

(Annex2-7)

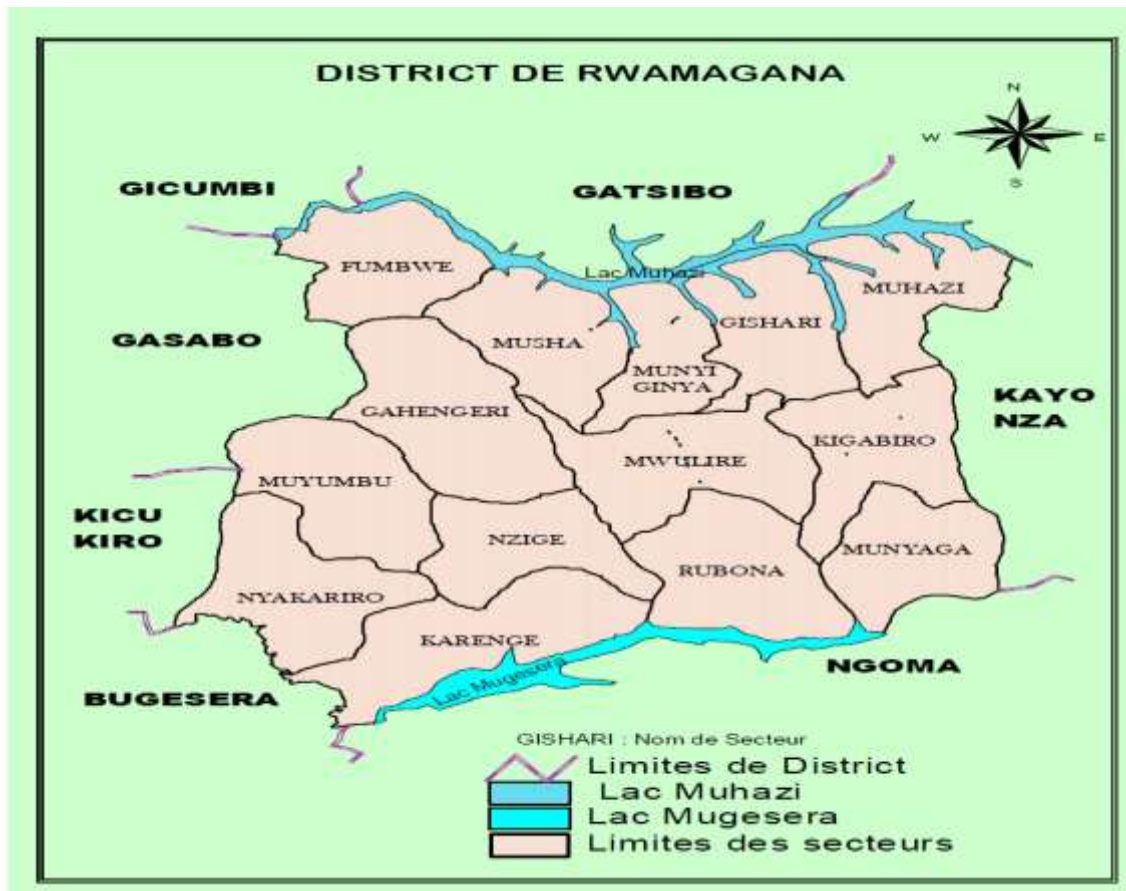
7. The Marshlands in Rwamagana

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1. The Outline of the Rwamagana District



(1) District demographic features

Rwamagana District was founded in 2006 as one of the seven Districts that constitute Eastern province (EDPRS self assessment district report). It was formed after joining together the former Districts of Muhazi, Bicumbi, two sectors of former Gasabo District (Fumbwe and Mununu) three sectors of former Kabarondo District (Kaduha, Rweru and Nkungu) and Rwamagana municipality. Rwamagana District forms part of Akagera River Basin and touches Lake Mugesera in the South and Lake Muhazi in the North. It is separated by the Districts of Kicukiro and Bugesera by River Nyabarongo

It is composed of 14 Sectors, 82 cells and 474 villages (Imidugudu) with a population of 310,238 (Provisional population and survey results 2012) on a surface area of 691.6 km². Rwamagana district is bordered by Ngoma and Bugesera Districts in the south, Gatsibo and Gicumbi District in the North, Kayonza District in the East, Gasabo and Kicukiro Districts in the West. NISR Provisional Population and Housing Census 2012 results reveal that Rwamagana

district population is currently 310,238 people. The table below shows the population in Rwamagana district by sector and sex, the average annual growth rate and the population density by administrative sector and the district

Table 1: Population specifics for Rwamagana District

Sector	2002 Total population	2012 population			Sex Ratio	Population change (2002-2012) (%)	Average annual growth rate (%)
		Male	Female	Total			
FUMBWE	13,752	10,541	11,233	21,774	94	58.3	4.7
GAHENGARI	14,891	11,500	12,175	23,675	94	59.0	4.7
GISHARI	15,017	11,100	11,975	23,075	93	53.7	4.4
KARENGE	18,443	11,127	11,720	22,847	95	23.9	2.2
KIGABIRO	23,906	16,238	16,671	32,909	97	37.7	3.2
MUHAZI	25,766	11,500	13,033	24,533	88	-4.8	-0.5
MUNYAGA	11,079	7,594	8,858	16,452	86	48.5	4.0
MUNYIGINYA	11,072	8,088	9,036	17,124	90	54.7	4.5
MUSHA	13,802	10,203	11,088	21,291	92	54.3	4.4
MUYUMBU	15,763	11,664	12,128	23,792	96	50.9	4.2
MWULIRE	13,091	10,848	11,846	22,694	92	73.4	5.7
NYAKARIRO	15,568	9,861	10,492	20,353	94	30.7	2.7
NZIGE	12,475	7,478	8,049	15,527	93	24.5	2.2
RUBONA	15,877	11,472	12,720	24,192	90	52.4	4.3
RWAMAGANA	220,502	149,214	161,024	310,238	93	40.7	3.5

Source: NISR Provisional Population and Housing Census 2012 results.

(2) Geographical Features

a) Topographical Make up

The District of Rwamagana is characterized, in general, by lowly undulating hills separated by valleys some of which are swampy and boggy. This kind of

topographical layout constitutes an important potentiality for modern irrigation system and mechanized agriculture.

b) Climate

The District of Rwamagana is situated between 1°57'2, 7" of south latitude and 30°26'8" of longitude, it experiences a moderate tropical climate with four seasons of which: two are cold and the rest dry (EDPRS self assessment district report). It experiences relatively large quantities of rains especially in the Months of April-May and October-December of every year. The average temperature ranges between 19° and 30° and it's constant all over the year.

c) Soils

Rwamagana district has very fertile soils almost in all its sectors. Most of the soils are loamy and few others are sandy with loam mixture. In some boggy areas, clay soil may be found. The soils permit growth of most types of foods such as: bananas, maize, cassava, beans, coffee, Pineapples and rice to mention but a few.

