



Institute of Water and Energy Sciences (Including Climate Change)

ASSESSING THE CAPACITY OF THE CURRENT INSTITUTIONAL FRAMEWORK IN RWANDA TO IMPLEMENT INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)

Diana Umulisa

Date: 05/09/2017

Master in Water, Policy track

President: Dr. Bernhard Tischbein

Supervisor: Prof. Masinde Wanyama

External Examiner: Dr. Kumar Navneet

Internal Examiner: Prof. Sidi Mohammed Chabane Sari

Academic Year: 2016-2017

DECLARATION

I *Umulisa Diana*, hereby declare that this thesis represents my personal work, realized to the best of my knowledge. I also declare that all information, material and results from other works presented here, have been fully cited and referenced in accordance with the academic rules and ethics.

ABSTRACT

Scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and protection of the environment, human health, food security and industrial development. This calls for the adoption of the Integrated Water Resources Management (IWRM) approach, which promotes coordinated development and management of water and other natural resources like land and forests, surface water and ground water, upstream and downstream interests. For the IWRM to be implemented an appropriate institutional framework is needed and therefore it requires policy makers to make judgments about which reforms and measures, management tools and institutional arrangements are most appropriate in a particular cultural, social, political, economic and environmental context.

The Government of Rwanda has been carrying out reforms in the water sector for the better management of water resources. However, there is overlap and fragmentation of roles given to Government institutions. There is lack of national institution decentralization at basin and catchment level, which leads to mismanagement of water resources and conflict in decision-making.

This study was done to assess the capability of the existing institutional framework for water resources management in Rwanda. A descriptive, qualitative design was adopted and used secondary data gathered from Water related policies, laws, publications, and national documents in relation to the research topic.

The data collected shows that Rwanda's water sector is governed under a sectorial and complex institutional framework which is insufficient in terms of capacity and organizational structure at the national, basin and district level. The water law of 2008 that is to be revised, there is a need to review mandates and roles of the different coordination platforms and address the need of the Catchment Committee. In addition, a pragmatic platform capable of making integrated situational analyses at the national level is missing and there is little participation from non-governmental actors in the decision making process.

Key words: IWRM, Institutional framework, Assessment

RESUME

La pénurie et l'utilisation abusive de l'eau douce représentent une menace sérieuse et croissante pour le développement durable ainsi que pour la protection de l'environnement la santé humaine, la sécurité alimentaire et le développement industriel.

En conséquence, Il est nécessaire d'adopter une approche intégrée de la gestion des ressources en eau (GIRE). Cela favoriserait le développement et la gestion coordonnée de l'eau et d'autres ressources naturelles comme les terres et les forêts, les eaux de surface et les eaux souterraines, les intérêts en amont et en aval.

Pour que la GIRE soit mise en œuvre, un cadre institutionnel approprié est nécessaire. Par conséquent, il faut que les décideurs politiques jugent les réformes, les mesures, les outils de gestion et les arrangements institutionnels les mieux appropriés et ceci dans un contexte culturel, social, politique, économique et environnemental. Le gouvernement du Rwanda a instauré des réformes dans le secteur de l'eau pour une meilleure gestion des ressources. Cependant, il existe un chevauchement et une fragmentation des rôles accordés aux institutions gouvernementales. Un manque de décentralisation des institutions nationales au niveau du bassin et des bassins versants est notable, ce qui entraîne une mauvaise gestion des ressources en eau et des conflits dans la prise de décision.

Cette étude a été réalisée pour évaluer la capacité du cadre institutionnel existant pour la gestion des ressources en eau au Rwanda. Une conception descriptive et qualitative a été adoptée et a utilisé des données secondaires recueillies à partir de politiques, lois, publications et documents nationaux liés à l'eau en rapport avec le sujet de recherche. Les données recueillies montrent que le secteur de l'eau au Rwanda est régi par un cadre institutionnel complexe qui est insuffisant en termes de capacité et de structure organisationnelle au niveau national du bassin et du district. La loi sur l'eau de 2008 doit être révisée; il est nécessaire d'examiner les mandats et les rôles des différentes plateformes de coordination et d'aborder l'omission du Comité des bassins. En outre, une plateforme pragmatique capable de réaliser des analyses situationnelles intégrées au niveau national manque. Enfin nous pouvons souligner le fait qu'il y ait peu de participation des acteurs non gouvernementaux dans le processus décisionnel.

ACKNOWLEDGMENT

I want to deeply thank everyone who helped me along the way. First and foremost, I thank God for His protection throughout the whole time of this research. Thank you to my supervisor, Prof Wanyama Masinde for his tips and positive energy; he has been a great support, I couldn't ask for more.

I would not have done this without encouragement and support from my family and friends. They have been a great pillar all my time in school. In a special way I thank my mother, Mrs. Mwiza Debora Toyota for her indescribable love, support and inspiration. Thank you to Grace Kayitesi, Rhadia Mutoni, Jane Muhoza, and Steve Kalisa; you have been and always will be my motivation. I cannot thank enough my good friends Eva Kimonye and Vivian Ogechi Nwandiaru who have been there for me in the course of this program, you are an inspiration and friends everyone would wish to have. You have been there to encourage me when I was down and most of all you believed in me even in times I couldn't believe in myself. Thank you Mohamed Hamel for your great support, I cannot take it for granted. You are indeed a true friend.

I extend my gratitude to PAUWES administration and students for their support in different ways, thanks to African Union Commission for believing in me and granting me this life changing opportunity that has opened my eyes and helped me find my own direction. Thanks to Water Policy class of 2017, it has been a great journey with these seven incredible, intelligent Africa's future policy makers. Our diversity makes us a great team and I can't wait to see what the future has for us.

Last but not least, I thank Mr. Francois Xavier Tetero for his support and guidance in shaping my career. He has always been my source of encouragement and I cannot thank him enough for his selfless deeds.

LIST OF ABBREVIATIONS AND ACRONYMS

CBO	Community-Based Organization
CO	Catchment Office
CC	Catchment Committee
DDG	Deputy Director General
DG	Director General
DPMT	District Project Management Team
EDPRS II	Economic Development and Poverty Reduction Strategy
EIA	Environmental Impact Assessment
EKN	Embassy of the Kingdom of the Netherlands
FONERWA	National Climate Change and Environment Fund
FP	Focal Point
FY	Financial Year
GoR	Government of Rwanda
ISU	Integrated Support Unit
IWRM	Integrated Water Resources Management
IWRMD	Integrated Water Resource Department
JADF	Joint Action Development Framework
LODA	Local Government Development Agency
MIDIMAR	Ministry of Disaster Management
MINAFFET	Ministry of Foreign Affairs and Cooperation
MINAGRI	Ministry of Agriculture
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance, Planning and Economic Development
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
MIS	Management Information System
MoU	Memorandum of Understanding
MSc	Master of Science
NGO	Non-Governmental Organization
NWCC	National Water Consultative Commission
PMO	Prime Minister's Office
REG	Rwanda Energy Group
REMA	Rwanda Environmental Management Authority
RMA	Rwandan Meteorological Agency
RNRA	Rwanda Natural Resources Authority
RURA	Rwanda Utilities Regulatory Authority
RWA	Rwanda Water Authority
RWFA	Rwanda Water and Forestry Authority
WIC	Water Inter-Ministerial Committee
WUA	Water Users Association

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CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

Water is a very essential natural resource to both the environment and ecosystem. Today, many of the world's natural water resources are facing overuse due to increased competition for and subtract ability of their use (Kaveh 2011).

Scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and protection of the environment, human health and welfare, food security and industrial development. In order to address water scarcity and misuse, water experts and policy makers attended International Conference on Water and the Environment (ICWE) in Dublin, Ireland, from 26-31 January 1992. Due to the increase of competing users; an approach of Integrated Water Resources Management (IWRM) was adopted as a way in which water can be managed for achieving sustainable development and to create a balance among the social equity, economic efficiency, and environmental sustainability. IWRM is defined as *“a process, which promotes the coordinated development and Management of water, land and related resources in order to maximize the resultant economic and social Welfare in an equitable manner without compromising the sustainability of vital ecosystems”* (Global Water Partnership 2000). IWRM calls for a more coordinated development and management of water and other natural resources like land and forests, surface water and ground water, upstream and downstream interests. IWRM is not a final product but a process; it requires both strategic and operational planning approaches.

In order to implement IWRM, the appropriate institutional framework is needed through which policies can be implemented. It should be noted that there is no standard blueprint for IWRM approach because every society has different water resources development priorities as well as challenges; Therefore for IWRM to be well implemented it requires policy-makers to make judgments about which reforms and measures, management tools and institutional arrangements are most appropriate in a particular cultural, social, political, economic and environmental context.

It is important to stress that IWRM is not an objective by itself. It serves the purpose of better planning of the critical resources, which are linked to land uses and water availability (Global Water Partnership 2009). Planners need to understand and acknowledge the increasing

pressure on land and access to water for consumptive and non consumptive uses, which, combined with external factors like climate change require new approaches to management. To reduce future conflict, it is important to plan development while being aware of the limitations of the available resources. Having in place a solid IWRM framework based on a medium and long-term timeframe will help to reach the planned development goals and can attract support from development partners in securing the required funding.

It is essential for integrated water resources management approach that water should be managed at the lowest appropriate level (Global Water Partnership 2009). IWRM acknowledges a catchment as the lowest unit where decentralized decision making occurs with the inputs of all stakeholders.

Having an adequate and conducive institutional framework in place is fundamental for reaching the desired Integrated Water Resources Management. The Rwanda Water Law (2008) and the National Policy for Water Resource Management 2011 provide the current policy direction around IWRM and underline the government's vision for sustainable and rationally managed water resources that meet Rwanda's socio-economic and development needs. One of the Policy principles of Rwanda national policy for water resources management of 2011 recognized the catchment based water resources management approach as essential to dealing comprehensively with water resources management issues. Definitely, water use has impact primarily on users within the same catchment, and vice-versa; including environmental uses (MINIRENA 2011). This reflects how water resources institutional and management arrangements ought to be set up at catchment or basin scale.

1.2 Problem statement

The Government of Rwanda has been carrying out reforms in the water sector for the better management of water resources. The National Water Policy 2011 gives the institutional framework for water resources management. It outlines the ministries and agencies that are involved in water resources management and gives authority to the Rwanda Natural Resources Authority (RNRA) to coordinate the implementation of all stakeholders and oversee the management of water resources. However, there is overlap and fragmentation of roles given to Government institutions. Water is managed independently in many government institutions which makes it difficult to manage in an integrated way because each ministry/agency makes independent decisions.

There is lack of national institution decentralization at basin and catchment level, which leads to mismanagement of water resources and conflict in decision-making. The institutional framework as stated in the national water policy identifies a district as the smallest administration body to implement policies and laws; this has been a problem in water resources management because water does not know administrative boundaries. Every district plans and implements its solutions to the problems facing their district not putting into consideration the whole catchment; this results in the lack of harmonization in the catchment where you will find that in the long run there is duplication of efforts and conflict between different administrative offices.

1.3 Justification

The Government of Rwanda has been carrying out reforms in the water sector for better management of water resources. This study will generate information that will be useful to the government in strengthening and revising the institutions in charge of water resources management. It will also contribute in realizing the goal of the national water policy “to manage and develop the water resources of Rwanda in an integrated, coherent and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations with the full participation of all stakeholders in decisions affecting water resources management” by suggesting the appropriate institutions through which policies would be implemented.

1.4 Objectives

1.4.1 Main objective

This study aims at assessing the capability of the existing institutional framework for water resources management in Rwanda.

1.4.2 Specific objectives

The specific objectives of the study are:

- i. To assess the current water resource institutional arrangement and their roles in Rwanda.
- ii. To assess the capability of the current institutional framework to implement IWRM.

- iii. To identify the gaps and opportunities in the institutional structure and coordination mechanisms.

1.1 Research Questions

- i. Which institutions in Rwanda are involved in the implementation of Integrated Water Resources Management and how are their responsibilities distributed?
- ii. How capable are the institutions in place to implement IWRM?
- iii. What is the existing coordination mechanism used in water resources management in Rwanda?

CHAPTER 2: LITERATURE REVIEW

2.1 Integrated Water Resources Management (IWRM)

Integrated Water Resources Management is not a new concept, despite recent, prominent national and international attention, IWRM concept progressed in some countries under different pretexts and terminology as many as 70 years ago (Biswas 2004), IWRM remained elusive (White 1998). It was recommended at the 1977 United Nation Conference in Mar del Plata. The conference led to the declaration of the 1980s as the “water sanitation decade” with the objective of providing drinking water and sanitation for all by 1990. The concept has undertaken a series of evolutions and refinements during numerous regional and international conferences (New Delhi in 1990, Delft in 1991, Dublin in January 1992 and Rio de Janeiro in June 1992) (Ferragina 2002). In order to address the water scarcity and misuse, five hundred participants, including government-designated experts from a hundred countries and representatives of eighty international, intergovernmental and non-governmental organizations attended the International Conference on Water and the Environment (ICWE) in Dublin, Ireland, from 26-31 January 1992. The conference adopted these Dublin principles.

