

Conditions & Factors that promote successful Mechanization

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1. FUNDAMENTALS IN MECHANIZATION



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1. Fundamentals in Mechanization

a) Clear Purpose of Mechanization

<Purpose of Mechanization>

Why we need farm mechanization?

Mechanization Strategies of some African countries say that mechanization is to achieve;

- Food security
- Economic Growth
- Relieving the farm labors

So, it is important to acknowledge;

- 1. Mechanization is the means, and itself cannot and should not be an objective**
- 2. The government has to be clear about what to achieve through Mechanization**

→ So, mechanization should be promoted only when it is the reasonable means toward the development goal



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1. Fundamentals in Mechanization

b) Need to look at Mechanization issue from multi angles

<What issue is Mechanization in Africa? >

Is the Agricultural Mechanization Technical Issue ?

- Surely Yes !!

But, it is also an Economic, Policy and Social Issue

→ So in promoting mechanization, issues in all these aspects need to be considered and addressed.



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1. Fundamentals in Mechanization

c) Profitability is the key for sustainability

<Profitability>

For self-sustenance of the farm mechanization, **its profitability is a requisite condition**. (Mechanization process should bring economic profit)

Farm household economy with Machinery

$$\text{Profit} = \text{Revenue} - \text{Cost}$$

Revenue: Amount of Produce X Price

Cost: Inputs Water Labor Time



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1. Fundamentals in Mechanization

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For self-sustenance of the farm mechanization, its profitability is a requisite condition. (Mechanization process should bring economic profit)

Farm household economy without Machinery

$$\text{Profit} = \text{Revenue} - \text{Cost}$$

Revenue

- More Amount of Produce
- X Price
- + Extra Income

Cost

- Inputs
- Water
- Less Labor
- Less Time
- Add. Cost of Machinery



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1. Fundamentals in Mechanization

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<Profitability>

For self-sustenance of the farm mechanization, its profitability is a requisite condition. (Mechanization process should bring economic profit)


Farm household economy without Machinery

$$\text{Profit} = \text{Revenue} - \text{Cost}$$

+ USD 100

More Amount of Produce X Price
+ Extra Income

Inputs
Water
Less Labor
Less Time
Add. Cost of Machinery



- USD 30
- USD 20
+ USD 1,500



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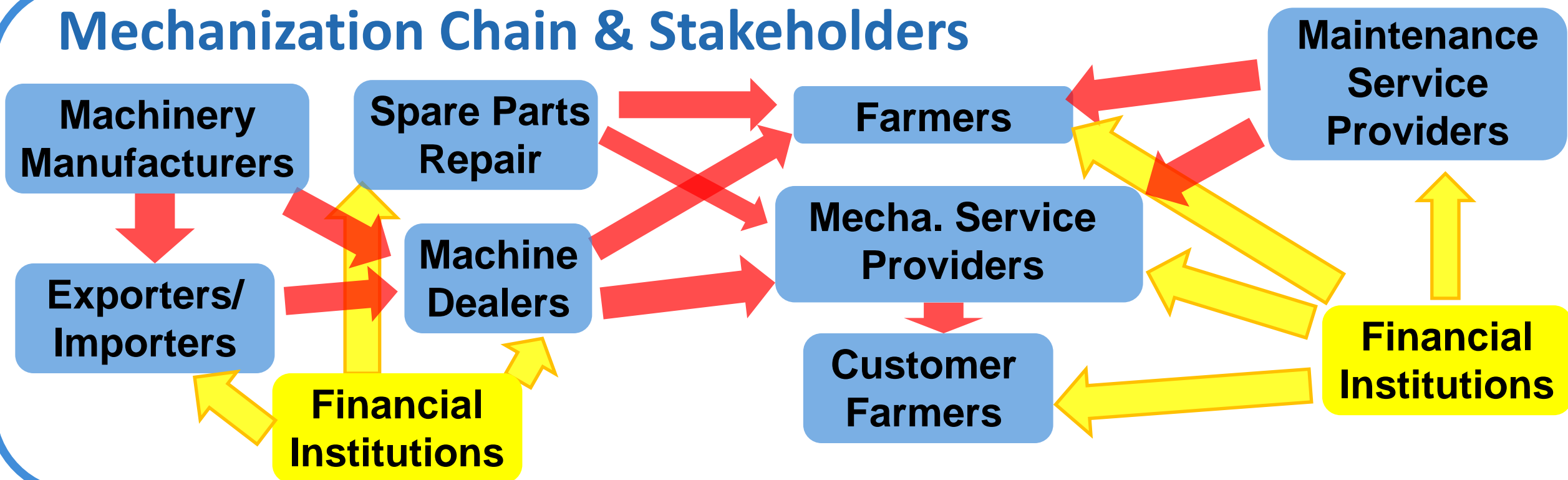
1. Fundamentals in Mechanization

c) Profitability is the key for sustainability

<Profitability for ALL>

For self-sustenance of the farm mechanization, its profitability is a requisite condition. (Mechanization process should bring economic profit)

