

(Annex 2-6)

6.The Marshlands in Nyagatare

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1.The Outline of the Nyagatare District

The District of Nyagatare is one of the seven districts making up the Eastern Province. The District is divided into 14 Sectors, 106 cells and 630 Villages. It spreads over an area of 1920, 11 Km², with Uganda at its North, Tanzania at its East, Gatsibo District at South and Gicumbi District on its West.

It is the one of the largest districts in the country with the total population of 466,944(NISR2012 population census results). The table below shows how the population is distributed across the 14 sectors that made up Nyagatare district.

Table 1: Population of Nyagatare district disaggregated by sectors and sex

| Sector | Population(male) | Population (female) | Total |
|------------|------------------|---------------------|--------|
| GATUNDA | 13,369 | 14,510 | 27,879 |
| KARAMA | 12,662 | 14,065 | 26,727 |
| KARANGAZI | 28,541 | 28,330 | 56,871 |
| KATABAGEMU | 16,789 | 17,862 | 34,651 |
| KIYOMBE | 8,016 | 9,045 | 17,061 |
| MATIMBA | 11,921 | 12,247 | 24,168 |
| MIMULI | 13,081 | 14,285 | 27,366 |
| MUKAMA | 10,450 | 11,369 | 21,819 |
| MUSHELI | 15,841 | 16,562 | 32,403 |
| NYAGATARE | 26,062 | 26,063 | 52,125 |
| RUKOMO | 16,681 | 17,696 | 34,377 |

| | | | |
|-----------|----------------|----------------|----------------|
| RWEMPASHA | 9,793 | 9,535 | 19,328 |
| RWIMIYAGA | 29,463 | 29,463 | 58,847 |
| TABAGWE | 16,020 | 17,302 | 33,322 |
| Total | 228,610 | 238,334 | 466,944 |

Source: NISR, 2012 provisional census results

(1) Geographical features

The District of Nyagatare is generally characterized by short hills separated by dry allies for a long period of the year (June- October). The District is located in the granite with low valley whose average altitude is 1513; 5m (District Monograph 2012)

(2) Climate

The District of Nyagatare experiences small quantity of rains and hot temperatures. According to the district climate survey of 2009, It is characterized by two main seasons: one long dry season that varies between 3 and 5 months with an annual average temperature varying between 25,3°C et 27,7°C. The monthly distribution of the rains varies from one year to another. Annual rain falls are both very weak (827 mm/an) and very unpredictable to satisfy the needs in agriculture and livestock.

(3) Hydrographic Description

The hydrographic network is very limited in the District of Nyagatare. A part from the Muvumba River that cuts across the District, The Akagera and Umuyanja rivers passing the District constituting its limits with Tanzania and Uganda respectively, there is no other big consistent rivers that can be

exploited by the population of Nyagatare. The district also has other few and small rivers such as Nyiragahaya, Kayihenda, Karuruma, Nayagasharara and Kaborogota. These are erratic and intermittent.

The weak river network constitutes a serious handicap to responding to the needs of water for people and animals.

(4) Fauna and Flora

The District of Nyagatare contains a half of Akagera National Park where a vast number of Wild life including buffalo, Antelopes and more other ruminants are living. The District also accommodates a huge variety of birds such as birds of prey, guinea-fowl, partridges, heroes and so forth. The hares, Wild boars, monkeys and more other small beasts of the rodent family are rarely found in the wooden savanna and in the natural vegetation.

This implicates the potentials for tourism and related economic activities to the district.

The Flora in Nyagatare is generally made of afforested savanna vegetation and some forestry gallery. The latter constitutes a very precious reserve which should be rationally exploited.

(5) Soils

The soil of Nyagatare District is characterized by the tightness of the hum fare layer of the soil brought about by the grassy savanna and by the verity soils that are rich in nutrients and mineral

2.Nyagatare District Irrigation Plan

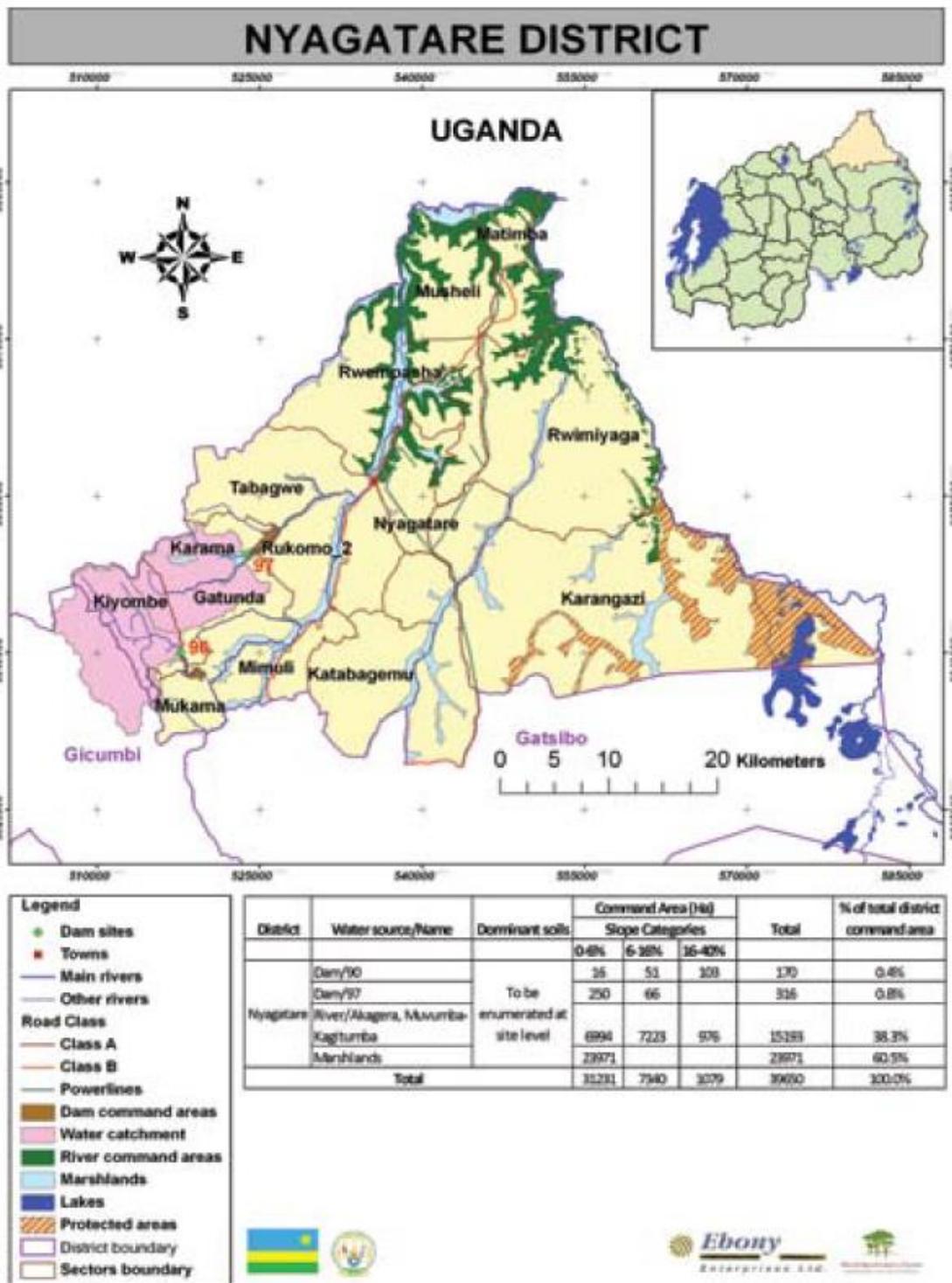
Nyagatare district has command areas represented in river, marshlands and dam domains. Riverine PIAs are all located along Akagera and Muvumba-Kagitumba rivers on the northern and upper eastern sections of the district. While the potential for dams is only possible in the southwestern zone of the district, the marshlands are evenly spread.