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. Since water sustain life its management should be conducted in holistic approach linking social and development with protection of natural ecosystem. Thus the users should be integrated in a management manner to sustain such resource
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels. This principle raises an awareness to all users from different levels as well as stakeholders regarding the importance of water and why it should be managed as well the policy makers that are involved in decision making regarding water resources usage
- Women play a central part in the provision, management and safeguarding of water. The pivotal role that women play in water resources has been reflected in the institutional, women being the providers and users of water and guardians of the living environment. In Rwanda the gender policy state that women constitute 53% of the Rwandan population. In the post genocide women are playing a major role as

household heads and economic managers thus it is important to include women in water resources management and decision making process (Five-year strategic plan).

- Water has an economic value in all its competing uses and should be recognized as an economic good. It is vital to recognize firstly the basic right of all human beings to have an access to clean water and sanitation at an affordable price, but the recognition of economic value of water among the users give water resources management against the wasteful and mismanagement of water resources (Ferragina 2002)..

IWRM is restricted to water quantity and quality; integrated watershed or catchment management refers to integration of water, land, and other natural resources including water quality (Davis 2007). Moreover, term river basin management is used broadly to refer to all activities engaged within a particular river basin; it reflects the implementation of IWRM and other strategic natural resource planning (Dourajeanni 2002). Activities associated with an IWRM redirect territorial and jurisdictional scales. At the national scale, a general framework that creates an enabling environment and supports macro socioeconomic objectives is appropriate, while specific outcomes in a particular location are appropriate at the river basin scale. Individual project level capital works, and operational and maintenance activities are most often appropriate at the sub basin level, which in turn should be consistent with larger river basin plans (Hooper 2005). In 2006, Cardwell makes three understanding observation about IWRM: it is a process, it is a goal directed process, and it is a matter of degree (Cardwell 2006). Thus its adoption does not require full integration and coordination of all possible aspects. Furthermore, Jønch-Clausen emphasizes that public support as well as politic interest, and institutions should (Biswas 2004)develop with initial focus on crucial, urgent matters where a demonstrated and appropriate scale is needed (Jønch-Clausen 2004).

The matter of degree and coordination, IWRM institutions can and do take various forms. However, coordination is the key aspect of institutional framework and its implementation both horizontal and vertical synchronization across national, regional, and local department levels including public and private entities and other related disciplines (Sabatier and F. 2005). The current international IWRM efforts try to merge two approach, top down and bottom up approach. The top down approach is either represented by the national or regional adoption of IWRM combined with the development and fostering river basin organization and governance (GWP 2006) and (Hooper 2005). The top down among other items provides an enabling environment e.g. legal participatory, education, and mechanisms for enforcement

and conflict management, and protection of under-represented sectors such as minority and indigenous groups. IWRM is best implemented operationally at the river basin or sub-basin levels, an operational unit contains of hydro geographic drainage basins, environmental management however it can extend beyond to what we can call problem sheds such as addressing habitat protection and this may require an additional coordination among adjacent river basins organization (Davis 2007). Past models and planning mechanisms and implementations have been not reflecting the local needs nor were any educational provided such that locals can be included in decision making process. It is recognized that bottom up approach will involve much of local's participation for a successful water resources planning and projects involvement as well as decision making at the lowest level (Global Water Partnership 2000) and (Creighton 2004). In many less developed countries, the challenge is often to create or restructure institutions and internal capacity to manage resources, while adequately engaging stakeholders - including those in informal sectors of society. In developed countries, it is more typical that institutions are well established (Davis 2007). The existing institution developed a fractional aspect to address particular facets of water management, for instance to develop hydropower or mitigate flood effects or expand agriculture in a particular location or river basin based on understanding and politics. Each of the institutions are governed by facilitating legislation, usually with specific and limited mandates (Davis 2007).

IWRM also tackle the water sharing aspect. Water sharing is an important component of IWRM. A broad definition of water sharing is control and allocation of water from headwaters to sea or sinks (Davis 2007); Rules about water sharing also involve clear mechanisms for conflict resolution, including important mediation and other methods that can be pursued prior to referral to the courts.

2.2 Institutions, Organizations and Management

In analyzing the arrangements of institutions in any context a clear understanding of the term institutions should be highlighted. In general sociology, an institution is “an organized, established, procedure” (Jepperson 1991).

The late Elinor Ostrom (1933-2012) was the theorist behind the new institutionalism school of thought which was a critique of the Garrett Hardin's theory of the tragedy of the commons. In Hardin's theory, he prescribed that in order to avoid the over-exploitation and depletion of

common pool resources there is need to convert them to public or private goods (Castro 2007). Ostrom then came up with the theory that not all common pool resources can be converted into public or private goods but people are capable of managing their own resources. (E. Ostrom 1993) Conceptualizes institutions as rules that are continuously being crafted and that these are used to organize interactions within a community. (E. Ostrom 1993) perceives institutions as rules that need to be crafted or designed and these designs are supposed to be done by people who have the skill to understand how the rules and other factors influence people's behaviors, these can either be the users themselves or external people.

(E. Ostrom 1993) Drives forward the idea that when the institutions are crafted as prescriptions based on design principles that will order how individuals are supposed to behave and interact with each other. The main argument is that in order for an institution to be sustainable and 'long-enduring' it has to follow the eight design principles; and these include defining boundaries, collective action in designing the rules, monitoring and sanctioning, conflict resolution mechanism among others (E. Ostrom 1993). She puts forward this argument by defining the design principles as ideas that "...help account for the success of institutions..." (E. Ostrom 1993), however these principles do not consider socio-political dynamics within a society. This argument is based on the assumption that people are rational beings who always make decisions based on calculation of benefits and costs. To help argue this (E. Ostrom 1993) talks about how the willingness of farmers to invest in the maintenance of irrigation infrastructure in an irrigation system is proof that they get more from the maintenance than they lose. These costs and benefits that are assumed or gained by individuals are only economic and not wider than that; however individuals are rational as well as social beings who also make decisions based on other factors like trying to maintain or contest social relations.

Another assumption that underlies this argument is that communities are a homogeneous and exist in a political setting in which the individuals that are affected by rules are involved in the design of those rules, hence the prescription on collective action in designing and modifying the operational rules.

Communities are able to enforce their own rules without the interference of external authorities and that enforcement by externals is no guarantee to compliance with the institutions. Although the Ostrom's mainstream institutionalism highlights that the

communities are able to manage their own resources, it does not get in depth with the institutional arrangements that come with development interventions. One of Ostrom's design principles is about collective-choice arrangements in which she asserts that there is need for participation of the affected individuals in planning and modifying the rules. This principle assumes that a community is a homogeneous setting, where once participation is there; it means that the outcome of the meeting is a representation of what was agreed upon by all the individuals involved.

Estrom (1993) goes on to argue that the success of an institution is dependent on the endurance and compliance of the community with an institution, but this gives questions like, is compliance of a community on an institution a measure of its success? However, success is sometimes propagated and it becomes a model from the rest of the world to follow (Rap 2006). Estrom (1993) also shows that the identification of design principles from existing institutions is based on a simplistic view that the institutions existed in isolation of wider global movements and that they were coming from the communities. The argument here is that there is a chance that the similar patterns observed on the different case studies were as a result of policy models that were being promoted prior to the analysis of these cases (Rap 2006).

Water resources development and management is a matter of institutions and not engineering design, as evidenced now in the 21st century and also supported by (Castro 2007) who highlights that to a large extent the problems of water that we are facing in this day are not technical but are socio-political.

The term institutions is defined as the process where people come together to collaborate and harmonize their activities (Hans M. Gregersen 2007). Estrom (1990) defines institutions as the sturdy and formal rules and arrangements to perform a single function, however, in exercising the agencies people have, they may choose to follow institutions when convenient for them for instance, (Bhat and Qureshi 2013) discussed the religious water uses practices in Islam as not just spiritual but as a hygienic practice to keep the body free from harmful microbes such as bacteria that cause infections.. That been said, the rules in use may not serve a single objective. Therefore, institutions are a combination of policies and objectives, laws, rules and regulations, established organizations, passed Laws and core values, operational plans and procedures, incentive mechanisms, mechanisms norms, traditions, practices and customs (Bandaragoda 2000).

The institution serves different functions based, the definitions given above highlight that the institutions are humanly devised “constraints” to shape human action (Bromley 1987). However, the dynamics of human behaviour can trigger the possibility of a repetitive conscious or unconscious tradition in order to fit into a new environment, which might lead to the formulation of a new institution or neglect of an existing one. This implies that people will knowingly or unknowing make decisions they are comfortable with irrespective of the institutions in place.

More to that, institutions naturally have dual facilities to both constrain and liberate individual and group action. The dual facilities of institutions are of particular importance in water management because most water-related rules are meant to limit the socially undesirable behavior by individuals and groups in the distribution and use of water (Bandaragoda 2000). Institutions and performance are interlinked indisputably, however how institutions contribute or affect performance is important to identify and evaluate the needs for change in the institutions depending on the performance level (Bandaragoda 2000).

2.3 Institutional Framework

Having an adequate and conducive institutional framework in place is fundamental for reaching a strong Integrated Water Resources Management (Global Water Partnership 2009). There is a need to focus on the enabling environment, the existing arrangements and roles and the development of the management instruments needed.

Enabling environment

The context or enabling environment within which IWRM can be implemented is as well often referred to as “water governance”. (Rogers and Hall 2003) Defined water governance as: "a range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services, at different levels of society". Effective governance systems are meant to enable practical management tools. Four fundamental dimensions of water governance have been identified:

- i. The social dimension, which focuses on equity of access to and use of water resources. This includes issues such as equitable distribution of water resources and services among various social and economic groups and its effects on society
- ii. The economic dimension, which highlights efficiency in water allocation and use

- iii. The political dimension, which focuses on providing stakeholders with equal rights and opportunities to take part in various decision making processes and
- iv. The environmental dimension, which emphasizes the sustainable use of water and related ecosystem (Bandaragoda 2000)

Key components of the concept of water governance are

- i. Power relations and interest from the perspective of actors and institutions,
- ii. Principles, related to transparency, accountability and stakeholder engagement and
- iii. Governance performance including efficiency and effectiveness of government in delivering and achieving its goals (Jepperson 1991).

The institutional framework for IWRM focuses on successfully forging collaborative relationships for effective and efficient coordination resulting in sustainable water resource management (Bulkley 2004). Therefore, where possible the relationships build on existing structures. Where needed, new and creative relationships are proposed and strengthened if required

CHAPTER 3: METHODOLOGY

3.1 Study Area

Rwanda is located in Central Africa as depicted in Figure 3.1 between latitudes 1⁰4' and 2⁰51' south, longitudes 28⁰45' and 31⁰15' east. It has a surface area 26340 sq.km with a population size of 12,163,917. Rwanda has a hilly mountainous relief with an altitude ranging between 900 m and 4507 m.



Figure 3.1 A map of Africa showing the position of Rwanda (Bayview 2016)

Rwanda is a water scarce country with renewable water resources 815 m³/capita/yr, receiving average rainfall of 1400 mm. Figure 3.2 shows lakes and rivers in Rwanda



Figure 3.2 A map of Rwanda showing water bodies (world atlas 2017)

Rwanda lie into two main hydrological basins and these are the Congo and Nile River basins. “A Catchment or river basin is defined as a part of the surface of the earth that drains into a common system” (Aboniyo, et al. 2017). The Congo-Nile divide is more or less perpendicular to the volcanoes that serve as a natural barrier to the catchment basins in Rwanda, North Kivu and southwest Uganda (REMA 2015), The Congo River Basin lies to the west of the divide, covers 33 per cent of the national territory and receives 10 per cent of the total national waters. The rivers on the west side of the divide; the Sebeya, Koko, Ruhwa and Rubyiro Rivers in Rwanda drain into the Congo River basin via the Rusizi River, then into the Atlantic Ocean. Lake Kivu is part of the Congo Basin; it is shared with the DRC and covers an area of 102,800 ha within Rwanda alone (REMA 2015). The Nile basin lies to the east of the Congo-Nile divide, covers 67 per cent of the total national territory and drains 90 per cent of Rwandan waters, mainly through the Nyabarongo and Akanyaru Rivers. The latter merge and make up the Akagera River, Lake Victoria’s principal tributary, which has an average flow of 256 m³/s and is considered to be the White Nile’s main source, contributing 9 to 10 per cent of the total Nile waters with a length of 6,695 km; the Nile River is the world’s

longest watercourse. Its main tributaries are the White Nile and the Blue Nile (NIB 2005).

