

QUICK SCAN RWANDA



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INTRODUCTION

Within the framework of food security policy, the Ministry of Foreign Affairs of The Netherlands is implementing the programme '**Geodata for Agriculture and Water (G4AW) Facility**'. The G4AW Facility aims to increase the agricultural sector output in G4AW partner countries. This is achieved by providing food producers with relevant information, advice and/or (financial) products through operational information chains using satellite data.

In the summer of 2014, a new call for tenders will be opened. In this call, the Ministry of Foreign Affairs of The Netherlands calls for good quality project proposals from viable partnerships.

Goal of the Quick Scan

The Quick Scan serves as input for preparing the country visit and the G4AW information and matchmaking workshop in Rwanda. In the workshop, the local context, constraints and challenges in agriculture will be discussed. Furthermore, the background and details of the G4AW Facility are provided and the development of partnerships is promoted.

This Quick Scan provides an up-to-date information assessment on agricultural and associated activities. It provides information from different perspectives and in a wider context (climate, water management). Additional, stakeholders from different types of organizations are identified and reported. The document is initially supporting the country visits and workshop, but the provided information can also contribute to the development of partnerships that are intending to bring forward a proposal in the second call of the G4AW Facility.

1 ASSESSMENT OF RWANDA WITH A FOCUS ON AGRICULTURAL ISSUES

1.1 RWANDA GEOGRAPHY, CLIMATE AND ECONOMY

Rwanda located in the Great Lakes Region, its area of 26,338 km² is mostly characterized by a topography gradually rising from the East at 1,250 m to the North/West at 3,000 m averaged altitudes. The wetlands (marshes, lakes and rivers) represent about 14.9% of the national territory. The averaged air temperatures and precipitations vary respectively between 16°C/1600 mm in the high altitude region, 19°C/1300 mm in the central plateau and 22°C/1000 mm in the lowlands of the East and West Rwanda. The highest annual temperatures recorded at Kigali (1983– 2013) is 35.4°C. That nature of hilly topography influences the climate which gives advantage for agriculture production for instance coffee, tea and many other crops. Land constitutes a resource of inestimable value as occupies the first place in the national economy employing more than 87% of the working population. However, there are some challenges to highlight for the agricultural development in Rwanda.

1.2 MAIN CHALLENGES FOR AGRICULTURAL DEVELOPMENT

Acidity of soil

The existing of hilly topography with steep slopes and heavy population pressure on the land contribute greatly to depleting fertility of the soil through speedy runoff and soil erosion. These factors make soils to have low natural fertility and a low nutrient retention capacity. It was demonstrated that “Most soils in Rwanda are highly weathered, dominated by kaolinite in the clay fraction, have a low cation exchange capacity . . . and are acid to strongly acid (pH < 5.5 and often < 4.8) often with aluminum toxicity...¹”.

Population density and livelihood

Rwanda population density of 416 per Km² and high number of workers in agriculture make land a very limited resources and vulnerable to degradation. Small and scattered farms as more than 80% of households have less than 1.0 ha of land which is over-cultivated (MINECOFIN, 2013, Economic Development and Poverty Reduction Strategy 2013 – 2018).

Low use of inputs and commercialization

Farmers demand for fertilizers is extremely weak, as it is essentially constrained by inadequate incentives and lack of financial capacity to invest in fertilizer. Therefore, Rwanda still depends mainly on imported inputs. Fertilizers and other key inputs (improved seeds and pesticide) are recognized as too costly or/and difficult to access by many farmers. Incentives are limited only for exportation while its primary role is to increase production and export output. The farmers are not skilled enough on the good agricultural practices. They need appropriate trainings at their fields and need to be given a clear policy addressing farmers’ incentives. Lack of good agricultural practices leads to low quality produce and constrains international competitiveness and market.

Climate change

The agriculture sector in Rwanda depends on rainfall regime and its pressing problem is mostly resulted from the weak meteorological capacity (weather prediction) and lack of an appropriate country’s meteorological policy;

Drought, irregular rains, landslides, and other related phenomena are major concerns for improving agricultural productivity;

¹ Ministry of Natural Resources, 2008, Rwanda Ecosystem Rehabilitation and Poverty Eradication Programme, draft concept note, p. 11

Insufficient post harvest management

In some areas, when rain regime favorable, farmers may be limited in selling surplus production mainly from banana, sweet potatoes and vegetables due to poor conservation.