There is ongoing irrigation of rice along the Muvumba valley, with marshland irrigation for hytCodervam 2&3 covering over 7km of canals and a further 7km of drainage works. Livestock production, a major priority, can be boosted through irrigation of fodder. The IMP study indicates that a total of 39 650 ha have good potential for irrigation in this district. Of these, the marshlands and river domains constitute the largest portions, with 23 971 ha (60.5%) and 15 193 ha (38.3%), respectively. The rest of the command areas belong to the dam domain, covering an area of 486 ha (1.2%). The total irrigation water requirement for Nyagatare is about 357.3 Mm³ partitioned into 239.7 Mm³ for marshlands and 117.6 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 Nyagatare

| | Area(ha) | Ratio(%) |
|-----------|----------|----------|
| Dam | 486 | 1.2% |
| Lake | - | 0% |
| River | 15,193 | 38.3% |
| Marshland | 23,971 | 60.5% |
| Total | 39,650 | 100.0% |

The total area of Marshlands in Nyagatare is **2,805 ha** which is **11.7%** of the Potential area of marshland.

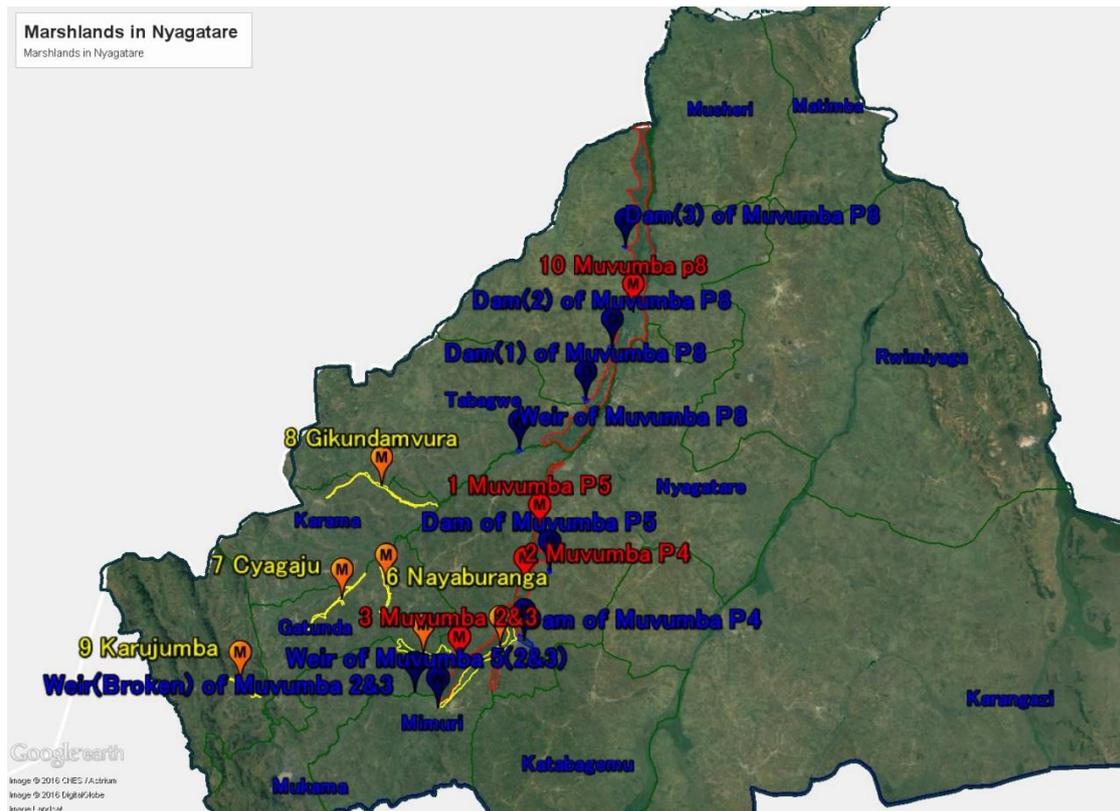


(Figure 1 :The Potential Irrigable areas in Nyagatare)

