **4 STATUS AND EFFECTS OF THE INTERNAL ENVIRONMENT OF THE RBDAs ON IWRM IMPLEMENTATION**

### **4.1 Introduction**

Chapters 4, 5, and 6 present the results of the analyses carried out and the findings obtained. As explained in Chapter 3, various strategies have guided the process of collecting and analysing the data, and the presentation of results and findings has been developed in line with the primary research questions (PRQs) and the subordinate research questions (SRQs) as shown in Figure 4-1 (carried forward from Chapters 1 and 2). In specific terms, the results of the textual analysis (or the first-order data) are first presented and then findings are drawn. The outcome of the textual analysis in Chapters 4 and 5 informs the institutional analysis presented in Chapter 6. Here, the results of the variance institutional approach (or the second-order data) which identifies the forces influencing IWRM implementation are presented, and then discussed in Chapter 7. Chapter 8 presents the proposed measures which might improve the quality of IWRM implementation at the river basin level in Nigeria.

In the interest of presenting a concise and focused analysis that is devoid of repetition and also in response to the primary research questions, the reporting of results and findings is structured along the themes investigated in both case studies. This is done more so that the research is not about comparing the activities of the selected cases but to identify the forces influencing IWRM implementation and the environments within which they are embedded. The next section presents the results of the textual analysis which examines the extent of implementation of IWRM at the river basin level in Nigeria. The chapter closes with a summary of key findings.

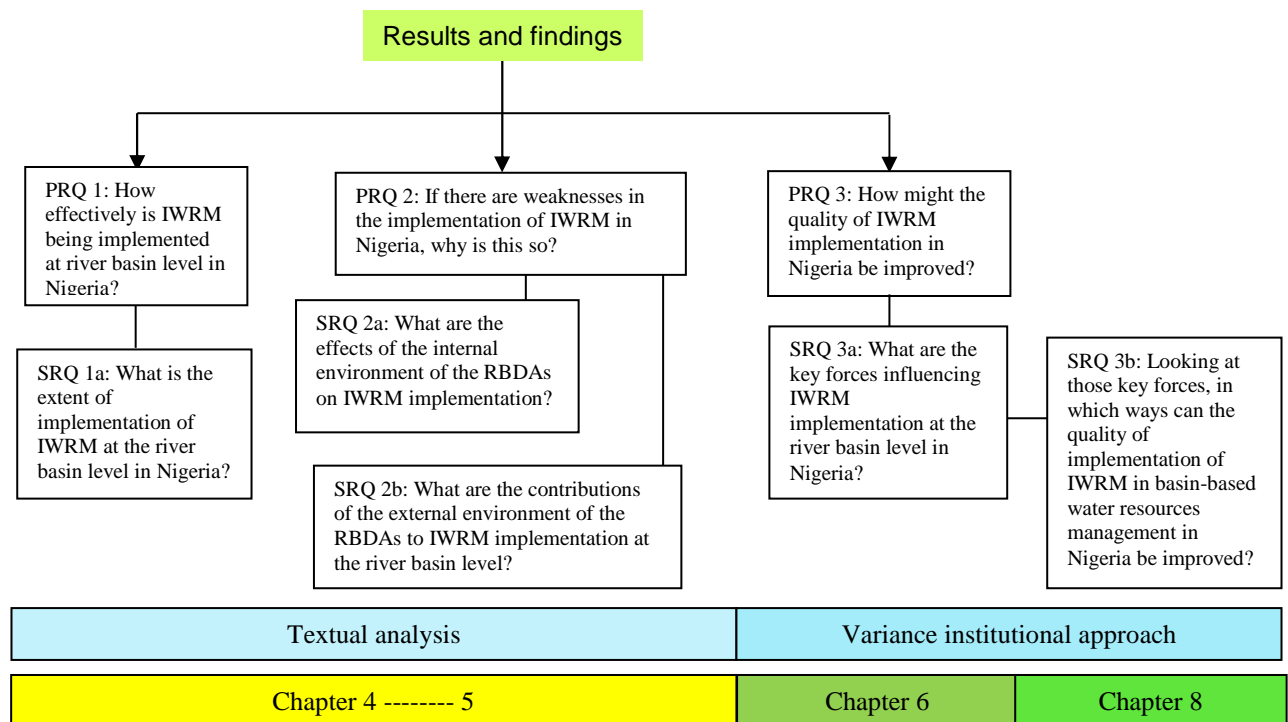


Figure 4-1 Research questions, approaches to data analysis, and chapters presenting them

## 4.2 The extent of IWRM implementation at the river basin in Nigeria

This section, which presents the results of the textual analysis of interview data on the extent of IWRM implementation at the river basin level in Nigeria, contributes towards answering PRQ 1 and SRQ 1a. To understand the extent of implementation of IWRM at the river basin level in Nigeria, two river basins were purposively selected and surveyed as described in Chapter 3. Within each river basin, three different types of actors (or organisations) were surveyed (for details, see Table 4-1). During interviews, respondents from the RBDAs, the national and international organisations who have heard of IWRM and showed some moderate understanding of IWRM in their description of what IWRM entails were requested to complete an IWRM prompt sheet. The prompt sheet asked respondents to rank the level of implementation of each of the IWRM elements on a scale of 0 to 3, where 0 = not addressed and 3 = largely addressed. However, it is important to stress that those respondents who were not familiar with the case river basins were not requested to complete the IWRM prompt sheet despite their ability to show some moderate understanding of what IWRM entails (this is applicable more to respondents obtained from the FMWR and NIWRMC).

Table 4-1 Summary data on average scores for the case river basins

IWRM element <sup>1</sup>	Case study 1: O-ORB				Case study 2: B-ORB		
	RBDA	National actors	International actors	Overall average	RBDA	National actors	Overall average
Integrated planning (a)	1.8	1.7	1	1.5	0.7	1	0.9
Non-government stakeholder participation (b)	1.2	1.3	1	1.2	0.5	0.7	0.6
Government stakeholder participation (c)	1.4	1.5	1	1.3	0.8	0.7	0.8
Inclusion of women (d)	1.2	1.2	1	1.1	1	0.7	0.9
Cost recovery (e)	0.9	0.8	0	0.6	0	0	0
Water as a social good (f)	2.5	2.5	2	2.3	2.7	2.3	2.6
Polluter pays principle (g)	0	0	0	0	0	0	0
Data collection (h)	1.7	2	2	1.9	1.7	1.7	1.7
Functional decentralisation (i)	1.2	1	1	1.1	1	1	1
Human capacity building (j)	2.3	2	2	2.1	2	1.7	1.9
IWRM principles and approaches embedded in legal and regulatory frameworks (k)	0.9	0.8	1	0.9	0.7	0.3	0.5
Conflict management (l)	1.6	1.7	2	1.8	0.8	0.7	0.8
Water laws enforcement (m)	0.5	0.5	1	0.7	0	0.3	0.2

Figure 4-2 describes the classification of respondents based on the interview data. The summary of the results of the textual analysis per actor is provided in Table 4-1. Using a radar chart, Figures 4-3 and 4-4 capture the summary of results per actor per basin, while Figure 4-5 presents the overall summary for the two case river basins. As illustrated in Chapter 3, the study quantifies the qualitative data obtained from the interviews via a 4-point Likert scale. The 4-points represent the four performance indicators that have been purposively selected (see the legend of Figures 4-3 through 4-5). The end results of the quantification on the radar chart show the extent of IWRM implementation. Essentially, a radar chart does not serve as a tool for comparing one performance indicator against another, but it simply shows the extent of performance of each of the IWRM elements on a scale. The radar chart illustrates a sign of weakness in application for any IWRM element if its total mean score is less than 3. The themes measured are the IWRM elements that were derived from Chapter 2 and summarised in Table 2-12.

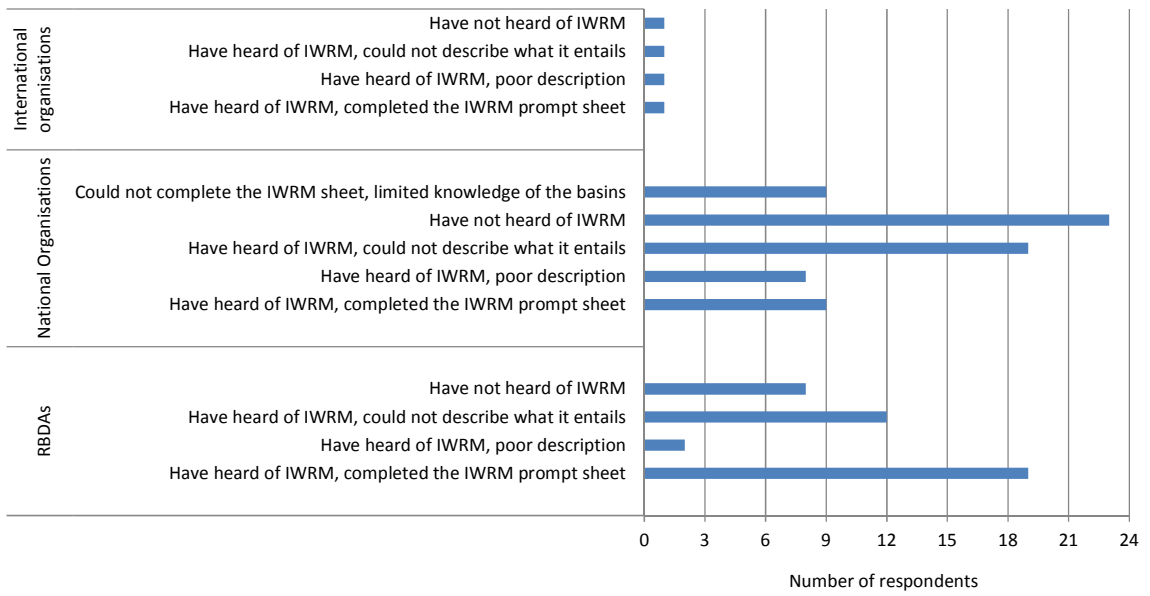


Figure 4-2 Classification of respondents based on the interview data

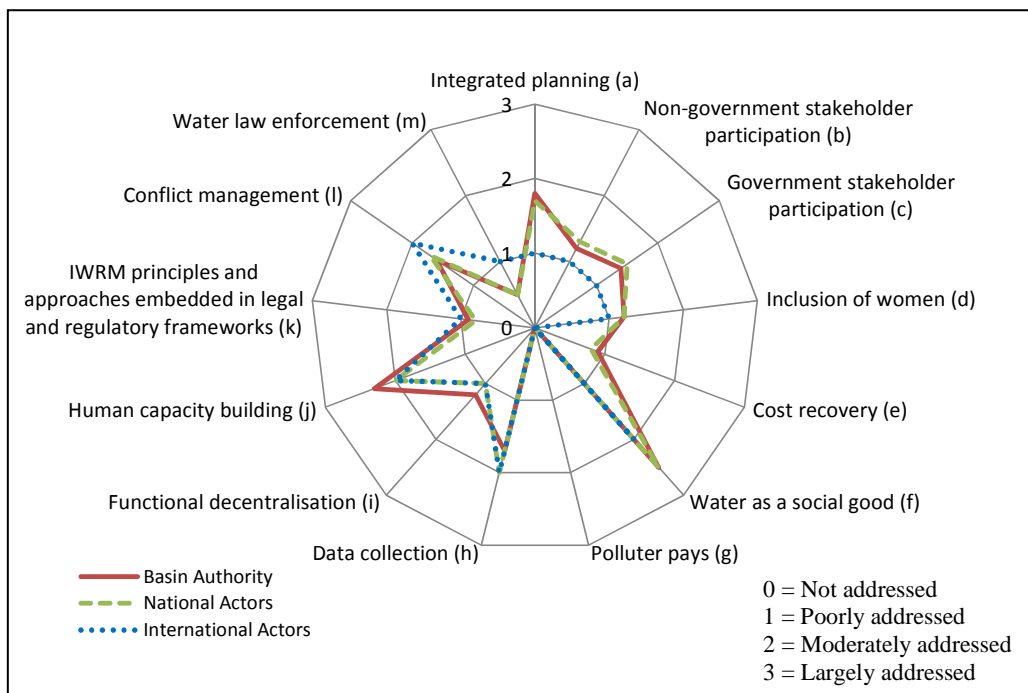


Figure 4-3 The extent of IWRM implementation in the O-ORB

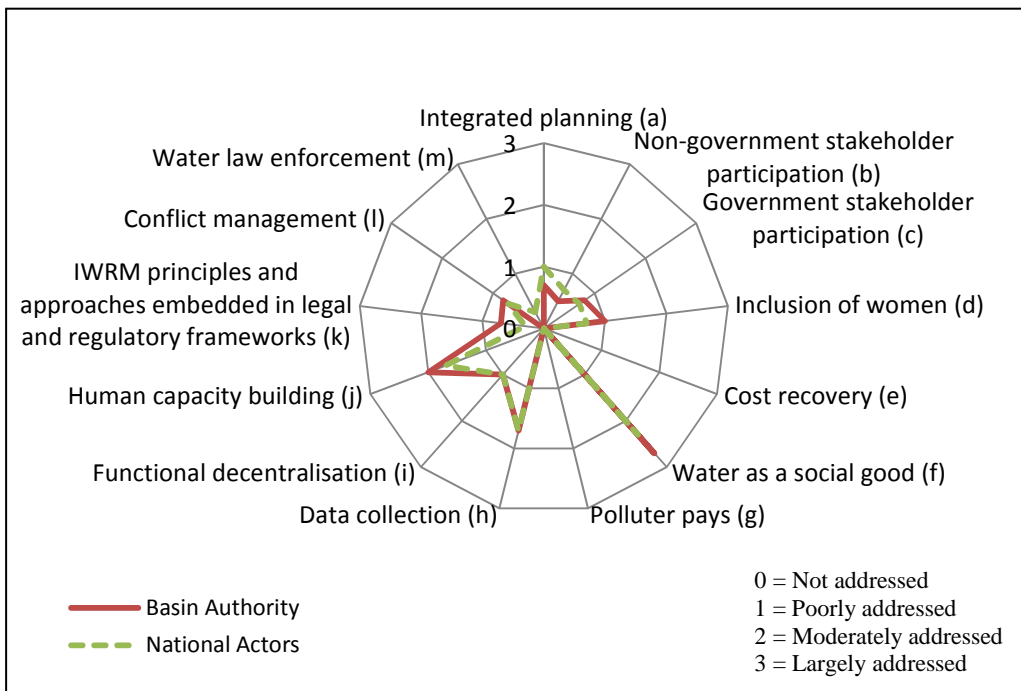


Figure 4-4 The extent of IWRM implementation in the B-ORB

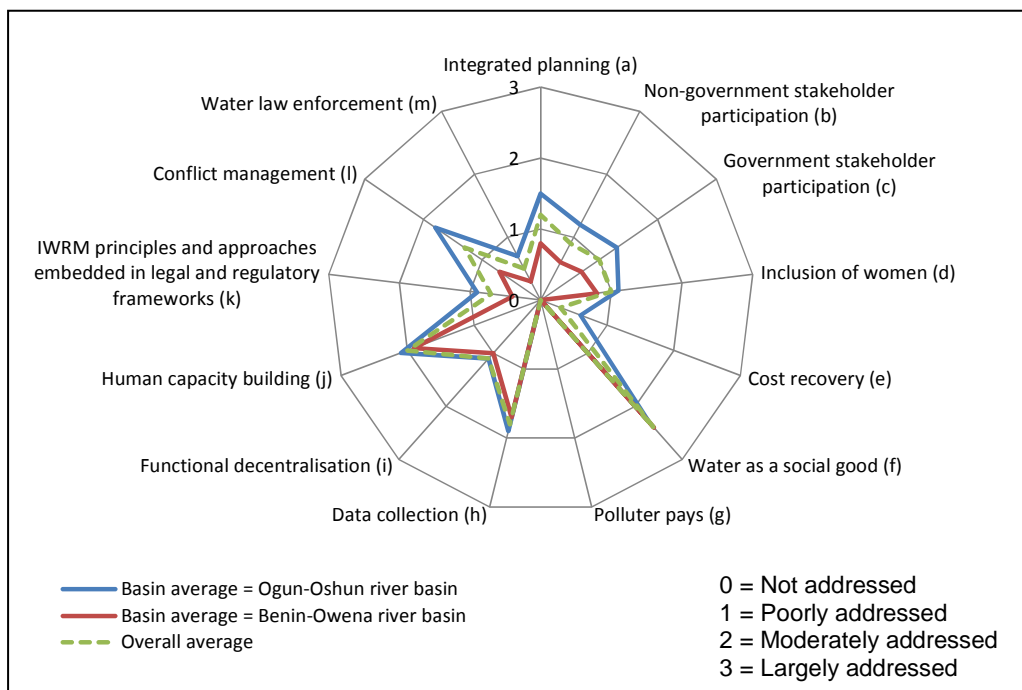


Figure 4-5 Summary of results of the extent of IWRM implementation in the surveyed river basins

Since this study is not about comparing the activities of the surveyed river basins, in drawing the key findings from the results of the textual analysis, the study has focused on the overall average scores as shown in Figure 4-5 (in dotted lines). Key findings are summarized as follows:



- a. The core IWRM elements (stakeholder participation, inclusion of women, cost recovery) were poorly addressed by the RBDAs at the river basin level in Nigeria, except integrated planning that was moderately addressed
- b. Other IWRM elements, such as, data collection, human capacity building, and conflict management were also moderately addressed
- c. Functional decentralisation (that is, between the FMWR and the RBDAs), the inclusion of IWRM principles and approaches in legal and regulatory frameworks, and water law enforcement were poorly addressed, while polluter pays was not addressed by the RBDAs
- d. Managing or treating water as a social good was well addressed in the basins by the RBDAs
- e. Overall, all the IWRM elements scored below 3 indicating that there are weaknesses in IWRM implementation at the river basin level in Nigeria; although the interpretation of this finding requires some level of caution in the case of “water as a social good”.

These findings corroborate those identified during the critical literature review presented in Chapter 2, and show that there are weaknesses in the implementation of IWRM at the river basin level in Nigeria. With this finding, the next question is: why is this so? To address this question (which corresponds with PRQ 2), two environments will be investigated to identify the influencing forces. They are: the internal environment of the RBDAs, and the external environment of the RBDAs. The next section examines the internal environment for factors (explicit and implicit) that might explain the inability of the RBDAs to give full effect to the implementation of IWRM in Nigeria, while Chapter 5 examines the forces in the external environment.

### **4.3 Internal challenges facing the RBDAs in the implementation of IWRM**

As neo-institutional theory suggests, organisations operate as open systems. Consistent with the open systems perspective, organisations function within their internal and external environments, both of which could shape organisational performance. Looking at the internal environment for explicit (formal) and implicit (informal) rules which govern RBDA actions, this section presents the results of the textual analysis of interview, document and observational data carried out to understand which internal factors explain the inability of the RBDAs to fully implement IWRM at the river basin level in Nigeria. The section, which contributes towards answering PRQ 2 and SRQ 2a, is split into four subsections as follows: Subsection 4.3.1 presents the results of the analysis of interviews and document data which examines the legal and regulatory instruments that the RBDAs comply with in practice and the IWRM elements that are enabled and/or constrained by these

instruments. Subsection 4.3.2 presents the results of the analysis of interviews, document and observational data that examines the factors influencing the RBDAs in giving full effect to the implementation of those IWRM elements that are enabled by the extant legal and regulatory instruments. That of the internal cultural environment of the RBDAs is presented in Subsection 4.3.3. Subsection 4.3.4 examines the role of water infrastructure development in IWRM implementation at the river basin level in Nigeria. A summary of key findings from the results of the textual analysis is presented in Section 4.4.

### **4.3.1 Provisions on IWRM in the legal and regulatory instruments**

Organisations are diverse and complex, and can be grouped into two types: (a) formal organisations, and (b) informal organisations. Formal organisations are those that have their existence defined by formal rules and regulations, while informal organisations are those that have their existence embedded in informal mores. To decipher the type of organisation as well as identify the extant legal and regulatory instruments that guide the operations of the RBDAs in Nigeria including what they say on IWRM implementation, respondents from both RBDAs were asked to describe the status of the RBDA and those legal and regulatory frameworks that they comply with in practice. Respondents (A1, A7, A18, A20, A21, A26; B1, B4, B7 – B9, B22, B27) revealed that the RBDAs are parastatals (defined by Public Service Rules (2008, p. 109) as “a government-owned organisation established by statute to render specified service(s) to the public”) under the FMWR, established by law, whose operations are governed by rules and regulations (A19, A21, A26; B4, B10, B22, B24, B27). The legal instruments that they comply with in practice (including their subsidiary legislation) (A10, A14, A19, A21, A26, A28; B10, B22) are listed in Table 4-2. However, respondents pointed out that the statutory functions of the RBDAs are spelled out in the River Basins Development Authorities Decree No. 35 of 1987 (A3, A21, A26; B4, B10, B22). On the availability of bylaws, respondents (A11, A21, A28; B10, B18, B19, B22 – B24, B27, B28, B30) explained that the RBDAs have no bylaws in place.

The results of legal and regulatory instrument analysis reveal that Section 5 (4) of the River Basins Development Authorities Decree No. 35 of 1987 empowers the RBDAs to make bylaws, but subject to confirmation by the National Council of Ministers. Furthermore, according to the respondents, the RBDAs are not operating under any international treaties, laws and regulations, agreements, guidelines, or conventions (A21, A22, A26, A28; B10, B22). However, the results of the documentary analysis, which are in agreement with the interview data, indicate that the RBDAs are established by the Federal Government of Nigeria as parastatals under the FMWR (Ogun-Oshun

River Basin and Rural Development Authority (O-ORBRDA), 1998; O-ORBDA, 2011a; Akinkoye, 2001; B-ORBDA, 1997, 1999, 2002, 2012; Ijasan, 2009a; Benin-Owena River Basin and Rural Development Authority (B-ORBRDA), 1999) whose operations are governed by laws and regulations (Are, 1984) and their statutory functions spelled out in the River Basins Development Authorities Decree No. 35 of 1987 (O-ORBDA, 1989, 1992, 1998, 2009, 2011a, 2011b; Fatokun and Ogunlana, 1988; Akinkoye, 1997; B-ORBDA, 1997, 2002, 2012; B-ORBRDA, 1999). The results of the documentary analysis also indicate that the operations of the RBDAs are being guided by the River Basins Development Authorities Decree No. 35 of 1987, the Water Resources Decree No. 101 of 1993 (now Water Resources Act, 1993, CAP W2 LFN of 2004), and the Privatisation and Commercialisation Decree No. 25 of 1988 (O-ORBDA, 2011a, B-ORBDA, 2002, 2012). To understand whether these legal and regulatory frameworks (and their subsidiary/ancillary legislation) enable and empower the RBDAs to implement IWRM at the river basin level in Nigeria, a legal and regulatory instrument analysis was conducted. Table 4-2 presents the results of the analysis. The table illustrates those IWRM principles and approaches that are enabled/constrained and the legal and regulatory frameworks enabling/constraining these. This suggests that legal and regulatory instruments are not just constraint structures, they empower as well.

As shown in Table 4-2, there is a paucity of provisions in the legal and regulatory instruments that enable and empower the RBDAs to have platforms for stakeholder participation, undertake conflict management, include women in basin activities, manage water as a social good, implement the polluter pays principle, and enforce water laws. Also, there is an absence of legal and regulatory instruments that encourage functional decentralisation between the FMWR and the RBDAs. However, there are provisions in the extant legal and regulatory frameworks that empower the RBDAs to implement some aspects relating to integrated basin planning, recover operating cost, collect data on water resources, water use, environmental and socio-economic parameters, and build human capacity. Despite the availability of legal and regulatory instruments empowering the implementation of these activities, looking at Figure 4-5, these activities are either moderately implemented (e.g., integrated planning, data collection, and human capacity building) or poorly implemented (e.g., cost recovery). In the case of private sector participation in river basin water activities, which is enabled by the Infrastructure Concession Regulatory Commission (Establishment, etc) Act of 2005 and the National Policy on Public Private Partnership of 2009, respondents from the RBDAs (A22, A23, A25; B17, B21, B27 – B30) remarked that there is no private sector involvement in river basin water activities.

Table 4-2 Legal and regulatory instruments and IWRM-related areas

Legal and regulatory documents		IWRM elements										
		Integrated planning	Stakeholder participation (including private sector participation)	Inclusion of women	Cost recovery	Water as a social good	Polluter pays	Data collection	Functional decentralisation (between FMWR and RBDAs)	Capacity building	Conflict management	Water law enforcement
a.	The Constitution of the Federal Republic of Nigeria 1999	X = No provisions	X	X	X	X	X	X	X	X	X	X
	The Constitution of the Federal Republic of Nigeria (First Alteration) Act No. 5 of 2010 <sup>1</sup>	X	X	X	X	X	X	X	X	X	X	X
	The Constitution of the Federal Republic of Nigeria (Second Alteration) Act No. 2 of 2010 <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X
	The Constitution of the Federal Republic of Nigeria (Third Alteration) Act, 2010 <sup>3</sup>	X	X	X	X	X	X	X	X	X	X	X
b.	Water Resources Decree No. 101 of 1993 (now Water Resources Act 1993, CAP W2 LFN of 2004)	X	X	X	X	X	X	X	X	X	X	X
c.	River Basins Development Authorities Decree No. 35 of 1987 <sup>4</sup>	To develop both surface and underground water resources; and formulate water resources master plan	X	X	To supply water from completed storage schemes to all users for a fee (no cost recovery)	X	X	To collect and collate water resources, water use, socio-economic, and environmental data	X	X	X	X

d.	The Public Service Rules of 2008 <sup>5</sup>	X	X	X	X	X	X	X	X	Supports capacity building	X	X
e.	The Public Procurement Act of 2007 <sup>6</sup>	X	X	X	X	X	X	X	X	X	X	X
f.	The Public Enterprises (Privatisation and Commercialisation) Act No. 28 of 1999 <sup>7</sup>	X	X	X	To recover recurrent expenditure	X	X	X	X	X	X	X
g.	The Land use Act No. 6 of 1978 <sup>8</sup>	X	X	X	X	X	X	X	X	X	X	X
	The Land Use Act (Validation of Certain Laws, etc.) Act No. 94 of 1979 <sup>9</sup>	X	X	X	X	X	X	X	X	X	X	X
	The Lands (Title Vesting, etc) Act of 1975 <sup>10</sup>	X	X	X	X	X	X	X	X	X	X	X
h.	The Public Lands Acquisition (Miscellaneous Provisions) Decree No. 33 of 1976 <sup>11</sup>	X	X	X	X	X	X	X	X	X	X	X
i.	Administrative guidelines regulating the relationship between Parastatals/Government-owned companies and the Government of 1999 <sup>12</sup>	X	X	X	X	X	X	X	X	X	X	X
j.	Government circulars <sup>13</sup>	No circulars relating to water resources management										
k.	Internal administrative guidelines <sup>14</sup>	No guidelines relating to IWRM										

1. No provisions on water; but provides, among other things, for the financial independence of the National Assembly and Independent National Electoral Commission
2. Provides for matters relating to elections and establishment of election tribunals and time for determination of election petitions
3. Establishes the National Industrial Court under the Constitution
4. The River Basins Development Authorities Decree No. 35 of 1987 repealed the River Basins Development Authorities Decree No. 87 of 1979. The River Basins Development Authorities Decree No. 87 of 1979 repealed the River Basins Development Authorities Decree No. 25 of 1976 and the Niger Delta Basin Development Authority Decree No. 37 of 1976 and their amendment Decrees No. 31 and No. 32 of 1977. The River Basins Development Authorities Decree No. 35 of 1976 repealed the Chad Basin Development Authority Decree No. 32 of 1973 and as amended by Decree No. 25 of 1975, and the Sokoto-Rima Basin Development Authority Decree No. 33 of 1973 and as amended by Decree No. 26 of 1975. The River Basins Development Authorities Decree of 1990 splits the Niger River Basin Development Authority into Upper Niger and Lower Niger without repealing its predecessor the River Basins Development Authorities Decree No. 35 of 1987. However, the River Basins Development Authorities (Amendment) Decree No. 33 of 1978 enlarges the membership of the Board of the Niger River Basin Development Authority by the inclusion of a representative of Sokoto State Government therein. In turn, the River Basins Development Authorities (Amendment) Act No. 7 of 1981 reconstitutes the membership of the Boards of the eleven River Basin Development Authorities by amending River Basins Development Authorities Decree No. 87 of 1979
5. Specifies the rules, regulations and procedures including core values and professional standards in the Public Service
6. Regulates and sets standards for public procurement and disposal of public property in Nigeria
7. Sets the River Basin Development Authorities for partial commercialisation. The Public Enterprises (Privatisation and Commercialisation) Act No. 28 of 1999 repealed the Bureau of Public Enterprise No. 78 of 1993, while the Bureau of Public Enterprise No. 78 of 1993 repealed the Privatisation and Commercialisation Decree No. 25 of 1988. However, the Public Enterprises (Privatisation and Commercialisation) Order of 2004 provides for core investors to whom up to 51 per cent of Government shares in enterprises to be privatised could be offered and Staff of public enterprises to be privatised who may be offered up to 10 per cent of shares to be offered for sale.
8. Vests all urban lands in the territory of each State (except lands vested in the Federal Government or its Agencies) solely in the Governor of the State, who holds such in trust for the people of the State, with similar powers conferred on Local Government Chairmen with respect to non-urban lands
9. No provisions on water
10. Vests the ownership, control and management of all land within the 100 metres limit of the 1967 shoreline and all land reclaimed near the lagoon, sea or ocean in or bordering Nigeria exclusively in the Federal Government of Nigeria
11. Provides a new basis for the assessment of compensation in respect of lands compulsorily acquired for the public purposes of the Federation or of a State
12. Defines the relationship between Government Ministries and Parastatals with a view to removing possible ways of conflict and misunderstanding
13. The researcher had no access to government circulars in both organisations; hence, they could not be reviewed. In the alternative, government circulars between 1995 and 2011 were obtained elsewhere and reviewed. The results indicate an absence of directives relating to water resources management. An exception is Circular Ref No. SGF/OP/I/S.3/V/82 dated 14<sup>th</sup> December 2001 that relates to capacity building, which restricts overseas trips from fiscal year 2002 with regard to participation in conferences, meetings, seminars and workshops, but without any particular reference to water resources management
14. According to respondents (A19, A21, A22, A26, A32; B5, B7, B9, B12, B14, B20), internal administrative guidelines are related to appointments, promotions and discipline of staff including staff welfare. This is in agreement with Chapter 16, Section 2 (a) of the Public Service Rules of 2008

### **4.3.2 Factors influencing the ability of the RBDAs in giving full effect to those IWRM elements enabled by legal and regulatory instruments**

This subsection takes a detailed look at the implicit (and other explicit) factors within the internal environment of the RBDAs constraining the RBDAs in giving full effect to the implementation of integrated planning, cost recovery, data collection, and human capacity building. In addition to this, factors promoting the implementation of water as a social good despite the absence of legal and regulatory instruments enabling its application as shown in Table 4-2 will also be examined. However, findings from the legal and regulatory instrument analysis (see Table 4-2) have also revealed that IWRM principles and approaches are poorly embedded in the legal and regulatory frameworks in Nigeria. This corroborates the findings obtained from the interview data shown in Figure 4-5.