Table 3.1 below shows in details water availability in Rwanda.

Table 3.1 Water availability in Rwanda

ITEMS	STATUS	POTENTIAL	STATUS	POTENTIAL
Surface water	101 lakes covering an area of 149.48 ha	7-6 billion m ³ /year	101 lakes covering an area of 149.48 ha	6.826 billion m ³ /year
	861 rivers of a total length of 6,462 km		861 rivers of a total length of 6,462 km	
Ground water		5-4.5 billion m ³ /year		4,554 billion m ³ /year
Rain water		28-25 billion m ³ /year		27,505 billion m ³ /year
Water yield/person		1,135-193 m ³ /person/year		670 m ³ /person/year
Water storage/person		7-5 m ³ /person/year		447 m ³ /person/year

(REMA 2015)

Rwanda is divided into 9 first order catchments (with various second or further order catchments, which jointly constitute the first order catchments) seven of these nine catchments are part of the Nile Basin, and two (in the West, on the shores of Lake Kivu) are part of the Congo Basin.

3.2 Data source and information

The methodology focused on desk reviews of water resources management policies and the existing institutional framework in Rwanda.

This study focused on collecting qualitative data which made use of secondary information. Secondary information was gathered from Water related policies, laws, publications, and national documents in relation to the research topic. These documents were obtained from the Government of Rwanda official websites and a personal visit to the Ministry of Environment and Natural Resources (MINIRENA) was done to have conversations with Rwanda Water and Forestry Authority employees to have a deeper understanding of how the system works.

3.3 Data analysis

Water resource institutional arrangement was assessed using four tools by Global Water Partnership which identify main institutional functions that are necessary to achieve strong institutional arrangement are used; these tools are:

i) Regulation and Enforcement

According to (Global Water Partnership 2017) Regulation and compliance refers to three different steps, and these are; having an Enabling Environment (setting up agencies that can establish and enforce policies on water management effectively), precisely indicate role of local-level authorities and provide information (provided by monitoring and evaluation bodies) that help in enforcing policies and laws effectively.

ii) Roles and features

The basic role of water institutions is to ensure that water supply and sanitation services are delivered and as IWRM principles entail; “water should be provided in adequate, quality, and affordable supplies” (Global Water Partnership 2017). These services can be given by public, private, or cooperatively owned and managed institutions and community-based water supply and management organizations.

iii) Coordination and facilitation bodies

Water being at a center of development, there are many sectors that are directly or indirectly affected by the management of this vital resource which result into having many actors in the water management sector. The effectiveness of an institutional arrangement depends on how its political, social, and administrative systems are able to carry out their particular roles; therefore there is a need of coordination and facilitation bodies at a national, regional and

international level to harmonize the actions of all involved entities. These bodies act as mediators in water resources management. These coordination and facilitation bodies for a water management system need to consider and be compatible with the legal frameworks as well as the water related policies in place. These include transboundary organizations which provide a framework for coordinating and facilitating the management of water resources across international boundaries, the national apex bodies which act as the central actor in water resources management to coordinate and ease the tension between different competing actors, civil society organizations which act as channels with which the population communicate their needs to other involved stakeholders and basin organizations with a mandate of monitoring, planning and developing water resources on a basin level (Global Water Partnership 2017).

iv) Capacity building

Capacity building is very essential in achieving a strong and effective institutional arrangement. This is done to make sure no stakeholder is left behind or slows down the achievement of the desired goal of managing water resources sustainably. Capacity building can be done on an individual, institutional or society level. The main objective is to identify the gaps and linkages within the institutional arrangement and show what can be improved. There should be information sharing and gathering networks and be able to provide training for water professional as well as building partnerships between stakeholders (Global Water Partnership 2017).

Assessing the capability of institutions to implement IWRM was assessed using three elements that are considered essential in the context of the delivery of policies as indicated in the guide for the review of institutional arrangements by the European Training Foundation; these are:

- i) Stakeholder participation: This refers to how capable the institutions are in engaging various stakeholders to come up with a common understanding and agreement.
- ii) Evidence based policymaking: This is the ability to study and understand the environment (access, gather and analyze data/information) and to be able to develop and articulate a vision or goal.

- iii) Policy cycle management: This includes the ability to explore different perspectives and manage priorities, be able to formulate and plan and manage projects and programs and evaluate the advancement to ensure set goals are met (European Training Foundation 2014).

CHAPTER 4: RESULTS AND DISCUSSION

4.1 The general water resources management overview in Rwanda

Rwanda is a scarce water country. Water is the most valuable of the natural resources of the country. Due to the population and the economic growth development of Rwanda, the Government of Rwanda has put in place the institutional framework for the conservation, protection, and management of the country's water resources resulted in the formulation of the water and sanitation policy of 2004 revised in 2011 and became the National Policy for Water Resources Management, and the Water Law No. 62/2008 to strengthen the water resources management sub-sector. The 2008 Water Law provides an institutional framework for the coordination of water resources management, a key ingredient of integrated water resources management; devolves water resources management functions to District based and user organizations, as required by the principle of stakeholder and user participation; and provides for charges to be levied on the use of water, which is an important tool for giving effect to the widely accepted principle 'water has an economic value'.

Rwanda's water sector is governed under a complex institutional framework. The institutions are categorized into policy and oversight institutions, management and implementation institutions, service provision institutions and regulatory institutions as shown in table 4.1. The institutional framework operates through the sector wide approach, which applies in the planning and budgeting process.

The institutional framework lacked a coordinating mechanism and the functions related to water resources management were not fully developed as well as the role and responsibilities of each sector based institution regarding water resources management were not clearly articulated, leading to confusion, uncoordinated action and overlap in implementation. Additionally, there was no institution with overall authority with a capacity to regulate the use and management of water resources by other sector based institutions. Capacity gaps arose mainly from limited technical and financial resources available for water resources management. These capacity limitations are even more acute within the decentralized institutions at a district level. In consequence, there has been a high degree of degradation of water resources arising from activities within the various sectors (MINIRENA, 2011). With the promulgation of a law establishing the RNRA with the mandate to lead the management of natural resources across sectors, there is potential to achieve a coordinated approach to

water resources management, in line with the Integrated Water Resources Management concept. To address the capacity limitations being faced by the sector, it will require concerted efforts in resource mobilization, human resource development and institutional capacity building (MINIRENA, 2011).

Table 4.1 Institutional framework in water sector

No	INSTITUTIONS	FUNCTION AND RESPONSIBILITIES RELATED TO WRM
Policy and Oversight Institutions		
	Ministry of Natural Resources (MINIRENA)	Formulation of Water resources management policy, strategic planning, coordination, quality assurance, monitoring, evaluation and capacity building. Put in place legal and regulatory framework
	Ministry of Local Government (MINALOC)	Establishment, development and facilitation of the management of efficient and effective decentralized government systems capable of law enforcement and delivery of required services to the local communities.
	Ministry of Agriculture, Animal Resources (MINAGRI) and affiliated agencies	Development, planning and coordination of the implementation of agricultural development policy in the country including irrigation, fishery and livestock.
	Ministry of Infrastructure (MININFRA)	Development of institutional and legal frameworks, national policies, strategies and master plans relating to water supply and sanitation, energy and transport subsectors.
	Ministry of Health (MINISANTE)	Policy formulation and promotion of hygiene and public health.
	Ministry of Family and Gender Promotion (MIGEPROF)	Coordination of gender, promotion and mainstreaming and family planning activities.

	Ministry of Education (MINEDUC)	Promotion of education including/capacity building and curricula development relating to water sciences and research on water resources management in schools and other educational institutions.
	Ministry of Commerce (MINICOM) and affiliated agencies	Policy formulation and promotion of investments by the private sector in water resources management/industries and manufacturing.
	Ministry of Foreign Affairs and Cooperation (MINAFFET)	Foreign and diplomatic relations including regional and international cooperation over shared waters.
	Ministry of Disaster Management and Refugee Affairs(MIDIMAR)	Coordination and policy formulation on disasters preparedness including flooding, landslides, droughts.
	Ministry of Defense (MOD)	Coordination and policy formulation on all issues related to the country security including water resources
Financing Institutions		
	Ministry of Finance, Planning and Economic Development (MINECOFIN)	Mobilization and allocation of financial resources for water resources development.
	Development partners	Provision and mobilization of financial and technical resources for implementing water resources management and development sector activities.
Regulatory Institutions		
	Rwanda Environment Management Authority (REMA)	Develop regulations and ensure protection and conservation of the Environment and natural resources across the Country.
	Rwanda Utilities Regulatory Agency (RURA)	Enforcement of compliance by public

		utilities with the laws governing their activities.
	Rwanda Bureau of Standards (RBS)	Provision of standards based solutions for Consumer Protection and Trade promotion for socio-economic growth in a safe and stable environment.
	Rwanda Natural Resources Authority (RNRA)	Autonomous agency responsible for management of natural resources including water resources management and allocation
Management/service Institutions		
	Water and Sanitation Corporation (WASAC)	Autonomous agency responsible for the delivery of water supply and sewerage services in the major towns and large urban centers including provision of oversight and support services to the local communities and other water supply service providers.
	Rwanda Development Board (RDB)	Facilitation of investment and support services to investors.
	User Communities	Management of water resources in the course of their productive and consumptive activities on a day to day basis
	Districts	Implementation of the government policies and laws
	Private Sector	Design, construction, operation and maintenance of water resources management infrastructure. Conduct training and capacity building for both central and local government staff. Provision of other commercial services.
	Non-Governmental Organizations (NGOs)	Supplement the public sector efforts in water

		resource management and development.
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(MINIRENA 2011)

The Government of Rwanda has put in place the Law No 06/2017 of 03/02/2017, establishing the Rwanda Water and Forestry Authority (RWAF) and determining its mission, organization and function. RWAF is one of the three institutions from the reforms of the former Rwanda Natural Resources Authority (RNRA). The law N°06/2017 of 03/02/2017 repealed the law N°53/2010 of 25/01/2011 which was establishing RNRA and has put in place three institutions such: Rwanda Water and Forestry Authority (RWAF), Rwanda Land Management and Use Authority (RLMUA) and Rwanda Mines, Petroleum and Gas Board (RMPGB).

Mission of RWAF

Rwanda water and forestry authority has a big mission composed of several following elements:

- i. To implement policies, laws, strategies and Government decisions related to the management of forests and natural water resource
- ii. To advise Government, monitor and coordinate the implementation of strategies related to the management of forests and natural water resources,
- iii. To assist public and private institutions in charge of management of forests and natural water resources in a bid to fight erosion;
- iv. To establish programs and strategies for production of tree seeds;
- v. To prepare programs of reforestation, forest promotion and appropriate management and support districts in the management of forests and natural water resources;
- vi. To undertake research, studies and other relevant activities with regard to the importance of forests in the national economy and to the exploitation of trees and wood based products and disseminate the findings;
- vii. To assist in the establishment of standards and regulations relating to the management of forests and natural water resources;

- viii. To monitor the respect of conditions to get a permission for water use;
- ix. To provide advice on determining fees to be paid for the use of natural water resources;
- x. To monitor the execution of agreements related to natural water resources management and distribution at the regional and international level;
- xi. To cooperate with other institutions and international organizations whose mission is related to forests and natural water activities.

4.2 The institutional set up

Integrated water resource management is the mandate of the Ministry of Natural Resources (MINIRENA) and delegated to the authority dealing with the day to day implementation of the policies, the Rwanda Water and Forestry Authority. MINIRENA hosts next to RWFA three other authorities; Rwanda Environmental Management Agency (REMA), Rwanda Land Management and Use Authority (RLMUA) and Rwanda Mines, Petroleum and Gas Board (RMPGB). As part of the Green Growth and Climate Resilience Strategy, MINIRENA developed as well a national climate change and environment fund (FONERWA).

At the ministry level four units exist that deal with policy development and providing advice to the minister. These units are: a planning, monitoring and evaluation unit; a mining and petroleum unit; a finance and administration unit; and a land, environment, water and forest management unit. This last unit is, of course, an important unit in the relation with RWFA since among its staff the following two positions are defined: a Water Resource Management Specialist and a Trans-Boundary Water Resource Initiatives Specialist.

RWFA as a new established authority, its structure and organigram is not yet approved and gazetted therefore it is still working with the departments that were functioning under RNRA. RNRA had as well various departments and one Division under the responsibility of the Director General. The division and different departments are: a Corporate Service Division; a Lands, Mapping & Registrar of Land Titles Department; a Geology and Mines Department; a Forestry and Nature Conservation Department; an Integrated Water Resource Management Department.

