(Annex 2-2)

2. The Marshlands in Gatsibo

Contents

1. The Outline of the Gatsibo District

(1) Location of Gatsibo District

Gatsibo District is one of the seven Districts making the Eastern Province. It is divided into 14 Sectors which are; Gasange, Gatsibo, Gitoki, Kabarore, Kageyo, Kiramuruzi, Kiziguro, Muhura, Murambi, Ngarama, Nyagihanga, Remera, Rugarama and Rwimbogo. It is also divided into 69 cells and 603 villages "Imidugudu". Spreading an area of 1585, 3 km2. The District borders with the Akagera National Park in East, to the North by Nyagatare District; to the West by GicumbiDistrict, to the South by Rwamagana and Kayonza Districts. (**www.gatsibo.gov.rw***)accessed 5th February 2013*

(2) District Demography

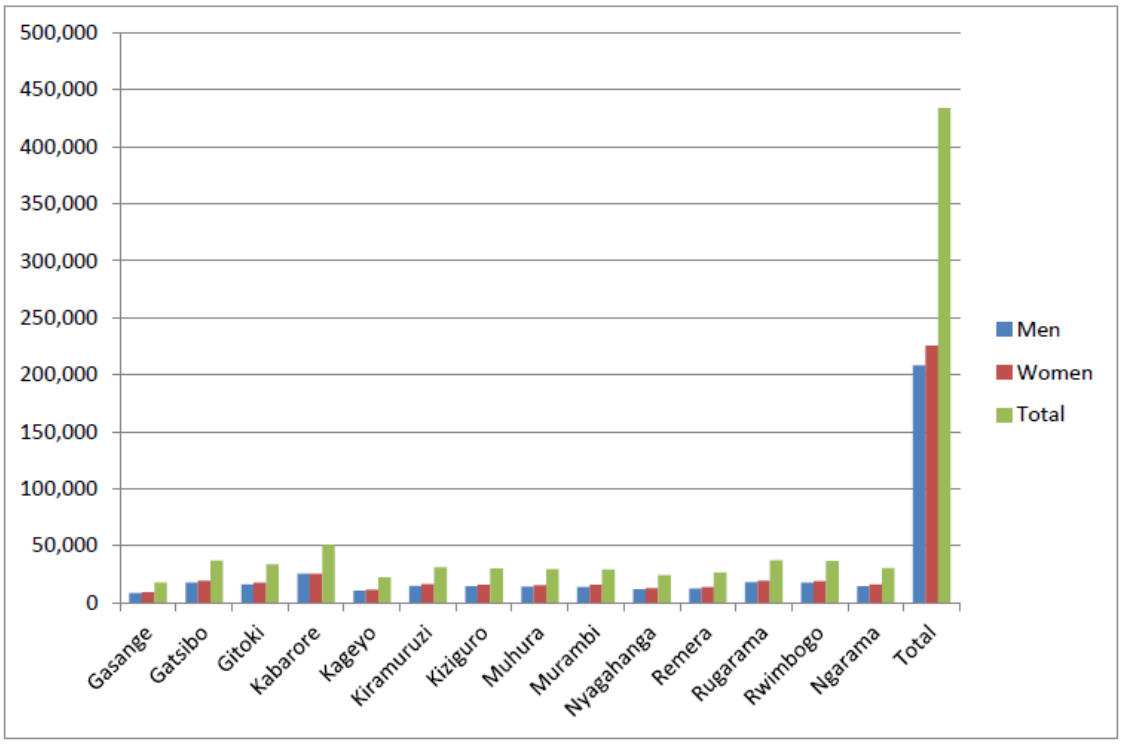
According to the 2012 National Census provisional results, the total population of Gatsibo District increased from 283,456 in 2002 to 433,997 in 2012. Gatsibo District has population density of 275 persons per square kilometer. The increase in the population represents a growth rate of 53.1% between 2002 and 2012. Males represent 48% of the population whereas females represent 52% of the population.

Table 2.1District Population NISR Provisional Census Results 2012

Sectors	Men	Women	Sex ratio	Total	Density(sq.km)
Gasange	8,524	9,234	92	17,758	464
Gatsibo	17,594	19,225	92	36,819	600
Gitoki	15,907	17,639	90	33,546	448
Kabarore	25,087	25,324	99	50,411	240
Kageyo	10,433	11,397	92	21,830	390
Kiramuruzi	14,723	16,232	91	30,955	512
Kiziguro	14,248	15,791	90	30,039	489
Muhura	13,992	15,211	92	29,203	524
Murambi	13,612	15,383	88	28,995	485
Nyagahanga	11,581	12,645	92	24,226	337
Remera	12,469	13,714	91	26,183	501
Rugarama	18,019	19,183	94	37,202	493
Rwimbogo	17,737	18,803	94	36,540	56
Ngarama	14,429	15,861	91	30,290	518
Total	**208,355**	**225,642**		**433,997**	**6,057**

Source: NISR Provisional Population and Housing Census 2012

Figure 2.1Gatsibo District Sector Population provisional results



According to the graph above,Kabarore Sector has the highest Population and the least populated sector in the District is Gasange. Female accounts 51.9% of the total population in the District while males are 48.1%. The demography of Gatsibo District can also be analyzed in relation to provincial and national level below.

Table 2.2 Population, growth and comparison of Gatsibo, Eastern Province and Rwanda

District comparison with Province and National	2002 Total Population	2012 Population			Sex Ratio[1]	Population change (2002-2012) (%)	Average Annual Growth Rate (2002-2012) (%)	Population Density (sq.km)
		Male	Female	Total				
Gatsibo	283,456	208,355 (48%)	225,642 (52%)	433,997	92	53.1	4.4	275
Eastern province	1,700,137	1,257,750 (48.4%)	1,343,064 (51.6%)	2,600,814	94	53.0	4.3	275
Rwanda	8,128,553	5,074,942 (48%)	5,462,280 (52%)	10,537,222	93	29.6	2.6	416

Source: Provisional National Population and Housing Census results 2012, NISR

The population change (2002-2012) is the a growth rate over the period calculated by total population in 2012 minus total population in 2002 divided by total population in 2002 expressed in percentages.

(3) Relief

The relief of Gatsibo District is characterized by scarcely short hills and flat land separated by valleys in East, East, South East and North while the West and South West is characterized by high mountains in administrative sector of Nyagihanga,Kageyo, Gatsibo, Muhura, Gasange and Remera which are characterized by two principal seasons: a long dry season and rainy season. Gatsibo District is characterized in general by lowly inclined hills and flat land separated by dry allies. The District is located in the granite low valley whose average altitude is 1550m spread on the plateau and the savannah of the Eastern part of the country. This kind of topographical layout constitutes an important potentiality for modern and mechanized agricultural farming. This relief offers to Gatsibo a vocation agro pastoral and tourism

(www.gatsibo.gov.rw) *accessed 5th February 2013*

(4) Hydrography

Gatsibo District is known of the low rainfall and high temperatures that limit the availability of water. The hydrography of Gatsibo District is largely constituted of streams and rivers such as; Walfu, Karungeri, Cyamuganga,Kanyonyomba, Rwangingo, Kabahanga, Kagina, Kagende, Rwagitima and Ntende. This hydrographic network combined with the aforementioned relief offers timeliness of irrigation in the District (www.**gatsibo**.gov.rw*) accessed 5th February 2013*

(5) Grounds

District is characterized by an abundance of the humus-bearing grounds ferralisols one originating laterite of the deterioration of the shales and phyllites, accumulation of the collisions in the valleys dry Martini. The ground of granite origin cuts has texture with little red clay especially in the South – West of the District. The termite mounds are covers the biggest part of the District (www.**gatsibo**.gov.rw*) accessed 5th February 2013*

The combined action of the lithosphere (rock and roll mother granite), atmosphere (rains), and biosphere (man and the other living beings) developed deep grounds drank of which the fertility by the drought of the more stressed climate by drying out winds blowing East. Thus the xérokaolisols in the party remains the ground type the more dominating. To the surface, they identify themselves by the narrowness of to bush-hammer humus-bearing brought by the grassy savannah.

The grounds of Gatsibo District contain ores such as the Cassiterite, the Colombo-tantalite, the wolfram, etc. they also contain ores of construction materials like the gravel, sand, hardcore, clay, etc.