3. The Outline of the Marshlands in Nyagatare District

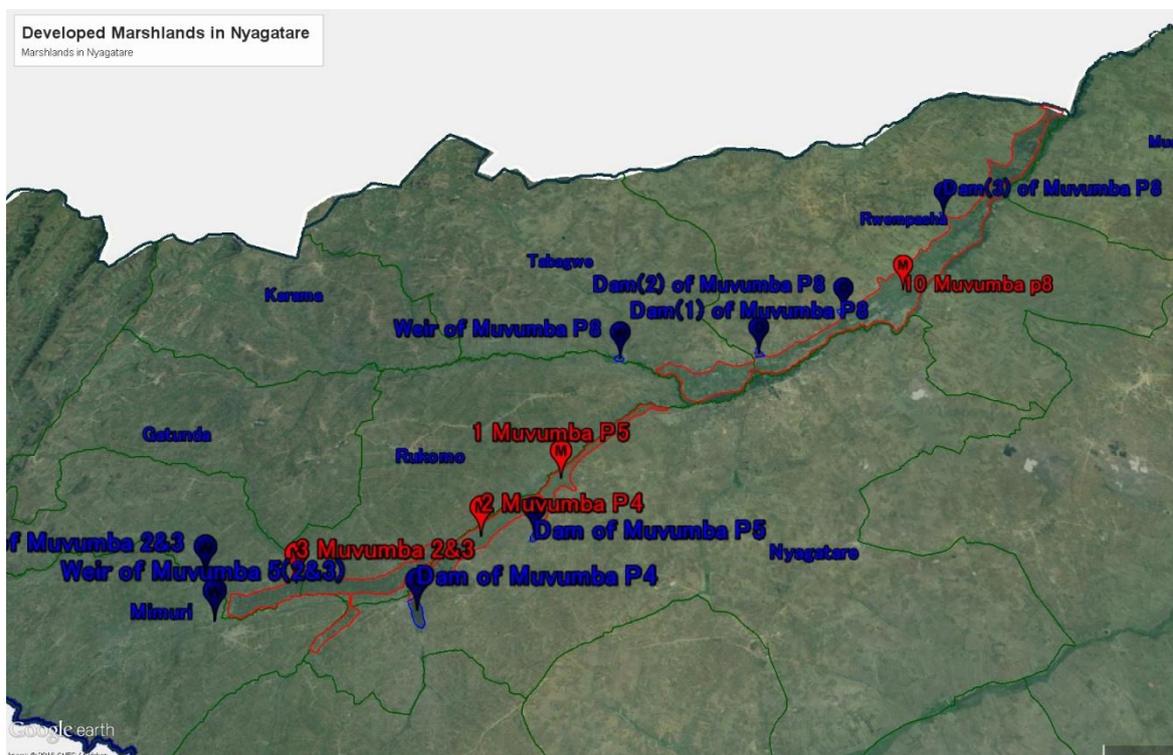
(1) The Outline of the Marshlands in Nyagatare District.

Nyagatare District has Ten (10) Marshlands, 2,805ha. They are Four (4) Developed Marshland, 2,467ha, and Six (6) Non-Developed Marshlands, 338ha.



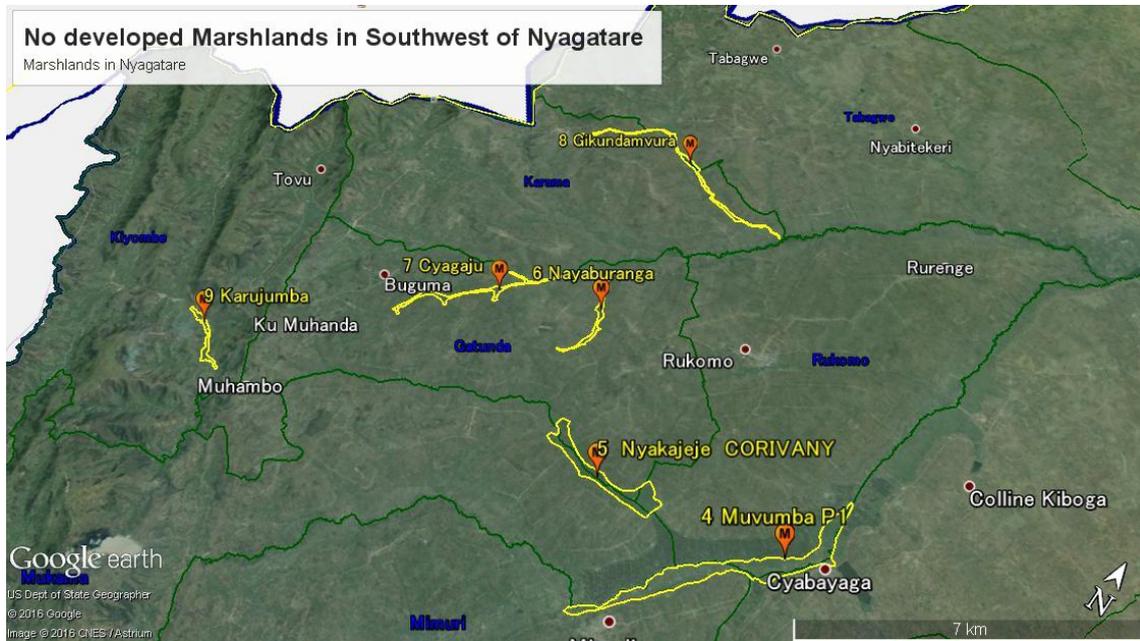
(Figure 2 : Marshlands in Nyagatare)

There are Four (4) Developed Marshlands along the Ngoma & Muvumba river in the middle of Nyagatare District. 1)The Muvumba P5 (140ha) was developed by RSSP in 2006 also, and 2)the Muvumba p4 (160ha) was developed by Chinese company and 3)Muvumba p2&3 was developed by Canada in 1980s. The water resource of these three Marshlands is Ngoma River. The 10)Muvumba P8 (1,750ha), which is the biggest Marshland Irrigation Project in Rwanda, was developed by RSSP in 2011, whose water resource is the Muvumba River.



(Figure 3 :Developed Marshlands in Nyagatare)

There are Six (6) Non-Developed Marshlands in the Southwest of Nyagatare, which are 4)Muvumba p1, 5)Nyakajeje CORIVANY, 6)Nyabunga, 7)Cyagaju, 8)Gikundamvura, 9)Karujumba.



(Figure 4: Non-Developed Marshlands in the Southwest of Nyagatare)

(2) Comments for Marshlands in the Nyagatare District

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

a) The Developed Marshlands

1)Muvumba P5, 2)Muvumba P4, 3)Muvumba P2&3, 10)Muvumba p8

These Four (4) Marshlands were developed by deferent donors, which means 1)Muvumba p5 by RSSP in 2006 with a Dam, 2) Muvumba p4 by Chinese company in 2003, 3)Muvumba P2&3 by Canada , 10)Muvumba p8 by RSSP in2011 with a weir and Three(3) Dams. Regarding facilities, there is a big problem in the Muvumba 2&3, which have a broken Weir and a canal with the broken Intake. These facilities should be rehabilitated immediately. Other three projects have some troubles like dyke for protection of flood in 1) Muvumba p5, low level of plot in 2)Muvumba p4 and the soil salinity in 10)Muvumba p8. We should solve these challenges.

b) The Non-Developed Marshlands

4)Muvumba P1,5)Nyakajeje CORIVANY, 6)Nyabunga, 7)Cyagaju,

8)Gikundamvura, 9)Karujumba

There are Six (6) Non-Developed Marshlands in the Nyagatare District.

4)Muvumba p1 is located along the Muvumba 2&3 site. If they can use water from the Ngoma River for Muvumba 1 site, the potential of this site to be developed is very high.