(3) Economic situation

The District is mainly characterized by business related activities in some parts of Rwamagana town and ten rural trading centers. Agriculture and live stock is the principal economic activity that employs over 80% of the population in rural areas of whom, at least 85% use traditional agriculture practices. The major crops of the district include bananas, rice, maize, pineapple and coffee. The District is rich in Minerals (Cassitérite, Colombo tantalite and Wolfram) especially in parts of the sectors of Musha, Mwulire and Gahengeri which is exploited by mining companies. The district has a big network of roads that connect it to other districts and also to agriculture production area but most of them are in bad condition. Only 102km of feeder road is in good condition. It has 2 km of tarmac road in Rwamagana town that facilitate transport and communication within the town. Regarding water transport, there are 5 small motor boats that provide navigation transport in lakes Muhazi and Mugesera.

2. Rwamagana District Irrigation Plan

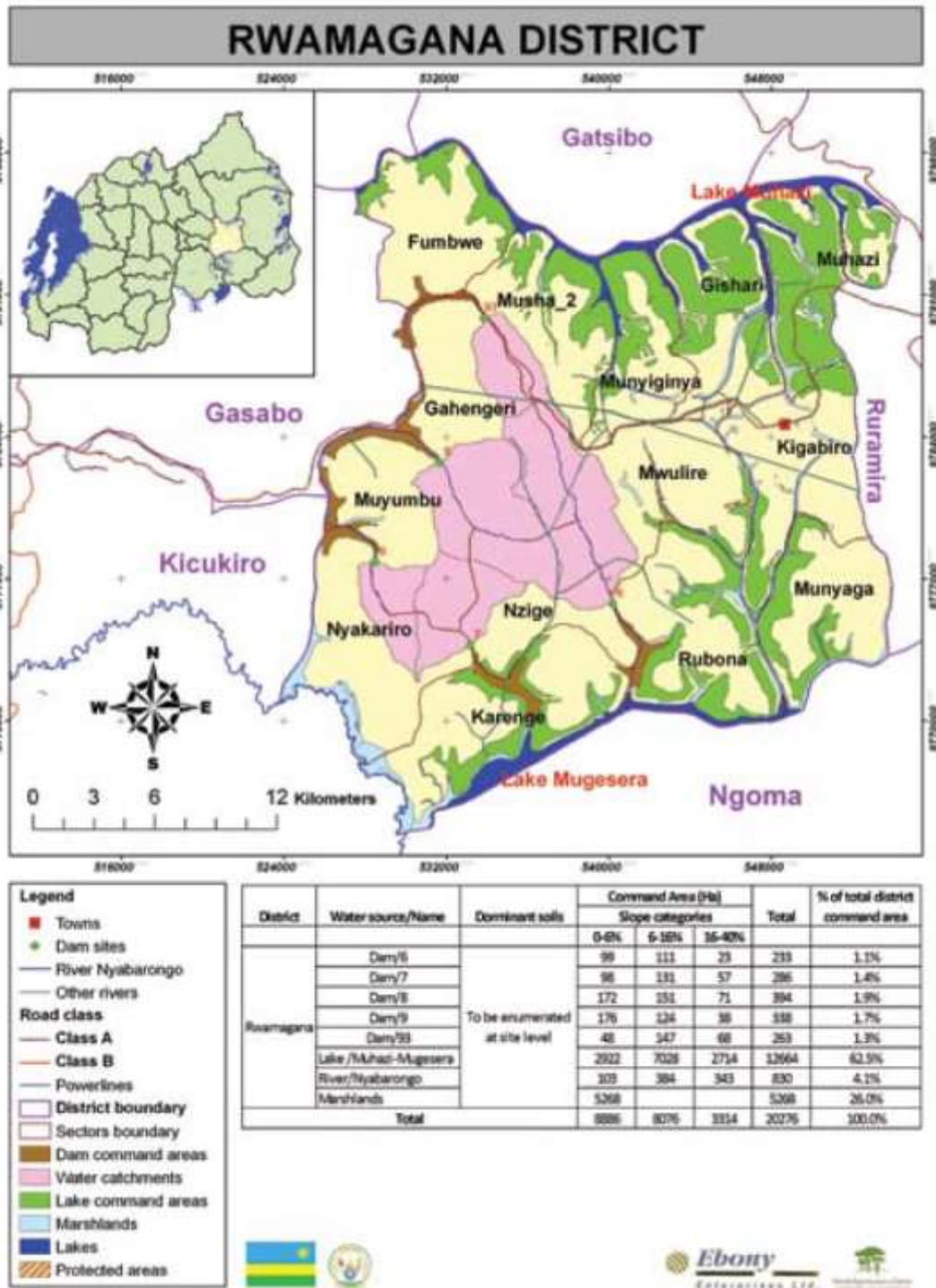
Rwamagana district has command areas represented in lake, river, marshlands and dam domains. These are evenly spread, giving an opportunity for different types of irrigation to be established within the district. A total of 20 276 ha have good potential for conventional irrigation in the district. Of these, the lake domain constitutes the largest area of 12 664 ha (62.9%), followed by the marshlands with a PIA of about 5 268 ha (26%). The command areas for dams in Rwamagana constitute 11% of the total irrigation potential.

The total irrigation water requirement for Rwamagana is about 165.3 Mm³, partitioned into 52.7 Mm³ for marshlands and 112.6 Mm³ for the rest of the command areas. Access to road and electrical power grid to these sites is good.

Table 2 :The Potential Irrigable areas in Rwamanaga

	Area(ha)	Ratio(%)
Dam	1 , 5 1 4	7 . 4 %
Lake	1 2 , 6 6 4	6 2 . 4 %
River	8 3 0	4 . 0 %
Marshland	5 , 2 6 8	2 5 . 9 %
Total	2 0 , 2 7 6	1 0 0 %

The total area of Marshlands in Rwamagana is **1,209 ha** which is **22.9%** of the Potential area of marshland.

