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Capacity Situation Analysis and Capacity Development Needs Assessment for Integrated Water Resources Management Sub-sector in Rwanda



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Development Needs Assessment for Integrated
Water Resources Management Sub-sector in
Rwanda
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Back cover: Left-Right – Water fetching quen; community workshop; dry landscape.

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Acronyms and Abbreviations

AfDB	African Development Bank
CBEHPP	Community Based Environmental Health Promotion Programme
CHWs	Community Health Workers
CSOs	Civil society organisations
DDG	Deputy Director General
EAC	East African Community
EDPRS	Economic Development and Poverty Reduction Strategy
EU	European Union
EWSA	Energy, Water and Sanitation Agency
GIZ	German Development Cooperation
HDI	Health Development Initiative
ICT	Information and Communication Technologies
IWRM	Integrated Water Resources Management
JADF	Joint Action Development Forum
JICA	Japanese International Cooperation Agency
KWAMP	Kirehe Watershed Management Project
LVB	Lake Victoria Basin
LVBC	Lake Victoria Basin Commission
LVEMP II	Lake Victoria Environment Management Project (phase II)
LWH	Land husbandry and Water Harvesting Project
MEAs	Multilateral Environmental Agreements
MIDMAR	Ministry of Disaster Management and Refugees
MIFOTRA	Ministry of Public Service and Labour
MINAGRI	Ministry of Agriculture and Animal Resources
MINEAC	Ministry of East African Affairs
MINICOM	Ministry of Trade and Industry
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
NBI	Nile Basin Initiative
NELSAP	Nile Equatorial Lakes Subsidiary Action Programme
NISR	National Institute of Statistics of Rwanda
NUR	National University of Rwanda
PAIGELAC	Inland Lakes Management Project
RDB	Rwanda Development Board
RAB	Rwanda Agricultural Board
RECOR	Rwanda Environmental Conservation
REMA	Rwanda Environment Management Authority
RIWSP	Rwanda Integrated Water Security Programme
RHA	Rwanda Housing Authority
RNP	Rwandan National Police
RNRA	Rwanda Natural Resources Authority
RTDA	Rwanda Transport Development Authority
RURA	Rwanda Utilities Regulatory Agency
RWASEF	Rwanda NGO Forum on Water, Environment and Sanitation

SIDA	Swedish International Development Agency
SWAp	Sector-wide Approach
SWG	Sector Working Group
TWG	Thematic Working Group
WAMACOs	Watershed Management Committees
WRM	Water Resources Management
WUGs	Water User Groups
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Background

This report presents the findings of the capacity situation analysis of Rwanda's water resources management (WRM) sub-sector, commissioned by the Rwanda Integrated Water Security Program (RIWSP) funded by USAID. The assessment is part of the USAID/RIWSP support to Capacity Building of Rwanda's WRM sub-sector. In particular, the support focuses on strengthening the Government of Rwanda's (GoR) IWRM Department's institutional capacity to implement its strategic plan for WRM. The capacity situation analysis will lead to a capacity development plan that constitutes the roadmap and priorities for all IWRM capacity building interventions in the coming years.

The assessment was carried out during February – March 2012, and includes: i) a mapping of all national institutions/actors in IWRM; ii) capacity situation analysis in selected institutions; iii) a synthesis of major capacity gaps in IWRM; and iv) key conclusions and recommended actions for building capacity of IWRM in Rwanda.

IWRM in the Context of Rwanda's Water Resources Management

The Global Water Partnership defines IWRM as an approach that aims to ensure the coordinated development of water and related resources to optimize economic and social welfare without compromising the sustainability of ecosystems. The key term is *integrated* which refers to the need for coordination among all agencies managing activities that affect water resources within a water catchment, watershed or basin. IWRM is thus a cross-sectoral, holistic and coordinated approach to water management whether at the catchment, watershed or basin level.

Rwanda has adopted a new Water Resources Management (WRM) policy and formulated a five-year strategy to implement the policy. The policy emphasizes that the country's water resources will be utilized and managed following the integrated water resources management (IWRM) approach. Subsequently, a new Natural Resources Management Authority (RNRA) has been created bringing the management of key natural resources including water under one roof, and creating a specific department for IWRM. Unlike other departments at RNRA which existed as autonomous institutions prior to the creation of RNRA, the IWRM Department has been created from scratch¹. It therefore has an uphill task of establishing itself institutionally, and then be able to coordinate the many actors, interests and issues in water management that transcend national boundaries. Institutional capacity development is therefore a key priority.

Existing Capacity for IWRM

There is a framework for water resources governance that supports IWRM, notwithstanding some contradictions and gaps. The WRM policy and strategy and revised national long-term vision are supportive of IWRM. The Government has developed a climate change and low carbon development strategy under which a financing plan is being developed. IWRM is considered a key area of support in the country's climate change adaptation plan. A number of institutions working on different components that relate to IWRM have been established with human resource plans (broadly reflected in organizational structure) that provide potential for IWRM-related expertise. There is growing awareness of water as an important resource at the highest level of political leadership, especially as evidenced in the renewed focus on rainwater harvesting, roll-out of irrigation projects and protection

¹ WRM as a function only emerged after the transfer of the Water Supply and Sanitation functions to Infrastructure Ministry. However, the department was not created until the establishment of the RNRA.

of lakeshores, river banks and watersheds. Supporting IWRM-related activities in Rwanda appears to be a priority of some of the country's development/financing partners, e.g. the World Bank, African Development Bank (AfDB), International Fund for Agriculture Development (IFAD) and some bilateral donors (notably Netherlands, Sweden, United Kingdom and United States of America).

Major Capacity Gaps

The assessment has identified several constraints of institutional, legislative, operational, strategic and financial nature that need to be address if Rwanda's water resources are to be managed in the framework of IWRM. *There are capacity gaps in all aspects of IWRM* - human resources (both in terms of numbers but more seriously in terms of lack of IWRM knowledge, skills and basic education); low levels of awareness of IWRM issues and the need for coordinated work; institutional systems are weak and most pronounced in ministries. In a nutshell, the whole institutional landscape reflects on-going reforms, with new and generally young staff. The main focus, however, is on delivering quick results. This institutional environment of continuous reforms requires capacity building to be a continuous and integral part of IWRM planning and programming with a long-term orientation. A more challenging issue is the lack of local structures by the IWRM sub-sector, as the allocation of WRM activities to decentralised entities is not really clear. Also, population and demographic factors are at the centre of IWRM and it will be important to identify and engage the relevant institutions.

Opportunities

The Vision 2020 (some of whose targets have been revised by the political leadership), present an opportunity as it is fairly easy to sense the overall development direction of the country, despite consistent institutional reforms. IWRM planners can base on this to prioritise IWRM activities and make reliable assumptions and risks regarding future water needs and development effects on WRM. Most institutions assessed are open to the IWRM concept although sceptical of how they will be coordinated. As a result of major restructuring, most institutions assessed (all except REMA, RBS and EWSA), are undertaking major staff recruitment. There is room to negotiate the structure if the institutional leadership can negotiate strongly with the Ministry of Public service (MIFOTRA)². The RNRA has too many priorities to work on and must be supported to focus on institutional building first. In fact, what will be done during this period up to February 2013 when the EDPRS II is expected to be finalised, will determine the budget resources allocated to the WRM sub-sector, and medium-term achievements (the targets of which are outlined in the present WRM Strategic plan.

Recommendations

In view of the identified capacity gaps and cognisant of the stated national IWRM priorities, the assessment recommends the following broad CB actions for IWRM in Rwanda:

- ✓ **Raise awareness** of stakeholders about water and IWRM approaches i.e. the importance and multi-faceted nature of water; its economic and social and ecological values; and the risks of access, availability and loss due to inappropriate management. Use multi-media communication

² Although institutional reforms in Rwanda are on-going and difficult to predict, institutions can engage MIFOTRA if they feel the structures and staff levels provided are not appropriate. REMA has recently succeeded in creating a position of Deputy DG and a Legal Unit due to be established. IWRM must engage the reform process on the basis of strong justifications to ensure appropriate functioning.

techniques to design and deliver appropriate messages across the stakeholder spectrum, focusing on the role and interests of each stakeholder category;

- ✓ **Develop institutional structures and systems** for integrated, participatory water governance. This will entail reviewing organisational structures and HR functions to attract, develop, effectively deploy and retain expertise; , articulate clear staff roles and working procedures, conducting functional analysis, mechanisms for performance management, functional relations, and data management protocols in the core IWRM institutions; stakeholder engagement strategies should be given high priorities, as should platforms and other mechanisms for coordination, collaboration and integration;
- ✓ **Develop the infrastructure** for collection and management of hydrological data including spatial information systems for decentralised water management. Priority must be given to state of the art technologies and capabilities for data integration and comparability, and applicability at local and trans-national scale.
- ✓ **Strengthen human resources** development in terms of technical knowledge and skills (e.g. water resources assessment, climate change modelling, negotiation) as well as institutional and governance skills (water law, regulatory instruments, policy analysis, stakeholder management, resource mobilisation), training of water policy analysts and planners;
- ✓ **Focus on knowledge management in particular:** It seems that even the information that is available is not proactively shared, making data and information access a big challenge to IWRM planning and decision making. Effective information management will be a critical priority that should be addressed as a tool to advance IWRM development. Focus should be on ensuring that appropriate knowledge is shared, utilised and continuously improved, not just generated. As part of advocacy and engagement of decision processes, the RNRA should be assisted to develop and disseminate policy tools such as policy briefs linking IWRM to different sector goals (e.g. public health, food security, disaster management, infrastructures, etc) should be developed and used in the engagement. The RNRA/IWRM must in this regard borrow a leaf from MINAGRI which used externally developed but nationally relevant policy papers to advance irrigation, mechanisation and other programmes that have received political support and donor financing.

Way forward: Implementation Approach for IWRM capacity building

The implementation approach of IWRM capacity building (CB) activities should take into consideration:

Timing and political priorities: Given that the EDPRS II preparation process has started, the IWRM sub-sector needs to carefully balance quick wins with long and medium-term activities of institutional building. In this respect, technical assistance is urgently required to help RNRA/IWRM get to its feet and exercise its statutory duty of managing the country's water resources especially in view of the ambitious plans by water user sectors.

Ensuring capacity development aligns with and is relevant to emerging IWRM issues: As a cross-cutting principle, CB interventions should focus on developing institutional systems with ability to attract, grow and retain expertise (given that IWRM skills are developed over time); pro-actively communicate and manage stakeholders and their interests; mobilise and effectively utilise funds and technical resources. Skills and knowledge must take into consideration the emerging IWRM challenges – such as globalisation, technology development and climate change; demographic transition and industrialisation; increasing demand for food

and commercial export agriculture; regional integration and renewed interest in biodiversity and ecosystems management. In this respect, a review of the Agricultural transformation strategy suggest that climate change effects (such as prolonged droughts and unreliable rainfall) and increased focus on commercial agriculture (horticulture and globally sensitive food crops like rice) are driving the increased demand for water in Agriculture. Modern information and communication technologies (ICTs) are already showing signs of improving governance and service delivery (including in the water sectors e.g. e-water) in Rwanda, and helping to diversify economic and livelihood opportunities, that would reduce pressure on water resources.

The logical next step is to translate the capacity needs into time-bound and costed capacity building activities and targets for the different actors.

1. INTRODUCTION

1.1 General Background

The Rwanda Integrated Water Resources Management (IWRM) Capacity Situation Analysis and Needs Assessment which this report presents was commissioned by the Rwanda Integrated Water Security Programme (RIWSP). RIWSP is a five-year programme funded by the United States Agency for International Development (USAID) and implemented in the context of the Global Water for Sustainability (GLOWS) by a consortium of organisations led by Florida International University (FIU) in partnership with CARE, Winrock International, World Vision U.S., Institute for Water Education of the United Nations Educational Scientific and Cultural Organisation (UNESCO-IHE) and the International Centre for Integrated Water Resources Management (ICIWaRM). The primary goal of the RIWSP is to improve the sustainable management of water quantity and quality to positively impact human health, food security, and resiliency to climate change for vulnerable populations in targeted catchments in Rwanda.

The framework for capacity building of Rwanda's WRM sub-sector is provided by the Water Resources Management Policy and Strategy (2012) that emphasise managing Rwanda's water resources through an integrated approach. IWRM Institutional capacity development has been identified in the GoR's WRM Strategic Plan as a key and urgent priority during the period 2011-2016. RIWSP, one of the first programmes to support the WRM sub-sector, has identified capacity needs assessment as an essential and logical first step in developing the IWRM capacity for Rwanda. It is in this context that the IWRM Capacity situation assessment was commissioned, the report of which is presented according to the outline in 1.2.

1.2 Structure of the Report

The report is organised in 5 chapters:

- *Chapter 1* presents an introduction to the assessment, including context, a background on IWRM and WRM in Rwanda as well as the assessment methodology;
- *Chapter 2* presents an institutional mapping of IWRM actors (or potential actors), i.e. national and local institutions- governmental and non government- that have responsibilities for components of IWRM – including housing and urban planning, public health, agriculture, energy, trans-boundary governance and international cooperation, water resources assessment and forestry.
- *Chapter 3* presents an assessment, on an institution to institution basis, of the IWRM capacity situation in selected institutions (core set from those mapped in Chapter 2) and

covers aspects of human resources, institutional structures and systems and in a number of instances, funding.

- *Chapter 4* synthesises the main IWRM capacity needs and capacity gaps, highlighting generic issues from most institutions and a few unique ones particularly for the IWRM Department.
- *Chapter 5* presents the key conclusions from the assessment process, and recommendations in terms of key areas for capacity building and what to include in the capacity development plan.
- *Annexes:* Annex 1 presents selected analytical tables for HR and institutional capacity, while Annex 2 is a detailed database of IWRM personnel included to highlight the gaps in numbers. In Annex 3, a list of people met/contacted is presented.

1.3 Overall Context of Integrated Water Resources Management

Integrated Water Resource Management (IWRM) was defined by the Global Water Partnership (GWP) 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.*" From this definition, IWRM approaches involve applying knowledge from multiple disciplines and working with diverse stakeholders to develop and implement efficient, equitable and sustainable solutions to water and development problems. Thus, IWRM is a comprehensive, coordinated, participatory planning and implementation mechanism for managing and developing water resources or otherwise addressing water-related development problems in a way that balances social and economic needs, and that ensures the protection of ecosystems for future generations.

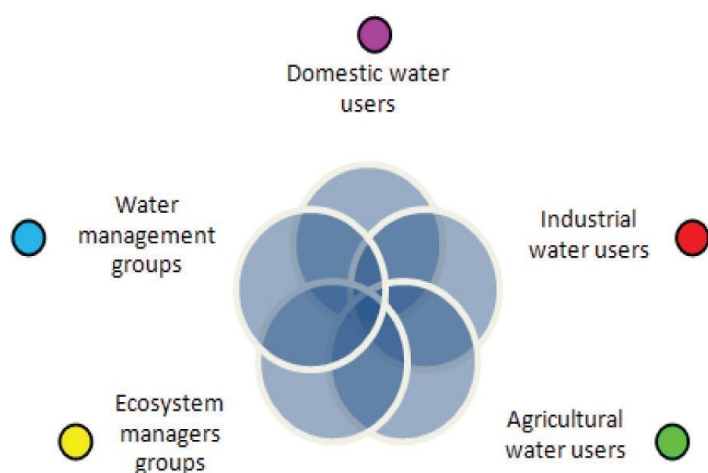
The inclusive, participatory and holistic nature of decision processes in the IWRM approach encourages equitable and sustainable management of water resources. The underlying principle is that the multiple uses of water— *for people and livelihoods, for agriculture, for healthy ecosystems,*—demand coordinated action, and that in order to realise optimal, equitable and sustainable benefits from water resources, you must balance the needs of all water users (and discharges) in the catchment. This should cover both consumptive and non consumptive uses (which include hydropower generation, regulating, recreational, spiritual or protective functions) of water.

IWRM as a National Commitment to Global Action

The World Summit on Sustainable Development (Johannesburg 2002) recognized the importance of IWRM in meeting sustainable development goals. The Summit Implementation Plan calls for nations to develop IWRM and water use efficiency plans by 2005, with support to developing

countries, through actions at all levels. Paragraph 26(c) of the Plan states that countries should “improve the efficient use of water resources and promote their allocation among competing users in a way that gives priority to satisfaction of basic human needs and balances the requirements of preserving or restoring ecosystems and their functions, in particular in fragile environments, with human, domestic, industrial and agriculture needs, including safeguarding drinking water quality.”

Bringing stakeholders to the same table may be a challenging task especially where interests are often times conflicting, where benefits of working together may not be clear to many actors and where some stakeholders feel they are more powerful and perceive that it may not be in their interests to work together. To some other stakeholders, however, IWRM may sound theoretical and not feasible so a more visually appealing and practically workable framework should be crafted to help visualise where, why and how the stakeholders have to meet to ensure win-win for



all. At the water user level, a framework for delineating and visualising interests and potential areas of conflicts and capacity requirements is summarised in Figure 1.

Figure 1: Framework for Visualising multi-user interests and potential conflicts.

(Source: Ruetinger et al, 2011: Water crisis and climate change assessment framework)

As Figure 1 illustrates, the IWRM framework helps delineate areas where a water user or those whose actions have impact on water should focus with specific issues, tools or resources.

The IWRM approach is expected to address the WRM challenges, as it is concerned with ensuring universal and sustained access to adequate clean drinking water, promoting balanced generation of hydro-power, sustainable irrigation, ensuring adequate water availability for ecosystems maintenance, minimising disasters such as floods and droughts, and controlling water pollution through sustainable land use, ecosystems restoration, sustainable settlement, urbanization and industrialization, among others. Through these practices, it is hoped that a country’s deficiencies in WRM, including imbalanced access to clean water and safe sanitation will be addressed.

1.4 Water Resources and Development in Rwanda

The GoR has rolled out ambitious multi-sectoral plans to utilize its seemingly vast freshwater resources to generate economic and social benefits for her population. Presently, Rwanda's main water uses are domestic consumption, agricultural production, hydro-power generation, industrial and recreational activities. It is expected that transport will become a major water use in the coming years if the on-going plans are translated into action. In rural areas, the main sources of potable water are rainwater tanks, shallow hand-dug wells, boreholes, natural springs, lakes and rivers. The third Household Living Conditions Survey (EICV III) results released in February 2011 indicated that 74% of the population has access to clean water supply. Although this represents commendable progress towards the 2017 target of 100% access, the Rwanda Citizen Report Card 2010 indicated that there are huge regional variations and that many citizens still obtain drinking water from unprotected sources (rivers and lakes are the main sources of water for 35.1% of eastern, 24.5% of northern, 31.6% of Southern, 28.6% of Western and 13.2% of Kigali residents). A third of citizens (33.5%) indicated that the water they consume is not clean at all³.

GoR is implementing a number of initiatives aimed at ensuring sustainable land management to reverse watershed degradation that has resulted from high population pressure and inappropriate agricultural practices. Erosion control and water quality improvement are some of the key high level targets of the present EDPRS being monitored by the Ministries of Agriculture (MINAGRI) and Natural Resources (MINIRENA).

Water is very important in Rwanda's development. The following development areas place water resources at the centre of Rwanda's development and underscore the need for IWRM capacity development:

1. **Water for agricultural production:** Increased water use for irrigation, wetland production, and cultivation of high water consuming grain and horticultural crops (flowers, sugar cane, vegetables and fruits) raise concerns for efficient irrigation technologies and access to water by other and downstream users. On the other hand, unsustainable land use practices upstream including inappropriate industrial fertiliser use could increase pollution of water resources (both surface and ground water), hence there is need for vigorous monitoring to prevent pollution.
2. **Water for hydro and geothermal energy:** Electricity generation is increasing with a focus on hydro-power production. Hydro and geothermal power projects usually have upstream and downstream issues, including access to water, security of dams, flooding, etc., that have to be well managed through IWRM approaches.
3. **Water for industrial processing:** Industrial water use is increasing (especially as washed coffee and horticultural exports increase). Efficient water use and pollution management are critical aspects of IWRM, for which inadequate capacity exists.

³ Rwanda Governance Board (December 2011): Rwanda Citizen Report Card 2010, p68, p71.

4. **Water for drinking and domestic use:** To realise 100% access to clean water by the 2017 Government target (which is well above the MDG 2015 target of halving the population without adequate clean water and sanitation), the GoR is rolling out various water supply programmes. This coverage will require efficient management of water by other uses.
5. **Water for health, hygiene and sanitation:** Most health problems in Rwanda are related to unclean water, poor hygiene and sanitation. Another important health problem – malnutrition, is also related to water as it results from repeated episodes of diarrhoeal diseases and intestinal parasitosis, as well as inadequate access to balanced diet food.
6. **Water for transport:** Rwanda is developing strategies for water transport in its navigable rivers, inland and shared lakes like Kivu. Navigation systems will raise concerns for water safety, pollution and maintenance of appropriate minimum water depth in river channels and lake shores.
7. **Water for ecosystems sustenance:** Climate change and unregulated water abstraction may reduce the water balance. Adequate water reserves are needed to maintain ecosystem functions such as biodiversity and regulating functions such as waste purification.
8. **Trans-boundary water management:** All of Rwanda's waters are transboundary, 90% belonging to the Nile Basin (which covers two-thirds of the country) and the remaining 10% belonging to the Congo Basin. An estimated 90% of Rwanda's water drain to the Nile Basin through the Kagera River formed by Nyabarongo and Akanyaru river systems. Thus, in-country water use must consider inflows from and outflows to other basin countries.
9. **Water related disaster management:** Rwanda has in the recent past faced a number of disasters, the most common and serious of which are water-related – droughts, drowning, landslides, floods, with associated effects such as epidemic outbreaks and economic losses.