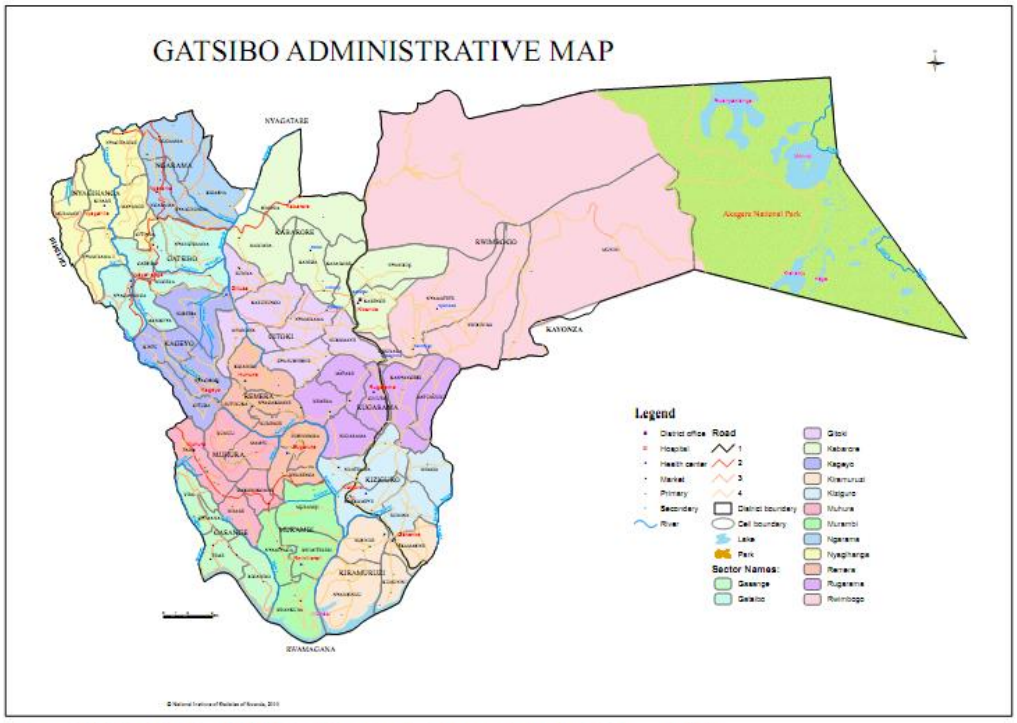
(6) The flora

The flora of the District of Gatsibo is characterized by a vegetation cover of steppe wooded. Its hills are covered by short grasses as well as small trees and shrubs. Concerning afforestation, the District of Gatsibo has access to Eucalyptus and of Pinus trees that are generally as a result of 10 afforestation. Agro-forest is also predominant in the north – west region of the District where coffee plantations are the major cash crops. (www.**gatsibo**.gov.rw*)*

accessed 5th February 2013

(7) The fauna

As for the wildlife, the District of Gatsibo has access to an inheritance of the former domain of hunting from Akagera National Park with diversified birds notably the rapacious ones are sparrow hawks, the owls, the sparrows, the guinea fowls, the partridges, the heroes, the ibis, the crows, the prick beef, etc. Also the Hares, the wild boars, the monkeys and other rodents live in the hills where there are small natural shrubs. The hippopotamus are met in the river Umuvumba and in the lake Muhazi. The crocodiles exist also in certain valleys dams as to Rwimbogo. The antelopes, the buffalo, other ruminating animals occupying the Akagera National Park (www.**gatsibo**.gov.rw*) accessed 5th February 2013*



Source: NISR 2012, EICV 3 (Thematic Report on Gatsibo, 2012)

(Figure 1 :The Administrative Map of Gatsibo District)

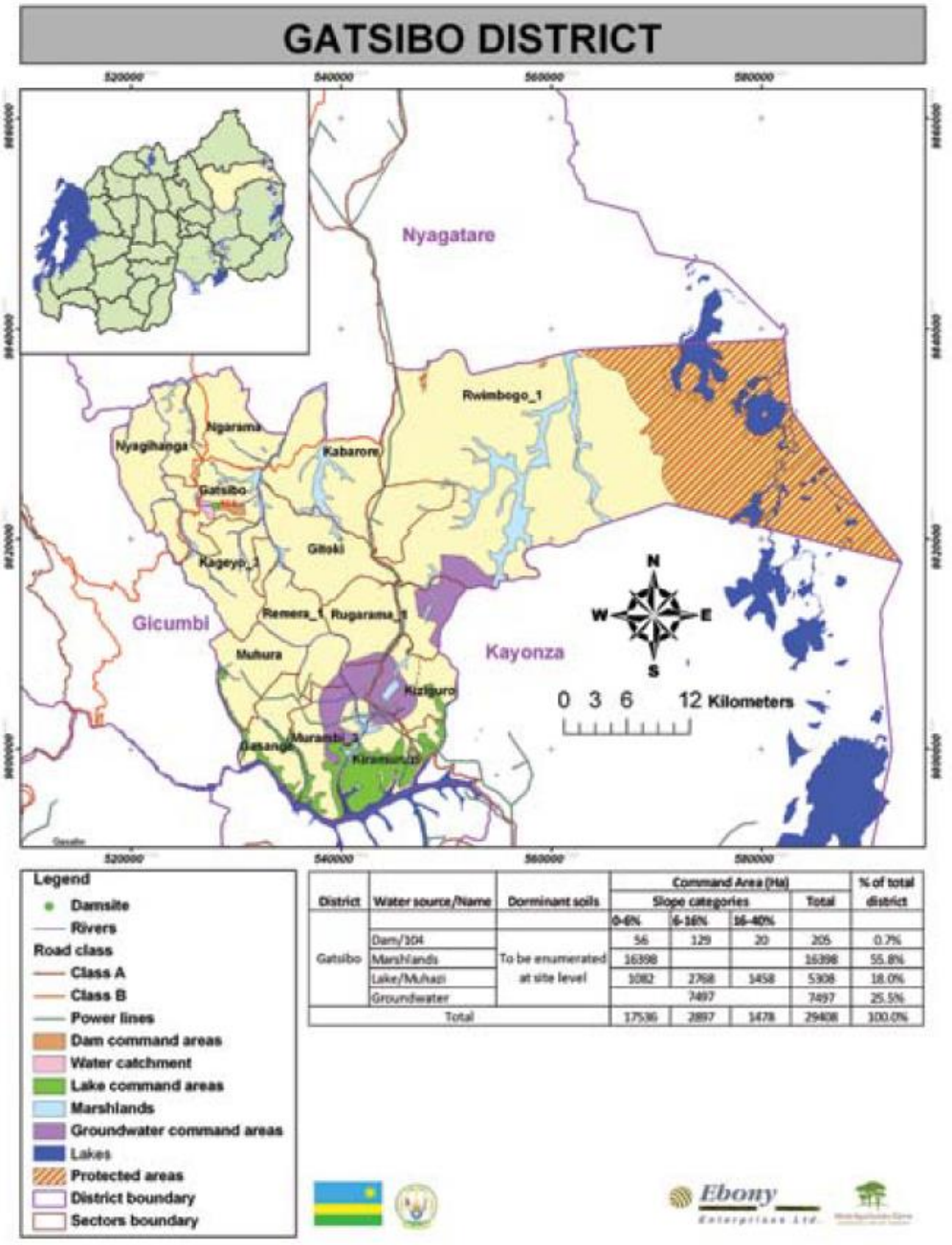
2. Gatsibo District Irrigation Plan

Except for the eastern part which is protected as a national park, the PIAs of Gatsibo district are spread in the central, southern and western regions with good irrigation potential for dam, lake, groundwater and marshland irrigation development. The PIAs have a combined area of 29 408 ha as shown in the plan map. There is good road and electricity access.
The irrigation water demand for these PIAs is approximately 220.6 Mm3. The lake water has to be pumped from Lake Muhazi at no more that 100m static head. Conventional drip and sprinkler irrigation systems can be applied, depending on the location and morphology of landforms. However, centre pivot sprinkler irrigation can only be applied after investigations have verified that sufficient groundwater is available. The precise irrigation systems can be mapped out according to engineering designs at site level.

(Table 1: The Potential Irrigable areas in Gatsibo)

	Area(ha)	Ratio(%)
Dam	205	0.7%
Lake	5,308	18.0%
River	-	0%
Ground water	7,497	25.5%
Marshland	16,398	55.8%
Total	29,408	100%

The total area of Marshlands in Gatsibo is **3,078ha**, which is **18.8%** of the Potential area of marshland.