#### **a Integrated planning**

Despite the fact that Sections 4 -1 (a) and (e) of the River Basins Development Authorities Decree No. 35 of 1987 empower the RBDAs to undertake a comprehensive development of both surface and underground water resources and formulate basin water resources master plans, respondents (A3, A17, A22, A23, A25; B17, B23, B26 – B30) explained that there is no basin master plan, and little attention was said to be paid to a coordinated development of both surface and underground water resources. While respondents agreed that there is political interference in river basin activities in Nigeria (A1 – A22, A26, A29 – A33; B1 – B9, B11, B12, B23, B24, B27), they went on to explain that political interference in river basin activities has made the formulation of basin master plans and integrated planning unworkable (A3, A14; B4, B7, B11, B27) (political interference will be examined more fully in Chapter 5).

Furthermore, while there is an absence of data on the total number of boreholes in the basins (A17, A19; B11, B13, B14, B23, B24, B28 - B30), respondents remarked that the dearth of legislation or regulatory instruments that regulate borehole drilling in Nigeria has further helped to constrain integrated planning (A19; B5, B14, B23). Corroborating this, the results of the review of legal and regulatory instruments reveal that there is no legal and regulatory framework regulating borehole drilling in Nigeria. Besides this, there is an indication that the dominant focus of the RBDAs on irrigated agricultural development has also curbed their ability to implement some other part of their functions as the results of documentary analysis show. For instance, the success recorded by the pioneer RBDAs (that is, Chad Basin and Sokoto-Rima Development Authorities, which were established in 1973) in the area of irrigated agriculture led the Federal Government of Nigeria to

establish more RBDAs in 1976 (O-ORBDA, 1978; Are, 2003; Akinkoye, 1997), while the newly formed RBDAs embarked on actions aimed at replicating the achievements of the pioneer RBDAs in the area of irrigated agriculture (O-ORBDA, 1978, 1979). As a consequence, irrigated agricultural practice was mimicked by the newly created RBDAs, and therefore, activities in support of agricultural production became taken for granted that other statutory functions were weakly considered. That the RBDAs followed a mimetic behaviour is captured by O-ORBDA (1978) as follows:

“Other major decisions taken at the inaugural meeting included the advice given to the General Manager, possibly accompanied by the Chairman, to visit other functioning River Basin Authorities like the ones [in] Kano, Sokoto and Maiduguri to acquaint themselves with the procedures adopted by these Authorities in performing the operations of the projects currently being handled by them” (p. 7).

The results of the documentary analysis also reveal that the RBDAs accepted and provided support for the implementation of irrigated agriculture by concentrating on water resources development for irrigation. This is backed up by the following statement:

“We have therefore accepted the challenge to serve. With the co-operation of our various consultants, the contractors who will execute our projects and the State Governments in whose areas we operate and the support and encouragement of the members of the Authority, we believe that the efforts of the Authority will be translated into increased agricultural productivity and a more satisfying life for people in our areas of operation” (O-ORBDA, 1978, p. 13).

Also in support of irrigated agriculture, below is an excerpt from the document of O-ORBDA:

“In furtherance of the Green Revolution Programme and the fact that irrigated agriculture is what the River Basin Development Authorities are expected to concentrate upon, the Authority has initiated plans to convert most of the 5,092 hectares of land cleared and currently being used for rainfed farms to irrigated farms” (O-ORBDA, 1982, p. 9).

However, the results of the analysis of the legislation establishing the two pioneer RBDAs reveal that the formulation of basin master plans and the need to integrate the development of surface and underground water resources were not part of their functions when created. The RBDAs were only empowered to undertake a comprehensive development of both surface and underground water sources in 1976 by the River Basins Development Authorities Decree No. 25 of 1976 and to formulate basin water resources master plans by the River Basins Development Authorities Decree No. 35 of 1987 (commencing in 1986). While it is not particularly clear what the basin water



resources master plan is meant to address, there is still an absence of provisions enabling and empowering the RBDAs to implement sectoral coordination, integrate the development and management of land and water resources, water and wastewater, green and blue water, water quantity and water quality at the river basin level in Nigeria. Furthermore, there is no provision that recognises (or empowers the RBDAs to implement) ecological reserve and priority of water use, and neither are these activities [(ecological reserve (A2, A3, A8 – A17, A19, A20, A22, A29, A32) or priority of water use (A2, A3, A8 – A14, A16 – A18, A20, A22, A24)] implemented in practice by the RBDAs. Besides the influence of the success factor of the pioneer RBDAs, “imprinting” effect (that is, the conditions prevalent at the time of creation – the need to develop the vast water resources for irrigated agriculture to mitigate the effects of droughts) and the various government policy thrusts on food production also coerced the RBDAs into focusing on water resources development for irrigated agriculture and food production activities.

## **b Cost recovery**

As illustrated in Table 4-2, there are two active legal frameworks that have provisions relating to basin water service charges. Section 4 – (1) (c) of the River Basins Development Authorities Decree No. 35 of 1987 empowers the RBDAs to supply water from their completed storage schemes to all users for a fee, while Section 8 (d) of the Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999 empowers the RBDAs to charge for water services they provide with a view to meeting their recurrent expenditures. On the response of the RBDAs to these provisions, some respondents (A11, A21) explained that the RBDAs, which still comply with the provisions of the Water Resources Decree No. 101 of 1993, are yet to comply with the provisions of Decree No. 28 of 1999 that were formulated to support the privatisation and commercialisation policy of the Federal Government. Two reasons were cited: one, that the Federal Ministry of Water Resources (FMWR) does not want to lose its authority over the RBDAs to the Technical Committee on Privatisation and Commercialisation (TCPC) (A21), and two, policy inconsistency – the policy was once suspended and later resumed, and the various mergers and demergers of the FMWR and the Federal Ministry of Agricultural and Rural Development (FMARD) (A11). On the other hand, the results of the legal and regulatory framework analysis reveal that though Decree No. 101 of 1993 and Decree No. 28 of 1999 support charging for basin water services both lack any enforcement mechanisms, while Section 15 (2) of the Water Resources Decree No. 101 of 1993 also disallows recovering cost from raw water services provided from publicly funded hydraulic infrastructures. In addition to this, the River Basins Development Authorities Decree No. 35 of 1987 also lacks provisions that empower the RBDAs to enforce the recovery of water service fees. While Section

19 of Decree No. 101 of 1993 empowers the Minister responsible for water resources to make regulations for the administration of water resources in Nigeria, there is no regulation in place which could help to enforce the water laws in Nigeria. However, the results of the documentary analysis, which corroborate the interview data, reveal that the inability of the RBDAs to comply with the provisions of Decree No. 28 of 1999 is also related to: (i) the non-provision by the federal government of the take-off grants promised under the Performance Agreement signed with the RBDAs in 1992 needed to kick-start the implementation of the partial commercialisation policy (O-ORBDA, 1993, 1998; Akinkoye, 1997, Mohammed, 1995), (ii) the resulting conflict over who monitors the operations of the RBDAs between the TCPC and the FMWR, and (iii) policy inconsistency – the various mergers and demergers of FMWR and FMARD (Mohammed, 1995). That the take-off funds were not made available by the Federal Government, the results of the documentary analysis (O-ORBDA, 2007, 2008, 2009, 2010, 2011a; O-ORBRDA, 1998, Anambra/Imo River Basin Development Authority (A/IRBDA), 2005, 2006; Anambra/Imo River Basin and Rural Development Authority (A/IRBRDA), 2004; River Niger Basin Development Authority, 1993; B-ORBDA, 2012) reveal that the Federal Government still continues to release recurrent grants to the RBDAs. As one respondent also put it: “Yes, on river basin financing, we still get our budgetary allocations for both capital and recurrent expenditures directly from the Federal Government” (A1).

To decipher what is happening at the field level, respondents were asked about the water service fee recovery experience of the RBDAs. Since the B-ORBDA has no water users under its direct command (B3, B6, B14, B15, B17, B20, B23 – B30), respondents from the O-ORBDA (A8, A22, A29) explained that there are two categories of bulk raw water users under the command of the RBDA in the basin: (a) the farmers (irrigation water), and (b) the Ogun and Lagos States Water Corporations. On raw water service fees, respondents (A24, A30) explained that the farmers are being charged 3,500 Naira (at US\$1 = 161.477 Naira, July 1, 2014) per hectare per season of three months, while the Water Corporations are being charged 25 Naira per million litres (A11). On the other hand, the results of the documentary analysis show that charges for raw water to the Water Corporations have been fixed by Government at 2½ kobo (100 kobo = 1 Naira) per cubic metre (or 25 Naira per million litres) and to the farmers at 500 Naira per hectare (O-ORBDA, 1992). On the part of the farmers, respondents (U1 – U5) explained that the O-ORBDA charges 3,500 Naira per hectare per season as irrigation water service fees, while respondents on the part of the Ogun State Water Corporation had no information on what the organisation pays as fees for the raw water abstracted (U6 – U11). On whether users are paying for raw water service fees, respondents from

the RBDA explained that aside from the farmers, the Water Corporations are not paying as expected (A4, A11, A19). Reasons ascribed encouraging the non-willingness of the Water Corporations to pay include the belief that the Ogun River cannot run dry (A3, A4, A11, A12, A29), a lack of legal mandate on the part of the RBDAs to enforce payment (A3, A4, A11), and the belief on the part of the Water Corporations that raw waters in river channels are available for free of charge (A11). Besides these, being government agencies (that is, the Water Corporations), the impact of socio-economic factor (e.g., poverty) was also ruled out. However, despite the outward expression of non-willingness to pay on the part of the Water Corporations, some respondents within the RBDA (A11, A19) still noted that whenever any of the Water Corporations requests for raw water, especially during the dry season, they pay. While the farmers pay for raw water service fees (U1 – U5), the results of the documentary analysis, which support the interview data, also show that the O-ORBDA does not fully recover its raw water service fees from the Water Corporations. As O-ORBDA (1991) comments:

“Unfortunately, they enjoyed executive backing from their States. For example, Ogun State Water Corporation is owing ... million for raw water released to ... Water Works. Even where meetings were held and agreement reached at the peak of the demand for water release, no sooner water was released that they reneged on the agreement” (p. 32).

According to O-ORBDA (1992), the inability of the RBDA to recover its raw water service fees from the Water Corporations is due to a myriad of factors. These are: one, a lack of enabling legislation that empowers the RBDAs to recover charges of raw water services, and two, the belief on the part of the Water Corporations that the RBDAs are set up to render social services (O-ORBDA, 1992). On the part of the Ogun State Water Corporation, some respondents (U7, U9, U10) explained that the organisation pays whenever requests are made for raw water releases, while others (U6, U8, U11) merely stated that the organisation pays for raw water. However, the results of the documentary analysis reveal that requests for raw water releases by the Ogun State Water Corporation were last made in 2004 (O-ORBDA, 2005, 2007, 2011b). In a rather clear manner, one respondent from the Water Corporation put it plainly that it is only on the Ogun River that the Corporation is having the problem of paying for raw water charges (U10). Under the present situation, the Water Corporations are hydrologically favoured by being located downstream of the Ogun River. However, to show that the unwillingness of the Water Corporations to pay for basin water service fees is primarily due to an absence of enforcement mechanisms; Sections 3, 9 (1) and 10 of the Water Resources Decree No. 101 of 1993 have requested that any person or any public authority may acquire a right to use or take water from any watercourse or any groundwater (listed on the ELL) on a commercial scale only with a licence issued by the Minister responsible for water

resources. In the case of the Water Corporations, there are no water licences. According to the respondents, the Water Corporations only pay the RBDA whenever requests for raw water are made (U7, U9, U10).

Although customers (in this case, the raw water users) can be a source of cognitive and normative pressures (e.g., influencing water service fee recovery), there is no data to suggest that the RBDAs depend on the raw water users for support or resources. Besides this, the data have revealed that the situation of cost recovery, which is poorly implemented by the RBDAs (as shown in Figure 4-5), is largely being encouraged and sustained by four major factors: one, a lack of enforcement mechanisms in relevant legislation; two, the conflicting stand of both the Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999 and the Water Resources Decree No. 101 of 1993 with respect to cost recovery; three, the support being provided by the FMWR which is encouraging non-compliance with the provisions of Decree No. 28 of 1999 by the RBDAs on cost recovery; and four, the failure of the Federal Government to provide the take-off grants promised under the Performance Agreement signed with the RBDAs in 1992. However, there is no evidence to suggest that the inability of the RBDAs to implement cost recovery is being influenced by the socio-economic situation (e.g., poverty) in the basin areas. Interpreting this result may require some level of caution in the case of Benin-Owena River Basin. This is because there are no water users under the direct command of the RBDA in the basin. How they will respond to the recovery of basin water service fees is not known. In the case of the river basins in Nigeria, according to Section 4 – (1) (c) of the River Basins Development Authorities Decree No. 35 of 1987, the only avenue for the RBDAs to generate revenue or recover cost is through raw water releases from their completed storage schemes. This, however, suggests a link between cost recovery and water infrastructure. A more detailed look at the situation of water infrastructure development is presented in Subsection 4.3.4.

### **c Data collection**

As indicated in Table 4-2, Section 4 – (1) (e) of the River Basins Development Authorities Decree No. 35 of 1987 empowers the RBDAs to collect and collate water resources, water use, socio-economic, and environmental data. When respondents from both case studies were asked about the data collection experience of their RBDA, respondents from O-ORBDA explained that the RBDA does not collect water use, socio-economic, hydrological and environmental data (A17, A24, A26), but collects meteorological data (A17, A26). This is in agreement with the results of the

documentary analysis which indicate that the O-ORBDA only collects and collates meteorological data (O-ORBDA, 2005, 2007, 2008, 2009, 2011b). In the case of the B-ORBDA, respondents (B13, B15, B19) explained that the RBDA does not collect water use, socio-economic and environmental data, but collects hydrological and meteorological data (B13, B15, B19). This is also in agreement with the results of the documentary analysis which reveal that the B-ORBDA collects and collates hydrological and meteorological data (B-ORBDA, 1992, 1995, 2007; B-ORBRDA, 1997, 2005). However, respondents from both cases explained that inadequate funding is a major factor constraining data collection (A17, A29, A32; B7, B9, B14, B20), while the results of the documentary analysis, which support the interview data, indicate that the constraints facing data collection are paucity of funds (O-ORBDA, 2005, 2007, 2008; B-ORBRDA, 1998) and poor remuneration of data collectors (O-ORBDA, 2005, 2007, 2008).

To have a better idea of how the RBDAs are being funded, with the purpose of exposing the influencing forces, respondents from both cases were asked to describe their organisation's funding experience. Respondents (A1, A6, A21, A25; B26 – B30) explained that the RBDAs are being funded by the Federal Government through annual budgetary allocations for both capital and recurrent expenditures. This response is in agreement with the results of the documentary analysis which show that the RBDAs draw their financial resources from the purse of the Federal Government of Nigeria (O-ORBDA, 2005, 2007, 2008, 2009, 2010, 2011; B-ORBDA, 2012). Despite being funded by the Federal Government, respondents remarked that the RBDAs still suffer from inadequate funding, untimely and non-release of funds (A22, A26, A29, A32; B4, B7, B9, B14, B20). This is in agreement with the results of the documentary analysis, which indicate that the RBDAs suffer from inadequate funding, untimely and non-release of funds (O-ORBDA, 1989; Fatokun and Ogunlana, 1988; Akinkoye, 1997, 2001; B-ORBRDA, 1998, 1999; B-ORBDA, 1997, 1999; Kaliel, 2000). In addition to this, two respondents (A17; B27) pointed out that government policy on mopping (or return) of unused funds by the end of the year is also limiting the availability of financial resources to the RBDAs. In support of this statement, Section 16 of the Finance (Control and Management) Act, CAP 144 Laws of the Federation of Nigeria of 1990 has compelled all public organisations to return unspent money back to the Consolidated Revenue Fund at the expiration of the year. Since the RBDAs are statutorily empowered to prepare and present their annual budget proposals for approval, those other factors promoting inadequate funding will be investigated more fully in Chapter 5.

#### **d Capacity building**

Figure 4-5 has shown that human capacity building is being moderately implemented by the RBDAAs. But the questions are: is the training IWRM related? If not, what are the influencing factors? To understand what is going on, respondents from both RBDAAs were asked to speak on the water-related staff training experience of their RBDA (this study expects water-related training to cover, for example, water resources use, conservation, protection, development, and management which are essential to IWRM). Although respondents (A2 – A20, A22, A25 – A27, A29 – A33; B1 – B9, B11, B12, B23, B24, B27) agreed that the RBDAAs do sponsor water related staff training, they however differ on whether the training programmes are related to IWRM or not. As would be shown shortly, the majority of respondents (A7, A9, A11, A13 – A16, A19, A12, A25 – A27, A32; B3, B7 – B9, B11, B12, B23) explained that not all water-related staff training programmes are related to IWRM; while some other respondents (A2, A3, A12, A20; B5, B6, B27) stressed that they are all related. Outside these categories of respondents, a few other respondents (A4, A8, A10; B24) explained that they would not be able to say if they are related to IWRM or not (these respondents represent those who had earlier reported their inability to describe what IWRM entails, but have heard of IWRM).

However, the results of the documentary analysis reveal that not all water-related staff training is related to IWRM (e.g., training programmes on report and proposal writing, work ethics and preventive maintenance, performance improvement for agricultural officers, the installation of small hydropower schemes and solar-powered pumping systems) (O-ORBDA, 2006, 2007, 2008, 2009, 2010, 2012). This corroborates the interview data which indicate that not all water-related staff training programmes are IWRM related. This finding requires caution in the case of B-ORBDA (the researcher had difficulties of gaining access to internal documents). On the influencing factors, the results of the analysis of relevant legal and regulatory instruments reveal that Chapter 12 of the Public Service Rules of 2008, as well as Chapter 1, Sections 107 (q) and 109 (q) and Chapter 20, Section 1009 of the 2009 Financial Regulations of the Federal Government of Nigeria which support capacity building in the public service sector make no particular reference to water resources, and by extension, to IWRM (unlike the 2009 Financial Regulations that makes specific reference to accounts and internal audit personnel in public organisations). Likewise, the main legislation on water, the Water Resources Decree No. 101 of 1993 and the River Basins Development Authorities Decree No. 35 of 1987, are both silent (or have no provisions) on human capacity building in the water sector. Furthermore, respondents (A17, A18, A22, A32; B1, B7, B9,

B20) also pointed out that the RBDAs do not have any formal (or internal) guidelines on human capacity building. When respondents were asked about the situation of financial resources for human capacity building, they explained that insufficient funding (from budgetary allocation) is a major factor affecting human capacity building (A9, A12, A17, A29, A32; B7, B20). Figure 4-6 shows the distribution of staff by qualification/function, which illustrates that there is an absence of human capacity in some relevant areas needed to implement IWRM. As the literature suggests, these areas include forestry, hydrology, ecology, remote sensing, geographic information system (GIS), and computer studies. However, impression from the interview data suggests that the RBDAs could implement IWRM if encouraged, as one of the respondents remarked:

“Well, I would say that the structure in place also suggests that we could implement IWRM. Even though there may be a need to train people ... and get them oriented towards this kind of IWRM” (A14).

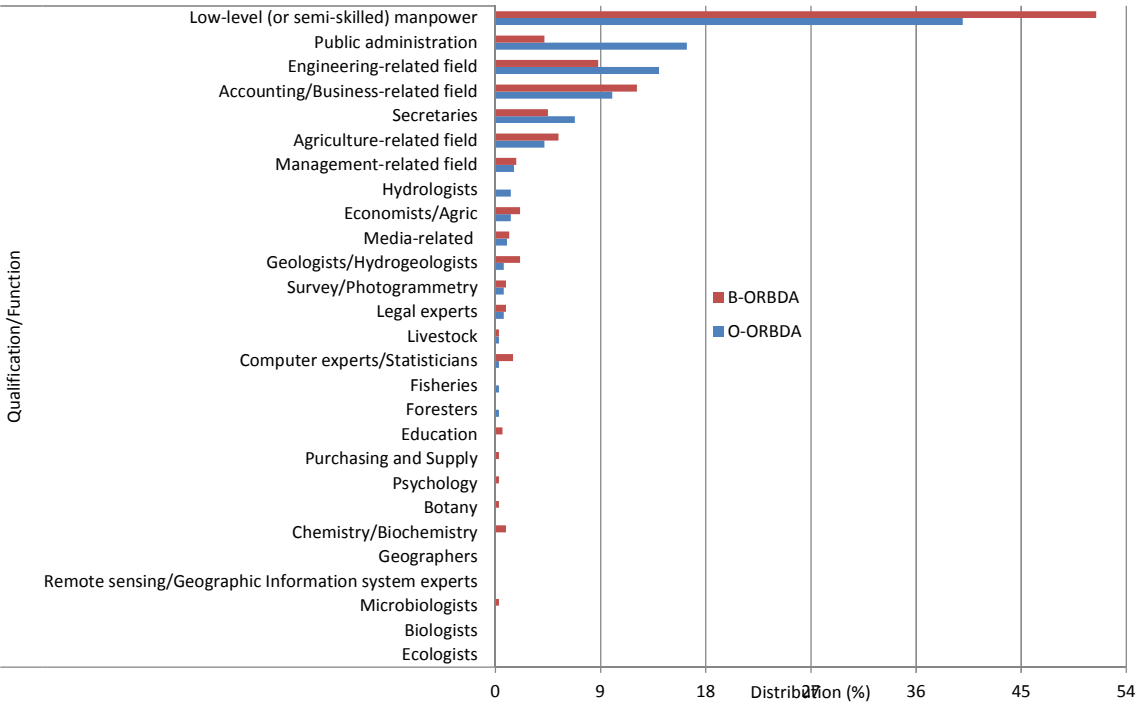


Figure 4-6 The distribution of staff by qualification/function (Compiled from Staff nominal rolls, 2012)

**e Water as a social good**

One of the findings of the results of the textual analysis in Section 4.2 revealed that water is well managed as a social good by the RBDAs. Contrary to this unexpected finding, Table 4-2 revealed that there is no legal and regulatory instrument that enables and empowers the RBDAs to manage water as a social good. In order to understand the factors promoting this situation (following the

results of the initial data analysis), respondents from both RBDAs were asked to describe their experience under the drinking water provision programmes. A number of respondents (A22, A23, A25; B6, B14, B27 – B30) pointed out that drinking water under the National Borehole Programmes and Constituency Projects (which are mostly powered by solar or mechanical energy sources) are provided by the RBDAs for free to beneficiaries. They further explained that the National Borehole Programmes are executed under the Federal Government policy intervention on drinking water which is geared towards achieving the Millennium Development Goals, while the Constituency Projects which are more of delivering political dividends to the electorates are embedded within the approved annual budgets. When probed further on whether it is normal (or acceptable) for the RBDAs to implement the approved budgets (even if the budget does not fully address their (RBDAs) expectations), respondents from both RBDAs (A17, A20, A22, A26, A32; B7, B9, B14, B20, B23, B24) remarked that it is normal, while some respondents (A17, A21, A22, A26, A28; B3, B7, B9, B10, B14, B20, B22, B23) asserted that the approved annual budget is an Act which the RBDAs are duty bound to implement (A17, A21, A22, A26, A28; B3, B10, B22, B24). However, the results of the analysis of the Constitution of the Federal Republic of Nigeria of 1999 indicate that budget proposals once approved by the National Assembly and signed by the President becomes an Act, hence a legal instrument. This suggests that the provision of water as a social good by the RBDAs is supported by a legal framework in Nigeria.

From the foregoing, the analysis of the extant legal and regulatory instruments that the RBDAs comply with in practice reveals that the RBDAs are empowered to implement some aspects relating to integrated basin planning, recover cost, collect data on water resources, environmental, water use and socio-economic parameters, and build human capacity. Despite the availability of legal and regulatory instruments empowering the implementation of these activities, they are either moderately or poorly implemented as illustrated in Figure 4-5. This prompted looking in-depth into factors that might be responsible. However, the results of the textual analysis reveal that the force constraining the ability of the RBDAs in the implementation of these activities is still regulative. In the case of managing water as a social good, despite the absence of legislative provisions enabling its implementation (see Table 4-2), Subsection 4.3.2 (e) has revealed that the forces promoting its implementation are still regulative.

### **4.3.3 The internal (cultural) environment of the RBDAs**

Following from the above, since it is not only within the legal and regulatory environments that the RBDAs are expected to function, this subsection examines other institutional environments for



(implicit) factors influencing the RBDAs in the implementation of their statutory mandates which have some IWRM elements embedded.

#### **a Decision making structure**

The internal environment of the RBDAs is also one of the environments that can exert influence on the choice of functions to be implemented by the RBDAs. One attribute that can be found in the internal environment of an organisation is the decision-making structure. The decision-making structure represents a repository through which strategic directions can be provided for an organisation in order for them to adopt a particular course of action. Put in another way, the decision-making structure can also represent a platform through which pressures and expectations can be imposed on an organisation, if externally linked. To gain an insight into what is going in the selected river basins; respondents from both cases were asked to explain what the laws governing the river basins say on RBDA decision-making and to describe their experience in practice. Respondents (A1 – A5, A7 – A13, A17, A19 – A22, A26; B1, B3 – B7, B9 – B12, B22, B24) explained that the laws governing the activities of the RBDAs have supported a hierarchical, top-down decision-making structure. This is in agreement with the results of the analysis of relevant legal and regulatory instruments (e.g., the River Basins Development Authorities Act No. 35 of 1987, the Water Resources Decree No. 101 of 1993, the Public Service Rules of 2008, the administrative guidelines regulating the relationship between Parastatals/Government-owned companies and the Government of 1999). This structure, which is shown in Figure 4-7, also coincides with the RBDAs' organogram (see Appendix H). On what happens in practice, respondents (A1 – A5, A7 – A13, A17, A19 – A22, A26; B1, B3 – B7, B9 – B12, B22, B24) explained that the decision making structure-in-use differs from what the laws say. Figure 4-8 illustrates this situation. As shown in Figure 4-8, respondents (A1 – A5, A7 – A13, A17, A19 – A22, A26; B1, B3 – B7, B9 – B12, B22, B24) explained that it happens in practice for the FMWR to communicate directly to the management of the RBDAs, thereby bypassing the Boards of Directors. However, some respondents (A10, A11, A19, A26; B5, B6, B24) pointed out that policy directives will still have to go through the Boards of Directors, while administrative and operational instructions can bypass the Boards to the management (A11; B4, B24). In the absence of the Boards of Directors (which was the case during the period of fieldwork in the two river basins, because the Federal Government was yet to constitute them); respondents agreed that the RBDAs do receive instructions directly from the FMWR (A1 – A5, A7 – A13, A17, A19 – A22, A26; B1, B3 – B7, B9 – B12, B22, B24).

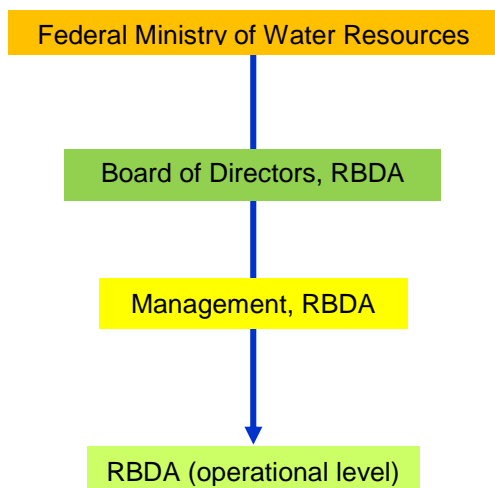


Figure 4-7 Decision making structure according to the laws

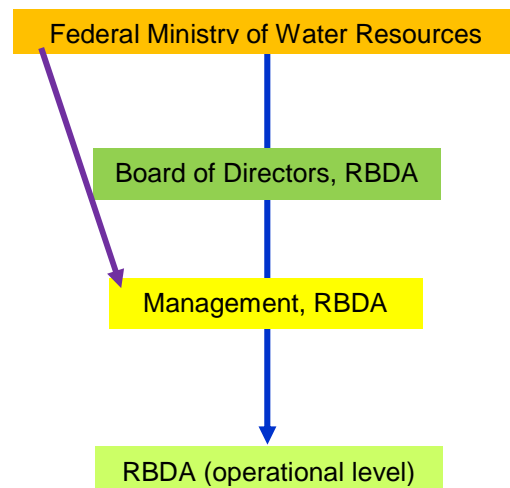


Figure 4-8 Decision making structure in practice

Furthermore, when asked who has the final say on RBDAs’ administrative and operational decisions, respondents (A1 – A5, A7, A9 – A13, A17, A19 – A22, A29; B1, B3 – B7, B9 – B12, B22, B24) stated that the FMWR is the highest decision making body for the RBDAs. This suggests that decisions made at a lower level of authority on the hierarchy are subject to the approval of a higher level of authority. To buttress this point, some respondents explained that the Boards of Directors, when in place, do ensure that the management of the RBDAs execute those decisions and policies of government or its representatives at the operational level (A7, A8, A26; B4, B6, B7, B12, B24). Since the RBDAs are referred to as parastatals under the FMWR (A1, A7, A8, A18, A20, A21, A26; B1, B4, B7 - B9, B22, B27), it is very much likely that the RBDAs will be subjected to ministerial controls, and thus, the centralisation of decision making. To drive this point home, respondents (A3, A4, A8, A10, A12, A21, A22, A26, A29; B1, B3, B5, B6, B22, B24) remarked that it is the FMWR that gives directions to the RBDAs on what to do, and that the RBDAs do not have the powers to take decisions outside the directives of the FMWR itself. Here is the comment of a respondent:

“..., the river basins the way they are structured, you know, they are parastatals under the Federal Ministry of Water Resources. They don’t have powers to take decisions outside the directives of the Ministry itself, which is our parent body. So what you get is that, most times, exactly the way the Ministry has said it should be done that is how it is done” (A21)

This remark is in congruence with the provisions of some relevant legal instruments in Nigeria. Section 6 of the Water Resources Decree No. 101 of 1993 empowers the Minister (responsible for water resources) to periodically review in the light of prevailing economic, financial, or technological conditions, activities, plans and proposals of the RBDAs. Likewise, Section 7 of the River Basins Development Authorities Decree No. 35 of 1987 empowers the Minister to give any of the Authorities directions, and further stipulates that it shall be the duty of that Authority to comply with such directions. Chapter 16, Section 2 (c) of the Public Service Rules of 2008 and Section 13 of the Administrative guidelines regulating the relationship between Parastatals/Government-owned companies and the Government of 1999 also empower the Minister to exercise policy control over the RBDAs. This arrangement is also reinforced by Item ii of Circular Ref No. SGF/OP/I/S.3/T.1/142 dated 2<sup>nd</sup> August 1999, which empowers the Minister to exercise policy control over the RBDAs. Additionally, the Public Service Rules of 2008 maintains that government parastatals are subject to the policy directives of the government.