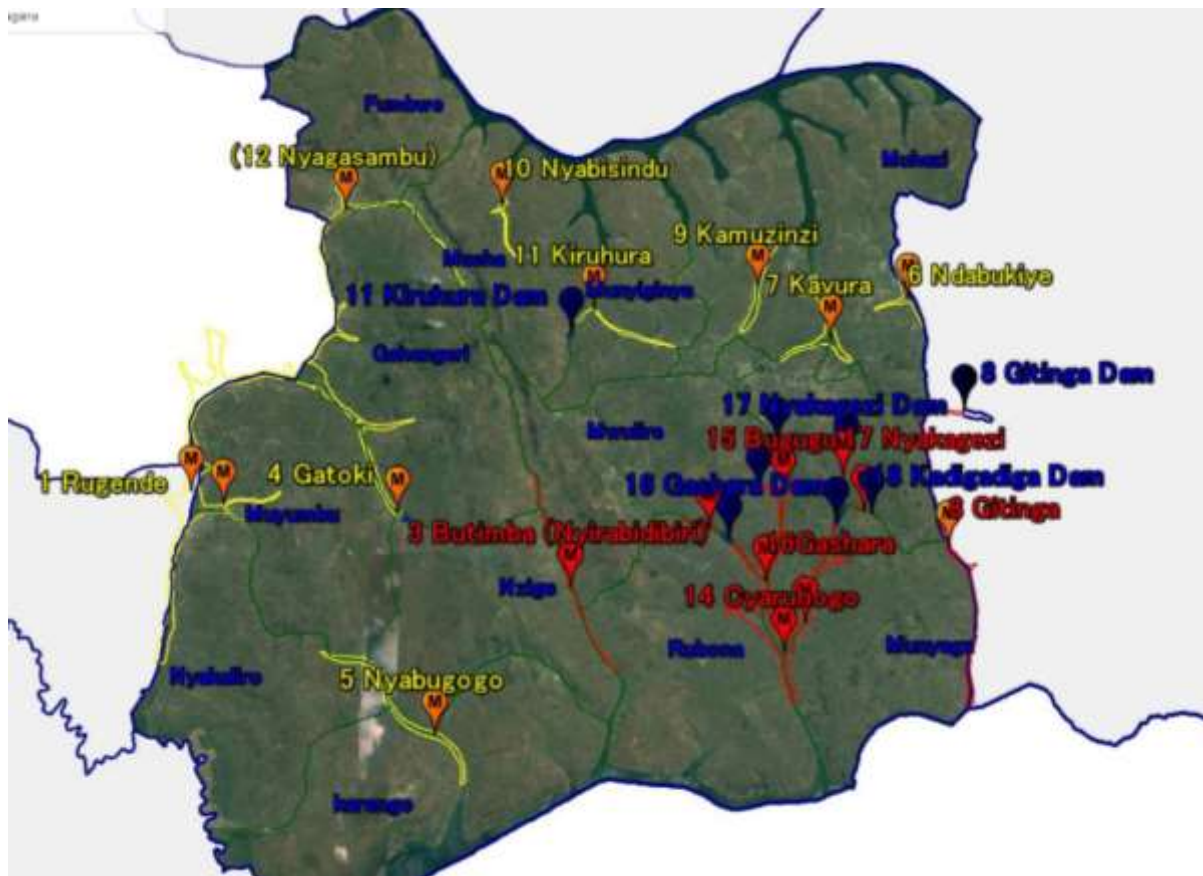


(Figure 1 :The Potential Irrigable areas in Rwamagana)

3. The Outline of the Marshlands in the Rwamagana District

(1) The Outline of the Marshlands in the Rwamagana District.

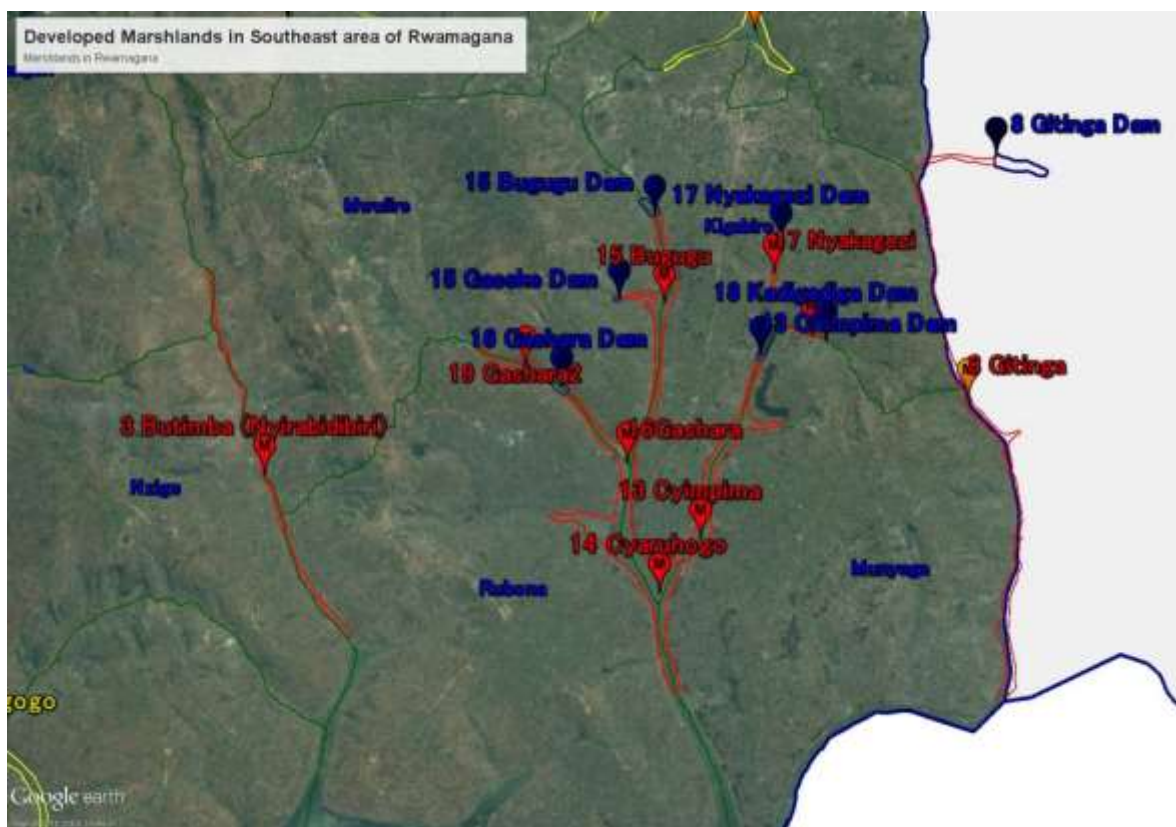
Rwamagana District has Nineteen (19) Marshlands, 1,209ha. There are Nine (9) Developed Marshland, 492ha, and Ten (10) Non-Developed Marshlands, 717ha.



(Figure 2 : Marshlands in Rwamagana)

In the Southeast of Rwamagana, there are Nine(9) Marshlands, 3)Butimba, 8)Gitiga, 13)Cyimpima, 14)Cyaruhogo, 15)Bugugu, 16)Gashara, 17)Nyakagezi, 18)Kadigandiga, 19)Gashara2 whose total area is 292ha. Except for 3)Butimba, all of the Marshlands of this area were developed by Chinese in 1970-1980s.

Except for the 14)Cyaruhogo, 19)Gashara2, they have Dams for irrigation. On the other hand, due to the ages of these facilities, it is necessary to rehabilitate Dams, canals and so on.



