

Progress of Agricultural Mechanization Process in Uganda

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1. (1) Access to the Machineries

- Availability/ affordability of the Machinery: 2-wheel Tractor: **7 importing companies/agents**, retail price in **US\$2,500-6,450**, estimated market size **US\$16,500-112,200**, 4-wheel Tractor: **9 importing companies/agents**, retail price in **US\$16,000-33,000**, estimated market size **US\$92,000-1,518,000**, etc
- Access to the Machinery: **Individual tractor owners**, hiring service: **US\$100-120/ha**, Interest rates on loan schemes towards the purchase of farm machineries **24-26%**
- Annual importation: 2-wheel Tractor: **100** per year, **0 import tariff (%)**, retail price in **US\$3,000-5,400**, 4-wheel Tractor: **200** per year, retail price in **US\$16,000-33,000**, etc

1. (1) Access to the Machineries

- Availability/ affordability of the Machinery: 2-wheel Tractor:
- **7 importing companies/agents**, retail price in **US\$2,500-6,450** estimated market size **US\$16,500-112,200**

Importing companies/agents	Tractor Make & HP	retail price in US\$	estimated market size US\$
Farm Engineering Industries Ltd	Yanmar (9.5& 11HP) Greaves (14HP)	5,400 & 6450	59,400 & 70,950
China North machine (U) Co. Ltd	Jiang Dong (10HP) Changfa (16&18HP)	2,500 5,200 & 6000	57,200
China Huangpai Food machines (U) Ltd	SH101 (10 HP) Amec (16 HP)	3,500 4,400	57,750 72,600
Asia Agro Industries (U) Ltd	Johnston (13HP)	3,200	49,280
National Agro Machinery Ltd	Shandong (10.5HP)	3,400	112,200
ETC Agro Tractors and Implements Ltd			
Car and General (U) Ltd	Honda (7.5HP)	3,000	16,500

1. (1) Access to the Machineries

- Availability/ affordability of the Machinery: 4-wheel Tractor:
- 9 importing companies/agents, retail price in US\$16,000-33,000, estimated market size US\$92,000-1,518,000

Importing companies/agents	Tractor Make	Retail price in US\$	Estimated market size US\$
Engineering Solutions	Massey Ferguson (India),	25,000	287,500
	Europad (China),	29,000	166,750
	Foton (China)	32,000	184,000
Heavy Duty Uganda Ltd	Massey Ferguson (reconditioned) (75HP)	20,000	360,000
Farm Engineering Industries Ltd	Sonalika (60HP)	26,000	149,500
	(90HP)	32,000	736,000
UGIRAN Company Ltd /Akamba (U) Ltd	Massey ITIMCO (60HP)	24,000	138,000
	(75 HP)	28,000	640,000
	(90 HP)	31,000	534,750

1. (1) Access to the Machineries

- Availability/ affordability of the Machinery: 4-wheel Tractor:
- 9 importing companies/agents, retail price in US\$16,000-33,000, estimated market size US\$92,000-1,518,000

Importing companies/agents	Tractor Make	Retail price in US\$	Estimated market size US\$
Cooper Motors Corporation	New Holland (60HP)	26,000	598,000
	(90HP)	33,000	1,518,000
ETC Agro Tractors & Implements Ltd	Mahindra (90HP)	32,000	552,000
Wava holdings Ltd	Deutz (65HP)	24,000	138,000
Car and General (U) Ltd	Tafe (75HP)	32,000	184,000
Farmrite Machineries & Equipments Ltd	Massey Ferguson (Pakistan) (40HP)	16,000	92,000
	(75HP)	30,000	345,000

1. (1) Access to the Machineries

- Access to the Machinery: **Individual tractor owners**, hiring service: **US\$100-120/ha**, Interest rates on loan schemes towards the purchase of farm machineries **24%**

Hiring service	US\$##/ha	
Individual tractor owners	100 - 120	

- Access to the Machinery: **4 companies** provide farm machinery back-up service : **US\$120/ha**,

Hiring service	US\$##/ha	
Cooper Motors Corporation	120	
Engineering Solutions	120	
Farm Engineering Industries Ltd	120	
UGIRAN Company Ltd	120	

1. (1) Access to the Machineries

- **Annual importation:** 2-wheel Tractor :

Importing companies/agents	Tractor Make	Number per year	Import tariff (%)	retail price in US\$
Farm Engineering Industries Ltd	Yanmar	10	0	5,400
China North machine (U) Co. Ltd	Changfa	10	0	5,200
China Huangpai Food machines (U) Ltd	SH101	15	0	3,500
Asia Agro Industries (U) Ltd	Johnston	14	0	3,200
National Agro Machinery Ltd	Shandong	30	0	3,400
ETC Agro Tractors and Implements Ltd			0	
Car and General (U) Ltd	Honda	5	0	3,000

