



**SOUTHERN PROVINCE**

**MUHANGA DISTRICT**

Tél/Fax : 562505

E-mail:[info@muhanga.gov.rw](mailto:info@muhanga.gov.rw)

Website: [www.muhanga.gov.rw](http://www.muhanga.gov.rw)

**Re:** Greening Muhanga District Development Plan (DDP)

DISTRICT:	Muhanga District
PROVINCE:	Southern Province
CLIENT:	Ministry of Local Government (MNALOC)
CONSULTANTS:	Adorin Amngaihnem & Ildephonse Niyonsenge
APPROVED DOCUMENTS DESCRIPTION:	1. MUHANGA DISTRICT NARRATIVE REPORT 2. MUHANGA DISTRICT LODA TEMPLATE FROR GREENING DDP (ANNEX)
VERSION:	FINAL
SUBMISSION DATE:	27th March 2015

We acknowledge final modification and updating of MUHANGA DISTRICT Narrative report and MUHANGA DISTRICT LODA template.

We approve both the document i.e MUHANGA DISTRICT Narrative Report and MUHANGA DISTRICT LODA Template for greening DDP.

Thank you for your usual collaboration.

SIGNATURE & STAMPED:	DATE:
NAME:	MUTAKWASUKU Yvonne
TITLE/DESIGNATION:	MAYOR OF MUHANGA DISTRICT
DISTRICT:	MUHANGA

# MINALOC Project to support the Greening of District Development Plans

---

*Data Collection Summary report: Muhanga District*

*Consultants: Adorin Amngaihnam & Ildephonse Niyonsenge*

*Signed:*

*Date:*

## Table of Contents

<b>Abbreviations and Acronyms .....</b>	<b>4</b>
<b>1. Introduction.....</b>	<b>5</b>
<b>2. Background.....</b>	<b>5</b>
<b>3. Scope of Work.....</b>	<b>8</b>
<b>4. Methodology .....</b>	<b>8</b>
<b>5. Summary of Actions and Recommendations .....</b>	<b>10</b>
<b>6. Conclusion.....</b>	<b>22</b>
<b>7. References .....</b>	<b>23</b>
<b>8. Annexes.....</b>	<b>24</b>
Muhanga District Checklist Template .....	24
Contacts: .....	25

## Abbreviations and Acronyms

DDP	District Development Plan
DRC	Democratic Republic of Congo
EARP	Energy Access Rollout Program
EDPRS 2	Economic Development and Poverty Reduction Strategy 2
EIA	Environmental Impact Assessment
EU	European Union
FONERWA	Rwanda Climate and Environment Fund
GGCRS	Green Growth and Climate Resilience Strategy
IDP	Integrated Development Planning
JADF	Joint Action Development Fund
LODA	Local Administrative Agencies Development Agency
MINALOC	Ministry of Local Government
MINEDUC	Ministry of Education
MIDIMAR	Ministry of Disaster Management and Refugees
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
MINISANTE	Ministry of Health
PPP	Public Private Partnership
RDB	Rwanda Development Board
REG	Rwanda Energy Group
REMA	Rwanda Environment Management Authority
RHA	Rwanda Housing Authority
RNRA	Rwanda Natural Resources Authority
SACCO	Savings and Credit Cooperative

## 1. Introduction

The Rwandan Ministry of Local Government (MINALOC) has commissioned a team of consultants to undertake a project to support the “greening” of District Development Plans (DDPs).

This report summarises the first stage of the assignment. Which was to review existing District Development Plans and to recommend where additional consideration of Climate Change and Environmental Management is needed?

The consultants visited eight districts of the Southern Province and each District were inputting the baseline and targets into the excel file of LODA template (as annexes) and a Narrative Report present here includes the key intervention areas. This narrative report identifies the key priority areas of interventions for Revising & Greening Muhanga District Development Plan.

This summary gathers together the recommendations that may require district level intervention.

## 2. Background

Climate change is a global issue that is predicted to affect Rwanda adversely and this will happen over a long period.