Within RNRA, different departments are having an interest in the IWRM agenda. Land and its various land uses are crucial to support the understanding of demands and potential

conflicts, Forestry and nature conservation are of importance in preserving the catchment areas and in preventing erosion and mines are traditionally a bulk user of water, with a substantial risk of contamination, though apparently, a lesser risk in Rwanda, from the waste water produced. This is however, just a small reflection of all key stakeholders at the level of the government. The following table provides an overview of Rwandan institutions involved in water resources management.

The first five policy and oversight institutions are, of course, critical; MINIRENA, the Ministry of Local Government (MINALOC), the Ministry of Agriculture and Animal Resources (MINAGRI), the Ministry of Infrastructure (MININFRA), and the Ministry of Disaster Management and Refugee Affairs (MIDIMAR). These mentioned ministries are either affected as primary users or instrumental in translating IWRM within the decentralization agenda. Rwanda Ministry of Finance and Economic Planning (MINECOFIN) as the financial entity is necessary since all the budgets for the Districts are channeled through this Ministry. Other important players are, of course, REMA, Energy Development Corporation Limited (EDCL), Water and Sanitation Corporation (WASAC), the districts and user committees. The user committees are often organized in water supply committees or agricultural water user groups often linked to irrigation schemes.

Analyzing in more detail the different key institutions and their roles with regards to IWRM, the following picture emerges:

MINIRENA

MINIRENA is responsible for the formulation of the water resources management policy, strategic planning, coordination, quality assurance, monitoring, evaluation, and capacity building. MINIRENA puts in place the necessary legal and regulatory framework, implemented through its agencies REMA, RLMUA, RMPGB, RMA and RWFA.

RWFA is de facto the Authority under which IWRM is implemented. The department of IWRM leads the day to day operations. Other departments under the three authorities under MINIRENA are all linked to either the use of land, minerals or forestry and nature conservation and strong inter-linkages with the IWRM department are essential.

REMA is responsible for ensuring that issues relating to environment and climate change are integrated into all national development programs and plays a leading role in ensuring the implementation of the national Green Growth and Climate Resilience Strategy adopted. REMA ensures that environmental regulations for sustainable development are complied with and, therefore, responsible for conducting Environmental and Social Assessments of strategic plans. Environmental impact assessments (EIA) are carried out by the Rwanda Development Board (under the responsibility of REMA) as part of the one-stop investment promotion strategy.

The Rwanda Meteorological Agency (RMA or Meteo Rwanda) is responsible for meteorological and climate monitoring, forecasting and information services. Formally it is the only agency with a mandate to monitoring meteorological and climatic parameters. Previously under MINIINFRA, RMA was moved to MINIRENA which is expected to improve collaborative working on water issues. For IWRM they are particularly important as a source of information and knowledge regarding inputs (precipitation) to the hydrological cycle as well as long term climatological trends and projected climate change.

MINALOC

MINALOC is responsible for the establishment, development, and facilitation of the management of efficient and effective decentralized government systems, capable of law enforcement and delivery of required services to the local communities. In 2014, MINALOC launched a public restructuring, whereby more staff was transferred from national level to district level. The restructuring reiterates the importance given to the decentralization process, whereby the district level is responsible for implementation of policies (they are endowed with a high degree of autonomy with regards to planning and budgeting). Financial flows between sector ministries and the districts are channeled via the ministry of finance.

LODA, the Local Government Development Agency under MINALOC, ensures a more technical relation between the districts and the sector ministries and is involved in the performance contracts at the district level, which since the budget year 2016/17 are becoming more outcome oriented. The role of the provincial level is coordination between districts. All staff at the districts are on the payroll of the district. However, staffing levels at the district are considered insufficient, and the districts continue to struggle having sufficient budget to ensure adequate staffing.

MINAGRI

MINAGRI is responsible for the development, planning and coordination of the implementation of agricultural development policy in the country including irrigation, fishery and livestock. Agriculture is the largest consumptive and non-consumptive water user in the country, where 90 % of the population is involved in agricultural activities (REMA 2011). Apart from intensification and diversification of the agricultural sector, the ministry addresses in its strategies as well a focus on sustainable management of natural resources, particularly soil and water (MINAGRI 2010).

The Land Husbandry, Irrigation and Mechanization Department (LIME) in the Rwanda Agricultural Board (RAB) has the mandate of Sensitization and mobilization of farmer beneficiaries and marketing entrepreneurs to implement irrigated and commercial agriculture; develop comprehensive land husbandry work on rain-fed command-areas catchment and irrigable land; provision and installation of the entire irrigation infrastructure on small, medium and large scales; command area management including operation and management of irrigation infrastructure.

The ministry has developed an irrigation master plan for the country, which needs to be further harmonized with the 2014 Rwanda National Water Resources Management Plan. It needs to take into consideration that further irrigation expansion affects wetlands and the functions that these wetlands fulfill in the water system in Rwanda. A sustainable long-term strategy fits well in the IWRM concept.

MININFRA

By Ministerial Order No 87/03 of 16/08/2014, the transfer of responsibilities and property of the former Energy, Water and Sanitation Authority (EWSA) has been regulated. The existing responsibilities have been assigned to three independent corporations, being: EDCL, Energy Development Corporation Limited; EUCL, Energy Utility Corporation Limited; and, WASAC, Water and Sanitation Corporation.

EDCL and EUCL form part of the Rwanda Energy Group (REG). For IWRM especially EDCL and WASAC are of importance, the latter responsible for providing quality, reliable and affordable water and sewerage services. Representatives of WASAC have actively

participated in the design of the IWRM program. From a drinking water service provision perspective, the corporation has to deal with various entities to obtain licenses, which include Rwanda Development Board (RDB), Rwanda Environmental Management Agency (REMA) and RWFA/IWRM amongst others, hence, the interest in the collaboration on water resources. WASAC has also developed a national water plan in 2012.

Within MININFRA, three national task forces exist, of which one is of interest for IWRM: the national task force storm water management, focusing on land use and urban planning, as well on water quality and environmental protection.

MIDIMAR

The June 2012 Disaster Management Policy identifies three key goals to be achieved; These are: building the resilience of communities, infrastructures and service providers to disasters by reducing their vulnerability and increasing their ability to withstand and minimize the effects of disasters and complex emergencies through adaptation to climate change by enhancing preparedness; providing fast, coordinated, effective and appropriate responses to disasters and complex emergencies; and ensuring timely recovery from disasters and complex emergencies, and leaving communities and families in a better position to withstand future hazards as well as building back better.

The minister of natural resource management is a member of the national Disaster Management Executive Committee (NDMEC), the highest disaster management decision-making body.

The policy identifies various hazards that could occur in Rwanda for which it has assigned lead players in case such disasters happen. In the situation of floods, landslides and mudslides, MINIRENA will ensure the role of co-lead. In other kind of disasters MINIRENA will play a less prominent role.

The three mentioned hazards have a strong link with integrated water resource management. IWRMD is involved with MIDIMAR in preventing these kinds of hazards by identifying timely interventions.

MINECOFIN

MINECOFIN is ultimately responsible for mobilization and allocation of financial resources for water resources development. MINECOFIN plays as well an important role in the Public Service Commission (PSC), ensuring that decisions made by the PSC on integrated water resources development interventions will be implemented by making the required funds available. Funds for interventions foreseen at the district level are channeled through MINALOC.

RDB

RDB is responsible for the identification of potential sources of rapid and sustainable growth within the agricultural sector. It will identify priority actions needed to stimulate increased agricultural growth and will identify key policies, institutional reforms and supporting investments needed to unlock growth in the country. RDB has put in place a one-stop investment promotion centre. To ensure environmental compliance of investment initiatives, RDB requests that EIA be conducted (if required). It oversees these EIA under a delegated responsibility from REMA.

RNRA

The Rwanda Natural Resources Authority was established by Law 53/2010 of 25 of January 2011. RNRA was the lead organization for IWRM in Rwanda and the RNRA-IWRM department started its operations in 2012. However, recently the single Rwanda National Resources Authority has been substituted by three new authorities as mentioned above. The change implies that the forest management and water department together form a new authority.

Over the years, several studies have been commissioned to assess the institutional aspects and capacity building situation for IWRM. In March 2015, a final report of a study was published, which had been commissioned by the Embassy of the Kingdom of the Netherlands. The institutional scan identified the most relevant stakeholders in the Rwandan urban (water) environment coming from public organizations, including knowledge institutes, Donor agencies, NGOs, network organizations as well as private sector entities, all involved in the

water sector (VIA Water 2015). Although the focus was not specific on IWRM, many of the mentioned stakeholders also play a role in IWRM activities.

4.2.1 Existing coordination mechanisms

The water law (law no 62/2008) sets the principle of management delegation from a national level to ultimately the water user associations. It indicates the hierarchy of plans to be made and gives the mandate to the various levels to either develop plans or take responsibility for the management of the implementation of the plans.

Coordination mechanisms need to be in place, ensuring that planning and management of the implementation take place.

The Water Law describes in its articles the different organs to be created or tasks attributed to existing entities related to IWRM initiatives.

The institutions in charge of water resources management under the Water Law (2008) are:

- The Ministry in charge of water resources (Art. 15), which is now the Ministry of Natural Resources;
- The National Water Consultative Commission (NWCC) (Art. 16);
- The Rwanda Water Authority (Art. 17), the role, which is played by Rwanda Water and Forestry Authority (RWFA);
- The Water Inter-Ministerial Committee (WIC) (Art. 18);
- The district committees for hydrographical basins (Art. 20);
- The basin committees at the sector level (Art. 22);
- The local water associations (Art. 24).

4.2.1.1 Existing platforms at the national level.

Further detail on the composition and functioning of the NWCC is provided through a Prime Minister's Order (No. 143/03 of 2013): The National Water Consultative Commission shall be a consultative organ without legal personality and financial and administrative autonomy. The NWCC may provide its recommendations on issues submitted to it, and the recommendations may be implemented. The Ministry in charge of water resources makes

follow up on the implementations of the recommendations given by the Consultative Committee.

The composition of the Commission is determined by the same Prime Minister's Order and it includes six ministers (Minister in charge of water resources, Minister in charge of water supply and energy, the minister in charge of agriculture and animal resources, the minister in charge of administration and local government, the minister in charge of natural disasters management and the Minister of defense), four Director Generals (Director General of the authority in charge of water resources management, Director General of the Rwanda Bureau of Standards, Director General of the authority in charge of water supply and energy, Director General of the authority in charge of environment, the Chief Executive Officer of Rwanda Development Board, the Director General of Rwanda Agricultural Board, the Representative of the Private Sector, the representative of Universities offering courses related to water and lastly a representative of non-governmental organizations working in water sector. The commission is shared by the minister in charge of water resources and meets twice a year and whenever necessary.

A second platform attached to the Prime Minister's Office is the Water Inter-Ministerial Committee. Its membership is composed of representatives of the departments dealing with water and is chaired by a Director in the Ministry in charge of water resources. It provides advice on draft water legislation, draft national water resources plans and all matters relating to water resources of national, regional or international relevance. While the Commission is a more policy-oriented advisory body, the WIC is to provide technical inputs on proposed plans and advise the Commission accordingly.

Both bodies are in place, but they have not met very frequently. While the government participants in the NWCC are clearly identified, it turns out difficult to identify the right organizations, people or institutions for the three other members.

Non-governmental organizations that have an important stake in water resource management are however, few, and more likely to be found at the decentralized level. So far, no national level operating NGO has been identified to take its seat in the National Water Consultative Committee.

4.2.1.2 Existing platforms at the catchment level.

Rwanda is subdivided in nine level-one catchments, of which two (2) catchments are connected to the Congo basin and the remaining seven (7) to the Nile basin. From an administrative perspective, the country is divided into five provinces and thirty districts. Administrative boundaries do not correspond with hydrological divisions.

Rwanda has not made any provision by law for establishing formal autonomous platforms at the catchment level. However, Ministerial Order No. 005/16.01 (Art. 11) makes provision for cooperation between district catchment management committees in those cases where districts share the same basin. This is frequently the case, and is in line with Article 81 of Law No. 87/2013 of 11 September 2013. This article determines the organization and functioning of decentralized administrative entities. Per this article, districts may enter partnerships, pull together their resources for the conduct of activities of common interest and even establish joint institutions and departments.