Limited access to financial services

The agriculture sector is constrained by insufficient access to finance and inadequate investment capital for farming, agro-processing and export development.

Inadequate Water and Irrigation development

Rwanda natural waters are generally good quality with pH between 6 and 7.5. Industrial and agricultural inputs are not yet important as significant polluters.

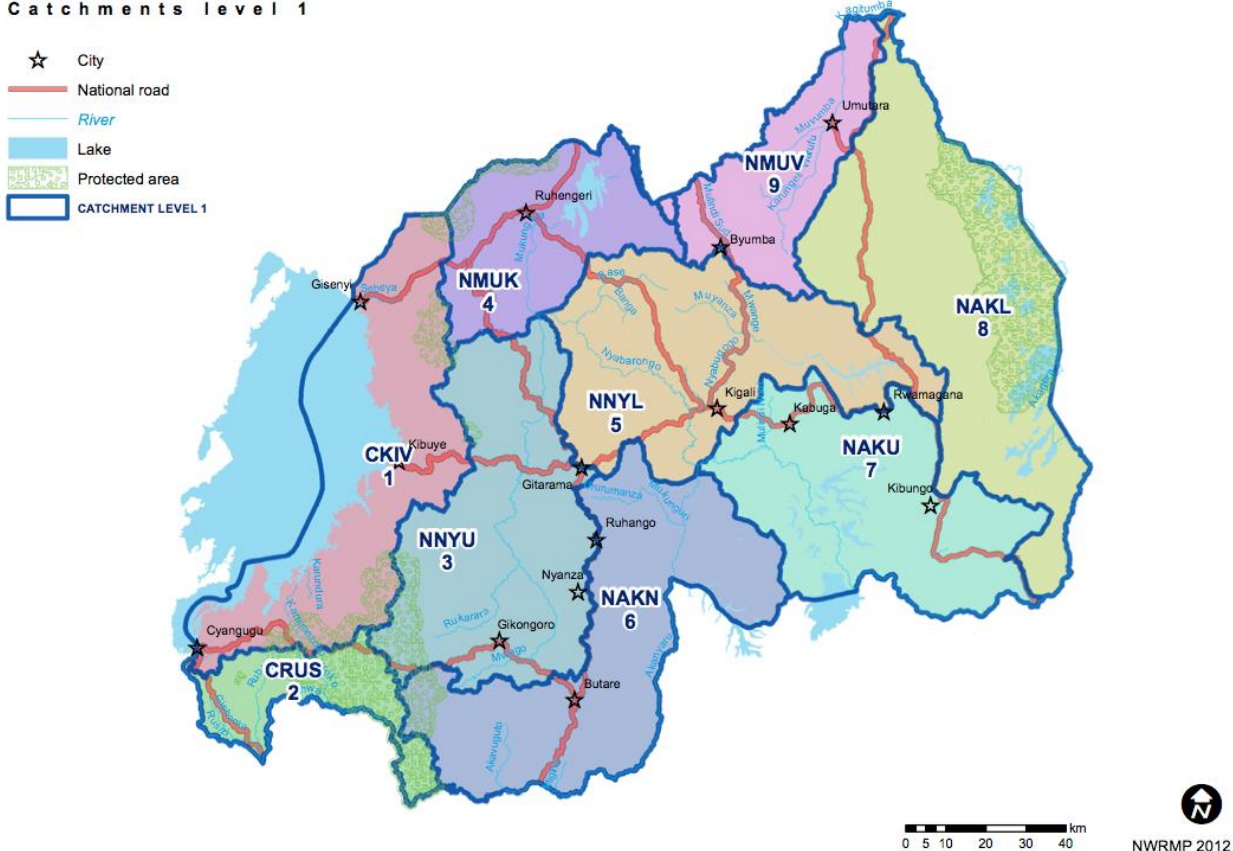
Although the Government is making effort to proving food security, water retention capacity of watersheds and hillside irrigation are still needed to be developed.