(Figure 3 :Marshlands in the Southeast area of Rwamagana)

In the North area of Rwamagana District, there are Six(6) Marshlands, which are 6)Ndabukiye, 7)Kavura, 9)Kamuzizi(Muhazi), 10)Nyabisindu, 11)Kiruhura, 12)Nyagasambu.

The Four(4) Marshlands, 7)Kavura,9)Kamuzizi,10)Nyabisindu,11)Kiruhura, are in the basin of the Muhazi Lake. The 6)Ndabukiye is in the basin of the Mugesera Lake. The 12)Nyagasambu is in the basin of the Akagera River.



(Figure 5: North area of Rwamagana)

(2) Comments for Marshlands in the Rwamagana District

We can make a classification of the Marshlands in Rwamagana for the 3 types below.

a) The Developed Marshland by Chinese or LWH

3) Butimba(Nyirabidibiri),8)Gitiga, 13)Cyimpima, 14)Cyaruhogo, 15)Bugugu, 16)Gashara,17)Nyakagezi,18)Kadigandiga,19)Gashara2

These Eight (8) Marshlands were developed by Chinese in 1970-1980s (8,14,15,16,17,18,19) or LWH(3), and Chinese constructed Seven(7) Dams. However, the situation of these facilities, Dams, canals, drainages, roads are not good, so the farmers suffer from the shortage of water sometimes. They should be rehabilitated soon.

b) The Non-Developed Marshlands in the Southwest area

1)Rugende,2)Nyirabuhene,4)Gatoki,5)Nyabugogo.

Non-Developed Marshlands in the Southwest area are consisting of Four (4) Marshlands. Lack of water and Flood affect farmers there. This area is located near Kigali-city, so the demands of the commercial products like Vegetables are high. Especially, the 1)Rugende is very a big Marshland and located near the main road between Kigali and Rwamagana. The RSSP project is planning to develop this Marshland.

c) The Non-Developed small Marshlands in the North area

6)Ndabukiye,7)Kavura, 9)Kamuzizi(Muhazi),10)Nyabisindu,11)Kiruhura, 12)Nyagasambu.

Non-Developed small Marshlands in the North area are consisting of Six (6) Marshlands, and Four (4) of them are in the Muhazi Lake basin.

They are suffered from the lack of water and the flood of water. It is necessary to consider about developing these Marshlands.

(3) The record of the field visit

The field visits of Marshland survey in were conducted on the schedule below. We asked the District Agronomist or Sector Agronomists to go to the Marshlands with us. On the field, we conducted the interview to Agronomists or Farmers about the situation of the Marshlands, and picked up the contact persons' phone number of the Cooperative or IWUOs in that field. After coming back to Kigali, we conducted the interview for those persons.

Date	Marshlands	Notes
4 th Feb,2016	Visit the agronomist of Rwamagana	
3 rd March,2016	1)Rugende,2)Nyirabuhene,3)Burimba,4)Gatoki, 5) Nyabugogo	
9 th March,2016	6)Ndabukiye, 7)Kavura, 8)Gitinga, 9)Kamuzizi(Muhazi)	
15 th March,2016	10)Nyabisindu, 11)Kiruhura, 12)Nyagasambu	
8 th Sep,2015	13)Cyimpima, 17)Nyakagezi, 18)Kadigadiga	
14 th Sep,2015	16)Gashara,19)Gashara2	
15 th Sep,2015	14)Cyaruhogo,15)Bugugu	



4. The individual data of the Marshlands in Rwamanaga

(1) Rugende Marshland

1)Sector: Muyumbu, Nyakariro, Nzige, Muwurire.

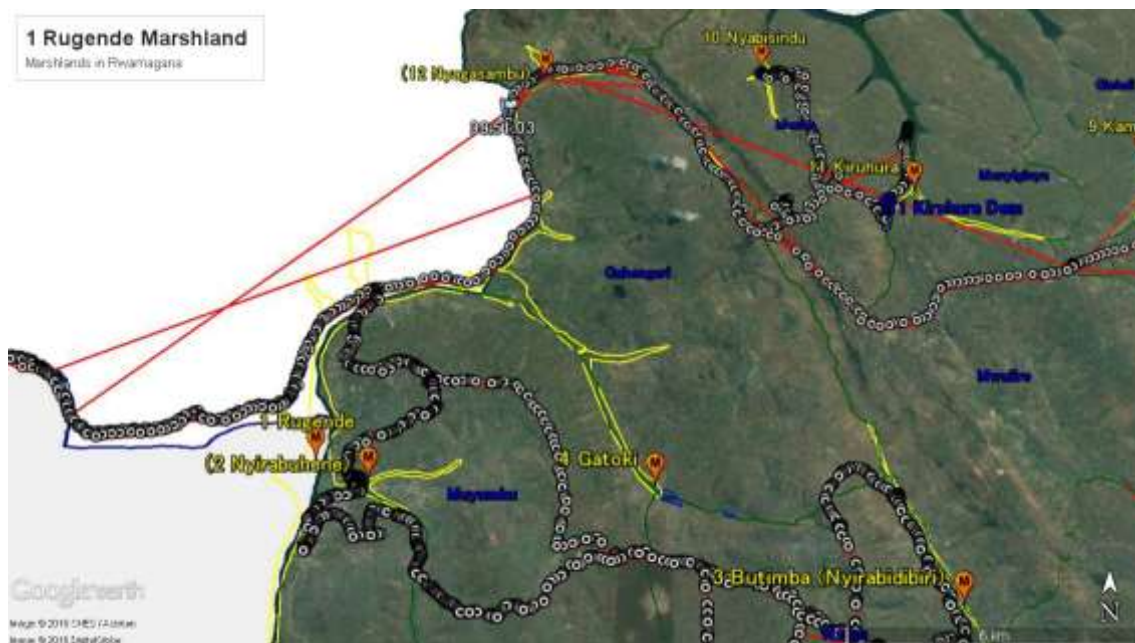
2)Size: 400ha

3)Status & Challenges: No developed. Rugende is the main marshland in Muyumbu sector. It is crossing Nzige, Muwurire, Muyumbu and Nyakariro Sectors. Down stream is Akagera Marshland.

4)Main crop: Maize, Beans, Soy beans and Vegetables.

5)Comments: Rugende is a long marshland with different cooperatives. Farmers mainly grow maize, beans and soya, but also one part of this marshland is occupied by few farmers making livestock.

6)Field visit date; 3rd March,2016



This marshland is very big and long.