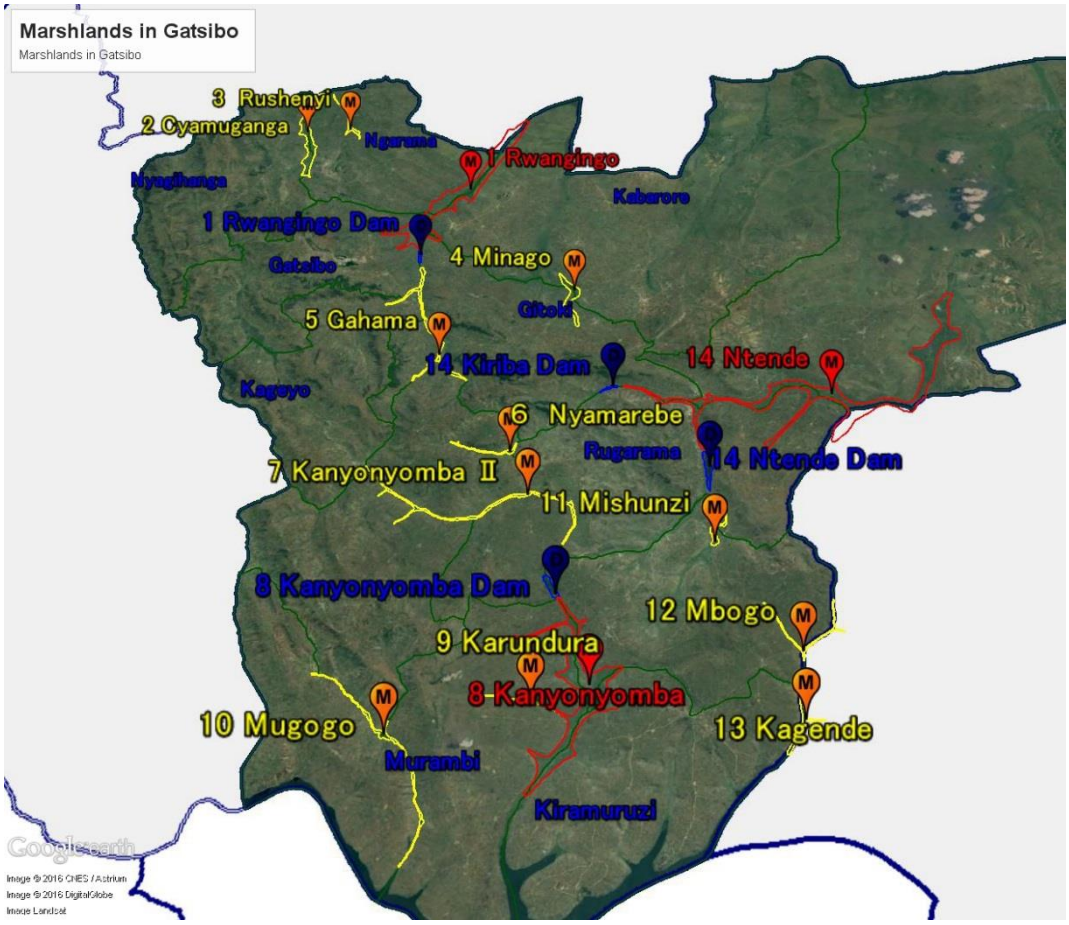
District	Water source/Name	Dorminant soils	Command Area (Ha)				% of total district
			Slope categories			Total	
			0-6%	6-16%	16-40%		
Gatsibo	Dam/104	To be enumerated at site level	56	129	20	205	0.7%
	Marshlands		16398			16398	55.8%
	Lake/Muhazi		1082	2768	1458	5308	18.0%
	Groundwater			7497		7497	25.5%
Total			17536	2897	1478	29408	100.0%

(Figure 2 :The Potential Irrigable areas in Gatsibo)

3. The Outline of the Marshlands in the Gatsibo District

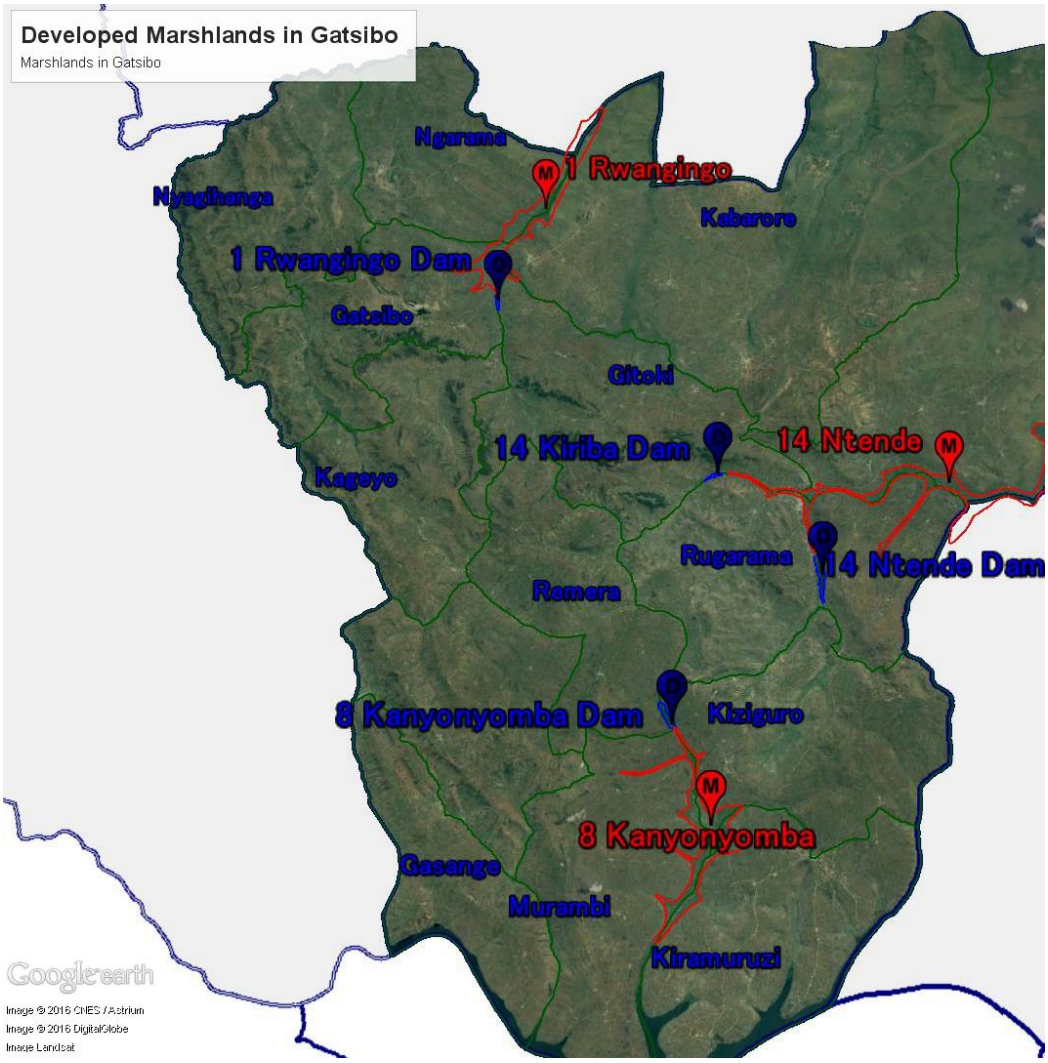
(1) The Outline of the Marshlands in the Gatsibo District.

Gatsibo District has Fourteen (14) Marshlands, 3078ha. They are Three (3) Developed Marshlands,2,393ha, and Eleven(11) Non-Developed Marshlands,685ha.



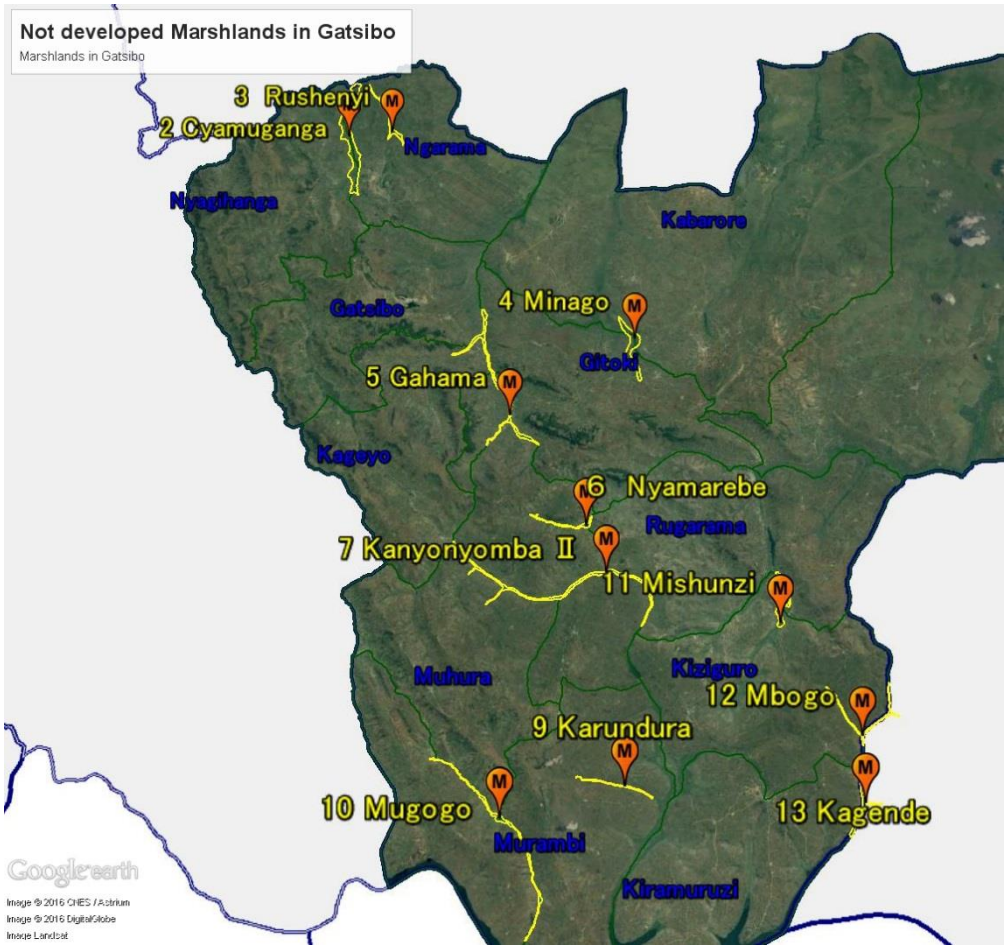
(Figure 3 :The Marshlands in Gatsibo)

There are the Three (3) Developed Marshlands in Gatsibo, which are 1)Rwangingo-Karangazi, 8)Kanyonyomba,14)Ntende.. All of them are developed by RSSP with Dams.



(Figure 4 :Developed Marshlands in Gatsibo)

There are Eleven(11) Non-Developed Marshlands in Gatsibo, which are 2)Cyamuganga, 3)Rushenyi, 4)Mingao, 5)Gahama, 6)Nyamarebe, 7)KanyonyombaⅡ, 9)Karundura,10)Mugogo,11)Mishunzi, 12)Mbogo, 13)Kagende.