Insufficient infrastructure for animal production processing and storage

The livestock sector contributes about 8.8 % of GDP. The challenge in this sub-sector is the lack or poor infrastructure for cold storage and low processing capacity. This compromises the reliability of the quality of milk and its commercialization. Other challenges are notably: insufficient water points for cattle in comparison with the number of animals, epidemic diseases which frequently affect animals, Poor veterinary services with few qualified cadres, unsuitable veterinary policy for the animal health.

Problems for agriculture due to stressed water balance in the nine catchment areas of Rwanda

Catchments level 1



Stressed water balance by year Catchment level-1		Significant erosion ¹⁾	Source of pollution	Conflicts	Trans- boundary	Remark
1. CKIV - Lake Kivu	-	Yes, b	-	Minor	DRC	
2. CRUS – Rusizi	2020 (Level-2)	Yes, a, b, c	Mining	Minor	DRC (Lake Kivu)	Rubiro level-2 catchment
3. NNYU - Upper Nyaborongo	-	Yes a, c	Mining	-		
4. NMUK – Mukungwa	-	Yes a, c	Mining	-	(Uganda)	
5. NNYL - Lower Nyabarongo	2030	Yes a, c	Mining, City of Kigali	-		
6. NAKN - Akanyaru	2020	Yes a	-	Trans-boundary	Burundi	Extensive peat wetlands
7. NAKU - Upper Akagera	2020	-	-	Trans-boundary	Burundi, Tanzania	
8. NAKL - Lower Akagera	2030	-	-	-	Tanzania	
9. NMUV - Muvumba	-	Yes, a	-	Trans-boundary	Uganda	

Causes for erosion:

- agriculture
- land-use changes and over-exploitation, e.g. deforestation
- mining

2. GOVERNMENT’S EFFORTS AND POLICY ON FOOD SECURITY (LINKED TO WATER AND CLIMATE)

Rwanda has good governance and political will to develop agricultural sector as being the economic backbone of the country by employing about 87% of the working population, producing around 46% of GDP and generating about 80% of the total export revenues (sources: MINAGRI, 2009). Newcomers to Rwanda should be well aware of the very strong result drive by the Government of Rwanda (GoR), underpinned by monitoring and data.

Strategic Plan for the Transformation of Agriculture in Rwanda). In this regards, Rwanda experienced different agricultural extension approaches, both Top down (Transfer of Technology and Training & visit) and Bottom up (Farming System Research, Participatory extension, Farmer to Farmer Extension, Partnership extension, Agricultural Knowledge Information System, Privatization of agricultural extension and Contracting for extension service delivery);

Government’s efforts are generally seen in following factors:

The existence of a National Agricultural Policy, approaches and programs; experiences of Ubudehe, Imihigo, Girinka etc. which can be built on in the effective participatory planning, implementation for quick positive impact in agricultural sector; the resettlement policy (Umudugudu) policy; the network of micro finance institutions present in all Districts; agricultural education institutions (UNR, ISAE, KIST, UNATEC...); increasing small agro processing units; communication facilities (local radios, newspapers, ICT); facilities given to local communities to take part in decision-making in the context of decentralization and good governance; existence of a good policy for cooperatives promotion and political stability in the country.

Performance contract (Imihigo) at all levels, has created motivation to workers who try to improve both quality and quantity of the agricultural product output. Farm inputs are currently being used including, imported fertilizers and the development partners are increasingly showing interest in the use of the modern inputs. In addition, the decentralization program has improved much access to basic services including the extension programs; this has had positive impact because it has managed to bring services closer to the farmers.

3. STATUS AND PROBLEMS OF SPATIAL INFORMATION SUPPLY IN THE AGRICULTURAL SECTOR AND ANALYZE THE INSTITUTIONAL CAPACITY TO SUPPORT VIABLE INFORMATION

Geographic information in Rwanda has a central role in supporting economies, improving business effectiveness in the private sector, enabling more efficient decision-making and increasing citizens' involvement in governance.

3.1 STATUS

About 80% of information used at all levels of development planning and decision-making is spatial (Østensen, 2001, Kolte et al, 2009). Spatial information supply in the Rwanda agriculture sector is evidenced by an increasing demand. This increase is due to the current drive by the Government of Rwanda (GoR) to promote evidence-based decision-making within the context of a knowledge-based economy. This requires the use of accurate data in the scientific analysis of a given situation in order to derive results that could feed into government policies.

