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WASHINGTON DC, MARCH 25-29, 2019



ASSESSING INSTITUTIONAL GOVERNANCE IN BALANCING FOOD PRODUCTION AND ENVIRONMENTAL PROTECTION IN PERI-URBAN WETLANDS OF KIGALI/RWANDA AND TROPICAL KILOMBERO FLOOD PLAIN/TANZANIA.

A COMPARATIVE ANALYSIS

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**Paper prepared for presentation at the
“2019 WORLD BANK CONFERENCE ON LAND AND POVERTY”
The World Bank - Washington DC, March 25-29, 2019**

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Abstract

Institutional Governance has been a challenge in balancing the food production and environmental protection in wetlands of Rwanda and Tanzania, their peri-urban wetlands are getting more encroached by the population for livelihoods. This conference paper compares the institutional arrangements in the Nyabugogo- Nyabarongo peri-urban wetlands/Kigali and Kilombero valley floodplain/ Ifakara peri urban area/Southeastern Tanzania. The major driving forces for alteration of Nyabarongo peri-urban wetland's functions in riparian urban community in Kigali lie in social and economic factors such as policies, markets, demographic trends, and institutions governing access to resources, weak coordination and poor enforcement. The wetlands management in Tanzania is very sectoral, with overlapping mandates among different institutions (e.g., land and water; wetlands and environment under Vice President office but the sites under Ministry of Natural Resources and Tourism)- The Kilombero (sub)catchments management faces similar national issues of conflicting institutions (different sector policies and laws) , mountains around Kilombero valley are mainly covered with forest, and land cover in valley itself is dominated by urban areas of Ifakara, some smaller settlements, and agriculture; The area is characterized by diverse land uses, land use intensity gradients, and interactions between large-and small-scale crop farmers, landless herders, and urban populations. The institutional challenges caused by demographic pressures, intensifying urbanization and conflicting policies and laws, among other driving forces. This paper will be orally presented in annual World Bank Conference on Land and Poverty, session " *Providing Policy advice through applied research*", World Bank Headquarters Office, Washington DC: MC-2850., March 27th, 2019, at 10:30 am.

Key Words:

Rwanda-Tanzania, Institutional Governance, Urban Wetlands conservation, Food production



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Introduction

Institutional Governance has been a challenge to balance the food production and environmental protection in wetlands of Rwanda and Tanzania, where the countries face inter-related issues of poverty, food insecurity, high population growth, intensifying urbanization, land and environment degradation, and resource competition. Most Rwandans rely primarily on agriculture for livelihoods, the country's high population growth rate and limited area for agricultural expansion (the average land holding per household is less than 0.5ha) has resulted in strong land pressure on the available uplands arable areas, resulting in reducing productivity. Consequently, the use of the wetlands has become of food security imperative which is clearly confirmed by existing intensive agricultural production in many of the country's valley and floodplain wetlands.

Tanzania is an agricultural country with 80% of the population depending on subsistence agriculture. Kilombero valley was identified as a potential agricultural area to enhance food security and meet the Sustainable Development Goal. A large seasonally flooded alluvial floodplain is within the Kilombero Valley. Expansion of agricultural land in the floodplain is restricted due to the existence of protected areas, i.e., the Kilombero Game Controlled Area, the Selous Game Reserve, and the Udzungwa National Park. Furthermore, changing climatic patterns affects agricultural production causing extreme periods of dryness, floods, and changes in seasonality. The two countries urban wetlands are getting more encroached by the population for food and livelihood income generating activities.

This paper compares the institutional arrangements in the Nyabugogo- Nyabarongo peri-urban wetlands and tropical kilombero floodplain. The major driving forces for alteration of Nyabarongo urban wetland's functions in riparian urban community in Kigali lie in social and economic factors such as policies, markets, demographic trends, and institution governing access to resources and poor enforcement. The Kilombero entire catchment covers an area of 40,240 km² and the mountains around Kilombero valley are mainly covered with forest, and land cover in valley itself is dominated by urban areas of Ifakara, some smaller settlements, and agriculture. The area is characterized by diverse land uses, land use intensity gradients. The institutional governance in the kilombero areas is challenged by conflicts among institutions operating in, these include conflicting policies and laws, weak coordination, lower institutional capacity, political interference/ lack of political good will, and lack of resources (financial and human).

Conceptual framework and Methods

Institutional Governance

The institutions are defined as social structures that have attained a high degree of resilience (Scott, 2001). They are composed of cultured- cognitive, normative, and regulative elements associated to activities and resources, to provide stability and meaning to social life. Claudia Pahl Wostl (2009) referred formal and informal institutions to natural or processes of development, codification, communication, and enforcement. Formal institutions are linked to the official channels of governmental bureaucracies. They are codified in regulatory frameworks or any kind of legally binding documents. Correspondingly they can be enforced by legal practices. Informal institutions refer to socially shared rules such as social or cultural norms. In most cases informal institutions are not codified or written down. They are enforced outside of