1. (1) Access to the Machineries

- Annual importation: 4-wheel Tractor :

Importing companies/agents	Tractor Make	Number per year	Import tariff (%)	retail price in US\$'000
Engineering Solutions	Massey Ferguson, Europad, Foton	10, 5, 5	0	25, 29, 32
Heavy Duty Uganda Ltd	Massey Ferguson	15	0	20
Farm Engineering Industries Ltd	Sonalika	5, 20	0	26,32
UGIRAN Company Ltd /Akamba (U) Ltd	ITIMCO	5,20,15	0	24, 28, 31
Cooper Motors Corporation	New Holland	20,40	0	26, 33
ETC Agro Tractors & Implements Ltd	Mahindra	15	0	32
Wava holdings Ltd	Deutz	5	0	24
Car and General (U) Ltd	Tafe	5	0	32
Farmrite Machineries & Equipments Ltd	Massey Ferguson	5,10	0	16, 30

Guidance:

1. (2) Challenges and Gaps for Mechanisation

Technical Aspects

- Lack of farmers' capacity in operation and management of machinery
- Optimal specification of machineries not identified
- Absence of a national centre for agricultural machinery and equipment testing and evaluation
- Lack of legal advisors on certification

Policy aspects

- Lack of farmers' financial capacity
- Absence of extension services
- Difficulties to access finance for agricultural machineries
- Absence of established zonal tractor hire services through PPP
- Weak linkages between research, training institutions, extension, farmers and market for effective agric mechanization development and promotion
- Lack of agricultural machinery after-sales services

1. (2) Challenges and Gaps for Mechanisation (Cont'd)

Technical Aspects

- Lack of trained personnel in sales and marketing
- Absence of a delivery system
- Lack of trained personnel for farm machinery repair and maintenance
- Lack of an agricultural machinery and equipment manufacturers association
- Lack of rural-based agricultural machinery repair and maintenance workshops

Policy Aspects

- Lack of agricultural machinery standards and test codes
- Lack of government loans to agricultural machinery dealers

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

Based on the analysis, technically appropriate machinery are proposed:

- For plowing/ tilling: xxxxx, because: xxxxx

Appropriate machinery for plowing/tilling	Reasons
Power tiller (10-12HP range)	Works faster than hand hoe
	High output
	Easy to operate and service
	Suitable for both upland and lowland paddy
Tractor (40-75HP range)	Works faster than power tiller
	Higher output
	Suitable for medium to large scale farming
	Can be operated under hire service

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

Based on the analysis, technically appropriate machinery are proposed:

- For harvesting: xxxxx, because: xxxxx

Appropriate machinery for harvesting	Reasons
4-row Paddy Reaper	Works faster
	High output
	Easy to operate and service
	Suitable for both upland and lowland paddy
	Good for individual or group ownership
	Can be operated under hire service

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

Based on the analysis, technically appropriate machinery are proposed:

Appropriate machinery for Rice milling	Reasons
Small Integrated Rice milling unit, of capacity 500-2,000kg/hr comprising of	Improve quality of locally milled rice
Paddy Pre-cleaner	Removing all impurities and unfilled grains from paddy
Paddy husker (rubber roll type)	De-husking paddy into brown rice
Paddy separator	Separating un-husked paddy from brown rice
De-stoner unit	Separating small stones from milled rice
Polishing unit (vertical abrasive + vertical Friction types)	Removing all or part of the bran layer and germ from brown rice & improving appearance of milled rice
Rice grader (Length grader)	Separating small and large broken from head rice
Bucket Elevators	bulk transport and conveyance of raw paddy, milled rice from one point to another

2. (1-b) Testing and certification

Current status/problems:

- Organisational structure; **Performance test done by AEATREC**
- Regulation for test of quality/ inspection or certification; **No Certification**
- Facilities; **Very limited**
- Human resources; **Limited**

Road Maps

- Ministry of Public Service to fill up vacant positions at MAAIF Hqrts and District Local Governments within the next 2 years
- Rehabilitate Namalere Research and establish the agricultural machinery/equipment testing and certification centre
- MAAIF to facilitate recruitment of appropriate human resources and provision of training

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

- 1. List of machineries to be domestically produced/ manufactured/ assembled:
 - **in production:** Mould board plough, Rice weeders, Rice threshers, Paddy cleaners, Small trailers
 - **in 3 years:** Chisel plough, Treadle pump
 - **in 10 years:** Disc plough, Planter, Rice huller
 - **beyond 10 years:** Rice destoner, Rice grader, Paddy separator, Paddy dryer, De-husker, Reaper