For the development of this technology, the government of Rwanda has trained officials in charge of spatial information in many ministries including the Ministry of Agriculture and Animal Resources (MINAGRI), its agencies and projects. Appropriate basic equipment and facilities in collecting and handling spatial data have been put in place like GPS, DGPS, ArcGIS, etc. Important geodata have been collected and are available for helping in decision making.

To equip MINAGRI personnel with skills in geospatial processing, different capacity building programmes have been implemented;

Even though there is a gap in using remote sensing data due to non-clear access to satellite data system. Rwanda has produced a country cover high resolution aerial photography (25cm) in 2008-2009 which is useful in country with limitation to be static in time.

Access to frequent high resolution satellite imagery and data are much needed to support agriculture as well as other domains in providing latest data and trends. This could enable visualizing the dynamic change of agri-transformation in terms of land use/land cover (NDVI, MNDWI, etc), intensity of soil erosion, practices against soil erosion, and practices for agriculture extension, soil characteristics, crop intensification, forest/tea/coffee cover, geology, rainfall data and so forth.

3.2 CHALLENGES

The awareness of the value of geographic information in Rwanda is currently high and the need for users to access existing data is evident. The challenge is to know what datasets exist, where they are and how to access them because most of data are scattered in the ministries and institutions. An additional challenge is that much data mainly exist in a 'hardcopy' format. Therefore there are many opportunities for digital systems.

Although much data is being gathered, 'owners' of the data often are not always willing or unable to share the data. This, for instance applies to climate/weather data.

Both data producers and users perceive the absence of national policy on data access and sharing. The need to share becomes apparent when individuals and institution cannot produce all datasets they want. Identifying data sharing arrangements is fundamental to understanding the kind of sharing mechanism required.

Like most African countries, Rwanda faces challenges that hamper establishing the National Spatial Data Infrastructure (NSDI). Basic requirements for implementing this are policies, appropriate institutional arrangement, strong partnership within and between institutions, human resources, datasets and custodianship, standards and technology.

The other challenge is skills gap among staff to be able to build a reliable and responsive GIS based dynamic information framework (GIS-DIF). The system should provide quantitative and geospatial baselines for land cover, land use, land quality, and hydrology for the watersheds. It could link data layers via functional distributed models to predict the impacts of climate, land cover, and land use changes on biodiversity, land, and water in way to understand changes on increased productivity.

Grassroots groups like Non-Governmental Organizations, local level non-profit agencies, voluntary associations are beginning to use spatial data and technologies in local planning, in problem solving and service delivery, but until recently, they were not recognized by researchers or policy makers as participants in data sharing efforts.

3.2.1 INVENTORY OF GENERAL INFORMATION SUPPLIERS ACTIVE IN THE AGRICULTURE DOMAIN
General information in the agriculture domain is mainly supplied by the Ministry of agriculture itself and affiliate organizations. These affiliate organizations are: Rwanda Agricultural Board (RAB), National Agricultural Export Development Board (NAEB), Marshland and hillside irrigation projects (LWH/RSSP) and Kirehe Watershed Management Project (KWAMP), etc.

In this area of spatial data, MINAGRI is also working in collaboration with other institutions to share geodata. Those institutions are: Centre for Geographic Information System of University of Rwanda (CGIS), Rwanda Natural Resources Authority (RNRA), Rwanda Meteorological Agency, National Institute of Statistics of Rwanda (NISR) and Ministry of Local Government (MINALOC).

3.2.2 INVENTORY OF SPECIFIC AGRI-SECTOR INFORMATION SUPPLY AND CURRENT MECHANISMS
Good decisions are based on good information. Good information is based on good data and analysis. Planning and modelling of proposed project are parts of information management which became a fully digital process.

Spatial data users are classified in diverse groups. Survey results revealed that majority of spatial data users in Rwanda are decision makers, Academia institutions, and institutions producing spatial data, Consultants, the media, grassroots groups and other organisations producing data for internal reasons.

The main spatial data producers identified are National Institute of Statistics of Rwanda (NISR 40%), National Land Centre (NLC 39%), CGIS (Centre for GIS 15%). Other organizations combined supply 6% of all datasets shared.

