

Mechanize or Perish?

Achieving Production Potential and Commercialization Aspirations



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Introduction

- Over 70% of the cultivated area (6.5 million ha) in Malawi is under smallholder farming
- Engaged by 3.1 million smallholder farm families with land holdings ranging from 0.5 to 2.5 ha (average 0.7ha)
- The estate sector utilises approximately 5% of the cultivated area (1.2 million ha)
- Smallholder farmers produce the bulk (80%) of the food crops such as maize, groundnuts pulses, cassava, sorghum, rice, potatoes, sunflower, livestock, wheat, vegetables and fruits.
- Cash crops include raw tobacco (\$694M in sales), tea (\$89.8M), other nuts (\$32.8M), raw sugar (\$32.6M), and soybean meal (\$22M)
- Other relevant value chains include rice, aquaculture, paprika and chillies, spices (garlic and ginger), coffee and livestock

Unique characteristics

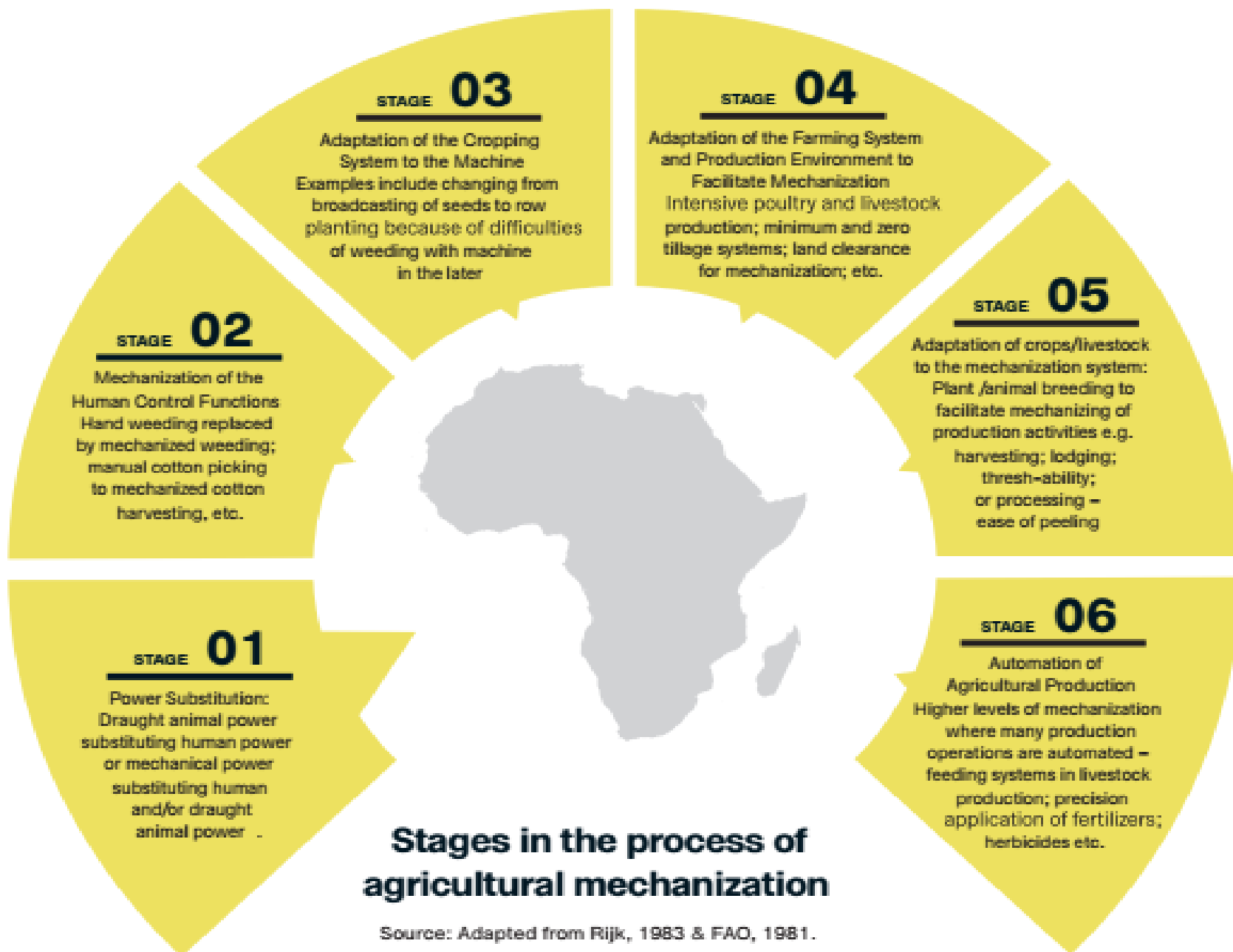
- Predominantly **smallholder** farming (rural based)
- Largely **subsistence** in nature
- **Low adoption** level of technologies (stuck to the hoe and manual labour)
- **Youth** and gendered labour (about 50% under 25yrs)
- Growing **population** (projected 30 million people by 2034)
- **Low mechanization/irrigation** levels