(Figure 5 : Non-Developed Marshlands in Gatsibo)

(2) Comments for Marshlands in the Gatsibo District

We can make a classification of the Marshlands in the Gatsibo District for the Two (2) types below.

1) The Developed Marshlands by RSSP.

a)Rwangingo-Karangazi, 8)Kanyonyomba,14)Ntende

All of these Three (3) Marshlands in Gatsibo were developed by RSSP. Regarding 1)Rwangingo-Karangazi, they are filling water in Rwangingo-Dam, so they should consider about training IWUOs about operation & maintenance of the facilities. The main challenges of the Kanyonomba and the Ntende are how to operate and maintain the facilities properly.

b) The Non-Developed Marshlands

The Non-Developed Marshlands are consisting of Eleven(11) Marshlands.

2)Cyamuganga, 3)Rushenyi, 4)Mingao, 5)Gahama, 6)Nyamarebe, 7)Kanyonyomba Ⅱ, 9)Karundura,10)Mugogo,11)Mishunzi, 12)Mbogo, 13)Kagende..

These Marshlands don't have enough water to cultivate rice, and some parts of these Marshlands are owned by individual farmers like hillside. Regarding these Marshlands, we have to consider about irrigation for horticulture products like the Small Scale Irrigation.

(3) The record of the field visit

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

Date	Marshlands	Notes
24th May,2016	1)Rwangingo-Karangazi,2)Cyamuganga, 3)Rushenyi	
25thMay,2016	4)Mingao, 5)Gahama, 6)Nyamarebe, 7)Kanyonyomba Ⅱ, 8)Kanyonyomba, 9)Karundura,10)Mugogo	
26thMay,2016	11)Mishunzi, 12)Mbogo, 13)Kagende	
9th June,2016	14)Ntende	

4. The individual data of the Marshlands in Gatsibo

(1) Rwangingo Marshland

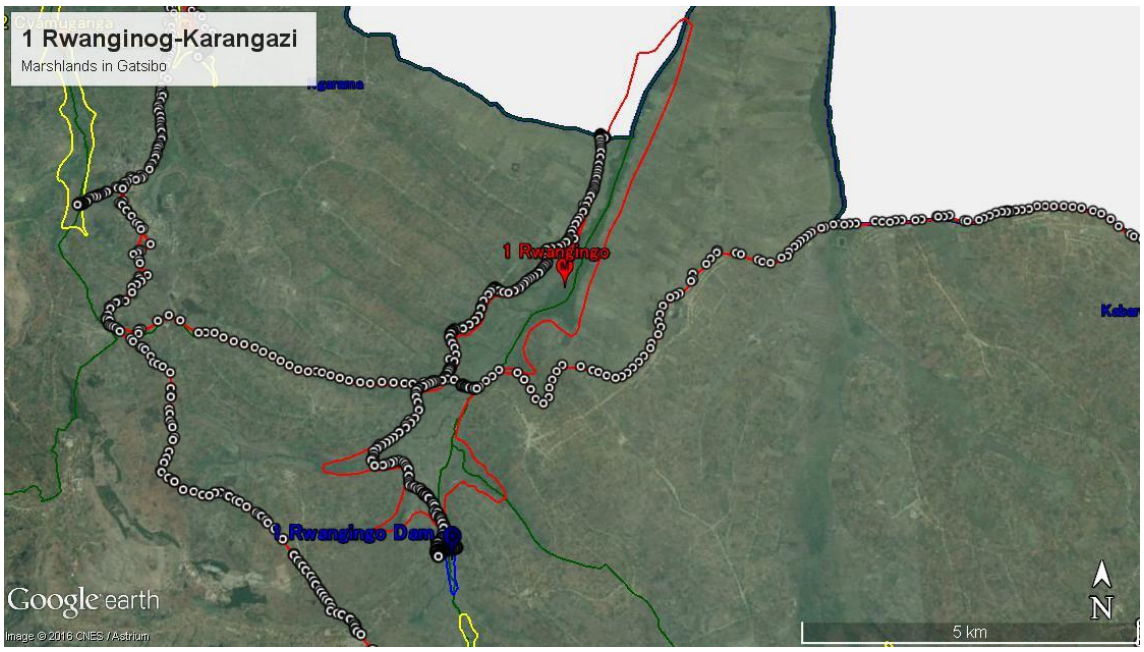
1)Sector　: Kabarore, Gitoki,Ngarama, Gatsibo, Katabagemu, Karangazi

2)Size: 1,100ha

3)Status＆Challenges: This Marshland was developed by RSSP in2015,2016. The Marshland was used for agriculture and cattle breeding

4)Main crop :Maize, Sorghum, Vegetables.

5) Field visit date; 24th May, 2016



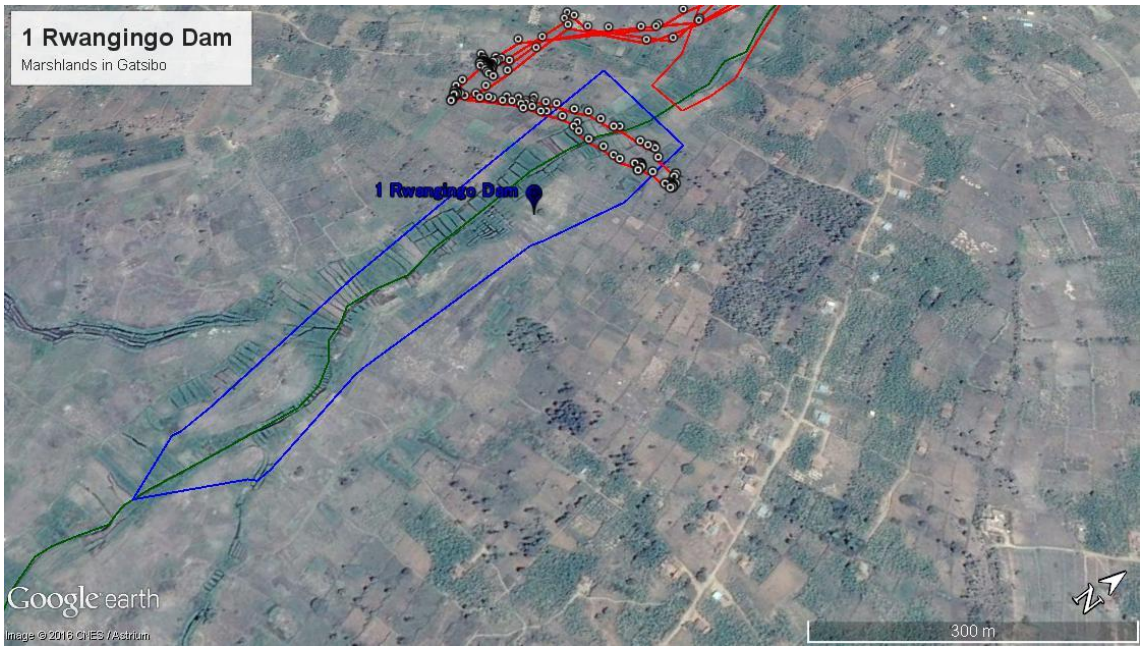
This Marshland which was developed by RSSP is very big. They are growing Maize, but after filling water in the dam they are considering about cultivating rice.

This is the diversion weir made of masonry.

With RSSP Irrigation engineer and RAB staff.

They are struggling to diverse water to the farm.

(1-2) Rwangingo Dam



Rwangingo Dam was constructed by RSSP Project in 2016.

They are filling water now.

This is the spillway which doesn't have the mesh for the fish farming.

The command area is not near the Dam.

(2) Cyamuganga Marshland

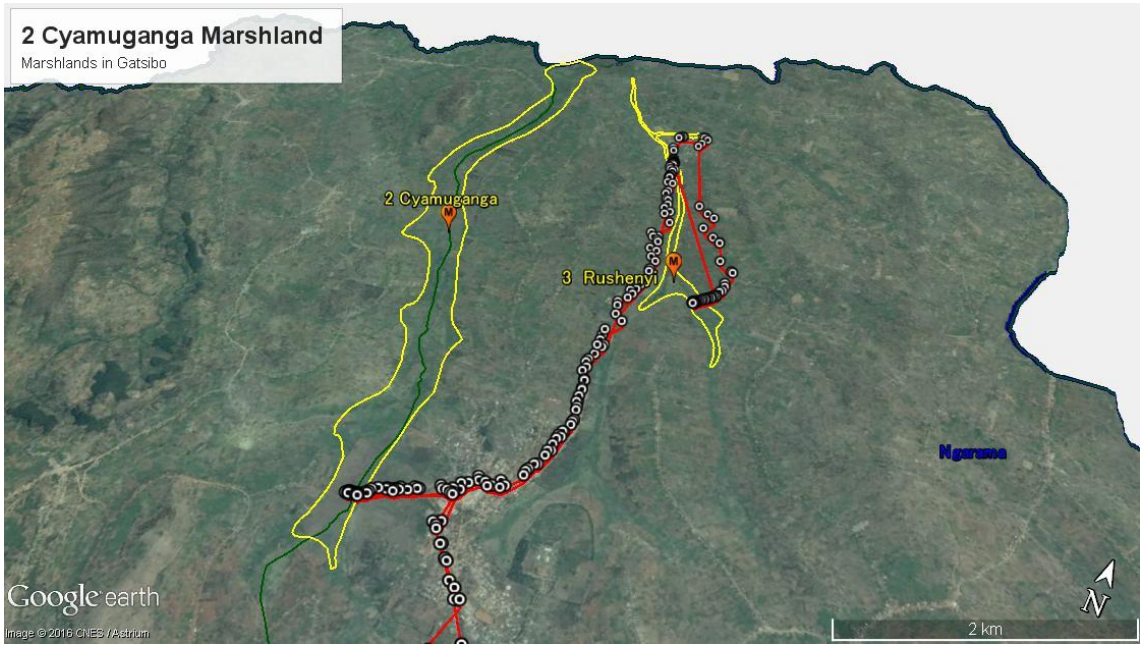
1)Sector: Ngarama Nyagihanga

2)Size: 200ha

3)Status&Challenges: Not developed. Farmers are rotating maize with beans. The Marshland has a small stream.