1.5 IWRM in Rwanda

Water (in the wide sense of its multi-dimensional existence and use), is perhaps the most important natural resource for Rwanda. Rwanda as an active participant at the Johannesburg Summit committed to putting in place a framework for managing water resources on the basis of IWRM principles. Although it came later than the 2005 target, the Government of Rwanda (GoR) has formulated a Policy, Law and Strategy for Water Resources Management (WRM), all of which are designed to manage the country's water resources in the framework of IWRM.

Despite the GoR's commitment and resolve to implement IWRM, it faces enormous capacity challenges. WRM institutions are new and under-staffed. WRM is a key function of the Rwanda Natural Resources Authority (RNRA), with a full IWRM Department headed by a Deputy Director General. There are no designated WRM personnel in decentralised entities (province or district), and basin and sub-basin structures are not yet in place. The water resources monitoring infrastructure is inadequate. Perhaps the biggest challenge of WRM in Rwanda is coordinating

and regulating water use. Water demand for different functions is increasing and there is presently no regulation or control of who, what or how to abstract or use water. These challenges are expected to increase as climate change effects intensify, and if watershed degradation is not reversed, leading to further decline of the quantity and quality of water resources, unless an effective water resources planning, coordination and regulatory framework is put in place. Establishing such a framework is a key on-going priority of the GoR. This capacity assessment exercise is part of the initial activities in this endeavour.

1.6 Scope and Methodology of the Assessment

The WRM capacity assessment has been undertaken using a range of techniques, including;

Document reviews: The review of policy and strategy documents, statistical databases enabled initial stakeholder analysis, understanding and assessment of the policies, laws and plans for relevance to IWRM; and understanding of the Government and partners' priorities and activities.

Rapid assessment using tabular formats and short questionnaires: Approved organisational structures and salary grades for the newly restructured institutions were obtained from the Ministry of Public service, and the institutions and positions analysed for their relevance to IWRM. The organisations and positions with core IWRM responsibilities were selected and analysed (see Annexes 1 and 2). Then selected positions were included in the tabular formats and specific information on staff capacities and activities requested from concerned institutions and agencies. The institutional instruments (e.g. policies, laws, guidelines and regulations) they use were analysed. At institutional level, 3 instruments were used for public agencies – tabular formats that compare approved and existing numbers; another for detailed information on education, experience and IWRM training; and a questionnaire for selected individual staff.

Personal interviews: Interviews were held with selected staff and institutional leaders within selected IWRM Institutions, including 3 national NGOs and 6 local associations in the field, water users associations in the districts visited and Joint Action Development Forums (JADF) members.

Field visits and direct observations: Field visits were conducted in the districts of Kirehe, Nyagatare (Eastern), Muhanga (Southern), Gasabo (Kigali), Gakenke, Musanze (Northern), Rubavu, Karongi (Western) provinces. Planned visits to Huye and Bugesera were not made because of a number of events organised by local authorities (who were target respondents) and lack of time to organise new schedules. In each province, visits were made to Provincial offices and Zonal Agricultural Offices. A list of stakeholders met is attached (Annex 2). Field activities were conducted during March 01- 16, 2012.

2. MAPPING IWRM ACTORS, ROLES AND RESPONSIBILITIES

2.1 General

The assessment identified 11 ministries and 15 Public Agencies which have a key role to play in the IWRM activities in Rwanda, in addition to civil society and private sector entities. Private sector entities were, however not assessed due to the limited visibility, low level of organisation and involvement in the water-resources management. Of these, a more detailed assessment was done for 6 ministries and 5 Public agencies/authorities which have a more direct role in IWRM. These institutions and their roles are discussed according to the level of operation i.e. national, sub-national, community or trans-boundary, and whether they are Government or non Governmental.

2.2 National level Institutions

The ministries and agencies considered to have critical and lead roles in IWRM in Rwanda because of their statutory roles, impact or influence over water resources management are summarised in table 1. The profiles, organisational roles and responsibilities are presented in a matrix in Annex 3.

Table 1: Mapping Public Institutions/Agencies in IWRM

	IWRM Domain	Organisation/Agency	Specific functions
1	Environment & Natural Resources	MINIRENA	Policy and legislation
		RNRA	IWRM coordination
		RDB/Tourism & Conservation	Water mgt in PAs
2	Agriculture & fisheries	MINAGRI	Policy and
		RAB;	Water use in agriculture
3	Infrastructure, Energy & Water utilities	MININFRA	Policy and legislation
		EWSA	Water & energy supply
		Rwanda Housing Authority	Utilities in housing
		Rwanda Transport Development Agency	Water in transport
		MINALOC	Decentralised governance
4	Regulatory Agencies	REMA	Environmental protection
		RURA	Utilities regulation
		RBS	Standards, testing
5	Education, Public Health and sanitation	Ministry of Health	Policy & legislation
		Rwanda Biomedical Centre	WASH
		MINEDUC	Water education
		Rwanda Education Board	WASH in schools
6	Disaster Management	MIDMAR	Policy & coordination
		National Police	Disaster response
7	Transboundary/International Water mgt	MINEAC	Regional integration
		MINAFFET	International cooperation
8	Financing	MINECOFIN	Budget
		Local Development Support Fund	Local project funding
9	Data & Statistics	Meteorology Rwanda	Weather data
		National Institute of Statistics of Rwanda	Statistical surveys

2.3 Decentralised and Community Level Institutions

Rwanda has implemented the Decentralisation Policy since 2001 with the objectives of promoting democratic participatory governance, improving and bringing services closer to the population. The district is a Local Government with responsibility for planning, financing and delivery of services. Water services are some of the decentralized services. Water supply and sanitation, agricultural extension, primary health care, and watershed protection are some of the IWRM-related services within the mandate of local authorities. Centralised services like protection of national water bodies, hydro-power production and marine transport, among others, cannot be undertaken without the involvement of local authorities, as they have a role in mobilisation, compensation and resettlement of affected/displaced people and other activities.

2.4 Academic, Training and Research Institutions

IWRM-related education, training and research in Rwanda is undertaken by the following institutions:

- 1. The National University of Rwanda (NUR)** based in Huye, Southern Province has at least 3 institutes and Faculties whose academic and research activities are related to IWRM:
 - ✓ The Faculty of Agriculture which trains Agronomists and Agro-forestry extension experts;
 - ✓ Faculty of Applied Sciences, Department of Civil Engineering offers an post-graduate training and research in Water Resources and Environmental management (WREM);
 - ✓ School of Public Health trains Medical and Public health professionals and is actively involved in epidemiological research related to water, environment and climate change;
- 2. Higher Institute of Agriculture (ISAE):** all Academic departments at ISAE have water related courses from year 1 (Eco-climatology) to final years. However, specific water resources management engineers are trained under the Soil and Agricultural Engineering Departments where 2 Options are offered: a) Soil and Water management option; and b) Irrigation and drainage option.
- 3. Kigali Institute of Science and Technology (KIST)** trains civil and environmental engineers and operates a centre for technological innovation. A number of the Engineers and technologists met in the districts, some ministries and agencies are graduates of these programmes.
- 4. Institute for Scientific and Technological Research (IRST)** conducts research in various scientific and technical fields including water resources. Research activities linked to WRM include domestic waste water purification, hydro electricity micro-stations; biodiesel and bio-ethanol production; malaria control; biodiversity and renewable energy. IRST has research stations in Huye, Kigali, Ngoma, Rusizi, Nyagatare and Musanze districts.

5. **Kicukiro Technical College (Kigali) and Tumba College of Technology** (in Rulindo, Northern Province) are training water-related technicians at the level of A1 (Advanced Diploma). These are, however, not yet on the market.
6. **Kitabi College of Conservation and Environmental Management (KCCEM)** is a training institution established to train conservation and wildlife management professionals in the country. Managed under the Rwanda Development Board's conservation and tourism Department, KCCEM is located in and shares premises with the headquarters of the Nyungwe National Park. It is also a centre for scientific research and has recently hosted regional scientific meetings on Afro-montane and Albertine rift biodiversity conservation.
7. **Institute for Policy Research of Rwanda (IPAR)** was established to undertake public policy-relevant research that would inform Government Policy in all development domains.

2.5 Civil Society Organisations

Civil society organisations (CSO) of different categories – faith-based organisations (FBOs) including religious groups, local and international NGOs are key providers of water services in Rwanda. Some directly provide clean water to rural communities; some are involved in promoting good behavioural practices in water, sanitation and hygiene, while others are involved in promotion of innovative technologies (e.g. in waste treatment and water purification) and others intervene in watershed production/conservation.

International NGOs have particularly played a key role in increasing access to clean water in rural areas, promoting behavioural practices in WASH, including water use efficiency activities such as rainwater harvesting, empowering communities to manage water services, and watershed protection through afforestation and sustainable land use practices. At higher levels, NGOs are involved in advocacy and accountability activities around access to clean water, in the context of MDGs and other international commitments. These NGOs work directly with communities and local authorities while some work through partnership with local NGOs and CBOs. They include Care International, World Vision; Water for People; World Conservation Society (WCS), International Gorilla conservation programme (IGCP), Norwegian People's Aid (NPA).

2.6 Trans-boundary and International WRM

The increasing focus on basin-wide approaches to managing resources has popularized the knowledge and interest in managing trans-boundary and/ or international interests in water resources. Consequently, because of the trans-boundary nature of Rwanda's water resources, water use has to consider other interests. In this respect, national institutions responsible for regional cooperation and international relations have a key role to play in WRM.

Presently, the main trans-boundary or international bodies with influence on and active involvement in Rwanda's WRM are:

- **Nile Basin Initiative (NBI):** Based in Entebbe, Uganda, the NBI provides a cooperative framework for managing water resources in the Nile basin, which encompasses 11 countries including Rwanda and all its neighbors. Rwanda is the second most upstream part of the Nile and has signed all Nile related treaties and protocols, including the new Nile Treaty due to be operationalised. NBI's physical in-country presence (through the NELSAP and its projects) facilitates its involvement in Rwanda's IWRM activities.
- **Lake Victoria Basin Commission (LVBC):** Based in Kisumu, Kenya, LVBC works through the Lake Victoria Basin Management Protocol signed by the Heads of States of all five riparian countries to ensure concerted and coordinated and sustainable management of water and other natural resources in the Lake Victoria basin to ensure equitable, productive and sustainable development in the region.
- **Economic Community of Great Lakes Countries (CEPGEL)** is a recently reactivated but not yet visible cooperation framework comprising Rwanda, Burundi and the Democratic Republic of Congo (DRC). Its new focus is to promote economic cooperation of the countries united by the Lake Kivu resources among others.
- **United Nations:** beyond normal cooperative with development partners and the Millennium Development Goals (MDGs) related to water, the UN's influence on the international and trans-boundary management of Rwanda's water resources and their active participation in the IWRM framework is focused mainly on the implementation and follow-up of International conventions, the most prominent of which are the Rio Multilateral Environmental Agreements (MEAs) i.e. the Framework Convention on Climate Change (UNFCCC); Convention to Combat Desertification (UNCCD); and Biodiversity Conservation (CBD) all of which have been ratified by Rwanda. Water resources management as a key aspect of each of the 3 Rio MEAs. The MEAs especially on Climate change is already a critical framework for setting targets, mobilizing resources, implementing and measuring the performance of IWRM activities in the country from all perspectives including health, safety, human rights, food security and ecosystems sustainability.

3. IWRM CAPACITY SITUATION ANALYSIS AND CAPACITY DEVELOPMENT ACTIVITIES

This chapter discusses the capacity situation in selected IWRM-related institutions that were assessed, with a focus on expert numbers, knowledge and skills; policy tools; institutional systems and networks; coordination structures/platforms; IWRM financing and future plans. The capacities in IWRM institutions and their connectedness are discussed on institution by institution basis in the sections below.

3.1 Natural Resources Governance Institutions

The institutions of governance of water as a resource are only evolving as discussed below:

1. IWRM Capacity in the Ministry of Natural Resources

Human Resources

The staffing structure of MINIRENA broadly reflects its new role of policy formulation and oversight although not all positions are filled up and the personnel have not been trained to effectively undertake their roles. Out of 3 Directors, only one is in place (Environment and Forests) and the other is acting Director of Planning expected to be confirmed by cabinet. A quarter of the 8 technical positions filled are WRM professionals (one has recently completed his MSc and has more than 10 years experience in the water sector). Given the number of sub-sectors that MINIRENA is handling and considering that much of the policy implementation is vested in RNRA and decentralised entities, the 2 WRM experts would be sufficient. However, it appears that they have not been equipped with policy analysis, formulation and monitoring skills. This is particularly important given the cross-sectoral nature of WRM and indeed other natural resources governance domains.

Cross-sectoral engagement is mostly undertaken by the EDPRS Facilitator seconded from MINECOFIN. One officer is designated as the NBI Focal Point but her status is described as “causal” i.e. not permanent staff. Between the 2 technical Units i.e. Forests and Environment; land and mines, it is not clear how WRM functions fit in all units. The division of roles between the different officers within the domain (e.g. the 2 WRM experts) needs to be clarified e.g. who is responsible for policy analysis, formulation, monitoring, data collection, etc.

Like other public agencies, staff recruitment in MINIRENA is done in consultation with the Public service Commission and subject to the structure approved by MIFOTRA.

MINIRENA is still going through the transition as a result of a merger between MINELA (Ministry of Lands and Environment) and MINIFOM (Ministry of Forestry and Mines), as a result of which mining and forestry officers are yet to move to MINIRENA headquarters. It is expected that the

transition would be completed soon; especially with the change management process that MINIRENA plans to undertake.

Policy and legal frameworks

There are comprehensive Policies, Laws and Strategies for all the 5 sub-sectors under the Environment and Natural Resources (ENR) sector overseen by MINIRENA. The Environment Protection Policy 2004; Land Policy 2004; Forestry Policy (May 2010); the Mining Policy 2009; and WRM Policy 2011. These policies highlight elements of WRM, for instance the forest policy focuses on rehabilitating and conserving forests to protect watersheds from degradation; the mining policy gives priority to controlling pollution and improving water use efficiency; while the land policy aims to promote sustainable land management for improved and sustained productivity, including conserving wetlands and other fragile ecosystems.

Institutional coordination and Collaboration

A Sector-wide approach (SWAp) mechanism was established in 2010. Sector programming and resource mobilisation through the ENR SWAP has, however, not taken off as earlier expected. A SWAp Coordination Secretariat is, however, in place with 3 one expert and 2 assistants on a temporary basis since January 2012. The SWAp Secretariat is developing guidelines for the ENR SWG and Sub-sector Thematic Working Groups (TWGs), as well as an information system to collect and share sector-relevant information. MINIRENA plans to commission a change management process support, to streamline institutional systems and coordination arrangements.

Capacity building

It was reported that there are plans to prepare legal and regulatory tools e.g. ministerial orders on water regulation, mining exploitation and wetlands management, and to develop the ministry's institutional capacity to formulate and monitor policies.

The Public Sector Capacity Building Secretariat (PSCBS) has recently undertaken a capacity needs assessment, but the approach was deemed by some senior officials as ineffective and not adequate to clearly identify the complex institutional capacity needs.

Major capacity issues and gaps

There are inadequate tools and instruments to operationalise the policies and strategies into clear results. The M&E system for the ENR sector remains incomplete and different sub-sectors are putting in place separate systems (e.g. Environment and biodiversity information system; water resources information system and the forest information database/system). Several provisions of ENR laws require formulation of subsidiary legislation, guidelines and regulations on water, mining licenses, water pollution permits, forest management, etc., that are not yet in place.

2. Rwanda Natural Resources Authority

All 4 RNRA technical departments (lands and mapping; forest management and nature conservation; Geology and mines; and IWRM) have a critical role in IWRM. The Director General (DG) and Deputy Director General (DDG) for mines and geology have PhDs, and the other 3 DDGs have Masters with backgrounds in engineering; forestry; geography and water resources management. RNRA's IWRM-related capacity issues are analysed at departmental level as follows.

The IWRM Department

The present organisational structure provides for 26 technical staff, 4 of which are senior management positions i.e. the DDG/IWRM and 3 Directors responsible for Planning and Regulation; Research and monitoring; and trans-boundary management. A total of 7 technical personnel are in place, only the DDG as a permanent staff. The others are contractual and were seconded from MINIRENA when RNRA was formed. Three of these experts are senior professionals with more than 15 years experience, a fairly rich understanding of national WRM and institutional architecture, and diverse professional backgrounds – WRM, economics/policy and chemistry/water quality. These could form the initial managerial team for kick-starting an institutional development process for IWRM.

The RNRA has advertised for approved positions in the Departments of IWRM and Forestry that are most affected by staff shortages (see *Imvaho Nshya No. 2257, 24 Werurwe, 2012; www.rnra.rw*). It is expected, however, that the recruitment process will be concluded during May-June 2012. Unlike other RNRA Departments that existed as organisations before, the IWRM Department is being created from scratch and needs special attention.

In addition to filling the gaps, it is observed that the 26 technical positions and respective knowledge disciplines provided for IWRMD (as indicated in table A1 in Annex 1), are not adequate to perform all the functions envisaged in the WRM Policy and strategy. Effective IWRM coordination requires multi-disciplinary expertise. For instance, there are no hydro-biologists or limnologists and only one analytical chemist (with a BSc level education). Thus, even when completely filled, the IWRM Department is unlikely to attract enough expertise to enable it monitor aquatic ecosystems or conduct water quality monitoring research. The initiative to partner with other institutions (e.g. on-going partnership with National University on water quality monitoring) should be analysed from a policy perspective as well as long-term needs.

As a central regulating entity, the IWRM requires a multi-disciplinary team of expertise for stakeholder coordination; water use regulation; water data collection, analysis and dissemination; especially for the central coordinating entity like IWRM. An ideal structure should have, among others, a water quality monitoring unit with qualified specialists in hydrology, hydro-geology, hydro-biology, limnology and analytical chemistry; a Policy analysis and monitoring unit with

expertise to analyse water demand, availability and use from a multi-sectoral perspective; a water resources assessment and monitoring Unit supported by a robust hydro-metric network. To achieve this, there is need to conduct a functional review of the IWRM Department to develop an appropriate organisational structure and staffing levels, cognisant of the GoR's public sector reform process.

Linkages with decentralised levels

There are no water services departments at the decentralised levels. Water supply is perceived to be under the Natural Resources but in some instances, because of the infrastructural nature of water works, it is attributed to the District Engineer. Other WRM functions (e.g. watershed protection) are deemed to be the role of Agriculture, Forestry and Environment Offices.

The IWRM Department relies on casually employed, unskilled hydrometric readers. Presently, 43 such personnel are deployed in different river systems where hydrometric stations exist – from River Mwange (in Rusumo south east) to River Burera in the extreme north. Some experts interviewed have questioned the accuracy and reliability of the data provided by such people who neither have the basic knowledge nor appreciate the importance of providing consistent, reliable and accurate data. Hence there is need to establish a clear hydrological system with competently trained personnel and ensure that they are part of the WRM system and are effectively supervised. There are plans, supported by the NBI (under its Kagera Basin Project) and other programmes to modernise and expand the hydrological monitoring infrastructure throughout the Rwandan river basins. Developing a competent cadre of field-level hydrological monitors should be part of this capacity development initiative.

Institutional issues

The IWRM institutional framework is generally evolving, shaped by the policy and legal instruments that the GoR is developing. The national WRM policy and strategy were launched on March 22, 2012 during the 2012 World Water Day celebrations. These instruments together with the Water Law earlier approved, stipulate fundamental institutional and management reforms in the WRM sub-sector, including managing the water supply-demand balance, and coordinating stakeholder interests through the IWRM approach. The RNRA is expected to develop a clear roadmap to identify concrete priorities on short-term basis; engage stakeholders and partners; mobilise resources; and lead the change process towards putting in place a functioning IWRM coordination mechanism.

There are on-going attempts to develop a Water Resources Information System, including rehabilitation of the national hydrological network. A 2009 study by the NBI/Kagera project found only 6 out of 17 stations on the Rwandan side of the Kagera functioning (Mikhandi, 2009).

RNRA/IWRM has developed MoUs with the Disciplined Forces (Prisons, Army Reserve force and National Police) to manually remove the Water hyacinth and protect river banks and lakeshores in certain parts of the country. Under these MoUs, the RNRA provides funding.

RNRA needs to develop a change management strategy; integrate different functions especially the IWRM-related aspects, create a common vision and build internal cohesion within the RNRA, as part of institutional development.

Capacity building and funding

There are emerging opportunities for funding the IWRM activities. Besides USAID through RIWSP that is providing technical support, the Netherlands Embassy and the Swedish Cooperation (SIDA) have indicated willingness to provide support. Under Lake Victoria Environmental management Project phase II (LVEMP II) recently approved by the World Bank Board, there is grant financing of USD 15 million, almost all of which will be invested in IWRM-related activities. Besides project management which will cover the smallest promotion, LVEMP II funds will be spent on 3 components, viz: i) strengthening institutional capacity for managing shared water and fisheries resources; ii) control and prevention of point source pollution; and iii) watershed management.

Under the current MTEF (Medium term expenditure framework 2011/12-2013/14), the Government budget for IWRM Department will increase from RwF 782 million (approx. USD 1.3 million) in 2011/12 to RwF 1.82 billion (USD 3 million) in 2012/13 and RwF 2.09 billion (USD 3.47million) in 2013/14 financial year⁴. The allocation by component is presented in table 2.

Table 2: Budget Allocation to WRM in the Medium Term (2011- 2014)

		Financial Year (RwF)		
		2011/12	2012/13	2013/14
	IWRM Component			
	Total IWRM	781, 911, 353	1, 819, 918, 750	2, 086, 739, 847
1	Water resources Governance	70, 868, 353	79, 706, 250	89, 669, 532
2	Water quality & quantity assessment and monitoring	264, 793, 000	804, 212, 500	944, 070, 313
3	Watershed rehabilitation and promotion of rational water use	446, 250, 000	936, 000, 000	1, 053, 000, 002

Source: Directorate of Budget, Ministry of Finance and Economic Planning.

