



## Progress of Agricultural Mechanization Process in **Rwanda**

**The Fifth General Meeting of CARD  
5-6 February 2013 in Dakar**

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## 1. (1) Access to the Machineries

### Availability

Designations	Public	Private	total
Tractors	144	96	240
Power Tillers	250	20	270
Rice Transplanter	35	0	35
Combine harvester	2	5	7
Importing Companies/agents	2	4	6

## 1. (1) Access to the Machineries

### Annual Need/Market size

Equipment	Annual Need	2015	2017	2020
Tractors	250	1000	1500	2500
Power Tillers	2000	7000	11000	17000
Planting Machines	1300	6400	11150	15200
Harvesters	800	2600	5250	7600
Post-Harvesting machines	1950	7800	12100	17950
Agro processing	10	20	30	45

- The annual need identification is based on the mechanization strategic goal : 25% of farm operation should be mechanized by 2017

## 1. (1) Access to the Machineries

### Access to the Machinery

- 16 Village Mechanization Services Centers (VMSCs) have been created so far for hiring and selling services.
  - 100.000 Rwf/ha = 154 usd/ha for the first tillage
  - 50.000 Rwf/ha =78 usd/ha for the second tillage
  - Fuel is a farmer charge
- Several Demonstrations has been carried out with the collaboration of the private sector/Market preparation
- 300 Farmers, 50 tractors operators and technician are trained/year on operation and maintenance of machinery

## 1. (1) Access to the Machineries

### Finance

Banks/ Company	Leasing Contract	Down Payment	Interest/ year	Leasing Period
<b>BRD</b> Rwanda Development Bank	Tractors and necessary attachments	20%	10-12%	5 Years
<b>VF</b> Vision Finance	Powers Tillers and its attachments	100,000 RwF	30%	1 to 3 years
<b>BPR</b> Banque Populaire Du Rwanda	Ongoing study to finance agricultural mechanization			

Few contribution of the existing banking systems with high interest rate in agricultural mechanization financing.

## 1. (2) Challenges and Gaps for Mechanization

### Technical Aspects

- Lack of capacity in operation and management of machinery
- Lack of Mechanization specialists
- Standards and technical specification of machineries not yet identified

### Policy aspects

- Lack of policy related to standards
- Lack of farmers' financial capacity
- Few contribution of the banking system with high interest
- Low engagement of private sector

## 2. (1-a) Matching Farm Equipment to Rice production systems

Based on the analysis, appropriate technical specifications of agricultural machinery are proposed:

- For plowing/ tilling:

Farm size (ha)	Draft	1st tillage implement	Width (m)	2nd tillage implement	Width (m)
Small (0.1 – 1)	Power tiller	Moldboard/Discs	0.2-0.4	Rotavator	0.5-0.75
Large (1 - 3ha)	Tractor	Moldboard/Discs	0.9-1.25	Rotavator/Discs	1-2.2

- For harvesting:

Farm size (ha)	Draft	Width (m)	Power (kw)
Small (0.1 – 1)	Small combine Harvester	0.75- 2	20 - 60
Large (1 - 3ha)	Combine Harvester	2 - 4	60 - 120

## 2. (1-b) Testing and certification

### Current status/problems

- Rwanda Bureau of Standards (RBS) is the current Organization for testing and certification but not agricultural machinery;
- The Task Force of Irrigation & Mechanization (TF) is currently testing and inspecting the quality of agricultural machinery (field testing and demonstration);
- No Facilities for testing and certification;
- Since October, 2011 a Mechanization Expert has been recruited by MINAGRI for technical assistance and capacity building of mechanization staff and young professional.

## 2. (1-b) Testing and certification

### Proposed Structure

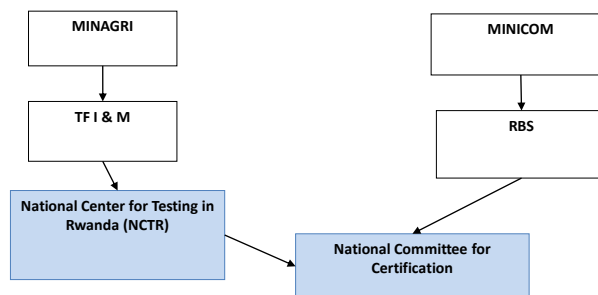


Figure : Organization Chart of Testing and Certification of Agricultural Machinery

## 2. (1-b) Testing and certification

### Road Maps

i) Improvement of existing organizational structures
<b>Mechanization National Center of Rwanda (2013-2014)</b>
ii) Development of required minimum facilities with different time horizons;
<b>Infrastructure improvement-2013, Internal equipment 2014</b>
iii) Recruitment of appropriate human resources and provision of training; and
<b>Recruitment and trainings should be organized by mid 2014</b>
iv) Linkage with international organizations
<b>JICA, South Korea, India and China</b>