In Two (2) Non-Developed Marshlands; 5)Nyakajeje CORIVANY and 8)Gikundamvura, they cultivate rice. These two Marshlands have potential to be developed for paddy fields. However, because of the shortage of water, we should consider about constructing Dams.

Regarding Three (3) Non-Developed Marshlands; 6)Nyabunga, 7)Cyagaju, 9)Karujumba, it is difficult for them to be developed, because of the shortage of water and bad access roads.

(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 Sector Agronomists to go to the Marshlands with us. On the field, we conducted the interview to Sector agronomists or farmers about the situation of the marshlands, and picked up the phone number of the contact persons of the Cooperative or IWUOs in that field. After coming back to Kigali, we conducted the interview for those persons.

| Date | Marshlands | Notes |
|---------------------------|---|-------|
| 7 th June,2016 | 1)Muvumba P5, 2)Muvumba P4, 3)Muvumba P2&3, 4)Muvumba P1 | |
| 8 th June,2016 | 5)Nyakajeje CORIVANY, 6)Nyabunga, 7)Cyagaju, 8)Gikundamvura, 9)Karujumba | |
| 9 th June,2016 | 10)Muvumba P8 | |



4. The individual data of the Marshlands in Nyagatare

(1) Muvumba P5 Marshland

1)Sector :Nyagatare

2)Size :140ha

3)Status& Challenges: The big challenge is the flood from the river during rainy season. Around 35ha are flooded and they would like to have a dyke to protect their plots. Another issue is the protection of canal from hillside erosion and cattle interrering the command area. Erosion is mainly coming from settlement around the Marshland

4)Main crop :Rice

5) Field visit date; 7th June, 2016



The Muvumba P5 Marshland was developed by RSSP in 2006.



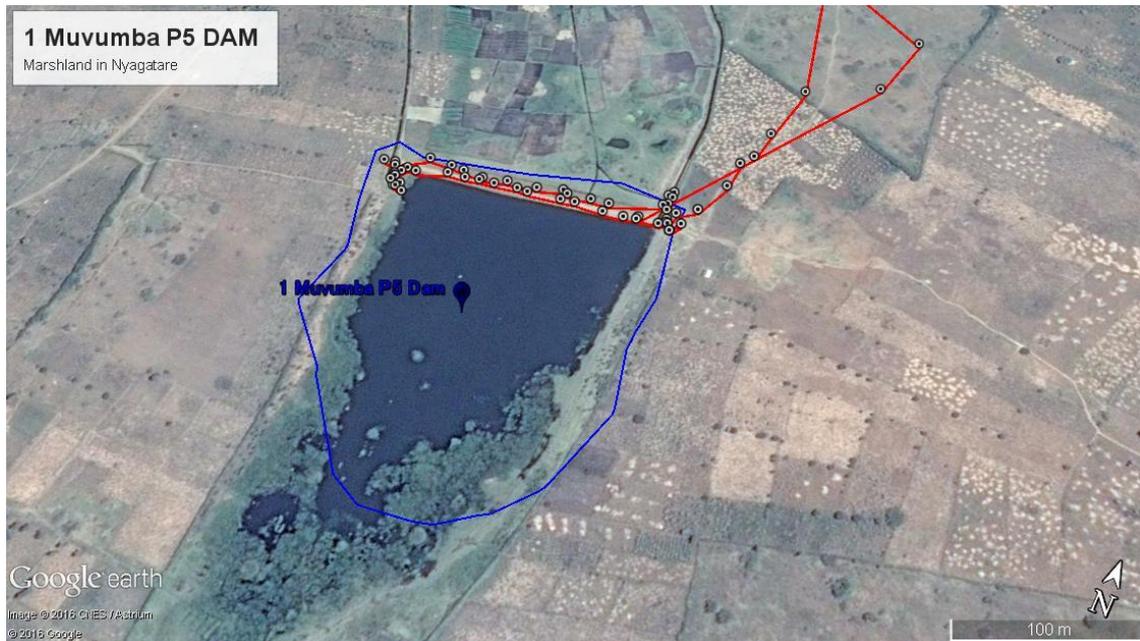
We visited the IWUO(Irrigation Water Users Organization) Office of the Muvumba P5 Marshland, and discuss the situation of their facilities.



Their big problem is the flood and they want to make the dyke to protect plots. The erosion from hillside is a big problem also.



(1-2) Muvumba P5 Dam



They have a Dam for the irrigation, but water source is the canal. This is the reservoir.



The IWUO officer mentioned that they suffer from the shortage of water in dry season because the upstream farmers take much water.



(2) Muvumba P4 Marshland

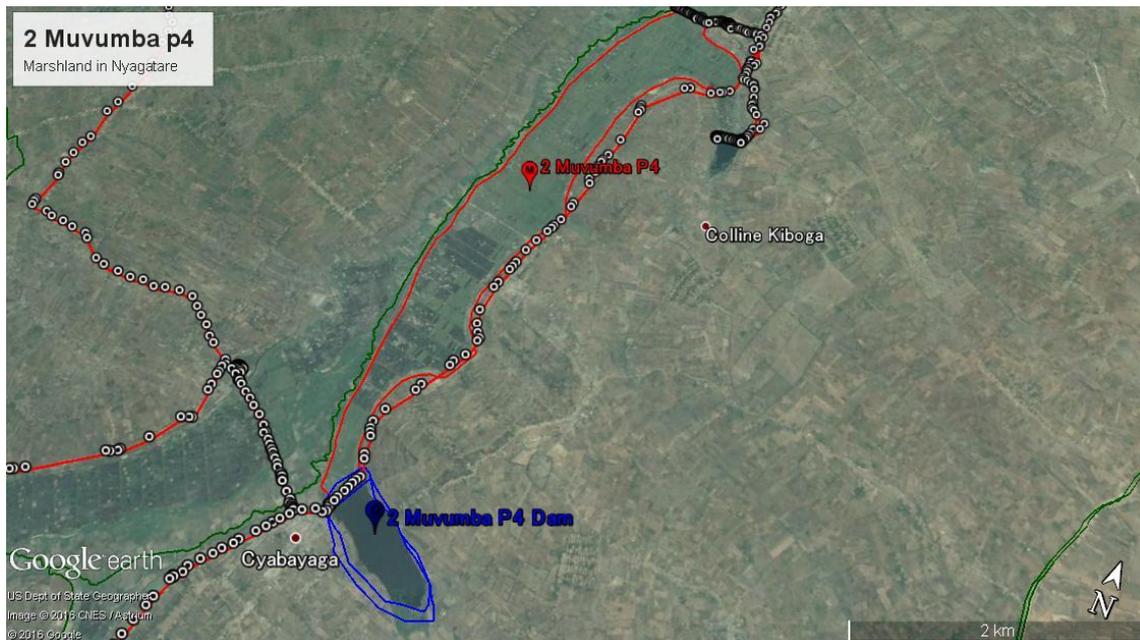
1)Sector :Nyagatare

2)Size: 160ha

3)Status& Challenges: Plots near the canal are at lower level which causes flood and near the river they have the shortage of water. The issue is the plot leveling.