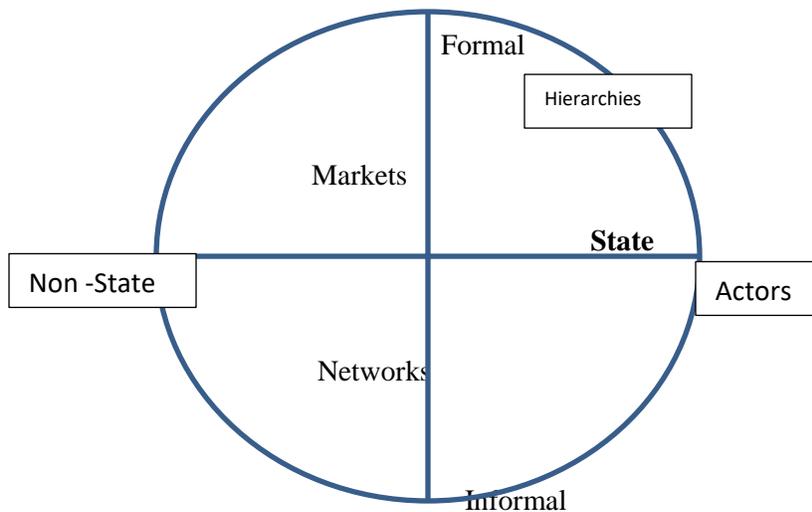
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legally sanctioned channels (Wostl, 2009). it is important to think not only about what form institutions should have, but also about the functions that institutions must perform—that is, think not only about the form of institutions, but also about their functions (WB, 2017) through credible commitment, support coordination and promote cooperation to achieve intended outcomes.

Institutions- Formal and Informal: Role of actor groups- state, non- state actors



Difference of Governance modes of bureaucratic hierarchies, markets, and networks regarding the degree of formality of institutions and the importance of state and non- state actors (Wostl, 2009).

DESK REVIEW, COLLECTION OF SECONDARY DATA AND PRIMARY DATA

A number of field visits, interviews and focus groups discussion with central and local government officials, and community consultation with farmers and local leaders were conducted in two wetlands sites identified for each country. A questionnaire was also administrated to officials from key line ministries and delivery agencies/boards/authorities/commissions, local government (districts) and local farmers in research sites. The findings revealed that the two countries have centralized institutional set up dealing with wetlands and environmental management- due to political top down approach, all institutional set up are at central level rather than local level and this creates unbalance of implementation and enforcement of policies and laws at decentralized entities- lack of awareness on importance of conserving the natural resources and environment, poor collaboration with the local stakeholders including farmers and Non-government Organization dealing with the land and agricultural production through wetlands.



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Analysis of institutional arrangement and Policy instruments¹ relevant to food production and environmental protection in Rwanda and Tanzania wetlands(Nyabugogo and Kilombero)

A review of existing policy framework and institutional arrangement revealed that Rwanda and Tanzania have strong centralized institutional set up dealing with wetlands conservation and environment management and weak decentralized systems to deal with nature -based solutions- due to political top down approach, all strong institutional set up are at central level rather than local level and this creates unbalance of implementation and enforcement of policies and laws at decentralized entities. Hence weak coordination on awareness on importance of conserving the natural resources and environment, poor collaboration with the local stakeholders including farmers and non-government organization dealing with the land and agriculture production through wetlands.

To cope with stressors like climate change, economic instability, and social-political or ideological shifts, environmental governance needs to formally embrace a broader set of environmental actors, organizations, and institutions, and become more flexible, responsive, and innovative (Daniel A. DeCaro, 2017) (Folke, 2005) (Chaffin, 2016). Vital natural resources are collapsing throughout the world because of unsustainable environment practices (Assessment(MEA), 2005) (FAO, 2012). Governance systems can theoretically be designed to facilitate and embrace adaptation, helping society navigate important transitions more gratefully (Shivakumar, 2005).

Distinction between resource management and resource Governance (Wostl, 2009), Resource management refers to the activities of analyzing and monitoring, developing and implementing measures to keep the state of a resources within desirable bounds. The notion of resource governance takes into account the different actors and networks that help formulate and implement environmental policy and/or policy instruments (Wostl, 2009). World bank defines Governance as the process through which state and non-state actors interact to design and implement policies within a given set of formal and informal rules that shape and are shaped by power. This paper defines power as the ability of groups and individuals to make others act in the interest of those groups and individuals and to bring about specific outcomes (WB, 2017).

Depending on the context, actors may establish a government as a set of formal state institutions (organizations and rules) that enforce and implement policies. Also depending on the context, state actors will play a more or less key role with respect to non- state actors such as civil society organizations and business lobbies. In addition, governance takes place at various levels, from international bodies, to national state institutions, to local government agencies, to community and business associations. These dimensions often overlap, creating a complex network of actors and interests (WB, 2017).

¹ *Policy instruments*- for purpose of these research topics, the term "Policy Instruments" refers to laws, orders or regulation, policies, strategies, programs, and projects relevant to wetlands in East Africa, Rwanda, 2016.



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Adaptive management is defined as systematic process for improving management policies and practices by systematic learning from the outcomes of implemented management strategies and by taking into account changes in external factors in pro-active manner (Claudia Pahl- Wostl, 2010).