## 2. (1-c) Scenario: List of machineries to be domestically produced

- 1. List of machineries to be domestically produced/ manufactured/ assembled:

### in 3 years

Machineries/ Implements (accessories)	Current Import Tarif & VAT (Rwf)	Views/policy
Moldboard Plough	0%	1-Once local manufacturers started manufacturing those equipments Government should protect them by necessary policy.
Rotary plow	0%	
Iron wheels	0%	
Rice threshers	0%	2-manufacturing equipment locally can reduce prices, create jobs, have an adapted equipment which satisfy farmers demand
Winnower	0%	
Solar Dryer	0%	3-treshers and winnower existing are to be improved
Mechanical weedder	0%	
Trailers, water pups	0%	
Power Tiller (assembly)		

## 2. (1-c) Scenario: List of machineries to be domestically produced

- 1. List of machineries to be domestically produced/ manufactured/ assembled:

within 10 years

Machineries/ Implements (accessories)	Current Import Tariff & VAT	Views/policy
Paddler	0%	1-Once local manufacturers started manufacturing those equipments Government should protect them by necessary enabling policy.
Disc harrow small and medium size	0%	
Powered weedder, seed drills	0%	2-manufacturing equipment locally can reduce prices, create jobs, have an adapted equipment which satisfy farmers demand
Nursery plate	18%	When manufactured locally, taxes are avoided, equipment are delivered for farmers on time.
Steering system and handle bar for rice planter	18%	
Power tiller steering system, handle bar	18%	
Chassis	18%	

## 2. (1-c) Scenario: List of machineries to be domestically produced

- 1. List of machineries to be domestically produced/ manufactured/ assembled:

beyond 10 years

Machineries/ Implements (accessories)	Current Import Tariff & VAT	Views/policy
Tires	18%	When manufactured locally, taxes are avoided, equipment are delivered for farmers on time.
Power tiller clutches	18%	
Batteries	18%	
Electric network	18%	
Starter	18%	
Milling machines	18%	
Small size harvesters	0%	1-Once local manufacturers started manufacturing those equipments Government should protect them by necessary enabling policy. 2-manufacturing equipment locally can reduce prices, create jobs, have an adapted equipment which satisfy farmers demand
Rice transplanter	0%	
Sprayers	0%	

## 2. (1-c) Scenario: List of machineries to be domestically produced

### Capacity Development needs

### Technical Capacity

N	Field	Profiles	Qty	Trainings	
				Training course	Type
1	R&D	Engineers	8	Designing, development of machinery technical aspects	Long term
2	Raw Materiel	Metallurgists	8	Technical specifications, appropriate raw materiel	Long term
3	Manufacturing	Mechanical, electric engineers, Artisans	24	Welding, carpentry, theory of machines	Short term
4	Assembling	Mechanics, technicians	16	Assembling parts machinery, engines..	medium term
5	Testing	Mechanical, electric engineers, operators	3	Performance testing, environmental impact of machines, operation Safety use testing	Short term
6	Certification	Legal advisor	1	Machinery Certification process	Medium term
7	Marketing	Sales engineer, Marketing officers, economist	24	accountancy skills, marketing skills, cooperation skills	Short term
8	Delivery System	Rural networking of dealers	8	Delivering, making contacts and networking	Medium term
9	Maintenance	Service Engineers, Mechanics, Technicians, Blacksmiths	32	Maintenance of machinery	Short and medium term

## 2. (1-c) Scenario: List of machineries to be domestically produced

### Capacity Development needs

### Financial Capacity

- Specific incentive for local manufacturers of agricultural machinery
- Lack of Manufacturers' financial capacity
- Taxes exemption for raw materiel
- Specific interest rate for machinery manufactures



## 2. (2) Policy Tools and Related Actions for change [1/3] – Enabling Environment

<b>Subject matter (item of reform)</b>	
MECHANIZATION PROMOTION/INVOLVEMENT OF THE PRIVATE SECTOR	
<b>Current status of the subject matter</b>	
Strategy is available (to be updated by March, 2013)	
<b>What changes do you suggest to this subject matter?</b>	
Introduction of subsidies of agricultural machinery	
- Farm machinery subsidies	
- Mechanization Investment subsidies	
<b>Who do you think will benefit as a result of this change and how?</b>	
<b>Who?</b>	<b>How?</b>
Supply chain (private sector)	Different farm machinery are available and delivered Competitions are created
Farmer	Different farm machinery are available and promoted
<b>As side effects, who do you think will be negatively affected by this change and how? In other words, who may oppose to this change and why?</b>	
<b>Who?</b>	<b>How? / Why?</b>
Is there any measure to mitigate the above negative effects? If yes, what?	
<b>Which ministries / organizations / companies are in charge of this matter? Who are the key persons to consult?</b>	
<b>Institution</b>	<b>Key persons</b>
MINAGRI	PS, Chairman TF I&M, DG RAB
MINECOFIN	PS
MINICOM	PS, DG Trade and Industry
PSF	Chambers.....
RBS	DG,
RDB	Investment Unit