4)Main crop: Rice

5) Field visit date: 7th June, 2016



They said that the problem is the plot leveling in this Marshland.



(2-2) Muvumba P4 Dam



This Dam's water resource is the canal from the upstream place.



(3) Muvumba P2&3 Marshland

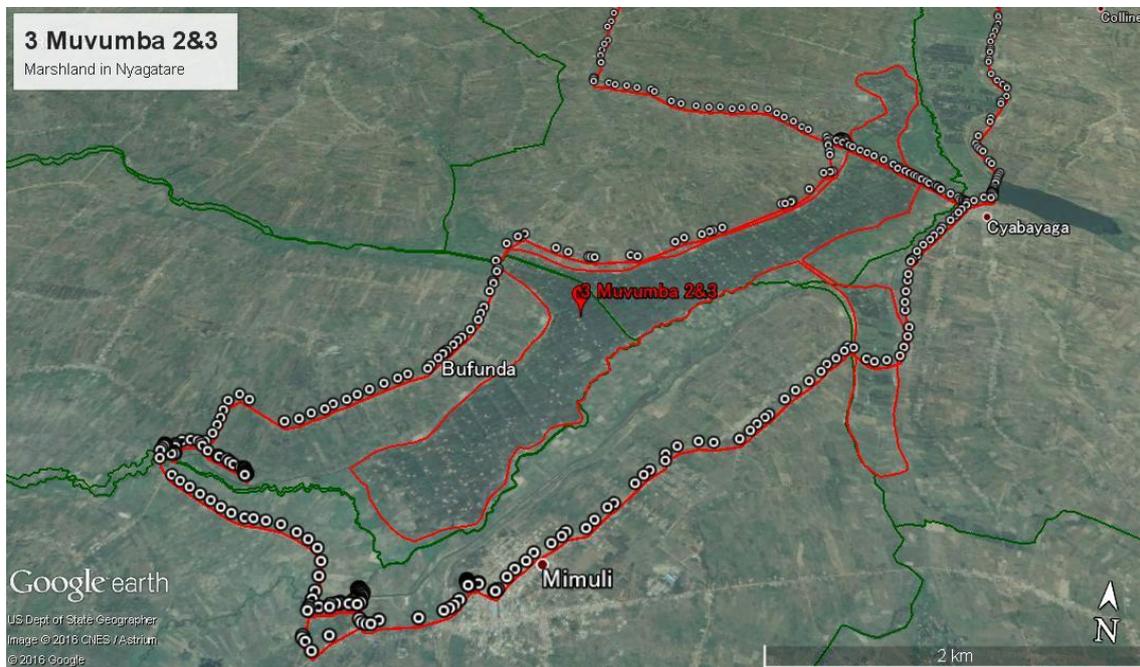
1)Sector: Mimuli, Rukomo

2)Size: 417ha

3)Status& Challenges: The main issues are related to the old infrastructure constructed in 1982. The main intake on the Ngoma River has been destroyed. Along the main canal, The intake for secondary canal is not operational. The dry areas are old, and they propose to increase the command area.

4)Main crop :Rice

5) Field visit date: 7th June,2016



The Muvumba 2&3 Marshland was developed by Canada in 1980. They cultivate rice.



The canal dyke was broken and it is very dangerous.



(3-2) The Weir(Broken) of Muvumba 2&3



The Weir and intake from the Ngoma River was broken. The Ngoma River flow into the canal directly, which is not good situation.



The IWUO president asks us to support to repair their Weir.



(4) Muvumba P1 Marshland

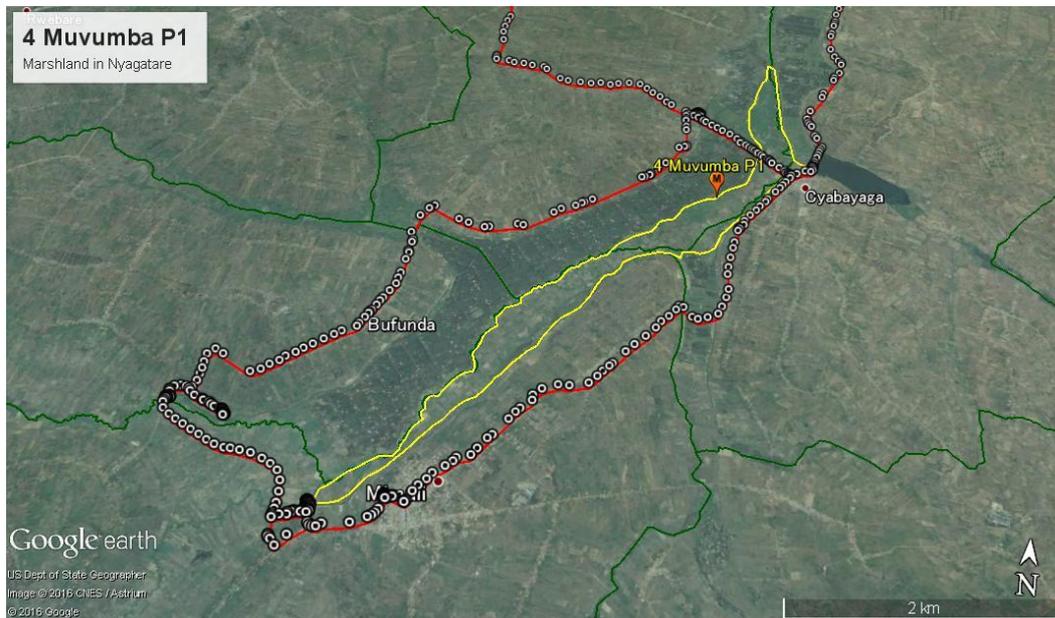
1)Sector : Mumuli

2)Size : 100ha

3)Status& Challenges: Individual farmers are growing sugarcanes and other crops. If the area is developed, they can expand the paddy field. In the former days, this area was flooded many times, but in nowadays there is no flood. That's why the area can be developed.

4)Main crop: Sugarcane etc.

5) Field visit date: 7th June, 2016



This Marshland has not been developed. The IWUO members of Muvumba 2&3 asked us to consider about developing this Marshland.