Why mechanize?

Mechanization covers all levels of farming and processing technologies, from simple basic hand tools to more sophisticated and motorized equipment. Benefits include:

- Eases and reduces hard labour
- Relieves labour shortages during peak (land preparation, planting, weeding)
- Improves productivity and timeliness of agricultural operations
- Improves efficient use of resources
- Enhances market access
- Contributes to mitigating climate related hazards



Source: Adapted from Rijk, 1983 & FAO, 1981.

The problem

- Almost all smallholder farmers in Malawi depend on hand-hoeing and human muscle-power to run all their farm operations (Production at **20-30% of the potential**)
- Farmers spend many weeks in undertaking physically gruelling farming activities that could be done in a matter of days or less.
- For example, to prepare one hectare of land for sowing using hand-hoe requires 23 to 31 person days (**up to 1 month of labour**).
- With mechanization, this same task can be accomplished in about 2-2.5 hours per hectare including setting up improved ridges

- The majority of rural smallholder farmers cannot afford to invest in agricultural machinery
- Agricultural machinery suppliers are mostly found in the larger towns and cities (CAMCO, FES, etc)
- Perceived low demand in rural areas for equipment (no justification for the establishment of distribution networks)

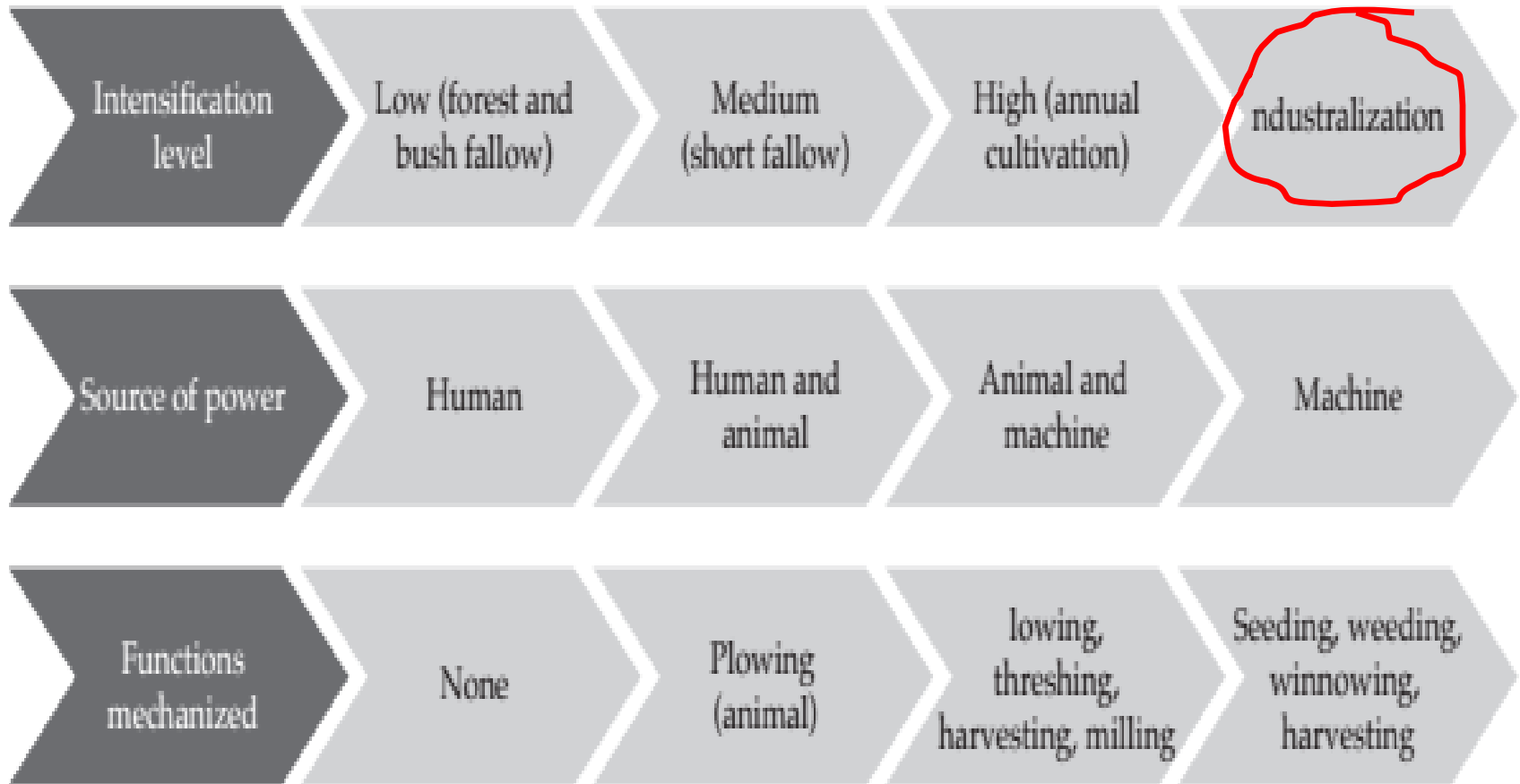


Policies

- National Agricultural Policy (NAP) & National Agricultural Investment Plan (NAIP)
 - Increase hectarage under mechanization
 - Promote agro-processing
- TEVET policy
 - Skills relevant to technological demand of the industries
- MW2063
 - Agricultural commercialization
 - Industrialization
 - Urbanization
- National Export Strategy
- SDG
- Malabo commitment