Furthermore, Section 4 (2) of the River Basins Development Authorities Decree No. 35 of 1987 provides that projects within the limits of the functions of the RBDAs shall be executed with the approval of the Minister responsible for water resources. In turn, Section 4 – (1) (c) explicitly provides that the RBDAs shall supply raw water to all users for a fee to be approved by the Minister in charge of water resources. Besides these legal frameworks, one of the core functions of the FMWR stresses that it is the duty of the FMWR to support, monitor and evaluate the programmes and performance of the RBDAs (FMWR, 2004, 2011). Aside from the fact that the FMWR regulates, supervises, monitors, controls, and directs the activities of the RBDAs (A5, A8, A26; B1, B3, B4, B6, B7, B9, B11, B22, B24), the FMWR is also engaged with the direct execution of water projects in the basins (A9, A26; B6, B14, B17, B24, B26 – B30). This behaviour, as the results of the legal and regulatory instrument analysis reveal, is also supported by Sections 8 (f) and 17 of the Water Resources Decree No. 101 of 1993 which empower the Minister (responsible for water resources) to execute water projects at the river basin level and functions so delegated. To cross-check the interview data obtained from the RBDAs on decision-making structure, respondents from the FMWR were asked who has the final say on RBDA decisions. Respondents went on to say that the decision making structure of the RBDAs is hierarchical (as shown in Figure 4.7), with the FMWR having the final say on RBDAs' operational and administrative decisions (F2, F4 – F9). Also, coinciding with Figure 4-8, respondents agreed that it happens in practice for the FMWR to communicate operational and administrative instructions directly to the management of the RBDAs, bypassing the Boards of Directors even when the Boards are in place (F2, F4 – F9). However, some

respondents added that policy decisions would have to be communicated to the RBDAs through the Boards of Directors once they are in place (F5, F8, F9). On the activities of the FMWR, respondents agreed that the FMWR monitors, supervises and regulates the operations of the RBDAs, and is also involved in the direct execution of water projects (such as dams and borehole projects) at the river basin level (F2, F4, F6, F8, F9).

Corroborating the interview data, the results of documentary analysis reveal that the FMWR is involved in the execution of hydraulic infrastructures (e.g., dam construction and borehole development for drinking water supply) in the river basins (FMWR, 2004, 2011). Besides the FMWR, respondents from the RBDAs posited that the RBDAs also interact with some organisations in the discharge of their duties (A22, A23, A25; B16, B17, B21). Table 4-3 lists these organisations, and the nature of their involvement in river basin activities. Since these organisations can be a source of both cognitive and normative influences, it is likely that the RBDAs will be sensitive to the values and norms of conducts that are deemed appropriate by these organisations and will strive not to violate them. However, despite this observation, there is no evidence to show whether dependency relationship exists between these organisations and the RBDAs, or which operations of the RBDAs are rather enabled or constrained by these organisations.

Table 4-3 Organisations<sup>1</sup> and nature of involvement in river basin activities

S/No.	Organisation	Nature of involvement
1	Federal/State Ministry of Agriculture	Provision of agricultural land
2	National/State Emergency Management Agency	Provision of emergency reliefs
3	Federal/State Ministry of Environment	Soil erosion and flood control
4	Federal/State Ecological Office	Implementation of flood control projects
5	Federal Ministry of Finance/ Budget Office	Financial advice, auditing and investigation
6	National Planning Commission	Project monitoring and data collection on short, medium, and long-term plans
7	National Water Resources Institute	Provision of training needs
8	State Ministry of Water Resources	Regulates water activities at the State level
9	State Water Corporation/Board	Bulk raw water users <sup>2</sup>

<sup>1</sup> There is no international organisations' assisted RBDA projects in the selected case river basins

<sup>2</sup> Only applicable to O-ORBDA

With regard to financial decisions, respondents (A1, A3, A8, A11, A25; B3, B7, B9, B14, B20) explained that the RBDAs have a threshold on the amount it could budget for and what it could spend without recourse to external approval. In the case of spending, above the approved financial thresholds, decisions are referred to, and ratified by, the FMWR, while those beyond the FMWR are

referred to the Federal Executive Council for approval. This is in agreement with the results of the analysis of relevant legal and regulatory instruments. The Federal Ministry of Finance Circular F15775 dated 27th June 2001 empowers the Chief Executives of Parastatals to make purchases not exceeding 0.7 million Naira. In turn, approval for purchases in excess of 0.7 million but below 20 million Naira is to be made by the Board of Directors, while from 20 million but less than 50 million Naira by the FMWR (in the case of the RBDAs); and above 50 million Naira by the Federal Executive Council. On the process of getting approval for budget proposals, some respondents (A3, A20, A21; B6, B7, B9, B14, B20, B24) explained that the RBDA annual budget proposals usually go through the FMWR, who does the vetting, to the National Assembly for approval.

To cross-check the interview data obtained from the RBDAs on financial decisions, respondents from the FMWR were asked who has the final say on RBDAs' financial decisions. Respondents explained that both the RBDAs and the FMWR have their financial thresholds. Decisions on RBDAs expenditures which are above the capacity of the FMWR are referred to the Federal Executive Council for approval (F5, F6, F8, F9). However, the results of the documentary analysis show that the RBDAs are fully dependent on the FMWR for their budget recommendations for funding, release of funds, and awards of contracts (Akinkoye, 2001).

From the foregoing, impression from the data is that the RBDAs are made dependent on the FMWR for support and/or resources, which is legally backed. The data indicate that vetting, policy control, performance evaluation and provision of directions are activities that are legally supported through which the FMWR do exert pressures or impositions by means of authority on the RBDAs. This therefore indicates on the one hand that if the pressures are not IWRM-related, then it becomes difficult for the RBDAs to implement these. On the other hand, if the pressures are not directed towards ensuring that the RBDAs give full effect to the implementation of their statutory functions (which have some IWRM elements embedded), then it becomes difficult for the RBDAs to implement these. To reinforce this submission, the results of the documentary analysis reveal that the belief at the ministerial level is that the RBDAs are mainly created to construct hydraulic infrastructures for water supply and food production (via irrigated agriculture) (Shaib, 1985; Mohammed, 1995; Ochekepe, 2012, 2013). On a critical assessment, this just represents a fraction of their functions as enshrined in Section 4 of the River Basins Development Authorities Decree No. 35 of 1987.

## **b Organisational values and motivations**

Organisational values and motivations are subtle forces which can exert implicit influence on organisational performance. Values, which are part of the normative and cognitive elements of institutions, are inextricably linked with morals, ethical codes and beliefs. They specify to organisational members what ought to be done or the right things to do, thereby either enabling or constraining certain organisational functions within the workplace. Apart from this, organisations may also be motivated (internally and/or externally) or interest-driven, which may be socially and/or legally encouraged and supported. To decipher the values of the RBDAs which are useful to this research, respondents from both RBDAs were asked to describe what they perceive as the values of their organisation or state the biggest mistakes a staff member can make in the organisation. Respondents indicated that the RBDAs value water resources development for irrigated agriculture and drinking water supply (A15, A17, A19, A26; B7, B9, B10, B14, B20), while one of the biggest mistakes one could make is to work outside the rules of the game (or what the laws and regulations say) (A20, A22, A25, A26; B7, B9, B20). However, some respondents (A22, A23, A25, A26; B7, B9, B14, B20) asserted that the Public Service Rules contains the code of ethics guiding the activities of organisational members.

In the case of organisational values, the results of the documentary analysis reveal that the interview data are in contrast to the espoused values of the O-ORBDA as captured by their mission statement. In addition to water resources development, water resources management is also reflected as part of the values of the RBDA (O-ORBDA, 2011a). In the case of the B-ORBDA, the stated values agree with their mission statement, which is to develop hydraulic infrastructure for water supply and agricultural development (B-ORBDA, 2012). The results of the analysis of the Public Service Rules of 2008 indicate, among others, that the government views refusal to take or carry out lawful instructions from superior officers and insubordination as improper behaviours within the organisational workplace (see Chapter 3, Sections 3 and 4). However, the Public Service Rules does not expressly support the incorporation of new knowledge in the organisational workplace. Furthermore, the results of the analysis of the observational data, which corroborate the interviews and document data, indicate that decision making in the organisations is top-down, with limited bottom-up approach. There is high respect for authority; a lower rank officer cannot go outside the chain of command and do things that will be out of line with what the boss has suggested. The RBDAs are departmentalised, and jobs within the organisations are standardised (or formalised). There is an absence of cross-departmental meetings, and little lateral communication among units of the organisations. While both RBDAs are unionised, there is no (official) platform for sharing

knowledge acquired through seminars, conferences, and workshops in both organisations, and management is centralised.

In the case of what motivate the RBDAs in executing their present duties, respondents explained that the RBDAs are motivated by the joy (A2, A5, A16, A17, A20; B1, B23, B24) people derive from, and the appreciation (A4, A7, A10, A17, A20) people show for, their involvement in the provisions of infrastructure for irrigated agriculture (A3, A7, A11, A17), drinking water supply (via boreholes) (A5, A7, A10, A16, A17, A20; B1, B4, B5, B8, B11, B23, B24), and agricultural production (A2, A4, A5). One respondent put it this way:

“So, what I am trying to say in essence is that if ... for instance [the ... RBDA] should site a project somewhere and the project is completed, ... then the community will show appreciation. The State Government will even stand up openly to raise commendation words for the Authority, and ... if you look at all those things, it propels the Authority to do more” (A10).

Other respondents (A6, A12, A14; B3, B7) stressed that their organisation is happy when funds are released to execute water projects in the basin.

From the above, impression from the data is that the internal cultural environment of the RBDAs is backed by relevant legal and regulatory instruments (which suggest a bureaucratic culture) and activities that are valued by the FMWR or motivate the RBDAs will receive more resources than those that are less valued. This suggests that if those values, those directives and what motivates the RBDAs are not related to implementing their statutory functions, then it becomes difficult for the RBDAs to implement these. That the RBDAs are bureaucratically organised administrative organisations also clarifies the issue behind why organisational members could not give effect to IWRM in what they do despite the openness of the RBDAs to knowledge acquisition including that of IWRM. With organisational members following laid down ethical rules that do not encourage the application of new ideas in the workplace, the ability of members to incorporate what they have learnt in what they do may be limited. Since the national or regional culture of a country could influence organisational performance, Chapter 5 takes a more detailed look at the influence of societal culture on IWRM implementation.

#### **4.3.4 Water infrastructure**

As pointed out in Subsection 2.5.8, aside from the institutional environment, neo-institutional literature asserts that the technical environment can also shape organisational performance. Since

the literature (see Subsection 2.3.3c) has suggested water infrastructure development (one of the elements in the technical environment) as crucial to the implementation of IWRM, this subsection identifies the water infrastructure needed by the RBDAs to implement IWRM at the river basin level in Nigeria and also examines its role in influencing IWRM implementation. This subsection, which presents the results of the analysis of document, interview and observational data, contributes towards answering PRQ 2 as illustrated in Figure 4-1. This subsection is divided into two parts: the first part identifies the water infrastructure needed by the RBDAs to implement IWRM at the river basin level in Nigeria looking at the statutory functions of the RBDAs, as well as the water infrastructures belonging to the RBDAs, while the second part examines the role of water infrastructure development in influencing IWRM application at the river basin level in Nigeria. Since institutions themselves can also actively constrain or enable the provision of water infrastructures as explained in Chapter 2, in the analysis presented in this subsection (e.g., for simplicity), water infrastructure is viewed as an entity and assumed to vary along with other independent factors (as explained in Chapter 2, and amplified in Chapter 3).

**a Water infrastructure: what is needed and what is available**

On the one hand, the results of the analysis of interview and document data (in Subsection 4.3.1) have revealed that the statutory functions of the RBDAs are spelled out in the River Basins Development Authorities Decree No. 35 of 1987. On the other hand, the results of the analysis of the legal instrument indicate that the functions of the RBDAs are captured by Section 4 of the River Basins Development Authorities Decree No. 35 of 1987. As the results illustrate, the RBDAs are to, within their basin area, (i) develop water resources for irrigated agriculture and raw water provision, (ii) manage water resources, (iii) collect and collate water resources, water use, socio-economic, and environmental data, and (iv) sell raw water to all users. This implies that the RBDAs will need infrastructures to (i) store and deliver water and manage flows, (ii) provide water services (irrigation systems), and (iii) collect and collate data. Although the RBDAs are charged with flood and erosion control functions by the River Basins Development Authorities Decree No. 35 of 1987, these functions have been transferred by the Federal Government to the Federal Ministry of Environment (Kaliel, 2000; FMWR, 2004; Ekaette, 1999; A22, A23; B16). Table 4-4 provides a summary of the water infrastructures belonging to the RBDAs in the surveyed river basins.



## **b The role of water infrastructure in influencing IWRM**

The literature suggests that two types of water infrastructure are needed to implement IWRM, namely: water infrastructure for developing and managing water resources, and water infrastructure for providing water services. In the case of developing and managing water resources, the suggested infrastructures include dams and reservoirs, transmission and distribution (or conveyance) systems, and flood/drought works. In the case of providing water services, these include hydropower plants, irrigation systems, transmission and distribution works for raw water supply, and treatment plants. Looking at the statutory functions of the RBDAs (as explained above), the available water infrastructures (Table 4-4), and comparing these with the suggestions in the literature on the water infrastructures needed to implement IWRM, it can be reasonably argued that the O-ORBDA (not the B-ORB, see Table 4-4) has some appreciable amount of water infrastructures to implement IWRM. However, the adequacy of these infrastructures, in terms of capacity, is less clear; in that the RBDA does not collect water use and socio-economic data (as explained in Subsection 4.3.2 (c)), and field irrigation, as the results of interview data analysis reveal, is less based on calculated crop water requirements (A3, A8, A11 – A14, A16 – A18, A20, A22, A24, A30, A31). Besides this, while there is no information on the dam potential of the B-ORB (B13, B14, B20, B27), that of O-ORB was estimated at 6358.67 million cubic metres (A20). On irrigable lands, in the B-ORB, out of a total of 10,080 hectares of land found to be irrigable within the Authority's areas of coverage, only 300 hectares are under pilot schemes (B3, B17). In the case of O-ORB, out of a total of 39,817 hectares, about 418 are under use (O-ORBDA, 2011a). However, the results of the analysis of interview data further indicate that, in O-ORB, the available water storage infrastructures are yet to be fully utilized (A8, A9, A11, A13, A14, A16, A26, A32). As one of the respondents commented (A11): "We just irrigate. No scheduling. [...]. Unfortunately, the dams have not been fully harnessed".

Drawing from the data, there is no evidence to suggest that the ability of the O-ORBDA to implement IWRM (e.g., cost recovery) is being constrained by water infrastructure. However, the situation is different in the case of the B-ORB. The construction of most of the water infrastructures needed to develop, manage and deliver water services is still on-going. The data suggest that even in the presence of an active legal instrument empowering cost recovery of basin water services, without functional infrastructures to store, deliver, manage flows, and provide water services, implementing cost recovery will still be practically impossible. For this chapter, the summary of key findings from the results of textual analysis is presented next.

Table 4-4 Water infrastructure belonging to the RBDAs

<b>O-ORBDA</b>			
S/No.	Description (total number in parenthesis)	Capacity (total)	Remarks
1.	Dams (including the associated infrastructures): - large multipurpose dams (2) - small and medium earth dams (8)	835 million cubic metres (mcm) 11.67 mcm	Not all the dams and reservoirs are in use or fully completed. For example, the Ikere dam civil works is 95% complete, while the mechanical and electrical (M&E) works are still on-going
2.	Groundwater well-fields	None	Boreholes are drilled and handed over to beneficiaries
3.	Irrigation schemes: - gravity  - pumped	150 hectares (ha) Canal lengths: - 1.3 kilometres (km) main canal - 1.7 km secondary canal - 3.5 km tertiary canal  1155 ha Sprinkler and centre pivot systems	Not all the irrigation systems are in use. For example, some sprinkler irrigation systems are not in use, while some centre pivot systems are still under installation  About 268 ha (possibly) in operation
4.	Table top computers (e.g., for data collation, processing, storage and retrieval)	Various sizes	Working
5.	Meteorological equipment	Various sizes	Working (not all)
<b>B-ORBDA</b>			
1.	Dams (including the associated infrastructures): - large multipurpose dam (1) - small earth dams (4)	36.25 mcm 6.79 mcm	The only multipurpose dam was completed in 2008 <sup>1</sup> , still awaiting use due to on-going construction work on ancillary downstream infrastructures. On the small earth dams, construction works are in progress.
2.	Groundwater well-fields	None	Boreholes are drilled and handed over to beneficiaries
3.	Irrigation schemes: - gravity  - pumped	300 ha Canal lengths: - 3.2 km main canal (concrete lining) - secondary and tertiary canals (earth lining)  Centre pivot systems	The 300 ha is under a pilot scheme.  Construction in progress (45 ha completed in October 2012)
4.	Table top computers (e.g., for data collation, processing, storage and retrieval)	Various sizes	Working
5.	Hydrological and meteorological equipment	Various sizes	Working (not all)

<sup>1</sup> The Owena multipurpose dam was commissioned in May 2007. The total period from conception to commissioning took thirty five years (Ijasan, 2009b). However, as at the time of fieldwork in the basin, the multipurpose dam was yet to be put into use.

(Sources: O-ORBDA, 2005, 2007, 2011a, 2011b; A3, A9, A17, A20, A19, A30; B3, B15, B17; observations, 2012)

#### 4.4 Summary of key findings from this chapter

In the preceding sections, the status and the internal factors which explain the inability of the RBDAs to implement IWRM at the river basin level in Nigeria have been explored. Key findings are summarised as follows:

- a. There are weaknesses in the implementation of IWRM at the river basin level in Nigeria.
- b. The internal factors responsible for these weaknesses are:
  - (i) There is a paucity of extant legal and regulatory frameworks that enable and empower the RBDAs to establish platforms for stakeholder participation, include women in river basin activities, implement polluter pays principle, have platforms for conflict management, and enforce water laws. Also, the Water Resources Decree No. 101 of 1993 has discouraged functional decentralisation between the FMWR and the RBDAs.
  - (ii) While the River Basins Development Authorities Decree No. 35 of 1987 encourages some aspects relating to integrated basin planning (that is, to undertake a comprehensive development of both surface and underground water resources and formulate basin water resources master plans), both this legal framework and others do not recognise or empower the RBDAs to integrate the development and management of land and water, green water and blue water, quantity and quality, water and wastewater, and sectoral coordination or make provision for environmental reserve. Also, the ability of the RBDAs to coordinate surface and underground water resources and formulate basin water resources master plans is also being constrained by political interference in river basin activities.
  - (iii) While the Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999 empowers the RBDAs to recover their recurrent expenditures from basin water services, the Water Resources Decree No. 101 of 1993 constrains the ability of the RBDAs to recover the cost of water services rendered from publicly funded hydraulic infrastructure. Other factors constraining the RBDAs from implementing the provisions of Act No. 28 of 1999 on cost recovery include the absence of enforcement mechanisms in the extant legal instrument, the support granted by the FMWR to the RBDAs encouraging noncompliance with the provision of Decree No.

28 of 1999 on cost recovery, as well as the failure on the part of the Federal Government to provide the promised take-off grants under the Performance Agreement signed with the RBDAs in 1992 in addition to policy reversals. While the River Basins Development Authorities Decree No. 35 of 1987 empowers the RBDAs to supply water from their completed storage schemes to all users for a fee, the legislation does not enable cost recovery in the light of IWRM and, in turn, lacks any enforcement mechanisms for water service fees recovery.

- (iv) While the RBDAs are empowered by the River Basins Development Authorities Decree No. 35 of 1987 to collect data, their ability to implement this provision has been curbed by inadequate financial resources which are influenced by government bureaucratic process on fund releases, untimely release of funds, government policy and legislation on mopping (or return) of unused funds.
- (v) There is no legal and regulatory instrument that encourages human capacity building in the water sector, and by extension, IWRM. Although the RBDAs are open to knowledge acquisition, and are aware of IWRM to some extent, capacity for IWRM implementation in terms of availability of financial and human resources is also limited.
- (vi) While managing water as a social good has been well implemented by the RBDAs, the factors promoting this are government policy on drinking water supply under the National Borehole Programmes and the implementation of the drinking water-related Constituency Projects under the Appropriation Act. Both government policy and Appropriation Act have encouraged drinking water provision for free to beneficiaries.
- (vii) In addition to the above, the ability of the RBDAs to give full effect to the implementation of their statutory functions is also being influenced by (a) the acceptance and the support provided for the implementation of irrigated agriculture by concentrating on water resources development for irrigation, (b) imprinting effect and the various government policy thrusts on food production, (c) the legally supported pressures from the FMWR, and (d) the norms and values operating within the organisational workplace.

- (viii) In the B-ORB, the absence of functional water infrastructures stands as a major barrier towards the implementation of cost recovery. However, there is no evidence to suggest that the implementation of cost recovery in the O-ORB is being constrained by water infrastructure. As illustrated in Subsection 3.5.2, since water infrastructure development also casts an influence on IWRM implementation (that is, cost recovery), this becomes part of the forces influencing the implementation of IWRM at the river basin level in Nigeria. This implies that the forces influencing IWRM implementation in Nigeria are not only institutional but technical as well.
  
- c. The study also threw up some other results. There is no evidence to suggest that the ability of the RBDAs to operationalize cost recovery is being influenced by the socio-economic situation (e.g., poverty) in the selected river basin areas. Also, there is no evidence to suggest that the RBDAs depend on the raw water users or other national organisations for support and/or resources, except the FMWR.

Following the open systems perspective adopted by this study, the next chapter examines the external environment of the RBDAs for factors influencing IWRM implementation at the river basin level in Nigeria.

## **5 CONTRIBUTIONS OF THE EXTERNAL ENVIRONMENT OF THE RBDAs TO IWRM IMPLEMENTATION**

### **5.1 Introduction**

In Chapter 4, this study examined the extent of implementation of IWRM at the river basin level in Nigeria and found that there are weaknesses in implementation. This prompted looking at the internal environment of the RBDAs for factors influencing IWRM implementation in Chapter 4. Moving on, this chapter focusses on identifying the factors influencing the implementation of IWRM in the external environment of the RBDAs. The chapter is divided into four sections. Section 5.2 investigates the influence of national and international organisations on IWRM implementation. Section 5.3 examines the presence and effects of societal culture on IWRM implementation, while Section 5.4 explores the effects of political structure for water governance in Nigeria on IWRM implementation. Lastly, Section 5.5 provides a summary of the key findings from this chapter. In order to present a concise and focussed analysis that is devoid of repetitions, the reporting of results is structured along the themes investigated in both river basins. This chapter contributes towards answering PRQ 2 and SRQ 2b (see Figure 4-1).

### **5.2 Effects of national and international organisations on IWRM implementation**

The environment of any given organisation is also composed of other organisations, national and/or international. Hence, it follows that organisations within the same organisational field can be a source of both cognitive and normative influences especially if one organisation is dependent on another for support, resources, and/or legitimacy. Aside from this, in the case of IWRM implementation, if the involvement of organisations in the water sector is not coordinated, their activities can make the integrated planning of basin water resources unworkable. To understand the nature of involvement of national and international organisations and whether they collaborate with the RBDAs in practice, three national (at Local, State, and Federal) and two international water-related organisations were surveyed. Due to the large number of organisations surveyed, detailed information about the analysis of responses obtained is not included here but available upon request (not more than six months after thesis defence). However, the outcome of the textual data analysis of roles and responsibilities (Subsection 5.2.1) and sectoral collaboration (Subsection 5.2.2) is presented.

### **5.2.1 Roles and responsibilities**

Evidence obtained from the analysis of roles and responsibilities of national and international organisations in the water sector in Nigeria reveals that both national (that is, the Local Government Authorities (LGAs), the States' Water Boards/Corporations, the States' Ministries responsible for water resources, agriculture, and environment, the Federal Ministry of Agriculture and Rural Development (FMARD), the Federal Ministry of Environment (FME), and the Federal Ministry of Water Resources (FMWR), as well as the Nigeria Integrated Water Resources Management Commission (NIWRMC) and international (that is, the World Bank and United Nations Children's Fund (UNICEF)) organisations are all involved in varying degrees in activities that have impact on water resources development and management at the river basin level in Nigeria.

### **5.2.2 Sectoral collaboration**

Aside from the FMWR that has the RBDAs under its direct supervision and the NIWRMC that is yet to become a legal entity, there is no legislation or internal regulatory guideline that mandates the national organisations to collaborate with, or involve, the RBDAs in the discharge of their water-related duties, and neither do they do so in practice. While the RBDAs are not explicitly mentioned, the only exception is the FME which has some legal and regulatory instruments empowering it to collaborate with other statutory agencies of government in the discharge of some of its water-related duties. However, the ability of the FME to collaborate in practice is being constrained by (i) the belief that it is our project, why involving others (silo effect), (ii) functional overlaps in the water sector, and (iii) the absence of guidelines that describe the Ministry's approach to, and operational procedures for, collaboration. The Ministry only tends to carry the RBDAs along during environmental impact assessment that involves them. Besides this, there is no evidence to suggest that the RBDAs depend on these national water-related organisations for support and resources, except the FMWR. In the case of the FMWR however, there is a vertical dependency relationship. Impression from the data suggests that the support and/or resources from the FMWR are not directed towards ensuring that the RBDAs give full effect to the implementation of their statutory functions (which have some IWRM elements embedded).

In the case of international organisations (the World Bank and UNICEF as identified in this study), evidence suggests that they are present in the water sector in Nigeria as providers of financial and technical support. Although these international organisations are sources of pressures through the conditions they impose before offering their involvement, there is no evidence that suggests a

dependency relationship or to suggest that the RBDAs depend on these international organisations (and/or their implementing agencies) for support and/or resources; and thus the possibility of the performance of the RBDAs being shaped by these international organisations. Impression from the data also reveals that the involvement of these international organisations, which is legally supported, has not encouraged integrated water resources development and management at the river basin level in Nigeria.

### **5.3 Societal culture and IWRM implementation**

As briefly highlighted in the latter part of Chapter 4, organisational performance cannot be separated from the wider societal culture in which the organisation is located. This implies that the national or regional culture where an organisation is situated could exert pressures on organisational performance more so that organisations do not pop out of (or emerge from) the thin air. This section investigates the presence and effects of societal culture on IWRM implementation. The three categories of actors surveyed are: the RBDAs, the national organisations, and the international organisations. To gain a better understanding, two areas were focused on: what the laws say (specifically from the RBDAs) and what happens in practice (from the RBDAs and others). The results of the textual analysis of interviews and document data are presented:

Respondents from the RBDAs were asked to explain whether any of the laws allow for local culture to affect the practice of water resources management at the river basin level in Nigeria and to shed light on those RBDA operations that are guided by local cultural beliefs in practice. On the position of the laws, responses are mixed. The majority of the respondents (A3 – A5, A10, A17, A21, A22, A27; B5, B6, B10 – B12, B22) explained that the laws governing the activities of the RBDAs allow for local culture to affect the practice of water resources development and management at the river basin level. On the other side, some respondents (A2, A7, A26) pointed out that the laws only allow to some extent, while some other respondents (A12, A21) said it depends on the type of activities. Outside these categories of respondents, a few other respondents (A8, A11, A20; B1, B3, B9, B24) explained that there is virtually no law that explicitly allows for local culture to affect river basin operations, while some other respondents remarked that they would not be able to comment on the position of the laws (B4, B7). From those that maintained that some laws supported local culture, some of them went on to point out that the Land Use Act No. 6 of 1978, the River Basins Development Authorities Decree No. 35 of 1987, and the Water Resources Decree No. 101 of 1993 contain provisions relating to local culture (A21; B10 – B12, B22).



Although there is no direct legislation on culture in Nigeria, the results of the analysis of relevant legal and regulatory instruments reveal that there are some laws that recognise the cultural aspects of the society. In the case of the Land Use Act No.6 of 1978, Sections 6 (1) (a) and (b) recognise customary land ownership rights, while Section 5-(2) of the River Basins Development Authorities Decree No. 35 of 1987 draws the attention of the RBDAs to Sections 2 and 6 of the Land Use Act on land acquisition for irrigation projects. On the other hand, Section 2 of the Water Resources Decree No. 101 of 1993 recognises customary water rights. The customary water rights entitle any individual to take water without charge for domestic, livestock and for personal irrigation from any water course to which the public has a free access. In Subsection (iii), it also empowers any person who has a customary or statutory right of occupancy to any land to take water from the underground water source or adjoining surface water source (that is, the riparian rights) without charge for domestic, livestock and personal irrigation purposes. In the same way, the Land Use Act No. 6 of 1978 empowers the holder of a customary right of occupancy [including holders of a statutory right of occupancy – in Section 15 (a)] to have the sole right to and absolute possession of all the improvements (including underground water) of the land. With individuals empowered to control underground water and take water in the absence of regulations or provisions in the legal instruments that empower the RBDAs to set abstraction limits, monitor, or do coordinated development and enforcement activities, the ability of the RBDAs to integrate surface and underground water resources and formulate basin water resources master plans is hindered. Aside from the legal instruments cited above, Section 21 of the Constitution of the Federal Republic of Nigeria of 1999 only emphasizes the need to protect, preserve and promote the Nigerian cultures. In the same vein, the Cultural Policy for Nigeria of 1988 and the National Policy on Integrated Rural Development of 2001 only seek to foster the preservation, promotion, and presentation of the material, institutional, philosophical and creative aspects of the Nigerian cultures without any particular reference to water resources.

With regard to what happens in practice, starting from the RBDAs, respondents (A2, A3, A5, A7, A10 – A12, A14 - A16, A18 – A21, A24, A26; B1 – B7, B9, B11, B12, B23, B24, B27) explained that basin activities focussing on the development of water resources are influenced by the cultural practices of the area where the projects are to be sited. In specific terms, respondents (A5, A7, A10 – A12, A14, A18, A19, A26; B1 – B4, B6, B7, B9, B11, B12, B24, B27) pointed out that the acquisition of lands for water projects (dams, irrigated agriculture, and borehole projects), the construction of dams on water ways (A3 – A5, A7, A11, A20; B1 – B7, B9, B11, B23, B24) and

borehole schemes (B1, B10, B11, B24) are guided by the cultural practices of the areas where these projects are to be located. Here is a statement made during the interview by a respondent:

“..., if it is in a community where you know that they wouldn't agree to such things we are allowed not to do that. So even in deciding the kind of projects you are going to site in such location, you think about their religious beliefs, their cultural practices, what they would ordinarily accept, what they would not ordinarily accept. Those things come into play in implementing whatever laws you want to implement” (A21).

According to the respondents, in order to minimise conflicts and ensure project completion, cultural practices are considered during the planning and execution of water projects (A7, A11, A19, A20, A26; B11, B24, B27). Paraphrasing the words of a respondent, besides technical suitability, cultural acceptability is also taken into consideration (A19). On the management aspect, respondents remarked that basin activities relating to irrigation water use and the recovery of basin water service fees (or payment for raw water) are not influenced by any local cultural beliefs (A2, A4, A6, A8, A9, A16, A17, A29 – A33). On the whole, some respondents remarked that respect for, and the need to safeguard the cultural resources (physical and non-physical) of the host communities do affect project selection and project location (A20, A21, A26; B5, B10, B24) as well as issues relating to customary land ownership rules for project location (B3). According to a respondent on cultural resources: “Don't say because you don't belief in it, it doesn't have an effect, no! You must agree with them, because at the end of the day, they are going to be affected” (A11). With regard to the effects of (modern) religious beliefs on water resources development and management, respondents pointed out that they have no influence (A2, A9, A11, A14 - A16; B3).