OVERVIEW OF THE STUDY AREAS

This study was conducted in Rwanda/ Nyabugogo- Nyabarongo wetlands and Tanzania/ Kilombero valley floodplain. The administrative units are located in the city of Kigali/Nyarugenge district, and Morogoro region/Kilombero District respectively (Figure 1).

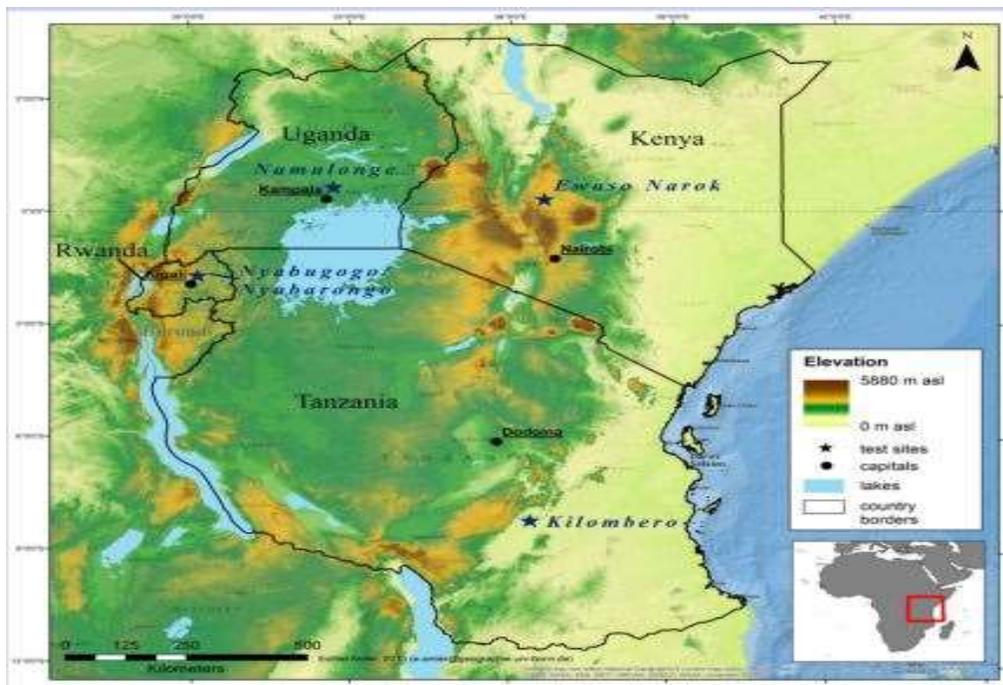


Figure 1: Location of study area (Nyabugogo/Rwanda and Kilombero/Tanzania)

Nyabugogo wetlands

Nyabugogo-Nyabarongo river altitude transect around Kigali, Rwanda. The selected study is located in the small inland valley swamps along the river from lake Muhazi and its tributaries. The climate is humid with annual precipitation higher than 1200 mm. within the undulated landscape, there are some valleys that are flooded during the rainy season. Most of the valley bottoms are already intensively used for agricultural production since the last decade. Nyabugogo river provides water to the Nyabarongo through the capital of Kigali and thus it offers opportunities for adopting a landscape perspective (Oosten, Uzamukunda, & Runhaar, 2018).



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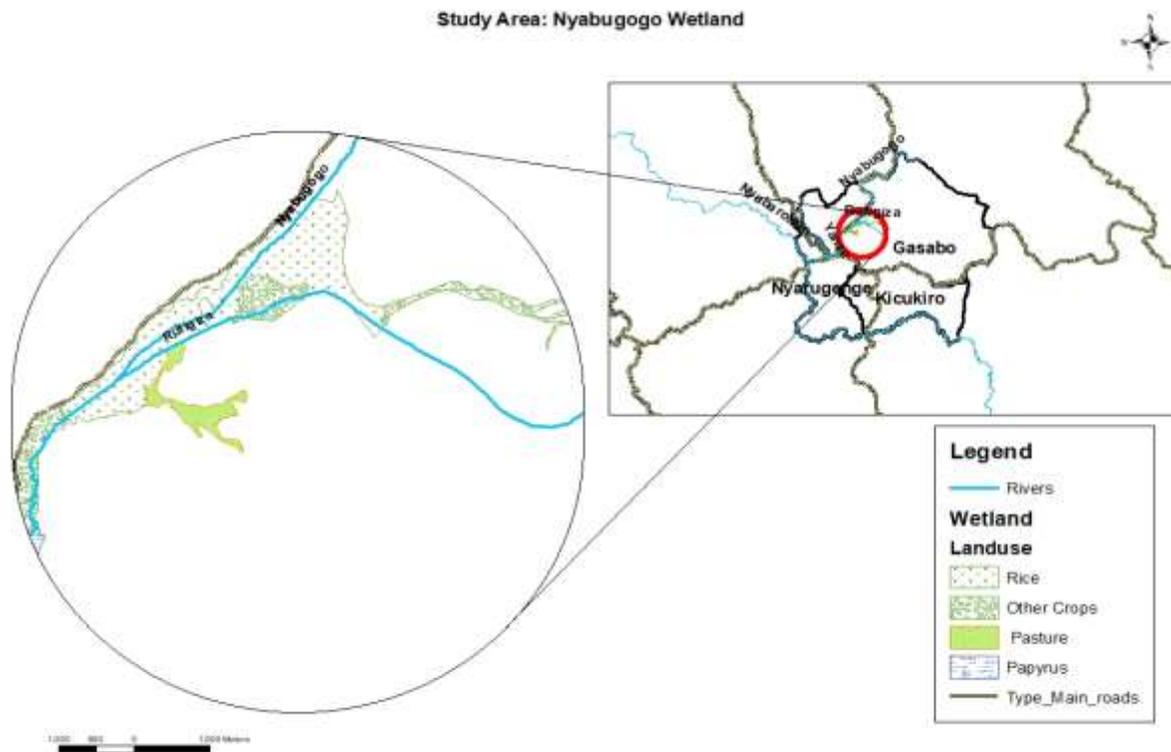