Mechanization Chain & Stakeholders



→ Mechanization should bring profit to all the above stakeholders in the mechanization chain



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1. Fundamentals in Mechanization

c) Profitability is the key for sustainability

<Profitability for ALL>

Successful and sustainable mechanization brings profitability to all stakeholders in the mechanization chain
(e.g. manufacturers, importers, machinery dealers, farmers, mechanization service providers, millers/processors, traders, mechanics, financial service providers)

If anyone in the chain does not make sufficient profit from mechanization, they will close their business and mechanization chain will be disconnected. (and, then the mechanization efforts will fail)



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2. CONDITIONS FOR SUCCESSFUL MECHANIZATION IN AGRICULTURE



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2. Conditions for successful mechanization in agriculture

“Economic profitability for all” is a pre-requisite condition for sustainable mechanization...

In other words;

Sustainable mechanization can happen only in areas where everybody can make profit by mechanization

Can economic profitability be ensured in the all parts of your country? → Maybe Not!

→ Seems mechanization is easier in some areas than in other areas

→ And mechanization efforts should be made in these areas



2. Conditions for successful mechanization in agriculture

a) Economic Aspect

What are the conditions for profit to everybody?

<Economic Aspects>

- **High Agricultural Production/ Potential**
- **Ideal topographic and soil conditions for mechanization (e.g. flat, soft soil)**
- **Total size of the production area (not each plot) – farm machinery can work a lot**
- **Low risk of natural/ climatic disasters**
- **Good access to market and transport infrastructure**
- **Prevalence of intensive/ market-oriented farming (cash crops/high value crops)**



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2. Conditions for successful mechanization in agriculture

a) Economic Aspect

What are the conditions for profit to everybody?

<Economic Aspects>

- Existence of private service providers – Functional mechanization chain (e.g. mechanization service providers, banks, workshops -maintenance work, spare parts providers)
- Concentration and Good Shape & Size of farm plots (e.g. Plots not scattered, and each plot is large and rectangle)
- Good Rural Infrastructure (e.g. Irrigation, rural road – easy entry)
- High labor cost and/or Scarce labor force



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2. Conditions for successful mechanization in agriculture

b) Policy Aspect

What are the conditions for profit to everybody?

<Policy Aspects>

- **Clear and consistent policy and strategy** for agricultural mechanization, Ideally based on legislations (e.g. tax, subsidies, import procedures)
- **Decent quality standard** for machinery (e.g. Quality assurance and regulation, Testing and Certification)
- Existence of **public advisory services**
- **Good and consistent financing policies**



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2. Conditions for successful mechanization in agriculture

c) Technical Aspect

What are the conditions for profit to everybody?

<Technical Aspects>

- **Suitable machinery** (e.g. Specification, size, type of attachment)
- **Sufficient capacity** of mechanization stakeholders (e.g. operators, repair & maintenance service providers)
- **Decent quality of locally produced farm machinery/ attachments/ tools**



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2. Conditions for successful mechanization in agriculture

d) Other Tips

<Some Useful Tips>

- **Mechanization is likely to gain profit in the lower stream of value chain** (e.g. processing, packaging)
- Mechanization is more likely to gain profit by **introduction of multi-purpose/ multi-crop machinery** (e.g. Tillers, Tractors)
- **Selection of right Mechanization Models/Approaches:**
Farmer ownership vs. Mechanization Service (farmers need to own machines?), Private-driven vs. Public-driven (who should lead the process?, and what roles to be played?)
- **Good plan and operation capacity are necessary** for successful (profitable) mechanization business



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2. Conditions for successful mechanization in agriculture

d) Other Tips

<Some Useful Tips – Continued>

- **Group ownership hardly works**
- **Manufacturing is a tricky attempt** - Do not think it simple
- **Plan mechanization in the broader picture** - Gov't support in Mechanization and industrial structure of national economy – Agrarian economy vs. Non-Agrarian economy
- **Role of public sector is very critical at the early stage of Mechanization** – but interventions should be made in careful and smart ways