4.2.1.3 Existing platforms at the district level.

The Water Law provides provisions for the establishment of district committees for hydrographical basins (Article 20 of the 2008 Water Law). The Ministerial Order, 2013, provided further clarification with regards to the composition of the district committees, prescribing participation of the following representatives:

- The District vice Mayor in charge of economic affairs;
- The in-charge of water at the District level;
- The in-charge of agriculture, animal resources, land, urbanization, urban development, forests, infrastructure and environment at the District level;
- A representative of hydrographic basin committees at each Sector of that District;
- A representative of National Women Council at the District level;
- A representative of the National Youth Council at the District level;
- Two (2) representatives of farmers at District level;
- A representative of water user organizations in the field of agriculture at District level;
- A representative of water users in domestic activities at the District level;

- Two (2) representatives of non-government organizations operating in the field of water in the District;
- A representative of the Private Sector at the District level;
- One staff of the National Authority in charge of Natural Resources operating at the level of the hydrographic basin.

The total number of participants in the District committees is 14 members, excluding additional participants in line with the provision to make use of competent people in the water domain. The committees should meet quarterly, or whenever it is considered necessary.

Per article 21, the District Basin Committee is endowed with the following powers:

- To propose the initial version of the master plan and management of the basin waters as provided for in this law;
- To propose to delimitation, if necessary, of under-basins and designation of the aquifers for which an integrated management of the water resource must be done;
- To formulate orientations and proposals concerning the planning and management of the waters of under-basins or aquifers;
- To formulate propositions of arbitration or solution in case of conflict of water uses;
- To formulate opinions on all technical or financial questions submitted to it by the administration;
- To value the relevance and feasibility of basin organs, to prepare their setting up if it would be judged necessary.

The Water Law envisages as well the establishment of basin committees at the sector level (article 22 and 23) for the management of a small basin or aquifer at the sector. By Ministerial Order the composition of the hydrographical basin committee at sector level reflects the composition of the District Committee. However, the District vice mayor has been replaced by the Executive Secretary of the Sector. The total number of members is 13. The sector-level committee is responsible for the following:

- To propose the initial version of the local master plan;
- To fix management procedures or the sub-basin waters or the aquifers, provided for under the law; and
- To formulate at its level propositions and opinions.

The district hydrographical basin committees operate at the district and sector level. Therefore, their jurisdiction is limited to the district or sector administrative boundaries. They take their decisions by consensus or, if this is not possible, by majority vote. The district level is too low to address the complexity of a large basin and therefore a Ministerial Order created the option to bring several district hydrographical basin committees (DHBC) together. The Ministerial Order N°005/16.01 of 24/05/2013, determining the organization and functioning of Hydrographical Basin Committees determines in article 11: “where hydrographic Basin committees of the same level share the same basin, they may collaborate for the proper management of the basin. The decision shall be reached on consensus, and if not possible, it shall be referred to a higher authority or to the Ministry in charge of water resources if the management of the basin involves several districts. The proposed Catchment taskforces develops further the collaboration in line with article 11.

4.2.2 Water user associations

Users of water can constitute a local association of water having legal entity in view of management, of enhancement of production, and protection of the water resources and fight against flooding.

The management of local water association is composed of representatives who have a role in the exploitation of rivers, streams, and lakes. The terminology "water user associations" has different connotations and often sector-specific, and can be linked to Agricultural water user associations or water supply associations. The proposed water user association at basin level is, in fact, a higher-level entity, which regroups representatives of the formerly mentioned user associations. Establishing the water user associations as referred to in Article 24 of the Water Law has yet to start.

4.3 Gaps and opportunities in the institutional structure and coordination mechanisms

At all levels, the understanding of the concept of integrated water resource management needs further attention, despite efforts already made by RWFA to enhance awareness on the subject.

4.3.1 National level

4.3.1.1 Identified gaps

To date, a pragmatic platform capable of making integrated situational analyses at the national level is missing. The role of the NWCC and the WIC is more of a coordination and advisory type. Joint Sector Reviews remain limited to the sector concerned and thematic working groups too non-committal. Furthermore, the relatively weak civil society organizations dealing with water makes it difficult to ensure participation of non-government actors in the NWCC, which puts pressure on the water governance principle.

The RWFA has the mandate to develop further such a platform but has not yet been able to start effectively such platform. This can be attributed to the fact that the authority is still rather new and must position itself in the playing field. Authority collaboration within MINIRENA is still weak, and management meetings address, at the most, progress of each authority. During meetings, less attention is paid towards integration of the various initiatives around land, forestry and nature conservation, water and mining and geology, which are very much interdependent. The IWRM approach should look to identify easy opportunities for inter-departmental collaboration, for example on information sharing.

One cannot ignore the fact that collaboration between different sector ministries is still weak and occurs mostly in solving a specific problem; instead of making sure that sector programs are in tune with the sustainable and economic use of the limited resources.

4.3.1.2 Opportunities

The MoU, governing the collaboration between MINIRENA, MINECOFIN, and the Embassy of the Kingdom of the Netherlands, signed in May 2015, indicates that specific attention will be paid to long-term strategic planning and interaction between water management, land management and food security, disaster reduction, also in the context of climate change. This acknowledgement paves the way for more intensified collaboration between the various authorities within MINIRENA.

Promotion of efficient and effective integrated water, land and related resources management, including investment planning and socio-economic cost-benefit analyses, trans-boundary water management, Institutional arrangements for cross-sector water and land management, including legislation and the introduction of gender aspects are inherent to this collaboration.

Such collaboration requires a pragmatic platform capable of making integrated situational analyses at the national level could benefit from the IWRM program. The program could address this issue through stronger integrating collaboration within the MINIRENA authorities and departments, starting to build an integrated land and water management platform. This platform can be extended by incorporating a limited number of key sectors like; agriculture, water supply, REMA, RMA and MIDIMAR. Limiting the size of the platform will keep the platform manageable and swift in its operations. DG-RWFA should take the lead in coordinating the platform and develop the IWRM agenda among the members.

4.3.2 Basin level

4.3.2.1 Identified gap

The national water resource management plan identified the lack of basin-level structures and proposed, in the long term, the establishment of catchment water management offices and catchment committees.

The suggestion to create the two entities at catchment level was not considered, a decision powered by a strong resistance to create an additional administrative level. Nevertheless, without creating an additional administrative level, there is a need to establish catchment water committees, which need to be organized in an efficient way, and which will have the required mandate to discuss catchment issues, having the capacity and mandate to prepare plans beyond the level of the district.

The difficulty arises from the legal documents that stipulate the tasks of the district basin committee and the basin committee at the sector level. The first task is the development of draft master plans and management plans. It provides the impression that a district catchment plan is composed of individual sub-basin plans and an overall catchment plan the sum of individual district basin plans. While issues and concerns of the different levels should be noted and taken into consideration, the catchment management plan should establish an integrated vision, in which local priorities and national developments are considered, while ensuring a sustainable management of the water and land resources. Once a catchment plan is developed, it should be translated into district plans to which the districts are committed and have the responsibility and the financial means to ensure its implementation.

Ensuring useful and equitable representation in the catchment committees (ensuring participation from the government as well as non-government actors and ensuring participation of women, being key players in the water sector) is important. It requires efficient communication mechanisms and stakeholder participation processes to ensure that all involved understand the consequences, be it opportunities or limitations that are the result of such integrated planning process.

At basin and district level, it is still difficult to identify the non-government participants in the process, while ensuring that they voice the concern of the users they represent and establish feedback mechanisms that enable the provision of information to the users.

4.3.2.2 Opportunities

The fact that the water law will be revised provides the opportunity to review the mandates of the different bodies and incorporate a provision for the establishment of a basin committee and its functions and tasks. It would as well require reviewing the mandates of the district basin committee and the basin committee at the sector level, to make integrated planning more realistic.

4.3.3 District level and below

4.3.3.1 Identified gaps

The introduction of IMIHIGO, which is a bottom-up planning and performance management framework, whereby community needs are translated into a District development plan, considering national priorities of sector ministries, Joint Action Development Forum (JADF) and Economic Development and Poverty Reduction Strategy (EDPRS II) considerations, started in 2006. The performance contracts are binding agreements between government agencies and the President of the Republic for the former to reach certain targets on socio-economic development indicators.

The stated objective of IMIHIGO is to improve the speed and quality of execution of government programs, thus making public agencies more effective. Performance contracts use an incentive-based mechanism, which favors delivery of sector outcomes and leaves little room for integrated planning at the district level. This would be a setback for introducing IWRM concepts at the district level. However, these shortfalls of the system have been

recognized and more integrated and joint planning is foreseen, however, not yet in sectors that are relevant for IWRM.

The relation between district governments and the RNRA-IWRM is also somewhat difficult. While RNRA- IWRM does not have any field officer (it seems that no field officers are foreseen), it tries to obtain part of its information from water supply or environmental district officers. These officers do not have specific experience in water management, and they work for the district (or sometimes for EWSA). Consequently, RNRA-IWRM cannot fully rely on the mentioned district officers to obtain information or to provide adequate service to water users.”

This situation has not been solved and given the staffing levels of the IWRM department it will also not be easy to make sure that this relationship improves at the short-term.

4.3.3.2 Opportunities

As part of the decentralization agenda, (MINALOC 2012), more autonomy has been granted to the districts, while ensuring that an adequate governance system is in place.

The overall goal of the policy is to deepen and sustain grassroots-based democratic governance and promote equitable local development by enhancing citizen participation and strengthening the local government system while maintaining effective functional and mutually accountable linkages between Central and Local Governments entities.

Districts are an important player in the process to make IWRM work at the decentralized level. Planning, budgeting and implementation will be done at this level. One of the weaknesses identified in the planning process was the difficulty in addressing integrated development, which requires joint sector planning. Having realized the need for more joint planning, more room was created in the budget year 2017/18, for interactive planning (joint performance agreements) around 7 strategic issues, which are included in the performance contracts of districts, being:

- Agriculture;
- Rural settlement and urbanization;
- Social protection;
- Service delivery;

- Export promotion;
- Energy; and
- Job creation.

Integrated water resources management at the district level will be a new phenomenon as well, but does not fit into the seven priority areas as mentioned above.

Nevertheless, given the nature of integrated water resource management, it makes sense to include integrated water resource management as the “eighth strategic issue” following a similar strategy of interactive planning. As part of the Local Economic Development Approach, districts have developed a potentialities assessment, which includes a lot of important information that is of interest to IWRM. Furthermore, districts have experience with thematic working sessions under the Joint Action Development Forum.

Collaboration between the relevant sectors needs to be guided by RWFA, who will play an active role in translating catchment planning into district action. Since RWFA will not have its own staff at the district level, the department depends on the collaboration with the existing staff at the district, which, de facto, requires joint action planning.

4.3.4 Other identified gaps

There are important missing platforms, which should be addressed and these are: learning platforms and platforms for knowledge management. Knowledge management has remained a blind spot, either because of lack of knowledge management capacity within the organizations or by failing to take up the knowledge management role.

4.4 Proposed adjustments of mandates / tasks of relevant organizations.

4.4.1 National level organizations / institutions

RWFA

Given the complexity of the water governance framework in Rwanda and the willingness to achieve the objectives stated in the water policy, RWFA and its departments should be

developed into a recognized and professionally acknowledged integrated land, water, and related resources management entity.

It requires a gradual shift, from the current situation, whereby the IWRM department within RWFA is working towards a more integrated land and water management platform. This platform can make use of the existing capacities of the sister authorities in MINIRENA, emphasizing the interaction between water management, land management, and challenges like disaster management, climate change and others.

4.4.2 Basin level

To ensure that these, yet to establish, Catchment Committees become functional, there is a need to work with representatives per district. The Catchments Task Forces should be put in place, and therefore, be composed of selected representatives from the District Hydrographical Basin Committees of all districts within a catchment, as follows:

- Vice Mayor for Economic Affairs;
- District Officer in charge of water resources;
- District Officer in charge of agriculture;
- District NGO representative;
- District private sector representative;
- District Women Council Representative.

At least one of the above members should be a female participant. The delegations reserve, on top of the delegates as mentioned above, five (5) spaces for district specific representatives, in function of the specific characteristics of the catchment. Possibly, it can include important NGO and/or private sector representatives (like tea estate or processing factory) to complement the committee.

Before meeting as a Catchment Committee, stakeholder engagement workshops need to be organized at the district level, providing opportunities to organized and non-organized water users (male and female) to voice concerns and issues, to be forwarded to the Catchment Committee.

The decision-making process could be as follows. The Integrated Water Resources Management Department (IWRMD) of the RWFA is the mandated authority to lead the

process of catchment planning, in collaboration with other central government agencies. The Catchment Committee will support the development of a draft catchment plan and ensure the necessary stakeholder consultations during the process. Approval of the draft plan by the districts is envisaged to precede formal submission to the Water Inter-Ministerial Committee (WIC) and further ratification after analysis by the National Water Consultative Commission (NWCC). Outcomes of the final plan will be disseminated to the public via district information sessions and making use of public notice boards at the district headquarters. District Hydrographical Basin Committees will be responsible for the implementation and monitoring of the agreed-upon basin plans.

