



RAB/JICA Team

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Contents

1. The Outline of the Eastern Province	1
(1) The Outline of the Eastern Province	1
(2) Population	1
2. Irrigation Plan of the Eastern Province	4
(1) Potential irrigable areas per Province in Rwanda.....	4
(2) Potential irrigable areas in the Eastern Province	6
3. The Marshlands in the Eastern Province.....	7
(1) The outline of Marshlands in the Eastern Province.....	7
(2) The Average Size of the Marshlands	10
(3) Marshlands Ratio in the Potential	11
(4) Problems of the Marshlands in the Eastern Province	13
(5) Dams etc. of the Marshlands in the Eastern Province	15
(6) Projects of the Marshlands in the Eastern Province	17
(7) Cooperatives & IWUOs in the Marshlands.....	18
(8) Rice Fields in the Marshlands	19
(9) The Under Size Ratio of the Non-Developed Marshlands in the Eastern Province	20
4. Recommendations.....	21
(1) Rehabilitation of some Developed Marshlands.....	21
(2) New development of some Non-Developed Marshlands	21
(3) Decentralization	22
(4) Make the development plan for the whole basin of the river	22
(5) Collect the data of Marshlands.....	23
5. The District data of the Marshlands in the Eastern Province	24
(1) The Marshlands in Bugesera	25
(2) The Marshlands in Gatsibo.....	26
(3) The Marshlands in Kayonza.....	27
(4) The Marshlands in Kirehe	28
(5) The Marshlands in Ngoma	29
(6) The Marshlands in Nyagatare.....	31
(7) The Marshlands in Rwamagana	32
6. The record of the field visits in the Eastern Province	33
(1) Bugesera.....	33
(2) Gatsibo	33
(3) Kayonza.....	33

(4) Kirehe.....	33
(5) Ngoma.....	34
(6) Nyagatare	34
(7) Rwamagana.....	34
7. The list of the interviewees and others.....	35
(1) Bugesera.....	35
(2) Gatsibo	35
(3) Kayonza.....	36
(4) Kirehe.....	36
(5) Ngoma.....	37
(6) Nyagatare	37
(7) Rwamagana.....	38
(8) Staff (Interviewers)	38
8. References.....	39

Annex1

The inventory of the Marshlands in the Eastern Province

Annex 2

1. The Marshlands in Bugesera
2. The Marshlands in Gatsibo
3. The Marshlands in Kayonza
4. The Marshlands in Kirehe
5. The Marshlands in Ngoma
6. The Marshlands in Nyagatare
7. The Marshlands in Rwamagana

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ABBREVIATIONS AND ACRONYMS

ACZ	Agroclimatic zone
EDPRS	Economic Development and Poverty Reduction Strategy
GoR	Government of Rwanda
GIS	Geographic Information System
Ha/ha	Hectare
IFAD	International Fund for Agriculture Development
IMP	Irrigation Master Plan
IMT	Irrigation Management Transfer
IMTA	Irrigation Management Transfer Agreement
IWUO	Irrigation Water Users Organization
JICA	Japan International Cooperation Agency
KWAMP	Kirehe community based Watershed Management Project
LIM	Land Husbandry, Irrigation and Mechanization Department
LWH	Land Husbandry, Water Harvesting and Hillside Irrigation
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINIRENA	Ministry of Natural Resources
NISR	National Institute of Statistics of Rwanda
NGOs	Non-Governmental Organizations
O&M	Operation and Maintenance
PADAB	Bugesera Agricultural Development Support Project
PAIRB	Bugesera Natural Region Rural Infrastructure Project
PAPSTA	Support Project to Strategic Plan for Agriculture Transformation
PIA	Potential Irrigation Area
PIM	Participatory Irrigation Management
QWMP	Quick Win Marshland Development Program
RAB	Rwanda Agriculture Board
REMA	Rwanda Environment Management Authority
RNRA	Rwanda National Resources Authority
RSSP	Rural Sector Support Project
SPIU	Single Programme Implementation Unit

1. The Outline of the Eastern Province

(1) The Outline of the Eastern Province

Eastern Province is the largest, the most populous and the least densely populated of Rwanda's five Provinces. It was created in early January 2006 as part of a government decentralization program that re-organized the country's local government structures. It has seven districts: Bugesera, Gatsibo, Kayanza, Ngoma, Kirehe, Nyagatare and Rwamagana. The capital city of the Eastern Province is Rwamagana.

The Eastern Province comprises the former provinces of Kibungo and Umutara, most of Kigali Rural, and part of Byumba.

Total area of Rwanda = 26,338 km² (10,169 sq mi)

Total area of Eastern Province=9,813.3617 km²



(Figure1: The Eastern Province; 1. Bugesera, 2. Gatsibo, 3. Kayanza, 4. Kirehe, 5. Ngoma, 6. Nyagatare, 7. Rwamagana)

(2) Population

The census population of the Eastern Province is totalled 2,600,814 people, including 1,257,750 males and 1,343,064 females, with a percentage of 48.4% and 51.6% of the total population of the province respectively .

(Table1: The population of the Eastern Province, 2002-2012)

District	2002	2012	Change (02-12) (%)	Annual growth rate(%)	Density (P/Km ²)
Bugesera	266,775	363,339	36.2	3.1	282
Gatsibo	283,456	433,997	53.1	4.4	275
Kayonza	209,723	346,751	65.3	5.2	179
Kirehe	229,468	340,983	47.5	4.0	286
Ngoma	235,109	338,562	45.0	3.7	393
Nyagatare	255,104	466,944	83.0	6.2	243
Rwamagana	220,502	310,238	40.7	3.5	455
Total	1,700,137	2,600,814	53.0	4.3	275

At the district level, Nyagatare and Gatsibo Districts are the most populated with respectively 466,944 and 433,997 inhabitants, while the districts of Rwamagana (310,238 inhabitants), Ngoma (338,562 inhabitants) and Kirehe (340,983 inhabitants) are the least populated.

During the intercensal period (2002-2012), the population of the Eastern Province has increased by more than a half (53.0%) of its population in 2002. This increase is the largest in the districts of Nyagatare (83.0%) and Kayonza (65.3%) and relatively lower in the districts of Bugesera (36.2%) and Rwamagana (40.7%).

This population increase is also expressed by the average annual growth rate which is 4.3% for the Eastern Province. It is higher in the districts of Nyagatare (6.2%) and Kayonza (5.2%) and relatively low in the districts of Bugesera (3.1%) and Rwamagana (3.5%). These high growth rates observed in the Nyagatare and Kayonza Districts will be elaborated upon in the analysis of the final results of the 2012 Census.

The population density of the Eastern Province is 275 persons per sq.km. This density is higher in the districts of Rwamagana (455 persons per sq.km)

and Ngoma (393 persons per sq.km) and lowest in the District of Kayonza (179 persons per sq.km).

2. Irrigation Plan of the Eastern Province

(1) Potential irrigable areas per Province in Rwanda

Based on the IMP(Irrigation Master Plan), They clarify the potential irrigable areas below.

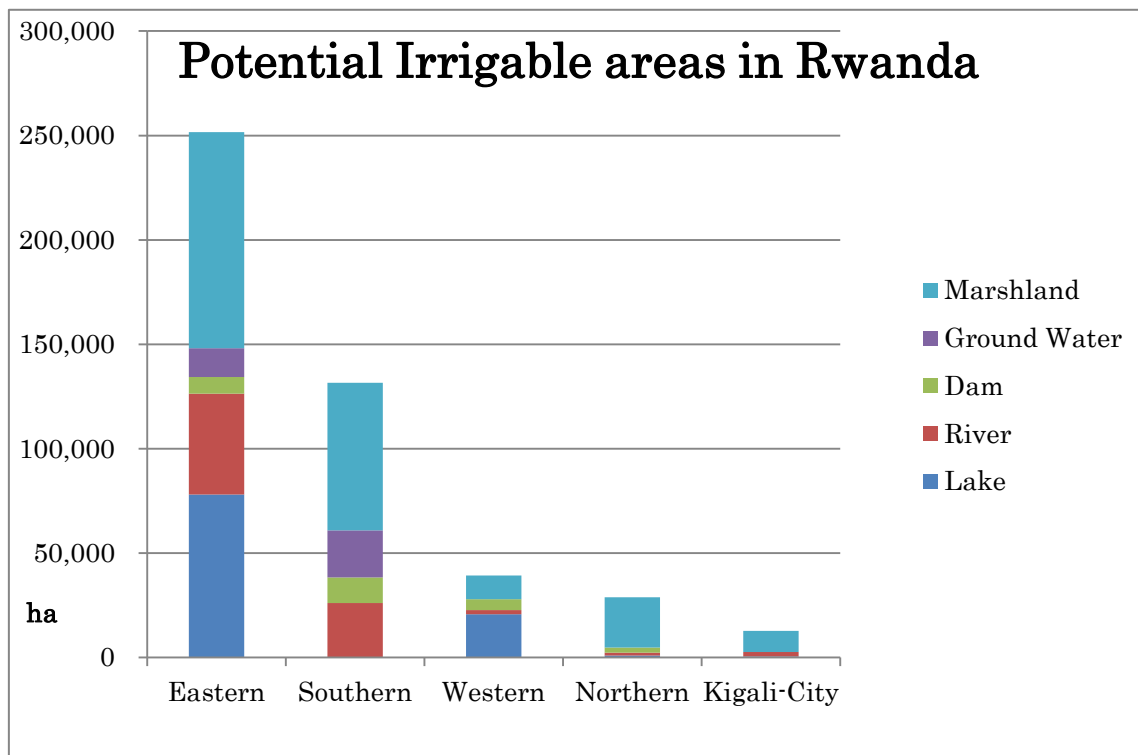
- Lake water resources 100,107ha
- Direct river and flood water 27,907ha
- Runoff for dams 125,627ha
- Ground water resources 36,432ha
- Marshlands 219,793ha
- Runoff for small reservoirs 125,627ha

The Areas in the Eastern Province is 251,573ha, which is the biggest area of the Potential Irrigable areas in Rwanda Provinces.

(Table 2: Potential irrigable areas per Province, 2010)

	Lake	River	Dam	Ground Water	Marshland	Total
Eastern	77,995	48,373	8,022	13,796	103,387	251,573
Southern	0	26,123	12,148	22,636	70,674	131,581
Western	20,644	2,024	5,262	0	11,379	39,309
Northern	930	1,317	2,475	0	24,104	28,826
Kigali-City	538	2,010	0	0	10,249	12,797
Total	100,107	79,847	27,907	36,432	219,793	464,086

※ Total Potential Irrigable Areas in Rwanda is 589,713ha
(464,086ha+125,629ha(Runoff for small reservoirs))



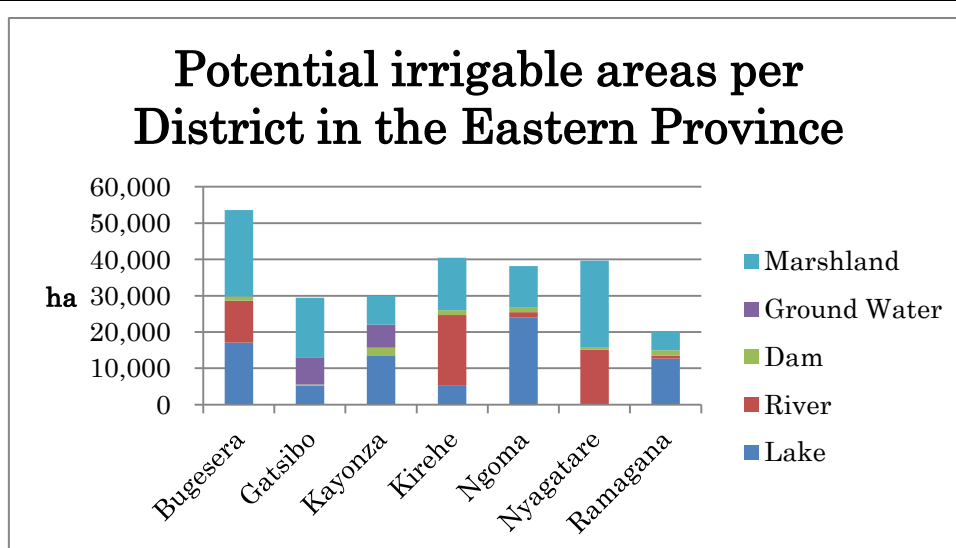
(Graph 1: Potential Irrigable areas in Rwanda, 2010)

(2) Potential irrigable areas in the Eastern Province

The Irrigation domain for the Irrigable areas per District of the Eastern Province is below. Total area is 251,573ha, and the biggest Potential irrigable area per District in the Eastern Province is that of Bugesera, 53,595ha.