Figure 2: Nyabugogo Wetlands

Kilombero river is a tributary of the Rufiji river, one of the major basins in Tanzania, and is situated in the south-eastern part of the country. The Kilombero entire catchment covers an area of 40,240 km (Constanze Leemhuis, 2017). The mountains around Kilombero valley are mainly covered with forest, and land cover in valley itself is dominated by urban areas of Ifakara, some smaller settlements, and agriculture (Burghof, Gabiri, Stumpp, Chesnau, & Reichert, 2017). The area is characterized by diverse land uses, land use intensity gradients, and interactions between large-and small-scale crop farmers, landless herders, and urban populations (Gabiri, et al., 2018).



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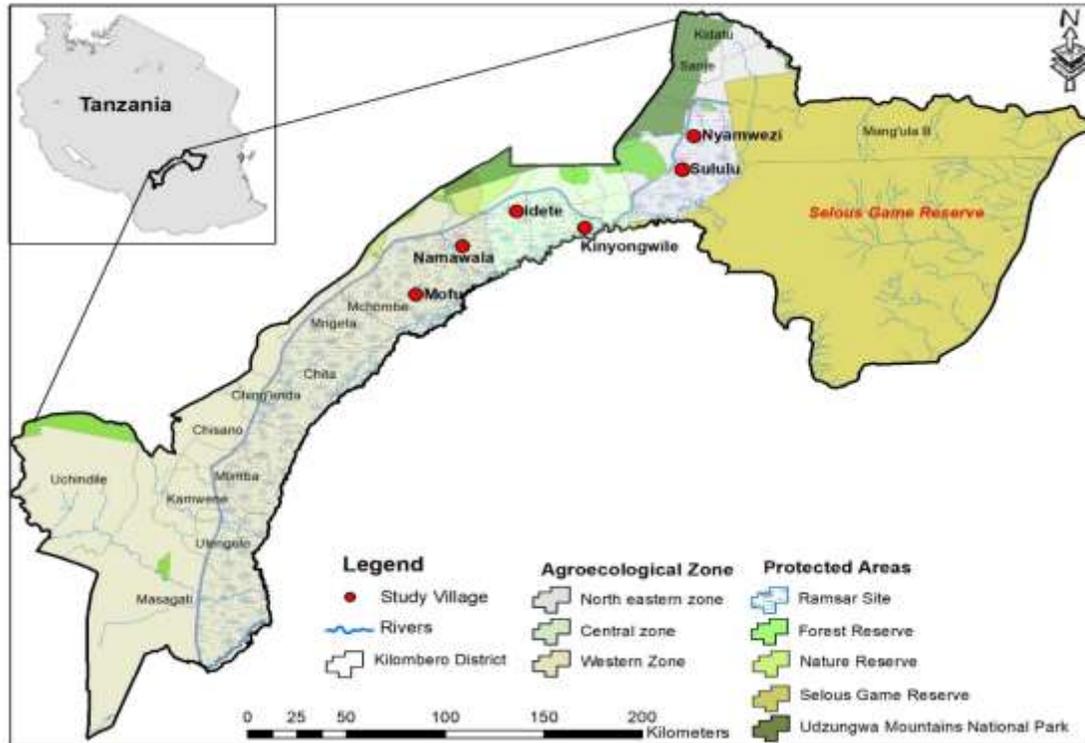


Figure 3: Location of study villages in Kilombero district, Tanzania

Country facts:

RWANDA

The overwhelming majority of Rwandans rely primary on agriculture for livelihoods. Rwanda's high population growth rate and limited area for agricultural expansion (the average land holding per household is less than 0.5 ha) has resulted in strong land pressure on the available upland arable areas, resulting in reducing productivity (Rwanda N. I., 2014) NISR². Consequently, the use of wetlands has become a food security imperative which is clearly confirmed by existing intensive agricultural production in many of the country's valley bottom and floodplain wetlands. The Government of Rwanda recognizes that the country has limited land and the pressure of the increasing population (2.8 per cent per year), coupled with the impact of climate change, may jeopardize the achievement sets goals. In Rwanda just 25 years ago (1990), forest covered 44% of Rwanda's territory, while the cropland only occupied 28 %. In 2015, more than 56 of the country's land areas have been converted to croplands to meet the food demands, at the extent of massive deforestation and wetlands degradation. However, these land conversions mainly for agricultural land use are associated with severe environmental problems including soil erosion by water and its water pollution (Karamaga, 2016). The comprehensive food security and vulnerability analysis 2015 report indicated that 70% of Rwandan households depends on food from markets and a geographical divide in malnutrition with 40% rural areas being the most affected and need enough land to increase their food

² National Institute of statistics of Rwanda



production (UN WFP, 2016). The Rwandan Ministry of Agriculture had planned to irrigate 100,000 ha from 20012 to 2017, as quoted by one official interviewed, however only 47,000 ha irrigated so far and big part is in wetlands instead of hillside irrigation as initially planned (Bizimana, 2017), major irrigation infrastructure targeted wetlands because it is affordable than hillside/upland irrigation infrastructure (Paul, 2017).

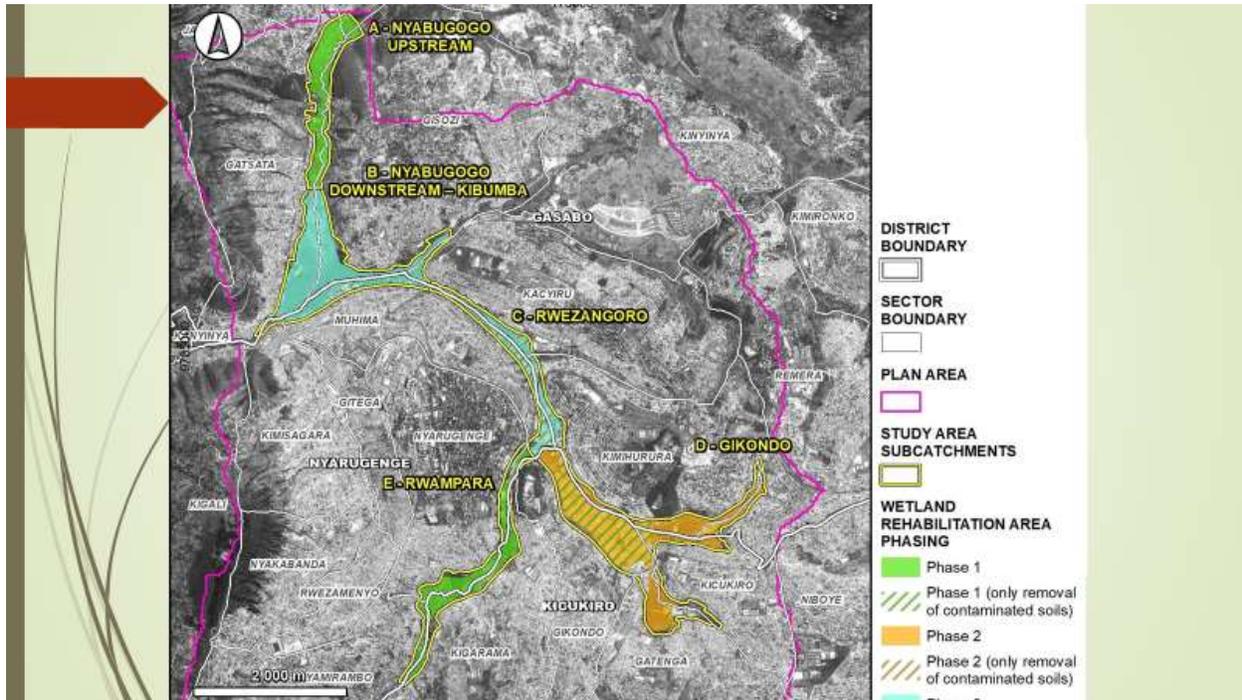


Figure 4: Nyabugogo wetlands and its sub-catchments at sectoral level

TANZANIA

Soil erosion by water is pressing environmental problems affecting the sustainability of many landscapes in Tanzania and the whole East Africa region. The kilombero catchment is a sub basin of the Rufiji basin in southwestern Tanzania with a size of about 40,240 km² and is characterized by high relief energy and distinctive data scarcity which are typical features in east African catchments (Constanze Leemhuis, 2017). Landscapes in the Uluguru Mountains in Tanzania are increasingly being affected by growing anthropogenic pressure leading to forest conversions into cropland and grazing areas. A significant urge of the cropland indicates deforestation, mainly due to the expansion of the rain-fed agriculture which has been a continuing trend in the watershed. Land use land cover change and its impacts on soil erosion were investigated in the upper Ruvu watershed over a 25 year (1991 through 2015) and results shows a decrease of natural forest by 77%, wetlands by 50%, woodlands by 44%, and an increase of croplands by 111%, shrub land by 39% and grasslands between 1991 and 2015 (RCMRD, 2017).