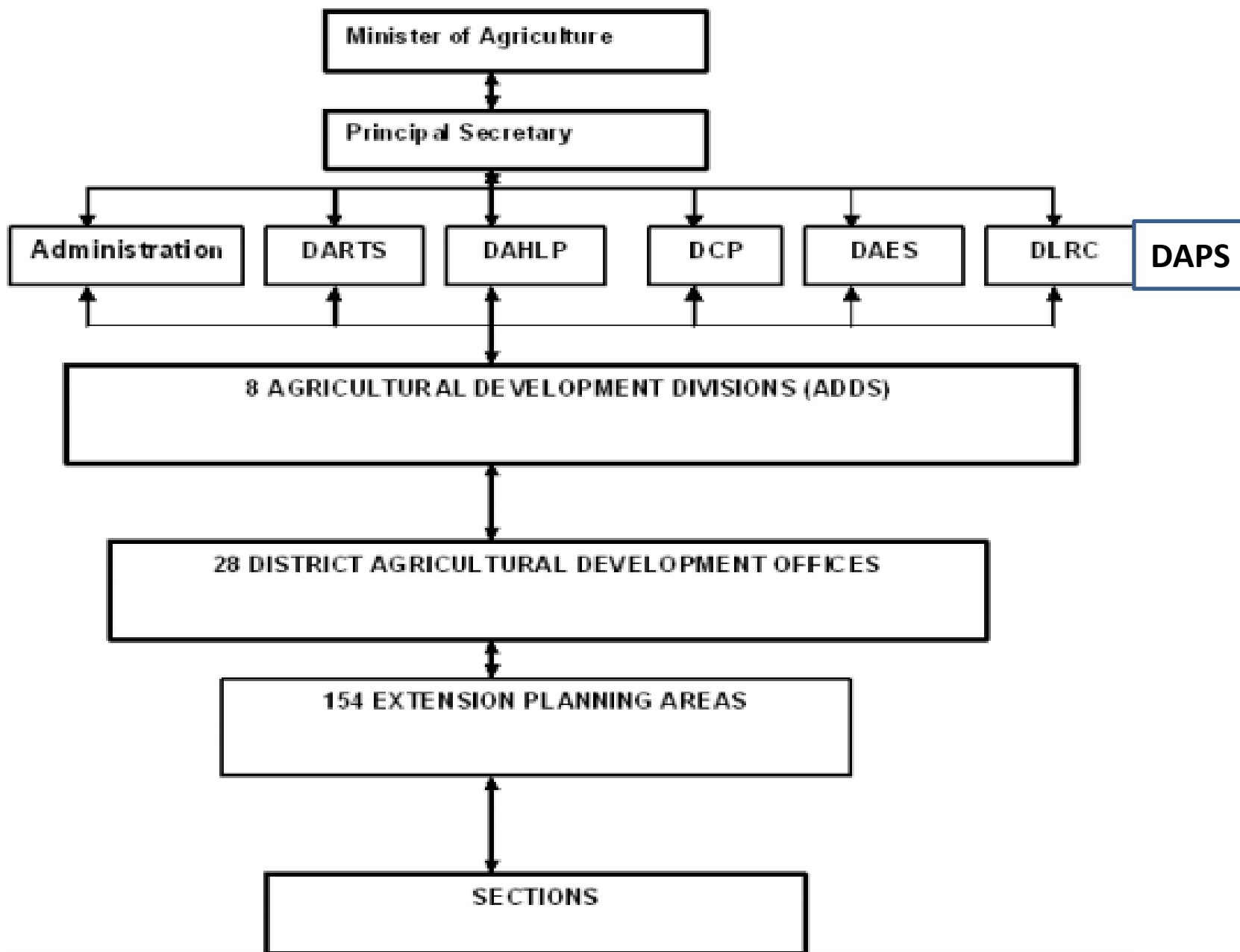
Sequential Adoption of mechanization



Source: Adapted from Pingali et al 1987

Mechanization in the Ministry

- Under the Department of Crop Production (with an inventory of tractors and equipment for hire: 90 tractors, 92 ploughs, 24 harrows, 60 ridgers, 49 trailers)
 - “to promote **crop enterprise mechanization** and agro-processing”
- Inefficient machinery hire schemes
- Little emphasis to farm power and machinery at DARS
- Oxenization promoted in the 80-90’s
- Tractorization based on partners brands not as demanded (case for SONALINKA)