(Table 3: Potential irrigable areas per District of Eastern Province, 2010)

	District	Irrigation Domain					
		Lake	River	Dam	Ground Water	Marshland	Total
1	Bugesera	17,115	11,507	1,128	0	23,845	53,595
2	Gatsibo	5,308	0	205	7,497	16,398	29,408
3	Kayonza	13,587	0	2,130	6,299	7,984	30,000
4	Kirehe	5,391	19,329	1,309	0	14,436	40,465
5	Ngoma	23,930	1,514	1,250	0	11,485	38,179
6	Nyagatare	0	15,193	486	0	23,971	39,650
7	Ramagan a	12,664	830	1,514	0	5,268	20,276
	Total	77,995	48,373	8,022	13,796	103,387	251,573



(Graph 2: Potential Irrigable areas in the Eastern Province, 2010)

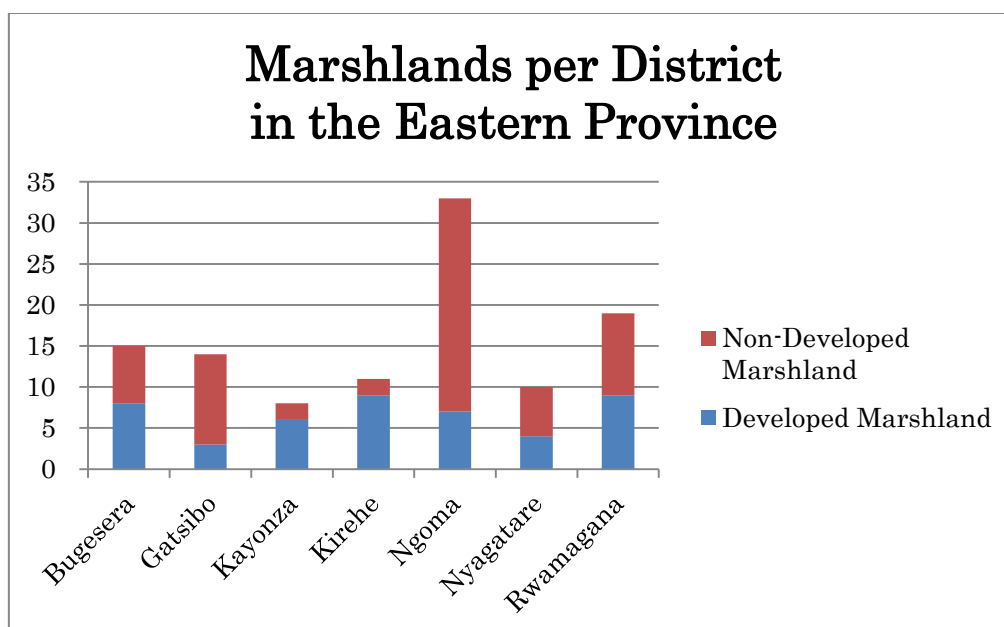
3. The Marshlands in the Eastern Province

(1) The outline of Marshlands in the Eastern Province

Eastern Province has One Hundred Ten (110) Marshlands, 14,546ha. There are Forty Six (46) Developed Marshlands, 10,758ha, and Sixty Four (64) Non-Developed Marshlands, 3,788ha.

(Table 4: Marshlands per District in the Eastern Province, 2016)

		Marshlands	Developed	Non-Developed
1	Bugesera	15	8	7
2	Gatsibo	14	3	11
3	Kayanza	8	6	2
4	Kirehe	11	9	2
5	Ngoma	33	7	26
6	Nyagatare	10	4	6
7	Rwamagana	19	9	10
	Total	110	46	64

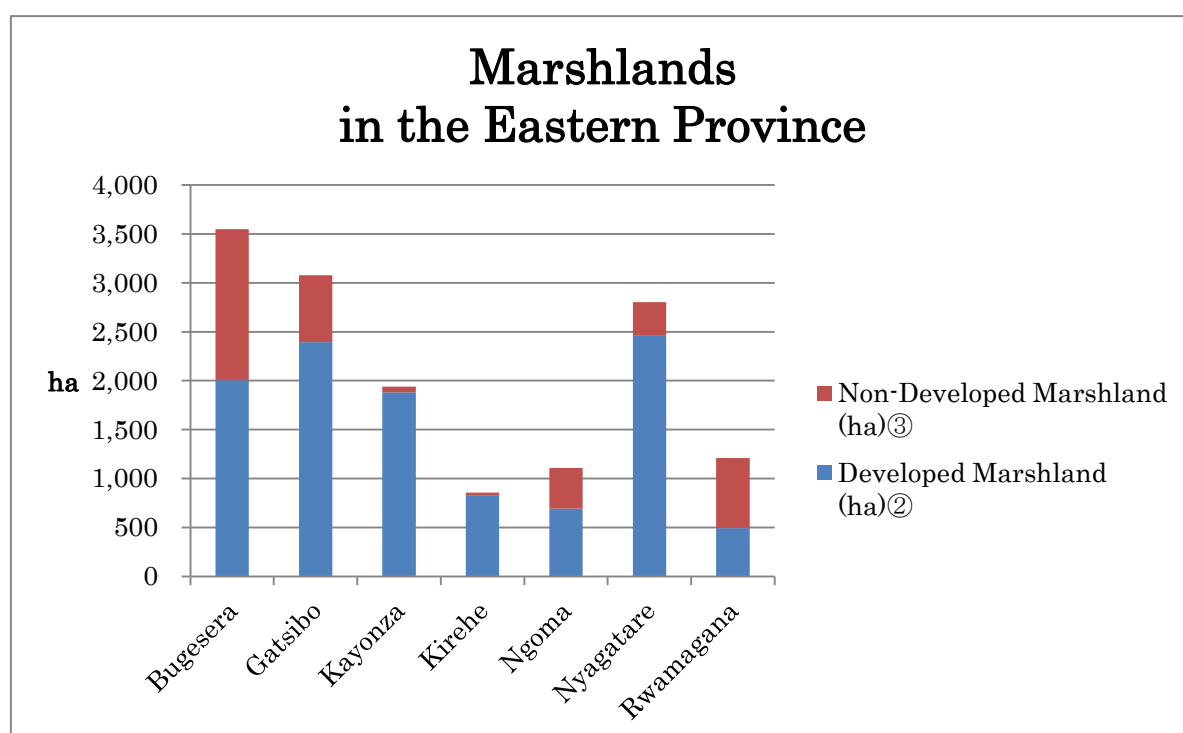


(Graph3: Marshlands per District in the Eastern Province, 2016)

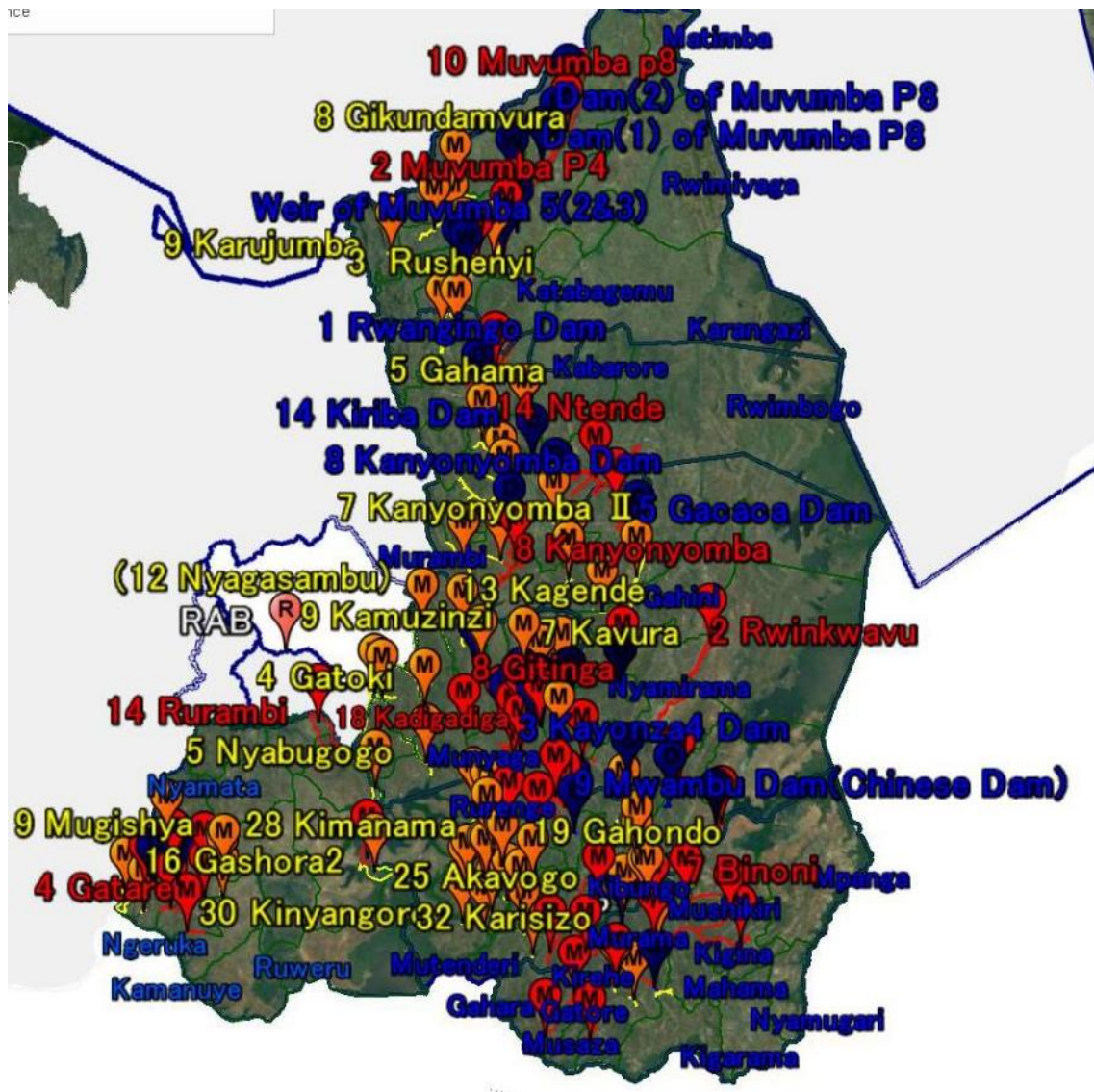
The total area of the Marshlands in the Eastern Province is 14,546ha, including Developed Marshlands, 10,758ha, and Non-Developed Marshlands, 3,788ha, with a percentage of 74.0% and 26.0% of the total Marshland areas of the Province respectively.