In the case of national and international actors, respondents were asked whether they are aware of any cultural influences on the way the RBDAs discharge their duties. Although responses vary, the majority of the respondents (U2 – U7, U11, AN2, AN6 – AN8, AN10, AN11, AN14, AIA3; BN4, BN8, BN10, BN13, BN18, BN20 – BN24, BN26, BN29 – BN32, BN36, BN39, BN43, BN46, BIA1) explained that they are not aware of any cultural influences on the activities of the RBDAs simply because of the limited interactions between their organisation and the RBDAs. Apart from this, some respondents commented that, from their little interaction and knowledge of the basin, the RBDAs are bound to obey and ensure the preservation of the host communities' cultural heritage (U10, AN4, AN12, AIA2; BN1, BN2, BN7, BN9, BN12, BN15, BN27, BN28, BN33, BN45, BIA2). According to a respondent: “So, for example, Osun shrine is a cultural heritage. So if we are talking of Ogun-Oshun River Basin, Osun is there. So, if they want to provide a dam, they must not go near it” (BIA2).

Buttressing their stand, some of the respondents went on to say that rivers or forest sites designated for spiritual purposes by the local communities or locations considered to be sacred are no go areas for the RBDAs no matter their technical suitability for river basin water projects (U10, AIA2; BN2, BN15). This implies that, apart from satisfying technical requirements, project locations must also meet cultural considerations. Nonetheless, it was stressed that respect for cultural resources can make the RBDAs change a project location or dictate the type of water projects to provide in a particular location (U10; BN12). However, since organisations are embedded within the larger society in which they operate, organisational performance can in turn be shaped by a set of cultural beliefs prevalent in that society or region. Bearing this in mind, this section set out to investigate the presence and effects of societal culture on IWRM implementation. The data suggest that cultural considerations pose a considerable impact on the integrated planning of water resources at the river basin level. In addition, the provisions of the extant legal instruments with respect to land and water use rights also have a constraining effect on integrated planning of basin water resources in Nigeria, and neither do they empower the RBDAs to regulate water resources development and use under the customary water use rights.

## **5.4 Political structure and water governance in Nigeria**

This study conceptualised (Figure 1-1) that the governance system for a country as a whole could influence the governance system for subunits (such as the river basins) in that country. To decipher the political arrangements for water governance in Nigeria and its effects on IWRM implementation, two areas were focused on: what the laws say and what happens in practice. This section is divided into two subsections. Subsection 5.4.1 takes a look at the relevant legal and regulatory instruments for an understanding of what the laws say on political structure for water governance in Nigeria and its effects on IWRM implementation. To decipher what happens in practice, Subsection 5.4.2 examines the presence of political interference in river basin activities and its effects on IWRM implementation.

### **5.4.1 Political structure for water governance and its effects on IWRM implementation**

In order to gain a better understanding of how the political system for water governance is structured in Nigeria and its effects on IWRM implementation, an analysis of relevant legal and regulatory instruments was carried out. The results of the legal analysis reveal that the Constitution of the Federal Republic of Nigeria of 1999 provides the political arrangements for water governance in Nigeria. As suggested by the 1999 Constitution, Nigeria is structured along a three-tier system of

government (Federal, State, and Local). Each tier is empowered to regulate the development and management of water resources. Accordingly, Section 4 – (2) of the Constitution of the Federal Republic of Nigeria of 1999 empowers the Federal Government of Nigeria to regulate all waters listed on the Exclusive Legislative List (ELL). In specific terms, Item 64 of the Second Schedule to the 1999 Constitution describes water resources on the ELL to mean all water sources affecting more than one State (including underground water sources) [see also Item 62 of the State Government (Basic Constitutional and Transitional Provisions) Decree of 1997]. However, the Schedule to the Water Resources Decree No. 101 of 1993 provides a list of those water sources to be affecting more than one State. In the case of O-ORB, these water sources are the Oshun River, the Ogun River, the Shasha River, the Ogun-Oshun sedimentary hydrological area, and all other water sources directly or indirectly discharging into the lagoon. In the case of B-ORB, these water sources are the Owena River and all other water sources directly or indirectly discharging into the lagoon. In the case of States and Local Governments, Sections 4 – (7) (a) and (b) of the Constitution of the Federal Republic of Nigeria of 1999 and Section 2 of the State Government (Basic Constitutional and Transitional Provisions) Decree of 1997 empower the State Governments to legislate on water sources that are not listed on the ELL. While Section 7a of the 1999 Constitution provides for the existence of the Local Governments, the Fourth Schedule to the 1999 Constitution and Section 28 of the Local Government (Basic Constitutional and Transitional Provisions) Act CAP 213 of 1989 empower the Local Governments to participate alongside the State Governments in the development of water resources. This implies that the 1999 Constitution and the Local Government (Basic Constitutional and Transitional Provisions) Act CAP 213 of 1989 do not allocate any particular water sources to the Local Governments.

However, the Constitution does not recognise or lacks provisions on collaborative governance between the managers of waters listed on the ELL and those not listed on the ELL. According to the 1999 Constitution, the legislative houses at the federal and at the state level are independently saddled with the primary responsibility of formulating laws to regulate water resources development and management in Nigeria. This therefore suggests the involvement of the law makers in the development and management of water resources in Nigeria. In the case of the Local Governments, the 1999 Constitution and the Local Government (Basic Constitutional and Transitional Provisions) Act CAP 213 of 1989 saddle the Local Government Councils with the responsibility of regulating the development of water sources at the local level in Nigeria. From the foregoing, aside from the suggested collaboration between the State and the Local Governments, both the 1999 Constitution and others do not recognise the cross-sectoral linkages of water

resources development and its use at the river basin level and the need to coordinate the planning of water resources at the river basin level. Although there is an absence of databases on surface and/or underground waters that belong to the State Governments (from the data obtained from the national actors), the effect of the absence of an integrated approach in the 1999 Constitution is that the legal framework has supported a fragmented and non-collaborative development and management of water resources at the river basin level. The Constitution does not reflect the complexities of interaction between the natural and human systems and the need to encourage synergy between different areas of activities in the water sector. However, an overbearing implication of this blindness is that it has contributed to a lack of, or hindered, sectoral collaboration.

#### **5.4.2 Effects of political interference on IWRM implementation**

As explained by respondents in Chapter 4, the RBDAs are parastatals under the FMWR, established by law, and its operations guided by rules and regulations. Since the RBDAs are public organisations operating at the federal level, following the statute that created them, they therefore come under the policy directives of the Federal Government. Since Nigeria practices the presidential system of government, the Nigerian government is composed of three arms: the executive, the legislature, and the judiciary. By function (according to the Constitution of the Federal Republic of Nigeria of 1999), the executive implements laws and programmes, the legislature formulates laws, and the judiciary interprets laws. By virtue of its creation, the RBDAs are part of the executive arm of government in Nigeria. To understand the life experiences of the RBDAs with respect to political interference, respondents were asked whether there is political interference in river basin activities. Respondents went on to explain that there is political interference (mostly from the elected members of the legislative arm of government and to some extent from the politically appointed members of the Board of Directors) in river basin activities (A1 – A22, A25, A26, A29 – A33; B1 – B12, B22 – B24, B27). Respondents highlighted that political office holders (referred to above) do interfere in river basin decision making (A1 – A22, A25, A26, A29 – A33; B1, B5 – B12, B22, B24). As one of the respondents commented:

“Some of the projects are not actually conceptualised by the River Basin [Development Authority]. You now have a member of senate or house of representatives that comes from a certain constituency putting projects in the budget for you to implement, I mean, no study before, no planning before, you don’t have a very clear conception of the project right from the word go, somebody just put it there for you [to implement]” (A14).

Aside from interference at the ministerial level (A8, A13, A19, A21, A26; B5 – B7, B9, B11, B12, B22, B24), some respondents pointed out that political office holders do interfere in river basin activities also at the operational level (A20; B24, B27); for example, according to a respondent, in project location (B24). Noting that the RBDAs have budget thresholds, respondents pointed out that the law makers incorporate their constituency projects into the RBDAs budget proposals at the National Assembly by deleting and/or reducing the cost of some of the proposed RBDAs’ projects (A3, A21, A25; B6 – B8, B12, B27). One respondent put it thus:

“When we conceive projects at our level, within the river basin, and we packaged the budget, you know it will still go to their table [the National Assembly] at the budget defence. At that point, there are two things they can do: it is either they throw what we have conceived away and put in what will benefit their own interest and incorporate it. ...., or they may just reduce what we have in the budget because they want to accommodate their own interest” (B27).

Corroborating the interview data, the results of documentary analysis reveal that both the B-ORBDA and the O-ORBDA suffered from interference from the political officeholders (Are, 2003). Figure 5-1 captures some examples illustrating areas of political interference in river basin activities in Nigeria based on the interview data (A1 – A8, A10 - A12, A14, A15, A17, A18, A19, A20, A22, A26, A29 - A33; B1 – B9, B11, B12, B23, B24, B27).

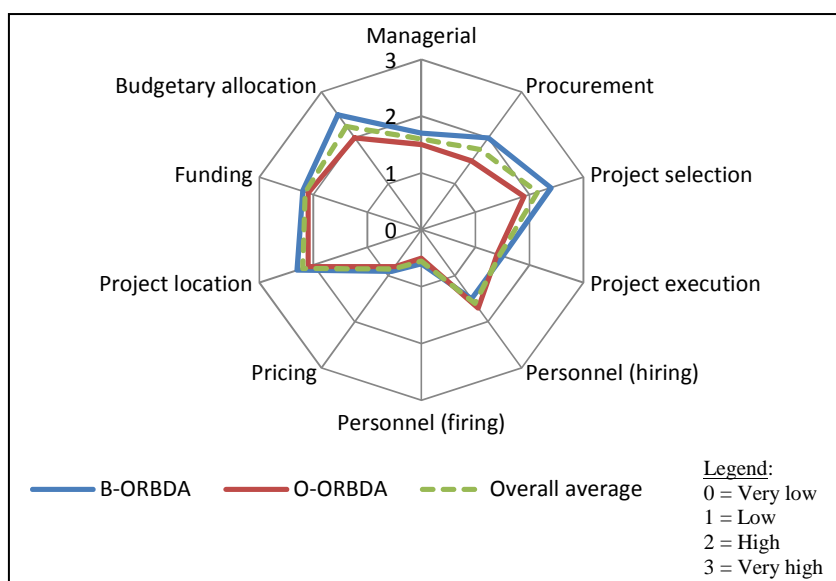


Figure 5-1 Areas of political interference in river basin activities

However, to uncover the institutional elements driving conformance since political interference in river basin activities in Nigeria is not backed by any statutes, respondents were asked whether their organisation sees political interference in river basin activities as normal (or acceptable) or

abnormal. Although responses are mixed, the majority of the respondents (A5, A7, A8 – A11, A14, A15, A17, A18, A22, A25, A32, A33; B2, B7, B8, B24) explained that political interference in river basin activities is normal. For example, according to a respondent: “It is normal. Government is powerful. Instructions can come to the River Basin Development Authorities to do one thing or the other. So we have to implement them. They are normal” (B8).

Others commented that political interference in river basin activities is abnormal (A3, A4, A6, A29– A31; B5, B6, B9, B11, B27). As one respondent persuasively argued (B27):

“Very abnormal! It is even affecting our system. Honestly, it is even affecting the system itself. For example, the issue of budgeting that I talked about, if we have a project that is supposed to cost about N500m, and somebody somewhere just reduced it to N50m; what do you do with the N50m? Is it for the studies alone? That is one. Then number two, it is abnormal because even the projects they themselves conceived and incorporated into the budget are unrealistic. They will not come and interact with the river basin to ask that the project I want to do for my community, what is the cost? Is it feasible? For example, you see the politicians putting what is not feasible in the budget for implementation. You can’t convince them. That is why I said their interference is seriously affecting us”.

However, some other respondents were not certain. These respondents stressed that if interference from the political officeholders is made in good faith for the betterment of the people it is normal, but abnormal when it is targeted at enriching the individuals (B1, B3, B12, B23). As a result of mixed responses, and in order to decipher the forces encouraging conformity, some of the respondents who had earlier stated that political interference was abnormal were asked why are there no protests in the organisation to show that organisational members dislike political interference. Again, responses are mixed. Some respondents (A4, A30; B9) explained that most people have come to accept the fact that there is nothing an individual can do about it, hence the need to go along with others. Two other respondents (A6, A12) remarked that the need to save one’s job encourages most people not to complain openly about it; while one other respondent (A29) pointed out that the acceptance is being nurtured by differences in people’s political, cultural and religious beliefs. Besides this, one respondent strikingly put it that the RBDA has learnt to accommodate political interference (B5). However, interviews and observational data analysis suggests that some of these responses were shaped by religious beliefs, hierarchical levels, and functional areas. For example, on the one hand, those that are religious reasoned that political interference is abnormal, while the majority of those at the middle-to-top management level stated that political interference is normal. On the other hand, the majority of those on the field explained that political interference is abnormal. While one may not be able to rule out personal interests,

observational data analysis reveals that the RBDAs implement the politically-influenced budgets without any protests. However, some respondents pointed out that the overriding factor is that once budget proposals (which incorporate the demands of the law makers) are approved at the National Assembly and assented by the President, it becomes a law and therefore legally binding on the RBDAs to implement. According to respondents, it is normal to implement the budget (A17, A20 – A22, A26, A28, A32; B7, B9, B14, B20, B23, B24). As one respondent asserted: “Very very normal. That is why I asked, why are we in the office? We are to implement government decisions, and the appropriation act is part of government decisions” (B24). Besides this, one respondent (B1) stressed that the National Assembly’s oversight functions constitute another platform through which the law makers ensure that ministries, agencies and parastatals of the federal government comply with the provisions of the approved budgets (or the appropriation act).

The results of the interview data analysis also show that there are factors encouraging political interference in river basin activities. Two respondents (A6; B28) put it as personal interests (corruption), another respondent (A7) ascribed it to a lack of fairness in the distribution of social amenities in the country by the Federal Government. A few other respondents (A12, A14, A15, A22, A25; B11, B28) pointed out that the political office holders are mostly driven by the need to fulfil electoral promises to their constituencies, while one respondent asserted that it is to seek electoral value or to be seen as performing politically (B27). However, as illustrated in Figure 5-1, project selection and project location are areas of high political interference which directly cast an influence on the implementation of integrated planning of basin water resources. In addition to this, since the RBDAs need financial and material resources to, among others, formulate basin water resources master plans, implement data collection, as well as build human capacity, these activities are also hindered by the high political interference in budgetary allocation and procurement (Figure 5-1).

## **5.5 Summary of key findings from this chapter**

In the preceding sections, the effects of the external environment of the RBDAs on IWRM implementation at the river basin level in Nigeria have been explored. Key findings from the results of the textual analysis are summarised as follows:

- a. The survey of national and international water-related organisations reveals that they are all involved in varying degrees in activities that have impact on water resources development



and management at the river basin level. Evidence suggests that there is no legislation or internal regulatory guideline that mandates these organisations to collaborate with, or involve, the RBDAs in the discharge of their water-related duties, and neither do they do so in practice. The only exception is the FME that has some legal and regulatory instruments empowering it to collaborate with other statutory agencies of government in the discharge of some of its water-related duties as well as the FMWR that has the RBDAs under its supervision. However, the ability of the FME to collaborate in practice has been constrained by a host of factors. Besides this, there is no evidence to suggest that the RBDAs depend on any national water-related organisations for support and resources, except the FMWR. Also, there is no evidence to suggest that the support and/or resources from the FMWR are directed towards ensuring that the RBDAs give full effect to the implementation of their statutory functions (which have some IWRM elements embedded). Apart from the national organisations, the international organisations (the World Bank and UNICEF) are also present. Although these international organisations are sources of pressures through the conditions they impose before offering their involvement, there is no evidence to suggest that the RBDAs depend on these international organisations (and/or their implementing agencies) for support and/or resources. However, the involvement of these national and international organisations has not encouraged the integrated planning of water resources development and management at the river basin level in Nigeria.

- b. In the case of societal culture and its effects on IWRM implementation, the Water Resources Decree No. 101 of 1993, the Land Use Act No. 6 of 1978, and the River Basins Development Authorities Decree No. 35 of 1987 recognise some cultural aspects of the society relating to land and water use. The provisions of the Land Use Act have empowered individuals to have control over underground water sources and those of the Water Resources Decree to take water from both surface and underground sources without charge for domestic, livestock and personal irrigation purposes, while Decree No. 35 of 1987 simply draws the attention of the RBDAs to the provisions of the Land Use Act. However, both these legal instruments and others lack provisions that regulate raw water abstraction, monitoring, wells/borehole drilling, coordinated water resources development, as well as enforcement, and neither do they empower the RBDAs to regulate these activities in practice. Evidence also suggests that local cultural beliefs have no impact on the implementation of cost recovery of basin water services. However, the data suggest that the need to safeguard local cultural resources (physical and non-physical) at the river basin level

impacts the development aspects of water resources (e.g., project selection and project location) as well as customary land ownership rules (in the case of project location).

- c. The analysis also revealed that the Constitution of the Federal Republic of Nigeria of 1999 has suggested the political structure for water governance in Nigeria and provided for the existence of both state and federal waters. However, the Constitution does not recognise the cross-sectoral linkages of the environment and water resources use and the need to integrate the development and management of water resources at the river basin level. In addition to this, there is political interference in river basin activities constraining integrated basin planning, the implementation of data collection as well as human capacity building.

These findings suggest that the external environment has a constraining effect on the implementation of integrated development and management of basin water resources. The next chapter presents the results of the institutional analysis of the findings derived from this chapter and Chapter 4.

## **6 INSTITUTIONAL ANALYSIS**

### **6.1 Introduction**

In the first part of Chapter 4, the extent of implementation of IWRM at the river basin level in Nigeria (that is, PRQ 1) was examined exposing weaknesses in implementation. Responding to PRQ 2 (if there are weaknesses in the implementation of IWRM in Nigeria, why is this so?) prompted looking at the internal environment of the RBDAs for factors influencing IWRM implementation in the second part of Chapter 4 and the external environment of the RBDAs in Chapter 5. Findings revealed that there are forces within both environments influencing IWRM implementation at the river basin level in Nigeria.

Employing the variance approach as explained in Chapter 3, this chapter presents the results of the institutional analysis. The process entails a review of the findings obtained from the first-order data in Chapters 4 and 5 and the use of contemporary institutional pillars (as described in Chapter 3) as a lens to expose the forces influencing the implementation of each of the IWRM elements. This chapter, which contributes towards answering PRQ 3 and SRQ 3a as illustrated in Figure 4-1, proceeds as follows: Section 6.2 brings together the findings derived from Chapters 4 and 5 on the factors influencing IWRM implementation and also presents the results of the variance institutional approach (or the second-order data). Following the structure adopted in Chapters 4 and 5, the reporting of results is arranged according to the IWRM elements investigated in this study. This chapter concludes the data analysis that started from Chapter 4.

### **6.2 The results of the variance institutional approach**

Due to the extent and detail of data presented in Chapters 4 and 5, Table 6-1 provides a summary of the key findings and forms the basis of the institutional analysis. As the literature suggests, all organisations operate in both technical and institutional environments. The literature also adds that both technical and institutional environments can shape organisational forms and influence organisational action and performance. Using the contemporary institutional theory as a lens, Table 6-1 details the results of the variance institutional analysis. As explained in Chapters 2 and 3, the variance analytical approach attempts to determine what forces influence the outcomes observed (that is, the extent of IWRM implementation as revealed in Figure 4-5) resting on the assumption that causes and outcomes are related in some unchanging ways.

From the outcome of the variance institutional approach, a number of findings emerges. However, it is useful to reflect on the overall patterns of the results of the variance institutional approach before attempting to discuss them. Table 6-1 also provides a summary of the forces influencing IWRM implementation at the river basin level in Nigeria (see column 5) and the nature of influence of these forces on IWRM elements (see column 6) as revealed by the variance institutional approach. The data provide substantial support for the conceptual framework illustrated in Chapter 1 by showing that there are forces within the macro and the operational environments influencing IWRM implementation at the river basin level in Nigeria. Although the study conceptualised that socio-economic conditions (e.g., poverty) would influence IWRM implementation at the river basin level in Nigeria (see Figure 1-1), the data do not support this theoretical idea. The confounding variable, water infrastructure, though not proposed in Figure 1-1, is supported by the data, and have a constraining effect on the implementation of cost recovery. The data also provide support for the expectation that societal culture would cast an influence on IWRM implementation. In addition to organisational culture, the data also show the presence of cultural resources (not artifacts) as an influencing element. Most treatments of institutions in the literature (see Chapter 2) only emphasise cultural-cognitive in which the word “cultural” is treated as a frame through which meaning is made, or as the semiotic aspects of culture (or as the “software of the mind” to borrow from Hofstede, 1991). As the data reveal, cultural resources (which have the spiritual use of water resources embedded) are made up of material resources to symbolise their presence or existence. Although contemporary institutional theory asserts that cultural-cognitive institutions are taken-for-granted entities, implemented unconsciously, activities related to cultural resources on the other hand, are implemented with conscious intention of actions since they are made up of symbolic material resources. This draws a line of distinction between the two elements. Therefore, this study is motivated by the data to suggest that cultural resources can be considered alongside others as an institutional element since they also shape organisational choices and behaviours.

However, as shown in Table 6-1, the forces influencing IWRM implementation at the river basin level in Nigeria, depending on the IWRM element, vary from regulative to normative, cognitive, and cultural elements as well as technical. Unpacking these forces, findings reveal that:

Table 6-1 The results of the variance institutional analysis

S/No.	IWRM element	Root factors (source(s) in parenthesis) [the chapter exposing the evidence in square bracket]	Type of force	Nature of influence
a.	Integrated planning	i. The River Basins Development Authorities Decree No. 35 of 1987 enables and empowers the RBDAs to undertake a comprehensive development of both surface and underground water resources and formulate basin water resources master plans. Both this legal instrument and others have no provisions empowering the RBDAs to integrate the development and management of land and water, green water and blue water, quantity and quality, water and wastewater, and sectoral coordination (including the provision of water for the environment) (document) [Chapter 4].	Regulative	Constraining
		ii. There is political interference in river basin activities (e.g., in project selection, project location and budgetary allocation) which constrains the implementation of integrated basin planning and other IWRM elements (interview and document) [Chapters 4 and 5].	Regulative and normative	
		iii. There is no legislation or internal regulatory guideline that mandates the national organisations (the LGAs, the States' Water Boards/Corporations, the States' Ministries responsible for water resources, agriculture, and the environment, the FMARD as well as the NIWRMC) to collaborate with or involve the RBDAs in the discharge of their water-related duties (interview and document). In the case of the FME, there are some legal instruments. The Ministry is constrained in practice by the belief that it is our project, why involving others (silo effect), functional overlaps in the water sector, and the absence of guidelines that describe the Ministry's approach to, and operational procedures for, collaboration (interview and document) [Chapter 5].  Besides the national organisations, the international organisations (the World Bank and UNICEF) are also present in the water sector at the basin level in Nigeria. However, the involvement of these international organisations, which is legally supported, has not encouraged integrated water resources development and management at the river basin level in Nigeria. There is no legal instrument mandating the international organisations (the World Bank and UNICEF) and/or their implementing agencies to collaborate with the RBDAs in what they do in the water sector and neither do they do so in practice (document and interview) [Chapter 5]	Regulative and cognitive  Regulative	
		iv. The Water Resources Decree No. 101 of 1993, the Land Use Act No. 6 of 1978, and the River Basins Development Authorities Decree No, 35 of 1987 recognise some cultural aspects of the society relating to land and water use which impact water allocation (surface and underground water resource) and the formulation of basin water resources master plans due to the absence of regulations on raw water abstraction, monitoring, wells/borehole drilling, coordinated water resources development, and enforcement. And neither do these legal instruments empower the RBDAs to regulate these activities under the customary water use rights. In practice, respect for (or the need to safeguard) local cultural resources (physical and non-physical) at the river basin level impacts the development aspects of water resources via project selection and project location (interview and document), while customary land ownership rights exert influences on project location (interview) [Chapter 5]	Regulative and cultural	

		<p>v. The Constitution of the Federal Republic of Nigeria of 1999, which establishes both federal and state waters, lacks provisions mandating integrated approach to the development and management of water resources at the river basin level (document) [Chapter 5]</p>	Regulative	
		<p>vi. The legally supported pressures from the FMWR which do not explicitly encourage the RBDAs to undertake a comprehensive development of surface and underground water resources and the formulation of basin water resources master plans (interview and document) [Chapters 4 and 5]</p>	Regulative	
		<p>vii. Other factors which do not encourage the RBDAs to give full effect to the comprehensive development of both surface and underground water resources and the formulation of basin water resources master plans include: the resource<sup>1</sup> support provided by the RBDAs privileging the implementation of irrigated agriculture facilitated by the success factor of the pioneer RBDAs, the conditions prevalent at the time of creation (imprinting effect), the various government policy thrusts on food production which also coerced the RBDAs into focusing on water resources development for irrigated agriculture and food production<sup>2</sup> (document), as well as the norms and values operating within the organisational workplace which encourage resource shift to hydraulic infrastructural development (interview and document) [Chapters 4 and 5]</p>	Cognitive, regulative, and normative	
b.	Stakeholder participation	The RBDAs are not empowered by any legal and regulatory instruments to have platforms for stakeholder participation <sup>3</sup> (document). Additionally, there is no legal document or internal guideline mandating the RBDAs to collaborate <sup>4</sup> with or involve other statutory agencies of government in what they do in the water sector (document) [Chapter 4]	Regulative	Constraining
c.	Inclusion of women in basin activities	The RBDAs have no legal and regulatory mandates to include women in river basin activities (document) [Chapter 4]	Regulative	Constraining
d.	Cost recovery	<p>i. The Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999 empowers the RBDAs to recover their recurrent expenditures from basin water services, while the Water Resources Decree No. 101 of 1993 curbs the ability of the RBDAs to recover cost of water services rendered from publicly funded hydraulic infrastructures. Other factors constraining the ability of the RBDAs in the implementation of the provisions of Decree No. 28 of 1999 on cost recovery include: the absence of enforcement mechanisms in the extant legal instrument, and the support granted by the FMWR to the RBDAs encouraging noncompliance with the provisions of Decree No. 28 of 1999 on cost recovery, as well as government failure to provide the promised take-off grants under the Performance Agreement signed with the RBDAs in 1992. In addition to these, the River Basins Development Authorities Decree No. 35 of 1987 does not mandate cost recovery of basin water services<sup>5</sup> and it equally lacks provisions empowering the RBDAs to enforce water service fee recovery (document and interview) [Chapter 4]. The observations on cost recovery are only applicable to the O-ORBDA.</p> <p>ii. In the case of the B-ORB, the key factor restraining the RBDA from operationalizing cost recovery is the absence of functional water infrastructures to store, deliver, and manage flows and provide irrigation services (interview and document) [Chapter 4]</p>	Regulative and cognitive	Constraining
e.	Water as a social good	The forces promoting the implementation of water as a social good are government policy on drinking water supply under the National Borehole Programmes and the Appropriation Act which enables the implementation of drinking	Regulative	Enabling

		water-related Constituency Projects. Both instruments promote the provision of drinking water by the RBDAs for free of charge to beneficiaries (interview) [Chapter 4]		
f.	Polluter pays	The RBDAs are not empowered by any legal and regulatory instruments to implement the polluter pays principle (document) [Chapter 4]	Regulative	Constraining
g.	Data collection	<p>Although data collection is empowered by the River Basins Development Authorities Decree No. 35 of 1987, this function is not fully implemented by the RBDAs in practice due to:</p> <ul style="list-style-type: none"> <li>i. inadequate financial resources, untimely and non-release of funds which are influenced by government bureaucratic process on fund releases, extant government policy and legislation on mopping (or return) of unused funds at the close of the year (document and interview)</li> <li>ii. the absence of enforcement mechanisms in both Decree No. 35 of 1987 and others driving data collection. Although the Water Resources Decree No. 101 of 1993 empowers the Minister in charge of water resources to formulate regulations to enforce the water laws, there is no regulation in place (document)</li> <li>iii. political interference in river basin activities (e.g., in budgetary allocation and procurement) which further constrains the implementation of data collection (interview)</li> <li>iv. the legally supported pressures from the FMWR which do not explicitly encourage data collection (interview and document)</li> <li>v. the resource support provided by the RBDAs favouring the implementation of irrigated agriculture (document), as well as the norms and values operating within the organisational workplace encouraging resource shift to hydraulic infrastructural development (interview and document) [Chapters 4 and 5]</li> </ul>	Regulative, normative, and cognitive	Constraining
h.	Functional decentralisation (that is, between the FMWR and the RBDAs)	The overlapping of functions (between the FMWR and the RBDAs) and the direct involvement of the FMWR in the execution of water projects in the river basins which are encouraged by the Water Resources Decree No. 101 of 1993 (interview and document) [Chapter 4]	Regulative	Constraining
i.	Human capacity building (including IWRM-related human capacity building)	<p>Although the Public Service Rules of 2008 and the 2009 Financial Regulations of the Federal Government of Nigeria encourage human capacity building in the public service sector, IWRM-related staff training is not fully implemented by the RBDAs in practice due to:</p> <ul style="list-style-type: none"> <li>i. the absence of legal and regulatory instruments empowering IWRM-related human capacity building in the water resources sector in Nigeria (document).</li> <li>vi. inadequate financial resources, untimely and non-release of funds which are influenced by government bureaucratic process on fund releases, extant government policy and legislation on mopping (or return) of unused funds at the close of the year (document and interview)</li> <li>ii. political interference in river basin activities (e.g., in budgetary allocation) which also curbs the implementation of human capacity building (interview)</li> <li>iii. the legally supported pressures from the FMWR which do not promote IWRM-related staff training (interview and document)</li> </ul>	Regulative, normative and cognitive	Constraining

		<p>iv. the resource support provided by the RBDAs privileging the implementation of irrigated agriculture (document), as well as the norms and values operating within the organisational workplace supporting resource shift to hydraulic infrastructural development (interview)</p> <p>v. the ethics (e.g., as provided by the Public Service Rules of 2008) and values (e.g., respect for rules and authority) guiding the activities of organisational members which do not explicitly support the incorporation of new knowledge (interview, document and observation), and the absence of platforms for the diffusion of new knowledge (interview and observation), in the workplace [Chapters 4 and 5]</p>		
j.	IWRM principles and approaches embedded in legal and regulatory frameworks	The instability in policy and/or government which often results into the frequent merger and demerger of the FMARD and the FMWR as well as changes in the personalities of the top operators of the FMWR, the extant government policy on posting of top operators (e.g., the Permanent Secretaries) in the Federal Civil Service in Nigeria, the personal interests of the top operators of the FMWR, the belief by top operators of the FMWR that decision making authority could be lost by instituting IWRM, the presence of (new) top personalities in the FMWR who may lack requisite knowledge in water resources (and/or IWRM), and government bureaucracies which make the process of institutional reforms cumbersome (interview). Furthermore, the Water Resources Decree No. 101 of 1993 also encourages a top-down (supply-driven) approach to the planning, development and management of water resources in Nigeria (document) [Chapters 4 and 5]	Regulative, normative, and cognitive	Constraining
k.	Conflict management	The RBDAs are not empowered by any legal and regulatory instruments to have platforms for water conflict management (document) [Chapter 4]	Regulative	Constraining
l.	Water laws enforcement	The RBDAs are not mandated by any legal and regulatory instruments to enforce water laws (document) [Chapter 4]	Regulative	Constraining

1. Resource is meant here to include both human and materials or any of the two
2. This is before the introduction of the River Basins Development Authorities Decree No. 35 of 1987 (which commenced in 1986) that limits the functions of the RBDAs to water resources development and management (and the subsequent sale of the non-water assets of the RBDAs under the partial commercialisation policy of the Federal Government)
3. Although Section 2(2) – 7 empowers each RBDA to establish an advisory committee, which is mostly governmental, to advise the RBDA with respect to its statutory functions (as illustrated in Section 4) or other committees as deemed fit to carry out any of the RBDA’s functions so delegated (see Section 2(2) – 7 (4)), this does not suggest a stakeholder platform.
4. This is without being blind to Section 2(2) – 7(3) (c) which empowers the advisory committee to advise the RBDA with respect to the need for a coordinated activity between the RBDA and the States Ministries of Agriculture in their areas of operation. However, this does not suggest that the legal framework empowers sectoral collaboration.
5. Basin water services refer to bulk raw water supply to the States’ Water Corporations/Boards and irrigation water supply to the farmers.