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

- **Capacity Development needs:**
- **Human Resource development**
 - Research and Development (Engineers)
 - Raw materials (Metallurgists)
 - Manufacturing (Mechanical Engs, Electrical Engs, Technicians, Artisans)
 - Assembling (Mechanics, Technicians)
 - Testing (Engineers, Machine operators)
- **Organizational development**
 - Management structures (Dealers' Associations and Manufacturers' Association)
 - Processes – Marketing, sales (Economists, Marketers', Sales Engs)
 - Delivery System (Rural networking of dealers)
 - Procedures – Maintenance & Support (Service Engs, Mechanics, Technicians)
- **Institutional and Legal Framework development**
 - Making legal and regulatory changes – Certification (Legal Advisors)

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

- Suggested Policy change: **Testing, evaluation, safety inspection and certification of imported machinery,**
- **i) What changes do you suggest to this subject matter?,**
 - Strengthen the functions of AEATREC for agricultural machinery testing and evaluation
 - Empower the Uganda National Bureau of Standards (UNBS) to establish Agricultural Machinery standards and test codes with AEATREC
 - Empower institutional capacity for certification of agricultural machinery and equipment
 - Promote alignment and consistency in standards of agricultural machineries and implements in Regional Networking
- **ii) For whom? = Actors on supply chain,**
 - International and domestic manufacturers, Importing agents and Dealers
- **iii) Tool,**
 - Establish testing, evaluation, safety inspection and certification of quality of agricultural machineries, implements and spare parts
- **iv) Actions**
 - MAAIF to facilitate improve the existing organization structures at AEATREC, UNBS
 - Develop required minimum facilities at AEATREC for machinery testing and certification
 - Recruit appropriate human resources and provide trainings
 - MAAIF (PS) to link with international organizations to facilitate regional networking

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

- Suggested Policy change: **Provision of zonal tractor hire services,**
- **i) What changes do you suggest to this subject matter?,**
 - Improve Agricultural Credit Facility (ACF) to expand and extend the services to more farmers by removing some constraints both banks and farmers face
 - Avail government loans for importation of agricultural machinery and equipment (tractors)
 - Spell out the cost of hiring a tractor for land preparation , etc in the tractor hire services policy
- **ii) For whom? = Actors on supply chain,**
 - Private sector
- **iii) Tool,**
 - Establishment of zonal tractor hire services through public-private partnership
- **iv) Actions**
 - MAAIF to facilitate forming an association of private tractor hire service providers to provide quality and affordable services to farmers
 - Government to mprove facilitation of Agricultural Credit Facility
 - Improve access to financial for agricultural machinery

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

- Suggested Policy change: **Build capacity of mechanics for repair and maintenance,**
- **i) What changes do you suggest to this subject matter?,**
 - Avail more qualified mechanics in rural areas
 - Provide hands-on / vocational training of mechanics at diploma and certificate levels
- **ii) For whom? = Actors on supply chain,**
 - Mechanics
- **iii) Tool,**
 - Build human capacity for use and maintenance of agricultural machinery/equipment
- **iv) Actions**
 - MAAIF to support establishment of rural-based agricultural machinery repair and maintenance workshops
 - MAAIF to support establishment of rural-based polytechnic / vocational institutes

3. (1) Way Forward: Technical Track

- Facilitate an agreement between MAAIF and financiers to promote local manufacturing of agricultural machineries and equipment
- Facilitate higher level meetings between MoE&S and MAAIF on capacity building of mechanics and operators
- Facilitate higher level meetings between MTIC and MAAIF to organize manufacturers' and dealers' associations
- Facilitate meetings between UNBS and MAAIF to install testing, evaluation and certification functions in the country
- Strengthening Capacity for Testing and Certification (both institutional and human resources)
- Approach international organizations to establish regional networking of testing and evaluation

3. (2) Way Forward: Policy Track

- Organized internal meetings with high-level officers in MAAIF to make the agricultural mechanization policy and strategy complete and concrete
- Facilitate inter-ministerial meetings on agricultural mechanization policy and strategy
- Organize wider stakeholders meetings to sensitize on enabling environment to promote agricultural mechanization

End

Annex

5. Matching Farm Equipment to Farm Size
 - 1) Tractors
 - 2) Rice Mills
 - 3) Combines
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)	25	100
10. Equipment sizes available (metre)	0.25	0.5
12. Draft (kN/m)	8	8
18. Purchase price (\$)	3,500	16,000
28. Total Operating Cost (\$/hr)	5.44	13.88
31. Total Fixed Cost (\$/hr)	3.85	14.27
32. Total Cost/hr (\$/hr)	6.96	28.14
33. Cost/ha (\$/ha)	66.84	67.55
Contract Rate (\$/ha)	76.87	77.66
Hiring service (\$/ha)	100	100