(Table 5: The Marshlands in the Eastern Province, 2016)

	Marshlands (ha)① (②+③)	Developed Marshland (ha)②	(%) (②/①)	Non- Developed Marshland (ha)③	(%) (③/①)
Bugesera	3,551	2,004	56.4%	1,547	43.6%
Gatsibo	3,078	2,393	77.7%	685	22.3%
Kayanza	1,940	1,880	96.9%	60	3.1%
Kirehe	856	830	97.0%	26	3.0%
Ngoma	1,107	692	62.5%	415	37.5%
Nyagatare	2,805	2,467	88.0%	338	12.0%
Rwamagana	1,209	492	40.7%	717	59.3%
Total	14,546	10,758	74.0%	3,788	26.0%



(Graph 4: Marshlands in the Eastern Province, 2016)



(Figure2: The Marshlands in the Eastern Province, Red: Developed, Yellow: Non-Developed, 2016)

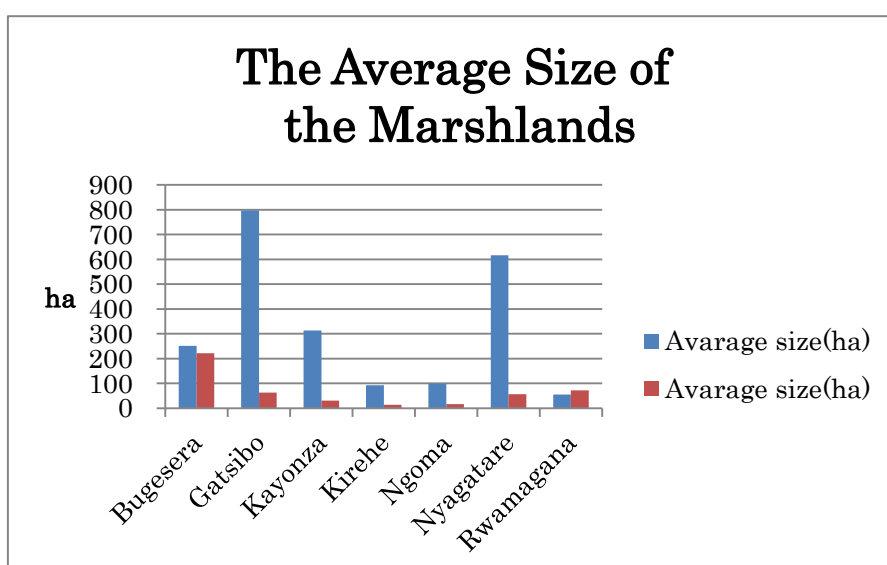
(2) The Average Size of the Marshlands

The total average size of the Marshlands is 132ha, with 234 ha of the Developed Marshland and with 59 ha of the Non-Developed Marshlands respectively.

The big average size of the Marshlands is 798ha of the Developed Marshlands in Gatsibo and 617ha of the Developed Marshlands in Nyagatare. The small average size of the Marshlands is 13ha of the Non-Developed Marshlands in Kirehe and 16ha of the Non-Developed Marshlands in Ngoma.

(Table 6: The Average Size of the Marshlands in the Eastern Province, 2016)

	Marshlands	Average Size(ha)	Developed Marshlands	Average size(ha)	Non-Developed Marshlands	Average size(ha)
Bugesera	15	237	8	251	7	221
Gatsibo	14	220	3	798	11	62
Kayonza	8	243	6	313	2	30
Kirehe	11	78	9	92	2	13
Ngoma	33	34	7	99	26	16
Nyagatare	10	281	4	617	6	56
Rwamagana	19	64	9	55	10	72
Total	110	132	46	234	64	59



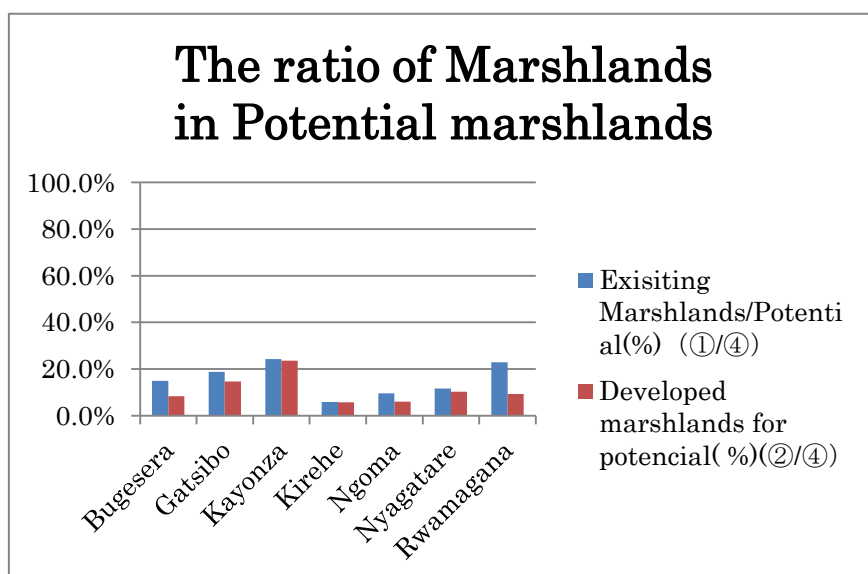
(Graph 5: The Average Size of the Marshlands in the Eastern Province, 2016)

(3) Marshlands Ratio in the Potential

The percentage of the total Marshlands, 14,546ha in the total Potential irrigable Marshlands in the Eastern Province is 14.1%, and the Developed Marshlands, 10,758ha, with 10.4%. The development of Marshlands should be focused on the Non-Developed Marshlands, 3,788ha.

(Table 7: Marshlands and Developed Marshlands Ratio, 2016)

	Marshlands (ha) ① (②+③)	Developed Marshlands (ha) ②	Non-Developed Marshlands (ha) ③	Potential ④	Marshlands /Potential (%) (①/④)	Developed marshlands for potential (%) (②/④)
Bugesera	3,551	2,004	1,547	23,845	14.9%	8.4%
Gatsibo	3,078	2,393	685	16,398	18.8%	14.6%
Kayonza	1,940	1,880	60	7,984	24.3%	23.5%
Kirehe	856	830	26	14,436	5.9%	5.7%
Ngoma	1,107	692	415	11,485	9.6%	6.0%
Nyagatare	2,805	2,467	338	23,971	11.7%	10.3%
Rwamagana	1,209	492	717	5,268	22.9%	9.3%
Total	14,546	10,758	3,788	103,387	14.1%	10.4%



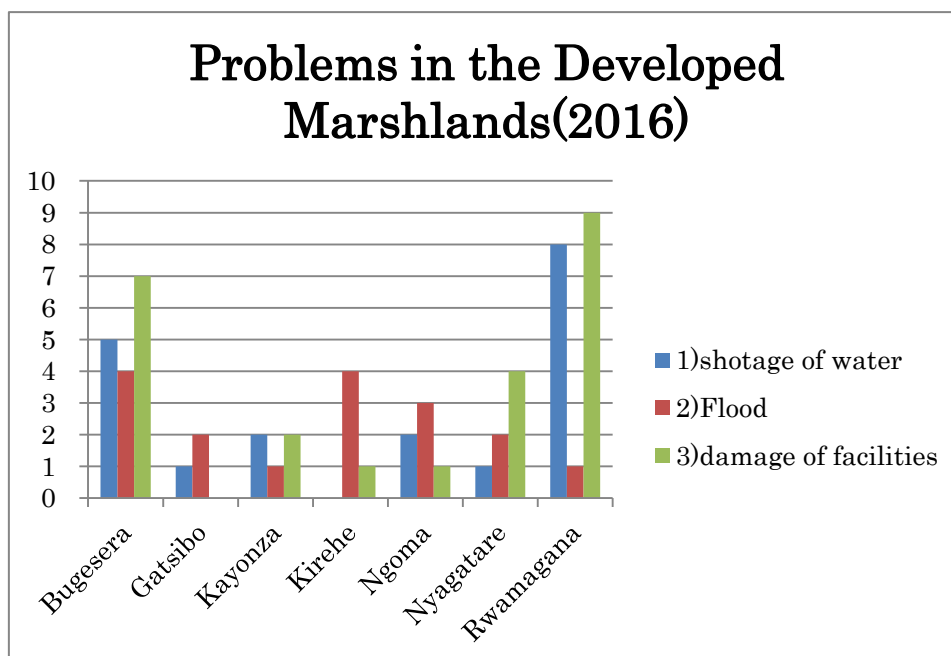
(Graph6: The Ratio of Marshlands in Potential Marshlands, 2016)

(4) Problems of the Marshlands in the Eastern Province

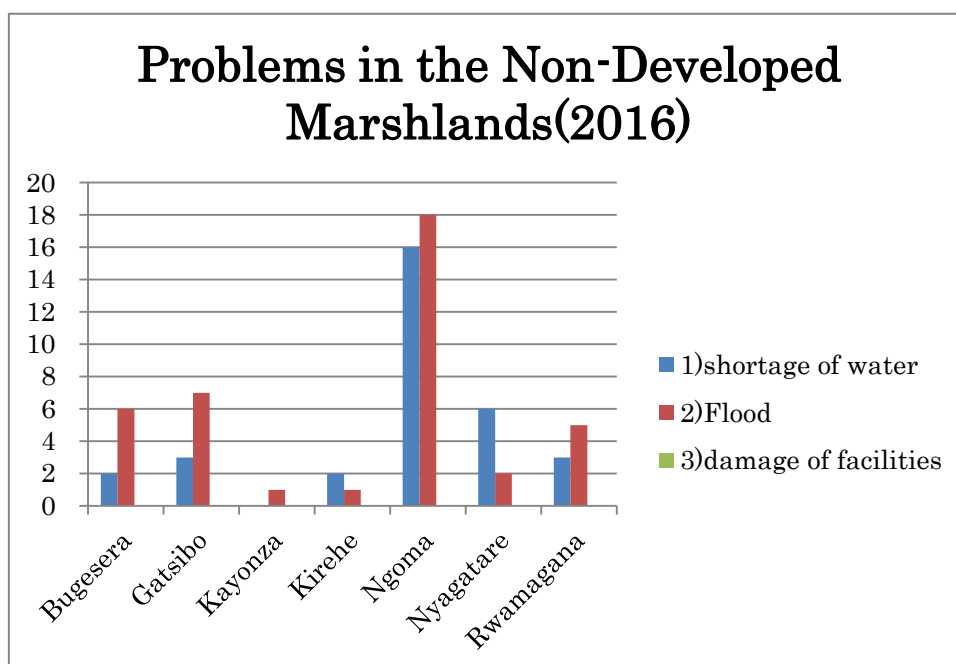
There are mainly three problems, 1) Shortage of water, 2) Flood and 3) Damage of the facilities in the Marshlands. You can understand that 1) Shortage of water and 2) Flood are serious problems especially for the Non-Developed Marshlands. 3) The damage of the facilities is the big issue for the Developed Marshlands.