- a. The forces constraining the ability of the RBDAs to include women in basin water activities, implement stakeholder participation, polluter pays principle, manage conflicts, and enforce water laws are regulative institutions. Additionally, the force curbing functional decentralisation (that is, between the FMWR and the RBDAs) also is regulative institution.
- b. However, the forces constraining the implementation of integrated planning of basin water resources are regulative, normative, cognitive, and cultural institutions.
- c. On the other hand, the forces constraining the implementation of cost recovery, in the case of the O-ORB, are regulative and cognitive institutions, while in the case of B-ORB, the force is technical.
- d. In turn, the force promoting or enabling the implementation of water as a social good are regulative institutions, while
- e. The forces constraining data collection, human capacity building (including IWRM-related human capacity building), and the inclusion of IWRM principles and approaches in the legal and regulatory instruments in Nigeria are regulative, normative, and cognitive institutions.

Drawing on the findings of the variance institutional analysis and those of Chapters 4 and 5, Figure 6-1 provides a graphical illustration of the overall findings of this study. First, the figure integrates the findings derived from the variance institutional approach (Table 6-1) with those derived from the textual data analysis (Figure 4-5) to give a comprehensive view of the key forces influencing each of the IWRM elements at the river basin level in Nigeria. Second, the figure also illustrates the environments within which the influencing forces are embedded and the nature of influence of each of the forces on the IWRM elements. As shown in Figure 6-1, to take an example: why integrated planning is moderately implemented in the selected case river basins in Nigeria can be traced to four institutional elements: regulative, cultural resources, normative, and cognitive. All of these institutional elements have a constraining effect on the implementation of integrated basin planning. However, while some of the legal instruments constraining the implementation of integrated planning are located in the macro environment of the RBDAs, some are also located in the operational environment. Apart from the regulative and cultural institutional elements, the other key forces (normative and cognitive) constraining the implementation of integrated planning are located in the operational environment of the RBDAs. As explained in Chapter 2, since the implementation of IWRM is dependent on the influencing forces, this suggests that any improvements made to these forces will have an impact on the IWRM elements and the extent to which they can be implemented in practice. As neo-institutional theory asserts, institutions not only constrain action but also enable

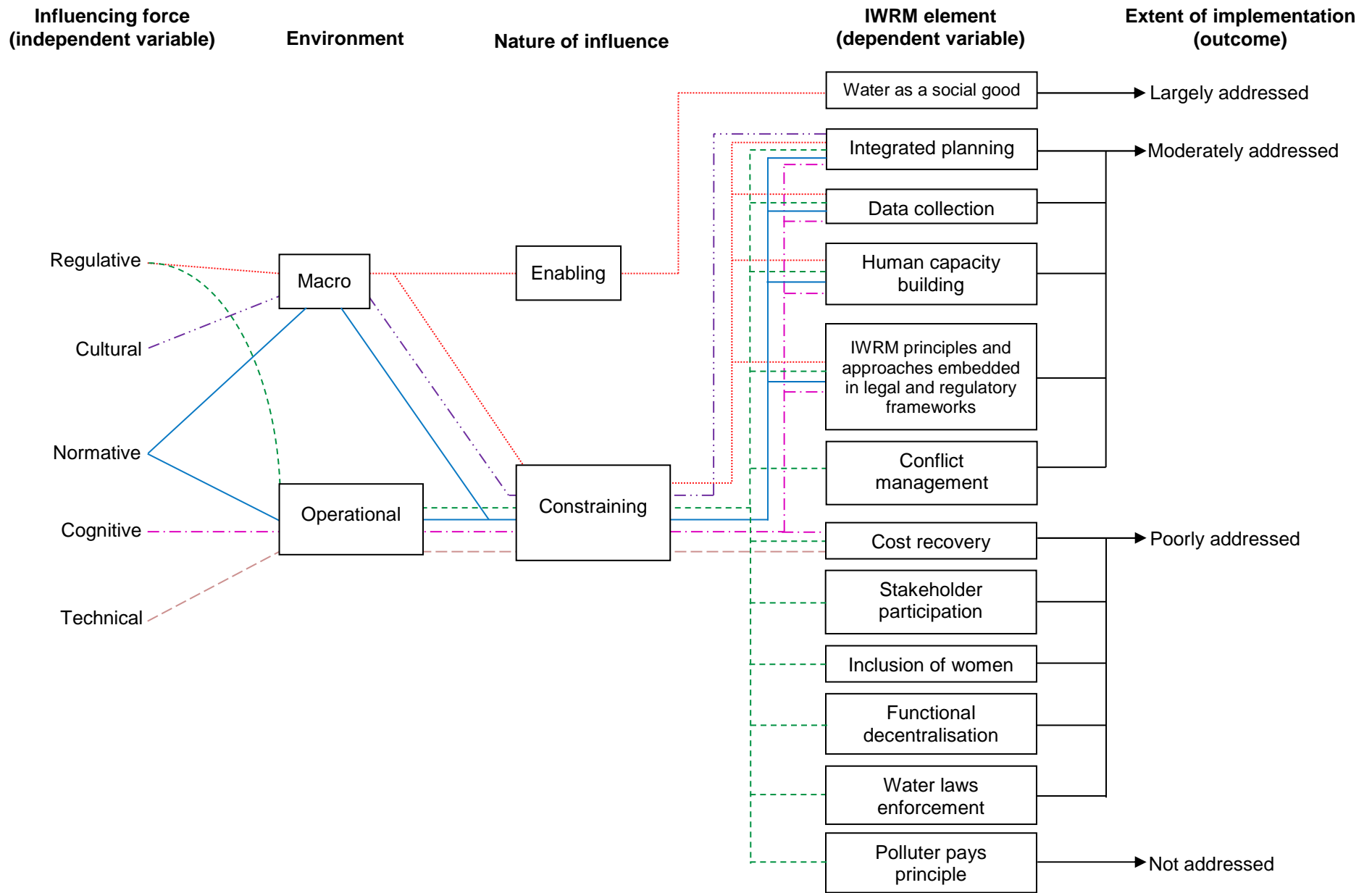


Figure 6-1 Summary of findings of this study on the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded

it. Recalling SRQ 3a, that is: what are the key forces influencing IWRM implementation at the river basin level in Nigeria? Figure 6-1 provides the answer, which can now be summarised as:

- (i) regulative, normative, and cognitive for integrated planning, data collection, human capacity building, and the inclusion of IWRM principles and approaches in legal and regulatory frameworks, and in addition to integrated planning, cultural resources;
- (ii) regulative, cognitive, and technical for cost recovery; and
- (iii) regulative institutions for water as a social good, conflict management, stakeholder participation, the inclusion of women in basin activities, functional decentralisation (that is, between the FMWR and the RBDAs), water laws enforcement, and polluter pays principle.

However, of all the IWRM elements shown in Figure 6-1, the implementation of water as a social good has the legal instruments promoting it embedded in the macro environment. The cultural resources element, which also constrains the implementation of integrated planning of basin water resources, is also embedded in the macro environment. Outside these, all other forces influencing the IWRM elements are embedded in the operational environment of the RBDAs, except normative which is embedded within both environments. As illustrated in Figure 6-1, the key forces influencing the implementation of IWRM at the river basin level in Nigeria can be summarised as comprising of both technical and institutional elements. Recalling PRQ 2, there are weaknesses in IWRM implementation in Nigeria because of the constraining and enabling effects of the institutional and technical elements on IWRM implementation. These findings provide support for the argument that both institutional and technical elements can influence organisational choices and behaviours as neo-institutional theory predicts. Overall, part of the findings of this study supports those identified during the critical literature review presented in Chapter 2 which indicate that institutional (regulative) forces are constraining the implementation of IWRM at the river basin level in Nigeria.

Having briefly reflected on the findings of this study and outlined the key forces influencing IWRM implementation in the surveyed cases, these will now be discussed in the light of relevant literature in the next chapter. Drawing on the discussions, the chapter also provides a revision of the conceptual framework formulated in Chapter 1.

## 7 DISCUSSION

Findings obtained from the textual data analysis in Chapters 4 and 5 and the institutional analysis in Chapter 6 indicate that (a) there are weaknesses in IWRM implementation in Nigeria, and (b) there is a multitude of forces influencing the implementation of IWRM at the river basin level in Nigeria, and that these forces are not necessarily stand-alone or disconnected from each other. Thus the discussion presented in this chapter responds to both PRQs 1 and 2 as illustrated in Figure 4-1, while responses to PRQ 3 are presented in Chapter 8. However, for a better understanding, answers to PRQ 2 (that is, if there are weaknesses in the implementation of IWRM in Nigeria (as revealed in Figure 4-5), why is this so?) are organised according to the key forces identified in Chapter 6. In the retroductive logic of enquiry, to borrow from Blaikie (2000, 2007), an explanation (or answer) is achieved by establishing the presence of the forces that are responsible for the weaknesses in IWRM implementation. The discussion also provides evidence to both support and challenge previous understanding about IWRM implementation experiences as well as the forces influencing implementation in Nigeria.

The chapter is divided into four sections. Section 7.1 discusses the findings derived from Chapter 4 on the state of IWRM implementation, drawing upon IWRM literature and others. Section 7.2 discusses the findings obtained from Chapters 4, 5, and 6 on the forces responsible for the weaknesses in IWRM implementation in light of relevant literature. In doing this, the section draws on both the IWRM and neo-institutional theory literature. Insights from the discussion are then linked back to provide a revised conceptual framework that suggests the forces influencing IWRM implementation and the environments within which they are embedded in Section 7.3. The chapter concludes with a summary in Section 7.4.

### 7.1 The extent of IWRM implementation at the river basin level in Nigeria

A sound understanding of the extent of IWRM implementation at the river basin level in Nigeria is a pre-requisite for investigating the influencing forces and suggesting measures which might improve implementation. Without this understanding, institutional responses may be partial or misplaced. However, a useful starting point for discussing the results of the textual data analysis which expose the extent of IWRM implementation at the river basin level in Nigeria on a 4-point Likert scale is Figure 4-5. As Figure 4-5 indicates, thirteen elements of IWRM (see also Table 2-12) were investigated, and the figure provides a summary of scores for each of the IWRM elements which reflect how effectively IWRM has been implemented in Nigeria. However, what is evident, looking at the overall average, from the results presented is that IWRM implementation in the surveyed river basins in Nigeria is limited.

Although the implementation of water as a social good is relatively largely implemented by the RBDAs (see Figure 4-5, item f), this should not be mistaken as strength. To put the argument in the right perspective, considering the case of Nigeria where government financial resources in the water sector are insufficient (NIWRMC, 2011), this constitutes a weakness and capable of constraining cost recovery or the ability of water infrastructure paying for itself. As emphasised by Ako et al. (2009), that water should be recognised as a social good does not imply that it has to be supplied free of charge. But in the case of Nigeria, as the data reveal (Chapter 4), drinking water projects are provided for free to beneficiaries without any mechanisms for cost recovery. However, according to the IWRM literature, GWP (2000b) asserts that raising revenue will help to ensure the financial sustainability of water investments. Jaspers (2003) also maintains that recovering cost would make the water sector attractive to private sector investments. Similar to the argument of these authors, Donkor and Wolde (2011) highlight that inadequate cost recovery could hamper the ability of water authorities to become self-financing, while Ako et al. (2009) also maintain that supplying water for free will affect the financial sustainability and care of the water supply infrastructures. Drawing on these statements suggests that the state of implementation of water as a social good (Figure 4-5, item f) in Nigeria will affect water management sustainability, revenue generation and investments in water infrastructures. This observation partly explains why there is no private sector participation in the surveyed river basins in Nigeria as revealed in Chapter 4.

However, it is important to add that the limited implementation of other IWRM elements (Figure 4-5) will also have some effects on water resources management in Nigeria. For example, with increasing population and expanding economic activities, the per capita demand for water will rise. Hence, there is a need for integrated water resources planning in Nigeria. As Fischhendler (2007) puts it, a higher degree of integration will allow for more optimal water resources management. Also, it is anticipated that the involvement of non-government stakeholders will ease water law enforcement and create a favourable environment for implementing cost recovery and polluter pays principle. According to Jembere (2009), with stakeholder participation, a sense of ownership is felt, and the local communities can provide an important indigenous knowledge database and ideas that could lead to implementable solutions to water problems (Ako et al., 2010). As it stands, these benefits may not be captured in the case of Nigeria. For example, as pointed out by Onosode and Ogban (2010), because key stakeholder are not involved in Nigeria, this has resulted into water project duplications in most cases. Furthermore, although IWRM recognises women as water users that should be given increased access to decision-making and increased participation in water resources management, and for the water sector to be gender sensitive, the inclusion of women in basin-based water activities in Nigeria is poorly addressed

by the RBDAs. As emphasized by Rahaman et al. (2004) and Martinez and van Hofwegen (2006), women play a vital role as providers and users of water and guardian of the living environment. In all cultures in Nigeria, women are primarily responsible for the provision, use and management of water, which is more or less part of their daily work activities. When women are unable to influence the decision-making processes that affect their everyday living, their economic and social opportunities can be limited (Goldin et al., 2008). This therefore suggests that women's inability to influence water decisions could result into a lack of water. However, Nyambod and Nazmul (2010) emphasise that a lack of water could have a positive feedback loop on poverty, exacerbating gender inequalities in employment and education. This partly explains why poverty is prevalent among women in Nigeria (e.g., the literature reports that more women are living below the poverty line in Nigeria than men (Alese, 2013; Pwanagba, 2013)). Additionally, since the implementation of functional decentralisation (that is, between the FMWR and the RBDAs) is limited, the issue of fiscal decentralisation is also out of consideration in Nigeria. As argued by Moriarty et al. (2010), a real decentralised decision making can only occur with decentralised financing. Since the decentralisation of IWRM responsibilities would facilitate poverty reduction interventions (Ahmad, 2003; Martinez and van Hofwegen, 2006), the possibilities of using water resources to address poverty issues will rather be missing in the case of Nigeria.

Also, a direct impact of limited data collection is that management ability to identify water problems, conflict areas and vulnerabilities, and appropriate solutions as well as establish water priorities and objectives and resolve water conflicts would be jeopardised. As argued by McDonnell (2008), data is an important component of the instruments needed to implement IWRM. As it is in the case of Nigeria, since data collection is not fully implemented, the possibilities for truly integrated water resources management are limited. Furthermore, with limited human resource capacity, organisational capacity to implement IWRM is also limited. Drawing on GWP (2009b) for the case of Nigeria, insufficient human capacity building for IWRM will curb organisational ability to cope with current and future water management demands. Although the RBDAs are open to knowledge acquisition, and are aware of IWRM to some extent (see Figure 4-2), the percentage of important human resource such as foresters, hydrologists, ecologists, remote sensing, GIS and computer experts in the RBDAs is clearly less adequate (see Figure 4-6). These functions are seen as critical to the success of IWRM and have been recognised in the literature (Ingram et al., 1984; Akpabio et al., 2007). With inadequate capacity building initiatives for IWRM, the likelihood of its success is low (Jembere, 2009). While this situation may not be limited to Nigeria, in a United Nations' status report on the application of integrated approaches to water resources management, insufficient capacity (both in numbers and knowledge) to

implement IWRM was also found in Algeria, Bosnia and Herzegovina, China, Guinea, Libya, Nicaragua, Saudi Arabia and Serbia (UNEP, 2012). Lastly, the weak inclusion of IWRM principles and approaches in legal and regulatory instruments in Nigeria to guide the multi-dimensional aspects of water resources, the resource managers and users will continue to undermine the implementation of IWRM. As pointed out by Sharma et al. (1996) and others (e.g., Hassing et al., 2009; Lankford and Hepworth, 2010), appropriate and enforceable legal and regulatory instruments are an essential prerequisite for the effective application of IWRM to water resources management. With conflict management and water laws enforcement not fully implemented, this will create disincentives for efficient resources management, leading to resource abuse and overexploitation as seen in the case of Nigeria and reported by some scholars (e.g., Akpabio et al., 2007). Besides this, the possibility of water management sustainability will also be directly affected by the non-implementation of the polluter-pays principle in Nigeria. While this situation may not be limited to Nigeria, Sosa-Rodriguez et al. (2014) reported that the polluter-pays principle is not fully applied in practice in the water sector in Mexico.

That IWRM is not effectively implemented in the surveyed river basins in Nigeria supports the findings obtained from the literature review and analysis made in Section 2.4 which indicate that IWRM is not fully implemented in Nigeria. This finding also corroborates that of Akpabio et al. (2007) who found that there are weaknesses in the implementation of IWRM elements investigated in the Cross River Basin in Nigeria. Although many scholars have commented on IWRM implementation that the concept is yet to be adequately realised in practice (e.g., Jeffrey and Gearey, 2006; Biswas, 2004; Merrey, 2008), similar implementation challenges could be traced to some other countries parties to IWRM. For example, in the survey of the water resources sector in Burkina Faso (Petit and Baron, 2009) and Cameroon (Ako et al., 2010), IWRM implementation was found to be limited. Using evidence from Mazowe Catchment in Zimbabwe, Chereni (2007) found that there are weaknesses in the implementation of IWRM elements investigated. Also, focussing on the Kafue river basin in Zambia, Uhlendahl et al. (2011) found the implementation of IWRM elements investigated to be limited. Therefore, the fact that IWRM faces a critical challenge of field-level implementation points to an underlying problem – that of translating science-based management concepts developed by academia into reality. However, drawing upon the results presented in Chapter 4 and the discussion outlined above, it can be reasonably submitted that there are weaknesses in IWRM implementation at the river basin level in Nigeria, which suggests that there are forces influencing its implementation. These forces, in the context of neo-institutional theory, are discussed in greater depth in the section that follows.

## **7.2 The key forces influencing the implementation of IWRM at the river basin level in Nigeria**

Having briefly reflected on the results of the data analysis presented in the previous three chapters, these will now be discussed in the light of existing knowledge as explained above. However, since the discussion is centred on a why question, alternative explanations are also considered where applicable.

### **7.2.1 The regulative element**

As shown in Figure 6-1, the effects of regulative pressures in the form of legislation and regulations that the organisations surveyed comply with in practice are significant. Some of the respondents interviewed (Chapter 4) highlighted the importance of laws and regulations as a framework that guides organisational performance and actions as well as the allocation of resources. According to neo-institutional literature, all legal and regulatory instruments are designed to affect organisational behaviour (Connor et al., 2008), and they constitute a coercive force (DiMaggio and Powell, 1991). In the case of the RBDAs, the mandate to comply with relevant legal and regulatory frameworks (see Table 4-1) is a significant formal pressure that influences the implementation of all the IWRM elements investigated in the selected river basins. The legal and regulatory instruments work in a way that they specify what the RBDAs and other water-related organisations are to do and directly or indirectly what they are not to do in the water sector in Nigeria thereby either enabling or constraining actions. For example, when a respondent was asked why the RBDA was not implementing women inclusion (Principle III of IWRM) in river basin activities, the response was that the law does not enable the RBDAs to do so. Despite the fact that the legal and regulatory frameworks that the RBDAs comply with in practice do not have provisions enabling the implementation of most of the IWRM elements investigated in this study (Table 4-2), there are still exceptions. For example, the Appropriation Act and other government policies, in line with government resolve to meet the water related Millennium Development Goals (MDGs) and drinking water provisions for all, have enabled the implementation of water as a social good which is largely implemented by the RBDAs (see Figure 4-5). This supports the arguments in neo-institutional literature that institutions not only constrain, they also empower as well.

However, as revealed in Figure 6-1, the majority of the legal and regulatory frameworks constraining the implementation of all the IWRM elements surveyed are located within the operational environment. An exception is integrated planning whose implementation is also being constrained by legal and regulatory frameworks in the macro environment (e.g., the Constitution of the Federal Republic of Nigeria of 1999 and the various legal and regulatory frameworks suggesting the involvement of the



international actors). This suggests that the forces influencing the implementation of integrated planning are embedded within both the operational and the macro environments. Besides the formal institutions, the data also reveal that informal institutions on water use also constrain the ability of the RBDAs to implement integrated planning. Although both the customary land ownership rights which have a link to water resources and the customary water use rights have been formalised, there is an absence of provisions in the extant legal and regulatory frameworks in Nigeria regulating the use of these rights. Thus at the societal level in Nigeria, these informal institutions still operate unregulated. Supporting the finding of this study, feedback from NIWRMC on the draft of the findings of this study indicates that the absence of relevant provisions in the legal and regulatory instruments in Nigeria has constrained the implementation of IWRM at the river basin level. This finding is consistent with the observation of a number of scholars (Ajai, 2012; Adeoti, 2007; Akpabio et al., 2007; Egbu, 2000) who have reported on the role of regulative institutions as constraining the implementation of the various IWRM elements investigated in their studies. Since this study also reveals that there is an absence of functional decentralisation in practice in Nigeria (that is, between the FMWR and the RBDAs), this finding is in agreement with Onosode and Ogban (2010) who found that the FMWR, which has the overall responsibility for policy advice and formulation, data collection, monitoring and planning, development, management and coordination of water resources in Nigeria, is also involved in service provision functions, such as the construction, operation and repair of hydraulic works, and the supply of raw water. While the literature has argued for a separation of functions among the three actors (i.e., the regulator, the resource manager, and the operator and provider of technical services) that are involved in the water sector (Shen, 2004; Jønch-Clausen and Fugl, 2001), in the case of Nigeria, there are functional overlaps encouraged by duplications in the Water Resources Decree No. 101 of 1993. Besides this, there is an absence of guidelines to support functional decentralisation in the water resources sector in Nigeria. Similar to the case of Nigeria, Inguane et al. (2013) also identified a lack of guidelines to direct decentralised water resources management as one of the factors constraining the implementation of functional decentralisation in water resources management at the river basin level in Mozambique.

That the implementation of IWRM is being constrained by regulative institutions may not be limited to Nigeria. For example, in the study of the Mhlatuze Catchment in South Africa, Funke et al. (2007) also identified regulative institution as one of the forces constraining the implementation of IWRM. Also for the Mekong region, institutional challenges were reported to be influencing IWRM application (Suhardiman et al., 2012). Similarly, in the study of the Kafue River Basin, Uhlendahl et al. (2011) found inadequate legal frameworks as one of the forces curbing the implementation of IWRM in the Zambian water sector. In Mozambique, weak legal instruments were identified as one of the key forces

constraining IWRM implementation (Gallego-Ayala and Juárez, 2011). In the survey of Huai River basin in China, Song et al. (2010) identified inadequate legal and regulatory instruments as one of the forces constraining the implementation of integrated approach to water resources planning and management. Furthermore, in the survey of Comoros, Somalia and Zambia, GWP (2009b) identified a lack of legal and regulatory instruments as one of the forces constraining IWRM implementation, while conflicting water sector laws and regulations was found as one of the forces weakening IWRM implementation in Ghana (Anokye and Gupta, 2011). Looking at Africa as a whole, Donkor and Wolde (2011) identified inadequate legal and regulatory instruments as one of the key forces curbing the implementation of IWRM in the region. However, in specific terms, in the case of Pakistan, Luken (2009) found inadequate legal and regulatory instruments (that is, the inability to incorporate the polluter-pays principle) as the factor constraining the implementation of the polluter-pays principle. In the Longgang River basin in China (Liu and Ma, 2010) and the Lake Taihu Basin in China (Wang et al., 2006), an absence of formal institutions and mechanisms was identified as the force curbing the involvement of non-government stakeholders in water resources management. Also, in the survey of IWRM implementation in Burkina Faso, Petit and Baron (2009) found a lack of provisions in relevant legal and regulatory instruments as constraining the implementation of integrated approach to land and water resources management. Furthermore, Mkandawire and Mulwafu (2006) found conflicting policies existing in the water and water-related sectors in Malawi as one of the forces constraining capacity building in IWRM. Similar to the situation of Nigeria (see Table 4-2), Manase et al. (2003) found a lack of provisions in relevant legal and regulatory instruments on women inclusion as the force constraining the inclusion of women in basin-based water resources management activities in Zimbabwe and also in Cameroon as discovered by Nyambod and Nazmul (2010). Also, in the study of Pahang River basin in Malaysia, Tan and Mokhtar (2009) identified a lack of legal provision enabling non-government stakeholder participation as curbing non-government stakeholder participation at the local planning level.

Although the extant legal and regulatory instruments in Nigeria (as illustrated in Table 4-2) do not have provisions empowering the RBDAs to have platforms for conflict management, impression from the field indicates that some consultations are still being made by the RBDAs during project planning and execution which are all designed to minimise conflicts and litigations in the courts of law. To minimise conflicts, field experience indicates that the RBDAs still undertake project specific consultations; for example, during request for land in the communities, as well as during planning and execution of water projects. As the IWRM literature suggests (Davis, 2013), greater stakeholder involvement at a level more than consultation is required in the planning, development, operation and maintenance of water

projects, and in water conservation programmes. The IWRM literature also maintains that stakeholder involvement could minimise water conflicts (Dungumaro and Madulu, 2003). However, the impact of regulative institutions on water resources management in Nigeria is numerous. For example, due to failures to implement cost recovery, the data reveal that the Federal Government is still responsible for meeting the recurrent expenditures of the RBDAs which negates the spirit of the partial commercialisation policy and the essence of the Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999. Also, consistent with the observation of GWP (2001), the non-implementation of the polluter pays principle in Nigeria has not created incentives for polluters to abate, reuse and minimise the pollution of water resources which could serve as a tool to generate new water. Furthermore, due to the absence of collaboration, sectoral approaches to water resources development and management, which has been criticised in the literature as inefficient (see, e.g., Kidd and Shaw, 2007; Funke et al., 2007; Agyenim and Gupta, 2011; Merrey, 2008; Foster and Ait-Kadi, 2012), are still prevalent in Nigeria. This has led to fragmented and uncoordinated use, development and management of water resources at the river basin level.

However, as revealed in Table 4-2, some IWRM elements are still enabled for application. Examples are human capacity building by the Public Service Rules and the 2009 Financial Regulations of the Federal Government of Nigeria and cost recovery by the Public Enterprises (Privatisation and Commercialisation) Decree No. 28 of 1999. Despite this, these IWRM elements are not fully implemented by the RBDAs (see, e.g., Figure 4-5). The data reveal that there are no enforcement mechanisms in the enabling legal instruments driving their implementation. Consistent with the suggestion of Hodgson (2006), to facilitate the implementation of regulative frameworks, enforcement mechanisms in form of sanctions and incentives are needed. Also, in the study of Guanajuato in Mexico, a lack of mechanisms for enforcing groundwater legislation was identified by Wester et al. (2009) as curbing groundwater management. This suggests that having provisions in the legal and regulatory instruments may not be sufficient to ensure the implementation of IWRM in practice, enforcement mechanisms are also needed. This observation has implications for suggesting measures that might improve IWRM implementation in Nigeria (in Chapter 8). The observation also supports that of Akpabio et al. (2007) who found that the Cross River Basin Development Authority lacks power of enforcement due to the absence of enabling provisions in the extant legal instruments.

Recalling the PRQ 2 with which we started, if there are weaknesses in IWRM implementation, why is it so? Looking through from the regulative lens, this is so because the legal and regulatory frameworks that the RBDAs and other water-related organisations comply with in practice lack provisions enabling

and empowering the implementation of the various IWRM elements. Where they exist, their implementation is also constrained by the absence of provisions on enforcement mechanisms. While the regulative element of institutions is not the only force influencing the implementation of IWRM as revealed in this study (Figure 6-1), discussions on others forces constraining especially the implementation of those IWRM elements enabled by relevant legal and regulatory frameworks in Nigeria (see Table 4-2) are presented next.

### **7.2.2 The normative element**

Apart from regulative institutions as explained above, the effects of normative institutions are also significant in that they constrained the implementation of those IWRM elements enabled by extant legal and regulatory frameworks in Nigeria (see Table 4-2). According to the literature, normative institutions suggest actions that organisations ought to take, and normally do not carry the force of law (Scott, 1995). In terms of water resources management, norms include how the RBDAs are supposed to behave in the water sector which may be internally and/or externally driven (e.g., by the political officeholders, other organisations within the field, or the public including the users of basin water services), how they should treat their basin water users, and the role that government is expected to play in the water sector (e.g., facilitate/implement water sector institutional reforms, implement and enforce extant legal and regulatory instruments).

As the data reveal, there are two sources of normative pressures in the surveyed river basins: the regulatory body (that is, the FMWR) and the political officeholders. Neo-institutional literature maintains that organisational performance can be shaped by response to pressures from other organisations within the field (Greening and Gray, 1994; Ahlstrom et al., 2003; Hu et al., 2007) which often seek voluntary and/or coerce compliance with standards and guidelines for operation (Scott, 1995; Leaptrott, 2005). As illustrated in Chapters 4 and 5, though there are national and international actors operating at the river basin level, there is no evidence to suggest that the RBDAs depend on these actors for support and/or resources; and thus the possibility of having their operations normatively and/or cognitively influenced, except the FMWR. In the case of the FMWR, there is a vertical dependency relationship as revealed in Chapter 4. Neo-institutional literature stresses that organisation dependent on another may have important effects on its performance. As the data reveal, the FMWR is legally empowered to exercise policy control over the RBDAs, provide support and resources, monitor, supervise as well as evaluate the programmes and performances of the RBDAs. To be legitimate, therefore, the RBDAs will be sensitive to those values and norms of conduct that are considered appropriate by the FMWR and will strive not to violate them. This suggests that, in addition to having a

coercive influence through policy prescriptions and guidelines for operation, the other activities of the FMWR (e.g., to supervise, to evaluate) which are legally backed, constitute a normative influence for the operators of the RBDAs. In the context of neo-institutional theory, it is possible for these normative influences to be preceded by those of cognitive or act concurrently. In this study, there are no data to substantiate this claim.