*It is likely to result in the increased severity and frequency of extreme weather events, increased droughts, increased floods and associated landslides. The seasons are also likely to be affected, rainfall patterns are likely to change even though average rainfall may remain the same.*

*Climate Change is a long-term problem that may not seem too serious now, but it is likely to cause a lot more problems in the future. Climate Change has implications for the majority of sectors and therefore it is important to consider the long-term implications of a changing climate on investment in hard and soft infrastructure.*

The UK DFID Economics of Climate Change Study (Watkiss et al 2009) undertook an analysis of the potential threats and opportunities of climate change in Rwanda. The findings from this – updated with other material – is summarised below.

The future impacts and future economic costs of climate change are very uncertain. However, aggregate models indicate that the additional net economic costs (on top of existing climate variability) could be equivalent to a loss of almost 1% of GDP each year<sup>1</sup> by 2030 in Rwanda, noting this excludes the future effects of floods and other extremes.

---

<sup>1</sup> Central net values (sum of positive and negative) for market and non-market effects. The results exclude future extremes and do not capture a large range of potential effects including all ecosystem services.

In terms of key sector effects:

- There are potentially large increases in the health burden of malaria in Rwanda. This arises because a large part of the rural population lives at higher elevations, where the disease is currently restricted by temperature. A new malaria risk model, based on altitude, found that climate change could increase the rural population at risk for malaria by 150% by the 2050s. There are also other vector borne human and livestock disease which are climate sensitive (e.g. tick borne disease). Changes in water borne disease, especially linked to extremes, are also highlighted.
- The impacts of climate change on agriculture in Rwanda are uncertain. Under some futures and with certain models, there are potentially important impacts on agriculture, but under other scenarios, there are modest effects or even benefits. However, the literature is primarily based on crop models, and thus does not take account of extreme events fully, or the effects of changing prevalence and range of pests and diseases (though they also do not take account of farm level adaptation or agricultural development). The green growth strategy cites Liu et al (2008) which projects that Rwanda could be a hotspot for food security, but this finding should be interpreted with caution, i.e. compared to other East African countries, the effects on the sector in Rwanda are likely to be more modest.
- There are potential impacts to some of the major agricultural crop exports (coffee and tea) as these are both temperature sensitive crops. The areas currently suitable for tea and coffee are likely to shift with climate change. This implies reducing productivity/quality or else shifting production to higher elevations (though there are obvious issues around land and soil suitability from doing this). Sugar cane is also a major export crop (by land area), and has some potential vulnerability through water demand.
- There are cross-sectoral impacts from the changes in extreme events. As highlighted in the climate section, there are indications of increased heavy precipitation for the region (e.g. which could increase the intensity of 1 in 10 year events by 10 to 50%), which would translate into increased flood, landslips and soil erosion risks. They would also mean a reduction in the return period of larger events, i.e. more significant floods would occur more frequently. Vulnerability is likely to be heavily affected by socio-economic trends, notably the high population increases. The analysis of future drought risks are highly uncertain, and many models project relative decreases in event frequency/severity with climate change,

though the risk of more negative changes, especially from changes to ENSO cycles, is potentially possible.

- There are risks to electricity supply, given the relatively high level of hydro generation in the future Rwandan electricity mix. This might primarily arise from increased flows (rather than droughts or low flows, though under some futures these could arise as well). Higher temperatures will also affect energy demand, though Rwanda's climate is temperate, and combined with low per capita income levels, the increased demand for cooling is likely to be modest.
- There are potentially large impacts on biodiversity and ecosystem services. Rwanda has exceptional biodiversity and ecosystem services are integral to the Rwandan economy, underpinning over 50% of GDP, as well as sustaining a very large proportion of the population. There are many stresses on these systems already and climate change will add to these pressures.
- Climate change is likely to have cross-sectoral effects on water. These could be to availability of supply (precipitation), water catchment and flow management (ecosystems) or demand (higher temperatures). These changes could be important, but are likely to be modest (in the immediate future) when compared to short-term socio-economic pressures and trends, e.g. rising water demand, population and socio-economic growth, land-use change.

EDPRS 2 (Republic of Rwanda, 2013) states that:

Climate change and the environment are cross cutting issues. With all key sectors expected to deliver including agriculture, energy, environment and natural resources, infrastructure, health, private sector and financial sector.