5. (2) Matching Farm Equipment to Farm Size Rice Mills

10 selected Steps out of 34	Small	Medium
1. Volume Milled (tons/year)	400	600
10. Equipment sizes available (kg/hr)	500	650
18. Purchase price (\$)	2,100	3,400
28. Total Operating Cost (\$/hr)	5.66	10.43
31. Total Fixed Cost (\$/hr)	1.58	2.62
32. Total Cost/hr (\$/hr)	7.24	13.05
33. Cost/t (\$/t)	26.06	26.09
Contract Rate (\$/t)	33.87	33.92
Charged in the market (\$/t)	37.0	37.0

6. (1) Chronology of events/ meetings

Date	Actions taken (meeting, etc) after March '12
19-03-2012	NRDS Taskforce drafted the following: <ul style="list-style-type: none"> - Publication of the NRDS - Rice data for 2008 - Rice data for 2011 - NRDS implementation activities
11-04-2012	NRDS Taskforce reviewed and approved the following: <ul style="list-style-type: none"> - Publication of the NRDS - Revised rice data for 2008 - Approved rice data for 2011 - NRDS implementation activities (profiles of new rice projects) approved.
03-07-2012	Policy Level Stakeholders' Consultation Meeting for Agricultural Mechanization

6. (1) Chronology of events/ meetings

Date	Actions taken (meeting, etc) after March '12
22-24/10/ 12	2 nd Mechanization workshop in Nairobi, Kenya
5/12/12	Held a meeting on agricultural finance between MAAIF and Centenary Bank
14/12/12	Internal meeting on harmonization of non-ATAAS and CARD

6. (2) List of the Participants (Policy Level Stakeholders' Consultation Meeting)

No.	Name	Job Title	Organisation
1	Bitariho Deo	Custom Supervisor	Uganda Revenue Authority
2	Kaleebi Mathias	Standards Inspector	Uganda National Bureau of Standard
3	Muliisa Klennie	Sr. Officer Agric. Fin. Facility	Bank of Uganda
4	Tinkamanyire Julius	Sr. Mech. Engineer	Min. of Works and Transport
5	Kaddu Peter	Executive Manager	Uganda Manufacturers' Association
6	Farooqui Nawaaz	Project Coordinator	Farm Engineering Industry Ltd.
7	Opolot Charles	Director	Local Government Association
8	Odogola Wilfred	Lecturer	Busitema University
9	Mutabazi Sunday	Commissioner	Min. of Agriculture, Animal Industry and Fisheries
10	Rasit Pertev	Sr. Agric. Economist	World Bank

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

	Small <150kg/hr	Medium 150-300kg/hr	Large >300kg/hr
No of mills	398	9	1
Main source of paddy	Individual Farmers	Individual farmers, Traders	Private sector, individual farmers, out-growers
Mainly sell to?	Rural shops/ brokers	Retail/ wholesalers	Exports/wholesalers , supermarkets
Major problems?	High % of broken grains, Stones. Poor postharvest handling and processing. Poor drying methods. Poor performing rice mills	High % of broken grains, Stones. Poor postharvest handling and processing Poor drying methods. Poor performing rice mills	Inadequate rice supply. Limited access to specialized repair and maintenance services. Poor quality paddy
Memo:			

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

	Urban	Rural
Total Volume (tons)	101,500	43,500
% of local rice	70%	30%
Grades of the most major rice	2	No grades
Price of the most major rice (\$/kg)	Approx. 1.5	Approx 1.0
Import Tariff (%)	75%	75%
Price difference (%)	0%	0%
Consumers' preference	Aromatic, Whole to broken, Sticky to non-sticky,	Aromatic, Whole to broken, Sticky to non-sticky,
Determinants by consumers	Price, cleanness, level of broken grains, Brand name	Price, cleanness, level of broken grains, Brand name

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

Any law/ policy on 'grading system' for rice sold in the markets?
if yes, please specify, Yes, Uganda National Bureau of Standards
If yes, which grades and how?
Milled Rice UNBS Standard US41 2005 Grade 1 (whole grain 90%, broken 10%) Grade 2 (whole grain 75% broken 25%) Grade 3 (whole grain 50% broken 50%)
Institutional Capacity: Which institution(s) is responsible for implementing milling standards and grades of rice sold in market? •Uganda National Bureau of Standards
What are the limitations in implementation of grades and standards? •Lack of Awareness •Inadequate capacity by UNBS •Poor quality of rice processing Machinery •Implementation of policies •Lack of rice quality testing facility