4)Main crop: Maize, Soy bean, Vegetables.

5) Field visit date; 24th May,2016



This Marshland has not been developed.

Some parts of this Marshland are cultivated by Prisoner.

They grow maize, but sometimes this Marshland was flooded in the rainy season.

(3) Ruhenyi Marshland

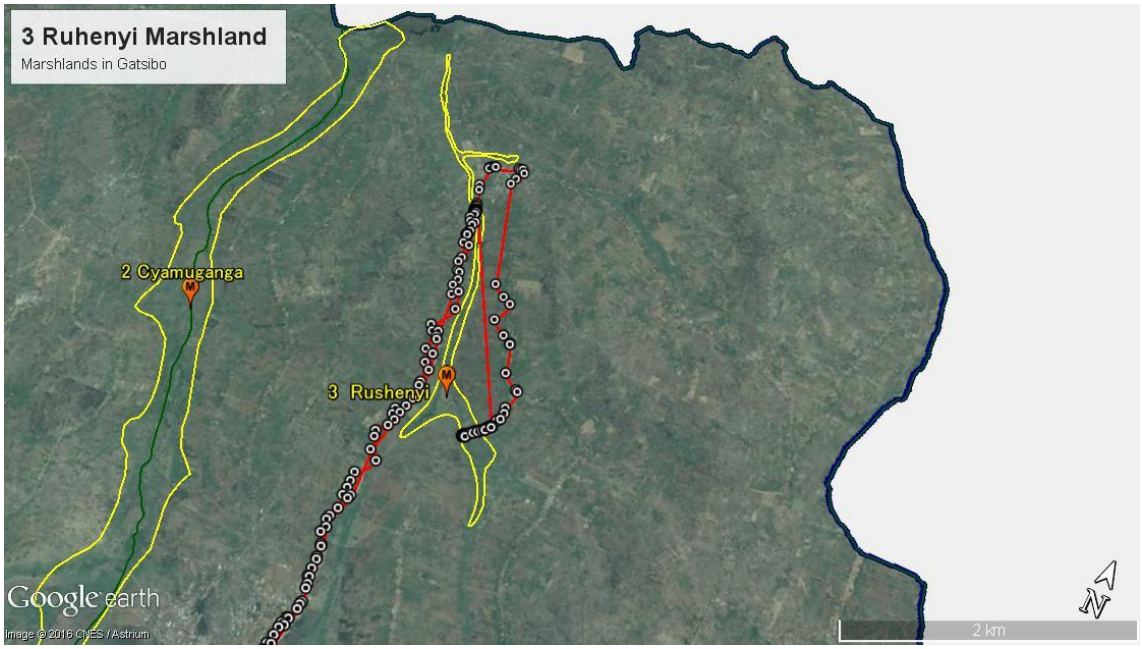
1)Sector: Ngarama

2)Size: 30ha

3)Status&Challenges: Not developed. The problem is that the Marshland is flooded in rainy season and suffers from lack of water in dry season.

4)Main crop: Vegetables, maize and sorghum

5) Field visit date; 24th May,2016



This Marshland has not been developed.

The problem is that the Marshland is flooded in rainy season and suffers from lack of water in dry season.

They are annoyed by the difficulty of water distribution.

The farmer said that all Marshland is flooded in rainy season.

(4) Minago Marhsland

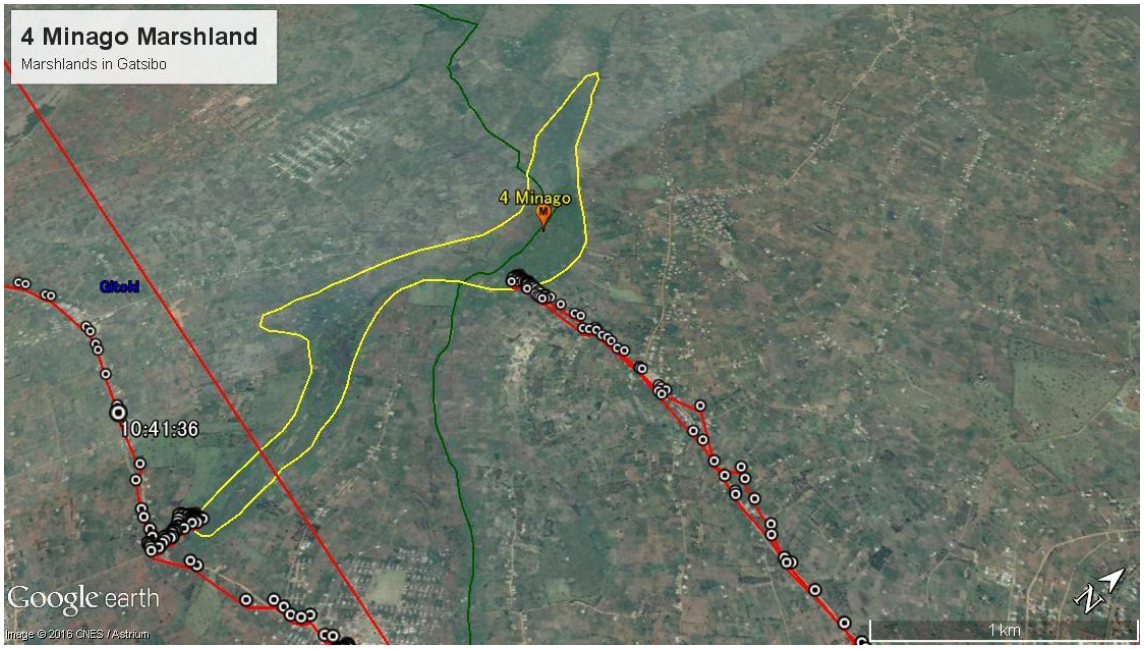
1)Sector: Gitoki, Kabarore

2)Size: 89ha

3)Status&Challenges: Not developed. The Marshland has enough water from springs. Farmers are cultivating vegetable but in the downstream area, there is Cooperative conducting fish farming.

4)Main crop :Vegetables

5) Field visit date; 25th May, 2016



The Minago Marshland has not been developed.

The water resources are springs, and the water is enough, but sometimes flooded.

They cultivate Soy beans, Vegetables and Maize. I think the potential of this marshland is high.

(5) Gahama Marhland

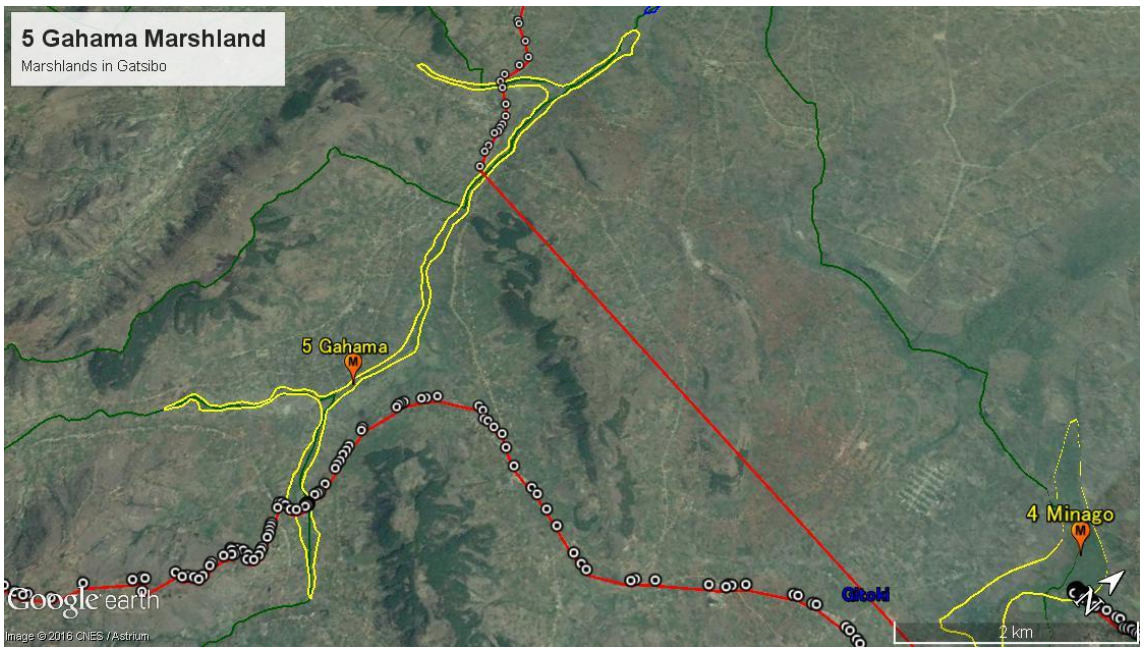
1)Sector: Gitoki,Remera, Kageyo

2)Size: 91ha

3)Status & Challenges: Farmers cultivate different crops. They make big Furrows to drain water.