(Table8: Problems of the Marshlands in the Eastern Province, 2016)

	Marshlands	1)shotage of water	2)Flood	3)damag e of facilities	Developed	1)shotage of water	2)Flood	3)damag e of facilities	Non-Developed	1)short age of water	2)Flood	3)dama ge of facilitie s
Bugesera	15	7	10	7	8	5	4	7	7	2	6	0
Gatsibo	14	4	9	0	3	1	2	0	11	3	7	0
Kayonza	8	2	2	2	6	2	1	2	2	0	1	0
Kirehe	11	2	5	1	9	0	4	1	2	2	1	0
Ngoma	33	18	21	1	7	2	3	1	26	16	18	0
Nyagatare	10	7	4	4	4	1	2	4	6	6	2	0
Rwamagana	19	11	6	9	9	8	1	9	10	3	5	0
Total	110	51	57	24	46	19	17	24	64	32	40	0



(Graph7: Problems in the Developed Marshlands, 2016)



(Graph8: Problems in the Non-Developed Marshlands, 2016)

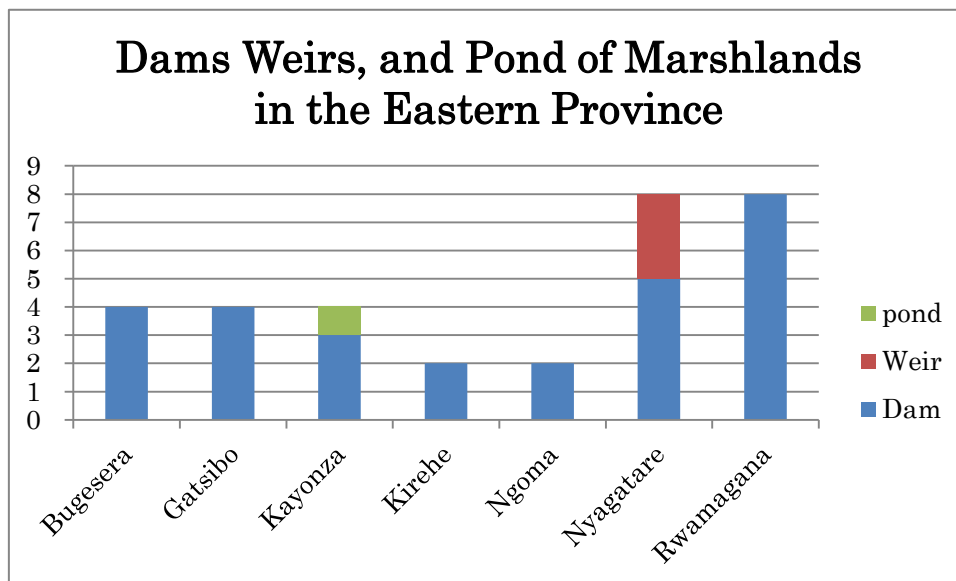
(5) Dams etc. of the Marshlands in the Eastern Province

There are Twenty Eight (28) Dams and Three (3) Weirs, One (1) Pond in the Marshlands of the Eastern province. Meanwhile, Twenty Two (22) facilities need to be rehabilitated, which are the Ruvubu Dams(2), Rwintare Dam, Gatare Dam (Bugesera), Kayonza Dam, Kirehe Pond (Kayonza), Mwambu Dam (Ngoma), Muvumba P5 Dam, Muvumba P4 Dam, Muvumba P8 Dams(3), Muvumba P5 Weir, Muvumba 2&3 Weir (Nyagatare), Gitinga Dam, Kiruhura Dam, Cyimpima Dam, Bugugu Dam, Gaseke Dam, Gashara Dam, Nyakagezi Dam, Kadigadiga Dam (Rwamagana). Especially, Muvumba 2&3 Weir was completely broken and should be rehabilitated soon.

(Table 9: Dams, Weirs, Pond of Marshlands in the Eastern Province, 2016)

		Dam	Weir	pond	Note
1	Bugesera	4(4)			2)Ruvubu(2), 3)Rwintare, 4)Gatare
2	Gatsibo	4(0)			1)Rwagango, 8)Kanyonyomba, 14)Ntende,Kiriba
3	Kayonza	3(1)		1(1)	Dam-1)Kayonza, 2)Rwinkwavu, 3)Kayonza Pond-4)Kirehe Pond
4	Kirehe	2			1)Sagatare ,2)Cyunuzi
5	Ngoma	2(1)			9)Mwambu, 11)Ngoma22
6	Nyagatare	5(5)	3(2)		Dam-1)MuvumbaP5, 2)MuvumbaP4, 10)MuvumbaP8(3) Weir- 1)MuvumbaP5 ,3)Muvumba2&3, 10)Muvumba8
7	Rwamagana	8(8)			8)Gitinga, 11)Kiruhura, 13)Cyimpima, 15)Bugugu,Gaseke, 16)Gashara ,17)Nyakagezi, 18)Kadigadiga
	Total	28(19)	3(2)	1(1)	Facilities needing Rehabilitation=22

※Red mark facilities are necessary for rehabilitation.



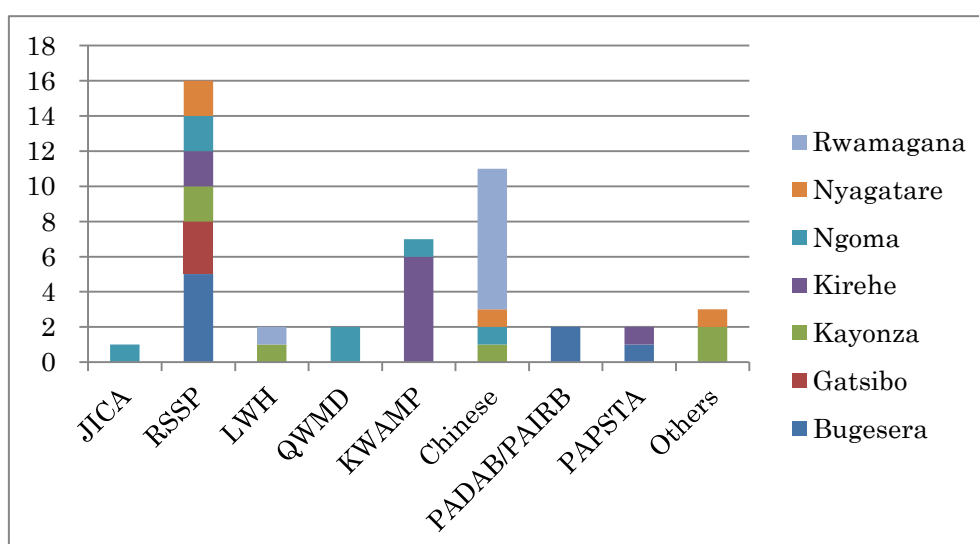
(Graph 9: Dams, Weirs and Pond of Marshlands in the Eastern Province, 2016)

(6) Projects of the Marshlands in the Eastern Province

All of the developed Marshlands were developed by Projects namely JICA, RSSP, LWH, QWMD, KWAMP, Chinese, PADAB/PAIRB, PAPSTA and Others. Especially, RSSP project contributed for the development of Marshlands in the Eastern Province very much, because RSSP developed the Sixteen (16) Marshlands of the Forty Six (46) Developed Marshlands. However, some facilities of RSSP project in early days are not working well. RAB should check these facilities and make the plan to rehabilitate them. The facilities of Chinese Projects, which developed Eleven (11) Marshlands in 1970s-1980s, are not almost working well. They should consider about the rehabilitation of them soon.

(Table 10: Projects of the Marshlands in the Eastern Province, 2016)

		JICA	RSSP	LWH	QWMD	KWAMP	Chinese	PADAB/ PAIRB	PAPSTA	Others	Total
1	Bugesera		5					2	1		8
2	Gatsibo		3								3
3	Kayonza		2	1			1			2	6
4	Kirehe		2			6			1		9
5	Ngoma	1	2		2	1	1				7
6	Nyagatare		2				1			1	4
7	Rwamagana			1			8				9
	Total	1	16	2	2	7	11	2	2	3	46



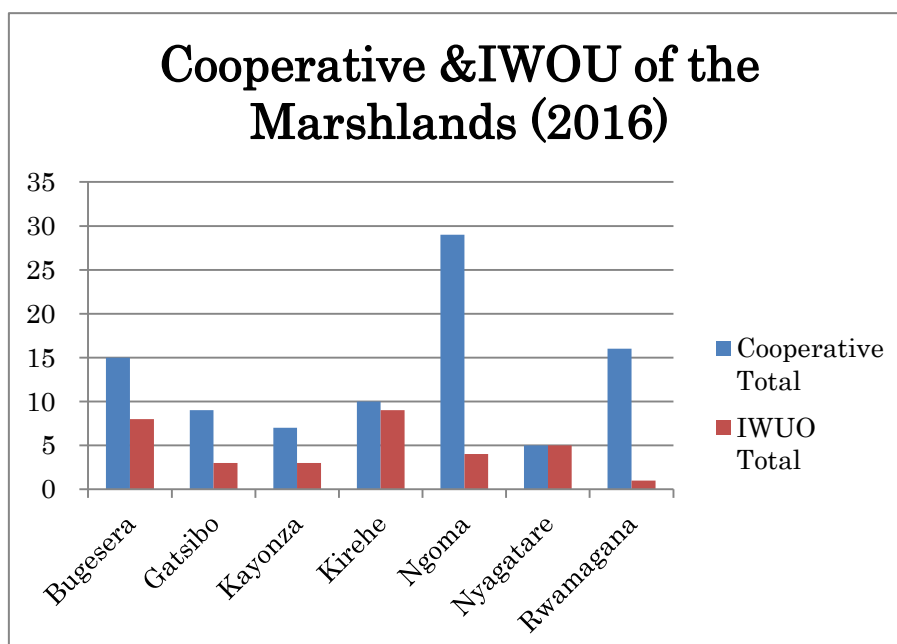
(Graph 10: Projects of the Marshlands in the Eastern Province, 2016)

(7) Cooperatives & IWUOs in the Marshlands

There are Ninety One (91) Cooperatives and Forty Six (46) IWUOs in One Hundred Ten (110) Marshlands in the Eastern Province. Compare to the Cooperatives, there are few IWUOs, especially for Non-Developed Marshlands. RAB should consider about setting up the IWUOs not only in the Non-Developed Marshlands with rice farming but also in old developed schemes.