(2) Nyirabuhene Marshland

1)Sector: Muyumbu,Nyakariro

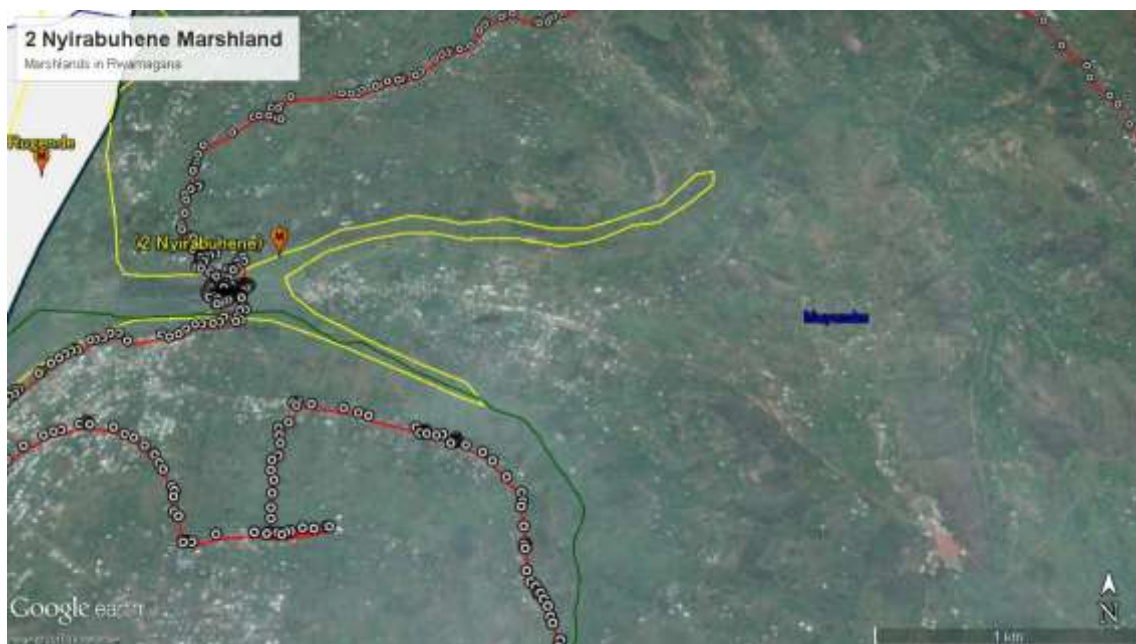
2)Size: Including the area of the Rugende marshland

3)Status & Challenges :Nyirabuhene is a branch of Rugende Marshland between Muyumbu and Nyakariro Sectors. In this marshland, there is a big nursery of macadamia and a cooperative growing corn.

4)Main crop: Maize, Beans, Vegetables

5)Comments: RSSP has completed studies for its development.

6)Field visit date; 3rd March,2016



They are making the nursery of the macadamia.



They are growing the Maize.



(3) Butimba(Nyirabidibiri) Marshland

1)Sector: Nzige, Rubona, Muwulire

2)Size: 200ha

3)Status & Challenges:LWH is developing the marshland and hillside of Butimba(Nyirabidibiri) marshland. Farmers cultivate maize, soya and vegetables in dry season.

LWH Project (LWH 34) is now stacked and Dam construction is stopping.

4)Main crop : Mize, soya and vegetables

5)Comments : The marshland is being developed by LWH as well as hillside. The contractor has stopped the work but RAB/MINAGRI is planning to restart soon.

6)Field visit date; 3rd March,2016



This is Dam site of LWH site (Rwamagana 34).It has stopped because of the bad condition of the bad contractor.



(4) Gatoki Marshland

1)Sector: Nzige, Gahengeri

2)Size: 80ha

3)Status & Challenges :Gatoki is a small branch of Rugende marshland. It has two small natural lakes upstream.

4)Main crop: Different crops

5)Comments: It is located upstream of Rugende marshland. There are two permanent natural ponds, but this marshland is too narrow.

6)Field visit date; 3rd March,2016



There are two natural ponds on the upstream of this marshland.



(5) Nyabugogo Marshland

1)Sector: Nzige, Karengu, Muyumbu

2)Size: 15ha

3)Status & Challenges :Nyabugogo is a small marshland between Nzige, Karengu an Muyumbu Sectors. In the marshland. water is not enough and according to the agronomist, some farmers have got the land title in the marshland. They cultivate the maize and vegetables.

4)Main crop: Maize, beans and vegetables.

5)Comments: The marshland is small but also very narrow.

6)Field visit date; 3rd March,2016



(6) Ndabukiye Marshland

1)Sector: Muhazi

2)Size: 45ha

3)Status & Challenges: This Marshland is cultivated by Ntsinda Prison. It is not developed and it is upstream of Gitinga marshland.

4)Main crop: Maize

5)Comments: The marshland is cultivated by the prisoners. The soil is sandy which may be difficult to cultivate rice.

6)Field visit date; 9th March,2016



Here is not cultivated.



You can see the Ntsinda Prison. The prisoners of that prison cultivate this marshland.



(7) Kavura Marshland

1)Sector: Muhazi, Kigabiro, Gishari

2)Size: 100ha

3)Status & Challenges: This marshland is near the Rwamagana Town. It is located upstream of the lake of Muhazi. They cultivate rice, maize, beans and soya.

4)Main crop: Rice, Beans, Maize, Soya.

5)Comments: Not developed and water is not enough upstream and it is flooded downstream near the Muhazi Lake.

6)Field visit date; 9th March,2016



They were cultivating rice.



(8) Gitinga Marshland

1)Sector: Kigabiro, Munyaga

2)Size: 65ha

3)Status & Challenges: This marshland was developed in 1980's years. The scheme has a dam but the command area is far from the dam and between them, there are a lot of no cultivated areas.

4)Main crop: Rice, Beans, Maize, Soy beans

5)Comments: Irrigation canals are not effective.

6)Field visit date; 9th March,2016



In this Marshland, many places were not cultivated.



(8-2) Gitinga Dam



The Gitinga Dam's situation is not bad.



(9) Kamuzizi (Muhazi) Marshland

1)Sector: Kigabiro, Munyaga

2)Size: 20ha

3)Status & Challenges: A small marshland upstream Muhazi Lake. In season A, they cultivate rice on only 7ha due to the shortage of water.

4)Main crop: Rice

5)Comments: They are flooded in the rainy season and no water in the dry season.

6)Field visit date; 9th March,2016



This marshland is located in the upstream of the Muhazi Lake.

They are cultivating rice in this small marshland.