The relevant institutional arrangements (including ensuring women participation in decision-making entities and the Catchment Committees) should be supported by regulations on the formulation and adoption of integrated catchment plans. The water law is to be reviewed this year regardless the fact that it was to be reviewed in 2016, therefore it is suggested that a task force within the IWRM department, with support from the Integrated Support Unit (ISU), should be established to make informed suggestions based on the experiences with the district and catchment level entities involved in the development of catchment plans.

4.4.3 District level and below

With the review of the Water Law, a revision is required of the mandate of the district basin committee, which has as part of its mandate the development of draft master plans and management plans. This level of plans should be developed at the level of the catchment, while the translation of the basin plan can be made at the district level, being responsible for its implementation.

Given the limited number of RWFA staff, and the mentioned "somewhat difficult" relation between RWFA and the district governments, the districts could review the job description of the identified staff that will be involved in IWRM. This person could follow a training (organized by RWFA) to ensure that the IWRM concept is well understood, and can be addressed at the district planning process. Further training of the vice-mayor for economics might seem useful as well.

4.4.4 Strengthening coordination between institutions

4.4.4.1 Horizontal strengthening

At the national level, horizontal linkages beyond the RWFA departments need to be further strengthened. This requires frequent interactions between the agencies of the various sector ministries as well as ministerial departments. The RWFA through the IWRM department will need to review and advise the various sector ministries on improving their respective master plans and harmonize these with the IWRM concepts. Such process will include the master plans of the Ministry of Agriculture (irrigation and livestock requirements), Department of Geology and Mines, especially regarding the aspect of waste water of the mining process, WASAC on the water demands for domestic water use and improvement of the sanitation approach, etc. These plans should be revised to account for sustainable use of water resources, and with special attention to the needs and demands of women.

At the national level, two committees have been installed: The National Water Consultative Commission, which has a more policy-making mandate and the Water Inter-Ministerial Committee (WIC), established by law, which provides the opportunity to bring together these various representatives from a more technical perspective. This committee meets twice per year, or whenever their input is required. DG RWFA is the executive secretary of the NWCC. The WIC should play an advisory role towards integrating water resources management among the various sector ministries. However, with regards to the WIC, there might be two obstacles; the size of the WIC will make it difficult to meet frequently, and given the fact that people have busy agendas, participants are likely to rotate between sessions of the WIC, jeopardizing the development of a common and harmonized agenda. Further clarification regarding the difference in role between the NWCC and the WIC might be required, with the latter being de facto a more technical meeting and the NWCC more involved in policy making.

DG-RNRA, having an important role to play vis-à-vis the NWCC and having an interest in a well functioning advisory support mechanism can support DDG-IWRM to introduce, smaller working groups, which can meet on specific technical aspects and which can be more flexible in preparing fruitful contributions to mainstream the IWRM concept. These can as well be instrumental in the preparation of the agenda for the WIC. Such working groups can be composed of the relevant MINIRENA authorities, MININFRA, Agriculture, and, depending

on the content, the Water Resources Regulation Unit and/or the Water Monitoring and Development Unit of the IWRM Department. Concerning floods and disasters management, a task force could be installed, composed of specialists from the Rwanda Transport Development Agency (RTDA), MIDIMAR and MINADEF, and the Water Monitoring and Development Unit of the IWRM Department.

Apart from working with ministerial department and agencies, it is important to strengthen as well the relation with relevant parliamentary commissions, to link issues related to water to other important discussions in the country, like climate change, peacekeeping, and food security.

A first activity to enhance horizontal linkages at the national level is to raise awareness about (the need for) IWRM among ministries and other national agencies (despite the awareness raising already being organized by RWFA-IWRM, more needs to be done). The IWRM department should develop a clear communication strategy, to disseminate IWRM concepts and present best practices to ensure that the added value of IWRM is shared on a regular basis. The objective of communicating best practices is to create interest and buy-in of related national level entities and other stakeholders.

On a more practical level, the ISU will support the IWRM department in finding innovative and rapid response modalities, like the earlier mentioned working groups, to ensure that key institutions become and remain committed to participating actively in IWRM activities.

4.5 Assessing the capability of the current institutional framework to implement IWRM

RWFA is the institution in charge of coordinating all the actors in water resources management. It oversees all the activities related to water management. However, it is still a new authority that has been established. Its structure and organigram has not yet been approved and gazette therefore it is still working under the departments that were functioning under RNRA. Therefore this assessment was done on the existing and working IWRM department in RNRA

4.5.1 Current institutional setup and staffing

The RNRA is composed of two units, one corporate services division and four departments. An SPIU has been put in place for RNRA in 2016, and the unit is in the process of developing its operational manual.

The 33-gazetted positions, foreseen at its establishment, were in practice never fully filled and already in 2014 it was argued that skills sometimes not fully match the job requirements, partially because the required skills are difficult to find in Rwanda. In 2014, the government launched a restructuring process to optimize staffing levels and since not all positions were staffed, a reduction from 33 to 24 staff positions was proposed whereby certain positions were abandoned, and others merged into one single position. Some new positions were as well created. In the initial 2012 structure seven out of the thirty-three positions were reserved for directors and heads of units, making the management rather heavy. The 2014 proposal included only two directors next to the head of the department and a total staffing plan of 24 positions. The difficulty to adequately staff all positions remains a challenge and to date four positions are still vacant.

Most of the staff members have an adequate professional background with either a BSc or MSc degree obtained from various universities either in Rwanda, the region or in the Netherlands as shown in Table 4.2. Universities and higher level entities cited are: Rwanda National University, ISAE, Makerere University (Uganda), Kenya Institute of Technology, Kenyatta University, University of Twente as well as Unesco-IHE (Water for Growth Rwanda 2017).

Table 4.2 Highest Level of education and main subject of studies

Highest level of education and main subject				
Background	BSc	MSc	A1 level	Grand Total
Administrative support to the HoD			1	1
Law	1			1
Geo-information science		1		1
Geography	2			2
Socio-Economics		1		1
Water resources survey/ management/ environmental management/ soil and water management	6	8		14
Grand Total	9	10	1	20

(Water for Growth Rwanda 2017)

Looking at the capability to act and commit from the organizational perspective, one can observe that the department faces challenges, but there are certainly many opportunities.

The main challenge the department faces is the number of staff in place to address all tasks at hand, like system analysis, coordination, facilitation and program and project management (including planning, monitoring, evaluation and information management). For various reasons, the department has encountered serious delays in taking up essential roles, required to provide information to efficiently plan and support water management decisions at catchment level.

To address the challenge of the staff size, the department is in the process of hiring interns that will participate in the field data collection process, to ensure consistency of data and monitor the data collection network. The interns may come to reduce the burden of the existing staff dealing with water monitoring to a certain extent, and they can concentrate more on the analysis and information sharing tasks. With regards to water quality control, the department has opted for the first three seasons to outsource this part of the monitoring and

data collection. Starting from season four, it is in plan that the department will become the implementing actor of the water quality control. Making information timely and adequately available should be a strong motivator for the department and provides as well the opportunity to become more visible to external customers and consumers of information.

With regards to another important function, the water permitting system, by the time the research was being carried out, the department was indeed facing a shortage of staff, and the two critical staff members, the lawyer and the hydrologist were not available. The lawyer was on maternity leave, while the only hydrologist employed in the department was pursuing his Master of Science in the Netherlands. There is therefore, beyond any doubt, need to strengthen the staff capacity for this task to avoid that absence of people stalls the intervention. New staff needs to be brought to the level as quickly as possible.

The departments' mandate in watershed planning, monitoring, and water governance, combined with the collaboration with the ISU provides a unique opportunity in support of the IWRM approach, if certain conditions are addressed and met. There should be five (effective four) watershed officers that will be full-time involved in the watersheds they oversee, meaning that most of the time they should be in the field instead of being in the office.

4.5.2 The capability to adapt and self-renew

The IWRM department is rather limited in its capacity to address the capability to adapt and renew. While the department tries as best as possible to address the IWRM agenda, it should be noted that many tasks that are implemented are ad-hoc and driven by priorities and emergencies, taking staff away from their official duties. There is no knowledge management strategy in place, and the existing monitoring activity is executed by the planning and monitoring unit in RNRA, where an officer is assigned to each department. This officer monitors monthly and quarterly the implementation progress of planned activities only. For the time being, it might be too artificial and beyond reasonable expectation to envisage much progress in this field. Nevertheless, the department should make a modest start, with support from the ISU to develop an initial strategy that addresses monitoring and learning, based on the experience recently initiated. This could include among others:

- Monitoring the performance, challenges, and successes of the four proposed pilot catchment offices (Cos). The results of this pilot can certainly guide the policy

discussion on the future setup of basin entities while acknowledging the autonomous and administrative role of the districts

- Document together with the ISU the planning process in the catchments, distilling learning elements for further improvement
- Monitor and improve the water governance modalities and processes.
- Monitor the level of engagement of the relevant agencies and ministries in accepting the IWRM approach and concepts
- Organize learning and exchange moments by introducing monthly one-hour lunch sessions, inviting consultants or other IWRM (or IWRM related) experts to present their experiences from Rwanda and abroad. A monitoring, evaluation and learning specialist can be envisaged in the team starting early 2018 when the ongoing catchment plans will be implemented. The future position can be included in the team at the department; individual job descriptions should incorporate monitoring and learning aspects whenever appropriate.

4.5.3 The capability to relate to external stakeholders

As mentioned already in the section dealing with the institutional setup, there should be a strong focus of the program to ensure that the department can effectively relate to external actors. Below opinion is based on several challenges the department is facing and opportunities identified.

The institutional position of the department is hierarchically too low to institutionalize the IWRM agenda. To institutionalize the concepts and approaches, the department needs to speak with authority on the subject and convene meetings with stronger/more influential agencies and ministries outside of RWFA. This aspect is critical since IWRM requires these other departments like agriculture, water supply, industry and mining, tourism and environment to discuss the economic, fair and sustainable use of water resources. To become this authority, it is, of course, important to provide the essential data and information, but more important it requires convincing the partners on accepting and implementing solutions that might not always be in line with their interests and expectations.

The existing staff profiles address only part of the required IWRM expertise and/or experience mainly tackling the technical aspects of IWRM. In liaising with other actors, the need emerges to have adequate staff in the team with economic, social, and resource planning

backgrounds. The need for diversifying staff profiles becomes clear if one assesses the current staffing profiles and the wider IWRM functions to be performed.

- As can be observed, many of the positions are geared towards the water resources information and monitoring function, some are geared towards the licensing activities, though it must be mentioned that the position of hydrologist and water use regulation officer are (temporary) not filled, which makes it quasi impossible to make any reasonable progress with the water permit task. Several positions have either a full or partial profile towards co-developing basin plans.
- One important aspect of IWRM is the need for strong water governance and an enabling environment. National platforms like the Water Inter-Ministerial Committee (WIC) and (National Water Consultative Commission) NWCC are in place. While it is still relatively early, given that these platforms have not met that many times, to reflect fully on their contribution towards the IWRM approach (in providing guidance to the department and other actors), there is need to strengthen these national platforms. Stakeholder participation at catchment, district and sector level needs be nurtured and, to make the dialogue effective, training/awareness needs to be provided to lower level government actors, NGOs, CBOs and the private sector.
- There is no enactment yet that water users are to pay for the water extracted. If enacted, the water permitting activity could become largely self-sustained, on the one hand, and it would at the same time increase the visibility of the department towards the public and other stakeholders (agencies, authorities and ministries). The challenges ahead combined with the need for change, the department should be able to develop a strategy how it would improve its position and where it would like to be in the public image in 2018. To become successful, the management needs a very proactive approach and excel in specific domains in the field of IWRM. Improving the performance of the department vis-à-vis interaction with other stakeholders will be more successful if the management in the department is backed by strong leadership in the RNRA and the willingness to bring all departments of RNRA in tune with the concept of IWRM. Harmonizing interventions, exchanging information and develop common strategies between the Departments of Lands, Forestry and Nature Conservation, and the IWRM department is of an essence.

4.5.4 The capability to deliver

The unpredictability of financial resources might remain a challenge for the coming years since commitments/ expenditure is linked to the availability of resources from the government.