As indicated in table 2, as much 57% of the budget in 2011/12, 51% in 2012/13 and 50% in 2013/14. This progressive budget increase reflects GoR commitment to implement the WRM Strategic plan but falls short of the required funding to implement the strategic plan. This underscores the need to prioritise resource mobilisation by the RNRA and IWRM stakeholders.

⁴ MINECOFIN, Directorate of Budget.

Within the national budget, there are opportunities to leverage financing from allocations to WRM-dependant sectors like energy and agriculture if the sub-sector effectively engage the EDPRS II preparation process.

Lands and Mapping

In the Department of Lands and Mapping, the assessment identified 13 positions relevant for IWRM, only 3 of which are filled up. The entire Department presently has 17 technical staff, including the DDG, and only 2 of these relate to the land planning and management function which is most linked to IWRM (Urban planner and Land use planner). The main focus is on land registration and tenure reform, and the other main function of land use management where IWRM issues are expected to be addressed, is yet to function properly.

Although recruitment is going on, the numbers will still be inadequate unless the organisational structure and staff levels are reviewed. For example only 3 land use monitoring and evaluation officers are provided for the whole country with the diverse land use activities. This could cause challenges to implementation of the Integrated Land Use Master plan, especially IWRM aspects.

As land use is a key issue for IWRM and a contentious one with vast interests, it is important to clarify the links with other key land use sectors like agriculture, industry and settlement.

Policy and regulatory tools

Considering that most IWRM issues relate to land (pollution and degradation from inappropriate land use) the most important institutional tools for sustainable IWRM from the perspective of land management is the National Land Use and Development Master Plan that came into effect in 2010, the law on land use planning (still in draft though) and the Digital National Land information system that is being developed. These tools should provide a framework for rational land use considering the importance of certain areas (e.g. wetlands) as critical water resources reservoirs.

IWRM in Geology and Mines Department

Nearly all (10 out of 12) staff in the Department are working on standard monitoring and mines inspection. With the exception of DDG (PhD in Geology) and one technician, all have Bachelor's level education in a range of fields including chemistry, geology and environmental geography.

Mining inspection is a challenge considering that the Department lacks adequate staff and tools for ensuring good practices including pollution control. More than 100 companies are involved in mineral production in more than 400 mines in Rwanda. Most of these mines are operated on a smallholder basis. It is difficult for one mining inspector to cover these mines scattered around the country. The mining experts also lack appropriate skills and tools (e.g. guidelines, GIS-based decision support systems) to deal with environmental, social and economic issues related to IWRM e.g. like efficient water use, pollution of surface water bodies and ground water aquifers.

Management of Aquatic and other WRM-related Ecosystems

Water for ecosystems sustenance is perhaps one of the most important functions that are threatened by management capacity challenges. This function is split between REMA, RNRA (IWRM and Forestry and Nature Conservation Departments), and RDB. Substantial portions of ecosystems that support water resources in Rwanda and where most biodiversity is concentrated are under National Parks (e.g. the Volcanoes and Nyungwe NP both in the Albertine region). There is no comprehensive Wetlands Management Policy but there are some guidelines on which wetlands can be subject to agriculture and which ones are to be strictly protected.

In the Volcanoes National Park, water has been reported to be a source of disasters especially during rainy seasons when runoffs destroy homes, property and threaten lives⁵ (see Mid-term review of PAB). In the Nyungwe Forest National Park, water is sometimes reported to be a source of human-wildlife conflict especially during periods of water scarcity. It is also rather complicated to manage especially in the Akagera NP where a number of lakes are used for fishing. RDB appears to be too constrained to manage WRM challenges, because of the institution's complex structure and core focus on investment promotion.

3.2 IWRM Capacity in Agricultural and livestock Production

In the agriculture and livestock sector, the capacity for IWRM has been assessed in 2 key institutions – MINAGRI and RAB. It should be noted, however, that NAEB (National Agricultural Export Board), the agency that promotes on export crops of coffee, tea and horticulture, has a very important role to play, as most of the water for production and industrial use in Rwanda relates to the value chains of crop commodities promoted by NAEB.

1 Ministry of Agriculture and Animal Resources (MINAGRI)

The new political orientation of the GoR requires MINAGRI (and other ministries) to focus on policy formulation and analysis; supervision, monitoring and evaluation of policy implementation; as well as resource mobilisation and capacity building of implementing agencies.

Human Resources and HRD issues

Nearly all positions identified as critical for IWRM are filled up (Annex 2) and 4 are high level managers (Director Generals). Of these, 4 have Masters' degrees while the others have Bachelor's degrees (A0 level) in a range of disciplines as summarised in table A.2 (Annex 1). Most (50%) are agronomists and animal scientists (36%) hence there are gaps in other agricultural disciplines.

MINAGRI indicated that they lack agricultural economists, water resources specialists, and mechanisation and land management experts. An issue of concern for IWRM is that there are no irrigation experts. MINAGRI's irrigation programmes (mostly undertaken under the LWH and RSSP

⁵ Various reports including the Mid-term Review of the Protected Areas Biodiversity Conservation Project, December 2010)

projects) presently rely on external experts (including irrigation technicians from Kenya working with local agricultural engineers). Only 4 people have received training in IWRM topics, both in-country and abroad. These are summarised in the table 3. A number of irrigation and land management technicians are, however, being trained at ISAE, Busogo.

Table 3: MINAGRI officers who have received IWRM-related training

	Officer	Courses attended	Level	Where?
1	Soil and Water Management Officer	Water management	Post-graduate certificate	Abroad (Israel)
2	Agriculture Financing Officer	Water for agriculture; Gender mainstreaming	Short courses	Abroad (Brazil); in-country
3	Professional/Cattle Development	Water development	Short course	Not established
4	Senior GIS Officer	GIS Applications in Water Resources Management	Short course	In-country

In terms of experience, most staff is new. At least 19 of the professional staff were recruited in January 2012 and 70% of the staff assessed have no more than 2 years work experience. Only the Director Generals and 2 Professional staff have more than 5 years' professional experience. Furthermore, Table A.3 (in Annex 1) summarises the levels of experience of staff by rank. **A key observation from table A.3 is that MINAGRI has a very young cadre of staff with no middle level specialists capable of performing policy analysis, formulation and implementation monitoring that is expected at ministerial level and especially so with IWRM.**

Other Observations about the HR capacities in MINAGRI in the context of IWRM are:

- 1) *There is limited capacity in WRM in all aspects of agricultural and livestock production. There is no officer directly responsible for planning, execution or monitoring water for livestock production in MINAGRI (runoff harvesting and use, valley dams, Girinka).*
- 2) *The fisheries and fish farming function are inadequately provided for in terms of HR. With only 2 positions for fishing and bee keeping, and only one staff in place, it is difficult to develop and monitor a fisheries policy in view of Rwanda's untapped fisheries potential.*
- 3) *The present HR structure, recruitment and remuneration tend to favour fresh professionals with limited experience. A senior officer with 16 years experience works under the same conditions and is remunerated at the same rate as a freshly recruited fellow Food Security Officer. Similarly, the only expert in water management, with a post-graduate training from Israel is remunerated at the same rate as a fellow Soil and Water management Officer who is a young recently recruited graduate with no experience or post-graduate qualifications.*
- 4) *There is lack of expertise to do cross-sectoral and long-term scenario-based analysis and modelling, which would include IWRM issues.*

The Policy framework and planning tools

MINAGRI has fairly sufficient planning tools. Besides the National Agricultural Policy, PSTA II and specific commodity policies, it has developed a strategy for gender mainstreaming in agriculture; agricultural information system; and has regularly updated statistical systems managed with NISR. These include the biennial agricultural and food security surveys and the biannual (six monthly) agricultural surveys providing fairly precise information for planning based on seasons.

Although natural resources (soil and water resources) have been major issues for the agricultural sector in Rwanda for long, most of the action is at project and operational level. Any information on water is referred to the land husbandry, water harvesting and hillside irrigation (LWH) project.

There are gaps in the policy tools being used for agricultural development:

(i) The Rice Policy, 2009 focuses on the potential for and strategies to increase rice production through marshland exploitation, but does not consider mitigation actions for the risk of water scarcity especially in view of multiple water and wetland resource uses and the threats of climate change. This would encourage or incentivise MINAGRI to invest in water-efficient rice production systems (e.g. upland rice schemes).

ii) Although the Agricultural Policy and the PSTA II do allocate resources for WRM, the focus is on Rain water harvesting for agricultural production through hillside irrigation and marshland production. Institutional capacity building in WRM is limited mostly at farmer level, and MINAGRI relies mostly on short-term external expertise in irrigation and water management.

iii) There is inadequate consideration of downstream environmental issues in agricultural development, especially those relating to water pollution from agricultural activities, water use efficiency in wetlands exploitation, and ecosystem management. This would compel agricultural planners to work with other sectors and downstream stakeholders.

Institutional framework issues

PSTA II being the main plan implemented through Rwanda Agricultural Board (RAB) and a number of Projects and Task forces – including one on Irrigation and Mechanisation. These Taskforces have been transformed into Programmes which are being implemented by RAB. MINAGRI has a well established Resource Centre supported by the Belgium Technical Cooperation (BTC). It was not established whether there are adequate literature or other resources for IWRM in agriculture.

The main institutional structures for the agricultural service delivery are MINAGRI, RAB and the districts, along with farmers' and agri-business cooperatives.

Sector coordination and financing,

The agricultural sector has since 2010, mobilised funds and designed programmes through a Sector-wide Approach (SWAp) mechanism in which a number of development partners – World Bank, European Union, DfID, Belgium Technical Cooperation (BTC), UN FAO, IFAD, Lux Development and USAID, among others, participate. Under the EDPRS, the Agricultural sector cluster is also well established and attended with relatively better stakeholder mobilisation

mechanisms than others. However, proactive involvement of MINAGRI staff needs to improve to ensure sustainability of technical assistance results.

2. Rwanda Agricultural Board

RAB implements the agricultural policy through its 3 technical departments and 4 Agricultural Zones (North, South, West and Eastern).

Human Resources

The creation of RAB brought together some 300 staff from the former Rwanda Agricultural Research Institute (ISAR), 60 and 70 staff from former Rwanda Agricultural Development Agency (RADA) and Rwanda Animal Resources Development Agency (RARDA) respectively. An additional number close to 300 mostly low skilled staff⁶ have been recruited bringing the total personnel establishment to 700. Most are working in the 4 Agricultural Zones.

In IWRM, there are only 4 experts with water related training: The Senior Scientist who coordinates research programmes in NRM has a PhD in wetlands management while another programme coordinator has graduate training in GIS and water resources management. Two officials have recently graduated with MSc in water-related disciplines (Water management and water engineering).

RAB's work conditions appear to have disadvantaged the researchers, a situation which could worsen the present HR constraints. For instance, Head of Research Programmes presently earn Frw 414,000 (approx. US \$687) as net pay but under the new arrangements, they will earn a less amount of Frw. 376,000 (US\$ 624). Some programmes have not taken off reportedly due to lack of people qualified as Programme Leaders. Table A.4 outlines some of the key programmes directly related to IWRM in agriculture.

Capacity Building programmes: Capacity building in RAB mainly focuses on long-term training of staff at MSc and PhD levels and the priority is the research area which has major capacity gaps. There are 3 PhD level scientists while 2 are on PhD studies in soil and water conservation one of whom is focusing on water resources.

Institutional framework

RAB integrates research and extension, and most planning and operational activities are deconcentrated in the 4 Agricultural zones. There are, however, some challenges in the relationship between the RAB decentralised structure with the Local Governments in planning and field delivery. Local Governments (district authorities) have complained that the agricultural sector has created a parallel decentralisation structure and taking up some of the district responsibilities.

⁶ RAB has only 41 Masters and 9 PhDs (including 2 Director Generals). An additional 4 are expected to complete their studies.

Funding

Agricultural programmes are well funded. The largest IWRM-related project is a US \$ 40 million World bank funded *Land Husbandry, Water Harvesting and Hillside irrigation* (LWH) Project running from December 2009 to June 2014. These funds focus on integrated management of land, and cover soil erosion control, establishment of infrastructure for water harvesting and hillside irrigation, and irrigation infrastructure along water bodies.

In addition to LWH, some US\$ 80 million is available for phase 3 of the Rural Sector Support Project (RSSP) that is expected to be implemented during 2012-2017, effective April 2012. RSSP 3 will focus primarily on rehabilitation of at least 7000 Ha of marshland for rice cultivation and development of 17,000 Ha of hillside lands adjacent to the target marshlands, also essentially for rice production. Previous phases of this project have also focussed on water resources development for increased agricultural production with a focus on cereals⁷. It's funded by the World Bank. Most of the funding, however, will go to infrastructure development.

For the research component, the natural resources management (NRM) programme was reported to be the best funded of the research programmes. The research activities related to WRM are, however, few, small and localised. They are summarised in table 4.

Table 4: IWRM Related Research Programmes

	Research Programme	Sub-Programme	Area of Focus	Source of financing
1	Water Productivity		Working with farmers & farmers' institutions to improve in-situ water productivity	ASARECA
2	Climate Change Adaptation		Identifying & supporting integrated and comprehensive approaches to climate change adaptation	REMA under the Africa climate change Adaptation Project (RwF 1 billion) for 3 years
3	Agro-meteorology		Modelling climate change and using the predictability models to improve farm-level decisions for better results; building capacity of farmers to respond to climate change;	Rockefeller Foundation
			Developing meteorological infrastructure	Rockefeller Foundation

Institutional framework, Collaboration and coordination

The climate change research activities, though small and localised, have provided incentives for collaboration. RAB NRM researchers are working with the Meteorology department (which provides data and infrastructure) in the localised climate prediction and simulation activities; while on soil conservation, they are working with RNRA. These research activities aim to develop

⁷ RSSP 1 (2001-2008) developed some 3,113 Ha of marshland and construction of 9 irrigation dams; while under phase 2 (2008-2011), 3,300 Ha of irrigated marshlands were rehabilitated and 8 irrigation dams constructed. Both phases cost US\$83 million (www.rssp.gov.rw).

knowledge tools to improve decision making at farm level. These are, however, still emerging, and the only formal institutional collaboration arrangement is an MoU between RAB and REMA, in which REMA provided funding amounting to Frw 1 billion to ISAR (now part of RAB) to undertake research on climate change adaptation

Some key observations with implications for IWRM in agriculture:

- i) *Large scale projects for irrigation and water management* (e.g. RRSP implemented since 2001) have focused on infrastructure, which will be challenging to sustainably manage unless strategic focus on HR and institutional capacity for irrigation and water management is made;
- ii) *Ensuring that the long-term orientation of research is reconciled with the quick tangible results approach that the extension aspect focuses on*, is a challenge for the fused Research and extension model of agricultural services being implemented by RAB. The assessment is of the view that although water resources and climate change adaptation are becoming critical issues in the agricultural sector, there is limited institutional attention (by way of funding, HR expertise development, institutional systems) directed at analysing and addressing the underlying IWRM challenges that Rwanda is facing in agriculture might result from the roll-out of agricultural programmes (such as pollution, water-efficient crop systems, drought-tolerant crops, etc).
- iii) *Reliance on external grants for research* may come with a risk that the research will tend to respond to problems defined by the grant providers rather than the actual policy-oriented challenges that the country faces. This underscores the need to plan for and actively mobilise funds on the basis of a nationally defined research agenda.
- iv) *RAB's partnerships are mostly at the level of research*, being a member of the international consultative group on agricultural research (ICGAR), it also has networks with ASARECA, AGRAR, CIAT and other organizations that mostly finance agricultural research, train scientists and promote information exchange and collaborative research. But very few of the existing research areas are IWRM related.
- v) *Water, natural resources management and climate change adaptation* domains were reported to have high opportunities for research funding. However, there are capacity gaps (in terms of expertise) that constrain the ability of RAB and MINAGRI to tap this potential. There appears to be no clear strategies to address such capacity gaps, only relying on supply-oriented grants;

3.3 Water for Fisheries and Aquaculture development

The Government has reactivated the fisheries sector through the PAIGELAC (Management of In-land Lakes Project) funded by the African Development Bank. PAIGELAC is a \$ 5 million project implemented since 2005 and is expected to end by June 2012. Although institutional capacity development is one of the 3 project components, the focus of the project has been on 3 aspects:

- a) restocking In-land lakes;
- b) establishing demonstration fish farming projects in selected wetlands throughout the country, mostly in the Eastern and Southern Province.
- c) Training and organising cooperatives and fish farming;

The project worked directly with and helped build the capacity of fishing cooperatives. In this sub-sector, it appears that the underlying concern is perhaps the level of appreciation of the importance of fisheries which determines the personnel and budget allocated:

- The MINAGRI organigram provides for only 2 Fisheries and Bee keeping officers. It was not established why distinctly different functions as Fisheries and Bee Keeping are combined. Only one has recently been recruited and no solid background in fisheries or aquatic sciences. For RAB, the structure provides for 7 fisheries extension and research officers to be based in the Southern zone. However, these are yet to be recruited.
- A considerable number of fisheries are located in the National Parks (Akagera NP) where none of the Park staff has knowledge in fisheries management. Fisheries in the Akagera and other parts of the country are contracted out to fishing cooperatives but the Park authorities' technical capacity to monitor them is limited.
- At least 12 out of 30 districts have lakes and wetlands with sizeable fisheries and fish farming potentials). These include the 4 districts sharing Lake Kivu (Rubavu, Nyamasheke, Karongi, Rusizi), Burera in the North, Huye, Bugesera, Rwamagana, Kayonza, Ngoma, Kirehe, Nyagatare and Gatsibo. None of these, however, has a District Fisheries Officer or a strategy for fisheries development. It is difficult for districts to develop or exploit the fisheries potential including aquaculture that has been promoted by the PAIGELAC project. In the districts visited, the main reason frequently cited for not recruiting Fisheries Officers where fisheries potentials existed were rigid organisational structure provided by the Ministry of Public service (MIFOTRA), inadequate capacity to meet the wage bill, and having natural resources officers to coordinate all such aspects.

3.4 IWRM Capacity in Energy, Water supply and Sanitation Institutions

1. Ministry of Infrastructure

Like other key IWRM sectors, infrastructure services are being implemented through specialised agencies. Subsequently, MININFRA has been restructured to create a lean staff structure.

Human resources for IWRM

The assessment identified 29 positions with IWRM-related functions at MININFRA, 18 of which are filled. Of these staff, 5 are senior level positions (1 DG and 5 Directors). The Unit of Urban Planning and Housing has only one recently recruited staff in-charge of community settlement policy. The Unit Director resigned and no one is handling urban planning and housing issues. Half of the staff were recruited in January and are hardly 2 months at work.

Only one staff – the Director of Meteorology has received training in IWRM-related disciplines, including weather observation and climate change adaptation.

Policy, legal and regulatory framework

All the 5 sub-sectors that MININFRA supervises have updated policies and strategies. The policy on water supply and sanitation, energy and Meteorology, have strong provisions for WRM, including water use efficiency, hydro-power production and climate change adaptation; increasing availability and timely supply of weather and climatic data for planning, among others. The transport policy recognises the need to improve infrastructure designs to minimise maintenance costs caused by water (erosion, runoff) and develop the national water transport potential.

Institutional framework

MININFRA functions mainly through the specialised agencies – RTDA, EWSA, RHA and now Meteo Rwanda. MININFRA is lead agency for the Sector working groups of transport; energy and Water Supply and Sanitation. These policy processes are coordinated by the Directorate of Planning.

There are capacity challenges at MININFRA. Most officers are new and have not had any training in policy analysis or formulation. They have no clear sector-specific guidelines for formulating policies or monitoring them or other tools that they could use in monitoring IWRM-related activities. MININFRA has not been actively involved in the WRM activities.

2. Energy Water and Sanitation Authority

This assessment covers the 3 functions of energy, water and sanitation which are all directly linked to IWRM.

Human Resources

In the water sanitation division, 32 core positions with 74 staff were identified as critical for IWRM, excluding technicians. Of these, however, only 25 are in place (34%), 6 have Masters (DG has an MBA, heads of Energy Divisions and Water and Sanitation Division have MSc). The Head of Water and Sanitation reportedly moved from MININFRA with literary the entire WATSAN Department that he headed until 2010. EWSA work conditions and salary scales are much higher than those of the Ministry.

The main HR gaps are in sanitation where no expert has yet been recruited; water sector studies, monitoring and evaluation (where only 3 out of 12 positions are filled up). There are no sanitation engineers, environmental safeguards advisors, no strategic planners or Economists. EWSA has 6 lawyers, none of whom has received any training in utilities or water law. There is a plan to train one (who has some sanitary training) in conflict management at the UNESCO-HE.

In WRM, some 2 staff in the water development department and 3 in the Water Utility Division have MSc in WRM. EWSA has only 10 A1 technicians (with advanced Diploma) and 100 A2 technicians (Certificate level education). A-1 technicians are mostly trained in Burundi and DRC, as no such training was offered in Rwanda (only recently started at Tumba and Kicukiro but graduates are not yet on the market).

In the energy Division, 77 positions were identified for IWRM but only 29 (38%) are filled up. There are 3 chemists and 2 legal specialists and no Economists. The others are mostly engineers with specialisation in electrical and electro-mechanical, engineering, civil and chemical engineering. Only 5 have received post-graduate training in WRM including hydrological modelling.

Although EWSA has existed as a single entity for long, energy and water departments function more or less as separate entities. The Sanitation management function is constrained by staff and lack of central sewer systems. EWSA has faced challenges in finding sanitation engineers. Table A.5 (in Annex 1) summarises the key skills and knowledge levels of selected staff in the WATSAN Division. An important observation from table A.5 is that few people have received training in other important IWRM aspects like watershed management, climate change adaptation, gender mainstreaming or water governance. Some of the critical areas which senior managers expressed interest in training are disaster management, climate change and stakeholder management.

Training Policy and facilities: EWSA has a Training Centre in Gikondo valley, Kigali which is fully equipped with water analysis laboratories, mechanical and civil workshops and adequate training facilities. The agency has a training policy that explains clearly the training for artisans, technicians and engineers (including Laboratory experts). The training covers technical and non technical focuses on EWSA staff and partners (especially private service providers like plumbers and contractors). The centre has supported practical training for the University Students (of NUR and KIST) for one full year under formal MoUs with EWSA. The areas normally covered at the training centre are outlined in table A.6 (Annex 1).