(5) Nyakajeje CORIVANY, Marshland

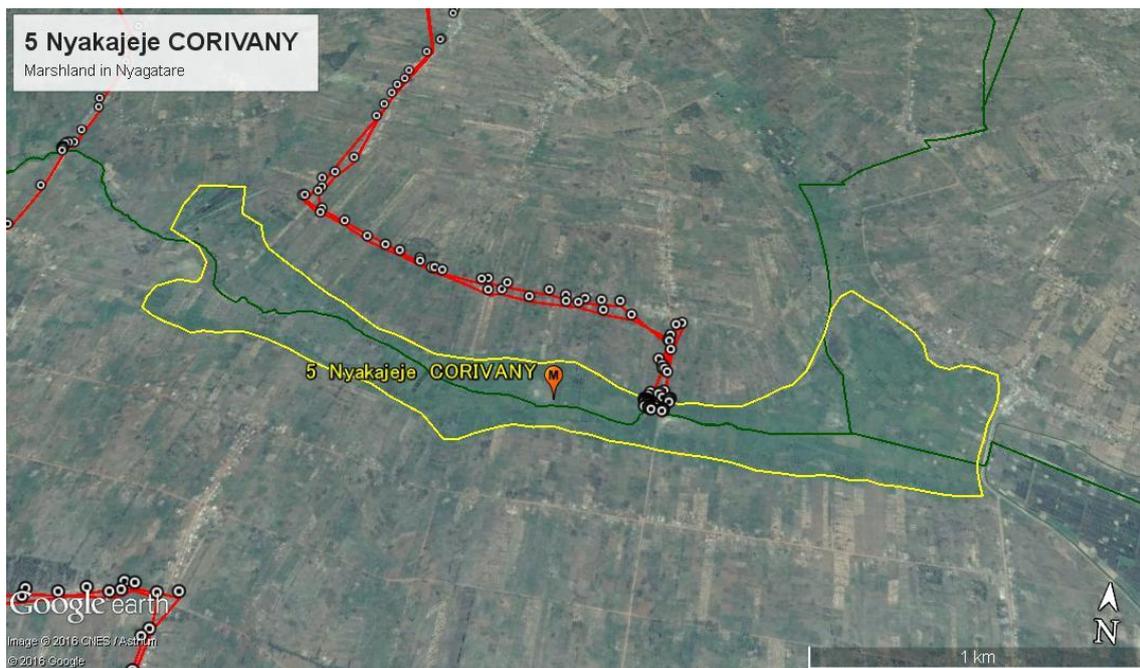
1)Sector : Gatunda

2)Size: 80ha

3)Status& Challenges: The main issue is the flood during rainy season and the shortage of water in dry season. Farmers would like to have a Dam in the upstream areas.

4)Main crop :Rice

5) Field visit date: 8th June,2016



The Nyakajeje CORIVANY, Marshland has not been developed, but the farmers made canals and plots.



The water source is the stream, and they suffer from the shortage of water in dry season. They should make the reservoir to store water.



They suffer from flood in rainy season.



(6) Nyaburunga Marshland

1)Sector : Gatunda

2)Size: 10ha

3)Status& Challenges: They are cultivating different crops. Water comes from spring but not enough

4)Main crop: Sweet and Irish potatoes, Vegetables, Sorghum and Maize

5) Field visit date: 8th June, 2016



They do the furrow irrigation, but they suffer from the lack of water especially in dry season.



They don't have the access road and it is not easy to convey the product to the market from this Marshland easily.



(7) Cyagaju Marshland

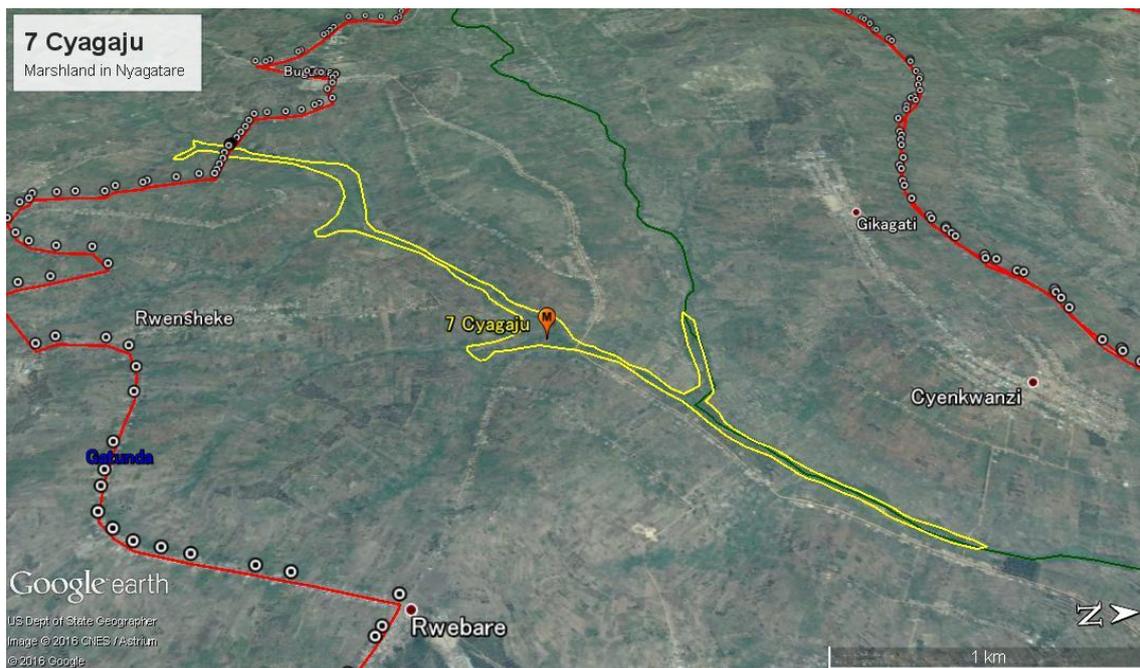
1)Sector: Gatunda

2)Size: 45ha

3)Status& Challenges: The marshland is too small and a large part is belonging to private farmers. Downstream farmers are cropping rice and it cannot be developed without a Dam

4)Main crop: Maize, sweet potatoes, vegetables and rice downstream

5) Field visit date: 8th June,2016



This Marshland suffers from the lack of ware in dry season and flood in rainy season. It is not easy to develop this Marshland.