(10) Nyabisindu Marshland

1)Sector: Musha

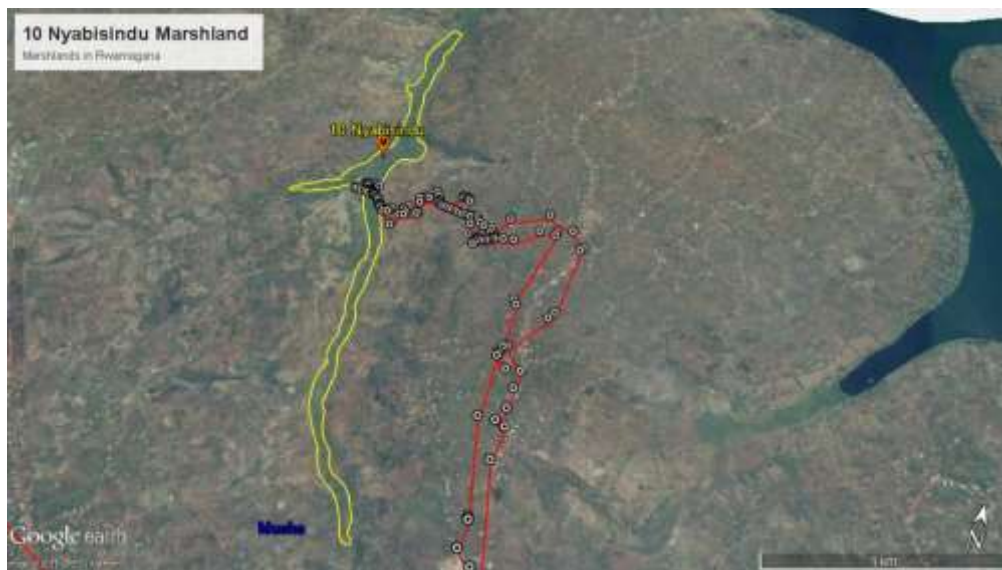
2)Size: 18ha

3)Status & Challenges :The marshland is located near Muhazi Lake. Water is coming from spring and a small stream and flowing to the Muhazi Lake .Farmers are organized into the cooperative. In Season A, they cultivate soya and maize after they grow vegetables.

4)Main crop: Soya, Maize, Vegetables

5)Comments: A small marshland upstream of Muhazi Lake.

6)Field visit date; 15th March,2016



(11) Kiruhura Marshland

1)Sector: Musha, Munyiginya

2)Size: 39ha

3)Status & Challenges :The marshland is not developed, upstream there is a dam made by mining company many years ago. It has no intake and the spillway is just a pipe. In the command area, farmers are growing maize, beans and vegetables. Fish farming also is done in a fish pond. This Marshland is connecting to the Muhazi Lake in the downstream direction.

4)Main crop: Beans, Maize, Vegetables

5)Field visit date: 15th March,2016



(11-2) Kiruhura Dam



This Marshland has not been developed. There is a Dam constructed by the mining company.



It has no intake and its spillway is just a pipe which is very dangerous during the rainy season.



In the command area, farmers are growing Maize, Beans and Vegetables. Fish farming also is done in fish pond.



(12) Nyagasambu Marshland

1)Sector: Fumbwe,Musha, Gehengeri

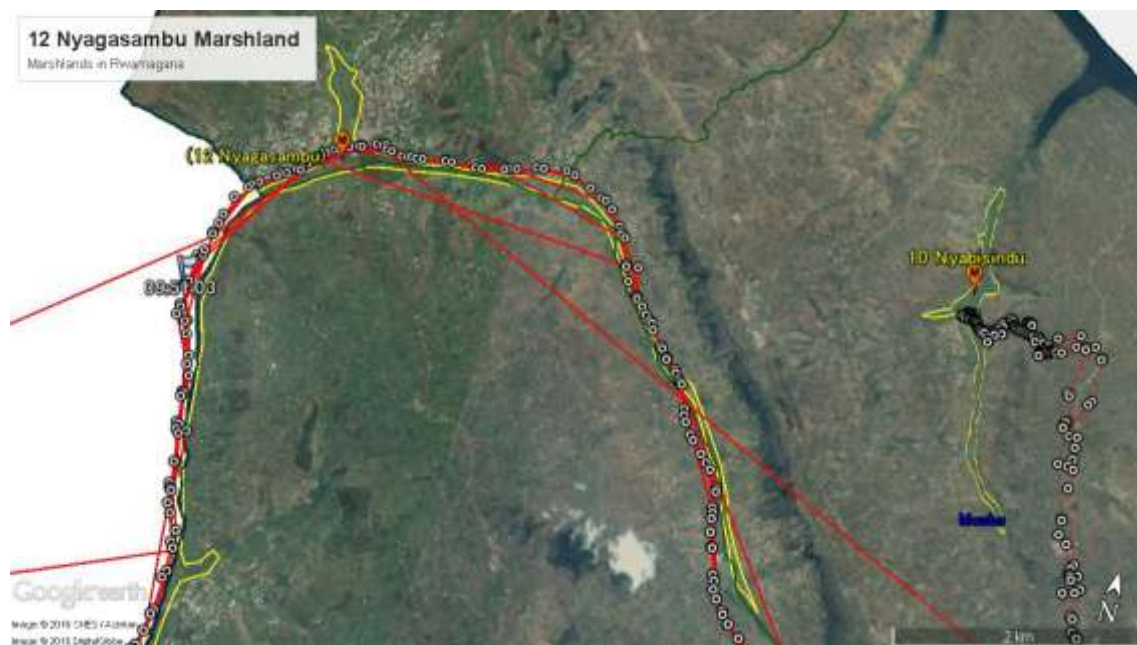
2)Size: Including the area of the Rugende Marshland

3)Status & Challenges :The Marshland is mainly occupied by individual farmers. A large part of it is occupied by cattle breeding and fish farming.

4)Main crop: Maize, Beans, Vegetables

5)Comments: The Marshland is mostly occupied by few farmers doing cattle keeping and fish farming. This Marshland is along the main road from Kigali to Rwamagana.