(Table 11: Cooperatives & IWUOs in the Marshlands in the Eastern Province, 2016)

	Marshlands	Cooperative Total	IWUO Total	Developed	Cooperative (Developed)	IWUO (Developed)	Non-Developed	Cooperative (Non-Developed)	IWUO (Non-Developed)
Bugesera	15	15	8	8	8	8	7	7	0
Gatsibo	14	9	3	3	3	3	11	6	0
Kayanza	8	7	3	6	5	3	2	2	0
Kirehe	11	10	9	9	9	9	2	1	0
Ngoma	33	29	4	7	7	4	26	22	0
Nyagatare	10	5	5	4	4	4	6	1	1
Rwamagana	19	16	1	9	9	1	10	7	0
Total	110	91	33	46	45	32	64	46	1



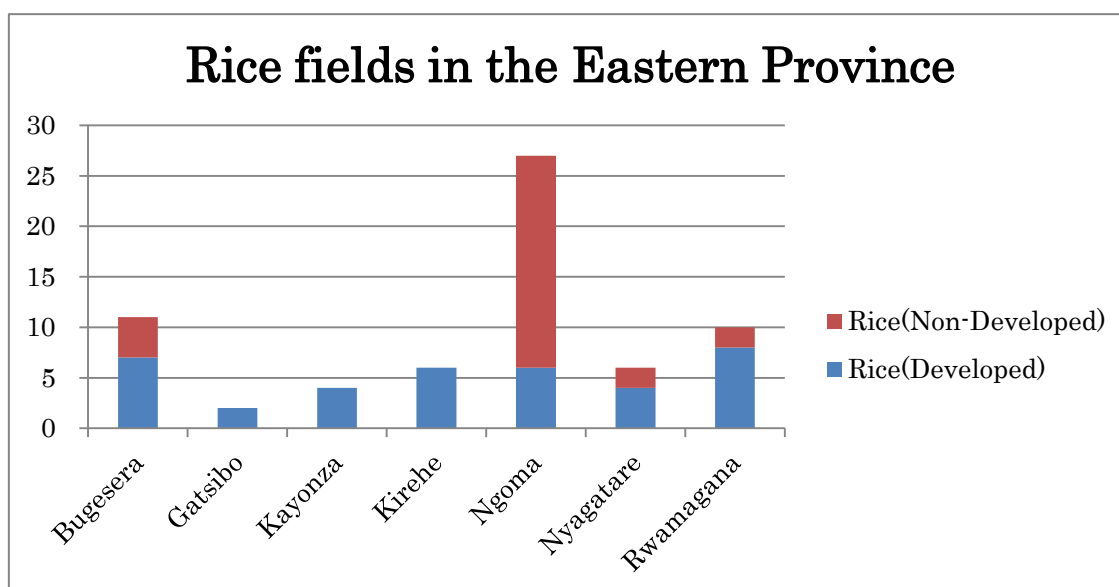
(Graph 11: Cooperatives & IWUOs in the Marshlands in the Eastern Province, 2016)

(8) Rice Fields in the Marshlands

There are many rice fields in the Marshlands of the Eastern Province. Farmers prefer to cultivate rice than other crops. Regarding the rice fields of the Non-Developed Marshlands, they should consider about developing them and pursuit good quality of rice.

(Table 12: Rice fields in the Marshlands in the Eastern Province, 2016)

	Marshlands	Rice Total	Developed	Rice(Devel oped)	Non- Developed	Rice(Non- Developed)
Bugesera	16	11	8	7	8	4
Gatsibo	14	2	3	2	11	0
Kayonza	8	4	6	4	2	0
Kirehe	11	6	9	6	2	0
Ngoma	32	27	7	6	25	21
Nyagatare	10	6	4	4	6	2
Rwamagana	19	10	9	8	10	2
Total	110	66	46	37	64	29



(Graph 12: Rice Fields in the Marshlands in the Eastern Province, 2016)

(9) The Under Size Ratio of the Non-Developed Marshlands in the Eastern Province

On condition that we should consider about the decentralization of the irrigation system, the table is given below for your reference. It is advisable to start the decentralization irrigation project of the under 20ha size for the Non-Developed Marshlands, which is 37.5% of the all Non-Developed Marshlands, and 6.2% of the all Areas. In the future, we should consider about increasing to the Under 50ha size, which is 71.9% of Numbers, 24.3% of Areas.

(Table 13: The Under Size Ratio of the Non-developed Marshlands in the Eastern Province , 2016)

Under Size(ha)	Numbers of Marshlands	Percentage of the Under Size	Area(ha)	Area(%)
20	24	37.5%	233	6.2%
30	35	54.7%	485	12.8%
40	39	60.9%	620	16.4%
50	46	71.9%	920	24.3%
100	54	84.4%	1488	39.3%
200	57	89.1%	1788	47.2%
1000	64	100.0%	3788	100.0%

4. Recommendations

RAB & JICA Team clarified the Marshlands in the Eastern Province as One Hundred Ten (110) Marshlands, 14,546ha, with Forty Six (46) Developed Marshlands, 10,758ha and the Sixty four (64) Non-Developed Marshlands, 3,788ha. However, there are some problems like shortage of water, floods, and damage of the facilities. RAB should hold the meeting and discuss how to use the Marshlands with the stakeholders like the RAB zone officers, the District/Sector Agronomists, Cooperative/IWUO managers and so on. It is advisable to ask the stakeholders to fix an order of priority to develop or rehabilitate their Marshlands. Based on these discussions, you should try to do some projects below.

(1) Rehabilitation of some Developed Marshlands

There are some facilities of the Marshlands which are necessary to be rehabilitated. The inventory of the Marshlands in the Eastern Province revealed that the Developed Marshlands have Twenty-Two (22) facilities which need to be rehabilitated. Especially, the Muvumba 2&3 Weir was completely broken and the facilities made by Chinese in 1970s-1980s are not working well, so it is necessary to hurry up to rehabilitate them. RAB should launch the survey to check the facilities, and based on the survey RAB should start the rehabilitation project of the irrigation facilities soon.



(2) New development of some Non-Developed Marshlands

The Non-Developed Marshlands suffer from many problems like the shortage of water, flood, and difficulty of water distribution. RAB should launch the new development projects of Non-Developed Marshlands like QWMD. Before starting the project, they have to hear the priority of development from the local government.

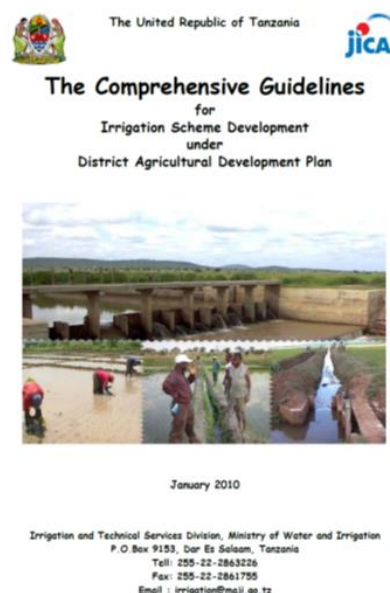
(3) Decentralization

There are many small Marshlands in the Eastern Province, especially the average sizes of the Non-Developed Marshlands in Ngoma and Kirehe are under 20ha.

RAB should

consider about the decentralization to Districts about the irrigation projects of the under 20ha development. RAB should provide the budget for small marshland development to the District and a technical support on irrigation scheme development and maintenance of facilities to local Engineers.

Regarding the decentralization, you should refer to JICA-Technical Cooperation for Formulation and Training of the DADP(District Agricultural Development Plan) Guidelines on Irrigation Scheme Development in Tanzania in February 2007-January 2010.



(4) Make the development plan for the whole basin of the river

The inventory of the Marshlands in the Eastern Province revealed that there are many potential areas to be developed in the basin of the river.

However, it is not easy to develop the Marshlands in the basin of the river like the Akanyaru, Gashora II etc. RAB should make the development plan for the whole basin of the Nyabarongo River, Muvumba River etc. with other Ministries.



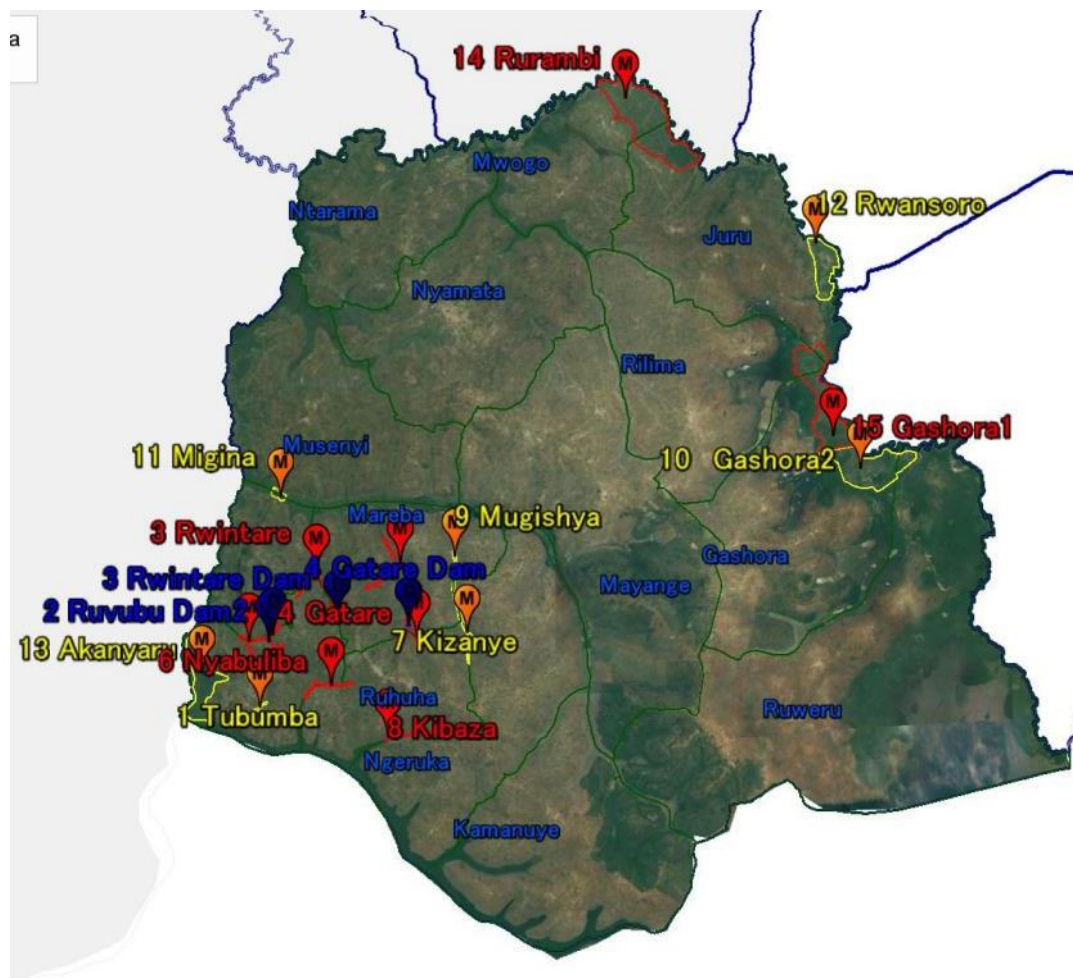
(5) Collect the data of Marshlands

It is very important to collect the data of Marshlands like the rainfall, river flow, temperature etc. to analyze the runoff of the Marshlands etc. RAB should set up the data collecting station at each candidate site for future planning.