The Board and Management strictly approve courses that they deem relevant to EWSA. The IWRM framework would help the EWSA Board to understand the importance of some disciplines.

Another aspect of training, relates to supporting student internship for Engineers and technicians. In this respect, EWSA has signed MoUs with the Kigali Institute of Management (KIM), Tumba College, Kicukiro Technical College, NUR and KIST to support students. EWSA provides internships

and some scholarship fund to the best performing student Engineers and offers them first priority whenever there are job openings.

Institutional Systems

EWSA operations are guided by the Law establishing EWSA and the Policy on water supply and sanitation and works under a Board of Directors and MININFRA. EWSA is transiting from an urban and commercial based utility company to national water and energy development and supply entity. Subsequently, there are on-going reforms in institutional systems and organisational structures. A district support unit is being set up to manage relationships with district actors and community level stakeholders to ensure effective management of rural water supply systems. However, there are capacity gaps in this domain especially relating to:

- Participatory planning and management of water facilities;
- Integrated management and monitoring of water supply services (including WASH aspects such as behavioral practices);
- Community management of water services;
- Public-private partnerships in social oriented services (not for profit water supply services);
- Operation and maintenance of rural water infrastructure;
- Watershed management and IWRM;

Coordination and Collaborative arrangements in IWRM

EWSA is actively involved in all sector platforms. It has a consistent representative in the WRM TWG, the Water Supply and Sanitation SWG and the Energy Cluster. EWSA recognises the need to work with stakeholders such as NGOs and district authorities, and is developing internal strategies to engage in, support and influence the different IWRM related platforms.

A forum of water users has been set up at national level to push for the interests of water users. The assessment is, however, of the view that this is an abstract structure considering that water users right from the community are not yet organised. It was difficult to establish how many protected water facilities have formal user groups because the districts did not have the data.

EWSA has extended water sources to include valley basins which collect rain water and other sources which are of interest to other users such as irrigation. A technical team has been nominated to work with other stakeholders (including MINAGRI, MINIRENA) on harmonising water use interests. It has an experience to build on, having collaborated with REMA, MINIRENA, MINAGRI, Local authorities and communities to address water conflicts in the Yanze watershed in near Kigali city. Strengthening the Institutional capacity to actively implement IWRM approaches will be a critical aspect of capacity building for EWSA.

In energy development, EWSA is diversifying energy sources – including biomass, methane gas, peat- to reduce use of hydro-carbons and address the shortfalls and risks of hydropower sources. However, climate change concerns and the possibility of multiple use which would require change of designs (e.g. to design multipurpose hydro power dams) have yet to be considered. EWSA experts met argued that it's a complicated and costly venture which would require change of designs for all its power and water supply plants, in addition to special expertise that presently are not available. EWSA Board should be supported to prioritise this in its investment plan.

Capacity building

In the area of water development, water supply and sanitation, EWSA has multiple MoUs with centres and institutions of excellence in Africa and the World to strengthen its institutional capacity. These are summarised in table 5.

Table 5: Existing MoUs for Institutional Capacity Building in Water supply and management at EWSA

	Organisation	Country or origin	Areas of support
1	GIZ	German Cooperation	Technical & financial support in training of EWSA staff and technicians in machinery operation & maintenance; water supply engineering; solid waste management; sanitation; WASH; stakeholder participation and gender mainstreaming
2	Vitens Avidens	Netherlands	Water supply systems design and management
3	STED	Tunisia	Advisory on design and implementation of large scale water supply projects;
4	ONEP	Morocco	Systems management- EWSA sends 6 staff annually to Morocco who then train as ToTs
5	Hamburg Wassen	Germany	Water supply design and management; technical skills training
6	National Water & Sewerage Cooperation	Uganda	Management of water supply systems; revenue collection
7	Rand Water	South Africa	Improving services management;

Source: EWSA, Water Development Division, March 2012.

Funding

EWSA is well funded – both from the energy development and water supply side. The Energy development programmes have received more than US \$ 100 million from the Energy basket fund that include the World Bank, AfDB, the EU and other development partners.

Most of the water supply activities are presently undertaken under the large scale water supply programme (PMEAR) and the LVWATER (Lake Victoria Water and Sanitation Project). The main partners to EWSA in water supply and areas of support are summarised in table 6.

Table 6: EWSA Donor Partners in Water and Sanitation and Areas of support

	Partner	Areas of support
1	UNICEF	Hygiene and hand washing in schools and selected communities. On-going project in Western province
2	AfDB	Water infrastructure and local community water management
3	World Bank	Rural water supply and community management of water facilities
4	EU	Water infrastructure
5	GIZ	Capacity building of technicians
6	JICA	Local community water maintenance equipment, skills,organisation
7	Red Cross	Water Supply project implementation
8	Water Aid	Water Supply (no capacity building component though)

Source; EWSA Water Development Unit, March 2012.

Most of these, however, relate to the utilities aspects. The upstream WRM aspects – such as watershed protection and water quality monitoring, have not yet received comprehensive interventions, save for the projects anticipated under LVEMP II.

Some challenges have been observed:

- *Reconciling the social and economic interests in water supply* - ensuring universal access, especially in rural areas where most poor people live while requiring water consumers to pay for water. There are some studies around payment for ecosystem services (including water) which would hopefully come up with models to resolve this policy dilemma.
- *There are gaps in the institutional arrangements and stakeholder coordination in water management at district level.* Environment and Infrastructure officers are both responsible for water management but no one is really accountable; none of the districts assessed has a budget for water development, facilities repair and maintenance. Records of NGOs-supported water facilities are not captured even within local platforms like Joint Action Development Forum (JADF).
- *EWSA has invested in upstream WRM before* (in the protection of watersheds in Yanze valley) and downstream (communities affected by EWSA projects; pollution management) with good results, but there is no proper framework for continued engagement.
- *EWSA operations rely on huge subsidies* – water supply operations do not pay energy costs (as power is supplied by the same company) and raw water abstracted from various springs/aquifers, water bodies is not paid for. Similarly, power production systems get water supplies without pay. Were EWSA required to pay for water abstraction, they claim the water bills would be unaffordable to many Rwandans.
- *Rural water supply systems are expected to be managed through contract approach* where EWSA develops the water supply system, hands it over to district and district authorities enter management contract with operators who recovers costs through sale of water at agreed rates. For this to work, however, it is important to ensure that the national and

global interests in ensuring universal access to clean water are protected and the capacity of districts and rural operators to manage water and sanitation business, including procurement and monitoring, are in place.

- *Shortage of technicians is a major bottleneck to efficient water management*– the country has only started training A1 technicians. This largely explains why there are no maintenance and repair technicians in rural areas. Water leakages and losses go unnoticed; repairs take long and are costly.

3.5 IWRM Capacity in Regulatory Institutions

In this regulatory category of IWRM institutions, the focus is on REMA, RBS, RURA and RHA. Whereas REMA regulates all aspects of environment and ecosystems management, the other 3 regulate utilities related to water resources (i.e. water, energy, waste management).

1. Rwanda Environment Management Authority

Human Resources development and management:

Nearly all (25/27) positions identified as relevant for IWRM work at REMA are in place. Of these, 4 are Directors. Only the DG has a PhD (in biological sciences), 3 have Masters (MBA- Marketing, MSc Meteorology and MSc in Water Resources Engineering) and the rest have Bachelors level education. At least 2 officers are presently on MSc courses in Rwandan institutions.

The most glaring gaps in REMA, in terms of expertise are in communication where the institution has not been able to recruit staff and presently rely on externally contracted media experts. Besides communication, there is one legal advisor but has no training or exposure to environmental or utilities law. The Policy, Planning and Research Department needs to develop a strong environmental/resource economics capability including skills, information and knowledge resource materials, including the economics of water as an ecosystem service.

REMA has received approval for a Legal Affairs Unit from the Ministry of Public Service and Labour (MIFOTRA) as well as the creation of the position of Deputy Director General. It is expected that these will be operational by July 2012.

In terms of IWRM-related training, most people assessed have attended training in a range of fields including climate change adaptation, environmental information systems. REMA achieves most of its work through projects- there are presently more than 5 projects with an average of 3 technical staff each.

Institutional systems and networks

REMA's institutional capacity is comparatively strong especially in terms of networks, public perceptions and links with Local Governments. REMA has supported district environment offices with office logistics (computers), training and transport (motorcycles); and has MoUs with some districts where local authorities receive funds to implement projects. REMA also counts with the approval and cordial partnerships with key UN agencies (UNDP and UNEP) especially on the basis of effectiveness with which it implements programs funded by these agencies. REMA is also a national focal point for most international conventions related to IWRM, including all the 3 Rio MEAs, Stockholm Convention on Persistent Organic Pollutants (POPs) and the Montreal Protocol in Ozone Depleting Substances (ODSs).

REMA has functional partnerships with national institutions like RAB which it has provided funding to conduct research on climate change adaptation; the Rwanda Information Office (ORINFOR) on broad casting environmental education and awareness messages; and a number of NGOs which implement project activities in the field. These MoUs, however, tend to be task oriented and short-term in nature. There is no training plan although opportunities arise under various projects.

In the area of knowledge management, REMA has published the State of the Environment Report and regularly publishes documents including guidelines and reports. It is also in the process of developing web-based database and environmental information systems with GIS capabilities. There are challenges in monitoring and evaluation.

Coordination and collaboration

REMA coordinates the fairly active TWG of Environment and Climate change but hardly participates in other sector clusters as required by its function of environmental mainstreaming.

Funding for IWRM

REMA has received adequate budget for its strategic plan through the 3-year rolling Medium term expenditure framework (MTEF). In addition, it coordinates a number of projects funded by different donors. Many of these relate to the Rio MEAs, poverty-environment initiative (PEI), climate change adaptation through the Clean Development Mechanism (CDM) and Biodiversity Conservation. Because of these diverse projects, REMA works closely with other institutions national institutions, NGOs and local governments.

There are on-going initiatives to set up the National Environment and Climate Change Fund with support from DfID, and IWRM will be a key beneficiary. It is not yet clear, however, how this fund will incorporate or work with the water fund envisaged under the water law 2010.

Policy, legal and regulatory framework

The National Policy on Environmental Protection, Organic Law on Environment and the Law establishing REMA (Law No. 04/2005) are the main tools defining Environmental protection and

conservation. At least 6 laws and more than 10 Ministerial orders covering a whole spectrum of IWRM-related issues from biodiversity conservation to pollution, water catchment protection and chemicals management have been developed to operationalise environmental legislation.

Major capacity gaps however exist among which include:

- Inadequate skills in environmental analysis, planning and monitoring;
- Inadequate follow-up inspection of projects for which EIAs have been approved;
- Inadequate planning, reporting and knowledge systems;
- Inadequate institutional capacity for stakeholder engagement;

2. Rwanda Bureau of Standards

RBS is the national standards and quality management agency in Rwanda. It has 4 primary functions i.e. standardisation, metrology, testing and certification. All of these are critical in IWRM.

Human resources

The approved structure provides for 80 people⁸ in the 25 positions deemed to have IWRM responsibilities, but only 35 people (44%) are in place. Of these, only one (the Director General) has a PhD and only 2 have a Masters. One is a technician with A-1 Diploma and the rest have BSc level education. Table A.7 (in Annex 1) provides a summary of the disciplines of staff targeted by the assessment. As indicated in table A.7, most assessed officers are food scientists (29%), Engineers (23%) and Chemists (17%). However, only 4 people have had training specifically related to IWRM (specifically food safety management).

RBS has a good system of staff retention (remuneration, work environment and job-related in-house training). This possibly explains why most people have worked at RBS for more than 6 years.

Policy, Legal and regulatory framework

RBS uses a national standards law and a set of standards, regulations and guidelines, including on water quality. RBS and its facilities are accredited by the International standards body – the International Standards Organisation (ISO). Consequently, national standards and guidelines that RBS uses are developed following ISO and related systems.

Institutional systems and facilities

RBS has internationally certified laboratories but there is no water laboratory at RBS. Although it tests water quality, RBS says it is not their core function and it relates mainly to standards certification e.g. for industrial purposes. With support from Trademark East Africa – multi-donor

⁸ This number may be high because it includes 2 positions of Quality testing Lab officers (19 positions) and Certification Officers (18) in which ideally only a few would have water-related expertise.

funded regional integration support organisation – RBS is being supported to develop testing and certification capability under a twinning arrangement with the British Standards Institute (BSI).

Coordination and collaboration with other institutions

It would seem that RBS is a fairly closed institution focusing on technical operations of standards setting and quality management. Engagement with other institutions tends to depend on the other institutions' initiative and there has been very limited engagement with IWRM institutions. Nonetheless, RBS works closely with MINICOM (which provides policy direction), specific industries, private sector federation and several regional standards bodies.

3. Rwanda Utilities Regulation Authority (RURA)

At RURA, just over half (14/24) of the positions with direct responsibility or role in IWRM, are presently filled up. At the top management level, only 1 out of the 4 Heads of Departments (Head of Legal and industrial affairs) is in place. The others (Water and Sanitation Regulations; Energy Regulations; and Transport Regulations) await cabinet appointments.

Human Resources

RURA has generally young but highly educated technocrats in the IWRM-related positions assessed. All but 2 (M&E Officer and Waterways Transport of Goods Officer) have masters degrees. Half of them have less than 5 years experience, 5 have between 5-10 years experience. Only 1 (Director of Energy Regulation) has more than 10 years experience. Although 11 people indicated that they have received training related to IWRM, only 3 have undertaken IWRM-specific training. These include Water and sanitation laws (2 officers trained); Environmental technology (1 officer); and Water resources assessment (1 officer).

Box 1: Skills gap in Water Resources Economics: Perpetuating in efficiency in regulation

Being a utilities regulatory agency, it is an issue of concern to find that none of the legal experts or subject matter specialists have specialised training in utilities law. Also, as the agency is regulating public and private corporations involved in using water for economic purposes, it is a concern that there are no economists, later on with specialised training in natural resources, environmental or energy economics and econometric modelling. This probably explains why the agency has not considered including water as an input into the costing models. Failure to consider the main input into a product process (simply because water abstraction or use for hydropower is a free public good) should be a major concern for IWRM because it perpetuates inefficiency in the whole water value chain. It is an international best practice that utilities and utility regulatory agencies have people specialised in utilities law, economics and insurance. This is a key area where RURA and the utilities agencies it regulates need support.

Institutional Systems, Regulatory tools and instruments

The regulatory tools and instruments that RURA uses are inadequate, only covering a few aspects of water supply and use. In interview with some senior managers, it was indicated that upstream and downstream concerns for the utilities they regulate (e.g. watershed protection/conservation, stakeholder management, water use efficiency and pollution control) receive little attention at RURA and are not reflected in the regulatory instruments they use.

On transport regulation, only aspects of water transport (boar riding) are covered. The concerns for pollution and water safety have triggered RURA to develop detailed guidelines for water transporters, especially those involved in commercial transport purposes. The Water transport guidelines, for instance, provide for penalties for in-land water pollution.

Like the utility agencies it regulates, *RURA does not include the cost of water in the costing system for water and energy costing systems*. The assumption is that water is freely available and only the cost of abstraction, transportation and processing are included. The only aspect addressed in the regulation is for the utility to consider downstream effects – e.g. ensuring fair price to consumers, addressing pollution downstream, etc. See box 1 for detailed analysis.

The other area of weakness is the *apparent lack of a strong statistical or management information system*. Regulation is a sensitive legal-political decision that requires good scientific information management. Apparent inability to use WRM data (such as water resources hydrological data, meteorological data, climate change data or other information on multiple water demand) makes it difficult for RURA to have an effective regulatory framework.

Collaboration and coordination

RURA works closely with REMA and EWSA and MININFRA. RURA staff actively participates in the Water supply TWG and Environment TWG. They are, however, not actively involved in other IWRM activities linked to WRM (e.g. no one attends WRM or ENR SWGs).

It would seem that more of the institutional staff time, resources and management attention are directed to regulating telecommunication providers and less on water-related utilities.

3.6 IWRM Capacity in Public Health institutions

Realising the links between health outcomes and water resources, Rwanda's health sector has made environmental health services a major priority area to reduce child mortality, eradicate extreme poverty and hunger (malnutrition), malaria, and fatal consequences of AIDS through prevention of diarrheal diseases, intestinal parasites (MoH, 2011)⁹. Thus, the MoH and RBC have a critical role and are actively interested in IWRM activities.

⁹ Ministry of Health. Annual Report 2010-2011.

Within the Ministry of Health (MoH), the assessment identified 12 positions, 10 of which are filled. Two of these are medical doctors with bachelor's degrees in medicine. The Environmental health Department is fairly well established. There are presently a team of 4 experts including:

- Hygiene inspection;
- Environmental health Department Coordinator;
- Food Safety Officer;
- Community Based Environmental Promotion Programme (CBEHPP) Supervisor
- There is, however, a gap of 4 CBEHPP Supervisors (one per Province) and the Drinking Water Surveillance Officer.

This is a serious capacity gap for IWRM, considering that most ailments afflicting the Rwandan population are water-related and local public health inspection is critical to addressing these challenges.

With the exception of one officer with a Master's degree, all professional level personnel in the Environmental Health Unit have Bachelor's degrees in environmental and public Health; and certificate level training in food safety and health communication.

Training and capacity building

There is a comprehensive environmental health training programme on healthcare waste management, injection safety and hand washing. These contents have been integrated into curricula of health training institutions.

- *MoH has recently trained 418 environmental Health Officers and in charge of CHWs on healthcare waste management and hand washing; Environmental Health maintenance technicians and waste handlers on the use and maintenance of Multipurpose separated waste pits; 950 Health workers in different Hospitals and 201 waste handlers on injection safety and health care waste management; incinerator operators on the use and maintenance of incinerators;*
- *MoH is training trainers of trainers (ToTs) in all districts on CBEHPP.* To this effect, MoH has developed and provided Guidelines and training manuals for CHWs and Community Hygiene Clubs and hygiene committees at village levels (Umudugudu); developed and provided food safety booklets to authorities and stakeholders at district level, which are important tools to promote good practices and behavioural change in hygiene, sanitation and environmental health.
- *MoH works with the media, through RBC/Health Communication Centre to promote hygiene behaviour change through multimedia communication including documentaries on malaria, community sketches and other awareness materials.*

Policy, legal and regulatory framework

There are comprehensive health policies, including the national health policy; Child health policy and child survival strategic plan; environmental health policy that guide health programmes related to IWRM.

Outside MoH, REMA has developed guidelines for Climate Change Adaptation and mitigation in the health sector and the personnel at MoH and RBC have been trained by REMA. The MoH has developed a hierarchical decentralisation structure based on function and designed around the referral and service delivery system – from 4 referral hospitals to 42 district hospitals, to more than 400 Health Centres and health posts. This system is integrated with CHWs who number at least 3 in every village. CHWs play a key role in community and environmental health care, mobilising and sensitising health care users, monitoring and providing information on the state of health issues into the health information system.

Coordination

The health sector has a well supported SWAp in which resources are mobilised to implement the health sector strategic plan. MoH is working with a number of partners including BTC, USAID and Global Fund. However, most IWRM-related activities are funded by GoR budget. Many of IWRM-related staff moved to RBC which is MoH's implementing arm.

3.7 Water-related Disaster Management

Disaster management in Rwanda is a concerted effort of many institutions but since the creation of MIDMAR, there has been shift from *ad hoc*, response oriented approach to more comprehensive planning and management. This assessment focuses on MIDMAR which is the core institution responsible for disaster management issues. On the other hand, MIDMAR is responsible for refugees where water, sanitation and health are critical issues.

Ministry of Disaster Management and Refugee Affairs

Human Resources

The assessment identified 16 positions including 4 Directors and 12 Professionals that have a role in IWRM, and all are in place. Only 2 of the 16 (12.5%) have Masters level education, the others have first degrees in a range of fields as summarised in table A.8 Annex 1).

From Annex 1 (table A.8), it is, however, noted that almost all personnel in disaster management have social backgrounds, and none has basic training in environmental, water resources or other science-based courses. None has training in GIS or spatial planning, yet risk analysis and management requires spatial or area-based information, which requires knowledge in these disciplines.

Although some officers (mostly directors) have had training in Disaster management related topics (including rapid assessment, reproductive health in emergencies, disaster management), and have considerable experiences in disaster management and humanitarian work, none has received training in IWRM related topics.

Policy and legal framework

The only existing Policy was formulated in 2009 under the National Police, and focuses mostly on disaster response. It is being reviewed and the current draft is still restricted. There is no formal system of planning or predicting and ensuring preparedness to disasters. These are areas they mentioned that would be priorities in the coming years.

At the time of the assessment, there was not a single map of disaster risk areas and type of disasters in different areas in MIDMAR offices.

Institutional framework and coordination mechanisms

There is a Disaster management taskforce that brings together several Government agencies (Prime Minister's Office; MINIRENA; REMA; National Police; Ministry of Defence; Ministry of Internal Security; Ministry of Finance and Planning; and Ministry of Local Government), Rwanda Red Cross and One UN (mostly the UN High Commissioner for Refugees) but generally meets when a disaster occurs and they are working on response measures.

MIDMAR needs to be supported to actively engage in IWRM related platforms as they are strategic for disaster management which are cross-cutting.

The Disaster management Unit (DMU) in MIDMAR is structurally small, in view of the high vulnerability to and incidences of disasters that Rwandan faces. The main IWRM issues raised in disaster management are:

- Responding to water-related disasters such as marine transport accidents; landslides and floods-related displacements and destruction;
- Cholera and other epidemic out-breaks related to sanitation and lack of clean water in refugee camps and areas affected by landslides and floods and other natural disasters;
- Citing camps in appropriate areas, especially those with easy access to clean water, fuelwood and minimal conflict with other people;
- Waste management.