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3. POLICY & INTERVENTION OPTIONS



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3. Policy & Intervention Options

<Policy Options to promote mechanization>

- Having clear and reasonable mechanization policy & strategy
- Implementation of policy & strategy in a consistent manner
- Favorable and consistent trading, tax and financing policy and regulations (e.g. Duty exemption, special financing)
- Investment in Rural Infrastructure
(e.g. water control, farm plots)
- Setting up adequate quality standards and testing & certification regulations
- Smart subsidy



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3. Policy & Intervention Options

<Options for interventions to promote mechanization>

- Capacity building for mechanization stakeholders (e.g. machinery owners, operators, repair & maintenance service providers, researchers)
- Provision of Advisory services (e.g. technical advises, business management)
- User protection measures (e.g. Warranty, Insurance)
- Financial support (Not necessarily direct financing)
- Support in research



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3. Policy & Intervention Options

<Critical Points>

- These Policy & intervention options are not exhaustive
- Also, they can give negative impacts on mechanization if implemented inadequately
 - Need careful design & implementation
- Ideal set of policy & interventions should be determined for each country



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3. Policy & Intervention Options

- List of “DON’T DOs” -

<Bad Ideas/ Approaches>

- Government/ projects taking over business (e.g. mechanization service, machinery supply)
 - inefficiency, killing private sector
- Creating new structure in mechanization chain in areas where private players exit
 - it can kill private business.
 - Better support those who are already in business, not new comers
 - If no private sector, that place is maybe bad areas for agricultural mechanization



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3. Policy & Intervention Options

- List of “DON’T DOs” -

<Bad Ideas/ Approaches>

- Direct import of agricultural machinery by the government fund or ODA
- Group Ownership – No clear responsibility, unsustainable, it can disturb serious businessmen
- Supply of machinery to entities (e.g. individuals, private player, public institutions or groups) with low technical, financial and managerial capacity
- Free distribution – No one will be serious, it can disturb serious businessmen



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3. Policy & Intervention Options

- List of “DON’T DOs” -

<Bad Ideas/ Approaches>

- Excessive subsidy – Can your country afford it forever?
- Importation of poor quality agricultural machinery – Avoid it even when they are cheap
- Importation of machines that can be produced domestically
- Wrong target beneficiaries – avoid political interference, profitability should be the priority criterion



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3. Policy & Intervention Options

Quick Test – Good or Bad?

- Private importation of agricultural tools, implements and powered machines with tax exemptions
- Promotion of tractor hiring services
- Subsidized delivery of machinery to farmers across the country
- Repair & maintenance by machine dealers and entrepreneurs
- Development, production and supply of simple machines by the public research institution
- Education and training of engineers, technicians, extension workers, operators and farmers
- Provision of commercial financing and soft loans
- Regulatory work and standardization by government



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4. CONCLUSIONS



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4. Summary & Conclusion

1. Government should have clear idea on why they want agricultural Mechanization - Mechanization should be promoted only when it is the right and reasonable means
2. Mechanization is an complicated issue, so should be looked at from multiple angles (Not only technical, but also socio-economic and policy)
3. Profitability is the most important key for mechanization - All stakeholders in the chain should gain a certain profit for sustainability
4. Mechanization can not happen across the country, at least for a short run. Therefore, mechanization efforts should start in areas with high profitability



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4. Summary & Conclusion

5. Contexts surrounding agricultural mechanization differ, so policy & interventions should be specified for each country, and Government should focus on creation of business environment
6. Public sector has more important roles to lead agricultural mechanization with sound competitiveness in the private sector through PPP, especially at early stage of mechanization
7. Mechanization happens easier in areas with high agricultural production, low climate risk, good market access, adequate rural infrastructure, and ideal topographic and soil condition.
8. Functional machinery supply chain by private is necessary in the target areas to mechanize



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4. Summary & Conclusion

9. Mechanization is easier at postharvest and processing operations that has high value-addition, than at field operations
10. Profitability is higher for multi-purpose and/or multi-crop machineries (e.g. tractors that can be used not only for, but also transport, harvesters for multi-crop use)
11. Important to select adequate mechanizaion approaches in terms of ownership, and business models
12. Successful/profitable business calls for good business plan and sufficient operation/management capacity – Interventions can be made to support stakeholders in these areas



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THANK YOU



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