5. The District data of the Marshlands in the Eastern Province

(1) The Marshlands in Bugesera



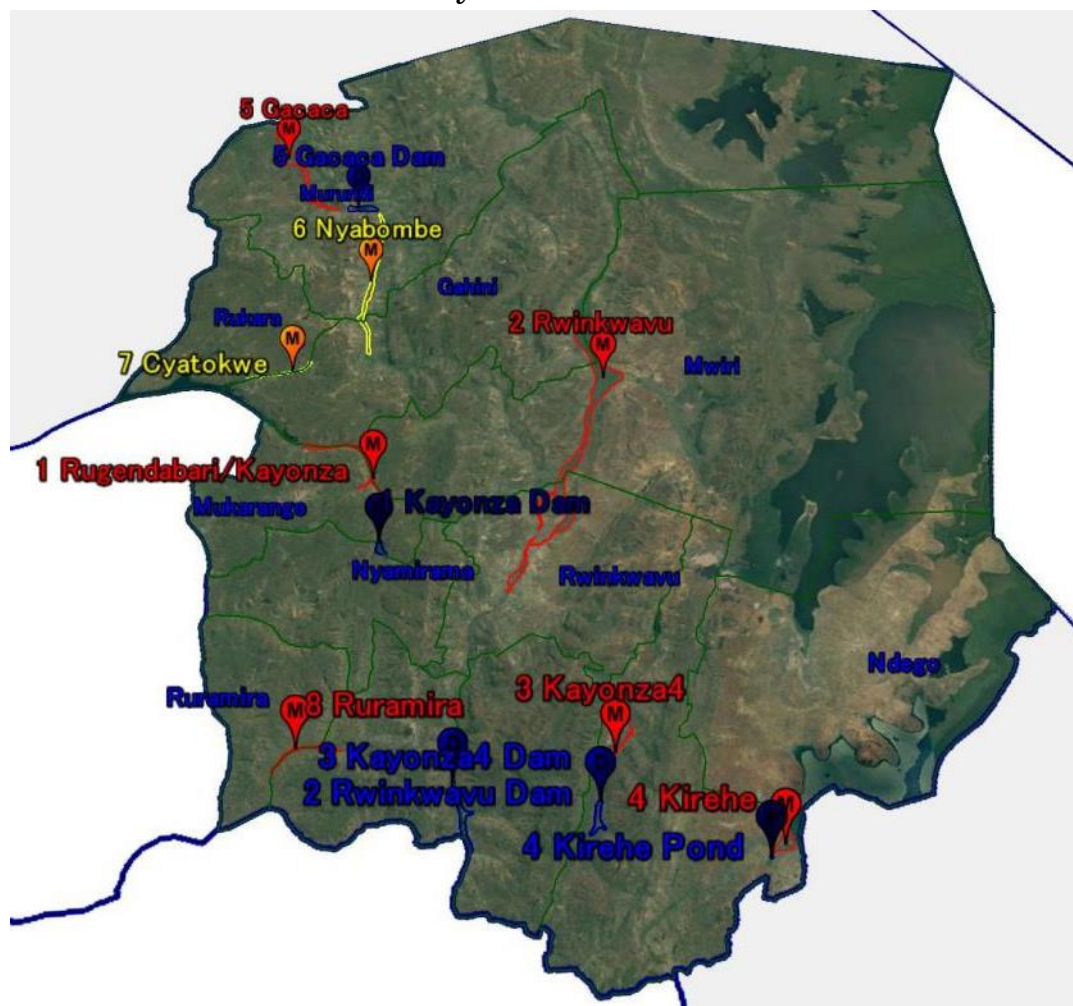
Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
2	Ruvubu	90	1	Tubumba	7
3	Rwintare	80	7	Kizanye	60
4	Gatare	57	9	Mugishya	40
5	Rwabikwano	85	10	Gashora2	750
6	Nyabuliba	52	11	Migina	40
8	Kibaza	40	12	Rwansoro	300
14	Rurambi	850	13	Akanyaru	350
15	Gashora1	750			
Total		2,004	Total		1,547

(2) The Marshlands in Gatsibo



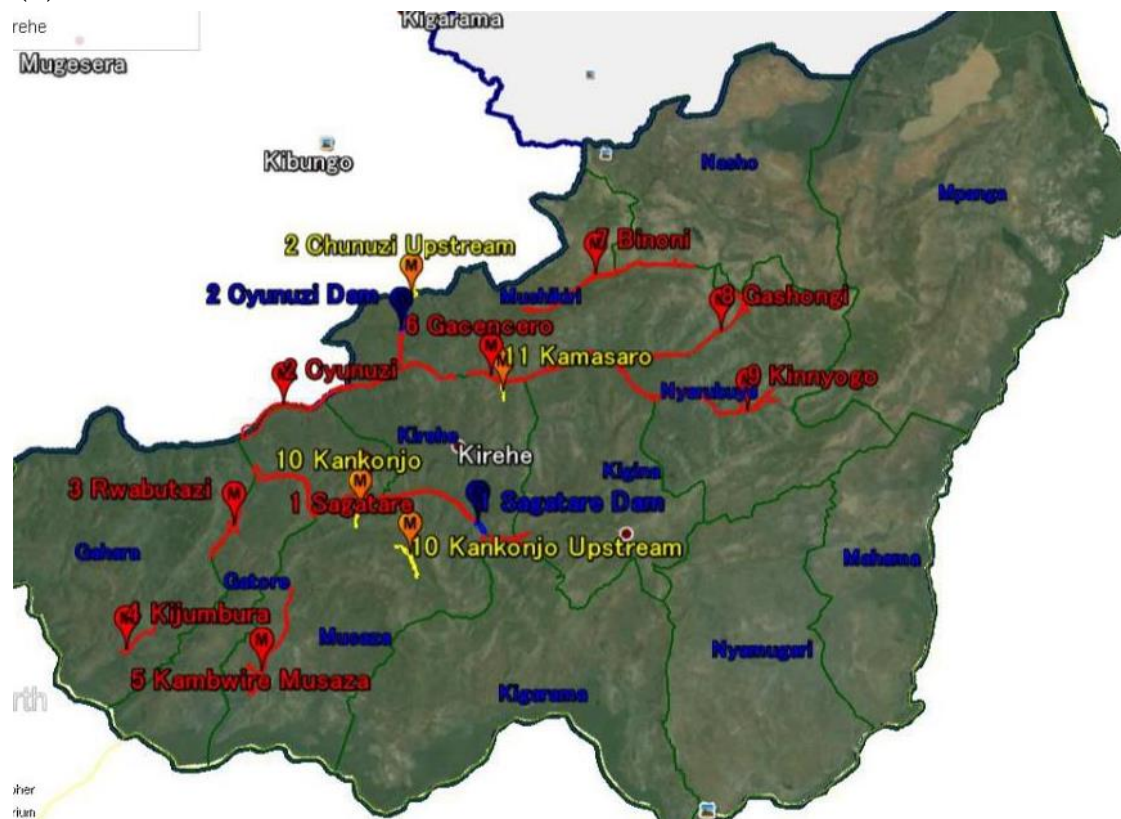
Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
1	Rwangingo	1,100	2	Cyamuganga	200
8	Kanyonyomba	393	3	Rushenyi	30
14	Ntende	900	4	Minago	89
			5	Gahama	91
			6	Nyamarebe	20
			7	Kanyonyomba II	100
			9	Karundura	14
			10	Mugogo	60
			11	Mishunzi	28
			12	Mbogo	26
			13	Kagende	27
Total		2,393	Total		685

(3) The Marshlands in Kayonza



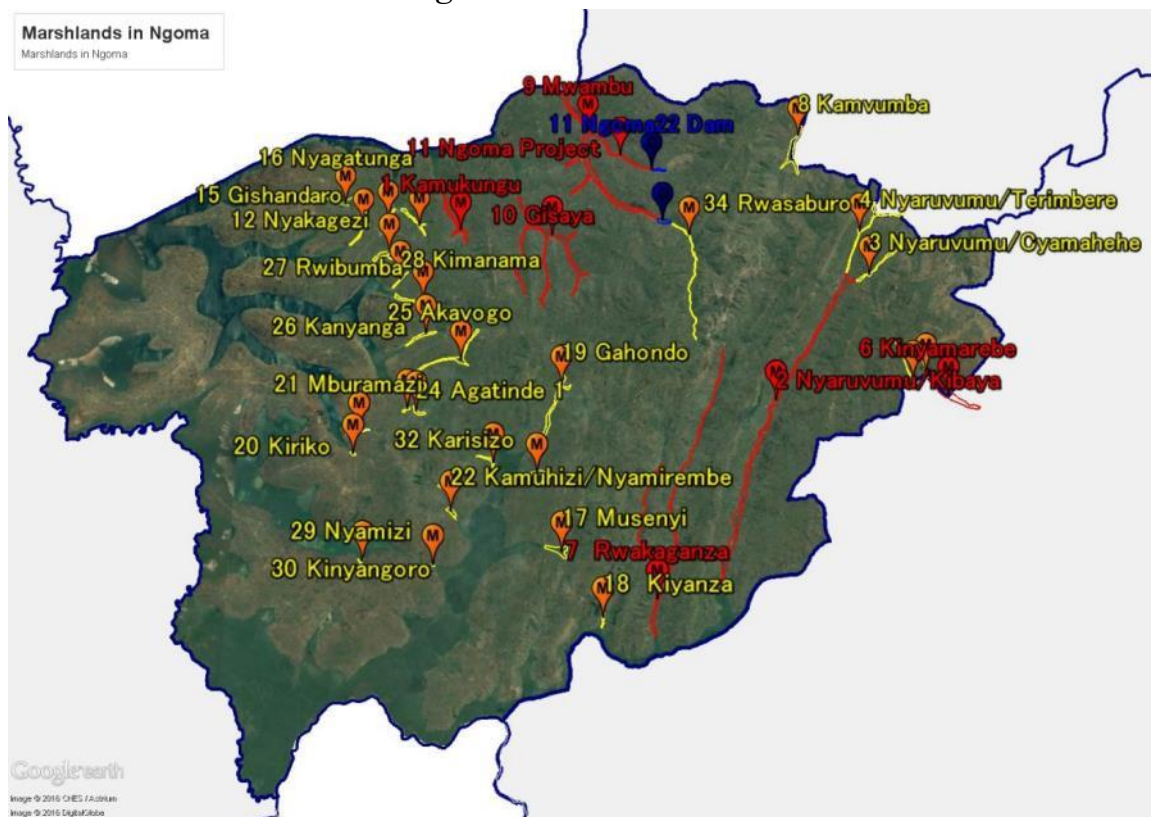
Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
1	Rugendabari/ Kayonza	138	6	Nyabombe	40
2	Rwinkwavu	1,100	7	Cyatokwe	20
3	Kayonza4	124			
4	Kirehe	86			
5	Gacaca	400			
8	Ruramira	32			
Total		1,880	Total		60

(4) The Marshlands in Kirehe



Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
1	Sagatare	95	10	Kankonjo	21
2	Cyunuzi	196	11	Kamasaro	5
3	Rwabutazi	110			
4	Kijumbura	18			
5	Kambwire-Musaza	89			
6	Gacencero	64			
7	Binoni	138			
8	Gashongi	55			
9	Kinnyogo	65			
Total		830	Total		26