3.8 Trans-boundary Water Resources and International Cooperation Institutions

Rwanda is involved in various regional and international IWRM-related networks and partnership arrangements. Besides the national institutions responsible for transboundary water issues – MINIRENA, RNRA and REMA, the regional and international cooperation ministries have a major role to play, especially in initiating, negotiating and sustaining water cooperation arrangements:

Ministry of East African Affairs

Human Resources

The assessment identified 22 positions in MINEAC with a role in IWRM within the context of MINEAC's mandate. Of these, 19 are filled and 3 are at the level of Directors. Only 2 of these indicated that their work and that of their Units had anything to do with water resources and instead tended to refer all issues to the Officer in-charge of Meteorology and Climate Change. This underscores the knowledge gap on IWRM issues.

The following observations need to be noted in the framework of IWRM capacity development:

- Hardly any training related to IWRM has been carried out;
- Most personnel have bachelors' level education, including those in Research positions. There is apparent lack of skills (and basic knowledge in research). Graduate training and experience are key requirements for people in research positions.
- Despite the fact that the staff positions provided by MIFOTRA are nearly filled up (85.4%), the personnel are over-whelmed by work probably because they are few. This makes it difficult for one to get out for training even if such opportunities arise;
- The only Statistician resigned and has not been replaced. Having a single officer in such a sensitive position and at junior level makes the institution's planning system vulnerable;

Institutional framework

MINEAC coordinates the entire national machinery for Rwanda's integration into the EAC, including facilitating the East African Business Council (EABC). In the areas of WRM, MINEAC together with MINIRENA are part of the Ministerial Committee of LVBC and participate in the EAC Climate change and water-related activities. At technical and local level, however, the inter-ministerial collaboration needs to be strengthened.

Ministry of Foreign Affairs and Cooperation

MINAFFET has positions for international bilateral and multilateral cooperation on environment; conventions. Most positions are not yet staffed, and the concept of IWRM has not yet been understood. It was observed that the capacity for regional and international engagement in areas related to IWRM is still limited for particularly three reasons:

- 1- Intra-governmental collaboration and coordination at the level of Ministries and agencies is low, even where functions are clearly related; there are few platforms that bring together different institutions regularly except perhaps at SWG and cabinet level.
- 2- Skills and knowledge in international negotiation, international water and environment laws, are limited, in part due to the lack of systematic capacity building and retention.
- 3- Lack of solid scientific data on the country's water resources, their uses and how this is linked to regional and international interests in water resources;

Coordination and Collaboration

Coordination and cooperation mechanisms between the RNRA or MINIRENA and MINAFFET on trans-boundary and international WRM issues are limited and generally *ad hoc*. Yet with only one officer coordinating trans-boundary WRM issues at RNRA, it would be expected that such a coordination unit works with other entities which also have personnel responsible for trans-boundary water related affairs.

In the context of the fact that trans-boundary water systems (certainly Congo and Nile basins in which Rwanda is central) are inherently political, economic and ecological, requiring strong engagement of diplomatic institutions. Capacity for IWRM in the 2 main diplomatic ministries in this regard and the connectedness with national water governance institutions need to be given attention in the IWRM capacity development process as there is generally low capacity.

3.9 IWRM Capacity in Transport

Rwanda Transport Development Agency

Human Resources

In the RTDA, out of 25 positions with functions linked to IWRM, 42 personnel are provided for but only half (22/42) are in place, including 14 senior managers (Director and above). Major recruitment was reported to be underway to fill up the positions.

However, with exception of 3 positions (Environment and Planning functions), all the other technical positions require basic qualifications in Engineering. Only one person (the Director of Planning) has received IWRM-related training (Environmental mainstreaming in infrastructure sectors). Yet the recognition that water management is an important aspect of transport planning is recognised at senior level in RTDA.

There is no HRD plan although RTDA has a budget for capacity building.

Institutional framework

RTDA is working on large scale infrastructure projects, including railway and airport projects; major road works design but most projects are designed and executed by external contractors. RTDA is new and yet to develop a corporate strategy for engaging other stakeholders, especially in WRM considering that water transport is a key area being developed, and runoff and precipitation are key design factors for the roads and bridges and road maintenance activities.

Coordination and collaboration

RTDA is keen to participate in all sector activities that influence their work but claimed that they often do not get information on what is happening e.g. in WRM. The 2 staff at RTDA who have attended Environment sub-sector working group did not know about the WRM TWG's existence.

There is increasing collaboration with the EAC Secretariat in the areas of infrastructure planning, and EAC Guidelines are being used to develop a national water navigation action plan.

IWRM **capacity challenges** in transport are partly due to the fact that water transport is just evolving and the transport sector generally has faced severe HR capacity constraints.

There has not been any training of staff in IWRM-related topics, nor are there any guidelines or documentation to which staff can refer. Knowledge of IWRM issues in transport is low¹⁰. RTDA plans develop the skills of district roads management units following decentralisation of local road maintenance funds. The energy and infrastructure sector guidelines for climate change adaptation developed by REMA have yet to be utilised in infrastructure planning. There is need for training on how to apply them.

A general observation about building IWRM capacity in the Transport sector

There is high level of awareness of WRM issues as critical to the transport sector – water is regarded as a principal enemy of infrastructures (roads and bridges) and considerable resources are spent designing to prevent water-related damage and repairing damages caused by water. The national transport strategy also recognises water as a key resource for cost-effective transport, and is working on marine transport projects. The transport sector relies on external private sector expertise in the entire infrastructure cycles – from design, procurement, construction, supervision, maintenance and repair. There is need to develop skills and knowledge in IWRM-related areas.

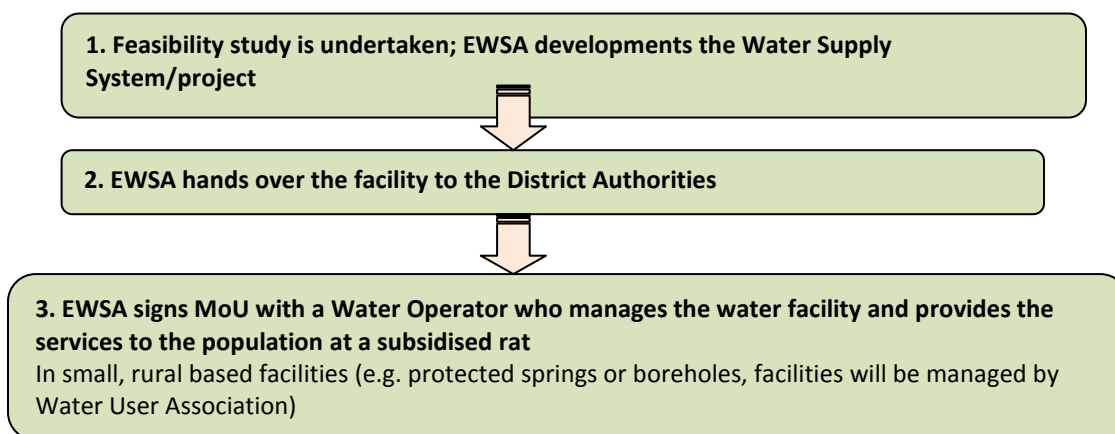
3.10 IWRM Capacity in Decentralised and Community levels

Before HR and institutional capacity issues in the districts and watersheds are discussed, it is important to understand the institutional environment that determines whether, how and where IWRM capacity can be developed, deployed and utilised:

The roles, responsibilities and functional linkages: Although water services are decentralised, it is difficult to describe the IWRM framework at sub-national level, specifically districts and lower level entities. Roles are not streamlined – in all districts visited, water services are reportedly under the district environment officer who mostly works with REMA where as water supply at national level is a responsibility of MININFRA. Although EWSA has been given the responsibility for rural water supply but it's not yet clear how this will be integrated in its district water office which is purely urban-based commercial oriented utility provider based on demand. Senior managers at EWSA head office reported that a district support team will be set up by June 2012 to assist coordinate the operations or rural water services. A framework for coordinating water users' associations, private providers and other stakeholders will be put in place. For the rural areas, they supply system was described as per the figure 2.

¹⁰ The only Marine Transport Engineer at RTDA was working on a Marine transport plan for Rwanda but reported that he has never had training on water transport, water safety, marine insurance or transport economics, except a few concepts as part of his BSc Engineering education.

Figure 2: Processes and main actors in rural water supply by EWSA



Multiple water developers, including NGOs are inadequately coordinated, and there are no clear data on how many clean water facilities (including protected springs, shallow wells, boreholes or stand taps), where they are, who has developed the facilities and who the beneficiaries/users are.

The role of local authorities in water management needs to be clarified and their engagement in water services improved. Districts only include water services in their priorities if the Ministry sends “earmarked funds” after establishing where there is need and potential for water provision. The perception at MININFRA is that districts have no capacity to plan and undertake complex water projects involving geotechnical studies and huge funds, so the ministry and its central agencies have to come in. Key aspects of water e.g. watershed protection or other WRM activities (e.g. river banks and lakeshores protection, afforestation, terracing) are only included in district development plans or performance contracts (*Imihigo*) if a responsible Ministry provides funds (usually from project) and requests them to include such activities.

Community-based WRM activities are scattered in various parts of the country where different projects are implemented and do not have plans for continuity beyond the lifespan of the particular project. The key on-going activities that have a component for community capacity building for IWRM are summarised in table 7 below.

Table 7: Some IWRM activities with Local capacity building aspects

Programme/Project	District(s)	Types of community-based IWRM activities
UNICEF/GoR WASH	Musanze, Rubavu, Nyabihu,	Community and school hand washing activities; clean water supply; promotion and training of hygiene clubs
GoR/PNEAR	All districts	Water supply systems, organisation & training of water users
REMA/DEMP	Eastern province districts around lake areas and river systems	Protection of catchments, lakeshores and river banks infrastructure; community-based NRM enterprises focusing on rural cooperatives; training of local NRM committees
LVWATER	Nyagatare and 22 other districts in LVB	Access to and capacity to manage water services infrastructure; reducing pollution by improving

			sanitation.
	MINAGRI/KWAMP	Kirehe district	Water harvesting; irrigation infrastructure and promoting community watershed and water management to in large scale and smallholder farming.
	MINAGRI/World Bank/LWH	Various districts, focusing on mountainous areas	Integrated management of Soil and water resources for sustainable agriculture; large scale water harvesting infrastructure. Limited local capacity development for maintenance though.

Source: Various documents and project Offices.

Human Resources

All districts have a District Environment Officer with a Bachelor's level degree in environment-related discipline (environment, biology, geography). Most have between 2-5 years' experience and the only training they have received is on environmental mainstreaming; education for sustainable development all provided by REMA in the districts. The IWRM knowledge levels of selected district officers are presented in table A.9.

Within districts, all sectors have Agronomists, some with A1 Diploma while others have a basic agricultural or rural engineering degree. None of these officers in the districts visited has attended training on IWRM-related topics. Besides, each sector has a Veterinary Officer working mainly on Girinka programmes. None of the 3 Vets interviewed has received any training related to water although only one appeared to understand that water for livestock is an issue to be addressed.

Institutional framework

Although all districts have these officers, the numbers and actual roles in IWRM tend to vary from district to district. In Rubavu, for example, 3 officers (health, infrastructure/engineer and environment officer) are involved in WASH while in Karongi and Musanze only 2 were mentioned. The Environment officer did not seem to be involved in WASH activities. In Gakenke district, there 4 district officers handling WASH activities (PNEAR has provided a fulltime officer).

PNEAR (national water supply programme) appears to be the main programme providing rural water through stand pipes. Its activities cover all districts visited. However, the activities under institutional capacity building vary considerable among districts. In some areas, PNEAR has provided experts to districts while in others follow-up roles are performed by district officials.

Coordination and Collaboration

The Joint Action Development Forum (JADF) was created by Ministerial Order of Minister of Local Government as a coordinating platform for stakeholders in planning, resource mobilisation and monitoring. It exists at sector and district levels and is the only platform where local authorities and intervening partners (donors, civil society, private sector, and community representatives) engage. The JADF exists in all districts and is chaired at district level by the Vice Mayor in-charge of

Economic Affairs and at sector level by the Executive Secretary. There are a number of active partners in the districts visited but there was limited indication that IWRM is a serious issue discussed in the JADF except in Nyagatare.

MINALOC (with support from SNV Netherlands) has been working to strengthen the JADF. There is one Permanent staff in each district to coordinate JADF activities on full time basis. Table A.10 (in Annex 1) summarises the personal with IWRM responsibilities.

Major observed challenges

- District authorities do not have discretionary powers to plan and allocate resources in IWRM. Most funds are transferred to districts strictly earmarked for specific activities. Since 2012, however, the new budget guidelines have outlawed inter-entity transfers and any funds to be spent in districts will have to be budgeted there and sent directly to districts. *This implies that the IWRM institutions should actively engage in district planning and budget processes;*
- *The institutional environment is not yet favourable to HR development.* It is not unusual to find District Engineers mobilising for health insurance or Environment officers in social programmes like *Bye Bye Nyakatsi* (operation to eliminate grass thatched houses) which is a housing and settlement issue. The district team is inter-woven and the pressure that Mayors are put on by central Government authorities is spread down to staff. They tend to work on emergencies although they have action plans. *“Ntabwo twipangira gahunda” complained one officer in Musanze, “Ntabwo dukurikiza gahunda twateguye” complained another Officer in Karongi. These statements translate into “We don’t plan for ourselves and we do not follow our own plans”.*
- *There is limited information on and institutional mechanisms to plan and manage water and other natural resources from a basin perspective.*

3.10.2 Community level

Community management of water resources tends to be undertaken as part of project activities that provide water services rather than systemic. Consequently, the type, nature of support and organisation of water user groups/associations or committees depends on the project. There are no uniform guidelines or policy tools to guide community mobilisation around water facility management. Some of the key IWRM related community structures are summarised below:

1. **Community health workers (CHWs):** CHWs are perhaps the most organised community level groups working on IWRM issues related to community health. There is a CHW team in every Umudugudu and are supervised by the district health officer and health centre in their sector. In IWRM, they work mainly on hygiene practices like hand washing, cleaning utensils and food; nutrition and safe disposal of wastes.
2. **Watershed committees:** Watershed groups have been formed by REMA/IMCE project in some critical wetland areas and MINAGRI/KWAMP project in Kirehe. In each programme,

the structure, tools and orientation are different. In Kirehe (KWAMP), the focus is on agriculture and water management while in REMA (both under IMCE and DEMP projects), the focus is on protecting riverbanks and lakeshores and integrated management of watersheds. In Kirehe district, participation in watershed planning among committee members is high and they use state of the art watershed maps. Table 8 shows participation in February-March planning sessions in selected watersheds.

Table 8: Community Participation in Watershed Planning in selected Watersheds in Kirehe District

Watershed	No. of Participants		Total
	Men	Women	
Nyakigera	22	13	45
Nyakerera	65	44	109
Kabugiri	82	22	110
Rwampanga	67	40	107

Source: Kirehe District Records/KWAMP Project Office, March 2012.

It should be understood that some watersheds cover more than one administrative units (in this case a cell) while in other instances, there may be more than one watersheds in one cell. The size of watershed explains the variation in numbers of people participating in planning meetings.

3. **Water user groups:** The MINAGRI-implemented LWH project has constructed water harvesting and irrigation infrastructure (valley dams) and mobilised farmers into water user groups (WUGs). These WUGs are different from those set in the south, east and Kirehe (under KWAMP) which focus on floodplain irrigation infrastructure. They are also different from those set up by PMEAR for drinking water supply management. There seems to be too many local structures on water management, some with overlapping functions. A watershed approach would help streamline their operations by bringing them together and identifying common issues.

4. **Imbangukira Gutabara:** these are community focal points that REMA nominated to monitor and report any form of environmental degradation. If a farmer extends beyond the 50-metre boundary from a lake, burns a bush or dumps waste into a river, they can halt his/her work or pick up a phone and call authorities. It was not established whether they are backed by law.

Some challenges in community water management

- ❖ The main problem with existing community-level WRM initiatives is that most of them are not well integrated such as the Kirehe one where watershed planning is purely focused on agriculture and other water needs are not considered.
- ❖ The management of WUGs are also not well coordinated within the local government system unlike the CHWs which have been facilitated and trained to provide health information and provide advisory services to health clients.
- ❖ In domestic water supply, a Water Users Association has been set up at national level with district representatives but it does not seem to be well linked with local user groups.

3.11 IWRM Capacity within civil society

Water supply, hygiene and sanitation (WASH) and watershed protection are some of the key areas in which a number of CSOs are involved. But their operations tend to be discreet, localized and not well organized despite being “organized” in multiple platforms and umbrellas¹¹. This assessment focused on the CSOs under the umbrella of Rwanda Water, Sanitation and Environment NGOs Forum (RWASEF). RWASEF brings together 12 NGOs, including:

- 1) Health Development initiative (HDI) that works on public health and hygiene issues;
- 2) *RECOR* which implements hygiene and sanitation activities in peri-urban areas of Kigali city; soil and water conservation, rainwater harvesting and climate change adaptation; biodiversity conservation around protected areas; and environmental education in schools.
- 3) *RECO* – Rwanda Nziza which implements environmental conservation and integrated development activities;
- 4) *Isuku asbl* works with communities and local authorities on hygiene and sanitation
- 5) *Amis de la Nature* (Friends of Nature) Association;
- 6) *Benishyaka Association* – working with widows and vulnerable people on water and sanitation
- 7) *Association Nzambazamalia Veneranda* - works on a range of socioeconomic development activities including WASH;

RWASEF is led by HDI (Chair) and *RECOR* (Vice Chair). It however does not have a secretariat office as it has no resources to finance its operations. Local CSOs in IWRM areas are very small institutionally and in terms of personnel. *ARECOR* for example has 6 technical staff, including the Executive Secretary and Programmes Officer based in Kigali, and 4 field-based staff.

Capacity building to IWRM-related CSOs has mainly focused on:

- Strengthening the institutional systems and skills development in resource mobilization, strategic planning and policy analysis.
- Trans-boundary water management supported by SIDA;
- Climate Change Adaptation through the Nile Basin Discourse Forum
- Education for sustainable development facilitated by world wide fund for nature (WWF);

USAID through Project implemented by IREX has supported some 40 Rwandan CSOs in strategic planning and resource mobilization through training and grant support. As a result, a number of local NGOs now have strategic and action plans with clear priorities, as well as established procedures and HR practices.

¹¹ The Rwanda Civil Society platform is organized around umbrella bodies- Individual members do not become members of the civil society platform but are represented through umbrella groups (which are thematic). This means that CSOs that belong to different platforms.

Some local organizations like Helpage Rwanda have considerable capacity in areas of IWRM such as soil and water management and watershed monitoring. Helpage has an annual budget of up to Frw. 1 billion and has fairly competent technicians. It has established partnerships with REMA and other organizations. However, Helpage mostly works as a contractor and not a typical CSO.

Coordination and participation

The Environment TWG appears to be more known to and attended by the CSOs assessed than the ENR SWG or WRM TWG. While 5 out of 9 CSO members who responded to the assessment have attended the Environment TWG, only 2 have attended the WRM TWG and none has been to the WRM TWG. They claimed they did not receive invitation to or information about it.

CSOs in IWRM areas are particularly constrained by:

- Inadequate funding;
- Lack of skills and inability to attract competent staff. One CSO leader remarked that it is difficult for a local NGO to hire an expert in WRM because they can easily find one in Rwanda and if they do, they demand much more money than they are able to pay.
- Lack of networking and coordination spirit with everyone wanting to do things on their own, hence its difficult to mobilize adequate resources and have a strong voice.
- Inadequate involvement of CSOs in sectoral activities. CSOs indicated that they are hardly invited to WRM activities or given access to information.

4. A SYNTHESIS OF MAJOR IWRM CAPACITY GAPS AND CAPACITY NEEDS

4.1 Summary

This chapter presents a synthesis of generic and specific capacity gaps and capacity needs for IWRM in the assessed domains. They are presented in 4 major areas: human resources; policy and legislative frameworks; Institutional and organizational gaps; financing (from a broad perspective).

A general observation is that most institutions are restructuring and have fairly new institutional systems, staff and policies. With the exception of EWSA, RBS and REMA, fewer than 30% of staff in the institutions have more than 5 years of institutional experience. Secondly, Ministries have very low capacity in terms of numbers, knowledge and skill levels of staff. Although under decentralisation ministries have retained purely policy analysis, formulation, monitoring and oversight and capacity building of implementing entities, none of the ministries has even 20% of the skills they need to do their tasks (except perhaps health). The difference between the ministries in terms of performance is that some have been able to hire external technical support (such as MINAGRI, MOH and MININFRA). Only the health and to a considerable extent agricultural sector, have robust information, monitoring and evaluation systems.

Policies and laws are in place in all IWRM sectors but they have not been translated into practical workable documents such as policy papers and action plans (except Agricultural sector); and there are no supportive policy instruments e.g. guidelines on how to do what, how to engage with who, how to monitor what,.. Where they exist (e.g. for environmental mainstreaming, climate change adaptation) they are not widely available to those who need them. Information exchange and sharing is generally low. On e-resources, the Budget library in MINECOFIN is the most easily accessible with up-to-date information. Apart from a few policy documents, many institutions;' websites do not have important documents relating to their IWRM work or indeed latest information on their policy implementation.

4.2 Human Resources Capacities

4.2.1 Adequacy of Staff

The main basis for determining the adequacy of staff numbers is the task (how much is to be done, the organizational structure and existing establishment). Most IWRM institutions have new structures arising from creation of new institutions (especially agencies from Ministry departments). Some are already operational but most will be implemented in July 2012. There are variations in the staff numbers, ranks and salary scales. Planning in some ministries (e.g. MINIRENA) is a small unit headed by a Director where as in others (MINAGRI, MININFRA), its bigger and headed by a Director General.