Mechanization in higher learning

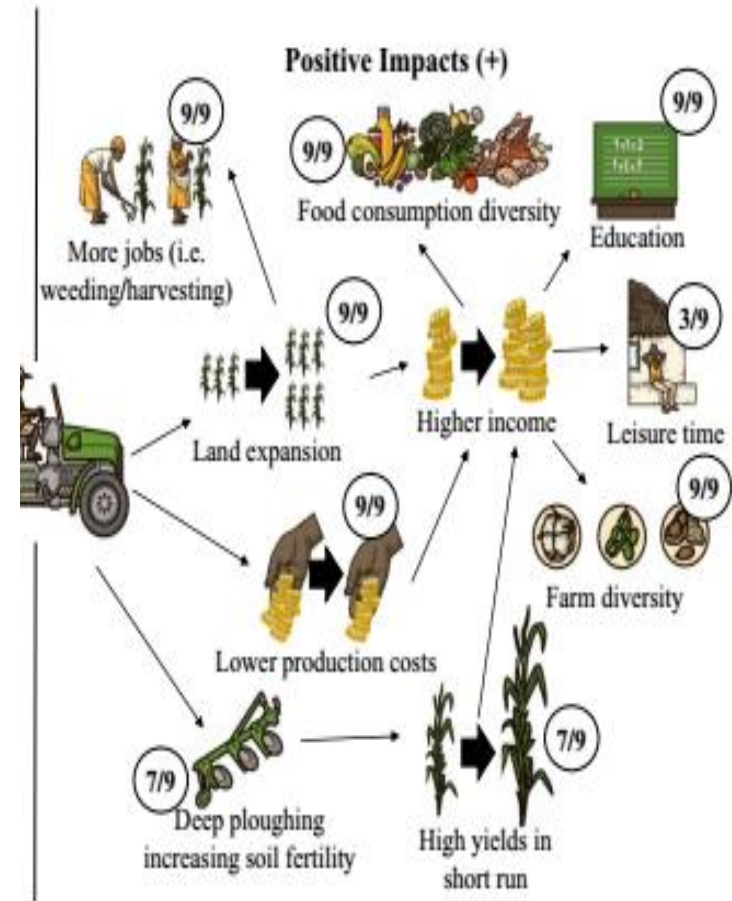
- Technical skills offered at various institutions
- Extensions services for farm power & machinery offered but not emphasized/specialized
- LUANAR, MUBAS, MZUNI, UNIMA, MUST, TEVET all providing skills for agricultural technologies
- General content (not specialized)