Therefore even at a district level each of these sectors needs to consider these issues in current and future development planning. Furthermore this project should engage districts and commit them to addressing three points as outlined in EDPRS 2:

- (i) mainstreaming environmental sustainability into productive and social sectors;
- (ii) reducing vulnerability to climate change and
- (iii) preventing and controlling pollution

The threats and impacts of climate change and environmental issues have the potential to affect all sectors in Rwanda. However, currently climate change and environmental issues are not given sufficient consideration in DDPs and performance contracts (imihigo). However these issues are included in national

level strategies, namely the Green Growth and Climate Resilience Strategy (GGCRS) (Republic of Rwanda, 2011) and the Economic Development and Poverty Reduction Strategy 2 (EDPRS 2).

Rwanda aims to develop sustainably; meaning that: Development for the needs of today should not forget the needs of tomorrow. A key component of sustainability is Environmental Management. This is seen by some a barrier to development because it imposes extra costs on society or the private sector. However, by protecting the environment we can help maintain a health society, improve resilience and reduce costs in the long-term.

Therefore this exercise to mainstream the GGCRS into DDPs and Performance Contracts means that the current predictions need to be taken into account alongside the requirements of current national strategies.

### **3. Scope of Work**

The key deliverables of the assignment as specified in the Terms of Reference are:

Each group of consultants are supposed to come up with a report indicating the results on the review of DDPs in line with climate resilience issues, strategies to address the identified loopholes and the implementation approach. The report will lead to the following:

- 30 District Development Plans (DDPs) integrating the Green Growth Climate resilience strategy;
- 30 District Performance Contracts (Imihigo) and Annual Action Plans integrating the Green Growth Climate resilience strategy;
- 30 Districts supported in designing fundable projects in order to implement the Green Growth Climate resilience strategy in their DDPs; in line with climate issues to be identified in the DDPs review;
- At least 30 project proposals arising out of greened DDPs that attract funding;
- 180 District staff (six per district) trained in the Green Growth strategy, development of project proposals and implementation;
- MINALOC technical team conversant with technical skills in the Green Growth strategy and development of project proposals and implementation.

This report provides details of the first stage of this process.

### **4. Methodology**

Due to the limited timescale involved in the project a standardised approach for each district was taken. This involved completing a standardised template

checklist (Annex 1) that was prepared and validated by all consultants and MINALOC at an orientation workshop in Musanze (19<sup>th</sup> to 21<sup>st</sup> Jan 2015).

The consultants visited Muhanga district for two days (17<sup>th</sup> and 18<sup>th</sup> of February 2015) to collect baseline data and to review the current documents. The consultants were also joined by Ernest (under contract from the Climate and Development Knowledge Network - CDKN) who was tasked with determining the districts level of understanding in environmental issues. Further to the document review district staffs were consulted.

The short timescale of the interviews and the unavailability of staff meant that it was not always possible to determine if districts had in place a strategy that accounts for the environment and climate change when achieving their targets in each sector.

**Table 1. Attendance**

Sl. No	Name of District Staff	Department	Phone Number	emails
1	Mpagaritswenimana Vedaste	Agronomist/ Environment Officer	0788777570	<a href="mailto:mpavedaste@gmail.com">mpavedaste@gmail.com</a>
2	Gustave Mugabo	Road Development & Maintenance Engineer	0788665531	<a href="mailto:mugalbogust@yahoo.com">mugalbogust@yahoo.com</a>
3	Yirirwahandi Ildephonse	Network & System Admin	0788634903	<a href="mailto:ildeyiri@yahoo.fr">ildeyiri@yahoo.fr</a>
4	Onesphore Nzabomimpa	Infrastructure property Management	0788442729	<a href="mailto:nzabonimpao@yahoo.fr">nzabonimpao@yahoo.fr</a>
5	Jean Bosco Harerimana	Cooperative and Business Promotion	0783264641	<a href="mailto:harelimanajb@yahoo.fr">harelimanajb@yahoo.fr</a>
6	Innocent Gashugi	In charge of Youth, Sport and Culture	0788515245	<a href="mailto:gashugi8@gmail.com">gashugi8@gmail.com</a>
7	Valerie Hakizimana	Secondary and Technical Education	0788488347	<a href="mailto:valerien082@gmail.com">valerien082@gmail.com</a>
8	Jean Damascene Karamage	Good Governance Officer	0788446131	<a href="mailto:kajedamas@yahoo.fr">kajedamas@yahoo.fr</a>
9	Emilien Ntagwabira	Primary Education, Nursery and Adult Literacy	0788878651	<a href="mailto:entagwabira@gmail.com">entagwabira@gmail.com</a>
10	Sostene Umutoniwase Kamana	Health Promotion and Disease Prevention	0788434208	<a href="mailto:umusoskamana@yahoo.fr">umusoskamana@yahoo.fr</a>
11	Gad Munyезamu	Livestock	0783697440	<a href="mailto:gamunyezamu@gmail.com">gamunyezamu@gmail.com</a>
12	Beata Uwamahoro	Gender and Family Promotion	0788479726	<a href="mailto:uwamahorobeata@yahoo.com">uwamahorobeata@yahoo.com</a>
13	Jerome Muberwa	District Disaster Management Officer	0788443663	<a href="mailto:ibigangu@yahoo.com">ibigangu@yahoo.com</a>
14	Anne Marie Nyirasafari	District Disability Officer	0785451803	
15	Eric Bizimana	Director of Planning	0788858152	<a href="mailto:bizimeric80@gmail.com">bizimeric80@gmail.com</a> ;