In terms of functionality, the numbers provided for IWRM assessed positions are fewer than optimal. Thus, there is need for MINIRENA and RNRA to leverage the IWRM staff allocated to ministries like MINEAC and MINAFFET and strengthen coordination and collaboration in dealing with international and trans-boundary IWRM issues. The IWRM HR gaps in selected institutions are summarized in table A.11 (in Annex 1).

At the level of technicians and artisans, there was not much analysis since discussions with EWSA, district and community level stakeholders, and a review of the 2009 skills audit (HIDA, 2009) indicates that technician level skills were very low and in some areas like plumbing lacking.

4.2.2 Knowledge and Skills in IWRM

There is serious gaps in skills, knowledge and experience in Policy analysis in all domains related to IWRM. IWRM requires that each sector that bases its functioning or has significant impact on WRM considers its implications on water resources and the potential impact of other water stakeholders on its performance. This requires specialized skills that unavailable in ministries. In all agencies, Professional analysts have an average of 0-2 years general work experience, and even less within the institutions they currently work in. In most Ministries and agencies assessed, there has not been any training in policy analysis or formulation, and many do not have reference tools to use.

In the RDB, especially in the Tourism and Conservation (Protected Areas management) and Investment Facilitation (EIA services; investment advisors), there are no staff with knowledge of IWRM. This makes it difficult to deal with WRM issues in the protected areas management.

Each of the 3 protected areas under RDB has unique WRM issues that need solid knowledge water resources governance from the perspective of ecosystem conservation; hazard management; exploiting aquatic resources to optimize economic returns while ensuring sustainability, conflict management and transboundary WRM issues. Without this, IWRM will not feature prominently in PA planning and management. It is essential that the managers, technical and policy staff of RDB especially those that inter-face with or are charged with managing PAs have essential IWRM knowledge.

IWRM policy and water governance: All the Ministries assessed lack sufficient knowledge and skills to perform their functions under the new dispensation i.e. policy analysis, formulation, monitoring and capacity building of implementing agencies. The dilemma is that the Agencies that these ministries are expected to guide and supervise seem to be institutionally stronger and better resourced than their line Ministries. The Policy and Strategic Planning Units in Ministries need to be strengthened to effectively undertake policy analysis, scenario-based planning, policy diffusion and monitoring as well as results management.

Corporate governance: A glaring gap that is often ignored is that all the agencies assessed have management boards but none of them has received training in or tools in corporate governance. IWRM issues such as social equity, ecological sustainability and responsible business are critical aspects of corporate responsibility and governance that WRM-related institutions should pursue. The closest and often the only training Board members receive is a few days of induction, even then focusing on the organizational culture and internal procedures of the corporation than on how to provide strategic guidance and Vision to the organisation.

IWRM-related data analysis and knowledge management: Hydrological data is useful when utilized for decision making. Data quality improvement and public investments in water resources assessment will depend on the extent to which decision making (e.g. irrigation, water supply, and pollution control activities) relies on scientific data. There are serious gaps in areas of data management – acquisition, collection, analysis, reporting and informing to influence decision processes. Efforts to develop IWRM data capability must be tied with analytical and evidence-based decision making skills.

Perceptions about water resources management: Although this assessment did not directly explore the individuals' perceptions of IWRM, it was clearly observed that many people do not understand the concept of IWRM and how their sectors are linked to water resources. Even the marine transport engineer in RTDA and some staff at EWSA (Energy and HR Departments) argued that their work had nothing to do with water resources and that it was the business of MINIRENA. *In addition, it was evident in most institutions assessed that water resources are still considered as a freely available, freely exploitable resource, irrespective of the scale, nature or purpose of exploitation/utilisation.* Perhaps because of this, the only institutional structures that have existed for long and are fairly strong, are those responsible for water mining and use. Thus, the starting point in IWRM capacity building should be to develop awareness and understanding engagement in inter-sectoral activities, so that actors can appreciate WRM from different perspectives.

The public sector has difficulties to attract experts in policy analysis, communication and media, engineering, law, economics, finance and accounting, which are critical aspects of IWRM largely because of intense competition from the private sector, NGOs and international development agencies which apparently offer better terms of service. This explains why most officers in Government in these disciplines usually have lower experience.

EIGHT key IWRM areas in which knowledge and skills are critically lacking in Rwanda:

- ✓ Policy analysis, including integration of cross-sectoral issues (major feature of IWRM);
- ✓ Communication – especially reporting (e.g. preparing de-briefs) feedback;
- ✓ Stakeholder engagement – dialogue planning, negotiation, conflict management; public-private partnership in IWRM (e.g. in social water and sanitation business); leadership

- ✓ Resource mapping and monitoring – including spatial and temporal data acquisition and application in decision process relating to expanding access to clean water, monitoring functionality of water facilities/losses, disaster prediction and watershed protection;
- ✓ Technical and econometric modelling- sediment load, climate change risk modeling, multi demographic and social modelling. These are important knowledge and skills areas for IWRM effective systems analysis and planning at local and trans-boundary scales;
- ✓ Resource mobilization – problem and issues analysis, IWRM budgeting and accountability;
- ✓ Corporate governance – social issues in water resources, as well as entrepreneurial activities in IWRM e.g. technological innovation in sanitation marketing;
- ✓ Knowledge management- data acquisition, information gathering, use, sharing.

The assessment is optimistic that addressing these gaps will create measurable results in:

- Better management of knowledge, including investing in data infrastructure, acquiring good practices in sharing of information to support decision processes;
- Mindset change from individual and institutional work practices to sector-wide practices and engagement; from focus on narrow outputs to big picture thinking on results which are measured across sectors; from discrete to systemic thinking.
- Mutual results-based accountability, feedback;
- Commitment to prioritizing and financing IWRM activities.

4.2 Policy Framework

In general, there are comprehensive policies that address IWRM's cross-sectoral issues. The general assessment of 5 selected IWRM-related policies in table 9 indicates that they are fairly coherent in terms of linkages and complementarity in the IWRM. But there are some concerns that need to be addressed through policy dialogue within IWRM.

Table 9: Evaluating the IWRM Gaps in selected sectoral Policies

	IWRM-linked policy	Key IWRM Issues	Rating for IWRM
1	Water Resources Management Policy, 2011	Basis for IWRM; it addresses all aspects of water efficiency, basin/watershed protection, pollution management, institutional capacity, financing and IWRM knowledge. Is consistent with decentralisation and Vision 2020.	++++
2	Water Supply & Sanitation Policy 2010	Recognises IWRM issues e.g. water institutions, pollution management, health & poverty. It does, however, not recognise water as an economic input that should be accounted for;	+++
3	Human Settlement Policy (2009)	Recognises the demographic and environmental challenges and seeks to organise settlements to improve coverage of utilities like water supply; improve sanitation and rationalise land use. Does not mention water resources or how to engage stakeholders.	+++
4	Agricultural Policy	Addresses land degradation issues which are the main concerns for WRM; argues for intensive use of water resources for	++

		production; but advocates extensive exploitation of wetlands in disregard of other WRM related functions; provides for water use efficiency but advocates for inefficient water uses like floodplain irrigation; minimal measures for managing agricultural pollution.	
5	Environment Policy (2005)	Comprehensively addresses ecosystem and pollution issues; protection of aquatic ecosystems. Provides for financing activities related to IWRM	++++

Rating scale: + (0-25) ++ (25-50) +++ (50-75) ++++ (75-100)

As indicated in table 9, the agricultural policies are rated lower than the other selected policies although they are really good and robust. The obvious concerns for IWRM are the high levels of inefficiency in flood plain irrigation in wetlands that are have multiple WRM functions and inadequate mechanisms to address agricultural pollution. But from a wider perspective, the main challenge is in knowledge gaps and policy analysis.

However, the main gaps in the whole IWRM policy framework relates to the following:

- i) **Solid knowledge of the policies:** Many of the staff and senior managers demonstrated need for more solid understanding of the sectoral policies and how they are supposed to be translated into action. The urgency of implementation tends to leave little room for staff to be oriented, trained or otherwise guided to intensify their knowledge of the sectoral policies they are expected to implement and how to work with others in realising policy objectives or targets. As a result, sometimes implementation of programmes is contrary to policy, policy priorities are often not implemented or implementation is slow. Tendencies of policy contradictions are also noted. *There is need for stronger engagement of staff and core stakeholders in the policy formulation processes, even when the policy formulation processes are led by external experts.*
- ii) **Policy ownership:** In terms of policy gaps, the biggest challenge relates to the policy framework not just policies – policies exist but the framework and institutional environment in which they are initiated, formulated and implemented does not reflect institutional (and wider stakeholder) ownership, understanding and use. Inadequate policy evaluation to identify and learn lessons for continuous improvement also creates problems.

The following actions will increase policy management:

- **Policy briefs:** Translate the policy into practical tasks, debates, arguments around certain policy priorities to get people to understand, get convinced and on this basis make decisions. Policy briefs will highlight the problem area, what the policy priorities are, how urgent an action should be taken, point out risks, fears and demystify them;
- **Policy dialogue;** the Rwandan society (like most African societies) is generally oral and it will be difficult to get busy Permanent Secretaries and Director Generals to read the WRM policy. Besides policy briefs, organise dialogue topics at all levels (e.g. food security and

watershed; water quality and health; climate change and water access), they will finance, participate and take the required action.

- **Policy evaluation:** Ensure that there are key results to show how the policy is being implemented and undertaken joint evaluation. This will certainly be a key task of the IWRM. Practical tangible results appear to be the main basis for public performance.
- **Communicate:** IWRM Policy documents should be translated in the languages actors use and published and publicised. Each IWRM desk should have a copy with key policy objectives, targets and indicators. Where necessary, develop and provide operational guides to get things done.
- **Analyse cross-sectoral links.** How will IWRM policy be useful document to MINAGRI or MINICOM? Change the perceptions by analysing areas where each sector priorities are linked with IWRM. These audio-visual analyses should be part of the awareness raising, policy dialogue, stakeholder engagement and resource mobilisation tools.

4.3 Legal and Regulatory Framework

Major capacity gaps in the legal framework for IWRM relate to the following:

Inadequate legal resources (*HR expertise, reference materials, legal bureaus*) *in the institutions:*

The main capacity gap that cut across all institutions is the lack of legal expertise. Although every institution assessed has at least a legal advisor, they appear to focus on operational issues such as checking and ensuring procurement contracts comply with relevant laws. There is no specialized expertise in the water sector regarding rights to access, use, safety, ownership among upstream and downstream stakeholders, etc. There is no expertise in this area and no on-going efforts to develop such expertise. RNRA and other IWRM institutions should focus on building a legal team especially in the context of managing demand and allocation through permits, enforcing penalties relating to over-use or misuse or application of the *polluter pays principle* in IWRM. *Without specialized training in Utilities law; water and environmental law, it will be difficult to implement some of the activities envisaged under the WRM Policy and Strategy.*

Inadequate legal instruments: The water law has yet to be operationalised due to absence of subsidiary legislation. These include Ministerial Orders and other laws to be created to implement the provisions of the Water law. There are, however, some contradictions in some legislation, due in part to the fact that many Ministerial orders are developed without due consultations or checking other legislation especially cross-sectoral ones. There will be need to made careful and wide references to the laws relating to mining, land management, local governance and commercial laws, among others. For instance, the National Environment and Climate change fund being established by REMA may make the Water Fund provisions redundant. The penalties provided in the Water transport law are different from those in the Environment law for the same offence; too many committees are created at district level by different Ministerial Orders all with a directive that they are chaired by Vice Mayor in-charge of Economic Affairs (e.g. Forestry

Committee, Environment Committee, JADF, Access to Finance, Girinka, Ubudehe,..). How will they function with these external responsibilities?

A comprehensive review of water-related legislation will have to be undertaken to assess the contradictions and gaps especially between laws relating to land ownership and use, water, environmental management, infrastructure and local governance.

4.4 Institutional Framework

The institutional framework in most agencies is characterized by continuous reforms. Professional career growth systems are limited. There is a tendency to focus on outputs and less attention is paid to developing sustainable institutional systems. Because of continuous reforms and high personnel mobility (turnover), it's difficult to maintain institutional memory. The key areas of capacity gaps are:

HR deployment, retention and development: most institutions lack adequate systems and procedures and practices for hiring staff and managing the human resource function. Only EWSA and RBS have a training policy, only EWSA has a training centre. Little wonder they have the highest staff retention levels among the agencies assessed. In the districts, personnel tend to be overworked and deployed in *ad hoc* basis, often to activities they did not plan to do and usually outside their domains. This makes it difficult to motivate professionals especially if wages are not attractive.

The Institutional environment needs to be improved to retain experts. In MINAGRI, a Soil and Water management officer with 9 years experience and a post-graduate certificate in water management occupies the same position and is remunerated at the same rate as a fresh graduate with no working experience. Similarly, 2 Food Security Officers (in-charge of crops) have a wide difference in experience (one with 16 years experience and another 1 year's experience), but they work under similar conditions and earn the same salaries.

The planning and human resources management (HRM) functions appeared to be under-valued and under-utilised in all Government institutions assessed. In most institutions, Chief Planners and HR Managers are placed much lower in the hierarchy, and in all situations, HR and Planning Units are under-staffed and under-facilitated. All HR Managers interviewed indicated that the key HRM work of designing, organizing training programmes for staff; motivation and retention, skills, remuneration, productivity, analysis of staff turn-over and other activities that relate to personnel productivity and career development, are not functions they do. The main focus was on office logistics, payroll issues and leave processing.

Institutional systems and cohesion: many institutions are being merged under rationalization bringing different organizational cultures without adequate efforts to integrate, facilitate and manage the change process and develop internal institutional cohesion. Institutional performance

cannot improve in such setting and there is need for leadership development and institutional change management processes.

Mechanisms for Collaboration and coordination: despite the SWAs and platforms for sector coordination – SWGs, TWGs and other clusters that were created under EDPRS, there is limited coordination within and across institutions. IWRM requires synergy and stronger institutional linkages more than technical expertise. *There should be initiatives to make SWGs/TWG meetings more interesting and productive as stakeholder platforms.*

Clarity of institutional roles in WRM: sometimes IWRM institutions appear unable to clearly delineate their roles in relation to other institutions. This makes it difficult to hold some institutions accountable for their actions or inactions. An example is Wetlands management whose functions are split between RNRA-IWRM; RNRA-Forests and critical ecosystems management; REMA and MINAGRI/RAB. The other relates to managing watershed and catchment basins where REMA is implementing many projects without a collaborative arrangement with RNRA. Local Governments are dealing with REMA mostly perhaps because of the strong bonds with the District Environment Office. *IWRM institutions especially those working on ecosystems management need to get together and streamline activities.*

Capacity for stakeholder coordination, dialogue and negotiation

Inter and intra-sectoral coordination appears to be new having been popularized during the EDPRS process. EWSA's expanded role to cover rural water supply will require that they increase their engagement with social sector actors, local governments and rural communities.

The IWRM Department must pay attention to coordinating functions, starting with the WRM TWG. Information flow, agenda setting and steering of discussions need to be taken as serious issues for advancing stakeholder interests and motivating them.

Given the multi-sectoral and multi-disciplinary nature of IWRM, institutional capacity in IWRM will depend on the responsiveness of two organizational functions, planning (which is responsible for priority setting and resource allocation) and human resources (which is responsible for hiring, training, motivation, retention, etc). These functions are inappropriately positioned within the organizational hierarchy, are inadequately staffed and under-facilitated, making them ineffective in addressing the serious HR and Institutional capacity challenges in the institutions assessed.

Monitoring, Evaluation and Learning systems: Only the Education and health sectors have fairly robust, integrated systems for monitoring program implementation systematically and in an integrated way from the community right up to national level (EMIS and HMIS respectively). However, the education sector does not have water-related indicators as key aspects of education (except number of latrine facilities for boys and girls). For instance, it is difficult to establish how many schools have water facilities (e.g. stand taps or rainwater harvesting tanks), hand washing

facilities; proportion of teachers with knowledge/skills in water or hygiene practices and pedagogy; existence of WASH clubs or programmes; water education in school curriculum, etc.

District authorities do not have adequate reliable records of water facilities or IWRM activities. It's difficult to determine how many safe water facilities exist and their level of functionality.

Many water development activities of NGOs are not captured by Local or national development authorities. Streamlining coordination will require change in attitude and behavioral practices of managers and staff in IWRM institutions, as well as putting in place institutional data systems.

In the local civil society, institutional capacity is very low – to elaborate projects, mobilise financing, generate information organise dialogue and influence policy processes. Most of CSOs' agendas are determined by the available financing and this makes it difficult to focus on issues and follow them through. The CSOs met are hoping that the IWRM framework will give them a platform and technical support to engage and build internal institutional capacities.

4.5 Knowledge Generation and Utilisation

There is inadequate capacity to generate, share and utilize scientific knowledge in IWRM.

In the agricultural sector, there are research activities going on in WRM-related activities but the scale and scope is too small to address the serious challenges that Rwanda is likely to face in agricultural water. Part of the problem is inadequate number of qualified researchers, institutional capacity to mobilize funding for policy-relevant research. Water resources-related research is particularly limited in the national research or academic institutions. The senior research scientists met indicated that water issues are only a recent area of focus as water issues in agriculture have only become serious with climate change increasing in the recent past. With less than 10 WRM experts (at both MSc and PhD levels) RAB cannot do much in IWRM especially research and policy.

Access to research-generated knowledge is also a big challenge. Information exchange is still a problem. A culture of sharing information is only evolving and many useful documents produced by some ministries/agencies are not accessible on their web-sites. Although sector-specific climate change adaptation guidelines have been developed and posted on REMA web-site, some key planning staff in the sectors for which the guidelines were designed, said they were not aware.

Opportunities exist for international partnership building with regional and international organizations present in the country, in developing IWRM capacity. However, these are not adequately being utilised and their potentials have not been assessed. These include:

- Nile Basin initiative (whose regional programme NELSAP is headquartered in Kigali;
- Virunga Trans-boundary Cooperation Framework – covering the Mountain Gorilla habitat of the Volcanoes complex; and
- Albertine Rift Conservation Programme which covers ecosystems in the western rift valley from Burundi, Rwanda, DRC and Uganda;

These have potential to promote regional collaboration, exchange of knowledge, skills and experiences and good practices in IWRM, mobilize financing, and provide technical support if well utilized.

4.6 IWRM Financing

The level of financing for IWRM activities varies from sector to sector and from institution to institution. Health, infrastructure and agriculture sectors are very highly funded both from national budget and externally. There are also opportunities to finance WRM activities within existing budget frameworks, especially in areas where WRM-related risks will affect the performance of economic and social sectors. The IWRM Department budget will increase substantially over the next 3 years from around RwF 800 million to well over RwF 2 billion. There is also opportunity to leverage financing from public-private partnership arrangements, as from emerging climate change windows such as the clean development mechanism. The key to accessing these funds for water governance through IWRM will be to invest in institutional machinery for resource mobilization.

Whilst opportunities exist, the biggest challenge in financing IWRM activities will be institutional ability to mobilise the funds – by designing attractive, bankable projects, engaging financing agencies proactively and consistently; and demonstrating value for money for executed activities.

4.7 A summary of Institutional capacity levels in selected Ministries and Agencies

From the assessment, the general rating of capacity levels for selected IWRM institutions are summarized in table 10.

Table 10: Summary of Capacity levels for selected IWRM Institutions

	IWRM Capacity component	Lead Ministries			Public Agencies				
		MINIRENA	MINAGRI	MININFRA	EWSA	RURA	REMA	RNRA/IWRM	RBS
1	HR-adequacy	+	++	++	+++	+++	+++	+	+++
	IWRM Skills & knowledge	+	+	+	++	+	++	+	++
2	Policy Adequacy & coherence	+++	+++	+++	+++	+++	+++	+++	+++
3	Legislative & Regulatory frameworks	++	+++	+++	+++	+++	+++	++	+++
4	Institutional systems, structures & Networks	+	++	++	+++	+++	+++	+	++++
5	Financing	++	+++	+++			+++	+	+++
6	Internal Capacity development/retention strategy/plan	+	++	+	+++	+++	++	-	+++

As observed in the table 10, the MINIRENA and the RNRN/IWRM Department are comparatively much worse off than the other core institutions. Secondly, the lead ministries appear apparently weaker than their implementation institutions. This could be a bottleneck in advancing IWRM programmes which require strong policy guidance and political leadership.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The assessment concludes on 4 important notes about Capacity situation analysis and capacity development in Rwanda's WRM sub-sector: major capacity gaps; capacity development opportunities; priority capacity building actions; and challenges to capacity building.

1. ***There are considerable opportunities for development an IWRM structure in Rwanda.*** First the political and policy environmental are conducive and supportive to IWRM approaches to managing Rwanda's water resources. A clear vision exists and it's fairly easy to sense the development direction and work around the long-term priorities of Government with regard to natural resources and WRM. Adequate policies exist and the institutions are being reformed around functions and results. There are signs that development partners are interested to support Rwanda's WRM agenda, and many IWRM institutions are well funded.
2. ***Existing institutional structures*** (those proposed in the new organisational structures) with responsibilities for water regulation may be sufficient at least to increase water efficiency and minimise water pollution from housing, municipal and industrial waste, if well utilised. But this will depend on the quality of personnel hired, the priorities set by the institutions and the effectiveness of the monitoring and compliance arrangements.
3. ***There are huge capacity gaps in all components and sectors of IWRM.*** Human resource gaps in terms of numbers but mostly knowledge and skills, fragile institutional structures. The whole institutional environment at national and sub-national level and even non state entities presents glaring gaps, yet capacity building continues to be emphasised verbally and in text as a priority. A more important area of concern relates to putting in place an appropriate and holistic mechanism for systemic capacity development.
4. Because of enormous constraints in the institutional environment, ***capacity development for IWRM, as indeed any other sector should be designed innovatively, with flexibility and long-term orientation.*** Working in an environment where quick and tangible results are demanded even without sufficient inputs; where there are constant reforms at every level- structure, leadership; where both personnel and function are changing quickly, is a big challenge for capacity building. This has implications for the priorities, design and delivery of capacity building activities, and follow-up actions. This reality must be factored in CB design.