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Table 1: Key drivers, factors and population characteristics in Rwanda and Tanzania

<i>Key Drivers and factors</i>	<i>Rwanda</i>	<i>Tanzania</i>
Total National Population	12,135,257	49,253,126
Total land area in km ²	26,338	947,300
Total wetlands areas(10 % of Ttl)	2,785.36	94,730
Total arable land	14,749	406,500
Total forest area	7,374	326,212
Permanent crop land (% of land area)	56	2.4
Annual population growth rate	2.7	3
Population density	471	56
Rural population	10,515,973	34,380,652
Urban population	1,737,684	14,872,474
Annual urban population growth	4	5
Urbanization rate	17	30

Source: Data collected from World Bank Group, Development research department (World Bank, 2015).

Research Findings and Situation Analysis

Governance structure in Kilombero

Tanzania has a multi-tier system of government: The Central Government (made up by President and different Ministries), Regional Governments and District and Local Governments. Local Governments are either urban Authorities (city, municipal and town councils), or rural Authorities (district councils). The latter incorporate small towns (township Authorities) as well as village councils. Local government is a centralized system of government with limited decision making and financial autonomy.

Local government exists in order to promote development and democracy at the district and sub-district levels of government. There are two types of local authorities: rural authorities, normally referred to as district councils; and urban authorities which include city, municipal and town councils. Hierarchically, a district council comprises wards, under which exist village governments and finally the 10-house cell system (or vitongoji). Within an urban context, the urban council comprises a municipality (if the top structure is a city) under which exist wards, then street government and, finally, the 10-house cell system. There are no village government structures in urban authorities.

People in the Kilombero valley are heavily dependent on the abundant natural resources - wildlife, forests/woodlands, fisheries, grazing land and water for agriculture and human consumption (Mombo, et al., 2011). The natural resources of the Rufiji basin, and in particular the Kilombero River sub-basin, are under growing pressure due to population growth, agriculture intensification, uncoordinated and fragmented land use changes, unsustainable demand for grazing, and the economic, social and environmental changes taking place at the local, national and international levels.



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Map of administrative Kilombero (Districts)

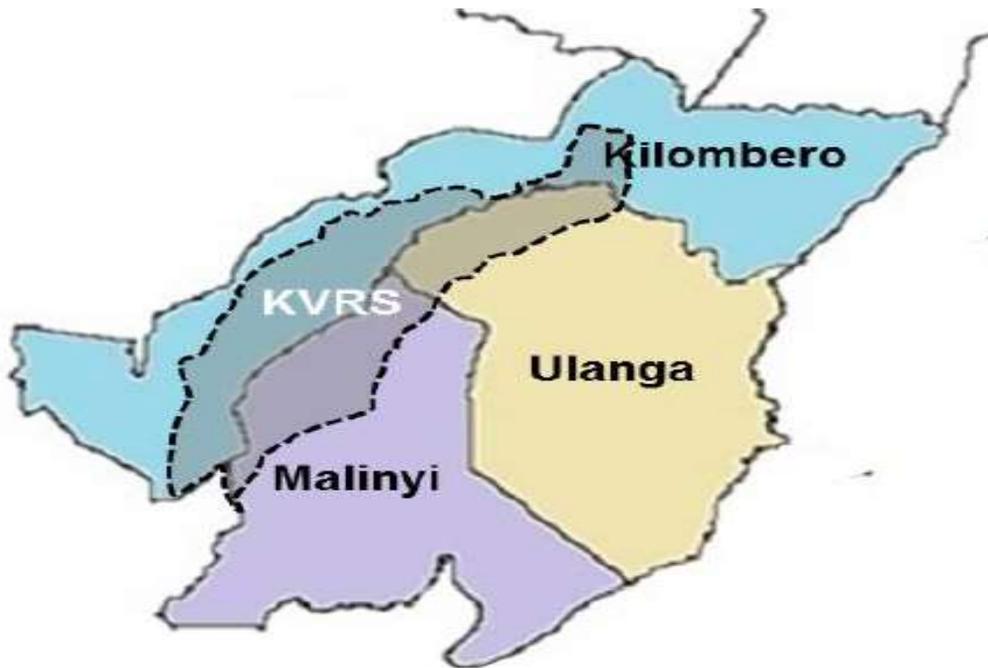


Figure 5: Maps of local administrative areas

The three Districts are composed of many wards and villages. Almost one hundred villages lie within or partly within the boundary of the KQRS and 16 wards have the majority of their area within the Ramsar Site. The District authorities have been working in collaboration with a range of stakeholders to develop Village Land Use Plans (VLUPs). The VLUPs are intended to provide a systematic assessment of land and water potential so that resources can be utilised in a sustainable way in order to address the needs of the people. As of June 2016, across the three districts approximately 50% of the villages had developed VLUPs. However, challenges remain in the implementation of the VLUPs. For instance, in Kilombero District it is acknowledged that none of the VLUPs developed since 2007 have been implemented.

