MOVING FROM SUBSISTENCE FARMING TO AGRIBUSINESS: THE ROLE OF MECHANISATION

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Business Development Manager – AATF
Overview

- Agricultural Mechanisation
- Agricultural Mechanisation in Africa: Facts and Figures
- Applications along Agricultural Value chains:
- Lessons from Case Studies
- Critical Success Factors for Mechanisation
Mechanisation gives an opportunity for smallholder farmers to transition from subsistence to commercial farming as it:

- Catalyzes increased production and reduces high labor costs
- Enhances efficient production at low cost and facilitates competitive pricing
- Promotes efficient use of inputs and improves supply chain
- It not only about machines, but structural linkages for value creation
## Facts and Figures on Mechanisation in SSA

<table>
<thead>
<tr>
<th>Sources of power for land preparation (% of total)</th>
<th>Human Muscle Power</th>
<th>Draught Animal Power</th>
<th>Engine Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA</td>
<td>65</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>East Asia</td>
<td>40</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>South Asia</td>
<td>30</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Latin America</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of tractors per 1000 ha</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA</td>
<td>2</td>
</tr>
<tr>
<td>East Asia</td>
<td>18</td>
</tr>
<tr>
<td>South Asia</td>
<td>12</td>
</tr>
<tr>
<td>America</td>
<td>28</td>
</tr>
<tr>
<td>Nigeria</td>
<td>1</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>0.5</td>
</tr>
<tr>
<td>Egypt</td>
<td>26</td>
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</tbody>
</table>
The Mechanisation Strategy

Mechanisation Service Provision – the viable option

- Identification, access and delivery of the right mechanisation equipment for the different operations
- Farmer aggregation, clustering and training on mechanisation and farming as a business
- Identification of local entrepreneurs and training them to be mechanisation service providers
- Training of tractor operators in mechanisation service provision
- Establish Mechanisation Model Farms (MMF) to provide technology demonstration and capacity building
- Leverage of digital technology to reach the last mile
- Financial inclusion to ensure farmers get realizable financing
  - Contract farming, micro financing, government support, project financing
- Facilitating logistics and supply, market Linkages for inputs and products from the farm
- Ensure value addition and local agroprocessing
Systems Approach to Mechanisation

- Improved Seeds
- Agronomy
- IT & Farmer Aggregation
- Mechanisation
- Agroprocessing
- Business Management
Mechanisation Approach

Step 1: Mechanisation Market Analysis

Step 2: Client engagements and business opportunity profiling

Step 3: Input and support system needs identified

Step 4: Prioritisation of mechanisation options

Step 5: Mechanisation of production

Step 6: Technical support in production

Step 7: Harvesting

Step 8: Product Marketing

Step 9: Business sustainability
Mechanisation lessons from Case Studies

Cassava Mechanisation and Agroprocessing Project (CAMAP) – Nigeria, Zambia, Uganda and Tanzania (TAAT)

Objectives:
• Improving cassava productivity and incomes for farmers
• Improve timeliness of efficiency of operations
• Reduce drudgery
• Improve quality of work
• Provide employment
• Stimulate rural growth
• Improve access to inputs and equipment
• Strengthen market linkages

PPP Agribusiness Models for Last Mile
# CAMAP Results

<table>
<thead>
<tr>
<th>Process</th>
<th>Manual</th>
<th>Mechanized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land preparation (ploughing &amp; harrowing)</td>
<td>30 days (240 hours)</td>
<td>1.5 hour</td>
</tr>
<tr>
<td></td>
<td>$180</td>
<td>$140</td>
</tr>
<tr>
<td>Stem preparation and planting</td>
<td>8 days (64 hours)</td>
<td>45 minutes</td>
</tr>
<tr>
<td></td>
<td>$120</td>
<td>$60</td>
</tr>
<tr>
<td>Weeding</td>
<td>12 days (96 hours)</td>
<td>30 minutes</td>
</tr>
<tr>
<td></td>
<td>$280</td>
<td>$50</td>
</tr>
<tr>
<td>Harvesting</td>
<td>45 days (320 hours)</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>$170</td>
<td>$100</td>
</tr>
<tr>
<td>Crop vigor</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uniformity of crop</td>
<td>35%</td>
<td>95%</td>
</tr>
<tr>
<td>Yields per ha</td>
<td>7 ton</td>
<td>30 tons</td>
</tr>
<tr>
<td>Income per ha</td>
<td>USD500</td>
<td>USD2,000</td>
</tr>
<tr>
<td>Market linkages</td>
<td>Traditional</td>
<td>Linked to processors</td>
</tr>
</tbody>
</table>

**Full Suite Mechanisation – The Economics**

- **SHF = $/ha**
- **Labor / Cost Reduction**
- **Yield Increase**
- **Time Savings**
- **Total Benefit**
- **Return on Investment**
- **Share of Additional Cost**

With the inclusion of additional services, the assumption for revenue earned per hectare increases. This means that the $ of hectares each producer must cover to breakeven actually drops as more production steps are mechanised.

*Note: the above table represents the estimated benefits of mechanisation on farm productivity and profitability.*
CAMAP Demand Impact pathways

Cluster approach - Uganda

Individual small holder approach

Gender sensitive approach

Private sector engagement - Nigeria

Project partnership approach - Nigeria
Agridrive Ltd – Spearheading Mechanisation

Agricultural Equipment Support
Mechanisation Service Provision
Agribusiness Support Services

Cassava
Soybeans
Rice
Groundnuts
Maize
Fodder
Use of Digital Agriculture – The Agridrive App

- AgridriveApp can be downloaded from Play Store
- Enables farmers to book and pay for mechanisation services
  - Ploughing
  - Harrowing
  - Planting
  - Herbicide Application
  - Harvesting
  - Haulage
- Enable Mechanization Service Provider to manage the provision of mechanization services
  - Identify who and where the farmers are
  - Identify what and when services are needed
  - Can track fuel usage and avoid abuse of equipment
- Support farmers with weather information and other e-extension support
- Partnering with Kurai to integrate with the use of drones for crop monitoring and herbicide application
Market Information Support System (MISS-CAMAP)

Digital information platform to facilitate provision of economically sustainable agriculture production

- Farmer and farm information
- Agro inputs information
- Market information (crop value chains available, buyers and sellers, quantities, prices)
- E-extension support system
1) Private Entrepreneur: Personal capital used to purchase equipment and provide service.

2) Association based market connection: Association membership to support access to financing and operational logistics.

3) Gov't sponsored Program: Equipment sourced through Gov't program using down payment and 3 year payback.

4) AATF /Assisted Program: Access to Fleet procured by AATF.
The Critical Success Factors

1. **Sufficient demand of mechanization is required for sustainable business**
   Realization of benefits to farmers (cost, time, yield) need to pull products and services through the system.

2. **Ability to access equipment has to be reliable and timely**
   Financial returns need to be in line with risks for entrepreneurs all throughout the supply chain to invest in developing business to provide mechanization tools and services

3. **Aftermarket business support is essential and required**
   Spare parts supply and knowledgeable technicians are obligatory to instill confidence in the system

4. **Experienced operators are needed to provide timely and quality services**
   Machinery management, usage, and maintenance are factors in equipment lifecycle performance

5. **Commercial business acumen promotes efficiency and sustainability**
   Building a company with service excellence (scheduling, coordinating and executing) needed to generate adequate returns
Thank you