5.2 Recommendations

The assessment recommends the following:

1. **Awareness of and value of water:** right from community level to policy making levels, it is apparent that there are variations in the people's perception of water as a resource that is important and scarce, that needs to be managed in coordinated way. Lack of adequate scientific data on actual state of water resources makes it even more complicated. It will be important to analyse the people's perceptions (from community to leadership, to scientists and policy makers) about water. Then design a perception and behavioral change intervention as part of capacity building for IWRM. This will increase the incentives and motivations for rational planning; investment in WRM; and develop interest to work together.
 - a. *Invest in awareness creation about the importance and value of water;*
 - b. *Techniques to manage, exploit, utilize and protect/conserves water;*
 - c. *Create institutional mechanisms for generating and sharing knowledge and monitoring how IWRM knowledge is used to create change and support the users;*
 - d. *Focus on building institutional structures as the basis to deploy and retain skills;*

2. **The RNRA/IWRM Department should be supported to build institutional capacity** (including restructuring of IWRM Department to provide appropriate HR and institutional resources) for the following IWRM functions:
 - i. **Research:** *Establish a research and knowledge management unit within IWRM Department:* As it is unlikely that any of the established national research institutions has a focus or special capacity in WRM-related research (apart from the NUR Laboratory), capacity building for WRM-specific knowledge generation will be difficult within the existing setting. The IWRM Department will need to be restructured to establish a specific unit for research, as no other institution has obligation to conduct WRM research.
 - ii. **Legal and regulatory management:** IWRM will need to develop a capable team of legal experts with knowledge in water and energy utilities law and regulatory mechanisms, environmental, human rights and international law to be able to deal with specialized legal issues, and to influence the multiple and often conflicting WRM legal frameworks.
 - iii. **Economic management:** IWRM will require a team of capable natural resource and utility economists with skills in policy analysis, economic modeling, price monitoring and valuation of water resources, if the Department is to effectively manage the supply-demand nexus and rationally allocate water. MINIRENA and RNRA/IWRM leadership should engage MIFOTRA to ensure that the structure and staffing are appropriate and reflect their staffing needs.
 - iv. **Financing:** there is need for IWRM to leverage funding from cross-sectoral interventions especially targeting those sectors that rely on or have greater impact on WRM i.e. agriculture, energy, industry and mining. In the immediate term, the RNRA should undertake public expenditure review (PER) to map and analyse funding potentially

available for WRM/WASH from other sectors and put in place mechanisms for influencing resource mobilization and expenditure in favour of IWRM.

- v. **Water governance institutions:** The process of creating an IWRM structure envisaged under the law, policy and strategy, be set up; comprising representatives from a wide cross-section of stakeholders; and the IWRM TWG should be streamlined and expanded, to oversee a comprehensive sectoral review and develop a national vision for water resources management. This will then clearly lay out the actual capacity gaps to be addressed.

3. Basin, sub-basin and catchment areas should be delineated and maps produced. This will be a basis for coordinating several watershed management initiatives, and generate local lessons and practices in basin or ecosystem-wide management. ***It will be important to follow a pilot approach and start with obvious areas like the Lake Kivu ecosystem which covers all aspects of IWRM*** including disasters, water transport and trans-boundary management. Besides, the Kivu ecosystem is one basin whose boundaries almost match with the administrative boundaries of the western province. Previous projects like DEMP (Decentralisation and Environmental Management Project) have also intervened on a basin-wide scale.

Mainstreaming IWRM in disaster management: the new policy being reviewed and the institutional structure (at the level of Ministry) presents opportunity to mainstream IWRM in disaster management. The fact that MIDMAR will shift focus from disaster response to comprehensive disaster preparedness and planning, will necessitate using IWRM information for planning and expertise in these areas will be critical.

A range of common IWRM knowledge and skill areas were identified by respondents. They should be detailed in the CB plan. *But the following 6 key areas of high level policy importance where huge capacity gaps exist should receive special attention:*

- 1) ***Climate change adaptation, demographic and other related concerns*** : all sectors using, depending on or affected by water resources have voiced concern of being affected by climate change, but very few have actual adaptation mechanisms in place or the knowledge to link climate change adaptation to planning and investment. This should be a critical priority area for training and institutional support. Equally, Rwanda's IWRM regime will have to deal with demographic pressures, change of land use, technological innovations, all of which affect the demand for water resources and shape how water resources are managed. WRM planners, leaders and sector technocrats shall be equipped with the knowledge and skills in how to integrate these issues into WRM activities.
- 2) ***Urban water and waste management:*** Urbanisation is increasing in Rwanda along with challenges of waste water management, pollution, sanitation and efficient water access

especially in peri-urban areas occupied by the poor. The RHA and local authorities have indicated that they need to plan for urbanization and rural settlements with water and energy utilities as key factors. Other considerations are appropriate land use to avoid or minimize pollution, harvest and use water and manage sanitation in an efficient and sustainable way. But they do not have skills or systems to do it.

- 3) **Capacity of local and community institutions** (both formal and informal) to plan, develop and manage water facilities and resources: mobilizing, facilitating organising, empowering and monitoring community groups' ability to manage water facilities without undermining their own abilities and interests is a key issue. Creating independent and sustainable community water management institutions that are participatory and democratic will be a priority.
- 4) **Develop institutional capacity** in modern, ICT-based, multi-sectoral water resources planning – institutional capability in predictive, scenario-based planning using scientific data and modern software based planning and decision support systems.
- 5) **Develop specialized knowledge and skills in legal and economic management** of water resources and their application to water allocation, regulation and financing;
- 6) **Developing a critical mass of technical skills for faster, cost-effective rain water harvesting.** The sensitisation about harvesting and using rainwater from roof tops and other run-off sources should be integrated in the on-going re-settlement reorganization plans and urban planning. However, shortage of trained technicians and artisans to design harvesting systems (e.g. construction of earth and concrete rainwater tanks, equipment for harvesting, filtering/cleaning and transporting water for different uses) has to be overcome. A blend of appropriate technology and skills in this respect are needed, building on some of the successful pilot projects.

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ANNEXES

Annex 1: Selected Analytical Tables

Annex 2: Human Resource Capacities in selected IWRM institutions

Annex 3: List of People Contacted

Annex 1: ANALYTICAL TABLES

Table A1: Knowledge Disciplines among RNRA/IWRM Technical staff

	Areas of specialisation	Number of staff
1	Water resources Management	1
2	Agriculture	1
3	Soil & Water management	1
4	Water Quality Monitoring	1
5	Engineering	1
6	Economics	1
7	GIS/ Database management	-
8	Statistics	-
9	Hydro-geologists/Groundwater	-
10	Hydrology/ Hydro-informatics	1
11	Management	-
12	Sociology/Socioeconomics	-
13	Forestry /Biodiversity	-
14	Hydrobiology /Limnology	-
15	Meteorology/Climatology	-
16	Water law/environmental law	-
	Total	7

Table A2: Knowledge Disciplines of IWRM related MINAGRI Officials

	Areas of specialisation	Number of staff
1	Agricultural Sciences/Agronomy	16
2	Veterinary Medicine	1
3	Animal Production/Resources	12
4	Phytopathology & Entomology	1
5	Economics	1
6	Geography	1
7	Statistics	1
8	Management	1
	Total	33

Table A3: Levels of Experience for Assessed MINAGRI Staff

Personnel Category	Experience in Years			
	1-2 years	2 - 5 years	5-10 years	Over 10 years
Senior Staff/Managerial (<i>DG, Director</i>)	0	0	1	4
Professionals	23	2	2	1
Total	23	2	3	5

Source: MINAGRI, HR Unit; Interviews with Key Officials.

Table A.4: Key RAB Research and Extension Programmes related to IWRM

IWRM related R&E Programme	Programme Location	Qualification of Programme Head	Comments/Observations
Rice	South	MSc	Head is a PhD Candidate on study leave
Horticulture	South	-	No qualified person among staff to head programme
Fish & Fish Farming	South	-	No qualified person among staff to head programme
Soil Conservation	South	MSc	PhD Candidate on study leave
Irrigation & Water management	East	MSC	Head also doubles as Director of NRM research and extension in the east zone
Mechanisation	East	-	No qualified person among staff to head programme
Agro-meteorology	South	MSc	Programme head doubles as Director of NRM research & extension in the south zone
Agro-forestry	South	MSc	Head is a PhD Candidate on study leave

R&E= Research and extension; Source; RAB, March 2012.

Table A5: IWRM Skills and Knowledge levels and Needs for selected staff in EWSA/ Water Division

	Position	Key qualification & Experience	Training in IWRM	IWRM training needed
1	Director General	MBA; 15 years experience	-	Water & energy law; corporate governance
2	DDG- Water & Sanitation	MSc (Environmental Chemistry; 5 years' experience	-	Water utilities law, water supply contract management
3	Director/Water Utility support Unit	MSc, Water supply; 20 years experience	-	Pro-poor water supply services; risk management
4	Director/ Water Development	MSc. Water Supply; 15 years experience	Water supply design; maintenance	Disaster management; water Conflict mgt; stakeholder management
5	Director of Water Studies & research	BSc (Chemistry); 30 years experience	Water quality analysis; monitoring;	-
6	Director of Projects	MSc (Infrastructure management; 12 years experience	Water supply Operation & Maintenance; water supply systems design.	Watershed management;
7	Research & Dev't Officers	1 has MSc (WRM); 5 years experience	Watershed planning; sedimentation mgt	Climate change & water resources modelling
		2 have BSc (civil Eng); 2-5 years experience	-	Water resources assessment & monitoring; watershed mgt; pollution control
		1 has MSc (Env'tal Sciences); 5 years experience	-	Climate change adaptation;
8	Water Sector Studies & Design Engineers	4 have BSc (Engineering)	-	Climate change adaptation; water resources modelling.

Table A6: Skills and Knowledge areas covered by EWSA Training Centre

	Category	Areas/courses
1	Technical Training	- Technical planning;

		- Plumbing;
		- Waste water management
		- Water supply designs;
		- Connections, repairs and maintenance;
		- Laboratory equipment
		- Micro-biology.
2	Non Technical training	Management
		Financial skills
		Business support
		Customer care

Table A.7: Education and Knowledge Disciplines of IWRM-relevant Staff in RBS

	Profession/ Area of training	No. of Staff
1	Agriculture	2
2	Food Science & technology	10
3	Mathematics	1
4	Civil Engineering	4
5	Electrical Engineering	3
6	Chemical Engineering	1
7	Chemistry	6
8	Business Administration	1
9	Information Science	1
10	Urban Planning	1
11	Public Health	1
12	Applied microbiology	1
13	Biotechnology	2
14	Public Administration	1
	Total	35

Source: RBS Human Resources Dept, March 2012.

Table A.8: Knowledge disciplines among IWRM-related HR in MIDMAR

	Areas of Specialisation	Number of Staff
1	Development Studies	2
2	Statistics	1
3	Sociology	3
4	Education	2
5	Management	4
6	Information Systems	1
7	Rural Development	1
8	Political Science & Public Admin	1
9	Economics	1
	Total	16

Source: MIDMAR HR Records, March 2012.

Table A.9: Qualifications and IWRM Knowledge levels of selected districts

	Position	No. with at least BSc/BA level (A0)¹²	Experience (years)	Training in IWRM
1	Environment Officer	All have Bachelors' degrees Qualifications vary from environmental science, geography, micro-biology; environmental technology	Varies between 2-5;	All have attended climate change, environmental mainstreaming sessions organised by REMA
2	Forest Officer	Trained mostly as Agronomists and Agro-forestry experts.	2-5 years' experience	In general, none, except 6 who have attended REMA training on environmental education; climate change
3	Agricultural Officer	All DAOs, have A0, most sector & cell agronomists have A1	Between 1-5 years; some recently recruited	
4	Health Coordinator	Public Health; Environmental Health training	2- 5 years; only one has 6 years experience	Have been trained in hygiene practices as ToTs
5	District Engineer	All have civil & Environmental Engineering degrees	2-5 years	None except WRM courses taken as part of degree
6	Statistician	Applied Statistics	2-5 years	None
7	Planner	Economics; management;	2-5 years experience	None

Source: District Records; Personal Interviews, March 2012.

Table A.10: HR and Institutional platforms for IWRM activities in Local Government System

	Administrative level	Officials & technocrats with IWRM responsibilities	Existing platforms for planning & coordination	Opportunities to implement IWRM actions
1	Provincial Admin	Director of Programmes; Zonal Agricultural Officers; Regional School Inspectors		Governor's team coordinate all inter-district activities; have direct connection with Ministers & Prime Minister
2	District	At least 8 officers including forest, envt, infrastructure, health education	JADF; Coffee Taskforce; District Planners Forums; CHWs coordination	DDP and <i>Imihigo</i> Contracts have become main avenues to influence local budgets.
3	Sector	Agronomist; Social Affairs Officer; Infrastructure Engineer; Asst Education Officer	JADF; Ubudehe team; Sector Council	Working with WASH NGOs to influence JADF & budget decisions
4	Cell	Executive Secretary;Coordinator Integrated Development Plan	Cell council; Ubudehe/IDP planning activities	Support local NGOs to influence local priorities in IWRM
5	Umudugudu/village	Coordinator & Executive Committee; CHWs; Water User Groups; WASH Committees;	Umuganda; Ubudehe	Work with water service delivery system to engage and empower WUGs, CHWs and other local actors

¹² A0 = Bachelors' degree; A1= Higher (Advanced Diploma); A2 = Ordinary Diploma/ Certificate

Table A.11: Human Resource Gaps in selected IWRM institutions

	IWRM Institution	Number of target IWRM staff			Comments on adequacy for IWRM work
		Approved	In place	Gap	
1	MINIRENA	21	6	15	Numbers are so few, technical units apart from planning appear to be non functional. A legal and Policy analysis unit are required but none is in place. No skills in policy areas.
2	RNRA-IWRM	26	1	25	IWRMD presently depends on 7 contractual staff and field workers; recruitment is on-going but the numbers will still be inadequate. No less than 40 will be required
	RNRA-Lands	13	3	10	Even if the gap for IWRM-related land functions is covered, the numbers will still be few. There are no IWRM skills
3	REMA	27	25	2	Despite small gap, IWRM skills are limited and the approved positions are few. It relies on project staff. Main gaps are in planning; environmental information management; legal & resource economics
4	MINAGRI	35	33	2	Although the gaps are nearly closed, most are recently recruited and only 4 have IWRM knowledge. There are huge gaps in knowledge and skills in IWRM and policy analysis
5	EWSA-Water	74	25	49	There is a challenge to fill the gaps; most gap is in sanitation, rural water supply and planning functions.
6	MININFRA	29	18	11	Recruitment is on-going to close the gap, but the approved numbers are inadequate. Urban planning and sanitation units have no staff.
7	RURA	24	14	10	The numbers are few even if the gap is closed; there are gaps in monitoring, research and information management
8	RTDA	42	22	20	The approved numbers would be adequate since most design and execution work is done by external staff;
	MIDMAR	16	16	0	Although all are in place, there is limited IWRM knowledge and no one with core IWRM education
9	MoH	12	10	2	IWRM knowledge is concentrated in the environmental health unit; biomedical and epidemiological experts need to be targeted
10	MINEAC	22	19	3	No IWRM knowledge in IWRM, low creativity or self-drive to network with other IWRM institutions

Source: Data from various institutions

Annex 2: IWRM Human Resources Capacity and Capacity Gaps in selected institutions

A2.1 RNRA/IWRM Department

	Position	Approved positions	Presently Filled up	Observations
1	Deputy Director General/IWRM	1	1	In place supported by 7 contractual staff. Staff working on project activities, not on the strategy or institutional plans.
2	DIRECTOR/Water Resources Planning & Regulation	1	-	Recruitment planned; adverts have been placed in local press and RNRA website
3	Dir./Research AND Monitoring	1	-	-recruitment in process
4	DIRECTOR/ Transboundary management	1	-	Recruitment in process
5	Water users' capacity building officer	1	-	Recruitment in process as for all positions up to 17
6	Ground water officer	2	-	
7	Surface water officer	2	-	
8	Water resources monitoring officer	4	--	
9	Water quality officers	2		
10	water data & information mgt officer	2	-	
11	Water use planning officer	2	-	
12	Water regulation officer	1		
13	regional water program officer	1	-	
14	international water affairs officer	1	--	
15	Strategic planning, M&E officer	1		
16	Communications officer	1	-	
17	Water permit administrator	2	--	
	Total	26	1	

A.2.2 Energy, Water and Sanitation (EWSA) – Water and Sanitation

SN	Position	Approved number	Presently filled up	Gap	Observations/ Notes*
1	Head of Electricity Utility Division	1	1	0	
2	Head of Water and Sewerage Utility Division Unit	1	1	0	
3	Head of Energy Development Division	1	1	0	
4	Head of Water and Sanitation Devt Division	1	1	0	
5	Director of Water Supply Operations Unit	1	1	0	
6	Director of Water Utility Support Unit	1	-	1	
7	Director of Sewerage Operations Unit	1	1	0	
8	Director of Water Supply Unit	1	-	1	
9	Director of Solid Waste Unit	1	-	1	
10	Director of Sanitation Unit	1	-	1	
11	Director of Water Commercial & Distribution Unit	1	-		
12	Director of Water Studies, Research & Development	1	1	0	
13	Director of Water Project & Programs Mgt	1	1	0	
14	Director of Legal & Transactions Unit	1	-	1	
15	Principal Engineer in charge of Water Treatment Plants	1	-	1	
16	Principal Engineer in charge of Water Supply in PPM	1	-	1	
17	Legal Advisors	6	1	5	
18	Strategic and Specific Studies Officer	4	-	4	
19	Water Sector Research & Dev't Officer	5	4	1	
20	Water and Sanitation Information Mgt Officer	3	-	3	
21	Water Sector Monitoring & Evaluation Officer	6	1	5	
22	Water Sector Studies and Designs Officer	6	2	4	
23	Water Treatment Plants Engineer	2	2	0	
24	Water Supply Network Management Engineer	2	2	0	
25	Water Supply Quality Management Engineer	1	1	0	
26	Sewerage Treatment Plant Engineer	2	-	2	
27	Sewerage Network Engineer	2	-	2	
28	Water Supply Engineer	4	4	0	
29	Solid Waste Engineer	2	-	2	
30	Sanitation Engineer	1	-	1	
31	Environmental Safeguards Advisor	4	-	4	
32	Strategic Planning Officer	8	-	8	
	Total	74	25	49	

A2.3. Rwanda Environment Management Authority

	Position	Approved positions	Presently Filled up	Gap	Observations
1	Director General	1	1	0	Planning to recruit DDG, position approved by MIFOTRA
2	Director of Environmental Regulation and Pollution Control	1	1	0	
3	Director / Environmental Planning, Research and Development	1	1	0	
4	Director of Environmental Education and Mainstreaming	1	1	0	
5	Director of Climate Change and International Obligations	1	1	0	
6	Legal Advisor	1	1	0	Inadequate, planning to set up a legal unit
7	Planning Officer	1	1	0	
8	Environmental Inspection, Audit and Monitoring Officer	2	2	0	
9	Standards and Regulatory Officer	2	2	0	
10	Chemicals Specialist	1	1	0	
11	Research Officer	2	2	0	
12	Environmental Information Systems	1	1	0	
13	Environmental Economist	1	1	0	Needs special training in environment and resource economics; analytical skills
14	Resource Mobilisation Specialist	2	0	2	
15	Environmental Mainstreaming Officer	1	1	0	
16	Environmental Education Officer	1	1	0	
17	District and Community Support Officer	1	1	0	
18	Clean Development Mechanism specialist	1	1	0	
19	Climate Data Specialist	1	1	0	
20	Environmental Conventions specialist	2	2	0	
21	Communication & Public Relations	1	-	1	Presently relying on external media experts
	Total	27	25		

A2.4 Name of organization: *Ministry of Infrastructure (MININFRA)*

SN	Position	Approved No.	Presently filled up	Gap	Observations
1	Director General Policy & Planning Coordination	1	1	0	
2	Director of Sector Planning & Data Mgt	1	1	0	
3	Director of Energy & Water Sanitation	1	1	0	
4	Director of Transports & Public Assets	1	1	0	
5	Director of Urban Planning & Housing	1	-	1	Recruitment is in the process
6	Director of Meteorology	1	1	0	
7	Professional in Charge of Urban Planning Mgt	1	-	1	Newly recruited, no IWRM training
8	Architect	1	-	1	
9	Professional in Charge of Community Settlement Policy Formulation	1	1	0	
10	Professional in Charge of Public Building Construction	1	-	1	
11	Professional in Charge of Roads' Infrastructures	1	1	0	
12	Professional in Charge of Energy Policy Formulation	2	1	1	
13	Professional in Charge of Energy Programmes Implementation Analysis	1	1	0	
14	Professional in Charge of Water Supply	2	-	2	
15	Professional in Charge of Sanitation Infrastructure Policy	2	-	2	
16	Professional in Charge of Land & Water Transport	2	2	0	
17	Professional in Charge of Corridor Coordination	1	1	0	
18	Professional in Charge of Road Safety	1	0	1	
19	Professional in Charge of Meteorology Policy Formulation	1	1	0	
20	Professional in Charge of Meteorology Data Analysis	1	1	0	
21	Professional in Charge of Climatology	1	1	0	
22	Professional in Charge of Agro-meteorology	1	1	0	
23	Professional in Charge of Planning, M& E	1	1	0	
24	Statistics & Database officers	1	1	0	
25	Quality Control Specialist	1	0	1	

A2.5 Ministry of Disaster Management and Refugees Affairs (MIDMAR)