Spatial datasets are stored as digital and/or paper maps. Those datasets are especially administrative boundaries, topographic maps, Roads, Socio-demographic data, land use, soil map, irrigated consolidated lands, Bathymetry of Lake and orthophotos.

They are mostly exchanged in map format printouts/hardcopies (47%), 32% are shared as shape files (.shp), 3% in portable document format (.pdf), and 8% are downloadable from the internet as non-dynamic maps. It implies that the data management system is predominantly paper-based. (*Source: university of Rwanda, 2011, an Assessment of the Current State of Spatial Data Sharing in Rwanda,*)

3.2.3 INVENTORY OF OTHER SECTORS

The demand for spatial information for decision making can be considered from different perspectives. Decisions are made at different administrative or organizational levels. Some of the sectors important for agriculture are: Agricultural Information and Communication Centre (CICA)² and Land Husbandry water harvesting and Hillside irrigation/Rural Sector support projects (LWH/RSSP) of MINAGRI which, regularly collect, produce, process, adapt, store and disseminate Agricultural Information and knowledge. They are working in partnership with all Districts of Rwanda (30 Districts) through RAB³, NAEB⁴, BDC⁵, CCI⁶, Farmers cooperatives and other related actors in agricultural sector. The Department of Planning in MINAGRI central is also important for information supply.

3.3 ONGOING G4AW RELEVANT ACTIVITIES AND/OR PROJECTS IN RWANDA

The very strong result drive by the Government of Rwanda (GoR) executing and implementing her policies, can be supported by monitoring and data from new information strategies (as provided by G4AW consortia). The organization(s) in charge of this is probably SAKSS under MINAGRI; more info:

In 2014, the NL embassy is in a process of developing a large multi-million Euro support programme on IWRM likely targeting RNRA and the larger water sub-sector. A Water Management Information System including a Water Permit System is under discussion. Goal is optimizing water use by the sector; e.g. for drink water supply (MININFRA-EWSA), for agriculture (MINAGRI), for energy (MININFRA) and for nature (MINIRENA). A need for data and data sharing exists and institutional questions about location and 'ownership' of data need to be addressed. Data will have to be 'fed into' the MIS/Water Permit System from the (local) decentral level, preferably directly and online by the water permit holders themselves. Spatial (open) database development and monitoring using remote sensing could support the above programme.

² Agricultural Information and Communication Centre; Communication Agricultural information and Knowledge services

³ Rwanda Agriculture Board registered Under Ministry of Agriculture aimed at developing agriculture and animal husbandry through their reform and using modern methods in crop and animal production, research, agricultural extension, education and training of farmers in new technologies.

⁴ National Agricultural Export Development Board registered Under Ministry of Agriculture aimed to improve the balance of payment of Rwanda Economy through increased agricultural exports.

⁵ Business Development Center prepares and nurtures entrepreneurs to start and grow business with ethical values

⁶ Through the dissemination of information and skills among local communities, the CCIs facilitate the replication of agricultural innovations and the effective implementation of sustainable watershed management plans in the Kirehe District.

4. ASSESSMENT OF OBVIOUS POTENTIAL FOR SUSTAINABLE SPATIALLY BASED INFORMATION SERVICES

A number of 'principles' could possibly be identified, aligning G4AW with Government of Rwanda policies and strategies. For instance the Government of Rwanda is keen on a lean government; on generating employment; on developing local ICT capacity (local institutes; Rwanda's ambition to become a regional ICT Hub).

With ownership of mobile phones and Internet subscribers increasing, the Government of Rwanda (GoR) is seeking to transform the country into a knowledge based economy and ensure it becomes a Regional ICT hub. As part of the Government of Rwanda's ongoing efforts, it is investing in numerous initiatives to take advantage of ICT's to foster Rwanda's economic development. Rwanda has funded computers in schools, built tele-centers (cyber cafes) in every district, ICT buses (mobile connectivity installed in buses). These are opportunities to remote rural areas to assist local people to access facilities and services online.

In the framework of food security policy, the Ministry of Agriculture wants to promote use of spatial data to increase the agricultural sector output. Geo-information domain is experiencing rapid growth of both computational power and quantity of information. Rwanda in particular is welcoming anyone to invest in geospatial technologies which can support agriculture to develop.