However, as illustrated in Table 6-1, the effects of normative pressures from the FMWR have constrained the implementation of integrated planning, data collection, and human capacity building. The argument is that, according to some respondents, if the directions and instructions from the FMWR are not oriented towards IWRM implementation, it then becomes difficult for the RBDAs to implement IWRM. As the results of textual data analysis revealed in Chapter 4, there is no evidence to suggest that the coercive and normative pressures from the FMWR are directed towards ensuring that the RBDAs give full effect to implementing IWRM or those IWRM-embedded functions enabled by relevant legal and regulatory instruments in Nigeria that the RBDAs comply with in practice (see Table 4-2). Impression from the data indicates that the prevalent activity of the RBDAs in the river basins is the development of hydraulic infrastructures for irrigated agriculture and water supply. This therefore implies that the legally supported pressures from the FMWR have skewed resources allocation in favour of water resources development for irrigated agriculture and water supply. This observation supports the argument of others (Abrahamson, 1991; Rowan, 1982; Scott, 1995) who assert that organisational activities that are receiving external support are likely to be adopted and retained than those lacking such support. That normative institutions constrained the implementation of those IWRM elements enabled by extant legal and regulatory instruments is also consistent with the argument of Scott (1995). Scott argues that conformance to normative requirements may compel organisations to depart from the legal and regulatory-based requirements. The feedback from NIWRMC on the draft of the findings of this study suggests that the failure of the RBDAs to implement their statutory functions might have paved a way for normative pressures from the FMWR. From the evidence available to this study, this argument could be turned the other way around. For instance, the Water Resources Decree No 101 of 1993 and the River Basins Development Authorities Decree No. 35 of 1987 empowers the FMWR to provide support and exercise controls over the RBDAs, thus creating a dependency relationship. In the context of neo-institutional theory, for the FMWR to exercise these legal requirements will also result into imposing some normative and cognitive pressures on the RBDAs. Over time, since this activity may have become habitual, the effects of normative (and/or cognitive) pressures may be less noticeable. This suggests that the inability of the RBDAs to implement their statutory functions (which have some IWRM elements embedded) may have been subtly but pervasively encouraged by the constraining effects of both

normative and cognitive pressures exerted by the FMWR. However, in support of the observation of this study, NIWRMC agrees that the RBDAs have confined themselves to hydraulic infrastructural development for irrigated agriculture and water supply in the river basins.

Drawing on the foregoing, the assessment of this study is that these two sources of influence from the FMWR (regulative and normative), in the context of neo-institutional theory, have two different effects. On the one hand, the normative pressures being exerted by the FMWR provide an important source of ideas about practices the RBDAs are to adopt. On the other hand, the policy prescriptions (coercive force) from the FMWR have a different effect than the normative influence. Since decision making is centralised (see Figures 4-7 and 4-8), these motivate the FMWR to mandate top-down instructions on practices the RBDAs should adopt which are received at the organisational level with little resistance. As noted by others (DiMaggio and Powell, 1983; Meyer and Rowan, 1977) and amplified by Mizruchi and Fein (1999), coercive pressure takes place when one organization depends on another organization for resources and support. Drawing upon Scott (1991), since the FMWR exercises this coercion by authority (see also Figures 4-7 and 4-8); they therefore influence the RBDAs to adopt practices that they favour. However, to borrow from Chizema and Buck (2006), the RBDAs will thus comply with pressures exerted by the FMWR in order to gain legitimacy and access resources. As emphasised by a respondent, exactly the way the Ministry has said it should be done that is how it is done.

Aside from the FMWR, the political officeholders (e.g., the legislators) also constitute another source of pressure constraining the implementation of those legally enabled IWRM elements at the river basin level in Nigeria. By law (e.g., the Constitution of the Federal Republic of Nigeria of 1999), the legislators are mandated to formulate laws for the regulation of federal waters in Nigeria (including budget approvals) and also provide oversight functions. This legal framework therefore enables and empowers the involvement of the legislators in water management activities in Nigeria. However, during the process of getting the budget proposals approved, the data reveal (Chapter 5) that the legislators do insert their own projects and in the process either delete and/or reduce the cost of some projects being proposed by the RBDAs in order not to violate the set budgetary thresholds of the RBDAs. After approval (which also requires the assent of the President of the country, according to the Constitution of the Federal Republic of Nigeria of 1999), the budget becomes an Act, a legal document. Apart from being a legal document, it also serves as a normative prescription which informs the RBDAs of what they are supposed to do in the river basins for the financial year. As some respondents put it, the RBDAs cannot implement any water projects not contained in the approved budget (or Appropriation Act) no matter good such intentions. In addition to this, normative influences are also exercised on the

RBDAs by the legislators during their oversight survey of the river basins. Since the essence of the oversight functions is to ensure that the RBDAs comply with the provisions of the Appropriation Act (which consists mostly of water projects related to hydraulic infrastructural development for water supply and food production), this suggests that the normative influences are directed towards ensuring that the RBDAs continue with the development of hydraulic infrastructures for water supply and food production. This further curbs the implementation of other statutory functions of the RBDAs. According to the respondents, some of these pressures are also exerted by the Boards of Directors (the political appointees), who are equally legally mandated to exercise administrative controls over the RBDAs.

Similar to the viewpoint of Li et al. (2007), it is argued here that at organisational level the acceptability of interference not decreed in the Appropriation Act or in any other legal and regulatory instruments that the RBDAs comply with in practice can be considered driven by normative institutional forces. This is because political interference is not a cultural-cognitive factor and organisational members will not obey it unconsciously and neither are the political officeholders who interfere in river basin activities regulative institutions (this observation is not blind to the fact that, in the case of Nigeria, the legislators are responsible for formulating the legislative text). However, as illustrated in Figure 5-1, the high political interference in the areas of procurement, project selection, project location, funding and budgetary allocation has a constraining effect on the ability of the RBDAs to implement those legally enabled IWRM elements (see Table 4-1) in the river basins. As some respondents remarked during the field survey, these are made possible in that both material and financial resources are less allocated to facilitate their implementation. In most cases, according to the respondents, the projects suggested by the political officeholders (e.g., the legislators) lack any form of prior planning since they were not initiated by the RBDAs. Since budgets are means of allocating resources in Nigeria, interference in budget proposals which favours hydraulic infrastructural development (e.g., borehole projects) becomes binding on the RBDAs to implement once the budget proposals become an Appropriation Act. Furthermore, since the RBDAs need financial and material resources to, for example, undertake the development of surface and underground water resources and formulate basin water resources master plans, the implementation of these activities is also constrained by the high political interference in budgetary allocation and procurement (Figure 5-1) which shifts resources to hydraulic infrastructural development for food production and drinking water supply. This observation supports the argument of Broberg et al. (2012) who maintain that political factors can impose constraints on organisational performance. It also supports the conclusion of Jembere (2009) who asserts that political support is vital for IWRM implementation. Budgeting which is a handy tool for the political officeholders (Covaleski and Dirsmith, 1988), serves to potentially influence the internal operating processes of the RBDAs by

promoting borehole projects over other functional mandates of the RBDAs. However, during oversight functions, as respondents pointed out, the legislators also ensure that the RBDAs comply with the provisions of the Appropriation Act. The process of carrying out these oversight functions, according to some respondents, has some elements of normative influences in that they give the impression that this is what is normal for the RBDAs to do. Since these expectations are internalised by the RBDAs, because it is expected of them, they therefore constrain the ability of the RBDAs in the implementation of those other functions not normatively supported. Feedback from the NIWRMC supports this finding that there is political interference in river basin activities which does not encourage IWRM implementation. Similar to the case of Nigeria, in the study of Pahang River Basin in Malaysia, Weng and Mokhtar (2007) identified political interference in river basin activities as one of the factors constraining IWRM implementation in the basin. Using case studies from five Southern Mediterranean countries, Araral (2010) found that in all the cases examined, the management of water supply suffers from political interference. Also, in the survey of the Western Bug River basin in Ukraine, Leidel et al. (2011) found interference at the operational level as one of the factors curbing IWRM implementation, while in the Loggang River basin in China, Liu and Ma (2010) identified political interference as a force constraining the implementation of cost recovery.

As revealed in this study, the RBDAs function within an organisational field in which the basin water users are also an important actor which could cast an influence on IWRM implementation (e.g., cost recovery). However, while neo-institutional theory maintains that organisations can depend on their customers for support and/or resources (Scott, 1992; Beck and Walgenbach, 2003) and therefore have their performance influenced, there is no data to suggest a dependency relationship between the RBDAs and the basin raw water users. Besides this, Priscoli (2013, cited in Bourget et al., 2013) and Dungumaro (2006) point out that socioeconomic factors can influence water resources management. Based on the findings of this study, there is no evidence to suggest that the ability of the RBDAs to implement cost recovery is being constrained by the socio-economic situation (e.g., poverty) in the basin areas. This finding should be taken with caution. For example, respondents in the B-ORB revealed that there are no basin water users under the direct command of the Authority. However, this does not suggest that there are no water users in the basin as observational data reveal, it only implies that they are not under the formal control of the B-ORBDA.

In terms of the role of government, the data reveal that inaction to institute water sector reforms (with IWRM elements fully embedded) can also be traced to the effects of normative institutions. While this study agrees with Margerum and Whitall (2004) who contend that policies often change with new



governments, impression from the data is that as new top operators emerge on the scene due to changes in policy and/or government, there is always the tendency for the value system underscoring previous actions to address water sector reforms to change. Feedback from NIWRMC supports this argument. The NIWRMC points out that there was an EU-assisted programme aimed at water sector institutional reforms between 2004 and 2007. However, due to changes in government and programmes, the effort remains inconclusive. Besides this, the belief that power could be lost (more of cognitive influence than normative) as revealed in this study, also provides support for inactions to institute (or complete) reforms. This study observes that previous inactions to institute (or complete) water sector reforms may be seen as highly rewarding and therefore considered to be acceptable by (new) top operators of the FMWR. As noted by Zucker (1977), acts performed by occupants of an office (by position and by role) may be seen as an objective fact which is capable of being transmitted and maintained. Since these acts may be padded by intrinsic and/or extrinsic rewards, the ability of the FMWR to institute (or complete) water sector reforms is rather constrained. This suggests that, as also noted by Zucker (1977), those actions that are more highly rewarded or that provide internally generated motivation will be more resistant to change. Since benefits (e.g., in terms of being in control) are likely to be derived by the political leadership of the FMWR, borrowing from Powell (1991), this study asserts that the inability of the FMWR to institute (or complete) water sector reforms may persist through the active efforts of those who benefit from them. This assertion is in agreement with Agyenim and Gupta (2011) who maintain that certain activities can be retained by organisations if they support their interests, and Molle (2008) who argues that certain practices may persist when they serve powerful interests. Aside from this, the Water Resources Decree No. 101, which encourages a top-down, supply-driven approach to the planning, development and management of water resources in Nigeria may also have provided both the normative and cognitive, in addition to regulative, supports for inactions.

Although not explicitly supported by data in this study since the case of cost recovery in the B-ORB is still not fully known, Horlemann and Dombrowsky (2011) identified the expectation to receive water services for free (normative element) as one of the forces curbing IWRM implementation in Mongolia. This tendency may not be completely overlooked in the case of Nigeria being a developing country like Mongolia. However, the findings that must be carried forward from this subsection are that normative institutions have a constraining effect on IWRM implementation. Essentially they have constrained the implementation of those legally enabled IWRM elements, and these forces are located within both the operational and the macro environments. Both the FMWR and the political officeholders (that is, the legislators) are important external sources of normative influences which inform the type of activities

being implemented by the RBDAs. Nonetheless, the political appointees on the Boards of Directors of the RBDAs can be regarded as an important internal source.

### **7.2.3 The cognitive element**

As revealed in this study (Figure 6-1), the forces responsible for the weaknesses in the implementation of integrated planning, data collection, human capacity building, the inclusion of IWRM elements in legal and regulatory frameworks and cost recovery can also be traced to the constraining effects of cognitive institutions. Cognitive institutions provide the frames for sense-making and choosing socially acceptable actions (Scott, 1995). In the context of neo-institutional theory, cognitive institutions represent informal ideas embodied in traditions, taken-for-granted assumptions and conventions, as well as widely shared customs, beliefs and practices (DiMaggio and Powell, 1991). As the data reveal, cognitive pressures affect the RBDAs primarily from two sources: internal and external. The internal sources have to do with the RBDA culture in the form of norms and values operating within the organisational workplace which support resources allocation to hydraulic infrastructure development. The literature maintains that organisational culture can serve as a guide to the choice of activities to be performed by an organisation (Abrahamson, 1991), and thus influence organisational performance (Heikkilä, 2013). Culture, in the context of neo-institutional theory, specifies what action is possible, and what action is less likely to be acceptable (Ahlstrom and Bruton, 2002). While the RBDAs value water resources development for irrigated agriculture and water supply (Chapter 4), the findings of this study also revealed that the RBDAs are motivated by the public accolade they receive for, and the joy they derive from, implementing activities that are related to the development of water infrastructure for irrigated agriculture, the construction of boreholes for drinking water supply, and their involvement in agricultural production. This evidence suggests a relationship between emotional element and cognitive institutions, although the influence of emotional elements as drivers of human behaviours and actions is weakly acknowledged by neo-institutional theory. However, that the RBDAs are motivated to implement hydraulic infrastructural development for water supply and agricultural production agrees with contemporary institutional theory which suggests that organisations may be interest-driven in order to obtain stability and legitimacy (Oliver, 1991). As emphasized by Zucker (1977), those interests of the public that meet actors' self-interests will be maintained. As a consequence, and in order to further their own interests and continue to enjoy the support of their external environment, this tends to affect internal resources allocation privileging hydraulic infrastructural development. Viewed from another perspective, it is possible that these values were internalised by the RBDAs from their external environment, which thereafter inform the RBDAs that these are the most acceptable ways to operate (normative institutions). As authors (Greening and Gray, 1994; Deephouse, 1996; Covaleski and

Dirsmith, 1988) observe, public interests exist and can shape organisational performance. The need for organizations to gain legitimacy, stability, and resources makes them conform to, or internalise, societal expectations (Ashworth et al., 2007). Viewed from this perspective, this suggests that activities that meet public interests will be internalised by the RBDAs; and thus have an impact on internal resources allocation decisions. Thus, borrowing from Covalleski and Dirsmith (1988), those socially more valued activities would receive a disproportionate share of internal resources than others that are less valued. This also accounts for why some of the statutory functions of the RBDAs (which have IWRM elements embedded) are neglected by the RBDAs.

However, the impact of organisational culture could be significant. While the norms and values operating within the organisational workplace are privileging hydraulic infrastructural development, the Public Service Rules (which provides the code of ethics) and other values (e.g., respect for rules and authority) guiding the activities of organisational members do not explicitly support the implementation of new knowledge in the workplace. In addition, as the data reveal, there is an absence of platforms for the diffusion of new knowledge in the workplace. This partly explains why knowledge about IWRM is not widely known in the surveyed organisations (see Figure 4-2). According to Robbins and Judge (2008), in bureaucratic organisations, rules and regulations are substitute for discretion. Although bureaucratically organised administrative organisations (like the RBDAs) may be open to new knowledge, they may not use it if the rules-in-use do not support their integration (Otlelea and Popescu, 2009). This makes the knowledge gained to be of little use as emphasized by Senecal and Madramootoo (2013). This observation agrees with Suppiah and Sandhu (2011) who point out that organisational culture can impede knowledge sharing and its use. Similarly, Cortner et al (1998) also acknowledge that organisational culture could present a substantial barrier to natural resources management. The observation is also consistent with the argument of Robbins and Judge (2008) who stress that those norms and values operating in the workplace can constrain organisational performance. In the case of this study, it has curbed the implementation of integrated planning, data collection, and human capacity building by skewing resources allocation in favour of hydraulic infrastructural development and agricultural production. Similar to this study, in the survey of the Hunter Valley in Australia (Mitchell and Pigram, 1989) and the Sokoto-Rima river basin in Nigeria (Mitchell, 1994) organisational culture was identified as one of the factors curbing the implementation of integrated approach to resource management.

The external sources have to do with (a) the success recorded by the pioneer RBDAs (Sokoto-Rima River Basin Development Authority and Chad River Basin Development Authority) in the area of

irrigated agriculture, (b) 'imprinting' effect, and (c) the impact of other water-related organisations in the water sector in Nigeria. Neo-institutional theory argues that success can lead to a direct imitation of activities. According to Mills and Murgatroyd (1991), what mostly shapes the repetition of behaviour, making it rule-like, is success. This is in agreement with the view of other scholars (Samsonova and Turley, 2006; Zucker, 1987) who assert that organisations will imitate the actions of successful organisations in their field. Although success may not be the only causal factor driving imitation tendencies, various authors (Samsonova and Turley, 2006; Abrahamson, 1991; Haveman, 1993) point out that mimetic pressure can also arise in situations of uncertainty or in recently constituted organisations, or when organisations want to appear legitimate (Abrahamson, 1991). To Mantzavinos et al. (2004), the need to gain practical knowledge (or knowing how) can also provoke the need to directly imitate the activities of others. Greenwood and Meyer (2008) attributes mimetic tendencies to the desire to avoid standing out. Scott (1995) argues that success and uncertainty can make organisations to imitate the actions of others, while Walters (2012) contends that ambiguities and uncertainties may influence organisations to copy proven activities of others within the same field in the pursuit of legitimacy. Having briefly reviewed these contributions, in the case of the RBDAs, impression from the data suggests that success was the primary driver (Chapter 4). Irrigated agricultural practice was mimicked by the newly created RBDAs (the newly created RBDAs also include the O-ORBDA and the B-ORBDA) and taken for granted as the proper way to organise, because doing so would enable them receive normative approbation, and because it was necessary in order to obtain resources as well as government/public support. Since the success factor of the pioneer RBDAs in the area of irrigated agriculture contributed to the creation of more RBDAs, following the line of thinking of Deephouse (1996), it therefore suggests that organisations that conform to the strategies used by the pioneer RBDAs will be recognized by regulators/government and the general public as being more legitimate than those that deviate from this behaviour. Recognising this, and borrowing from Walters (2012), the newly created RBDAs will therefore direct their efforts towards being legitimate within their environment; hence, the focus on irrigated agriculture thereby neglecting their other statutory functions. This finding should be taken with caution in the case of B-ORBDA. This is because the researcher had no access to old internal documents in the B-ORBDA through which documentary evidence could be obtained to support this claim. However, feedback from NIWRMC indicates that the RBDAs have focussed more on water resources development than on water resources management.

In addition to the success factor, irrigated agriculture was also "imprinted" on the newly created RBDAs. As emphasised by others (Scott, 1992, 1995; Boeker, 1989), conditions present at the time of founding tend to imprint itself on the organisation and influence its performance. Drawing upon

documentary evidence obtained from the O-ORBDA, the severe drought that hit the country in 1972, which caused widespread crop failure and famine, the acceptance of various recommendations by government to boost food production through irrigated agriculture, coupled with the success recorded by the pioneer RBDAs in the area of irrigated agriculture which impressed the government made the Federal Government to create an additional nine RBDAs in 1976. These activities tend to imprint itself on the newly created RBDAs, since the operators of these RBDAs are part of the society and were aware of what happened. However, the legal instruments establishing the two pioneer RBDAs in 1973 did not empower them to undertake some aspects relating to integrated planning (e.g., the comprehensive development of surface and underground water resources and the formulation of basin water resources master plans). It was in 1976 that all the RBDAs (both pioneers and newly created) were empowered to undertake the development of surface and underground water resources by the River Basins Development Authorities Decree No. 25 of 1976. Also, it was in 1987 (commencing in 1986) that the RBDAs were empowered to formulate basin water resources master plans in addition to the integrated development of both surface and underground water resources by the River Basins Development Authorities Decree No. 35 of 1987. While the 1987 legal instrument empowers the RBDAs to undertake these activities, because water development for irrigated agriculture and food production has become habitual, this contributed to the inability of the RBDAs to implement these activities and other components of their statutory functions which have some IWRM elements embedded. According to neo-institutional theory literature, once certain organisational activities become habitual, the ability to make changes can become difficult (Leaptrott, 2005).

Viewed from another perspective, the continued implementation of water resources development for irrigated agriculture and food production may have been supported by some intrinsic and/or extrinsic rewards. This is consistent with the normative framework approach. This approach argues that resistance to change can be a function of internally generated or internalised motivations (Zucker, 1987). This internal or internalised motivation is seen as deriving from activities that are more highly rewarded or acknowledged. For instance, if more rewards are associated with one action than with another, the more highly rewarded action will be exhibited or promoted. Therefore, those actions that are more highly rewarded (internally and/or externally) will be more resistant to change. This agrees with Hodgson (2006) who asserts that habitualised activities may have acquired some inherent normative content. However, as pointed out by Brousseau et al. (2011), humans and/or organisations are driven by both intrinsic and extrinsic motivations. In the case of the RBDAs, the development of hydraulic infrastructures for irrigated agriculture seems to have been internalised due to the presence of intrinsic and extrinsic rewards (e.g., the compliments they receive from the public) as well as government

support. This suggests that as a result of imprinting effects both cognitive and normative pressures are aligned to constrain the ability of the RBDAs in the implementation of those IWRM elements enabled by extant legal and regulatory frameworks in Nigeria.

Furthermore, as illustrated in Table 6-1, the inability of the RBDAs to implement integrated basin water resources management can also be traced to the effect of sectoral interests (cognitive force) resulting from the presence of other water-related organisations in basin-based water resources management in Nigeria. While this may not be limited to the case of Nigeria, in the study of Berki Watershed in Ethiopia (Jembere, 2009) and Mongolia water sector (Horlemann and Dombrowsky, 2011) sectoral interests were identified as curbing the implementation of integrated water resources planning. However, in terms of the role of government, the data also reveal that inaction by the FMWR to institute water sector reforms (with IWRM elements fully embedded) can also be traced to the effects of cognitive institutions as revealed in Table 6-1. This finding is consistent with those of others. For example, Bandaragoda (2006) identified some cognitive-related elements as being responsible for the failure of water sector institutional reform attempts in Asia, or as constraining water resources management institutional reform in Israel (Fischhendler and Heikkila (2010). In the case of Zimbabwe, Manase et al. (2003) found reluctant by policy makers (cognitive force) to make provisions relating to gender mainstreaming in the legal frameworks as curbing women inclusion in water resources management. Focussing on the Kafue River basin, Uhrendahl et al. (2011) identified a cognitive-related element (not wanting to lose their power and authority) as constraining the implementation of water sector reforms to support functional decentralisation. Although not explicitly supported by data in this study, Swatuk and Rahm (2004) found that the belief that water will not run out as one of the forces curbing the implementation of sustainable water resources management in Botswana. This may be applicable in Nigeria especially to those State water utilities drawing water from the Ogun River which is perennial in nature. However, as illustrated in Figure 6-1, all the cognitive forces acting have a constraining effect on IWRM implementation, and these forces are located within the operational environment. No feedback was received on the draft of the findings of this study from NIWRMC on the influence of cognitive institutions on IWRM implementation. Therefore, a finding of this study which suggests that organisational culture has an influence IWRM implementation supports the conceptual framework formulated in Figure 1-1.

#### **7.2.4 The cultural resources element**

Although weakly emphasised in neo-institutional literature, cultural resources (not to be confused with the semiotic aspects of culture as explained in Chapter 6), which have the spiritual use of water

resources embedded and made up of material resources, also exert a constraining influence on the implementation of integrated planning (Figure 6-1). The data reveal that the effects of cultural resources are noticeable in that they empower the use of certain locations as well as the type of water projects that can be sited and prohibited others. According to the respondents, the construction of dams, the development of land for irrigation purposes, the construction of flood and erosion control structures as well as borehole schemes for drinking water supply are all guided by the local cultural resources (including the spiritual use of water) of the areas where these projects are to be sited. In which case, according to the respondents, local cultural practices are considered during the planning and execution of the water projects. While organisational and societal cultures are inextricably linked (Brown, 1995; Schein, 1992; Robbins and Judge, 2008), this finding is in agreement with others (Schein, 1992; Brown, 1995; Robbins and Judge, 2008) who assert that societal ways of life can constrain organisational performance. Since organisations are part of the wider social systems (Hinings, 2012), these social systems, according to Ashworth et al. (2007), are characterized as the sources of norms, beliefs, resources and values that permeate organisational life and influence action. Apart from this, although water-related customs and traditions in relation to ownership and use of water resources in Nigeria see water in streams, rivers, and lakes as a communal property and its use as free to all (Ramazzotti, 1996; Kuruk, 2004), there is no evidence to suggest that local cultural beliefs (cognitive institutions) or resources impact the ability of the RBDAs to recover cost of basin water services. This finding requires caution in the case of the B-ORB, this is because as at the time of field survey in the basin there were no revenue-yielding hydraulic infrastructures in place yet (see Table 4-4). How societal culture/cultural resources would impact the recovery of basin water service fees is weakly understood. However, as shown in Figure 6-1, cultural resources institutional element (as put forward in Chapter 6) is located in the macro environment. No feedback was received from NIWRMC on the influence of cultural resources on the integrated planning of basin water resources. However, consistent with the finding of this study, Rahaman and Varis (2005) observed that in an attempt to implement IWRM in the Ganges River basin in South Asia, the spiritual and cultural dimensions of water manifested themselves as one of the factors hampering the implementation of IWRM. Also, drawing lessons from the case of Rufiji River basin in Tanzania, Maganga (2003) concluded that neglecting cultural practices relating to water use could cause IWRM implementation to fail. Nonetheless, the finding of this study on societal culture also supports the conceptual framework formulated in Figure 1-1.

### **7.2.5 The technical element (water infrastructure)**

As illustrated in Figure 6-1, water infrastructure (treated as an entity in this study) also impacts the ability of the RBDAs to implement cost recovery. While the situation in the O-ORB and B-ORB is not

exactly the same, the absence of functional water infrastructure plays a dominant role in constraining the ability of the B-ORBDA in the implementation of cost recovery. Although both RBDA's are affected by political interference (see Figure 5-1), in relative terms the B-ORBDA seems to be more affected. For example, the only multipurpose dam in the basin (see Table 4-4), which was yet to be put into use as at the time of the field survey, took 35 years to construct. As the data reveal, political interference (which shifts resources allocation in favour of other water projects, e.g., borehole schemes) is a major factor responsible for the slow pace in the construction of the dam. However, in the case of O-ORBDA, the dominant forces curbing the implementation of cost recovery of basin water services are traceable to both regulative and cognitive institutions (see Table 6-1). In the study of the Cross River Basin in Nigeria, Akpabio et al. (2007) found that the inability of the Basin Authority to recover cost of irrigation water services is related to the unwillingness of the farmers to pay for irrigation water. This observation is not supported by this study. Drawing lessons from the experience of industrial countries, Gourbesville (2008) concluded that hydraulic infrastructure development is crucial to water resources development. While other literature (Teodosiu, 2007; GWP, 2012) agrees that water infrastructure development is crucial to IWRM implementation, Greening and Gray (1994) and Scott (1992) maintain that organisational environments are not only institutional but technical as well. Besides this, Grey and Sadoff (2007) also draw a link between hydraulic infrastructure and institutions, arguing that without the infrastructure to store and deliver water as well as manage flows, water institutions are severely constrained. Similarly, GWP (2009b) argues that the best policy and legislation cannot help manage flows, without the necessary infrastructure being in place. Although the influence of water infrastructure development was not conceptualised in Figure 1-1, this has been exposed in this study to constrain cost recovery. Feedback from NIWRMC on the draft of the finding of this study suggests that cost recovery could be difficult to operationalise in practice in the absence of functional water infrastructures. The finding of this study on water infrastructure development is in agreement with Merrey (2008) and Muller (2010) who assert that cost recovery can be difficult to implement in the absence of hydraulic infrastructures to manage and deliver water resources. Also, in the survey of Eastern and Southern Africa, GWP (2009b) found inadequate water infrastructure development as one of the forces curbing IWRM implementation in Angola, Burundi, Comoros, Djibouti, Mozambique, Somalia and Madagascar. Furthermore, in the Study of Mkoji Sub-catchment in Tanzania, Mehari et al. (2008) discovered that inadequate water infrastructure development constrained the implementation of cost recovery.

In summary, although the river basins surveyed in this study are national river basins without any transboundary relationship, a country situated river basin can still be governed by international legal and



regulatory instruments. While GWP (2009c) supports this view, there is no evidence to suggest that the activities of the RBDAs in the surveyed river basins are being guided by, or their performance being influenced by, any international treaties, laws and regulations, agreements, guidelines, or conventions. Recalling the PRQ 2 with which we began, if there are weaknesses in the implementation of IWRM in Nigeria, why is this so? This study has found that both technical and institutional elements are the forces responsible for the weaknesses in the implementation of IWRM at the river basin level in Nigeria. In the first place, there are no provisions in the extant legal and regulatory frameworks that both the RBDAs and other water-related organisations comply with in practice which enable and empower the implementation of most of the IWRM elements investigated. Where there are provisions, the implementation of some of these IWRM elements is also curbed by the absence of enforcement mechanisms in the extant legal instruments or regulations to drive implementation. In the second place, for those IWRM elements that are enabled by the extant legal and regulatory instruments, their implementation is further curbed by normative, cognitive and cultural elements of institutions as well as technical element (water infrastructure) operating within the macro and operational environment in Nigeria. In part, the findings of this study support the argument of others (Yamakawa et al., 2008; Ellison, 2007; Greenwood and Holt, 2008; Grigg, 2008; Lamoree et al., 2005; Watson, 2004) who assert that the inability to implement IWRM can be attributed to institutional problem. This is because institutions not only specify actors and their roles, they also create frameworks that enable or constrain actions. In the same light, other scholars (Ako et al., 2010; Hukka et al., 2007; Jønch-Clausen and Fugl, 2001) also maintain that institutional frameworks are very crucial for a successful IWRM implementation. However, while the case of cost recovery differs between the two river basins surveyed, in the B-ORB, the inability of the RBDA to implement cost recovery is mainly related to the absence of functional water infrastructures. This implies that technical elements can also curb IWRM implementation at the river basin level. Overall, the findings of this study are in agreement with others (Scott, 1992, 1995; Fogarty and Dirsmith, 2001) who posit that both technical and institutional elements can exert influences on organisational performance.

However, this study has found that all the forces identified play important but different roles in the implementation of IWRM in Nigeria. Regulative institutions function through the use of legal and regulatory frameworks to empower or prohibit actions, while normative institutions function through humans to define practices that are expected of the actors. Cognitive institutions also function through humans to reflect actions that are appropriate and conceivable. Cultural resources, which function through humans and/or non-humans, institutions define activities that are permitted within certain geographical location and discourage others. Also, the availability or non-availability of technical

elements (water infrastructure) in the workplace dictates what an organisation can do or not do. In the case of this study, what is common among all the institutional elements is that they all serve to inform what the actors are to do in the water sector in Nigeria thereby prohibiting the implementation of others. However, it is important to highlight that while the role of regulative institutions in influencing the extent of IWRM implementation can be very clear, it can be difficult to clearly distinguish normative from cognitive influences. This is in agreement with the view of other scholars (Hu et al., 2007; Mizruchi and Fein, 1999). This is because, in practice, the two can overlap, although in most cases, as this study would like to submit, the effects of cognitive forces may stand alone or precede those of normative. This is also noted by Hu et al. (2007), and Scott (1994) who argues that cognitive institutions can shape behaviours in the absence of normative institutional elements. However, this is not to say that all the institutional elements cannot be acting concurrently (or in mutually supporting ways) as observed in this study and in a number of others (Mizruchi and Fein, 1999; Greenwood and Meyer, 2008; Ashworth et al., 2007). However, when the elements are aligned as observed in this study, the strength of their combined forces can be formidable. Apart from this, one observation derived from this study is that where technical element is dominant, it might be difficult to have institutional influences operating. An example is the case of cost recovery in the B-ORB. This suggests that while institutional elements can influence technical elements, technical element can also in turn influence institutional elements. In light of the findings and discussions made above, a refined framework illustrating the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded is presented next.