Challenges/barriers

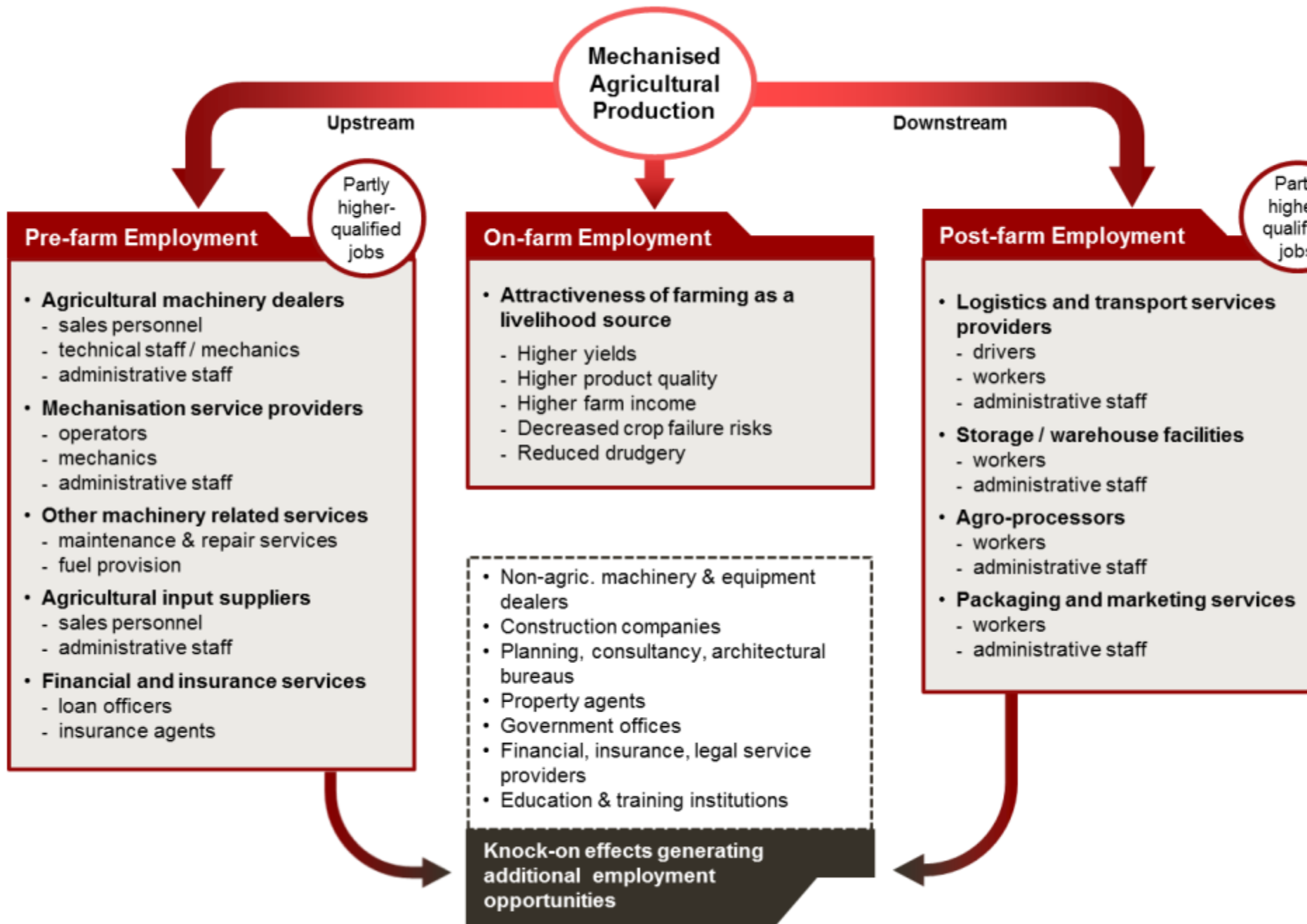
- Finances to own machinery (hiring vs ownership)
- Unattractiveness of agriculture to young people/social pressure (wasted investment, degrading occupation)
- Land issues (scarcity, rights)
- Working in groups
- High energy costs
- Lack of coordinated efforts