4)Main crop: Sweet potatoes, vegetables, soy beans

5) Field visit date; 25th May,2016



This Marshland has not been developed.

They said that they suffer from the lack of water in dry season, and flood in rainy season, additionally, the erosion from hillside is a big problem.

I think that there is not so much water in this area, and not suitable for development of QWMDP Project.

(6) Nyamarebe Marshland

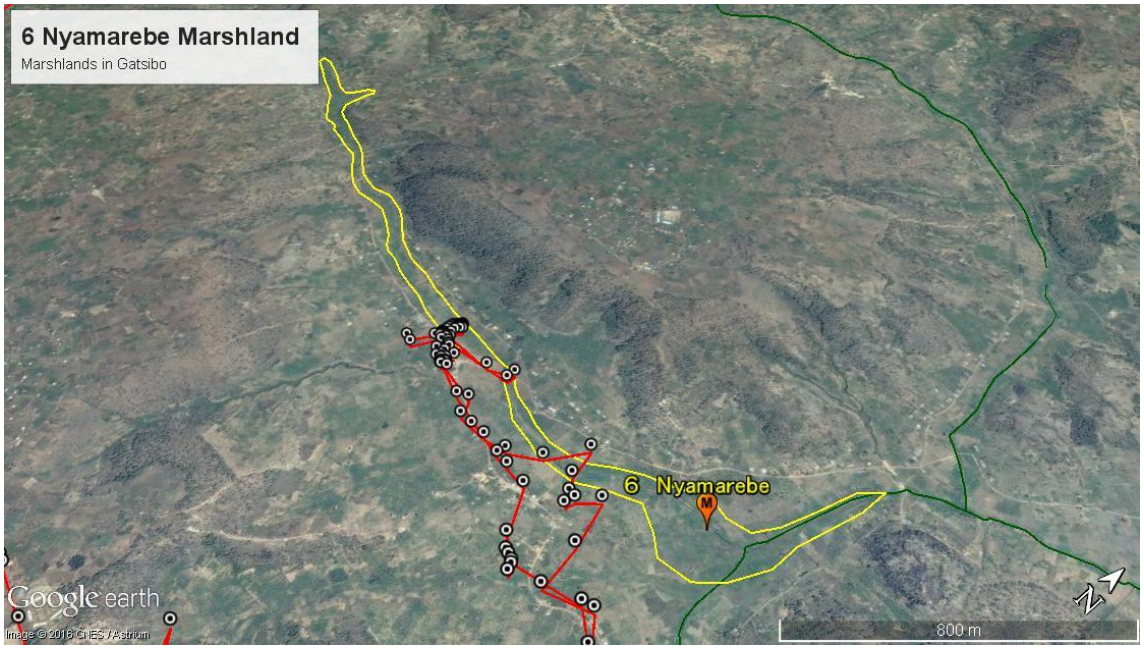
1)Sector :Remera,Rugarama

2)Size: 20ha

3)Status & Challenges: The Marshland has a perennial stream, but the command area is not flat.

4)Main crop :Maize, Soy beans, Sweet potatoes, Vegetables

5) Field visit date; 25th May,2016

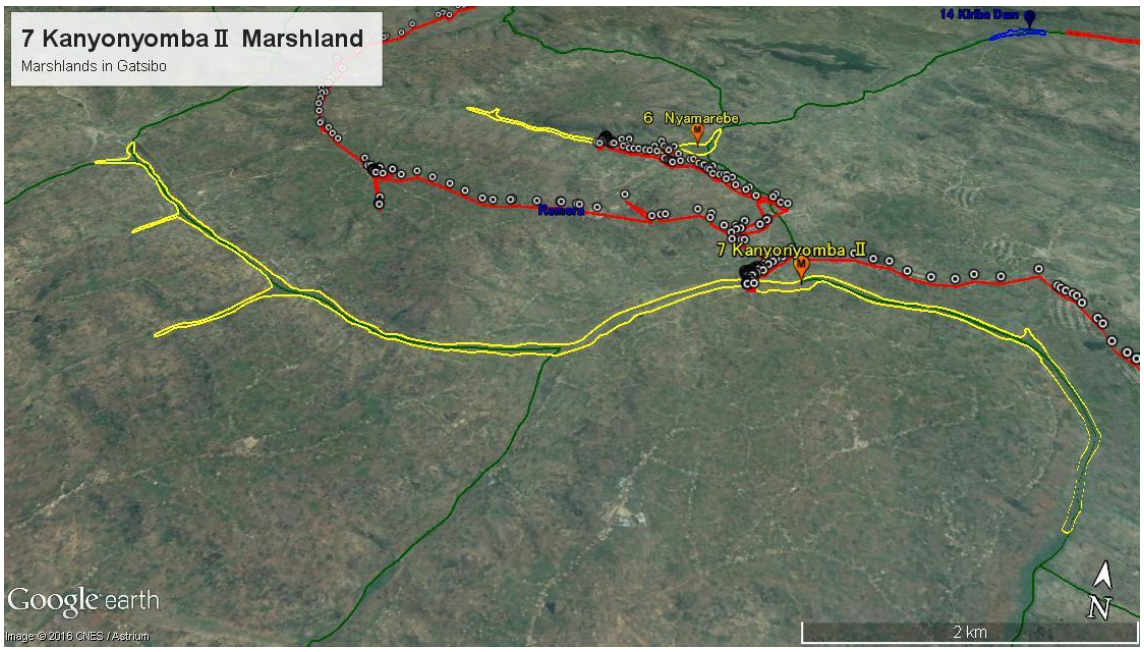


This Marshland has not been developed and located at the upstream area of KIRIBA Dam which was constructed by RSSP Project.

The individual farmers cultivate Beans and Maize. Water is not enough for rice.

(7) Kanyonyomba Ⅱ Marshland

1)Sector: Remera, Muhura, Rugarama
2)Size: 100ha
3)Status＆Challenges:
4)Main crop: The Marshland has enough water but is located at the upstream area of the Kanyonyomba Dam. This Marshland's development may cause the shortage of water in the downstream Dam. Farmers are conducting small irrigation for Vegetables
5) Field visit date; 25th May,2016



Kanyonyomba Ⅱ Marshland has not been developed and located at the upstream area of the Kanyonyomba Dam.

The situation of farm is very good. Water is enough for Beans, Vegetables and Maize, but is not enough for rice because this water is for the Kanyonyomba Dam.

They are using the sprinkler, and planning to ask MINAGRI to support them with the Small Scale Irrigation.

(8) Kanyonyomba Marshland

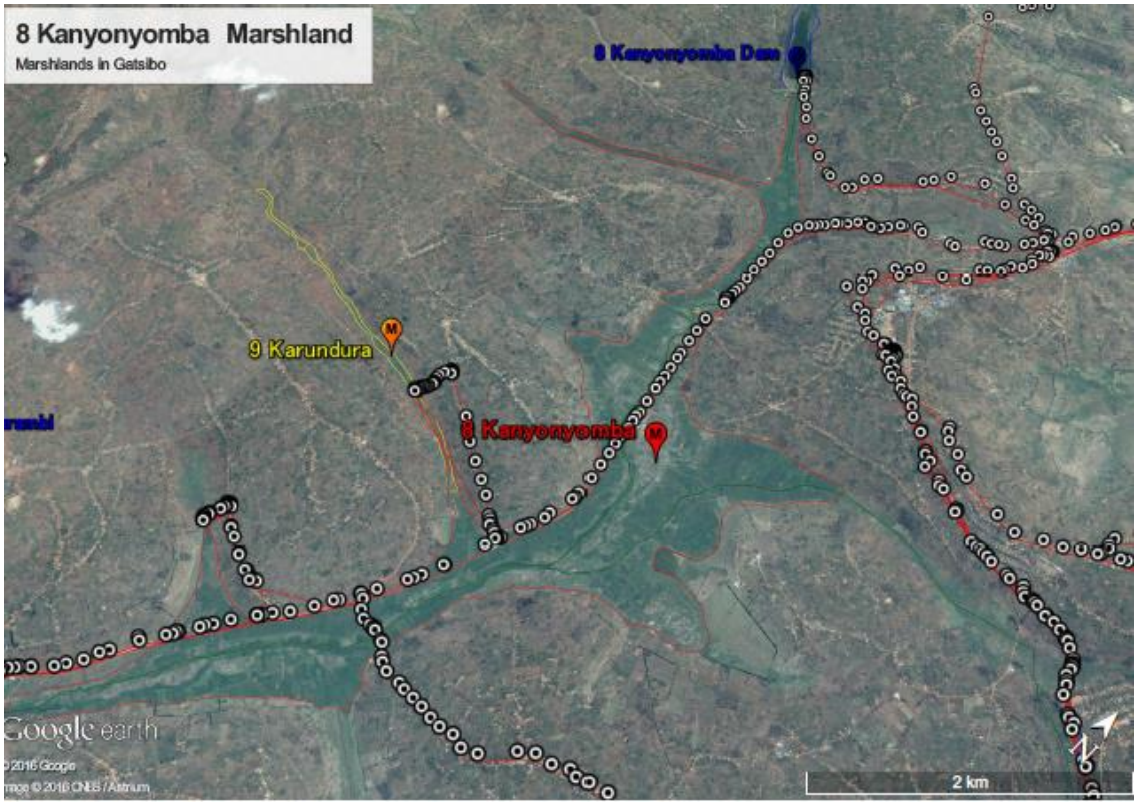
1)Sector: Kiramuruzi Murambi Kiziguro

2)Size: 393ha

3)Status&Challenges: This Marshland was developed by RSSP in 2007. The main issue is the water distribution.