Sl. No	Name of District Staff	Department	Phone Number	emails
				<a href="mailto:bizeric2000@yahoo.fr">bizeric2000@yahoo.fr</a>

### Staff consultation:

The Muhanga town was one of the 8 districts of Southern province with 100% attendance of district staff, well conversant with English and the staffs were very pro-active.

Documents reviewed during this exercise comprised:

- District Development Plan 2013-2018, Muhanga District, Southern Province – May 2013
- Performance Contract (Imihigo), Muhanga District, Southern Province – February 2015

The interview started with an introduction of the MINALOC project to Green DDPs and the purpose of our visit to the district. This was followed by some questions that have been designed to understand what training needs the district staff have in relation to climate change and environmental issues. After this brief exercise we moved onto populating the Checklist Template. In conjunction with document review this exercise provided details of targets and progress within the district and problems the district is facing.

Though there was 100% attendance of district staff, the information collected has some missing gaps which may be completed during validation stage. The collection of accurate data on baselines and targets is essential to this project because it helps to understand what environmental management and climate change resilience measures already exist in the district i.e. terracing, agroforestry and biogas. Furthermore, to prove that a project it is *additional* it is important to know the available (MINECOFIN) budgets (any future proposal (to FONERWA) should be *additional* to existing funds and programs). As such the unavailability of staff was problematic.

## 5. Summary of Actions and Recommendations

It is beneficial to provide some narrative explanation of the data and other findings from this exercise. This starts with the key findings from the templates and finalising the key priority areas which needs specific interventions in the district. Furthermore, the actions proposed for environment and climate change for key priority sectors are listed in the next page.

Even though districts have their own specific issues, it should be noted that a lot of issues and interventions are common to several districts. However, where applicable specific issues have been given further consideration.

Where a sector representative was not available in a district the common recommendations found across several districts have been used.