### **7.3 Revising the conceptual framework**

To this point, the discussions in Section 7.1 were aimed at providing a better understanding of the forces influencing the implementation of IWRM at the river basin level in Nigeria. To achieve this, the section has primarily drawn on findings obtained from Chapters 4 through 6, and relevant literature in developing the arguments and interpretations. Therefore, Section 7.3 provides discussions on the revised conceptual framework.

Following the retroductive research strategy adopted by this study, an attempt was made in Chapter 1 to conceptualise the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded. This led to the development of a conceptual framework (Figure 1-1). Since the influencing forces are not susceptible to direct observation, the researcher's task, as pointed out by Blaikie (2000), is then to establish whether the conceptualised framework exists from empirical data, If this test is successful, Blaikie (2000) argues that this gives a good reason to believe in

the existence of the conceptual framework. However, drawing on the findings of this study and the discussions presented in Section 7.2, the existence of all the conceptualised elements in Figure 1-1 is not supported by the field data. This suggests a need to revise the framework in light of the data obtained. To therefore complete the cycle of the retroductive style of enquiry, a revised framework illustrating the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are embedded is presented in this section (Figure 7-1). Consistent with the retroductive logic which allows for an iterative design, the revised framework shares some similarities with the initial conceptual framework (Figure 1-1). For the sake of simplicity and in order to avoid repetitions, this section describes the differences between the initial and the revised framework and explains the relationship between the two levels of influence (macro and operational) in the revised conceptual framework in relation to the field data.

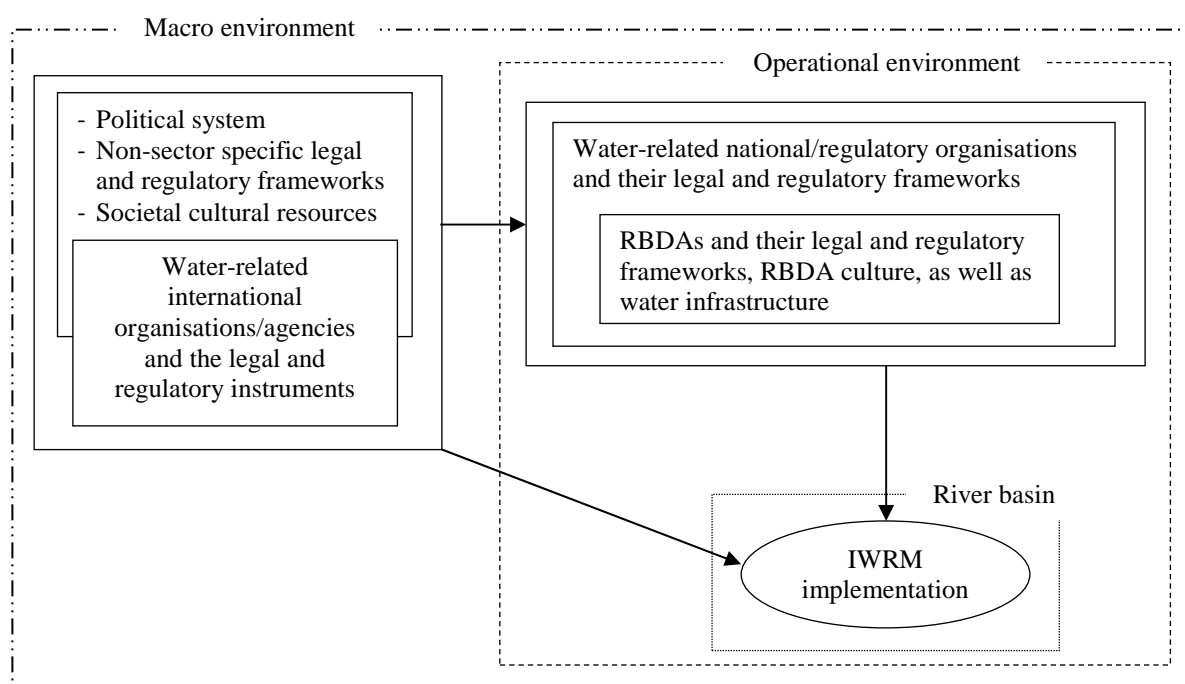


Figure 7-1 The revised conceptual framework illustrating the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded

As shown in Figure 7-1, the environments influencing the implementation of IWRM at the river basin level in Nigeria can still be traced to the macro-environment and the operational environment as initially conceptualised. Although water infrastructure was not proposed as an influencing element (see Figure 1-1), this is because, as reviewed in Chapter 1, some scholars argue that the RBDA's have focussed more on water resources development than water resources management. However, consistent with the variance institutional approach, and in order to eliminate rival explanations, water infrastructure development was selected as a confounding variable as suggested in the literature (see Chapters 2 and 3). However, as revealed in Chapter 4, water infrastructure casts a constraining influence on the

implementation of cost recovery in the B-ORB. Furthermore, although it was conceptualised in Figure 1-1, socio-economic conditions (e.g., poverty) have no effect on the ability of the RBDAs to implement cost recovery. Evidence suggests that the O-ORBDA only supplies raw water to the States' Water Corporations (another public organisations created by the State Governments) and the farmers operating within their agricultural lands. Although these public organisations do not pay for raw water abstracted as expected, the data do not attribute this behaviour to poverty. Additionally, while it was suggested in Figure 1-1 that the basin water users within the operational environment would cast an influence on IWRM implementation, there is evidence to suggest that the States' Water Corporations contribute to constraining integrated basin planning through abstractions from surface and underground water sources without involving the RBDAs. In contrast, there is no evidence to suggest that the farmers have an influence on IWRM implementation. However, it should be noted that the influence of socio-economic factor in the case of B-ORB is poorly understood as the RBDA had no water users under its direct command as at the time of the field survey. This may require further research when there are functional RBDA-owned water infrastructures in the basin.

In terms of relationship between the macro-environment and the operational environment (Figure 7-1), since both environments are inextricably intertwined there is a need to explain which environment is dominant in light of the findings of this study. Starting with culture, since societal culture and organisational culture are inextricably linked, the wider societal culture in which the RBDAs are expected to operate generally casts an influence on RBDAs' performance. As Meyerson and Martin (1987) emphasize, cultures are socially constructed realities and are formed by influences from inside as well as outside an organisation. Nonetheless, Scott (1992) contends that the environments are a supplier of ingredients of which organisations are composed. Besides this, the political system also casts an influence on the governance arrangement for water resources management in Nigeria and the powers of the legal and regulatory instruments in the operational environment. Also within the macro environment, since the Constitution of the Federal Republic of Nigeria of 1999 provides for both federal and state waters, the extent to which other legal instruments can go in regulating water resources in Nigeria will be subject to the limits provided by the grand norm from which they derive their authorities. For example, since State laws have to be consistent with the Constitution (see, e.g., Sections 3 and 5 of the Constitution), the ability of these instruments to prescribe sectoral collaboration is constrained since the Constitution does not recognise sectoral collaboration. In addition to this, the interests of the legislators in the National Assembly who are saddled with the responsibility of formulating the legislative texts to regulate the development, management and use of water resources in Nigeria may also reflect in the legal instruments they formulate thereby influencing tasks and competencies (and also the nature and

powers of States/Local Governments' legal instruments) within the operational environment. This observation supports Bourget et al. (2013) who contend that resource management approaches that do not acknowledge political factors may be difficult to implement. Furthermore, since the international organisations are sources of both cognitive and normative pressures, their involvement in the water sector also contributes to shaping legal and regulatory instruments in the operational environment; thereby either directly or indirectly constituting the actors, what they are to do and not to do in the water sector in Nigeria. Additionally, since the international organisations also provide water services (although indirectly), their involvement also curbs the ability of the RBDAs to implement integrated basin planning.

Just as the external environments profoundly shape organisational performance, the literature also argues that organisations too can influence their external environments (Dawson, 1996; Scott, 1992; Oliver, 1991; Robbins, 1990). This implies that the relationship between the macro and the operational environment or between the internal environment of the RBDAs and their external environment should not be seen as a one-way traffic. As some authors argue, organisations are not passive receivers of pressures from their environments (Suddaby, 2010; Lounsbury, 2001; Oliver, 1991). In the case of the RBDAs, since they are actors in the water sector and strongly interconnected with the FMWR, the RBDAs may implicitly influence their environments by lobbying for favourable operational guidelines or against certain regulations, or by seeking the endorsement of certain operations or decisions. The outcome of this influence may subsequently reflect in the national legal and regulatory frameworks or operational guidelines shaping the practices of the RBDAs. But how and which strategies will be, or are being, followed by the RBDAs to influence their environments are open to future research. However, impression from this study is that the macro-environment has a dominant influence on the operational environment than the other way around. It should be noted that activities within both environments are dynamic and complex (e.g., a change of government can usher in new statutes and lead to the death of others). Also, as the data reveal, most of the activities of the international actors in the water sector in Nigeria are for a specific period. Some may be renewed, while some may not. Besides this, there may be new entrants.

#### **7.4 Summary of this chapter**

In the literature, regulative institutions are mostly acknowledged as the forces influencing IWRM implementation. The findings of this study extend this understanding to show that forces influencing IWRM implementation at the river basin level in Nigeria encompasses more than the regulative elements of institutions. This suggests that other elements – normative, cognitive, cultural resources and

technical – need to be considered as well when investigating the forces influencing IWRM implementation at the river basin level. As demonstrated in this study, the retroductive logic of enquiry has provided the pathway for this research in order to realise its main aim. The robustness of this logic of reasoning has helped this study to identify the forces influencing the implementation of IWRM at the river basin level in Nigeria and the environments within which they are embedded which have been previously unknown. Within the framework of the retroductive logic, the initial conceptual framework has given direction to this research and informed the data collection and analysis. However, the revised conceptual framework which illustrates the forces influencing IWRM implementation in Nigeria and the environments within which they are embedded is not a prescriptive model that should be applied as a blue print to all the river basins in Nigeria. Instead it can serve as a guide to scientists, managers and practitioners to ask questions about what is going on in other river basins with a view to improving basin-based water resources management following the IWRM approach. Therefore, this study shares the belief that the retroductive style of reasoning seems a particularly suitable logic for researching the complex socially constructed forces influencing IWRM implementation at the river basin level and locating the environments within which they are embedded. The next chapter concludes this thesis. It draws the implications of the findings and the limitations of this study as well as its contributions to knowledge and suggestions for future work. Since the findings of this study have revealed that there are weaknesses in IWRM implementation, the concluding chapter also suggests ways in which IWRM implementation in Nigeria might be improved.

## 8 CONCLUSIONS

### 8.1 Introduction

To this end, the main aim and the primary research questions (carried forward from Chapters 1 and 2), which address the knowledge gaps this study set out to fill, are (Table 8-1):

Table 8-1 Overview of the main aim and primary research questions

A. Main aim: To identify the forces influencing the implementation of IWRM as an approach to improve basin-based water resources management in Nigeria and the environments within which they are embedded
B. Primary research questions: <ol style="list-style-type: none"><li>1. How effectively is IWRM being implemented at the river basin level in Nigeria?</li><li>2. If there are weaknesses in the implementation of IWRM in Nigeria, why is this so?</li><li>3. How might the quality of IWRM implementation in Nigeria be improved?</li></ol>

This chapter, therefore, offers conclusions and contributions to knowledge as well as the limitations of this study and suggestions for future research. The final chapter begins in Section 8.2 by examining the main findings in light of the main aim and research questions outlined in Table 8-1. It discusses how the knowledge gaps have been filled by this study towards realising the study's main aim as well as suggestions on measures which might improve IWRM implementation in Nigeria. The contributions to knowledge which arise from this study are described in Section 8.3. The limitations of this study are provided in Section 8.4, while the implications of the findings of this study for water management practices in Nigeria are highlighted in Section 8.5. Lastly, suggestions for future research are made in Section 8.6.

### 8.2 Filling the knowledge gaps

#### 8.2.1 PRQ 1: How effectively is IWRM being implemented at the river basin level in Nigeria?

The achievement of PRQ 1 is described in Chapters 2 and 4. Important insights obtained from these chapters are that there are weaknesses in the implementation of IWRM in Nigeria. This finding suggests that IWRM is not being effectively implemented at the river basin level in Nigeria. The findings obtained from Chapter 4 extend those of Chapter 2 by showing in addition that government stakeholder participation and the inclusion of women in basin water activities are weakly addressed by the RBDAs in Nigeria. However, as revealed in Chapter 4, the implementation of water as a social good is largely addressed by the RBDAs in the surveyed river basins. This constitutes a weakness as discussed in Chapter 7 in that it disallows the possibilities of water infrastructure paying for itself. This study

concludes with certainty that IWRM is not being effectively implemented at the river basin level in Nigeria. The achievement of PRQ 1 led to probing for the influencing forces, PRQ 2.

### **8.2.2 PRQ 2: If there are weaknesses in the implementation of IWRM in Nigeria, why is this so?**

The achievement of PRQ 2 is described in Chapters 4 through 7. As the data reveal, there are weaknesses in the implementation of IWRM in Nigeria because of the absence of provisions in the extant legal and regulatory instruments that both the RBDAs and other water-related organisations in Nigeria comply with in practice enabling and empowering the implementation of many of the IWRM elements. Where there are, the implementation of those enabled is also constrained by the absence of enforcement mechanisms in the extant legal and regulatory enabling their implementation. Besides this, influences from normative, cognitive, cultural resources as well as technical elements are other forms of constraining pressures in the context of an effort by the RBDAs and other water-related organisations to implement IWRM. These elements make certain practices appropriate or to receive attention for implementation and prohibit others as revealed in Chapters 4 and 5. Through the constraining and enabling duality of institutional and technical elements, this has resulted into weaknesses in IWRM implementation at the river basin level in Nigeria.

Recalling the main aim of this study therefore (Table 8-1), the forces influencing the implementation of IWRM as an approach to improve basin-based water resources management in Nigeria as identified in this study can be categorised into two: institutional and technical. In the context of neo-institutional theory which serves as a guide for this study, the institutional elements are made up of regulative, normative, cognitive, and cultural resources, while the technical component consists of water infrastructure. Classifying the influencing forces in terms of environment in which they are embedded reveals that both regulative and normative elements of institutions are located within both the macro and the operational environments. The cognitive and technical elements are located within the operational environments, while the cultural resources element is embedded in the macro environment. In terms of relationship, impression from the data is that the macro environment has a dominant influence on the operational environment than the other way around. While the literature has held the regulative institutions responsible for the weaknesses in IWRM implementation (see Chapter 2), the findings of this study support this idea and further assert that the influencing forces can also be traced to the normative, cognitive, cultural resources as well as technical elements. Although weakly emphasized in the literature, this study has shown the environments within which the influencing forces are located in Nigeria. This study, therefore, asserts with some certainty, and thus concurs with neo-institutional



literature that both institutional and technical elements can influence the implementation of an action. In the case of this study, IWRM application to improve basin-based water resources development and management.

Since the investigated river basins in Nigeria respond to the same institutional environments, there seems to be no major differences in the institutional forces influencing IWRM implementation in both cases. For example, as revealed in this study (see Figures 4-5 and 5-1), the behaviours of the RBDAs seem to exhibit a similar pattern. This is consistent with neo-institutional theory which emphasises that the behaviours of organisations responding to the same institutional pressures tend to be similar (DiMaggio and Powell, 1991). However, the two river basins have differences in their technical environment. While the ability of the B-ORBDA to implement cost recovery is being constrained by the absence of functional water infrastructures, in the O-ORB, the ability of the O-ORBDA to implement cost recovery is only being curbed by institutional elements – regulative and cognitive. This observation is consistent with the argument of Scott (1995) who maintains that both institutional and technical forces can separately impact organisations.

### **8.2.3 PRQ 3: How might the quality of IWRM implementation in Nigeria be improved?**

Since the forces responsible for the weaknesses in IWRM implementation have been revealed, this leads to fulfilling PRQ 3. It is envisaged in this study that exposing the root causes could help to better understand how IWRM implementation might be improved in Nigeria. This subsection discusses the proposed measures by drawing from Chapters 4 through 7 as well as Chapter 2.

It has been argued in the literature (see Chapter 2) that a strong positive correlation exists between institutions and their ability to enable the application of management techniques. In the same vein, the literature also asserts that institutional analysis can be used to identify improvements to be effected to an institutional framework. Therefore, consistent with change research which addresses the “how” question, the proposals presented in this subsection entail a description of the suggested improvements to the influencing forces and the specification of stages based on the findings derived from this study. However, for the sake of clarity, the proposed improvements (Table 8-2) are structured along the key forces influencing the IWRM elements identified in Chapter 6.

Table 8-2 The proposed measures that might improve IWRM implementation in Nigeria

S/No.	Key influencing force(s)	IWRM element(s) being influenced	Influencing force(s)		The proposed improvements
			Current situation	Desired situation	
1	Regulative, cultural resources, normative, and cognitive	Integrated planning, data collection, human capacity building (with respect to IWRM), and the inclusion of IWRM principles and approaches in legal and regulatory frameworks	Constrained the implementation of these IWRM elements	Should empower the implementation of these IWRM elements	<ul style="list-style-type: none"> <li>- The main water laws<sup>1</sup> should be amended to incorporate provisions that empower/strengthen the RBDAs in the implementation of these IWRM elements, insulate the RBDAs from governmental and political interference in river basin activities, and the process of institutional reforms in the water sector from the political environment</li> <li>- The legal instruments suggesting the involvement of the national and international actors should be amended to support and facilitate sectoral collaboration in the water sector in Nigeria as well as discourage functional overlaps.</li> <li>- The Constitution of the Federal Republic of Nigeria of 1999 should be altered to recognise and provide for integrated basin planning and sectoral collaboration in the water sector</li> <li>- The Public Service Rules should be revised to incorporate values and norms that promote stability in the policy environment in Nigeria as well as encourage an organisational culture that supports the implementation of new knowledge and the accomplishment of their statutory functions</li> <li>- The basin bylaws<sup>2</sup> should elaborate on the statutory functions of the RBDAs, provide detailed operational guidelines and procedures as well as a step-by-step approach to accomplishing these functions including performance targets</li> </ul>
2	Regulative, cognitive, and technical	Cost recovery of basin water services	Constrained the implementation of cost recovery	Should enable the implementation of cost recovery	The main water laws should be amended to empower the RBDAs to implement and enforce cost recovery as well as insulate the RBDAs from governmental and political interference in water pricing and hydraulic infrastructure development.
3	Regulative	Water as a social good, conflict management, stakeholder participation, the inclusion of women in basin activities, functional decentralisation (that is, between the FMWR and the RBDAs), water laws enforcement, and polluter pays principle	Promoted the implementation of water as a social good, and constrained the implementation of others	Should mandate the implementation of cost recovery (without jeopardising the social goodness of water) and other IWRM elements	<ul style="list-style-type: none"> <li>- The main water laws should be amended to reflect and empower the RBDAs to implement these IWRM elements, while the basin bylaws, which take into account the peculiarities of each river basin, should elaborate on the operational guidelines and decision-making procedures necessary to implement these IWRM elements<sup>3</sup>.</li> <li>- The Water Resources Decree No. 101 of 1993 should be amended to support functional decentralisation</li> </ul>

<sup>1</sup> The main water laws are: the River Basins Development Authorities Decree No. 35 of 1987 and the Water Resources Decree No. 101 of 1993

<sup>2</sup> Although there were no bylaws in place as at the time of the survey, it is anticipated that these will be put in place in the future to regulate all aspects of water resources development, management and use following the IWRM approach

<sup>3</sup> It is envisaged that with a stakeholder platform in place, the key non-state water users (e.g., cultural and spiritual users) will be involved to improve basin-based water resources management in Nigeria with a view to diminishing their constraining effects.

## **a The proposed improvements to the influencing forces**

As shown in Table 3-8, since the RBDAs and other organisations surveyed (except the farmers) are formal organisations whose operations are guided by laws and regulations, the suggested measures to improve IWRM implementation essentially focus on improvements that could be made to the regulative frameworks (Table 8-2). This approach is in agreement with suggestions in the literature (Dacin et al., 2002; DiMaggio and Powell, 1991). These authors argue that to destabilise institutions, shocks can be introduced. Accordingly, the regulatory instruments have been acknowledged in the literature as an important vehicle for institutional change (DiMaggio and Powell, 1991). In the case of culture, since culture tends to persist, to break the influence of organisational culture, revisions/amendments to the extant legal instruments are also suggested to serve as a shock. The suggested revisions essentially seek to make significant changes to the RBDA culture (the values and norms) which are needed to enable them embrace all their statutory functions for implementation. This approach is in agreement with Hafsi and Tian (2005) who argue that for laws and regulations to be effective, there is a need for a change in the basic values and beliefs of organisational members who are the implementers of these laws and regulations. Since the proposed institutional change is expected to facilitate an improved IWRM implementation, the suggestions are in tandem with the conclusion of Williams (2007) that “[w]hen rules change, behaviour changes, as does the possibility of changed outcomes” (p. 263). As revealed in Chapter 4, in addition to the institutional elements, technical factor also exerts an influence on the implementation of cost recovery. Since the technical environment and the institutional environment are inextricably linked, to facilitate improved investments in water infrastructure, the suggestions have focused on the extant legal frameworks to insulate the RBDAs from governmental and political interference in river basin activities. This approach is also consistent with the suggestions of Scott (1992) and Lounsbury (2001). These authors maintain that the technical environment can also be institutionally constituted and structured, which suggests that a change in one will affect the other. Haveman et al. (2001) also assert that the regulatory frameworks can be employed to influence the technical environment.

Another key factor guiding the selection of options is that of keeping notice of the transaction (and/or transformation) costs of institutional change which have to be effective in order to support the implementation of the proposed measures in practice. The literature highlights that all laws have costs (Hoffman et al., 2012; Hagos et al., 2011), and for laws to become rules, they have to be enforced to the point that the activities they specify become customary and acquire a normative status. This implies that in suggesting improvements to the regulative frameworks attention has to be paid to costs (e.g., development and enforcement costs). In this study, a less costly option (e.g., the amendment of extant legal frameworks) has been suggested. To illustrate, looking at the case of

Nigeria, it is assumed that the cost of formulating a new national legislation will be higher than the costs of amending an existing one. In terms of enforcement, it is assumed that the costs of a self-enforcing law and an externally-enforced law (e.g., second-party or third-party enforcement) will differ with the latter being guessed as higher than the former.

## **b Specification of stages**

While measures to improve the regulative frameworks have been suggested above, there is still a need to give consideration to the specification of stages. In terms of legal reforms, many a literature has suggested the transition from a policy instrument to a legislative instrument. For example, the African Development Bank (2000) sees policy as the basis for legislation, strategic planning and operational management. Björklund et al. (2009) also point out that policy serves mainly as a guide for decision-making, while law provides a set of enforceable statutes and regulations. This therefore suggests that law and policy are interconnected, with law resting on policy. However, in the case of Nigeria, a finding of this study (in Chapter 5) revealed that the water policy is still at the draft level. In order to understand the extent to which the draft document has encouraged IWRM implementation at the river basin level in Nigeria, a critical review and analysis of the 2009 draft water policy document was made. The results, which indicate that IWRM principles and approaches are not fully embedded in the draft document, have made the proposed suggestions in Table 8-2 relevant. This implies that to guide the statement of the water laws appropriately, the draft water policy document will have to be revised to fully reflect the principles and approaches of IWRM as suggested in this study. This approach is consistent with the views of GWP (1999, p. 10) who asserts that “[t]he statement of policies is relevant to the interpretation, application and enforcement of legislation”.

To put the revised policy (as suggested above) into practice will require the reforms of the extant water laws (the River Basins Development Authorities Decree No.35 of 1987 and the Water Resources Decree No. 101 of 1993) and others which will also incorporate the suggested amendments. While institutional recognition should not be seen as an end in itself, this study shares and extends the thinking that it is important to consider it as a crucial part of the process of ensuring a better application of IWRM to water resources management. This study, therefore, agrees with Sharma et al. (1996) who comment that appropriate and enforceable water resource legislation is a pre-requisite for the effective application of IWRM to water resources management, and also with Lankford and Hepworth (2010) who assert that IWRM should be clearly embedded in the appropriate regulatory institutions in order to encourage its implementation.

However, prior to this study, the literature contains relatively little information about the presence of other institutional elements – normative, cognitive, cultural resources as well as technical – as forces influencing IWRM implementation at the river basin level in Nigeria. Thus, most suggestions on how IWRM implementation might be improved have only focussed on curing the regulative instruments (see Chapter 1). While future research is required to test the proposed measures, this study extends the suggestions in the literature to include options that might help to improve the effects of regulative, normative, cognitive, cultural resources as well as technical elements on IWRM implementation in Nigeria.

### **8.3 Contributions to knowledge**

This study has made a primary contribution to IWRM and a secondary contribution to neo-institutional theory. It does this by providing a more in-depth understanding of the extent of IWRM implementation in Nigeria, the forces influencing its implementation and the environments within which they are embedded, as well as by demonstrating the utility of neo-institutional theory in water management research. More specifically, recalling the main aim of this study, it has identified the forces influencing IWRM implementation at the river basin level in Nigeria to be institutional (that is, regulative, normative, cognitive, and cultural resources) and technical (that is, water infrastructure). This is in addition to the environments within which these forces are embedded. In general, the study has also made three distinct contributions to knowledge. Firstly, in terms of the research process developed and applied (that is, the methodological contribution). Secondly, with reference to the conceptual framework derived (that is, the theoretical contribution). Lastly, in terms of the potential practical application of the knowledge generated by this study with reference to the findings derived (that is, the substantive contribution). These specific contributions are summarised below in turn:

The methodological contribution: the developed qualitative research methodology is suitable for the purpose of accomplishing the main aim of this study. It is comprehensive and unobtrusive and has provided the means through which to facilitate a certain type of explanatory research where the production of new knowledge between researcher and research participant is socially constructed. The practicability and usefulness of the methodological approach, developed and used in this study, to expose the forces influencing IWRM implementation and the environments within which they are embedded has been demonstrated in this study. Through the use of this approach, the study has not only surfaced the extent of IWRM implementation, the influencing forces, as well as the environments in which the influencing forces are embedded, but has employed the theoretical

knowledge and information as well as the life experiences and insights of actors grounded in practice to generate rich data and new knowledge. The research approach of this study could serve as a methodological tool for institutional analysis.

The theoretical contribution: the conceptualisation of the data collection and analytical tools and the findings that were obtained have provided a more solid understanding and knowledge by revealing the extent of IWRM implementation at the river basin level in Nigeria as well as the forces influencing their implementation. Furthermore, the environments, which are the operational and the macro environments, within which the influencing forces function in Nigeria have also been exposed. Of importance is the initial conceptual framework developed that proposes an illustration of the forces influencing IWRM implementation at the river basin level in Nigeria and the environments within which they are located as well as the revised conceptual framework that finally illustrates the forces that affect the extent of IWRM implementation at the river basin level in Nigeria and the environments within which the forces are embedded. To this end, this study agrees with others (see Chapter 2) that both technical and institutional forces can enable or constrain management action (e.g., in the case of this study, the implementation of IWRM at the river basin level).

Substantive contribution: this study also has a clear contribution for practice. The developed methodological approach and the revised conceptual framework coupled with the understanding and knowledge presented in this study lend itself as a toolbox which can be used by scientists, managers and practitioners to ask questions about what is going on in other river basins in Nigeria and elsewhere with a view to generating an increasing understanding and knowledge needed to improve basin-based water resources management following the IWRM approach. Besides this, the suggested improvements can make an important contribution to supporting efforts to improve IWRM implementation in the surveyed river basins in Nigeria.

#### **8.4 Limitations of this study**

Qualitative social science research often has some practicalities to cope with in terms of access to field data and information. This study is no exception. A limitation is that this study took only two case studies (both located in the south-western part of Nigeria) to explore the forces influencing IWRM implementation at the river basin level in Nigeria as well as the environments within which they are embedded, and as such, the limitations of case study approach have to be taken into account when evaluating the outcomes of this study. It should be noted that case studies, like any other ones, are limited in their ability to make generalisations (external validity). To overcome this problem, looking at the case of Nigeria, would require the inclusion of other river basins in the survey.

However, the constraints of time, other resources (e.g., money, access, etc.), and insecurity issues (e.g., kidnapping, bombing, etc.) in Nigeria made this impossible. However, an attempt was made to survey many relevant stakeholders and respondents within the selected river basins as much as possible. Also, since one key instrument associated with the use of case studies approach is interview, there is the likelihood that respondents may bias responses in systematic and/or unsystematic ways. A researcher may not recognise these response biases during a cross-sectional survey. However, to improve the reliability and validity of the data, the use of multiple sources of evidence – documents, interviews, and observations, was put in place to triangulate data sources. Additionally, for reasons of reliability and objectivity in data analysis and interpretation, the draft of the findings of this study was sent to some of the organisations surveyed in Nigeria (the two RBDAs and the NIWRMC) to ascertain whether the researcher has accurately portrayed and interpreted the collected data and/or the life experiences of research participants. While no serious discrepancies were spotted by the NIWRMC (others did not return their comments), the feedback indicates that the forces that have been identified are relevant to the case of IWRM implementation at the river basin level in Nigeria. However, it is important to point out that the total picture that emerged from this study is beyond the experience of any one of the participating individuals/organisations. This observation is also noticed in the feedback received from NIWRMC on the draft of the findings of this study. The organisation could not comment on some of the findings.

A second limitation in this research is related to the survey strategy used – a cross-sectional research survey. In each river basin, about 4 months were spent, while one month was used to survey those in Abuja. Whether these study periods were adequate is difficult to judge but results should be seen in this context. However, it is arguable to say that following a cross-sectional survey might have limited the researcher's access to many more potential respondents who may be willing to contribute to this research project. While this limitation may be seen as a weakness or strength, the literature argues that data saturation is difficult to achieve in practice (see Chapter 3). However, to reduce the inherent weaknesses in the purposive sampling method adopted by this study, which has been adjudged in the literature as suitable for qualitative research, data gathering efforts were coupled with snowball sampling to enrich data collection.

Lastly, it should be noted that this study followed an outsider approach. Generally, coupled with the brief stay and the general insecurity in Nigeria, in some organisations, the researcher being an outsider was limited in terms of access to some strategic information and documents relating to financial and other internal documents. This made it difficult for the researcher to understand how financial resources were being allocated (especially within the RBDAs), and in the case of old

documents, the researcher could not do a historical trace needed to have relevant insights into the internal activities of the B-ORBDA in the early days of creation. However, to overcome either situation would require an insider approach or action research.