## 2. (2) Policy Tools and Related Actions for change [2/3] – Enabling Environment

<b>Subject matter (item of reform)</b>	
IMPOSE AFTER SALES SERVICE, WARRANTY AS PRE CONDITION FOR AGRICULRURAL MACHINERY SOLD IN RWANDA	
<b>Current status of the subject matter</b>	
Such service are very minimal	
<b>What changes do you suggest to this subject matter?</b>	
-Establishment of guidelines for after-sales service for all machines sold in Rwanda	
-Warranty should be as pre-condition	
- Supply of spare parts as pre-condition	
<b>Who do you think will benefit as a result of this change and how?</b>	
<b>Who?</b>	<b>How?</b>
Farmers and service providers	Can be warranted on investing in machinery services ,
International manufacturers and Importers	Quality improvement of the services
<b>Negative side effects (who and how)</b>	
<b>Who?</b>	<b>How? / Why?</b>
None	
<b>Institutions and key persons responsible</b>	
<b>Institution</b>	<b>Key persons</b>
MINAGRI	PS, Chairman of TF I&M
MINICOM	PS, DG Trade &Industry,
PSF	Dealers, Outlet Managers and chamber of industry
RBS	DG and Department of Inspection
RDB	Department of Registration

## 2. (2) Policy Tools and Related Actions for change [3/3] – Enabling Environment

<b>Subject matter (item of reform)</b>	
ENFORCE STANDARDS AND QUALITY OF AGRICULTURAL MACHINERY	
<b>Current status of the subject matter</b>	
No standards available	
<b>What changes do you suggest to this subject matter?</b>	
Standards and quality on agricultural machinery has be developed. Rwanda Bureau of standard has plan in new future	
<b>Beneficiaries on changes and how</b>	
<b>Who?</b>	<b>How?</b>
Farmers	Will get quality machinery
Local manufacturers	Will produce standard machinery for regional market
<b>Negative side effects (who and how and measures)</b>	
<b>Who?</b>	<b>How? / Why?</b>
None	
<b>Is there any measure to mitigate the above negative effects? If yes, what?</b>	
<b>Which ministries / organizations / companies are in charge of this matter? Who are the key persons to consult?</b>	
<b>Institution</b>	<b>Key persons</b>
MINAGRI	PS, Chairman TF I&M
PSF	CEO
MINICOM	PS
ISAE	RECTOR
RBS	DG

## 3. (1) Way Forward: Technical Track

- On going establishment of technical specifications book of agricultural machinery which can help to identify appropriate machineries according to local conditions;
- Starting discussions with RBS on machinery standards and certification;
- Technical assistance and capacity building of local manufactures to improve domestic production of machineries;
- Every fiscal year MINAGRI establish a plan for strengthening Rural Capacity of Repair and Maintenance ;

### 3. (2) Way Forward: Policy Track

- MINAGRI is updating the Mechanization Strategy taking in account Policy changes for Enabling Environment mainly involvement of the private sector;
- MINAGRI Started handing over the mechanization services to the private sector;
  - Since 2011, three private companies have been established to deliver agricultural machinery and after sales services;
  - A go ahead is already given to a foreign Company to establish a mechanization services center in Eastern Province (hiring, repair and maintenance and training);
  - On going discussion with local company to run the power tillers assembly plant already built by MINAGRI.

## Thanks



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## Annex

### 5. Matching Farm Equipment to Farm Size

- 1) Tractors
- 2) Combines
- 3) Rice Mills

### 6. Progress of the Mechanization Process

- 1) Chronology of events/ meetings
- 2) List of Participants

### 7. Summary/ Points of Questionnaire on Processing

- 1) Current Capacity of Milling
- 2) Current Market Situation
- 3) Standard and Grading System

### 5. (1) Matching Farm Equipment to Farm Size Tractors

10 selected Steps out of 34	2 wheel	4 wheel
1. Area covered (ha)	10.00	40.00
10. Equipment sizes available (meter)	0.50	1.00
12. Draft (kN/m)	4.00	7.00
18. Purchase price of tractor (\$)	3,500.00	20,000.00
20. Purchase price of plow (\$)	150.00	2500.00
28. Total Operating Cost (\$/hr)	7.50	23.00
31. Total Fixed Cost (\$/hr)	5.98	24.58
32. Total Cost/hr (\$/hr)	11.15	47.58
33. Cost/ha (\$/ha)	44.60	47.58
Contract Rate (\$/ha)	49.06	52.34