As results, most institutions are hopeful to use Geographic Information Technologies (GITs) in their day-to-day activities, producing geographic data of different themes and presenting maps in different reports.

For the sustainability of geospatial services in Rwanda:

- A master's programme for Geo-Information science has been opened in the University of Rwanda in partnerships with American and European Universities.
- The land and mapping department has been created in Rwanda Natural Resources Authority with the mandate to develop policy on spatial data, Spatial Data Infrastructure (SDI), data sharing and develop geospatial services.
- The domain of micro insurance is new in Rwanda and needs to be scaled up. Spatial based Information are tools for Agro-insurance services to access micro climate data to be able to monitor climate variability and risks, agricultural yield forecast as well as agriculture production mapping.

In 2014, the NL embassy is in a process of developing a large multi-million Euro support programme on IWRM likely targeting RNRA and the larger water sub-sector. A Water Management Information System including a Water Permit System is under discussion. Goal is optimizing water use by the sector; e.g. for drink water supply (MININFRA-EWSA), for agriculture (MINAGRI), for energy (MININFRA) and for nature (MINIRENA). A need for data and data sharing exists and institutional questions about location and 'ownership' of data need to be addressed. Data will have to be 'fed into' the MIS/Water Permit System from the (local) decentral level, preferably directly and online by the water permit holders themselves.

4.1 SPECIFIC POTENTIALS FOR GENERAL AGRICULTURAL ISSUES

Acidity of soil

- DTM generation using satellite data for mapping slopes with an appropriate scale;
- Potential Risk maps can be derived based on the slope, slope length, slope angle, etc.;
- As input to hydrological GIS based watershed runoff modeling;
- Hydrological analysis and monitoring using RS help in assessing the extend of already available; damage inflicted by erosion and with that hot spot areas for taking prioritized measures.

Population density and livelihood

Using remote sensing as a mapping tool of the agricultural region can help in decision making for land evaluation and land use planning. Using time series (when available also from archives) one can detect changes in land use and with that support spatial processes in agricultural activities (like logistics, infrastructure, storage facilities, etc.)

Low use of inputs and commercialization

In order to minimize losses of inputs farmers need management information on their crops, water use efficiency/waterproductivity, etc. It is important to preserve natural fertility of soils and also to grow crops on the right suitable soils for each croptype requiring specific conditions (water, soil, micro climate, etc). Landevaluation prior to crop scheme planning and landuse planning in general can be accompanied with remote sensing mapping of regions on medium scales (sub catchment level or more detailed: 1 : 25K). When optimization of crop management is started one can minimize costs on inputs and increase crop growth performance and production and indirectly a better return and profit on the long term.

Climate change

The agriculture sector in Rwanda depends on rainfall regime and its pressing problem is mostly resulted from the weak meteorological capacity (weather prediction) and lack of an appropriate country's meteorological policy; Drought, irregular rains, landslides, and other related phenomena are major concerns for improving agricultural productivity; A combination of remote sensing and meteorological monitoring and data analysis will help predicting and observing changes in the agro-climatological conditions and with that the risks involved in extremes in climate affecting the sector.

Insufficient post-harvest management

In some areas, when rain regime favorable, farmers may be limited in selling surplus production mainly from banana, sweet potatoes and vegetables due to poor conservation. Remote sensing and GIS based information systems can help and support in logistic routing and optimize the storage facilities (or planning of new storage stratagies) in order to minimize losses in the post-harvest situation.

Inadequate Water and Irrigation development

Although the Government is making effort to proving food security, water retention capacity of watersheds and hillside irrigation are still needed to be developed. With remote sensing water use by agricultural activities can be monitored and managed. In combination with the development of IWRM sector and accordingly also local field information acquisition on ground water and the water balance in general, the agricultural sector can benefit from the new spatial information to manage the risks and water availability needed for irrigation and water management in general.

Insufficient infrastructure for animal production processing and storage

Insufficient water points for cattle in comparison with the number of animals, epidemic diseases which frequently affect animals, Poor veterinary services with few qualified cadres, unsuitable veterinary policy for the animal health. Remote sensing could support in planning grazing areas and water availability and with that continuity in food and water supply for cattle.