**Table 2: Key Priority Areas**

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
Agriculture	Cropland: Terracing (Radical Terracing & Progressive Terracing)	<ul style="list-style-type: none"> <li>▪ High mountain with steep slope area of Ndiza zone: Nyabinoni, Mushishiro, Rongi, Kabacuzi, Kibangu, Kiyumba Sectors (beyond 2000 m) are severally affected by land degradation &amp; soil erosion               <ul style="list-style-type: none"> <li>○ Reduction of productive land capacity</li> <li>○ Loss of plant &amp; biodiversity</li> <li>○ Damage waterways eg. sedimentation and changes in the quantity, quality &amp; timing of water flow</li> <li>○ Splash erosion associated heavy rainfalls</li> </ul> </li> <li>▪ Most of the HHs cultivate on less than 0.3 ha (41.8%) and between 0.3-0.9 ha (40.8%)               <ul style="list-style-type: none"> <li>○ Lack of big land for agriculture leads to over exploitation of small land using traditional</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Lead Institutions – MINAGRI</li> <li>▪ Relevant District Department               <ul style="list-style-type: none"> <li>○ Agriculture</li> <li>○ Water</li> <li>○ Forestry</li> <li>○ Environment &amp; Natural Resources</li> <li>○ Energy</li> <li>○ Mining</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Joint planning for erosion control               <ul style="list-style-type: none"> <li>○ Forming a committee to prioritise erosion control for multiple benefits, i.e. in areas of high risk where infrastructure can also be protected.</li> <li>○ Land consolidation and crop selection should take into account erosion risk and measures such as strip farming should be used where required.</li> </ul> </li> <li>▪ Cultivation on steep and fragile slopes greater than 40° should be restricted to perennial crops (coffee, other suitable crops) that provide permanent vegetation cover. Given the difficulties in implementing such measures, priority should be given to prohibiting tillage cultivation on slopes greater than 55°</li> </ul> <p><i>(Source: UNEP Report for Rwanda: 'Environmentally Sustainable Development')</i></p>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
		techniques, consequently low production and productivity		<ul style="list-style-type: none"> <li>▪ Changing pattern of landuse: eg by relocating cropland or pastures on lower slopes and reforesting on the steep slopes</li> <li>▪ Erosion control measures: Vegetative barriers (such as grassy strips, hedgerows with pruned trees or shrubs) planted on the contour</li> <li>▪ Crop rotation for increasing soil fertility</li> </ul>
	Marshland Development	<ul style="list-style-type: none"> <li>▪ Sectors of Cyeza, Shyogwe, Nyamabuye and a part of Muhanga sector has large areas of marshlands that are a potential for growing varieties of water tolerant crops</li> <li>▪ Availability of low or non-exploited marshlands which are suitable for rice and other vegetables</li> </ul>		<ul style="list-style-type: none"> <li>▪ EIA to be enforced wherever applicable</li> <li>▪ Increasing the area of arable marshlands</li> <li>▪ Creating cooperatives for marshlands exploitation : Increasing yield of rice and other vegetables - using organic manure</li> <li>▪ Protection &amp; Conservation of Marshland: 10% - No development Zone</li> </ul>
	Agro- Processing/ Industrial Development for Value Addition	<ul style="list-style-type: none"> <li>▪ Low capacity of farmers for post-harvest storage</li> <li>▪ Limited Processing leads to wastage of production</li> </ul>		<ul style="list-style-type: none"> <li>▪ <b>Urban Area:</b> Muhanga District industrial park [Feasibility &amp; Industrial park Master plan &amp; EIA conducted &amp; approved - is under</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
		<ul style="list-style-type: none"> <li>▪ Increasing SMEs in urban area - without proper integrated planning will lead to low production and also increasing pollution (water pollution, air pollution, improper waste management)</li> </ul>		<p>construction] will host SMEs that utilise raw material sources –</p> <ul style="list-style-type: none"> <li>○ Ensure Green technology development to be adopted : Green Industry will thereby the sector-strategy for the realization of Green Economy and Green Growth in the industry sector</li> <li>▪ <b>Rural Area:</b> Develop a small unit decentralized [community level or co-operative level] village-based agricultural processing centres (agro-processing for sweet potatoes, mushrooms, honey, pork) that incorporate low-carbon sources of energy, such as biogas-digesters and solar driers-Increase livelihood and reduce poverty</li> <li>▪ Develop niche export crops under organic and fair-trade branding.</li> </ul>
Urbanisation	Urban Landuse Master Plan	Inexistence of detailed town master plan: Muhanga Detailed Master Plan has been developed, but under approval from cabinet <i>[In a hurry to developed the Master</i>	<ul style="list-style-type: none"> <li>▪ Lead Institutions MININFRA</li> <li>▪ Relevant District Department <ul style="list-style-type: none"> <li>○ Urbanization &amp;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Detailed Urban master plan of the City to be approved and implemented: Adopt Sustainable Landuse management</li> <li>▪ Strictly enforce Planning</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
		<p><i>Plan - there is lack of quality: no room for improvement and absence of consultation with different professionals, local stakeholders at each sector- Source District Staff]</i></p> <ul style="list-style-type: none"> <li>▪ Unplanned planning</li> <li>▪ Uncontrolled Development</li> <li>▪ Urban Infrastructure at risk</li> <li>▪ Increase in informal/ slum settlement</li> </ul>	<p>Settlement</p> <ul style="list-style-type: none"> <li>○ Private Sector Development</li> <li>○ Water</li> <li>○ Sanitation</li> <li>○ Transport</li> <li>○ Environment &amp; Natural Resource</li> </ul>	<p>Regulations</p> <ul style="list-style-type: none"> <li>▪ Creates more urban green belts/ green corridors along roads, round-about, lakes, parks</li> </ul>
	Urban Settlement	<p>Muhanga Town is located in central plateau with surrounding hilly areas and sits atop a series of ridges, with floodplains beneath.</p> <ul style="list-style-type: none"> <li>▪ Increasing urban sprawl</li> <li>▪ Increase in informal/ slum settlement</li> <li>▪ Uncontrolled construction without compliance with law</li> </ul>		<ul style="list-style-type: none"> <li>▪ Principles of compact city need to be applied more strictly</li> <li>▪ Vertical growth density to be adopted</li> <li>▪ Strictly enforce Planning Byelaws/ Regulations</li> <li>▪ Use of Energy efficient building materials – suits the best with local climate</li> </ul>
	Rural Settlements	<ul style="list-style-type: none"> <li>▪ Majority of population in Muhanga District live in rural area with 76.7% living in isolated rural housing - houses are built on slopes at high risk zones</li> <li>▪ High slope of terrain - The</li> </ul>		<ul style="list-style-type: none"> <li>▪ "IDP Model" initiative should be implemented in all sectors</li> <li>▪ Relocation of houses from high risk zones</li> <li>▪ Provide easy access to all</li> <li>▪ Promote renewable energy technologies for cooking and</li> </ul>