- For the program to deliver and implement the minimum set of activities, continuous annual water monitoring, water permitting, updating IWRM plans, ensure stakeholder engagement, it is suggested to make a financial forecast for the coming five years. The department can then make a risk assessment in case of insufficient resources and make its arguments to ensure this minimum funding. Risks are gaps in data collection, inadequate planning processes or limited stakeholder engagement, which will each have an additional cost in the years to follow. Calculating these costs might give the authority a better negotiation position with the ministry of finance. This kind of negotiation will require however more involvement between the IWRM department and the financial director in the corporate service unit.
- Systems are in place, though they do focus more on internal processes and outputs than on outcomes and “impact”. Under the leadership of the DDG there is need to develop a 5-year strategy that should focus on how to ensure that IWRM is conceptualized with clear milestones and allocating contributions of the various divisions in the department. This strategic plan should as well include aspects on how lessons learned and pilots implemented can feed the policy debate at national level concerning IWRM.
- With support from the ISU and with backing from the EKN a more coherent staffing plan need to be realized, since the risks are very high that the department remains understaffed and continues staying too limited in focus.
- Staff positions that need to be incorporated in the department should be a mix of technical and non-technical positions.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

The existing water law was gazetted in 2008, while the water policy is of 2011. Therefore there is a need to update the water law in line with the water policy. The legal framework of IWRM is elaborated in the Water Law of 2008 and the respective ministerial orders since 2008. The framework is in line with the desire of the government to keep administrative levels limited and hence the decision not to establish water basin offices at the level of basins. There is, however, a need to establish basin-level task forces, which are composed of representatives of district basin committees, for developing integrated basin plans, which take into consideration district and water user priorities as well as national priorities.

Given that the Water Law will be revised, it is important to review mandates and roles of the different coordination platforms and address the omission of the Catchment Committee. IWRM and IWRM-ISU can set up a working group to address this aspect and incorporate early lessons from the pilot catchments. In general, the understanding of the concept of integrated water resource management is still limited. This hampers further collaboration between sector ministries, who have all prepared master plans. These master plans need to be further harmonized and reviewed in line with the National Water Resources Master Plan.

The proposed and now existing national platforms NWCC and WIC are not yet very instrumental. They have had limited number of meetings, and the agenda needs to be improved and representation of non-governmental participants in the NWCC has not yet been solved, thus affecting the governance aspect. The task division between the WIC and NWCC seems not always straightforward and should be with the support of IWRM-ISU further developed.

One cannot ignore the fact that the RWFA is still a young authority and needs to position itself better. Guidance and support from the Director General are important to develop the IWRM program into a land and water management platform, which embraces the other two newly established authorities; Rwanda Land Management and Use Authority (RLMUA) and Rwanda Mines, Petroleum and Gas Board (RMPGB), as well as Meteo Rwanda and REMA. Additionally, the ISU, which started in May 2015, is gradually positioning itself. There is a need for RWFA to work in close collaboration with sister authorities while keeping the momentum going to develop the program in a land and water resource management platform,

which opens the scope for collaboration with other authorities within MINIRENA in helping further develop the concepts around IWRM.

The WIC, while being a technical committee, it has a large group of participants and risks becoming too administrative and not serving its technical purpose. Besides, non-consistent participation from entities and having different representatives from one meeting to another reduces the effectiveness of the WIC.

There is also lack of a pragmatic, integrated water resource management platform capable of making integrated situational analyses at the national level.

The IMIHIGO planning process is mainly sector driven and incentive based. The budget year 2015/16 has introduced an outcome focus in the process in 7 strategic areas. IWRM does not fit in these seven strategic areas therefore IWRM at district level would require integrated planning. This aspect needs to be further addressed including recommending that the implementation of IWRM planning and management processes is included in the IMIHIGO contracts of key government bodies.

Capacity development of RNRA-IWRM is seriously challenged by the number of staff employed. Several critical positions that are required to address essential functions of the department are not in place, temporarily not filled, or just not enough in numbers. While the level of education seems adequate, there is a too narrow diversification of professionals within the department. Most of the staff have a technical water background, which is of course, important; though for implementing IWRM there is need to integrate staff with complementary skills and backgrounds (gender expertise, communication, water governance, water economics/accounting, etc.). This situation is considered critical for the development of the IWRM approach and to be able to live up to the IWRMD mandate and the expectations of the IWRM concept.

ISU has supported the IWRMD with the “retooling” of the monitoring network for measuring the water flows and the water quality aspects, which is one of the fundamental tasks of the department. Availability of data is limited since the collection of data has not taken place over the last two years. Retooling and training the staff in the collection of data and setting up a reliable data network is a major step forward. It is suggested that basic training of tools and related software should be organized by the manufacturer and then further followed up

through on the job coaching by the ISU. The option to incorporate interns in the data collection process is also an adequate solution for supporting immediate needs in data collection but more importantly, in addressing, possibly, future staffing challenges.

More to that, the department has so far only been able to provide limited “added value” to other players in the field, given that water resources and water quality data are not systematically collected, analyzed and translated in reports. A strong link with EDCL, RDB, and RAB/Agriculture can serve the purpose of making data dissemination an important activity of the department, therefore a strong working relationship with these agencies should be promoted by the department.

The water permitting system, a second important function next to data collection and monitoring, is severely hampered by the lack of staff. The consequence of not having additional capacity in house can be felt since the lawyer in charge of the process is on maternity leave and the hydrologist not around. Other staff members and mostly less informed are stepping in but might not have the right background to deal with the subject at hand.

There is also a problem of watershed managers that are not enough present in the field and lack accurate knowledge of the water users and uses in their catchments, as a result, Potential and existing conflicts are insufficiently mapped due. Future developments are as well not sufficiently addressed yet. While waiting for additional positions and introducing new ways of working, there is a need to train these staffs better and gradually at a more advanced level on the concepts of IWRM.

The current positioning of the IWRM department is not adequate. Combined with a limited diversified staff profile, the department lacks essential skills and competencies to engage with other ministries and departments to discuss sector plans and priorities and make them adhere to the IWRM approach and concepts. The department has not yet reached the stage that they can speak with authority on the subject.

Making the IWRM concept work cannot be the sole mandate of the IWRM department. There is also a need to have the other newly established MINIRENA authorities and the older ones (REMA and RMA) to take up their respective roles and contribute their knowledge and inputs. Linking land and water, forestry and nature conservation, as well as climate change to

water resources management seems a necessary and logical step to take. Therefore the department should take an active stance on defining their mandate and make other entities understand their added value. The required governance processes need to be strengthened further and the IWRMD is to play an important role. Monitoring progress and incorporating learning in the day-to-day management can further improve the interaction and vertical/horizontal coordination. These coordination mechanisms address the department's role vis-à-vis the WIC and the NWCC as well as the link to districts and other stakeholders (CSOs, NGOs, WUA, Private sector, etc.)

Last but not least, the Rwanda Water and Forestry Authority (RWFA) has to ensure that adequate funding is set aside for the IWRM process in the coming years to guarantee the minimum functions it needs to address (permit issuing, data collection and analysis, awareness raising, ensuring adequate governance processes) and while systems are in place, there is a need to make these systems and the staff involved work more towards outcome and impact than towards inputs and outputs.

To successfully introduce the IWRM approach in Rwanda, it is important that the enabling environment receives adequate attention, especially since many of the potential participants have a limited understanding of the concept and its related processes. A strong focus on the participation of stakeholders is essential. Cross-cutting issues with an emphasis on gender should be agreed upon, and it is recommended to perform an examination of existing documentation on the assessment of the role of women in water management at all levels (strategy, planning, implementation, exploitation and monitoring) and for all resources and uses. However, the examination should not be limited to "gender in the strictest sense" but be extended to other specific social groups.

Progress can be seen regarding the development and mainstreaming of IWRM in Rwanda, though needless to say, challenges still exist. A conducive institutional framework is in place, and, as has been observed, certain aspects might require further attention. Having the framework in place is essential but it needs to be accompanied by:

- Attention to the enabling environment, which ensures attention for the social, environmental, political and economic dimension of water governance.
- Clarity on roles and functions and,

- Adequate management instruments (planning, implementation, monitoring, and coordination).

In conclusion, the results of this study were limited to time. Views from other actors in the water sector and how they are engaged in the decision making process by the national coordinating body were not captured in this study due to limited time and resources. Further research can be conducted to explore more about how all stakeholders would be involved capturing how sectors that in one way or another in connected to water resources would want to be engaged. It would further show how lack of proper institutional arrangement has impacted water resources in Rwanda. Research can also be done on assessing the role of non-governmental organizations involved in water related activities in Rwanda and how they Incorporate IWRM principles in their project activities

REFERENCES

- European Training Foundation. *Guide for the review of institutional arrangements*. European Training Foundation, 2014.
- Bandaragoda, D. J. *A Framework for Institutional Analysis for Water Resources Management in a River Basin Context*. International Water Management Institute, 2000.
- Bayview. *2016/03/sanders-and-clinton-on-the-next-rwanda/rwanda-in-africa-map/*. 2016. <http://sfbayview.com> (accessed September 27, 2017).
- BBC. *BBC Africa*. 2016. <http://www.bbc.com/news/world-africa-36248334> (accessed 11 12, 2016).
- Biswas, A. "Integrated water resources management: A reassessment. A water forum contribution." *Water Int*, 2004: 248–256.
- Bromley, D.W. *Irrigation institutions: The myth of management*. Texas University., 1987.
- Bulkley, J. *Watershed Planning and Management: Institutional Realities*. 1. Watershed Management 2000, 2004.
- Cai, Yanpeng, Wencong Yue, Linyu Xu, Zhifeng Yang, and Qiangqiang Rong. "Sustainable urban water resources management considering life-cycle environmental impacts of water utilization under uncertainty." *Resources, Conservation and Recycling* 108 (03-04 2016): 21-40.
- Cardwell, H. C. "Integrated water resource management: Definitions and conceptual musings." Edited by J. Contemp. *Water Res. Educ.*, 2006.
- Creighton, J. *Designing effective public participation programs* . *Water Int.*, 2004.
- DAVIES, RICHARD. *Floodlist*. 2016. <http://floodlist.com/africa/rwanda-floods-landslides-gakenke-muhanga> (accessed 11 12, 2016).
- Davis, M. D. " Integrated Water Resource Management and Water Sharing." *Water Resources Planning and Management*, 2007: 427-445.
- Design principles in long-enduring irrigation institutions *Water Resources Research* 1993
- Design Principles in Long-enduring Irrigation Institutions *Water Resources Research* 1993
- Dourajeanni, A. J. *Gestión del agua a nivel de cuencas: Teoría y práctica.* " Serie recursos naturales e infraestructura No. 46, Economic Commission for Latin America and the Caribbean, . Division of Natural Resources and Infrastructure., 2002.
- E.A.C. *East African Community: ENVIRONMENT & NATURAL RESOURCES*. 2016. http://www.eac.int/environment/index.php?option=com_content&id=151&Itemid=98 (accessed 11 16, 2016).
- Edwards, Dr. William. *The value of Soil Erosion to the Land Owner*. Iowa: Iowa Learning Farms, 2012.
- Effective Water Governance *Science and Education* 2003

Global Water Partnership http://www.gwp.org/en/learn/iwrm-toolbox/Institutional_Arrangements/

Integrated Water Resources Management Stockholm Global Water Partnership 2000

Integrated Water Resources Management in practice better water management for development London Earthscan 2009

Integrated Water Resources Management in Practise Earthscan 2009

Governing the Commons: The Evolution of Institutions for Collective Action Cambridge University Press 1990

Governing the Commons: The Evolution of Institutions for Collective Action Cambridge University Press 1990

GWP. *Setting the stage for change*. Global Water Partnership, 2006.

Hooper, B. (2005). *Integrated river basin governance: Learning from international experiences*. London: International Water Association Publishing, 2005.

Integrated Watershed Management "Connecting People to Their Land and Water" CAB International 2007

Jepperson, Ronald L. *Institutions, institutional effects, and institutionalism*. University of Chicago Press, 1991.

Jønch-Clausen, T. "TEC background paper ." 10 (2004).

Karamage, Fidele, et al. "USLE-Based Assessment of Soil Erosion by Water in the Nyabarongo River Catchment, Rwanda." *International Journal of Environmental Research and Public Health*, 08 2016.

Kenya, Republic of. *Water Act* . Nairobi: Government Press, 2002.

Langbein, W. B. "Science in Your Watershed: General Introduction and Hydrologic Definitions." In *Manual of hydrology*. 1995.

Mbonigaba, Muhinda J. J. "Rwanda Agricultural Sector and its Impact on Food Security and Economy." Kigali: Rwanda Agriculture Board, 2013.

Meene, S. Van de, and R. Brown. "Towards an Institutional Capacity Assessment Framework For Sustainable Urban Water Management." *National Urban Water Governance, School of Geography & Environmental Science, Monah University*, 2007.

MINAGRIRwanda Irrigation Master Plan The Government of Rwanda 2010

MINALOC National Decentralization Policy (Revised) The Republic of Rwanda 2012

MINIRENA. *National Policy for Water Resources Management*. Kigali, City of kigali: Ministry of Natural Resources, 12 2011.

MINIRENA. *WATER RESOURCES MANAGEMENT SUB-SECTOR STRATEGIC PLAN (2011 – 2015)*. Kigali: Ministry of Natural Resources, 2011.