5 PARTNERSHIPS BETWEEN STAKEHOLDERS IN RWANDA AND DUTCH SECTOR

In general Rwanda is currently developing a monitoring strategy for following and controlling the policies to be implemented and executed. In that sense remote sensing is of great interest to the government (agriculture and water policy) as a tool for governance and evaluation. In that sense important stakeholders are mainly from government (certainly water related issues in agriculture) and some from private nature:

Government and public stakeholders:

Water resources management is a public domain implemented through different users depending on water resources. Integrated water resources management (IWRM) can be described as the coordinated development and management of water, land, and related resources to maximize the resulting economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. This makes the institutional setting of IWRM complex, as mechanisms are required for involving all water dependent stakeholders at all levels.

Three important aspects of IWRM need to be mentioned. Firstly, that it does not follow administrative but catchment boundaries (watersheds), often cross-district and cross-border. Secondly, that it requires horizontal, cross-sector alignment (so also agriculture). Thirdly that it requires vertical alignment, national-local, and decentralisation of decision making to the catchment levels. The latter provides advantages in terms of effectiveness and quality of decision-making. The key term is *integrated* which refers to the need for horizontal and vertical coordination and alignment of policies, strategies, planning, development, implementation and monitoring of activities by water dependent stakeholders.

Water activities by the Government of Rwanda are covered by a number of ministries and departments. The Ministry of Natural Resources (MINIRENA) hosts the department dealing with IWRM (RNRA-IWRM), additional to departments dealing with Lands/Mapping, with Forestry/Nature Conservation and with Geology/Mines (**Error! Reference source not found.**). MINIRENA hosts two semi-autonomous institutions: Rwanda Natural Resources Authority (RNRA) and Rwanda Environment Management Authority (REMA; in-charge of environmental monitoring including Environmental Impact Assessment compliancy).

Other key governmental stakeholders depending on water resources are the Ministry of Agriculture and Animal Resources (MINAGRI, among others responsible for agriculture, irrigation, agro-industrial use, water demand, livestock and fisheries); the Ministry of Infrastructure (MININFRA⁷, among others responsible for urban and rural potable water supply, hydro / geothermal power development, navigation on waterways and meteorology) which hosts Energy, Water and Sanitation Authority-EWSA; the Ministry of Local Government (MINALOC, among others responsible for urban and rural potable water supply development and supervision of District/Sector Committees) and; the Ministry of Trade and Industry (MINICOM, among others responsible for industry and tourism). Most of these institutions are open to the IWRM concept and indicate an increasing need for water data and information, although they have questions and are sceptical of coordination (cf. USAID, 2012).

⁷ MININFRA's IWRM interests for instance are secure water supply, minimum sedimentation levels and maintaining appropriate minimum (ground) water levels for hydro / geothermal power and navigation.

Private Stakeholders:

Main private sector stakeholders in the IWRM sub-sector are water services providers operating under license from EWSA, which include Netherlands based Aquanet and Vitens-Evides International, Bralirwa breweries in which Netherlands Heineken holds a majority share (Gisenyi and Kigali), commodities producers e.g. active on coffee, tea, rice and sugar (Kabuye Sugar Works), farmer's associations and hospitality industry. Smallholder farmers, farmer-organisations and the government own most irrigation schemes in Rwanda. Since mid-1990s GoR is actively implementing a privatisation policy.

Institutional stakeholders:

Many development/financing partners are supporting water dependent activities in Rwanda, such as irrigation, hydropower and water and sanitation, e.g. World Bank, African Development Bank, International Fund for Agriculture Development and some bilateral donors, including Germany, Japan, Korea, the Netherlands, Sweden and United Kingdom. However, support for the IWRM sector is meagre. Early 2013, probably for political/financial reasons, USAID prematurely ceased funding of IWRM programme 'Rwanda Integrated Water Security Program (RIWSP), after having funded the preparation of a capacity assessment of the IWRM sub-sector (USAID, 2012). Rwanda is also member of a number trans-boundary or international bodies influencing or involving 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

Table 5.1. Ministries and public agencies having a key role in IWRM in Rwanda [Source: USAID, 2012]⁸

⁸ Analysis and intervention logic for water - IWRM programme 2014-2017, Netherlands Embassy Kigali, 18 February 2014