Sector	DDP Output	Environmental Problem/Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
		<p>rural mountains area of Ndiza (Kiyumba, Kibangu, Rongi, Nyabinoni sectors) and mountains around Nyabarongo river (Mushishiro, Nyarusange, Muhanga sectors), hampers access to adequate infrastructures development.</p> <ul style="list-style-type: none"> <li>○ High rate of rural-urban migration</li> <li>○ Risk in communication system during disaster</li> <li>○ Limited access to water, energy &amp; Transport</li> </ul>		<p>lighting in the imidugudu sites</p> <ul style="list-style-type: none"> <li>▪ Efficient use of water &amp; promote Rainwater harvesting in HHs</li> </ul>
Infrastructure	Urban Waste Management	<p>Waste management is currently very limited</p> <ul style="list-style-type: none"> <li>▪ Waste are generally collected and disposed of without any existing landfill operating in an environmentally sensitive manner</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lead Institutions MININFRA</li> <li>▪ Relevant District Department <ul style="list-style-type: none"> <li>○ Urbanization &amp; Settlement</li> <li>○ Private Sector Development</li> <li>○ Water</li> <li>○ Sanitation</li> <li>○ Transport</li> <li>○ Environment &amp; Natural</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Proposed Landfill - EIA to be conducted &amp; implemented</li> <li>▪ New landfill undergoing feasibility study &amp; is plan to be constructed in the medium term future - to follow technical requirements, like separation of the waste stream to utilize higher value reusable, recyclable and compostable materials: Recycles urban waste as a productive resource</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
	Sanitation	<ul style="list-style-type: none"> <li>▪ Some buildings have septic tanks and most urban households count with pit latrines</li> <li>▪ Gradual deterioration of the environment due to improper sanitation in rural areas</li> </ul>	Resource	<ul style="list-style-type: none"> <li>▪ District Sanitation Master Plans as part of the Urban Development Master Plans under development by REMA to overcome the challenges of sanitation - Adopt &amp; implement</li> <li>▪ Plan for Centralized Sewerage System/ collective system in New Planned Settlement/ New Housing Apartments in Urban Area</li> <li>▪ Hotels (existing &amp; proposed) to have their own centralized wastewater/ sewerage treatment system</li> </ul>
	Energy	<p>16% of HH have access to electricity: Limited access to electricity supply for lighting</p> <ul style="list-style-type: none"> <li>▪ 86% of households used Wood as source of energy – Health impact, increase pollution</li> <li>▪ High consumption of biomass : destructive to the environment</li> </ul>		<p>Improved Energy Efficiency – Lighting and Cooking</p> <p><b>Rural Area</b></p> <ul style="list-style-type: none"> <li>▪ A small number of households can share access to energy from biogas</li> <li>▪ Better cooking technologies like cook stoves will reduce rural impact on urban expansion due to increased cooking fuel demand</li> <li>▪ Enterprise support to mainstreaming of existing energy efficient technologies such as cook</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
				<p>stove which will limit impact of higher urban population</p> <p><b>Urban Area</b></p> <ul style="list-style-type: none"> <li>▪ Promote LED lighting for HHs &amp; Street lighting</li> <li>▪ Promote Solar Energy for street lighting, public lightings, hotels for water heating</li> </ul>
	Transport	<ul style="list-style-type: none"> <li>▪ Increasing Road development – EIA not enforce</li> <li>▪ Fairly number of People travel to &amp; fro Kigali or other Southern province districts &amp; few Western Province Districts from Muhanga [Transporting goods and the workforce], and the more they rely on their transport &amp; more people travel, the more congested the roads become with increasing the levels of traffic fumes and also increasing risks taken on the road. <ul style="list-style-type: none"> <li>○ exacerbate health issues and worsen environmental degradation and the impact of climate change</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>▪ EIA to be enforce &amp; monitor EMP</li> <li>▪ Limit initial investment in creating paved feeder roads. This approach will allow flexibility in roll-out of other infrastructure, as well as associated enterprise development &amp; environment protection is of priority.</li> <li>▪ Promote Efficient Public Transport</li> <li>▪ Tree Plantation along all existing &amp; proposed roads and Re-planting of trees cut during road construction</li> <li>▪ Urban planning spatial strategies to ensure a compact and efficient layout which will balance transport mobility and accessibility</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
				<ul style="list-style-type: none"> <li>○ Well planned accessible street layout provides convenience for local citizens in reaching social and economic opportunities</li> <li>○ Increase pedestrian walkway</li> <li>○ promote use of non-motorized transport (principally bicycles)</li> </ul>
<b>Environment &amp; Natural Resources</b>	Rivers/ wetlands	<ul style="list-style-type: none"> <li>▪ Flooding in the Nyabarongo valley due to poor water harvesting in the Nyabarongo watershed</li> <li>▪ Water pollution from surrounding mining &amp; Quarries</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lead Institutions – MINERENA - REMA</li> <li>▪ Relevant District Department <ul style="list-style-type: none"> <li>○ Environment &amp; Natural Resources</li> <li>○ Agriculture</li> <li>○ Water</li> <li>○ Forestry</li> <li>○ Energy</li> <li>○ Mining</li> <li>○ Private Sector Development/ Cooperatives</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ EIA enforce for any new development</li> <li>▪ Monitoring Pollution</li> <li>▪ Integrated water resource management of Nyaborongo Valley</li> <li>▪ Water Harvesting techniques to be implemented</li> <li>▪ Protection of shoreline &amp; riverbanks of Nyabarongo valley tributaries Muhanga, Ururumanza, Sagarara, Kiryango, Base, Akabebya, Mukunguri rivers <ul style="list-style-type: none"> <li>○ Buffer zone (5 mts) with Bamboos Plants and "French Cameroon" along the river banks</li> </ul> </li> </ul>