Economic activities vs Institutional Governance

As part of the GoT's efforts to enhance food security, reduce poverty and vulnerability to climate change, a strategic approach has been developed to foster agricultural growth. The Southern Agriculture Growth Corridor of Tanzania (SAGCOT) programme is a public-private partnership that aims to achieve rapid and sustainable growth across a corridor of land stretching from Dar es Salaam through Morogoro, Iringa and Mbeya to Sumbawanga near the border with Zambia and includes the KQRS (RAMSAR, Wilson, McInnes, Mbaga, & Ouedraogo, 2017). Over the coming 20 years, the SAGCOT programme aims to bring 350,000 ha of farmland into commercial production, to increase annual farming revenues by US\$1.2 billion, and to



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lift more than 2 million people (roughly 450,000 farm households) out of poverty (Tanzania Government, 2012). However, without appropriate planning and management, there remains a risk that the SAGCOT programme will repeat agriculture-related mistakes already made in the Kilombero Valley, with potentially serious risks to the sustainability of the benefits generated (RAMSAR, Wilson, McInnes, Mbaga, & Ouedraogo, 2017).

Table 2: Key Policies and laws relevant to wetlands Governance in Tanzania and Rwanda

Tanzania	Rwanda
Agriculture policy, 2013	Environment Policy, 2005
Wildlife policy, 2007	Biodiversity Policy, 2011
Wetlands strategy, 2014	Wildlife Policy, 2013
Water act, 2009	Agriculture policy, 2004
Wildlife conservation act, 2009	Land policy, 2004
Environment policy, 1997	Irrigation Policy, 2010
Land policy, 1997	Wetlands regulation, 2017
Environmental management act, 2000	Water resource management policy, 2009
Water policy, 2002	Forest Policy, 2011
Wetlands guidelines, 2014	Disaster management policy, 2009

Source: Policy matrix Review of the existing policies and legislation in Rwanda and Tanzania, Author, January 2018

Situation Analysis in Kigali/ Nyabugogo Wetlands

Rwanda has 860 marshlands and 101 lakes covering total surface of 278,536 ha (10.6 per cent of the country surface area), these wetlands has been particularly in their conversion to agricultural production to enhance food security, boosting agricultural production, revitalize the rural economy and reduce poverty (Nduwayezu, T, & Niyibizi, 2015). Rwanda’s hilly topography and the influx of migrants to unplanned urban settlement on flagire slopes combined with increased rainfall due to climate change (REMA, 2017). Therefore Wetlands developments has been thought as a solution to become production hotsts and food basket for the country and approximately 30 per cent (90,000 ha) of the swamps are is already being used for agriculture all over the country, Kigali city wetlands occupy an area of 12.5 per cent which are also considered as potential areas for agriculture activities (Nduwayezu, T, & Niyibizi, 2015)., with a very high demographic growth during last decade by 2012, the city’s population was 10.7 per cent of the country population in 2012 (REMA, 2017).

This has caused reduction in size of many wetlands and croplands, reduced wetlands water and their productivity declined most of them have remained fragmented with 94% of rural households cultivated at least one parcel of land in 2016/17 with 56 per cent of households across the country having less than 0.3ha (NISR, 2018). This has resulted to continuous drainage, pollution due to over exploitation wetlands conservation and is difficult to control unless local communities understand the value of wetlands and other unsustainable uses of thes resources (Obiero, 2012). The institutional arrangements to deal with the overexploitation of wetlands vs Agriculture and livelihood is still a challenge. Local Government and Central Government institutions are always conflicting due to weak coordination and low institutional capacity. Rwanda deployed, through decentralized system, the environmentalists and Agronomists to district level but the impact is still low compared to what was the expectation, the required responsibility and delegated capacity(in terms of human resources) are not matching- this increases the institutional



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barriers, one of the reasons of not having the capable and enough staff at decentralized level(local government) is the lack of financial resources (FAO U. F., 2017).

Nyabugogo urban wetlands and livelihood Kilombero wetlands Rice Plantation



Figure 6.

Outcomes of the world café regarding Institutional aspects in Kilombero, Tanzania

Challenges	Solutions/options	Gaps
Conflicting institutions(policies and laws)	Harmonization	✓ Weak coordination
		✓ Low institutional capacity
		✓ Lack of political good will
Coordination challenges	Common forum for interpretation and implementation of policies	✓ Resource availability
		✓ Political interference
		✓ Autonomy of authority(e.g districts administration vs other statutory boards and relevant ministries).

Outcomes of Morogoro Group discussion in water management workshop, October 2017



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CONCLUSION

Nyabugogo and Kilombero wetlands are more important sources of livelihoods for most dwellers in the areas. The institutional arrangements, as cross cutting issues in the areas, are crucial to deal with the balance of ongoing conservation activities vs production, from central to local Government arrangements. All two countries have presidential systems of Government, with similar governance regime on agricultural production, food security, and environment and natural resources management including wetlands utilization and conservation. However, their implementation, enforcement and compliance measures are somehow different to deal with the surrounding communities. Local government exists in order to promote development and democracy at districts and sub-districts levels of Government and this resulted in the weak coordination of Central Government policies applied in the wetlands areas.