SN	Position	Approved No.	Presently filled up	Gap	Observations
1	Director of Strategic Planning Unit	1	1	0	Although all positions are occupied, there they have no skills in WRM0-related disaster management
2	Director of Disaster Management & Programs Coordination Unit	1	1	0	
3	Director of Research & Public Awareness Unit	1	1	0	
4	Director of Refugees Affairs Unit	1	1	0	
5	Legal Advisor	1	1	0	
6	Professional in Charge of Planning and Budgeting	1	1	0	
7	Professional in Charge of Monitoring & Evaluation	1	1	0	
8	Professional in Charge of Resources Mobilization & Partnership	1	1	0	
9	Professional in Charge of Disaster Mgt	1	1	0	
10	Professional in Charge of Disaster Operational Preparedness	1	1	0	
11	Professional in Charge of Recovery & Rehabilitation Programs	1	1	0	
12	Disaster Research & Capacity Building	2	2	0	
13	Public Awareness & Prevention	1	1	0	
14	Social Services & Camps Coordination	1	1	0	
15	Statistician	1	1	0	
	Total	16	16	0	

A2.6 Name of organization: Rwanda Transport Development Authority (RTDA)

		Approved No.	Presently filled	Gap	Observations
1	Director General	1	1	0	
2	Head of Roads Planning Division	1	1	0	
3	Head of Roads Development Division	1	1	0	
4	Head of Roads Maintenance Division	1	1	0	
5	Director of Air, Rail and Marine Transport Unit	1	1	0	
6	Director of Roads Safety & Environment Unit	1	1	0	
7	Director of Bridges Unit	1	-	0	
8	Director of Roads Surveys and Design Unit	1	-	1	
9	Director of Pavement and Materials Unit	1	-	1	
10	Director of Contract Mgt Unit	1	-	1	
11	Director of Roads Maintenance Programming Unit	1	-	1	
12	Director of Maintenance Operations Unit	1	-	1	

13	Director of District Roads Support Unit	1	-	1	
14	Director of Roads Inspection and Emergency	1	-	1	
15	Environmental Specialist	1	1	0	
16	Senior Survey and Design Engineer	1	-	1	
17	Bridges Design Engineer	1	1	0	
18	Bridges Maintenance Engineer	1	1	0	
19	Roads Maintenance Engineer	3	1	2	
20	Roads Construction Engineer	6	4	2	
21	Roads Maintenance Programming Engineer	4	3	1	
22	District Roads Support Engineer	4	1	3	
23	Zonal Inspector and Emergency Engineer	4	1	3	
24	Zonal Maintenance Engineer	2	2		
25	Marine Transport Engineer	1	1		No training on IWRM except undergraduate study
26	Total	42	22		

A2.7: Name of organization: *Ministry of East African Affairs (MINEAC)*

SN	Position	Approved No.	Presently filled up	Gap	Observations
1	Director of Strategic Planning and Policy Research	1	1		
2	Director of Economic, Infrastructures & Productive Sectors	1	1		
3	Director of Social, Political, Legal & Judicial Affairs	1	1		
4	Legal Advisor	1	1		
5	Professional in Charge of Trade	3	3		
6	Professional in Charge of Infrastructures, Science & Technology	2	1	1	
7	Professional in Charge of Agriculture, Livestock & Food Security	1	1		
8	Professional in Charge of Meteorology & Environment Mgt	1	1		
9	Professional in Charge of Tourism & Wildlife Mgt	1	1		
10	Professional in Charge of Education, Sports and Culture	1	-	1	Resigned
11	Professional in Charge of Health & Community Dev't	1	1		
12	Professional in Charge of Legal & Judicial Affairs	1	1		
13	Professional in Charge of Policy Research	3	3		
14	Professional in Charge of Planning	1	1		
15	Professional in Charge of Monitoring & Evaluation	1	1		Recently recruited
16	Statistician	1	-	1	Resigned
17	Information, Communication & Education Officer	1	1		
	Total	22	19	3	

Annex 3: Mapping National Institutions in IWRM

	Ministry/Agency	Profile summary and core roles/responsibilities in IWRM	Category/level of operation
1	Ministry of Natural Resources (MINIRENA)	Responsible for initiation, formulation and overseeing the implementation of policies and legislation in 5 sub-sectors that constitute the environment natural resources (ENR) sector i.e. environmental protection and conservation; forestry and nature conservation; geology and mining; Land management; and water resources management. MINIRENA works through and supervises 2 semi-autonomous institutions: Rwanda Natural Resources Authority (RNRA) and Rwanda Environment Management Authority (REMA).	Policy and legislative oversight
2	Rwanda Natural Resources Authority (RNRA)	Created in 2011 with the mandate of ensuring that Rwanda's natural resources are carefully planned for, rationally, productively and sustainably managed for the benefit of all Rwandans, RNRA comprises 5 Departments, created by merging former agencies responsible for geology and mines, land registration and sustainable use, Forestry, and the Department of Water Resources Management.	Planning, implementation and regulatory
3	Rwanda Environment Management Authority (REMA)	REMA was formed by Law No. 04/2006 with the mandate to protect and conserve the environment in Rwanda. By this law and subsequent subsidiary legislation, REMA has mostly regulatory but also educational and development functions. REMA fulfils its mandate through 4 Departments (and a support Department), all of which implement aspects of WRM: i) Environmental Education and Mainstreaming; ii) Climate Change Management and International Obligations; iii) Pollution control and Environmental Regulations; iv) Research, Environmental planning and Development. Because of the centrality of water resources, as a direct and indirect ecosystem service, quality and quantity of water are key indicators that REMA as an environmental regulatory body is monitoring and enforcing.	public environmental education and regulatory agency;
4	Ministry of Infrastructure (MININFRA)	MININFRA is a composite of 5 sub-sectors all of which are directly related to water resources and their management, viz: Water Supply and Sanitation; Transport; Energy; Meteorology; Housing and Urbanism. MININFRA's main role is to formulate and supervise the implementation of sectoral policies, monitor and evaluate sectoral strategies/plans and mobilise resources together with MINECOFIN.	Policy and legislation
5	Energy Water and Sanitation Authority (EWSA)	Established in June 2011 to provide energy (electricity and other forms), clean water and sanitation services to the population in urban and rural areas. EWSA is a successor agency to Rwanda Electricity Company (RECO) and Rwanda Water and Sanitation Company (RWASCO) earlier established from Electro-Gaz, a company that has been providing water supply and electricity services since 1939. Unlike its predecessors, EWSA has an expanded role of providing sanitation services and rural water services.	Service delivery in water, sanitation and energy
6	Rwanda Utilities Regulatory Authority (RURA)	RURA was established by Law No. 39/2001 as a national agency with the mandate of regulating service provision and protecting utility customers' health and interests in the sectors of ICT (telecommunications); energy; water and sanitation. In addition, RURA advises utility providers on the quality of services rendered to customers. In the sectors of transport (water ways), water supply, sanitation and energy, RURA's regulation aims to promote fair competition, sustainable and efficient use of water resources and ensure better quality of services to customers at fair prices.	Regulation of energy, water, transport and communication utilities
7	Rwanda Housing Authority (RHA)	RHA was established by Law No. 40/2010 of 25/11/2010, with the principal mandate of organising the built environment (including housing, settlements and urban development) to ensure sustainable development. In the context of IWRM, RHA will play a major role in promoting water use efficiency by promoting roof-top water	Regulation housing; management of public buildings

		harvesting, promoting efficient water distribution equipment/materials; and ensuring improved waste management including recycling in urban areas; promoting cleaner energy and low-energy use building technologies, among others.	
8	Meteorology Rwanda	Newly created Agency (cabinet has recently approved it as a separate agency) created from the Department of Meteorology in MININFRA. It is responsible for weather observation and climate monitoring, collection, processing and dissemination of climatic data.	Climatic data provision and weather monitoring
9	Rwanda Transport Development Agency (RTDA)	RTDA was established in 2010 by Law No. 02/2010, as an agency responsible for planning, monitoring and management of activities in the transport sector. RTDA is particularly concerned with reducing the effects of water on transport infrastructure through improved designs and maintenance (of roads, bridges) as well as developing and regulating marine transport.	Transport development and maintenance
	Ministry of Agriculture and Animal Resources (MINAGRI)	Is responsible for policy formulation, oversight and monitoring of national programmes for crop, livestock and fisheries production and development to ensure the country's food security, rural development and economic transformation. Until 2003, MINAGRI was also responsible for forestry services.	Policy and legislative oversight on agriculture
	Rwanda Agricultural Board (RAB)	was formed in May 2011 by merging 3 agricultural institutions i.e. Rwanda Agricultural Development Agency (RADA), Rwanda Animal Resources Development Agency (RARDA) and the Rwanda Agricultural Research Institute (ISAR). RAB has 4 functional departments and a support department, in line with the present agricultural policy orientation i.e.: Mechanisation and Irrigation; Agricultural Extension; Research; and Livestock Development in addition to Corporate Services (a support department).	Agricultural planning and implementation
	Ministry of Trade and Industry (MINICOM)	Responsible for Policy formulation, oversight and monitoring in the sectors of trade, tourism, industry and cooperatives. MINICOM has put special focus on small and medium enterprises (SMEs) and industries. Its major role and interest in IWRM relates to exploiting the potential of water resources for recreation business, ensuring water availability for industries, and reducing water pollution from industrial and commercial activities.	Industry policy and legislative oversight
	Rwanda Bureau of Standards (RBS)	RBS is the national institution responsible for developing and enforcing standards in the country, set up by provisions of Law No. 03/2002 (reviewed under Law N° 43/2006). In June 2012, RBS will be restructured to become Rwanda Standards Board (RSB). The RBS role in IWRM mainly relates to water quality monitoring and pollution control.	Regulation of standards, testing and certification
	Rwanda Development Board (RDB)	RDB is a complex national agency that was created to provide integrated, one-stop services for investment promotion and facilitation. It brings together the services of investment promotion (in all sectors including agriculture, tourism, infrastructure, education, etc), business registration and information technology. RDB manages the country's 3 national parks- Nyungwe National Park, Volcanoes National Park, and Akagera National Park. The first 2 parks are afro-montane forest ecosystems located in the Albertine rift eco-region in the North West and Northern parts of the country and are key national and regional water towers, while the Akagera NP holds many small water bodies (Lakes, swamps, streams) that are critical trans-boundary aquatic ecosystems. The second RDB's role in IWRM relates to its responsibility in environmental impact assessment (EIA) of investment projects to ensure that licensed investments comply with the country's environmental laws, as part of the one stop centre service provision.	Management of protected areas; management of investments
	Ministry of Health (MoH)	Has mandate of ensuring that Rwandans receive good health care by continuously improving health services through the provision of preventive, curative and rehabilitative health care, thereby contributing to poverty reduction and improved well-being of the population. MoH's key strategies are based upon the new National Health Sector Policy	Policy and

		which focuses on: development and decentralization of health care system; integrated management of childhood illnesses; and enhancing community participation in health care the management and financing. MoH has a small but increasingly active Unit of environmental health and community health that focuses on reducing the health burden through an integrated approach. This, together with the epidemiological surveillance units are the main interface for IWRM in the health sector.	
	Rwanda Biomedical Centre (RBC)	Established by Law No.54/2010 of 25th January 2011 with the principal mission of providing and ensuring quality health service delivery, education and research. RBC is a merger of several health institutions and a number of Departments that were under the Ministry of Health (MoH), including Kigali Health Institute (KHI), the National Commission on HIV/AIDS Control; TRAC Plus; National Reference Laboratory; Health Communication Centre; and the National Referral Hospitals (with its decentralized health care delivery infrastructure). The MoH has increasingly paid attention to the fact that water-related challenges are responsible for up to 80% of the disease burden and water related disasters are increasingly affecting health care delivery. These IWRM issues have influenced the RBC and MoH focus on community health, hygiene and sanitation behavioural practices, and balanced nutrition.	
	Ministry of Disaster Management and Refugee Affairs (MIDMAR)	Created in November 2010. The Disaster Management Unit in MIDMAR was established in 2003 under the Ministry of Local Government (MINALOC), to coordinate disaster response actions. It was then moved to the Office of the Prime Minister, then to the Ministry of Internal Security, and then to the National Police, from where it was moved to MIDMAR when the new ministry was created.	
	Rwanda National Police (RNP)	Established in 2000 from different internal security and community Police services. The RNP plays 2 major roles in IWRM: i) Disaster management - Until the set up of MIDMAR in 2010, RNP was the overall coordinator of the Disaster management Unit, and remains one of the lead agencies (and probably the most organised institution) in Disaster response in the country. ii) The Department of Marines under Commission of Operations & Public Order has the mission of ensuring security for all water users in Rwanda's territorial waters. In this respect, it is mandated to a) <i>Maintain law and order in Rwandan territorial waters;</i> b) <i>Prevent crimes and illegal trafficking in Rwandan territorial waters;</i> c) <i>Make a thorough control of Rwandan border waters;</i> d) <i>Apprehend offenders in waters and process their dockets for prosecution;</i> and e) <i>Search and rescue people, materials drowning under waters within Rwanda.</i>	Law enforcement; and disaster response
	Ministry of East African Affairs (MINEAC)	was established in 2008 following Rwanda's admission into the East African Community (EAC). It has responsibilities for promoting the EAC regional integration agenda in Rwanda. Management of shared water resources and other ecosystems is at the centre of EAC's development cooperation strategies from transport, to trade, agriculture, fisheries and climate change adaptation. As the Principal liaison body linking Rwanda to the EAC, MINEAC will increasingly influence IWRM through related EAC protocols, Guidelines and protocols that call for harmonisation and standardisation of governance frameworks.	Policy and coordination of regional integration in the EAC
	Ministry of Foreign Affairs and Cooperation (MINAFFET)	Responsible for formulation and implementation of foreign relations and international cooperation policies. It oversees and coordinates international conventions. In IWRM, MINAFFET has a duty in negotiating and implementing cooperation programs in WRM, not only with the countries that share river basins with Rwanda (Congo and Nile Basins) but also at international cooperation level. The trans-boundary and international nature of Rwanda's water resources requires that IWRM becomes part of Rwanda's diplomacy and regional cooperation strategies.	Implementation of international cooperation policies and maintenance of diplomacy

Ministry of Education (MINEDUC)	Responsible for formal education and oversees some of the largest and most widespread public building infrastructure- schools and training centres. In IWRM, MINEDUC's interest and role mainly relate to water education, WASH in schools, water efficiency and rainwater harvesting in education facilities.	Policy on formal & non formal education & research
Rwanda Education Board (REB)	Responsible, <i>inter alia</i> , for school inspection, monitoring education activities, planning and establishing education infrastructure and curriculum development. In IWRM, REB is particularly concerned with monitoring education quality indicators relating to access to adequate clean water and sanitation especially for girl-children, nutrition in school, rain water harvesting in school infrastructure, and water education activities in schools and higher learning centres.	Implementation of education programmes including sanitation
Ministry of Finance and Economic Planning (MINECOFIN)	Responsible for national resource mobilization and allocation to different sectors. It oversees and coordinates sector planning and performance monitoring. For IWRM, MINECOFIN is well placed to facilitate coordinated and integrated management of water resources, especially to influence the big budget consumers (energy, transport, agriculture, industrialization, health and education) to prioritise IWRM issues. By influencing priorities and budgets of sectors, MINECOFIN should lead the efforts to promote IWRM approaches by providing appropriate budget incentives.	National planning, Resource mobilisation and financing through budget
National Institute of Statistics of Rwanda (NISR)	National body responsible for designing, executing and publishing official statistics and data on development indicators in Rwanda, including in all areas related to IWRM. NISR also provides technical guidance and quality assurance and approval of studies and surveys to be undertaken by any party in the country. Monitoring and Evaluation of IWRM activities on a national scale and in accordance with international standards particularly requires that appropriate IWRM indicators are mainstreamed into the national statistical systems, including censuses, Demographic and Health Surveys (DHS), Household Living Conditions Survey (HLCS/EICV) and Agricultural and Food Security Surveys.	National statistical surveys, and standards in data and statistical systems
Ministry of Local Government (MINALOC)	Responsible for formulating and overseeing the implementation of national decentralisation, community development, social protection and local service delivery policies and strategies, with good governance and territorial administration as central pillars. Water services are decentralized and community water management must be implemented in the framework of community development, decentralized service delivery and social protection policies and strategies. MINALOC also oversees the Rwanda Governance Board (RGB) where decentralisation and other governance implementation activities are coordinated. Most importantly for IWRM, MINALOC has initiated and coordinates the Re-settlement re-organisation programme which is a multi-sectoral national programme to fast-track poverty reduction through the grouped settlements concept.	Policy and oversight decentralised governance and service delivery
Rwanda Local Development Support Fund (RLDSF):	RLDSF was established in June 2011 from the Common Development Fund (CDF) established in 2002, mobilize resources and support local development activities in the framework of decentralisation. RLDSF is particularly important for decentralized IWRM activities considering that it's the main funding mechanism for investment projects in districts. Under the revised Decentralisation Policy, emphasis is being put on local economic development with districts taking the lead in planning and implementation of projects, and the RLDSF is expected to handle large scale projects including rural water supply, sanitation and watershed management projects. Funding of IWRM activities under RLDSF will depend principally on: a) whether the local authorities identify IWRM activities as priorities and b) the extent to which IWRM activities feature in funding criteria or technical support to Local authorities.	Resource mobilisation and financing of local development programmes

Annex 4. List of People Met/Interviewed

No	Names	Title	Institution
1.	Dr. Gahakwa Daphrose	Deputy Director General/Research	Rwanda Agricultural Board
2.	Kabalisa Vincent de Paul	Deputy Director General/IWRM	RNRA/IWRM
3.	Asiimwe David	Human Resources Manager	RNRA
4.	Tetero Francis X	Watershed Management Coordinator/Sebeya	RNRA/IWRM
5.	Mugunga	Coordinator/ Trans-boundary Waters	RNRA/IWRM
6.	Muganga Robert	Project Coordinator/IWRM	RNRA/IWRM
7.	Habinshuti Japhet	Land Use Planner	RNRA/Lands & Mapping
8.	Eng. Kamanzi M. Franco	Director, Regulations & Standards Unit	Rwanda Housing Authority
9.	Kalimba Innocent	Head of Division/ Construction & Legislation	Rwanda Housing Authority
10.	Kalisa Catherine	Director of Housing Inspection Unit	Rwanda Housing Authority
11.	Nshimiyuimana Fabien	Urban Environment Specialist	Rwanda Housing Authority
12.	Rwigamba Vincent	Urban Planning & Tools Development Engineer	Rwanda Housing Authority
13.	Uwanyiligira M. Aimee	Head of HR Management Section	EWSA
14.	Kanyesheja Jean Bosco	Director of Water & Sanitation Development	EWSA
15.	Nyirubushi Lulisa Roger	Head of Training Centres	EWSA
16.	Kanyamihigo Charles	Ag. Director/ Energy Development	EWSA
17.	Byigero Alfred	Director of Energy Regulation	RURA
18.	Mutware Alexis	Ag. Head of Electricity	RURA
19.	Mukasekuru Eugenie	Director of Finance & Administration	RURA
20.	Uwizeye Huigette	Human Resources Officer	RURA
21.	Dr. Leon Namahungu	Senior Scientist/Natural Resources Mgt	RAB
22.	Undoyenzeza Domina	Human Resources & Admin. Manager	RAB
23.	Mutaganda Amin	Senior Researcher/Forestry & Agro-forestry	RAB
24.	Gapusi Jean R	Senior Researcher/ Forestry & Agro-forestry	RAB
25.	Myambi Celestin	Head of Zone/ Eastern	RAB
26.	Raphael Rurangwa	Director General-Planning	MINAGRI
27.	Muhongerwa Patricia	Director of Human Resources	MINAFFET
28.	Muligo Godfrey	Director of Administration & Finance	REMA
29.	Tushabe Rachel	Director of Environmental Education & Mainstream	REMA
30.	Duhuze Remy Nobert	Director of Environmental Regulation & Monitoring	REMA
31.	Busokeye Marie Letitia	Director of Planning, Research and Monitoring	REMA
32.	Ntabana Alphonsine	Project Manager/DEMP	REMA
33.	Kabenga Innocent	Assistant Regional Project Manager	NELSAP/Kagera Project
34.	Ssengendo Godfrey	Assistant Regional Project Manager	NELSAP/Kagera Project
35.	Frantz Brian	Development Officer/Economic Growth	USAID
36.	Mpambara Aimee		USAID
37.	Bamurebe Sharon	Policy Researcher/Social Affairs	MINEAC
38.	Mazimpaka Jean Paul	Human Resources	MININFRA
39.	Ndacyayisenga J. De Dieu	Professional In-charge of Infrastructure	MINEAC
40.	Nzasabimana Fred D	Professional In-charge of Meteo & Environment	MINEAC
41.	Kayira Justin	Director, Disaster management Unit	MIDMAR
42.	Munyazikwiye Jerome	Budget Officer	MIDMAR
43.	Sehene Chrisostome	Executive Secretary	RECOR
44.	Bucyayungura Ernest	Programmes Coordinator	RECOR
45.	Ntagengerwa Eric	Director of Planning	RTDA
46.	Nsengimana Anselme	Marine Transport Engineer	RTDA

47	Mbanda Theoneste	Manager/Human Resources & Administration	RTDA
48	Mudakikwa Antoine	Veterinary Officer/Dept of Tourism & Conservation	RDB
49	Umulisa Louise		Health Devt Initiative
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53	Hitimana Regis	Director of Planning & Health Information System	MoH/MINISANTE
54	Katarwa Joseph	Head of Environmental Health Desk	MoH /MINISANTE
55	Rwakunda Christian	Director General/ Planning & Policy	MININFRA
56	Niyongira Natalie	District Agriculture Officer	Kirehe District
57	Kalekezi Thaddee	Permanent Secretary	Civil Society Platform
58	Musabyimana Innocent	Director of Planning	MINIRENA
59	Katanisa Peter	Facilitator/Consultant ENR SWAP Secretariat	MINIRENA
60	Benegusenga Aziza	EDPRS Facilitator	MINIRENA
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62	Muhawenimana Antoine	Water Department	EWASA/Rubavu
63	Hakizimana Francois	Infrastructure Officer	Musanze district
64	Munyurangabo Oreste	Infrastructure Officer	Karongi District
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