Sector	DDP Output	Environmental Threats	Problem/forest	District Responsible Departments	Environment and Climate Change Actions Proposed
	Forest	<ul style="list-style-type: none"> <li>▪ DFMP - 2009               <ul style="list-style-type: none"> <li>○ Excessive exploitation of forest resource</li> <li>○ Abundance of old forest to be harvested and replaced</li> <li>○ Risk of Forest fires</li> </ul> </li> <li>▪ The district Natural plants or ecosystems have disappeared, leaving room for crops and artificial forests</li> <li>▪ Degradation of environment caused by erosion, deforestation and human occupation in high risk zones</li> </ul>			<ul style="list-style-type: none"> <li>▪ Revising/ updating DFMP</li> <li>▪ Afforestation &amp; reforestation with Native plants as per DDP targets               <ul style="list-style-type: none"> <li>○ Degraded forest ecosystems will be rehabilitated through afforestation and re-forestation and forestry resources sustainably managed</li> </ul> </li> <li>▪ Protection and conservation of Busaga natural forest</li> </ul>
	Mining	<ul style="list-style-type: none"> <li>▪ Unsustainable exploitation of minerals and quarries in Cyeza, Kabacuzi, Kibangu, Kiyumba, Muhanga, Mushishiro, Nyamabuye, Nyarusange, Nyabinoni, Rongi, and Rugendabari sectors - associated with High</li> </ul>			<ul style="list-style-type: none"> <li>▪ EIA to be enforce and EMP to be monitored</li> <li>▪ Compliance with environment conservation standards by the mining companies will be promoted - building a clean environment in mining areas.</li> <li>▪ Mining related activities will</li> </ul>