6)Field visit date; 15th March,2016



(13)Chimpima Marshland

1)Sector : Kigabiro, Munyaga

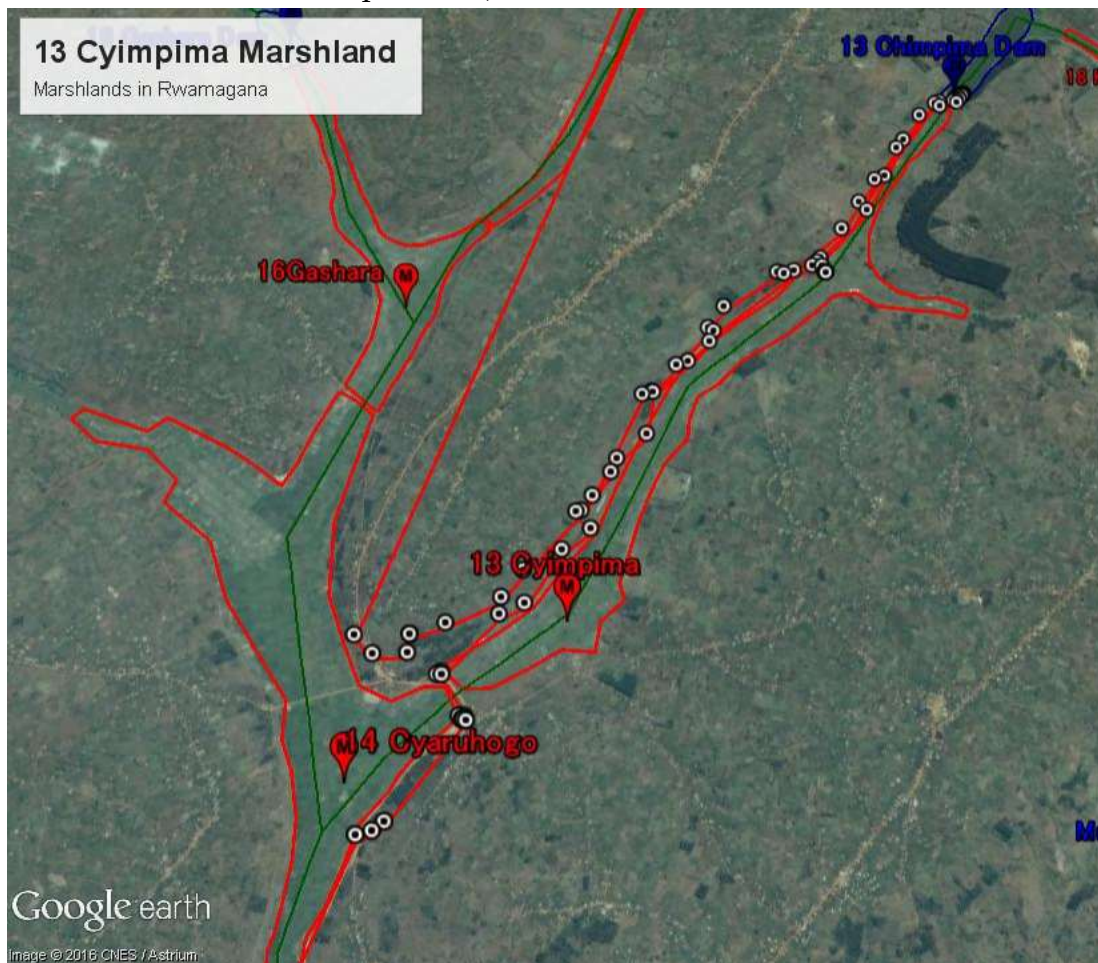
2)Size : 53ha

3)Status & Challenges :Dam and Irrigation canals are old and need to be rehabilitate. The main crop is rice but water is not enough.

4)Main crop: Rice

5)Comments : The Marshland was developed by Chinese in 1982.

6)Field visit date: 8th September,2015



This is the boarder of Cyimpima Marshland.



Some dry areas are broken.



Some canals are not working well.



This is the diversion of the canal, but now it is not working well.



This is the valley of Mine. You can see the hillside which suffer from a serious erosion.



Some canals are working well.



The access road needs the place for parking area to cross each other.



(13-2) Cyimpima Dam



This is the spillway of the Cyimpima Dam. This spillway affects the downstream road.



(14) Charuhogo Marshland

1)Sector: Munyaga, Rubona

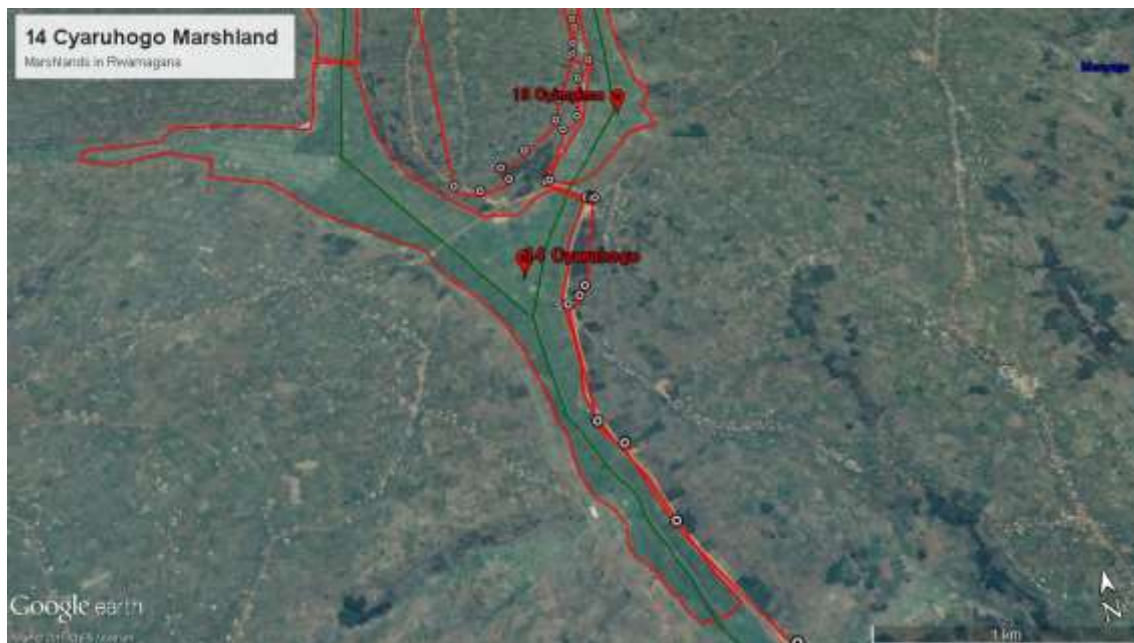
2)Size: 90ha

3)Status & Challenges :There is no Dam and the irrigation facilities need to be rehabilitated.

4)Main crop: Rice

5)Comments: The Marshland was developed about 40 years ago, but in some area of this Marshland, they can cultivate rice only one season because of the shortage of water. Farmers want to make Dams for it.

6)Field visit date;15th September,2015



This is the Warehouse of the Coricha Cooperative, which was built by Chinese thirty years ago.



Some parts of this Warehouse were broken.



They are stocking fertilizers, seeds and so on in the warehouse.



This is the post-harvest machine, which was provided by the donor in USA. However, they don't use this machine now because these machines were almost broken.



We checked the culvert in the bridge of the border between the Cocuricyi Cooperative and the Coricha Cooperative.



Because of the sedimentation, the culvert is not working well.



This is the canal and diversion of the Charuhogo Marshland. However, it is not working well.



Here is the border from the swamp into the lake. There is much mud.



This is the border candidate of the command area of this project. The downstream area of this border is flooded sometimes a year.



This is the broken bridge which is reinforced by the loges.



This is the small dyke of the upstream area of the Coricha Marshland.



This intake is broken and they cannot impound water, hence they want to construct a Dam in this area.



They can cultivate rice only one season in this area (24ha) in the upstream area of the Coricha Marshland.



They want to make a Dam in the upstream area of the Coricha Marshland.