### 5. (2) Matching Farm Equipment to Farm Size Combines

10 selected Steps out of 34	Small	Medium
1. Area covered (ha)	50.00	200.00
10. Equipment sizes available (metre)	1.80	2.5
12. Draft (kN/m)	4.00	8.00
18. Purchase price (\$)	20,000.00	60,000.00
28. Total Operating Cost (\$/hr)	27.00	53.00
31. Total Fixed Cost (\$/hr)	33.33	80.00
32. Total Cost/hr (\$/hr)	60.33	133.00
33. Cost/ha (\$/ha)	60.33	66.50
Contract Rate (\$/ha)	78.43	86.45

### 5. (3) Matching Farm Equipment to Farm Size Rice Mills

10 selected Steps out of 34	Small	Medium
1. Volume Milled (tons/year)	500.00	1,000.00
10. Equipment sizes available (kg/hr)	500.00	1,000.00
18. Purchase price (\$)	55,000.00	120,000.00
28. Total Operating Cost (\$/hr)	5.21	9.50
31. Total Fixed Cost (\$/hr)	4.13	9.00
32. Total Cost/hr (\$/hr)	9.33	18.50
33. Cost/t (\$/t)	22.40	22.20
Contract Rate (\$/t)	29.12	28.86

## 6. (1) Chronology of events/ meetings

Date	Actions taken (meeting, etc) after March '12
26 April 2012	Stakeholders meeting, core working group identification
10 May 2012	Core group meeting
28 May 2012	Core group meeting
18 June 2012	Core group meeting
2 August 2012	Core group meeting
19 October 2012	Video Conference Seminar 2: 'Efforts of small-scale farmers to improve rice quality at post-harvest, on-farm level and practices at rice mills and distribution in South-East Asian countries'
22-24 October 2012	2 <sup>nd</sup> Regional Mechanization Workshop in Nairobi Kenya
21 <sup>st</sup> November	Stakeholders consultation workshop

## 6. (2) List of the Participants

No.	Name	Job Title	Organisation
1	SENDEGE Norbert	DG Crop production	MINAGRI
3	Prof SANKARAHAM	Lecturer	ISAE
4	BOUTOUTA Abdelatif	Mechanization Expert	TF/MINAGRI
5	NDAGANO Jean Claude	Officer	RAB
6	PHILIPE	Staff in trade unit	MINICOM
7	TUYISABE Jean Damascene	VMSC Manager	TF/MINAGRI
8	MUGWANEZA Bellise	Agri Business officer	TF /MINAGRI
9	MUTABAZI Minc Aime	Extension officer	TF/I&M
10	Narcisse		ABEM
11	Benjamin		RSSP
12	RURANGWA Raphael	DG planning and Program Coordination	MINAGRI
13	FURAHA Pascal	Ag.Program Coordinator	JICA
14	NODA Tatsuki	Ag. Program Manager	JICA

### 7. (1) Current Capacity of Milling [1/3]

	Small <150kg/hr	Medium 150-300kg/hr	Large >300kg/hr
Number of mills present		50	10
Main source of paddy		Traders, Cooperative	Cooperatives, Out grower schemes
Mainly sell the milled rice to?		Retail/wholesalers	Exporters/wholesalers
Major problems?		Color (polishing)	Purity (mixtures)

Guidance:

### 7. (2) Current Market Situation [2/3]

	Urban	Rural
Total Volume (tons)	116000	
% of local rice	20%	50%
Grades of the most popular rice	2	2
Price of the most popular rice (\$/kg)	1.4	1.1
Import Tariff (%)	20%	20%
Price difference between local and imported rice of same type (%)	16%	5%
Consumers' preference	long and medium/slender types (indica)	

### 7. (3) Standard and Grading System [3/3]

**Any law/ policy on 'grading system' for rice sold in the markets?**

Ministerial instructions on milling operations (MINICOM)

**If yes, which grades and how?**

Small mills in marshlands generally produced Grade 3 rice. The government has recently banned such mills and has approved only those mills that can produce a minimum of Grade 2 rice (NRDS)

**Institutional Capacity: Which institution(s) is responsible for implementing milling standards and grades of rice sold in market?**

Rwanda Bureau of Standard (RBS)

**What are the limitations in implementation of grades and standards?**

Compliance, awareness, human resources, technical difficulties, lack of policies....

# Thanks



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