Sector	DDP Output	Environmental Problem/ Threats	District Responsible Departments	Environment and Climate Change Actions Proposed
		<p>international demand for Coltan and Cassiterite</p> <ul style="list-style-type: none"> <li>▪ Few Mining without EIA and absence rehabilitation policy</li> <li>▪ Illegal Mining <ul style="list-style-type: none"> <li>▪ Water pollution</li> <li>▪ Increase sedimentation in surrounding area</li> </ul> </li> </ul>		<p>ensure sustainable exploitation of minerals and quarries. Mining sites will have efficient water and waste management system. A couple of activities will be implemented with the fundamental nature of protecting the environment. Sound waste management techniques (recycling) will be promoted to improve environmental health.</p> <ul style="list-style-type: none"> <li>▪ Under Construction and operationalization of Agakiriro Centre (handcraft, and exploitation of quarries) and developing processing mining products industry especially in area not suitable for agriculture – Green Technology to be adopted [EDPRS II Priority for Muhanga District]</li> <li>▪ Monitoring of Illegal Mining</li> </ul>

## 6. Conclusion

The work so far has shown that the district is already implementing actions that are contributing to Green Growth and Climate Resilience. However, the investments being made are not necessarily targeted to be as effective as possible in achieving those goals.

Several recommendations for improved management of risks have been made along with some of the strategies required. Within the short period allowed it has not been possible to examine all the possible risks and solutions. However, a good foundation can be put in place if the recommendations are followed.

The district has already been working on greening the DDP with the Climate and Development Knowledge Network (CDKN). As such the district has a better understanding than most of what this exercise is trying to achieve.

The approach that CDKN took allowed for more detailed research into specific areas that are critical to the district. The research conducted in the two days of this contract has not penetrated to the same depth as CDKN's work. Both methods have positive aspects, but it would be advantageous to have more time to discuss certain issues with the district.

However, using CDKN's information we can build on recommendations produced by the MINALOC project. It is also possible in some areas to build on CDKN's recommendations.

Availability and technical ability of district staff are probably the greatest challenges to the success of the project.

Capacity building will form a large part of the project with the district ultimately having to take ownership of planning for and managing its own environmental problems. Through improved capacity, knowledge, joint planning and information sharing the district can start to identify its own problems more effectively and can develop its own interventions, be they policies or projects. With the right personnel leading implementation an understanding of environmental management and a flexible approach to solutions the district can own the process and work towards sustainable green growth.

## 7. References

- *CDKN - Climate and Development Knowledge Network (2015). Kigali*
- *Economic Development and Poverty Reduction Strategy (EDPRS II): 2013–2018 - Rwanda*
- *Muhanga District (2013). District Development Plan 2013-2018.*
- *Muhanga District (2014) Performance Contract (Imihigo).*
- *Republic of Rwanda (2011). Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development. Kigali*
- *Republic of Rwanda (2013). Economic Development and Poverty Reduction Strategy 2013-2018. Kigali*
- *Watkiss et al (2009). The Economics of Climate Change in Rwanda. Final Report to DFID and DANIDA. Stockholm Environment Institute, Oxford.*
- *Summary Report Rwanda : From Post-Conflict to Environmentally Sustainable Development (2009-2010) – UNEP Report*
- *Agriculture Sector Working Paper – REMA (2011)*
- *Guidelines for Mainstreaming Climate Change Adaptation and Mitigation in the Agricultural Sector in Rwanda – REMA (2011)*
- *Guidelines to Mainstream Climate Change Adaptation and Mitigation in the Energy and Infrastructure Sector in Rwanda – REMA (2011)*
- *Guidelines to Mainstream Climate Change Adaptation and Mitigation in the Health Sector in Rwanda – REMA (2011)*
- *Muhanga District Economic Potentialities – LODA (2013)*

## **8. Annexes**

### **Muhanga District Checklist Template**

## **Contacts:**

### **Adorin Amngaihnem**

International Consultant  
Rwanda: +250 783942354  
India: +91 9911000575  
[adorin.gwite@gmail.com](mailto:adorin.gwite@gmail.com)

&

### **Ildephonse Niyonsenga**

National Consultant  
Rwanda: +250 788520373  
[imanzi2008@gmail.com](mailto:imanzi2008@gmail.com)