(15) Bugugu Marshland

1)Sector: Kigabiro,Mwurire

2)Size: 30ha

3)Status & Challenges:2 Dams(Bugugu Dam and Gaseke Dam) and irrigation facilities need to be rehabilitated and water is not enough.

4)Main crop: Rice

5)Comments: The Marshland was developed 40 years ago and Dams and canals need rehabilitation.

6)Field visit date;15th September,2015



This is the Warehouse of the Cocuribu Cooperative.



They stock the agricultural machines in the Warehouse.



The farmers cultivate rice and thin out.



In the drainage canal, there are many grasses.



This is diversion from the Gaseka Dam which is broken.



(15-2) Bugugu Dam



This is the Bugugu dam.



This dam was reinforced by the sand bags.



This is the left-hand intake of the Bugugu Dam.



Based on the dam design, they set up the spillway here, but someone constructed dyke on the spillway.



This is the right-hand intake of the Bugugu Dam.



They put on the plug to stop to intake water.



There are no ripraps on the surface of the Bugugu Dam.



There is some erosion in the catchment area of the Bugugu Dam.



Someone recommended us to transfer the dam-axis to the downstream area.



(15-3) Gaseke Dam



The management house of the intake for the Gaseke Dam was broken.



This is the Gaseke Dam.



The reservoir is covered with grasses.



The dyke of the Gaseke Dam was damaged by the erosion.



Here is the spillway of the Gaseke Dam which is not working well.



The intake was broken.



(16) Gashara Marshland

1)Sector: Kigabiro, Mwurire

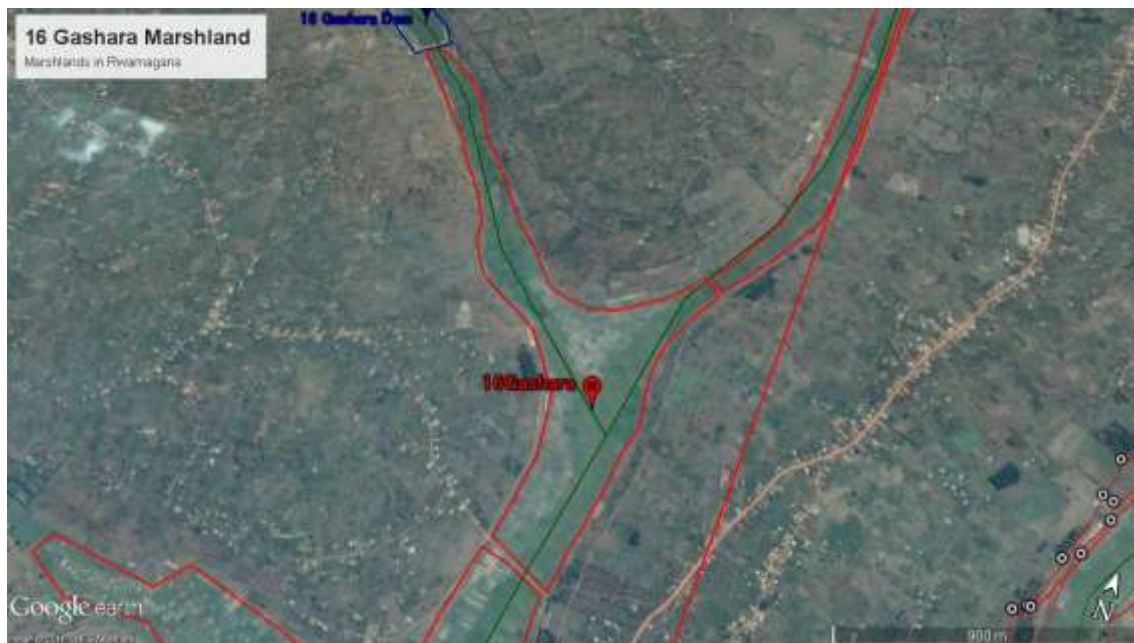
2)Size: 36ha

3)Status & Challenges :Dam and irrigation network need rehabilitation.

4)Main crop: Rice

5)Comments: The Marshland was developed 40 years ago. Dam and Canals need rehabilitation.

6)Field visit date;14th September,2015



They said that this bridge is a bit dangerous.



This is the canal from the Gashara Dam.



There is erosion from hillside which affects the access road.



(16-2) Gashara Dam



This is the Gashara Dam.



The Gashara dam has no Riprap.



There is much sedimentation in the reservoir of the Gashara Dam.



The ant nest affect the Dam stability.



This is the intake house.



The valve of intake was broken and is leaking water any time.



The spillway was buried by the soil from hillside erosion.



The erosion of the hillside is very serious problem for the Gashara Dam.



This dry area is always wet due to the ground water. The president of the Cooperative is considering moving to another upper place.



(17) Nyakagezi Marshland

1)Sector: Munyaga, Kigabiro

2)Size: 6ha

3)Status & Challenges :A small Dam and irrigation canals were developed by Chinese in 1980s, but they are old and need rehabilitation. In rainy season, downstream part of this Marshland is flooded from Chimpima Dam Reservoir.

4)Main crop: Rice

5)Comments: This Marshland was developed 40 years ago. The Dam Reservoir is invaded by swamp grasses and irrigation network need rehabilitation. The Marshland is located right side in the upstream are of th Chimpima Dam.

6)Field visit date;1st June,2015



This Marshland is located in the downstream area of the Nyakagezi Dam. The water is flowing not only in this canal but also in the paddy field.



(17-2) Nyakagezi Dam



We checked the downstream area of Nyakagezi Dam. The intake of dam is only this one. There is not a valve in this intake.



(18) Kadigadiga Marshland

1)Sector: Munyaga

2)Size: 4ha

3)Status & Challenges :They have small Dam upstream and irrigation canals developed by China in1980s, but they are old and need rehabilitation. In rainy season, downstream part of this marshland is flooded from Chimpima Dam.

4)Main crop: Rice

5)Comments: This marshland was developed 40 years ago. Dam is invaded by swamp grasses and irrigation network need rehabilitation. The marshland is located left side upstream of Chimpima Dam.

6)Field visit date;8th September,2015



This Marshland is located in the upstream area of the Cyimpima dam. The Cooperative wanted us to rehabilitate facilities of this Marshland.



(18-2) Kadigandiga Dam



This is the small Dam of this Marshland. It is not working well.



(19) Gashara2 Marshland

1)Sector: Kigabiro, Mwurire

2)Size: 8ha

3)Status & Challenges :There are the irrigation canals developed by Chinese in1980s, but they are old and need rehabilitation.

4)Main crop: Rice

5)The Cooperative wanted us to rehabilitate the facilities of this Marshland..

6)Field visit date;14th September,2015



This Marshland is located in the upstream area of the Gashara Dam. You can see much sedimentation.



They cultivate rice in this Mrashland.



This diversion is not working well. They wanted us to repair it.



(The end)