ACKNOWLEDGEMENT

The work presented here is the results under the support of the research project: The GlobE: Wetlands in East Africa Project funded by the German Ministry of Education and Research and the German Ministry for Economic Cooperation and Development through University of Bonn with a focus on reconciling food production and environmental protection in wetlands of East Africa (<http://www.wetlands-africa.uni-bonn.de>). Rwanda Environment Management Authority provided the overall coordination and guidance on the project implementation in consultation with other Government implementing agencies in Rwanda. The views expressed in this document cannot be taken to reflect the official opinions of these organizations.



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Works Cited

- Assessment(MEA), M. E. (2005). *Ecosystems and Human well-being: Syntesis* . Washington: Island Press.
- Bizimana, C. (2017, May 16). Technical Advisor in the Ministry of Agriculture.
- Burghof, S., Gabiri, G., Stumpp, C., Chesnau, R., & Reichert, B. (2017). Development of a hydrogeological conceptual wetlands model in the data-scare north-eastern region of Kilombero Valley, Tanzania. *Hydrogeology*.
- Chaffin, B. C. (2016). Emergence, Institutionalization and renewal: Rhythms of adaptive governance in complex social-ecological systems. *Environment Management*, 81-87.
- Claudia Pahl- Wostl, G. H. (2010). Analzing complex water governance regimes: The Management and Transtion Framework. *Environmental Science & Policy*, 571-581.
- Constanze Leemhuis, F. T. (2017). Sustsianbility in the Food- Water- Ecosystem Nexus: The role of Land Use and Land Cover Change for Water Resources and Ecosystems in the Kilombero Wetlands. *Sustainability*.
- Daniel A. DeCaro, B. C. (2017). Legal and Institutional Foundations of adaptive Environmental Governance. *Ecology and Society*.
- FAO, F. a. (2012). *State of the World's Forest*. Rome, Italy : FAO.
- FAO, U. F. (2017). *Kenya Agriculture Development- Assessing Institutional Barriers to National adaptation Plan Implementation*. Nairobi: FAO.
- Folke, C. T. (2005). Adaptive Governance of social-ecological Systems. *Annual review of environment and Resources*, 441-473.
- Gabiri, G., Burghof, S., Diekkruiger, B., Leemhuis, C., Steinbach, S., & Naschen, a. K. (2018). Modeling Spatial soil water dynamics in Tropical Floodplain, East Africa. *MDPI*.
- Mombo, F., Speelman, S., Huylenbroeck, G. V., Hella, J., Pantaleo, M., & Moe, a. S. (2011). Ratification of Ramsar convection and Sustainable Wetlands Management:Situation analysis of t he Kilombero Valley Wetlands in Tanzania. *Agricultural Extension and Rural Development*, 153-164.
- Nduwayezu, J. B., T, I., & Niyibizi, A. (2015). Comparative Levels of Waters and Air Pollutants in Kigali City and Kitabi and Benefits of Cleaner Energy- Biodiesel in Rwanda. *International Journal of Ecosystem*, 108-115.
- NISR, N. I. (2018). *Integrated Household Living Conditions Survey, EICV5*. Kigali Rwanda: NISR.
- Obiero, K. R.-O. (2012). Community Perceptions on the Impact of the recession of LakeVivtoria Waters on Nyndo Wetlandss. *Scientific Research and Essays*, 1647-1661.



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ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
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- Oosten, C. V., Uzamukunda, A., & Runhaar, H. (2018). Strategies for achieving environmental policy integration at the landscape level. A framework illustrated with analysis of landscape governance in Rwanda. *Environmental science and Policy* 83, 63-70.
- Paul, K. L. (2017, June 17). Deputy Director General in charge of Integrated Water resource Management.
- RAMSAR, Wilson, E., McInnes, R., Mbaga, D. P., & Ouedraogo, & P. (2017). *Rasar Advisory Mission report on Kilombero Valley in Tanzania*. Geneva: RAMSAR.
- RCMRD, R. C. (2017). Space Science Touches Lives- Science and Policy. *Science and Policy*. Nairobi: RCMRD.
- REMA. (2017). *State of Environment and Outlook Report: Rwanda Environment Management*. Kigali: REMA.
- Rwanda, N. I. (2014). *National Agriculture survey*. Kigali: NISR.
- Scott, R. (2001). *Institutions and organizations*. Thousand Oaks: Sage Publication.
- Shivakumar. (2005). *The constitution of development: Crafting Capabilities for self- governance*. New York: Palgrave Macmillan.
- Tanzania Goverment. (2012). *Southern Agricultural growth Corridor of Tanzania: Strategic Regional Environmental and Social Assessment*. Dar es Salaam : Tanzania Government .
- UN WFP. (2016). *Kenya Policy landscape and its relavance to National Action Plan Implementation*. Nairobi: World Food Program.
- WB, W. b. (2017). *Global Development Report on Governance and Law*. Washington: World bank Group.
- Wold Bank. (2015). *Land Governance in East Africa*. Washington DC: World Bank.
- Wostl, C. P. (2009). A conceptual framework for analyzing adptativa capacity and multi-level learning processes in resource Governance regimes. *Global Environmental change* , 354-365.



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Kilombero Wetlands- with uplands views



Nyabugogo wetlands views





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