(8) Gikundamvura Marshland

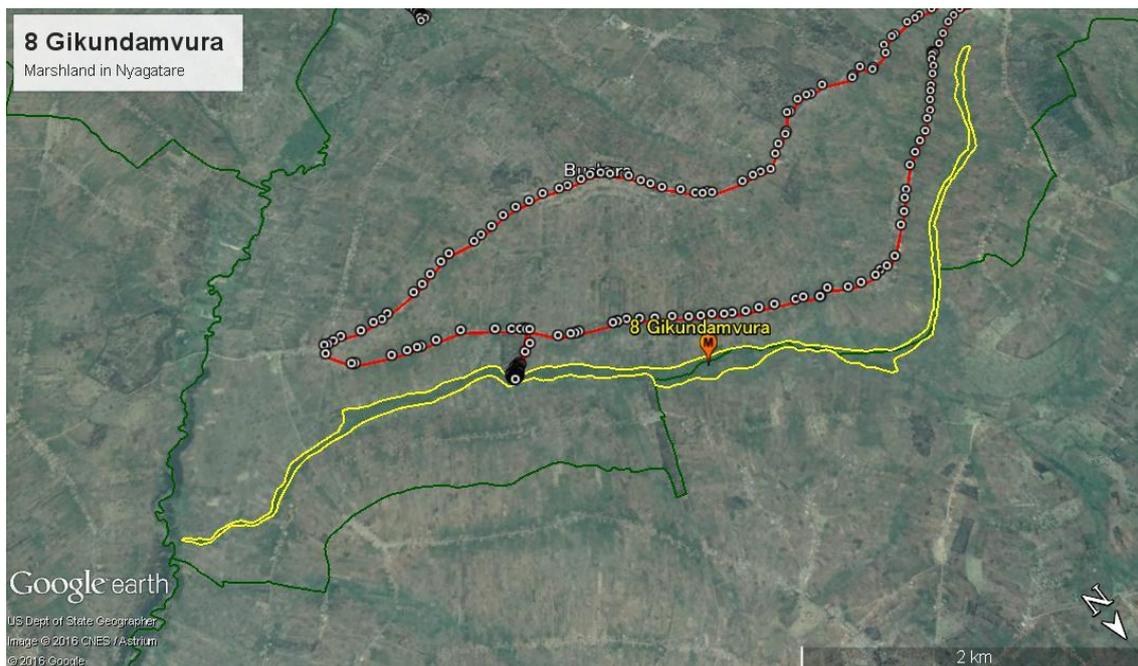
1)Sector : Karama

2)Size: 47ha

3)Status & Challenges: Farmers are growing rice from 2009. They tried to make irrigation canals and they expanded the command area. Water is not enough, that's why the Dam construction is needed

4)Main crop :Rice

5) Field visit date: 8th June, 2016



They are growing rice, but suffer from the lack of water.



They said that to remove weeds in the plot is a big issue.



(9) Karjumba Marshland

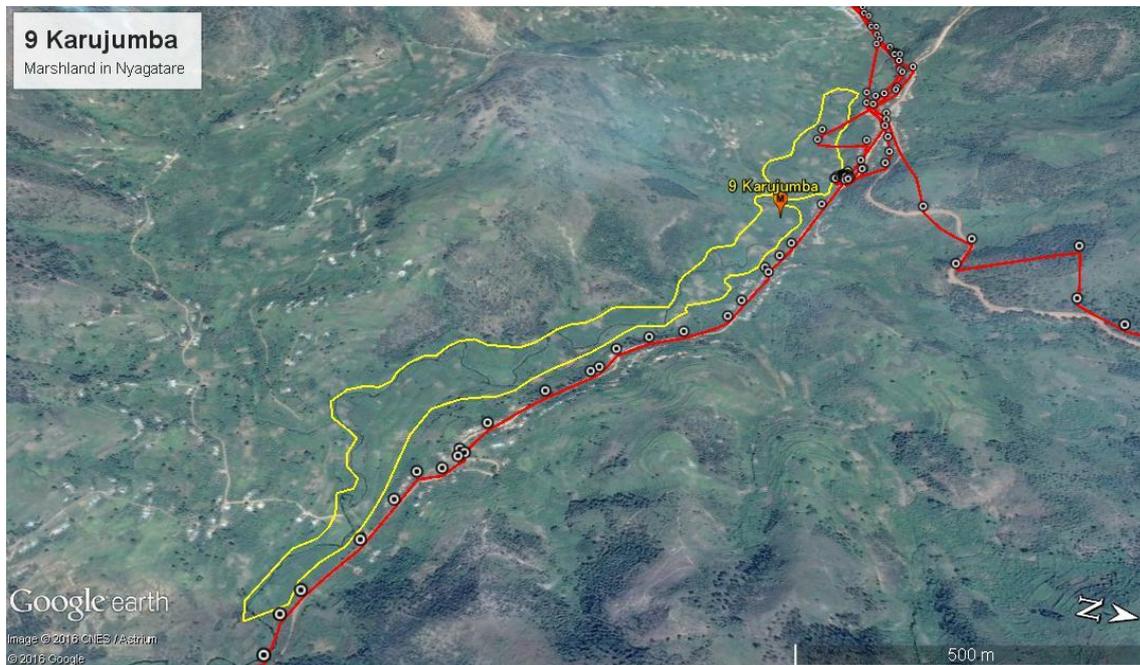
1)Sector: Kiyombe

2)Size: 56ha

3)Status& Challenges: The main issue is the big flood from Gicumbi mountain during rainy season. The Marshland has not been developed but it needs a big Dam to control water flow from the upstream areas to the downstream areas.

4)Main crop: Maize, Sorghum and Soybean

5) Field visit date: 8th June, 2016



This Marshland has not developed and they suffer from the lack of water sometimes.



The access road is good and it is suitable for QWMD.