## **8.5 Implications for water management practices in Nigeria**

Despite acknowledging its limitations, some implications can still be drawn from the findings of this study. Nigeria is a signatory to the United Nations Water Charter and other international protocols which directed member nations to adopt and apply IWRM to the development, management and use of their water resources (National Council on Water Resources, 2013). As a result, IWRM was adopted in Nigeria to address the country's numerous water-related development and management problems, such as, water for food, water for health, water for energy, and water for environment (National Council on Water Resources, 2013). This implies that the development, use, protection, and management of water resources in Nigeria is an essential component of the country's overall development strategy which affects all levels of the society from individual consumers to agricultural and industrial production. However, as part of the framework to address Nigeria's water-related problems, the RBDAs were created and saddled with the responsibility of overseeing the river basins. By arrangement, the RBDAs are to develop, manage basin-based water resources, and provide water supply services to all users (e.g., the farmers, the State Water Corporations/Boards, the industries, etc.). With IWRM being weakly implemented at the river basin level in Nigeria as revealed by this study, the ability of the RBDAs to appropriately address the shortages of potable water supply in urban and rural areas, the poorly used irrigation potential, the degrading watersheds and watercourses, the fragmented water resources development and management as well as inadequate data collection, all in a situation of rapid population growth and dwindling government financial resources is limited. The fragile status of water management in Nigeria can further be illustrated by an example from the drinking water sub-sector. In terms of water availability, Nigeria surface water resources potential has been estimated at  $267.3 \times 10^9 \text{ m}^3$ , while that of groundwater has been estimated at  $51.9 \times 10^9 \text{ m}^3$  (Federal Republic of Nigeria, 2004). Despite this relative availability, for example, as of 2010, access to potable water supply in Nigeria was put at 56% of the population (FMWR, 2012b). This suggests that roughly half of the country's population put at 158.4 million (in 2010 estimates, growth rate 3.06%) do not have access to potable water supply. However, national water supply coverage of 100% is being expected by 2025 with a population of 225 million people (FMWR, 2012b). Despite this ambitious projection, with IWRM being weakly implemented as revealed in this study, the water sector in Nigeria may have difficulties meeting this and other water-related targets. Already, there are indications in the literature pointing that Nigeria may not be able to meet the water-related Millennium Development Goals by 2015 (Igbuzor, 2011; Imoudu, 2012;



National Bureau of Statistics, 2013; Office of the Senior Special Assistant to the President on the MDGs (OSSAP-MDGs), 2013).

The example highlighted above illustrates the importance of IWRM to the water sector in Nigeria. However, this study acknowledges that IWRM can be effectively implemented to improve basin-based water resources use, development and management in Nigeria. To realise this calls for a well-articulated approach. The approach which should be tailored after the conditions needed to translate IWRM from theory to practice will start by incorporating the IWRM elements in relevant legal and regulatory instruments in Nigeria. This calls for water sector institutional reforms to accomplish, and the process will entail putting in place a National Water Policy effectively rooted in IWRM and legislative instruments that support and enforce the Water Policy implementation. Since Nigeria has organisational structures in place, in the form of the RBDAs, it is essential to provide the necessary political and financial support for the RBDAs to enable them implement their statutory functions following the IWRM philosophy. This also calls for a zero interference in the activities of the RBDAs on the part of the government in Nigeria. Therefore, this study recognises that in an environment such as Nigeria, the role of the RBDAs is significant towards addressing the country's water-related problems. However, as revealed in this study, it should be pointed out that the approach and success of the process could be influenced by political, social, economic and cultural conditions. Also, the implementation of IWRM could take a long time, and therefore the need for consistency in pursuing the goal through an effective implementation process is important to avoid derailment.

## **8.6 Suggestions for future research**

This study has provided a better understanding of a complex phenomenon (forces influencing IWRM implementation and the environments within which they are embedded). In doing this, it has also revealed a number of potentially fruitful areas for future research. Most importantly is the case of cost recovery in the B-ORB which is not fully understood. For instance, the findings of this study (in Chapter 4) have revealed that there are no water users under the direct command of the B-ORBDA. This suggests that how they will respond to the recovery of basin water service fees is still unknown. This, however, warrants future research, especially when the RBDA has put in place functional water infrastructures. This will offer the opportunity to understand and explain the response of the basin water users to water service fees recovery/cost recovery.

Furthermore, while this study has revealed that there is an internal resources allocation favouring hydraulic infrastructural development for water supply and irrigated agriculture in the basins (in Chapter 4), how this happen is not fully understood (e.g., whether organisational actions are preceded

by conscious or unconscious awareness of intention are not fully known). While it can be difficult for organisations to report on what they do unconsciously, this can be exposed by employing participant observation. The outsider orientation of this study prevented such an opportunity. For an explanatory research project like this one, this is a significant issue. This might have provided more data showing – how and which resources are being moved and when they are being moved, as well as an understanding of the driving forces at each stage and measures that might be suggested to help improve the situation in Nigeria. However, to expose what is going on will benefit more from an insider approach.

Bureaucracy as theorised by Max Weber (1924/1946-7) tends to play down emotions in bureaucratically organised administrative organisations (see Robbins, 1990), but the presence of labour unions could present a different scenario. In the case of the RBDAs, despite being bureaucratically organised, a finding of this study (in Chapter 4) revealed that the RBDAs are unionised. Since labour unions (under the influence of emotional elements, e.g., fear) can encourage or discourage the development, application and enforcement of certain laws and regulations within an organisation, this suggests that emotions can serve as an influencing force. Put in another way, unionism can provide the platform for the display of emotions which in turn could influence organisational behaviours and/or IWRM implementation. While this link is not pursued in this study due to time and financial constraints, this presents itself as a candidate for future research which will benefit more from an insider approach.

Furthermore, as gathered from the field, numerous national organisations are involved in water-related activities at the river basin level in Nigeria. Although three key water-related national organisations - the Ministries/Agencies in charge of water resources, agriculture and environment – were purposively selected and surveyed (bearing in mind the constraints of time and financial resources), to fully understand the effects of the national water-related organisations on IWRM implementation would require surveying these other organisations in the future, namely: the Ministries/Agencies in charge of health and social services, power and steel, solid minerals development, petroleum resources, and transport at the three tiers of government in Nigeria. However, it is difficult to make suggestions on the international water-related organisations, because their activities in the water sector in Nigeria are usually for a period (e.g., the life-span of the World Bank-assisted Fadama III project is 5 years, starting from 2009 to 2013, while that of UNICEF-assisted rural water and sanitation programme is to close in 2013). Nonetheless, those that may be present in the future, which are not covered by this study, present themselves as candidates for future

research. For researchers to address all the suggested future research areas raised here, working in the robust insights of neo-institutional theory would be helpful.

Lastly, to improve the generalisability of the findings and conclusions of this study as well as the revised conceptual framework, it is considered important to replicate the research methodology used for this study in other river basins in Nigeria. While the revised conceptual framework is to an extent a proposition based on field evidence (not a blue-print), this tool can be tested in the future with other river basins in Nigeria and elsewhere that follow the IWRM approach to basin-based water resources development and management.

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# APPENDICES

## Appendix A: The various IWRM experiences in the water sector in Nigeria

Table A-1 The various IWRM experiences in the water sector in Nigeria

S/No.	Focussed basin(s) <sup>a</sup>	Performance description	Code	Rating <sup>b</sup>				Source(s)/Type of literature	Remarks <sup>c</sup>
				0	1	2	3		
1.	Komadougou Yobe (Northeast)	Inadequate databases	d		1			Carter (1995)/Peer-review	Some of these findings are also reflected in the study of Akpabio et al. (2007) and Olajuyigbe (2010). This suggests little or no improvement post 1995.
		Lack of integrated, basin-wide planning	a	0					
		Lack of recognition of informal water uses	a	0					
		Lack of policy on water allocation	g	0					
		Absence of integrated water management policy	g	0					
		Excessive focus on capital-intensive schemes	a		1				
2.	Ogun-Osun (Southwest)	Poor cost recovery from irrigation schemes	c		1		Olubode-Awosola et al. (2006)/Peer-review	Scant information that suggests that irrigation management has improved beyond 2006 level	
		Inadequate funding and deteriorating irrigation infrastructure	c		1				
3.	Ogun-Osun (Southwest)	Polluted river course (above WHO limit)	c		1		Jaji et al. (2007)/Peer-review	No recent literature that indicates improvements	
4.		Failure to recover cost	c	0			Oyebande (2006)/Peer-review	No recent literature that suggests any improvements	
		Lack of decentralised decision-making process	e	0					
		Lack of stakeholder participation	b	0					
5.	Cross River Basin (Southeast)	Integrated planning not in place	a	0			Akpabio et al. (2007)/Peer-review	No recent literature that indicates improvements	
		Meteorological services (not effective or reliable)	d		1				
		Policy lacking in coordination definition	g	0					
		Power of enforcement and regulation is absent at basin level	h	0					
		No by-laws at basin level	g	0					
		Roles and responsibilities are inadequately harmonised by the regulatory frameworks	g		1				
		Low level of user participation	b		1				
		Very weak water policy, legal, and administrative arrangement	g		1				
6.		Lack of data	d	0			Oteze (2006)/Peer-review	No recent literature that indicates changes	
7.	Benin-Owena	Lack of law, policy and administrative framework on stakeholder participation	g	0			Adeoti (2007)/Peer-review	Thin information that suggests any improvements on non-government	

	(Southwest)	Lack of non-state actors' involvement in practice	b	0					water stakeholder involvement
		Regulatory documents lack definitions on non-state stakeholder participation	g	0					
8.		Policies lacking in combating desertification and mitigating the effects of drought	g	0				Medugu et al. (2008)/Peer-review	Thin literature on the presence of new policy addressing desertification
9.		Lack of database relating to groundwater	d	0				Akujieze et al. (2002)/Peer-review	Scant literature that suggests the availability of new regulation addressing groundwater management
		Absence of regulation and legislation on groundwater	g	0					
		Poor human capacity building on groundwater development and management	f		1				
10.		Lack of data on wetland health	d	0				Uluocha and Okeke, (2004)/Peer-review	Scant information regarding recent improvements on wetland management
		Poor wetland management	a		1				
11.	Upper Benue and Sokoto-Rima	Lack of integrated basin planning	a	0				Adams (1985)/Peer-review	The findings of Adams are also noted in the work of Akpabio et al. (2007). This suggests that little or no improvements have occurred since then.
		Failure to resettle reservoir evacuees adequately	a		1				
		Large scale irrigation projects proved uneconomic	a	0					
		Little efforts in the field of watershed management	a		1				
12.	Cross River Basin	Water laws ineffective to resolve the issues of control, ownership, management, and protection of water resources	g	0				Akpabio (2007)/Peer-review	No recent literature that indicates changes
		Lack of coordination among various organisations within the water sector in practice	a	0					
		Very low cost recovery made on water resources	e	0					
		Lack of water rules enforcement in practice	h	0					
		Powers of enforcements and regulations are absent in the legal frameworks	g	0					
13.		Inadequate planning and management of groundwater resources	a	0				Nwankwoala (2011)/Peer-review	No recent literature that indicates change
14.		Lack of inter-sectoral coordination	a	0				Goldface-Irokalibe (2008)/Grey	No recent literature that indicates changes
		Weak database management	d		1				
		Water laws lack provisions and mechanisms for inter-sectoral coordination, tariff setting and conflict resolution	g	0					
15.		No articulate water policy in Nigeria	g	0				Olajuyigbe (2010)/Peer-review	No recent literature that indicates changes
16.		No sub-basin management structure in practice	a	0				Adeoti (2010)/Peer-review	No recent literature that indicates changes
		Lack of legal recognition for water management at the sub-basin level	g	0					

17.		Policy inadequacies to ensure effective water resources management	g		1		Goni (2006)/Peer-review	No recent literature that indicates changes
		Lack of data for planning	d	0				
		Lack of community participation	b	0				
		Poor cost recovery	c		1			
18.	Nation-wide study	Presence of upstream/downstream conflicts	h		1		Commission of the European Communities (2006)/Grey	Some of these findings are also discovered by Akpabio (2008), Akpabio et al. (2007), and Jaji et al. (2007).
		Top-down management approach, without beneficiaries involvement	b	0				
		Little cost recovery, poor asset management	c		1			
		No effective data collection or monitoring system in place	d	0				
		Lack of groundwater data	d	0				
		Presence of overlapping responsibilities, and no actual accountability	a	0				
		Lack of ability to develop water management plans	f	0				
		There is little or no enforcement to prevent pollution	h		1			
		No catchment management	a	0				
		There are erosion and flooding problems	a		1			
		Some basins are not truly along hydrological boundaries	a		1			
		No clear separation between resource manager and service provider	e	0				
		No provision in the law for private sector involvement and communities as important stakeholders	g	0				
		Present laws lack proper provisions and mechanisms on inter-sectoral coordination, tariff setting and conflict resolution	g	0				
		Regulatory machinery within the water sector is weak	g		1			
		Uncoordinated approach to water law administration	a	0				
The water laws fail to recognise the need for stakeholder participation	g	0						
Dams are poorly managed	f		1					
No dam rule curves	d	0						

		Lack of consideration to downstream users especially with respect to dam construction	a	0					
19.	Cross River Basin	Insufficient understanding of IWRM	f		1			Akpabio (2008)/Peer-review	No recent literature that suggests improvements
		The water law lacks definition conveying full bureaucratic autonomy to the basins	g	0					
		Coordination among various organisations within the water sector and other sectors is non-existent.	a	0					
		The water law lacks clear measure for ensuring and enforcing accountability	g	0					
		No effective powers for regulating and enforcing water resources exploitation in the basin	h		1				
20.		Needs for improvement in institutional capacity	f		1		Egbu (2000)/Peer-review	Although some of these findings are embedded in more recent works, thin literature exist indicating changes	
		Lack of economic measures for pollution management	c	0					
21.		Uncontrolled wastes discharges – industrial and domestic - in rivers	a	0			Bichi and Anyata (1999)/ Peer-review	Also noted in many other literature post 2000	
22.	Hadejia-Jama'are wetlands and the Komodugu Yobe basin	Many of the river basin boundaries follow political (or state) borders rather than hydrologic boundaries	a		1		Thomas and Adams (1997)/Peer-review	Some of the findings of Thomas and Adams are also captured by the Commission of the European Communities (2006)	
		Poor planning at the river basin level	a		1				
		Poor sensitivity to the spatial and temporal complexities of flood plains	a		1				
23.		Problem of river pollution	a		1		Ajibade (2004)/Peer-review	River pollution problem is also noted by Jaji et al. (2007)	
24.	Sokoto-Rima (Northwest)	Integrated approach is not being followed	a	0			Mitchell (1994)/Peer-review	The finding of Mitchell is also noted by Akpabio et al. (2007)	

<sup>a</sup> There are twelve river basins in Nigeria (see also Adeoti, 2007, 2010; Olajuyigbe, 2010)

<sup>b</sup> As illustrated in Table 2.3

<sup>c</sup> The majority of these findings are to some extent applicable to other river basins in Nigeria. This is because, as also noted by Akpabio (2008), the River Basin Development Authorities in Nigeria work with uniform mandates and objectives which is consistent with the legal instrument setting them up – the River Basins Development Authorities Decree No. 35 of 1987.

## Appendix B: Interview schedule for the RBDA

Introduction: This interview schedule is designed to help elicit information (A) on the legal and regulatory framework and (B) on what the Authority do in practice. I would like to explore the internal governance arrangements of the River Basin Development Authority (RBDA) for factors influencing the implementation of Integrated Water Resources Management (IWRM) in practice, and also on your views about the activities of some other actors (or organisations) involved in the basin-based water resources management in Nigeria.

### Part A: Legal and Regulatory obligations

*with reference to internal and external laws – formal and informal*

1. What do the laws governing the river basin say on RBDA decision-making?
2. Do any of the laws allow for local culture to affect the practice of water resources management at the river basin level?

### Part B: What happens in practice

*with reference to internal and external laws – formal and informal*

1. Have you heard of Integrated Water Resources Management (IWRM)?
2. What experience of IWRM does the RBDA have?
3. Does the RBDA sponsor water related staff training?
4. How is water allocation managed in the basin?
5. Can you tell me about some of your operations that are guided by traditional practice?
6. Is there any political interference in river basin activities?
7. Lastly, what motivations do you think the RBDA has in executing their present duties?

## B.1 IWRM prompt sheet

Please rate the level of implementation of each of the following Integrated Water Resources Management (IWRM)-related issues looking at the Nigerian water sector and the [named] River Basin in particular. Indicate your choice in the box provided:

Table B-1 Integrated Water Resources Management (IWRM) prompt sheet

S/No.	Issue	Not addressed	Poorly addressed	Moderately addressed	Largely addressed
1	Integrated planning of water resource				
2	Non-government stakeholder participation in basin activities				
3	Platform for government stakeholder participation in basin activities				
4	Inclusion of women in basin activities				
5	Cost recovery				
6	Managing/Treating water as a social good				
7	Polluter pays				
8	Data collection				
9	Functional decentralisation (that is, between the Fed. Min. of Water Resources and the River Basin Development Authorities)				
10	Human capacity building (with respect to water resources management)				
11	IWRM principles and approaches embedded in legal and regulatory frameworks				
12	Conflict management (with respect to water resources management)				
13	Water laws enforcement				
Other important remarks, please state:					

## B.2 Political interference prompt sheet

From your experience, please rate the level of political interference in basin activities as indicated below:

Table B-2 Level of political interference

S/No.	Level of political interference	Mark your choice
1.	Very low	
2.	Low	
3.	High	
4.	Very high	

Table B-3 Areas of interference

S/No.	Description	Very low	Low	High	Very high
1	Managerial				
2	Procurement				
3	Project selection				
4	Project execution				
5	Personnel (hiring)				
6	Personnel (firing)				
7	Pricing				
8	Project location				
9	Funding				
10	Budgetary allocation				
Others (Please list below):					



### B.3 Decision-making prompt sheet

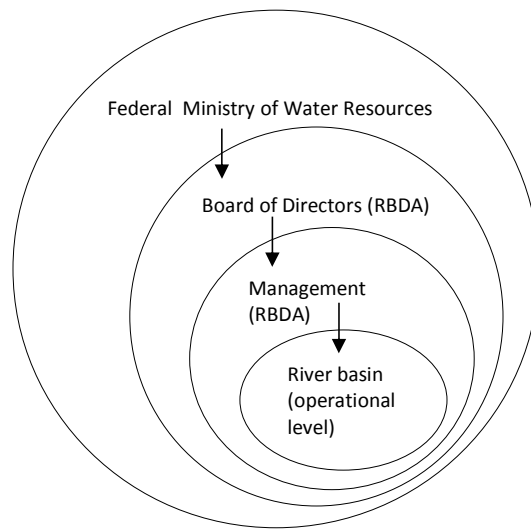


Figure B-1 Decision making line (according to the law)

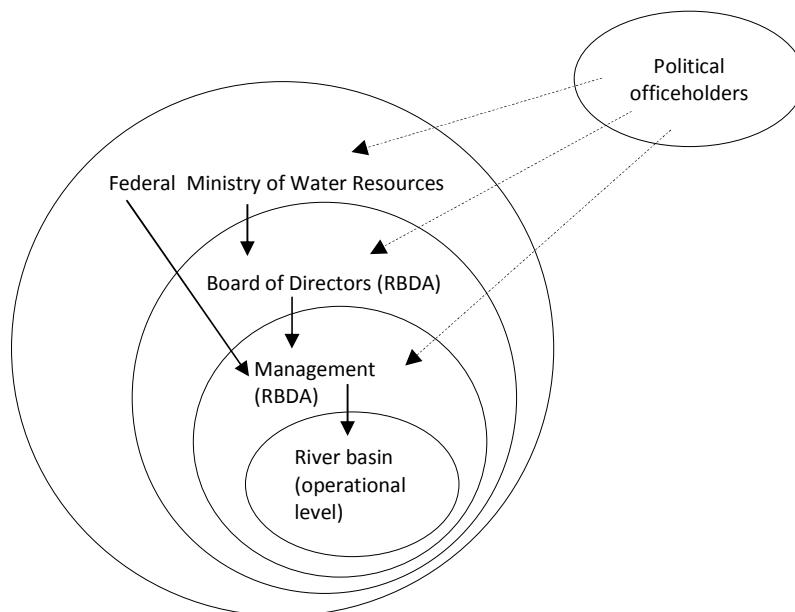


Figure B-2 Decision making line (in practice)

## **Appendix C: Interview schedule for national and international actors (or organisations)**

Introduction: This interview schedule is designed to help elicit information (A) on the legal and regulatory frameworks and (B) on what your organisation do in practice. I would like to explore the organisation's roles, responsibilities, interests, and mode of involvement in the water sector in Nigeria for factors influencing the implementation of Integrated Water Resources Management (IWRM) at the river basin level, and also on your views about the activities of some other actors (or organisations) in the basin-based water resources management in Nigeria.

*Please note, where I have used "your", I am referring to "your organisation"*

### **Part A: Legal and regulatory obligations**

1. Can you explain to me the legislation and regulations that suggest your organisation's involvement in the water sector in Nigeria?

### **Part B: What happens in practice**

1. Have you heard of integrated water resources management (IWRM)?
2. Are you aware of any cultural influences on the way the [named] River Basin Development Authority discharge their duties?
3. Do you notice any other organisational involvement in water activities in the basin?
4. What benefits have your organisation gained from their involvement in the water resources sector in Nigeria?

## Appendix D: Interview schedule for users of basin water services

Introduction: This interview schedule is designed to help elicit information (A) on the internal activities of the River Basin Development Authority from your perspective as a User of basin water services and (B) on your activities in the basin. I would like to examine these for factors influencing the implementation of Integrated Water Resources Management (IWRM) at river basin level in Nigeria, and also on your views about the activities of some other actors (or organisations) in the basin-based water resources management in Nigeria.

Part A: In practice aspect of the [named] River Basin Development Authority

*with reference to formal and informal laws/organisations*

1. Are you aware of any cultural influences on the activities of the [named] RBDA?
2. Have you heard of integrated water resources management (IWRM)?
3. Are you aware of any other organisational involvement in water activities in the basin?

Part B: In practice aspect of users of river basin water services

1. Do you pay for raw water released by [the named] River Basin Development Authority?
2. In your view, do you think raw water is worth paying for?
3. How would you describe your interests in the basin's water resources?

## Appendix E: Cover letter for informal pretesting

Environmental Science and Technology Department  
School of Applied Sciences  
Cranfield University, VINCENT Building  
Cranfield, Bedford, MK43 0AL

UK

Dear Sir/Ma,

### REQUEST FOR ASSISTANCE (INTERVIEW SCHEDULES PRETESTING)

I'm Olusegun Adeoti, a student of Sue and Peter. Please, I would like to know if you would be willing to cast your eye over my research interview schedules at your free time and provide feedback on clarity and scope. The exercise is likely to take about an hour of your time.

The study seeks to provide a better understanding of the forces influencing the implementation of Integrated Water Resources Management (IWRM) at the river basin level in Nigeria, the environments within which they are embedded and to suggest measures that might improve implementation.

Thanks

Segun

## Appendix F: An initial start list of codes

Table F-1 An initial start list of codes

Categories and sub-categories	Codes
1. Status of IWRM application (SIA) SIA: IWRM action areas	1.1
2. Regulative Institutions (RI) RI: Formal (Policy/legislation/regulatory instruments) RI: Informal (traditional law)	2.1 2.2
3. Normative Institutions (NI) NI: Formal/Informal (a)	3.1(a)
4. Cultural-Cognitive Institutions (CCI) CCI: Culture/Taken-for-granted/Belief	4.1
5. Basin socio-economic conditions (BSEC) BSEC: Present socio-economic conditions	5.1
6. Basin Water infrastructure (BWI) WI: Active water infrastructure	6.1
7. Others (those that may emerge from the data)	7.1

## Appendix G: Information letter



Environmental Science and Technology Department  
School of Applied Sciences  
Cranfield University, VINCENT Building  
Cranfield, Bedford, MK43 0AL, UK

Date:

To:

Dear Sir/Madam,

A PhD study of Integrated Water Resource Management in Nigeria – Information Letter

The study, in which I am seeking your/your organisation's participation, is designed to investigate the forces which affect the implementation of Integrated Water Resources Management (IWRM) Principles at the river basin level in Nigeria, the environments within which they are embedded and to suggest measures which might improve implementation. The research is being conducted by myself, Olusegun Adeoti, a PhD/MPhil student at Cranfield University and a staff member at the Federal Polytechnic, Ado Ekiti, Ekiti State, Nigeria. The PhD/MPhil study is being conducted under the supervision of Prof. Sue White, Prof. Paul Jeffrey and Dr. Peter Howsam of Cranfield University, UK. The PhD/MPhil programme is being sponsored by the Education Trust Fund (ETF) under the ETF Fellowships for Tertiary Institutions in Nigeria. The field survey part of the study has been approved by the Ethics Screening Committee of Cranfield University. On completion of the study, having gained a PhD, I intend to use the knowledge gained to contribute to river basin management and capacity building in water resources management in Nigeria.

My aim is to interview those who are familiar with the legal and regulatory obligations of the organisation and to find out what is happening in practice. As a way of assuring you (or your organisation) of the scope and type of questions that will be asked, a copy of the interview script is attached. This will also help guide our discussion, which I expect will last about one hour. Please note that any documents that may provide relevant information would be very welcome.

Please be assured that any information provided will be held in strict confidence by the researcher. At no time will the name of designated respondents (or that of your organisation) be reported along with their responses. All data will be reported anonymously, in group form only. At the conclusion of each interview, the respondent will receive a raw transcript of the interview for verification and validation, and all taped records including field notes will be destroyed at the end of the study at Cranfield University.

Your/Your organisation's participation in this research is totally voluntary and you/your organisation are/is free to select any questions you/your organisation may wish to respond to. And also to withdraw at any time during the interview process without prejudice, and to request removal of any data that you/your organisation may have contributed.

I do hope you/your organisation will be willing to participate. If this is the case then, I would like you/your organisation to complete and send the letter below confirming your/your organisation's consent to participate.

I intend to visit you/your organisation in the month of ..... 2012 or at your/your organisation's preferred date, but not later than November 2012.

Please note that there will neither be any costs nor any payment relating to participation in this research project. On completion of the study, a copy of the thesis will be made available to you/your organisation.

I look forward to hearing from you/your organisation.

Yours Sincerely,

Olusegun Adeoti

**Informed Consent Form**

**A PhD study of Integrated Water Resource Management in Nigeria**

1. I/My organisation has/have read the information provided in the information letter.
2. I /My organisation agree(s) (     ) /do not agree (     ) to participate in this research project. (Please tick your/your organisation's choice)

I/My organisation understand(s) that:

1. I/My organisation is/am free to withdraw from the project at any time and is/am free to decline to answer any particular questions.
2. While the information gained in this study will be published, I/My organisation will not be identified, and individual/organisational information will remain confidential.

Name/Name of Organisation: .....

Address: .....

Signature (if possible): .....

Date: .....

**Please return this form by mail, or email to:**

Olusegun ADEOTI  
Environmental Science and Technology Department  
School of Applied Sciences  
Cranfield University, VINCENT Building  
Cranfield, Bedford, MK43 0AL, UK

Email: o.adeoti@cranfield.ac.uk

**You may wish to retain a copy of the information letter and the informed consent form for future use.**

# Appendix H: The recommended organisational structure of the RBDA

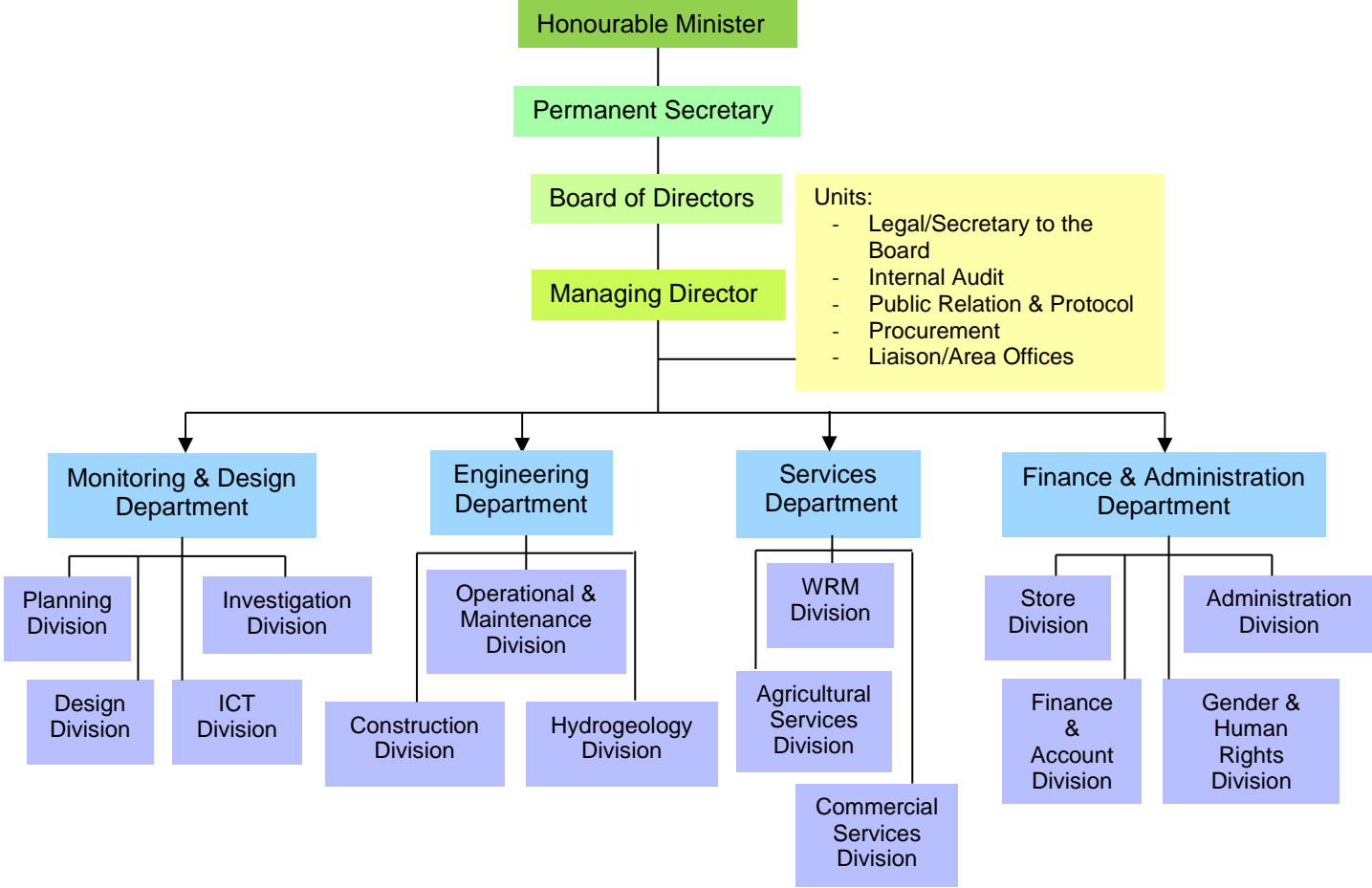


Figure H-1 The recommended organisational structure of the RBDA (Source: O-ORBDA, 2011a)

(Note: The climate change unit, created in 2010, has been added as a unit under the Managing Director (FMWR, 2012a)