Opportunities

- Perceived benefits of mechanization:
 - On-farm employment
 - Increased productivity
 - Decreased pressure on arable land
 - Decreased drudgery
 - Agricultural mechanization pre-farm employment
- Customary land act (registered land rights)
- Urbanization
- Finances (AGCOM, NEEF, banks)
- Interest in irrigation
- Multi-stakeholder interest



Direct and indirect employment effects of mechanised agricultural production:



Successful case studies

Simple machinery improves productivity

Job planter: A simple hand held drill with seed and fertilizer dispensers and a sharpened point that opens a hole through vegetative soil cover and deposits seed and fertilizer at a required depth.

Ripline: Rippers powered by animal draught power or small 4 wheel tractors which cultivate a narrow strip of soil where seed can then be planted. Riplines break the soil to a depth of just 5-12 cm to enable direct seeding, causing minimal disturbance to the soil surface compared with conventional practices.

Small 4 wheel tractor: Small four wheel tractors (<30 hp) and implements are used to build improved ridges and graded conservation agriculture raised bed systems.

The treadle pump

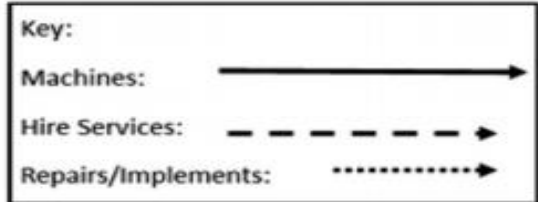
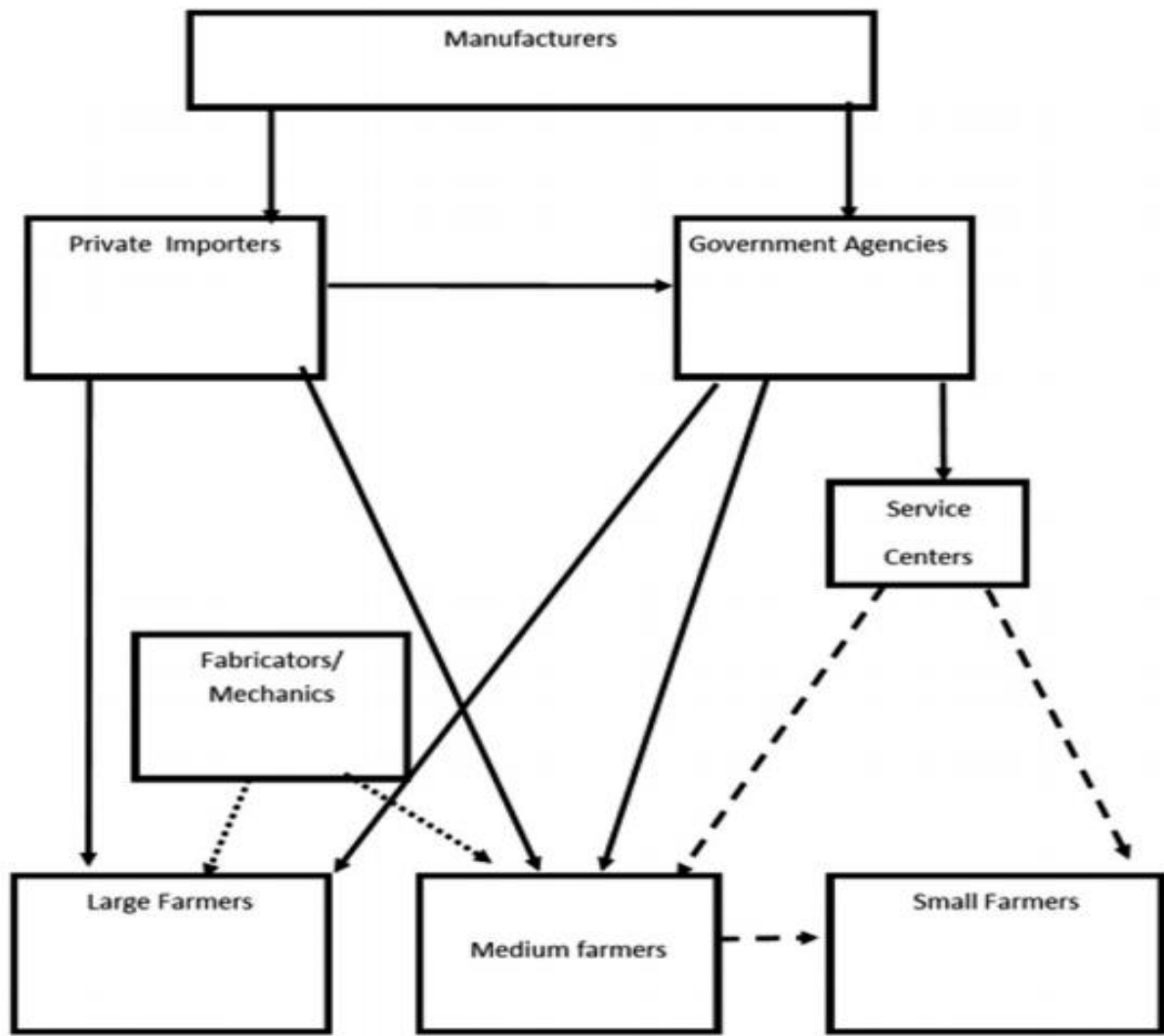
- Successful or not?
- A case of the need for R&D in appropriate technology
- Social, economical and environmental analysis



Recommendations

- A harmonized **agricultural mechanization policy**?
- **Subsidy** on equipment & machinery?
- **Department of Mechanization** in the ministry
- Creating **mechanization demand** through awareness/demonstrations
- **Private sector** led machinery supply
- R&D in **appropriate technology** at DARS and higher learning institutions
- Provide investment funds/**loans** for equipment acquisition using land as collateral
- **Capacity building** for extension workers

Supply chain for mechanization





We either mechanize or perish



Thank you