4)Main crop :Rice

5) Field visit date; 25th May, 2016

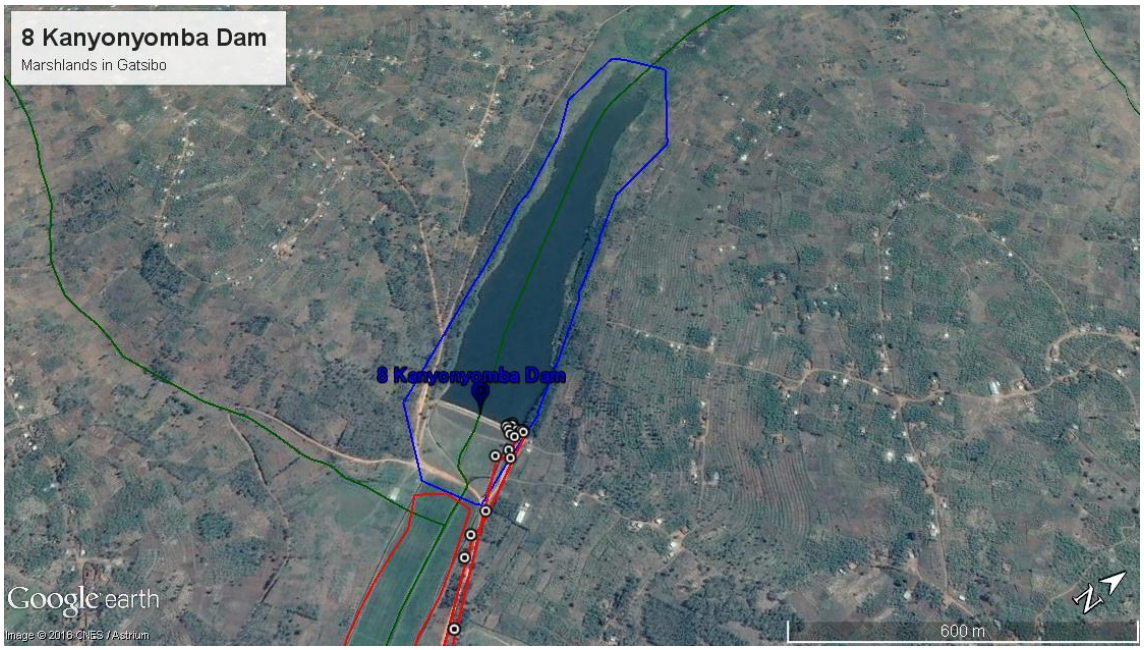


Kanyonyomba Marshland was developed by RSSP, where they cultivate rice.

The drainages are working well.

However, sometimes there are empty canals.

(8-2) Kanyonyomba Dam



Kanyonyomba Dam was constructed by RSSP.

The Dam facilities are working well.

You can see the command area of this project in the downstream area of the Kanyonyomba Dam.

(9) Karundura Marshland

1)Sector :Murambi

2)Size: 14ha

3)Status&Challenges: The Karundura Marshland is a small branch on the Kanyonyomba Marshland. It has a small stream. Farmers are cultivating different crops. If developed, they can cultivate rice.

4)Main crop: Sweet Potatoes, Vegetables, Soy beans, Maize.

5) Field visit date; 25th May, 2016

The Karundura Marshland is a branch of The Kanyonyomba Marshland. This Marshland has not been developed, and they are cultivating Sorghums, Maize , Beans.

They said that the situation of this marshland was not good.

There is no flood and no erosion.

(10) Mugogo Marshland

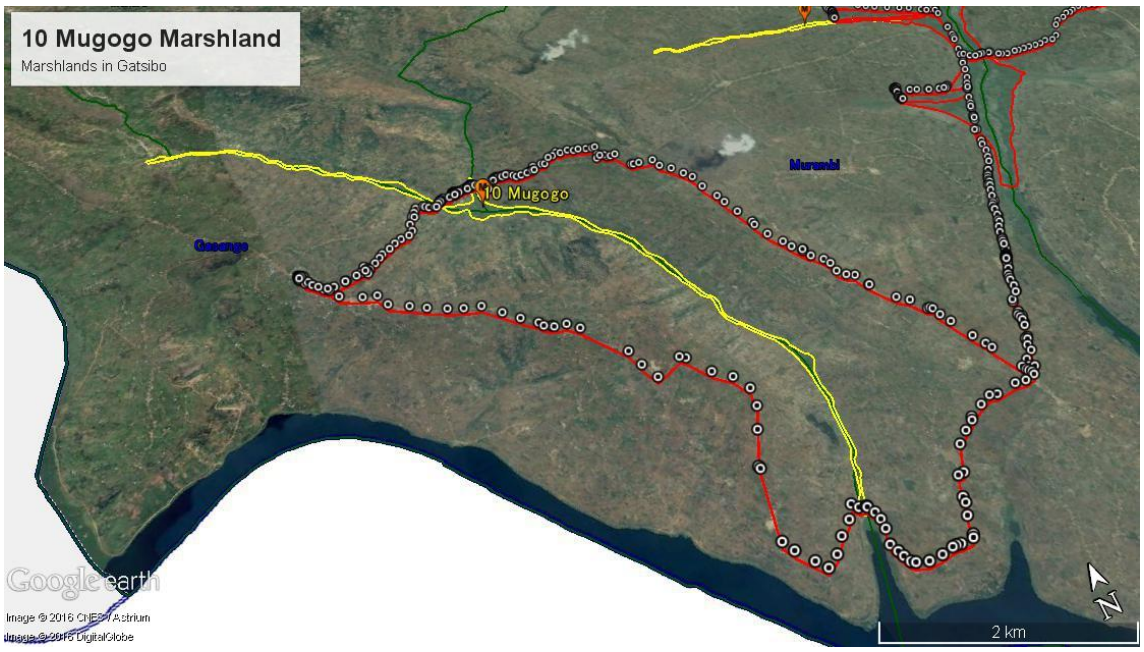
1)Sector: Gasange,Murambi,Murura

2)Size: 60ha

3)Status&Challenges: This Marshland has not been developed. There is a problem of the shortage of water.

4)Main crop: Beans, Potatoes and Vegetables

5) Field visit date; 25th May, 2016



This Marshland has not been developed.

They cultivate Beans, Potatoes and Vegetables.

However they said the water is enough.

(11) Mishunzi Marshland

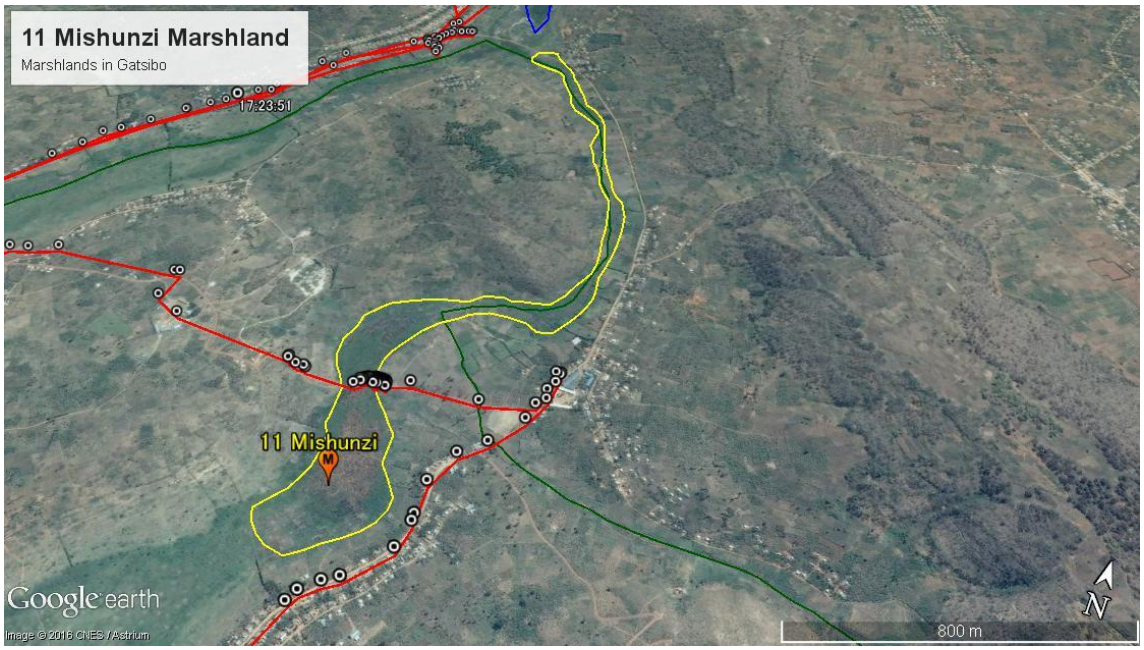
1)Sector: Kiziguro,Rugarama

2)Size: 28ha

3)Status＆Challenges: This Marshland has not been developed.