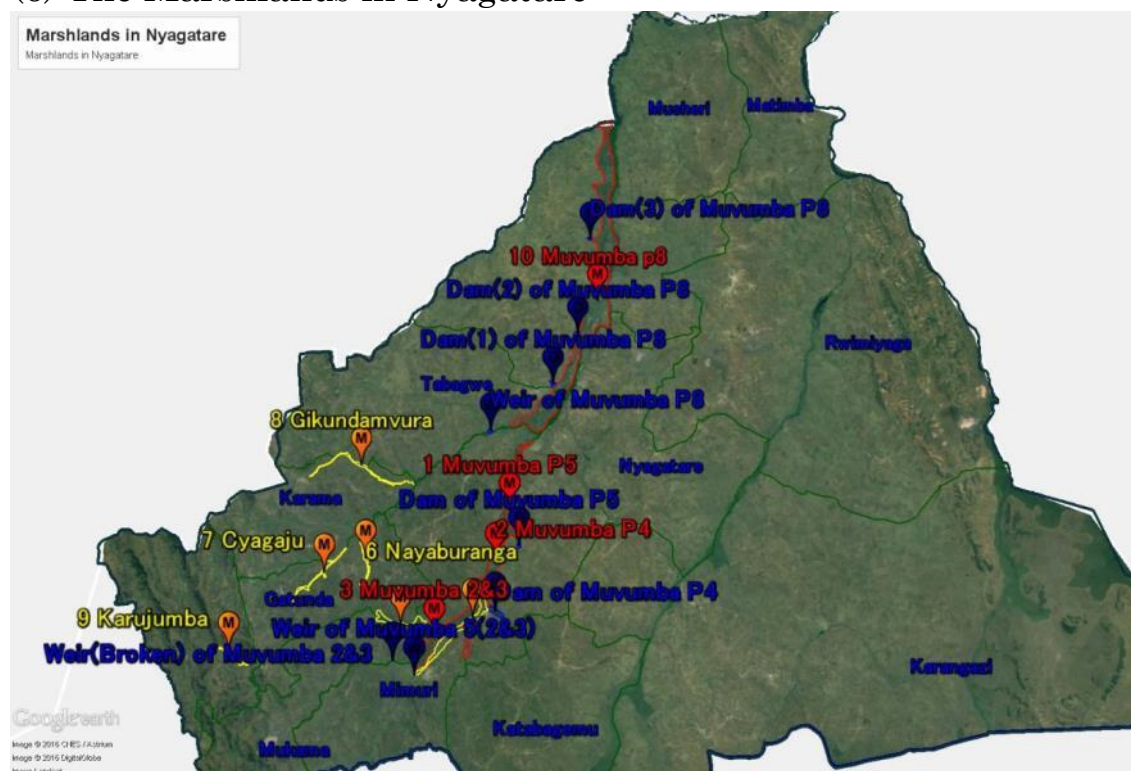
(5) The Marshlands in Ngoma



Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
1	Kamukungu	32	3	Nyaruvumu/ Cyamahehe	23
2	Nyaruvumu/Kibaya	233	4	Nyaruvumu/ Terimbere	34
6	Kinyamarebe	50	5	Rwamukobwa	10
7	Rwakaganza	150	8	Kamvumba	43
9	Mwambu	100	12	Nyakagezi	20
10	Gisaya	92	13	Rutabagu	6
11	Ngoma Project	35	14	Nyamabuye	15
			15	Gishandaro	9
			16	Nyagatunga	12
			17	Musenyi	27
			18	Kiyanza	4
			19	Gahondo	52
			20	Kiriko	3
			21	Mburamazi	5

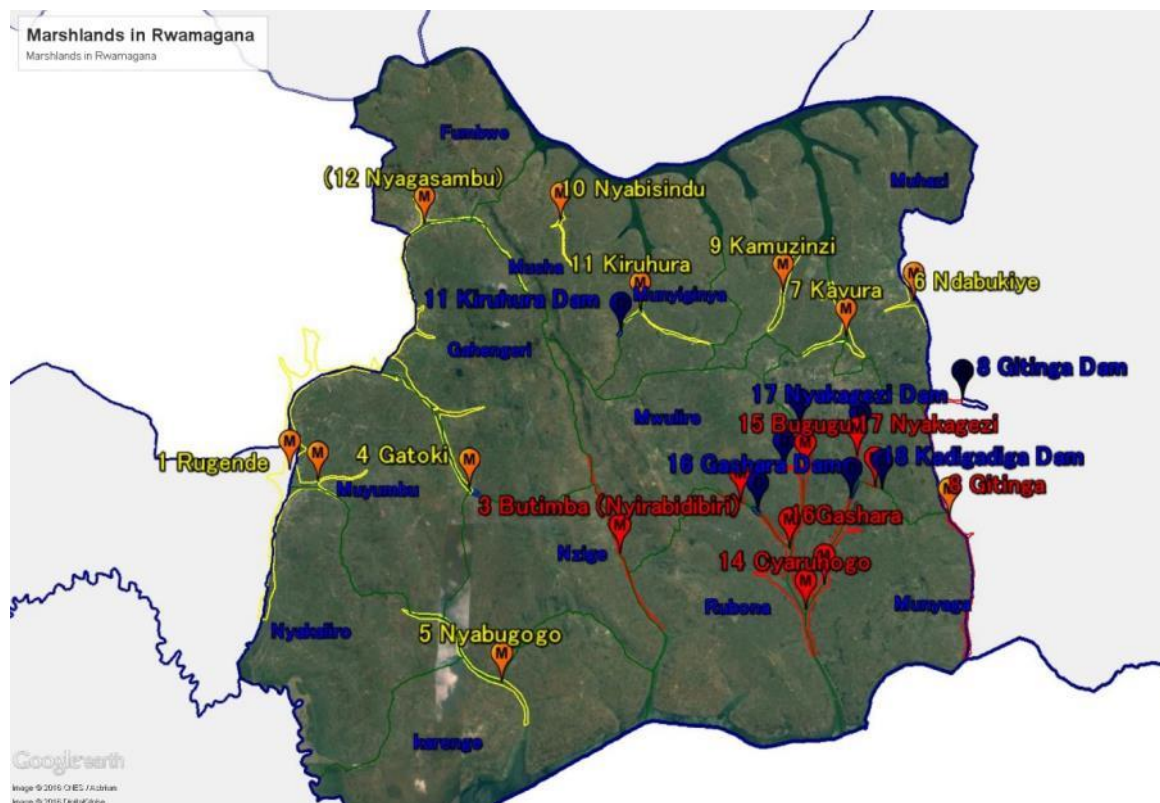
			22	Kamuhizi/ Nyamirembe	13
			23	Mizibiri	7
			24	Agatinde	11
			25	Akavogo, (nyamugali, nyakagezi, bitare)	32
			26	Kanyanga	14
			27	Rwibumba, Gashununu	18
			28	Kimanama	6
			29	Nyamizi	2
			30	Kinyangoro	2
			31	Mubujaga	8
			32	Karisizo	19
			33	Rwasaburo	20
Total		692	Total		395

(6) The Marshlands in Nyagatare



Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
1	Muvumba P5	140	4	Muvumba P1	100
2	Muvumba P4	160	5	Nyakajeje CORIVANY	80
3	Muvumba P2&3	417	6	Nyaburunga	10
10	Muvumba P8	1,750	7	Cyagaju	45
			8	Gikundamvura	47
			9	Karujumba	56
Total		2,467	Total		338

(7) The Marshlands in Rwamagana



Developed Marshland			Non-Developed Marshland		
No.	Name	Size(ha)	No.	Name	Size(ha)
3	Butimba (Nyirabidibiri)	200	1	Rugende	400
8	Gitinga	65	2	(Nyirabuhene)	-
13	Cyimpima	53	4	Gatoki	80
14	Cyaruhogo	90	5	Nyabugogo	15
15	Bugugu	30	6	Ndabukiye	45
16	Gashara	36	7	Kavura	100
17	Nyakagezi	6	9	Kamuzinzi (Muhazi)	20
18	Kadigadiga	4	10	Nyabisindu	18
19	Gashara2	8	11	Kiruhura	39
			12	Nyagasambu	-
Total		492	Total		717

6. The record of the field visits in the Eastern Province

(1) Bugesera

Date	Visited Marshlands
21 st April,2015	10)Gashora2
3 rd June ,2015	14)Rurambi
3 rd Feb,2016	Visit the agronomist of Bugesera District,Mr.Jean Dieu.,15)Gashora1
9 th Feb,2016	1) Tubumba,2) Ruvubu, 3)Rwintare, 4)Gatare, 5)Rwabikwano, 13)Akanyaru
11 th Feb,2016	7)Kizanye, 8)Kibaza, 9)Mugishya
16 th Feb,2016	11)Migina
25 th July,2016	6)Nyabuliba,12)Rwansoro

(2) Gatsibo

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

(3) Kayonza

Date	Visited Marshlands
16 th Mar,2016	1)Rugendabari/Kayonza, 2)Rwinkwavu,
22 nd Mar,2016	3)Kayonza4, 4)Kirehe, 2)Rwinkwavu
23 rd Mar,2016	5)Gacaca, 6)Nyabombe,7)Cyatokwe
19 th April,2016	8)Ruramira

(4) Kirehe

Date	Visited Marshlands
17 th May,2016	1)Sagatare,2)Cyunuzi
18 th May,2016	3)Ruwabutazi,4)Kijumbura,5)Kambwire-Musaza, 6)Gacencero,7)Binoni, 8)Gashongi, 9)Kinnyogo
19 th May,2016	10)Kankonjo, 11)Kamasaro

(5) Ngoma

Date	Visited Marshlands
10 th Mar,2016	11)Ngoma Project
19 th April,2016	1)Kamukungu
26 th April,2016	2)Nyaruvumu/Kibaya,3)Nyaruvumu/Cyamahehe, 4)Nyaruvumu/Terimbere,5)Rwamukovwa, 6)Kinyamarebe,7)Rwakaganza,31)Mubujaga
27 th April,2016	8)Kamvumba,9)Mwambu,10)Gisaya
4 th May,2016	12)Nyakagezi,13)Rutabagu,14)Nyamabuye 15)Gishandaro,16)Nyagatunga,25)Akavogo
5 th May,2016	17)Musenyi,18)Kiyaza,7)Rwakaganza,33)Rwasoburo
10 th May,2016	19)Gahondo,20)Kiriko,21)Mburamazi 22)Kamuhizi,23)Mizibiri,24)Agatinde,32)Kirisizo
11 th May,2016	26)Kanyanga,27)Rwibumba,28)Kimanama, 29)Nyamizi,30)Kinyangoro

(6) Nyagatare

Date	Visited Marshlands
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

(7) Rwamagana

Date	Visited Marshlands
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

7. The list of the interviewees and others

(1) Bugesera

	Names	Organization	Position	Contact
1	Jean de Dieu	Bugesera District	District Agronomist	0788 401 749
2	Nyirimana Emmanuel		Cell Executive Seretary	0787 422 888
3	Nzabonitegeka Ildephonse	Ruhuha Sector	Sector Agronomist	0788 517 655
4	Mbarubukeye Peter	Bushenyi Cell	Executive secretary	0787 686 332
5	Nkusi Francois Xavier	Nyamata Sector	Sector Agronomist	0788 353 977
6	Hakizimana Bosco	Gacaca Cell	SEDO	0784 262 679
7	Vincent	Ntarama	Sector Agronomist	0788 355 944
8	Siboyandemye Jonas	Cooperative/ Tubumba	President	0788 516 424
9	Nteziryayo Emmanuel	CORIVARWI/ Rwintare	President	0788 813 390
10	Mukabutera Eugenie	Twizamure/Gatare	President	0788 666 239
11	Nzeyimana David	COTERWA/Rwabikwano	President	0788 562 853
12	Sindayigaya Martin	CORINYABURIBA	President	0788 463 542
13	Niyibaho J. M. V	COPAUKI/Kizanye	President	0783 057 117
14	Mukankuranga Odette	Inkingi y'ubuhinzi/Kibaza	President	0788 457 897
15	Ntaganira Elias	IZMGM/Mugishya	Prsident	0788 466 459
16	Rwasa Jean Pierre	INDAKUKI/Gashora2	President	0788 788 897
17	Nkezabera Bernardin	COARIMU/Migina	President	0783 303 258
18	Gasasira Daniel	KOABUJU/Rwansoro	President	0783 229 897
19	Rurambi	CORIMARU/ Rurambi	President cooperative President IWUO	0783 467 716 0783 841 530
20	Laurent Joseph	CODUMUGA/ Gashora1	President cooperative President IWUO	0788 788 087 0784 032 089