(10) Muvumba P8 Marshland

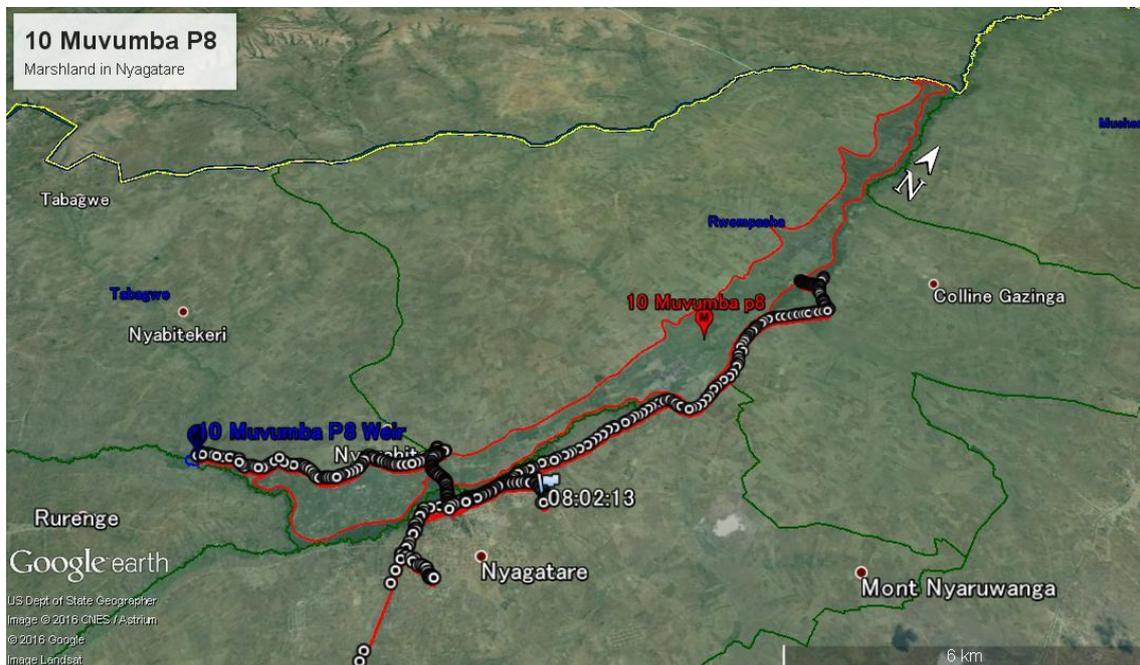
1)Sector: Tabagwe, Rwempasha, Musheru

2)Size: 1,750ha

3)Status& Challenges: They have an issue of sedimentation causing cracks of some facilities. The canal of 28km needs culverts in the different area to allow people around to cross the canal. They face the shortage of water in July, August and they have to irrigate day and night to address the issue. Another issue is the soil salinity which causes the loss of 2ha every year

4)Main crop: Rice

5) Field visit date: 9th June,2016



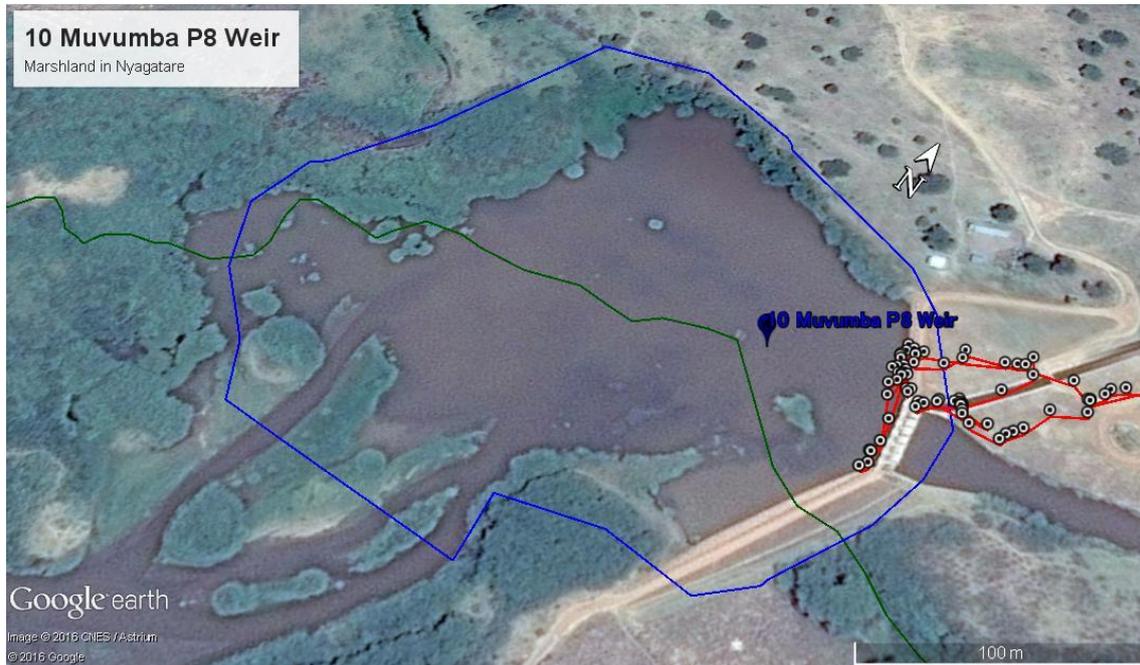
This Marshland was developed by RSSP in 2011.



They have long canals.



(10-2) Muvumba P8 Weir



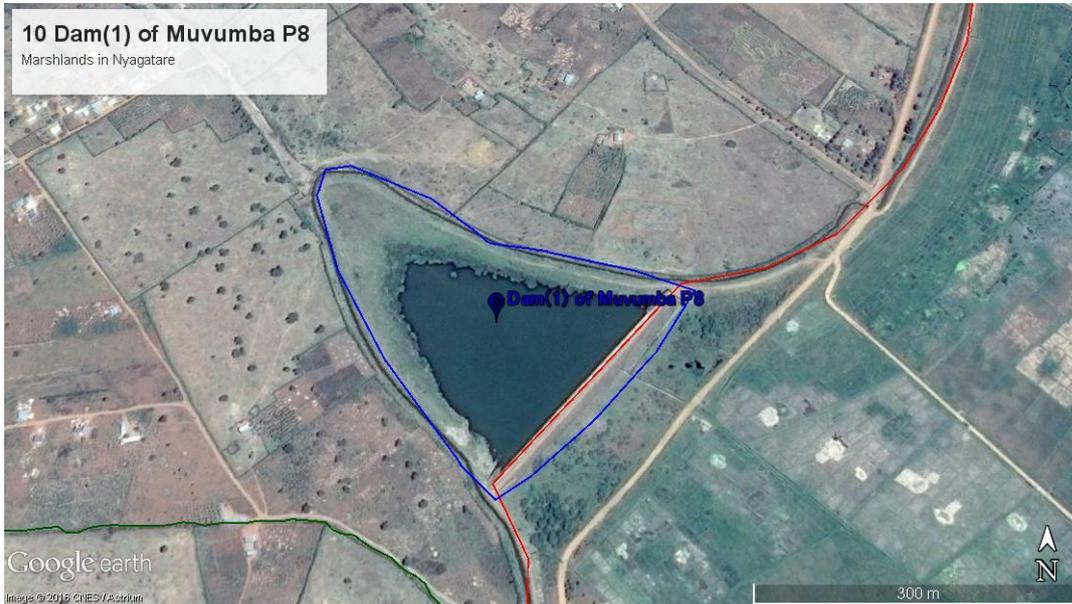
This is the Weir and the Intake of this project.



There is sedimentation in the reservoir.



(10-3) Dam(1) of the Muvumba P8



They have 3 Dams along the main canal.



(The end)