4)Main crop: Sorghum and so on

5) Field visit date; 26th May,2016



This marshland is like Swamp. They cut the grasses for feeding cows.

They cultivate Sorghums also.

She was preparing to combine grasses to use for the house use.

They said this area is flooded in rainy season.

(12) Mbogo Marshland

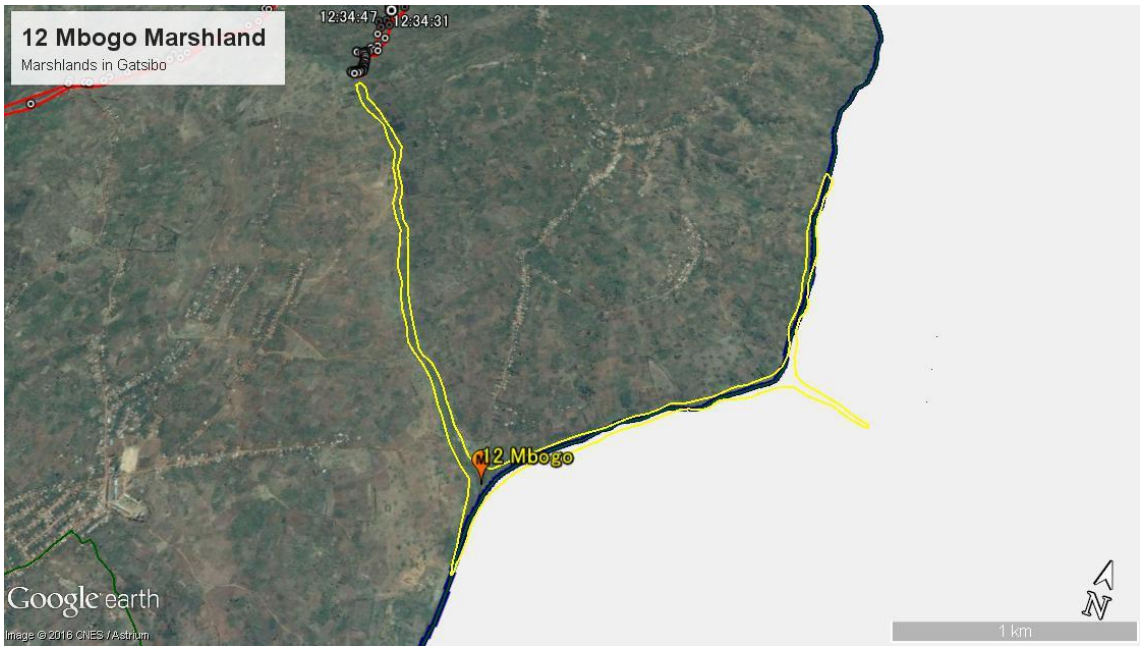
1)Sector:Kiziguro

2)Size: 26ha

3)Status＆Challenges: This Marshland has not been developed.

4)Main crop :Beans, Sorghums

5) Field visit date; 26th May,2016



Mbogo Marshland has not been developed.

They cultivate Soy beans and Sorghums.

They suffer from the lack of water, but no flood and no erosion.

(13) Kagende Marshland

1)Sector:Kiramuruzi

2)Size: 27 ha

3)Status＆Challenges: This Marshland has not been developed.

4)Main crop :Maize, Potatoes

5) Field visit date; 26th May, 2016

Kagende Marshland is not bad situation. They cultivate Vegetables, Maize and Potatoes.

There is enough water, but they said that they suffer from the lack of water in dry season.

The water resource is the spring. They use it for the domestic water.

They said the bad road to the market protect from conveying good quality products.

(14) Ntende Marshland

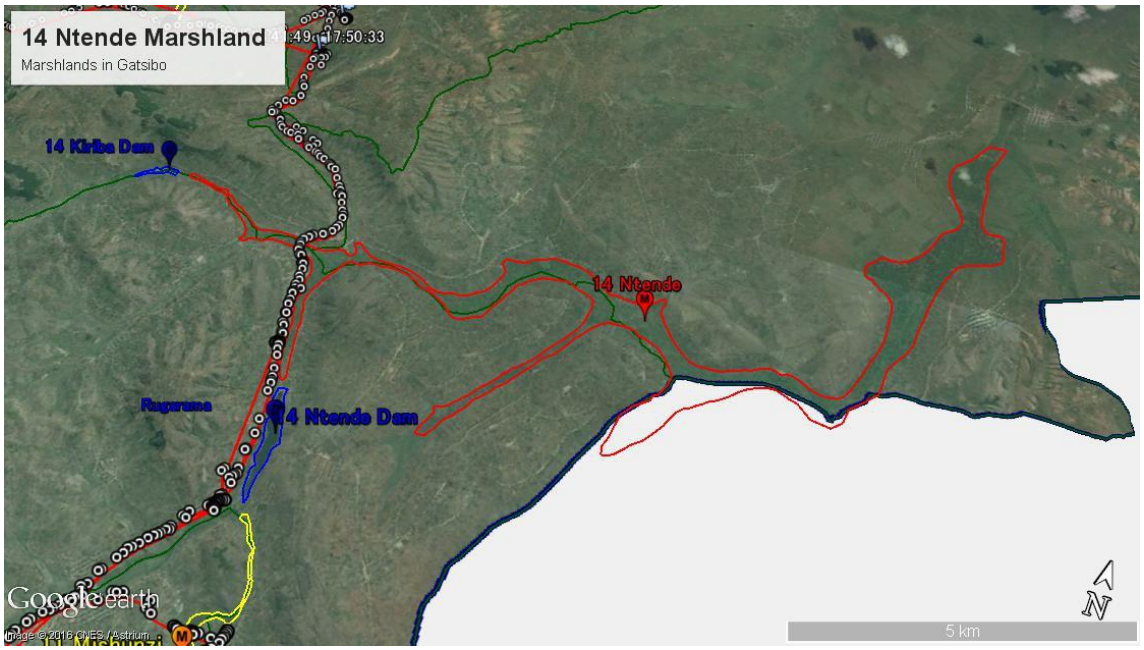
1)Sector: Rugarama, Rwimbogo, Gitoki

2)Size: 900ha

3)Status＆Challenges :Developed by RSSP in 2009

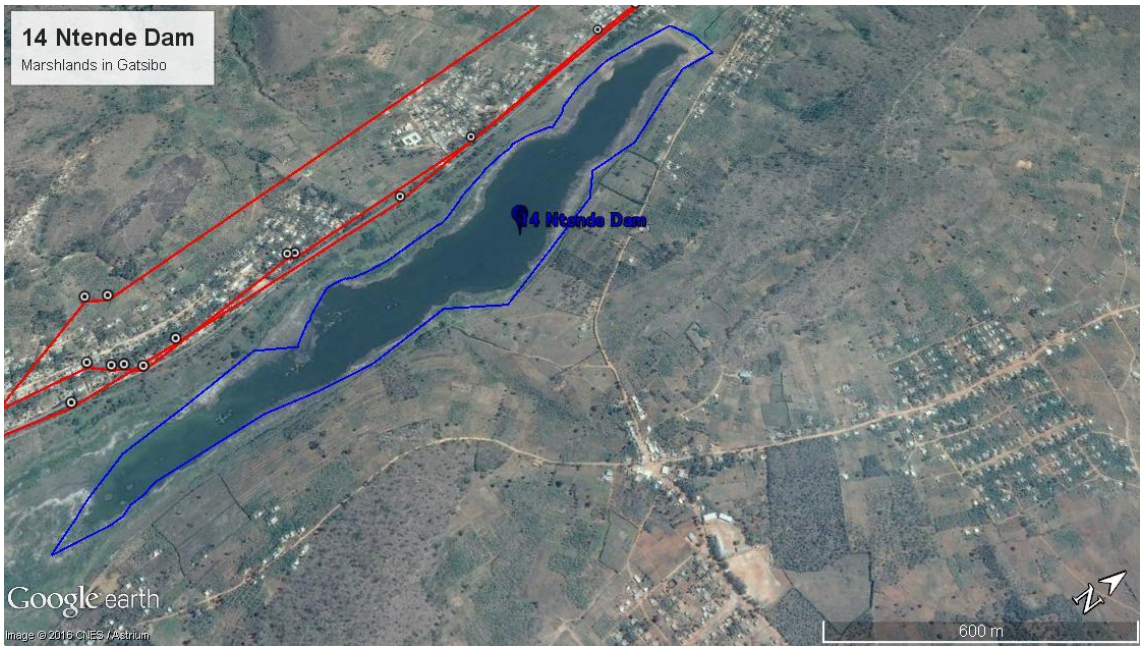
4)Main crop: Rice

5) Field visit date; 9th June, 2016



The Ntende Marshland was developed by RSSP in 2009.They cultivate rice.

(14-2) Ntende Dam



The Ntende Dam was constructed by RSSP along the main road.

This reservoir suffer from grasses. Sometimes IWUO remove these grasses.

(14-3) Kiriba Dam

Kiriba Dam is another dam in this project.

The spillway seems to be too small.

(The end)