National Water Resources Management Authority for A Sustainable Water Use in Rwanda
Sustainable Resources Management Journal 2017

NIB. *Transboundary Environmental Action Project, National Nile Basin Water Quality Monitoring Baseline Report*. Nile Nasin Initiative, 2005.

Ostrom, E. G. "Rules, games, and common-pool." *University of Michigan Press*, 1994.

Policy Implications of Institutional Arrangements for Sustainable Management of Common Pool Resources: The Case of Groundwater. *American Society of Civil Engineers* 2011 1981-.....

REMA. *Atlas of Rwanda's Changing Environment: Implications for Climate Change Resilience*. Kigali: Rwanda Environment Management Authority, 2011.

REMA. *State of the environment and outlook report*. Kigali: Rwanda Environment Management Authority., 2015.

REMA. *CLIMATE CHANGE AND NATURAL DISASTERS*. Kigali: Rwanda Environment Management Authority, 2013, chap9.

Republic of Kenya. *Integrated Water Resources Management and Water Efficiency Plan for Kenya*. Nairobi: Republic of Kenya, 2009.

RNRA. *Integrated Water Resources Management Programme Rwanda*. Kigali: Rwanda Natural Resources Authority, 2015.

Sabatier, A.P, and W. F. "Collaborative approaches to watershed management." Cambridge: MIT Press, 2005.

Samuel, Asumadu-Sarkodie, Rufangura Patrick, Herath MPC Jayaweera, and Phebe Asantewaa Owusu. "Situational Analysis of Flood and Drought in Rwanda." *International Journal of Scientific & Engineering Research* 6, no. 8 (August 2015): 960-970.

Sehlke, G. "overview of the environmental and water resources institute's "guidilines for integrated water resources management" project." *American Society of Civil Engineers* 1 (2005).

Shah, T. G. "Irrigation Institutions in a Dynamic economy: what is China doing differently from India? ." *Economic* , 2004: 3452-3461.

Significance of Personal Hygiene from Islamic Perspective *IQSR Journal of Humanities and Social Science* 2013

The role of formal and informal institutions in the water sector UNEP 2002

The success of a policy model: Irrigation management transfer in Mexico *The Journal of Development Studies* 2006

UN/WWAP. *Water for People*. UN World Water Development, 2003.

VIA Water *Institutional Scan Water Sector Rwanda* Kingdom of Netherlands 2015

Water for Growth Rwanda *Capacity Development and Strengthening Plan* Kigali Water for Growth Rwanda 2017

Water Governance in the Twentieth-first Century *Ambiente & Sociedade* 2007

White, G. "Reflections on the 50 year International Search for integrated water management. ." *Water Policy*, 1998: 21–27.

world atlas. *World Map/ Africa / Rwanda / Maps / LARGE COLOR MAP*. 2017.

<http://www.worldatlas.com/webimage/countrys/africa/lrgcolor/rwcolor.htm> (accessed September 27, 2017).

World Bank. *Trading Economic*. 2015. <http://www.tradingeconomics.com/rwanda/gdp-per-capita> (accessed 11 16, 2016).

ANNEX 1

Relevant Articles in the Water Law determining bodies and assigning responsibilities

LAW N°62/2008 OF 10/09/2008 PUTTING IN PLACE THE USE, CONSERVATION, PROTECTION AND MANAGEMENT OF WATER RESOURCES REGULATIONS

Article 7: Priority in water distribution

The supply of water to the populations shall be the priority in the distribution of water resources. The supply of water to animals shall constitute the second priority as well as the hydroelectric energy production.

Article 16: National Water Consultative Commission

There shall be established a National Water Consultative Commission composed of: 1 Representatives of Government; 2 Representatives of various public and private water utilizers.

The Minister chairs the Commission's meetings. The structure, the functioning and the composition of the commission are fixed by the order of the Prime Minister.

The National Water Commission shall be consulted on the following matters: 1. planning projects in the water domain elaborated to the national level or the big hydro graphic basin level and on the revision of these projects; 2. projects of water supplying, planning, management and transfer of water from basin to basin, with national character as well as in the big projects of the same category of provincial character; 3. any water related issue, in case the Minister deems it necessary.

Article 17: Rwanda Water Authority

A special Law shall determine powers, responsibilities, organization and the functioning of the National Water authority.

Article 18: Water Inter Ministerial Committee

There shall be established in the Prime Minister's office a Water Inter-Ministerial Committee composed of ministerial department representatives concerned with water in their domain and whose supervision shall be by a Director in the ministry of water.

It shall be consulted on all legislative drafts /Bills regarding planning in the water domain elaborated at the national level, as well as on matters of national, regional or international level.

Article 19: Boundaries of hydrographical basins

Rwanda consists of two main hydro graphic basins, namely Congo basin and Nile Basin. The two basins have also got some other ancillary basins.

The boundaries of their water make-up are shared by other countries. The delimitation and the denomination of basins or sub-basins hydro graphic or aquifer systems are determined by the law.

Article 20: District Committees for Hydro graphic basins

There shall be established a basin district committee composed of: 1. administrations' representatives concerned by water; 2. elected representatives of the local decentralized communities; 3. representatives of the different categories of water users.

The Committee may in its work use competent people in the water domain.

The basin committee holds meetings in the premises of a district or in any other place indicated by the beneficiary entities.

The Committee shall be assisted by an Executive Secretary.

The organization and functioning of the committees shall be determined by Ministerial Order.

Article 21: The basin committee mission

The basin committee shall be charged with: 1. to propose the initial version of the master plan and management of the basin waters as provided for in this Law. 2. to propose the delimitation, if necessary, of under-basins and the designation of the aquifer for which an integrated management of the water resource must be done; 3. to formulate orientations and proposals concerning the planning and management of the waters of under-basins or aquifer; 4. to formulate propositions of arbitration or solution in case of conflict of water uses; 5. to formulate opinions on all technical or financial questions that is submitted to it by the administration. 6. to value the relevance and the feasibility of basin organisms, to prepare their setting up if it would be judged necessary.

Article 22: Basin committee at the sector level: There shall be established a committee for the management of a small basin or aquifer at the level of the administrative decentralized authority of the district to which it is connected where it is deemed necessary, sub-basin or hydro graphic basin committee at the sector level. The structure and functioning of this committee shall be the same as set out for the basin committee at the district level.

Article 23: Responsibilities of committees at sector level

The Sector committee shall have the following responsibilities: 1. to propose the initial version of the local master plan; 2. to fix management procedures for the sub-basin waters or the aquifer, provided for under this Law; 3° to formulate at its level propositions and opinions.

Article 24: Local Water Associations

Users of water can constitute a local association of water having legal entity in view of management, of enhancement of production, and protection of the water resources and fight against flooding. The management of local water association is composed of representatives who have a role in the exploitation of rivers, streams and lakes.

Article 25: Delegation of powers

Districts may delegate to local water associations the management of water utilization as well as the infrastructure in accordance with this law.

Article 28: Master plan of water resources and management

The Minister in charge of water establishes a national master plan and management of water resources after opinion of the water interdepartmental committees and the water national commission. He values from census results on water at national level. It shall be established for a length of fifteen (15) years and can be revised every five (5) years, except exceptional circumstances requiring a modification of its content before the deadline.

Article 29: Management vision

An Order of the Minister provides for the main management visions with regard to water resources of the basins described in this law in such a thorough, sustainable and appropriate way. Administrative programs and decisions in the water domain must be either compatible or made compatible with the master plan mentioned in Article 28 of this Law.

Article 30: Hydro graphic basin master plan and their management

In each hydro graphic or aquifer correspondent to a hydro graphic unit or coherent hydro geologic, a diagram of waters planning and management fixes the general objectives of water resources integrated management as well as the aquatic ecosystems. It shall be established for a five (5) years period by the basin committee in conditions provided for by this Law and is approved by the administrative authority.

The arrangements must be compatible with arrangements of the planning national diagram and waters management.

Programs and administrative decisions in the water domain must be either compatible or made compatible with diagram arrangements of waters planning and management.

Article 31: Management of sub-basins and aquifer

In sub-basins or aquifer correspondent to a hydro graphic unit or coherent geological hydro graphic, a local diagram of planning and management of waters can be instituted by the committee of sub-basin or aquifer according to the same modes that the diagram of waters planning and management and to specify its objectives.

It is approved by the decentralized administrative authority territorially competent.

Article 48: Use of water for irrigation

Lawful land owners shall be required to rationally and optimally utilise water resources.

The administration in charge of irrigation shall apply principles of integrated management of the water resource as provided for in this Law.

ANNEX 2

List of water-related legislation

- The Constitution of the Republic of Rwanda, 2003 as subsequently amended
- Organic Law N° 04/2005 of 08/04/2005: Determining the Modalities of Protection, Conservation and Promotion of Environment in Rwanda
- Law N°62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources regulations
- Law N°53/2010 of 25/01/2011 establishing the Rwanda Natural Resources Authority and determining its mission, organization and functioning
- Law N° 43/2013 of 16/06/2013 governing land in Rwanda
- Law N°16/2012 of 22/05/2012 determining the organization, functioning and mission of the National Fund for the Environment
- Law No 30/2012 of 01/08/2012 governing the use of agrochemicals
- Law N° 58/2008 of 10/09/2008 determining the organization and management of aquaculture and fishing in Rwanda
- Ministerial Order No 003/2008 Of 15/08/2008 relating to the requirements and procedure for Environmental Impact Assessment
- Ministerial Order No 005/2008 Of 15/08/2008 establishing modalities of inspecting companies or activities that pollute the Environment
- Ministerial order N°007/16.01 of 15/07/2010 determining the length of land on shores of lakes and rivers transferred to public property
- Ministerial order N° 26/03 of 23/10/2008 determining the list of chemical and other prohibited pollutants
- Prime Minister's Order N° 143/03 of 24/05/2013 determining the organisation, functioning and composition of the National Water Consultative Commission
- Ministerial Order N°002/16.01 of 24/05/2013 determining the procedure for declaration, authorization and concession for the utilization of water
- Ministerial Order N° 003/16.01 of 24/05/2013 determining the structure and contents of the aquaculture and fishing concession contract
- Ministerial Order N° 004/16.01 of 24/05/2013 determining the list of water pollutants
- Ministerial Order N° 005/16.01 of 24/05/2013 determining the organization and functioning of hydrographical basin committees

- Ministerial Order N° 006/16.01 of 24/05/2013 determining the organization of water resources data collection, treatment, management, exploitation and communication
- Ministerial Order N° 007/16.01 of 24/05/2013 determining the main management visions of water resources in the main hydrographical basins in Rwanda
- Ministerial Order N°010/11.30 of 18/11/2010 determining aquaculture and fishing zones
- Ministerial Order N°001/11.30 of 23/11/2011 establishing irrigation water user's associations in irrigation schemes
- Law N°04/2012 of 17/02/2012 governing the organization and the functioning of national nongovernmental organizations
- Law N°05/2012 of 17/02/2012 governing the organization and functioning of international nongovernmental organizations

ANNEX 3

Catchments repartition in Districts and their occupied areas

Catchment		Districts		Overlap between district & Catchment		
Name	Area (km ²)	Name	Area (km ²)	Area (km ²)	% Catchment	% District
Muvumbaca catchment	1568	Nyagatare	1920	940	60	49.0
		Gicumbi	830	455	29.0	54.9
		Gatsibo	1582	152	9.7	9.6
		Total		1547	98.7	
Nyabugogo catchment		Gasabo	429.21	304.50	18.33	70.95
		Gatsibo	1582.32	293.80	17.68	18.57
		Gicumbi	829.52	339.64	20.44	40.94
		Kayonza	1934.96	174.57	10.51	9.02
		Kicukiro	166.71	19.88	1.20	11.93
		Nyarugenge	133.95	44.20	2.66	33.00
		Rulindo	566.98	294.12	17.70	51.87
		Rwamagana	681.96	190.29	11.45	27.90
		Total		1 661.00	99.98	
Sebeya catchment	363	Ngororero	679	37	10	5
		Rutsiro	1157	139	38	12
		Nyabihu	532	38	11	7
		Rubavu	388	150	41	39
		Total		363	100	
Upper Nyabarongo catchment	3,347.60	Karongi	993.03	426.26	13	43
		Ngororero	678.99	560.11	17	83
		Rutsiro	1,157.29	96.49	3	8

		Huye	581.53	293.59	9	51
		Nyanza	672.14	295.34	9	44
		Ruhango	626.78	316.05	9	50
		Muhanga	647.71	319.49	10	49
		Nyamagabe	1,090.36	1,016.58	30	93
		Total		3,323.91	99	
Total	6,939.96			6,894.91	99.35	