(2) Gatsibo

	Names	Organization	Position	Contact
1	Bernard	Gatsibo District	District Agronomist	0781 791 206
2	Busoro Desire	Remera Sector	Sector Aronomist	0783 858 145
3	Umutesi Francoise	Kabarore Sector	Sector Aronomist	0784 287 521
4	Habyarimana Gilbert	Kiziguro Sector	Sector Aronomist	0781 075 106
5	Buregeya Sylver	Gasange Sector	Sector Aronomist	0785 994 223
6	Manirakiza Josiane	Ngarama Sector	Sector Aronomist	0788 408 270
7	Karera Francois Xavier	Gitoki Sector	Sector Aronomist	0788 599 398
8	Kayishema Appolinaire	Murambi Sector	Sector Aronomist	0788 542 335
9	Munyunzwe Pierre Claver	Gatsibo Sector	Sector Aronomist	0788 404 166
10	Manzi Alexis	Rwimbogo Sector	Sector Aronomist	0786 142 351
11	Rudasingwa Marc	Rugarama Sector	Sector Aronomist	0786 326 777
12	Gumisiriza Patrik	Kageyo sector	Sector Aronomist	0788 426 114
13	Habimana Richard	Nyagihanga	Sector Aronomist	0782 347 846
14	Rwakibibi John	Kiramuruzi	Sector Aronomist	0788 730 650
15	Nzeyimana Jean Baptiste	KOPAMUCYA	Coop President	0783 665 309
16	Kalisa	Growing Rice Rwangingo	Cooperative Advisor	0782 429 877
17		CORIMAC	IWUO Manager	0788 861 938
18	Rulinda Benoit	COPROMAGA	Coop President	0782 329 237
19	Jean de Dieu	RSSP	Irrigation Engineer	0788 646 504
20		Twitezimbere Mbogo	Cooperative V/P	0726 911 913
21	James	Ntende	Manager	0782 813 252
22	Baryinyonza Jean Bosco	Mbogo marshland	Famer	0783 393 532

(3) Kayonza

	Names	Organization	Position	Contact
1	Ngabonziza Hussein	Kayonza District	District Agronomist	0788 490 193
2	Kanuma Aphodis	Kabare Sector	Sector Agronomist	0788 447 950
3	Nsingizumuremyi Protogene	Ndego Sector	Sector Agronomist	0788 778 374
4	Kamarampaka Innocent	Mwili Sector	Sector Agronomist	0788 538 238
5	Mwizerwa Emmanuel	Kabarondo Sector	Sector Agronomist	0788 462 918
6	Ruterana Claire Fontaine	Murama Sector	Sector Agronomist	0788 470 359
7	Imaniyo Eric	Mukarange Sector	Sector Agronomist	0788 603 927
8	Kavaruganda jean Pierre	Gahini Sector	Sector Agronomist	0785 047 961
9	Kamanzi Audace	Murundi Sector	Sector Agronomist	0785 093 381
10	Rulinda Dieudonne	Rwinkwavu Sector	Sector Agronomist	0788 594 845
11	Nyiraneza Hyacintha	Ruramira Sector	Sector Agronomist	0788 516 546
12	Mukamurara Julienne	Nyamirama Sector	Sector Agronomist	0788 632 142
13	Rugumaho Faustin	INDATWA KAYONZA/Rwiri	Coop President	0783 368 092
14	Kanani Pascal		President (Hillside)	0788 224 816/ 0782 897 591
15	Bizimana Deodatus	COCURIKA/Kabare	Coop President	0782 065 253
16	Niyireba Evalist	Duterimbere Murundi/Gac	Coop President	0787 532 433
17	Nsanzimana Jean Bosco	Twitezimbere Nyabombe	Coop President	0783 076 850
18	Rukundo Martin	abesamihigo	Coop President	0782 812 809
19	Joseph	COCURIRU	Coop President	0788 639 327

(4) Kirehe

	Names	Organization	Position	Contact
1	Nsabimana Joseph	KWAMP	IWUOs Specialist	0788 601 314
2	Kabalisa Jean Claude	Kirehe District	District Agronomist	0788 484 368
3	Buteto Monique	Kirehe District	District Irrigation Officer	0788 897 784
4		HODECO/Uruzabibu		
5	Mbarushimana Bonaventure	Musaza	Sector Agronomist	0788 808 429
6	Muganineza Jimmy Frank	Gatore Sector	Sector Agronomist	0788 632 199

(5) Ngoma

	Names	Organization	Position	Contact
1	Niyongabire Janvier	Ngoma District	District Agronomist	0788 277 622
2	Nzabagerageza Ildephonse	Sake Sector	Sector Agronomist	0788 493 878
3	Haringanji Jean Guillaume Pilote	Jarama Sector	Sector Agronomist	0788 539 667
4	Mukayiranga Glorioso	Murama Sector	Sector Agronomist	0783 225 372
5	Nyiratombora Clementine	Kibungo Sector	Sector Agronomist	0788 640 278
6	Habyarimana Alexis	Rukumberi Sector	Sector Agronomist	0788 433 577
7	Namahirwe Antoinette	Zaza Sector	Sector Agronomist	0788 601 954
8	Ngirumuhire J. Baptiste	Mugesera Sector	Sector Agronomist	0788 467 354
9	Mwima Bitegetsimana	Kazo Sector	Sector Agronomist	0788 678 578
10	Sekibibi Elia	Mutendri Sector	Sector Agronomist	0788 560 161
11	Niyonzima Viateur	Rukira Sector	Sector Agronomist	0788 499 158
12	Nzabirinda Damien	Rurenge Sector	Sector Agronomist	0788 656 113
13	Musanabandi Marie Jeanne	Gashanda Sector	Sector Agronomist	0783 514 261
14	Nsekanabo Stanislas	Karembo Sector	Sector Agronomist	0788 443 429
15	Buranga Felix	CORIMI	Group President	0725 972 726
16	Venuste	CORIMI	Cooperative President	0785 242 434
17	Mulisa	COPRIKI	Coop Agronomist	0783 518 593
18	Nkurunziza	Rwamukobwa marshland	Village leader	0783 226 580
19	Uwigize Narcisse	COAUKI	Coop President	0782 879 680
20	Evaliste	COPAMUNYA	Coop President	0788 778 169
21	Usabamungu Christophe	COARA	Coop President	0783 032 581
22	Makombe	COPRIMWA	Coop President	0788 732 272
23	Rusagara	COCURIGI	Coop President	0788 567 902
24	Nkurunziza Francois	CORIMI	Group President	0725 033 993
25	Uwimana Jean Damascene	CORIMI	Group President	0722 537 421
26	Niyirora	CORIMI	Group President	0726 005 974
26	Mukansengiyumva Costasie	Kigarama Rice Farmers	Coop President	0781 673 080
27	Ntibazi	Kigarama Rice Farmers	Former Coop President	0788 556 427
28	Ndaruhutse Theoneste	CORIMI	Group President	0725 019 137
29	Rugumyangabo Theoneste	CORIMI	Group President	0722 154 378
30	Nsengimana Augustin	CORIMI	Group President	0722 987 436
31	Kayinamura Francois	CORIMI	Group President	0786 457 904
32	Bideli Fidel	CORIMI	Group President	0785 444 314
33	Theophile	CORIMI	Group President	0727 852 927
34	Harerimana Innocent	CORIMI	Group President	0722 945 185
35	Ntezimana Dominique	CORIMI	Group President	0727 143 409
36	Hategekimana Sylvain	CORIMI	Group President	0782 403 585

(6) Nyagatare

	Names	Organization	Position	Contact
1	Fulgence	Nyagatare District	District Agronomist	789006244
2	Niyitanga Theoneste	KARAMA	Sector Agronomist	0788 547 624
3	Mucunguramfizi Andrew	MIMULI	Sector Agronomist	0788 446 641
4	Nyirabahire Adrienne	KARANGAZI	Sector Agronomist	0788 761 452
5	Nzeyimana Etienne	KATABAGEMU	Sector Agronomist	0788 451 909
6	Dusabeyezu Josephine	RUKOMO	Sector Agronomist	0788 821 679
7	Rwabigwi Alexandre	KIYOMBE	Sector Agronomist	0788 583 193
8	Sibomana Jean Dominique	TABAGWE	Sector Agronomist	0788 773 509
9	Rutinywa Vincent	MUSHERI	Sector Agronomist	0788 464 448
10	Ingabire Christine	NYAGATARE	Sector Agronomist	0788 495 426
11	Mberabagabo Elie	GATUNDA	Sector Agronomist	0788 839 187
12	Niyibigira Clementine	MUKAMA	Sector Agronomist	0788 486 910
13	Musabyimana Jean Bosco	RWEMPASHA	Sector Agronomist	0788 669 718
14	Munderere Alfred	MATIMBA	Sector Agronomist	0788 690 703
	Jean Damascene	CODERVAM	WUO President	

(7) Rwamagana

	Names	Organization	Position	Contact
1	Ukizuru Innocent	Rwamagana District	District Agronomist	0788 845 669
2	Niyoniringiye Janvier	Bujyujyu Cell	EIS	0787 858 477
3	Simpunga Gilbert	Muyumbu Sector	Sector Agronomist	0788 646 665
4	Gashayija Gaston	Nzige Sector	Sector Agronomist	0788 476 636
5	BIZIMANA André	Cooperative Union	Union Agronomist	0785 799 477
6	Rudasingwa Thomas	COCURIBU	Coop President	0788 407 135
7	Ntirenganya Eugene	COCURIBU	Coop Agronomist	0788 282 164
8	Nsekanabo Joseph	COCURICYI	Coop President	0783 168 813
9	Gashema Olivier	COCURICYI	Coop Agronomist	0788 667 123
10	Rwabupfizi Copens	COCURIGA	Coop President	0782 175 348
11	Habimana Amani	COPERIG	President	0783 360 005
12	Rutaganda Jean Baptiste	COCURIMU	President	0783 340 034
13	Semana Frederic	Urumuri rwa Musha	Coop President	0782 025 245
14	Mukaperezida Therese	Twiteganyirize ejo hazaj	Coop President	0786 110 372

(8) Staff (Interviewers)

	RAB officers			
	Names	Organization	Position	Contact
1	UWITONZE Theogene	Head office	Senior Rural Engineer	0788 669 659
2	MUKESHIMANA Angelique	Eastern Zone	Community Development Officer (CDO)	0788 774 233
3	RUGIMBANA Jean Claude	Eastern Zone	Irrigation Technician	0788 469 832
4	KIMAZI Jean Paul	Eastern Zone	WUO Officer	0788 271 017
	JICA Officers			
	Names	Organization	Position	Contact
1	Takuji TANAKA	JICA	Irrigation Adviser	0783 868 188
2	Jules NZABONIMANA	JICA	Irrigation Adviser Assistant	0788 621 742

8. References

- (a) Rwanda Irrigation Master Plan(2010)
- (b) Inventaire rapide des marais du Rwanda(REMA,2008)
- (c) The District Development Plan
- (d) The plans and drawings of Irrigation Projects like JICA, RSSP, QWMD, KWAMP, Chinese Project, PADAB/PAIRB, PAPSTA and Others
- (e) The Marshland DATA BASE from RAB (2015)
- (f) Eastern Province official website
(<http://www.easternprovince.gov.rw/index.php?id=2>)
- (g) Wikipedia "the Eastern Province Rwanda"
(https://en.wikipedia.org/wiki/Eastern_Province,_Rwanda)