



Food and Agriculture
Organization of the
United Nations

Sustainable Agricultural Mechanization

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The background (Why Sustainable Agricultural Mechanization)

Smallholders in Africa in 2016

Most of the smallholders are women (as a result of rural-urban migration and lethal pandemics)

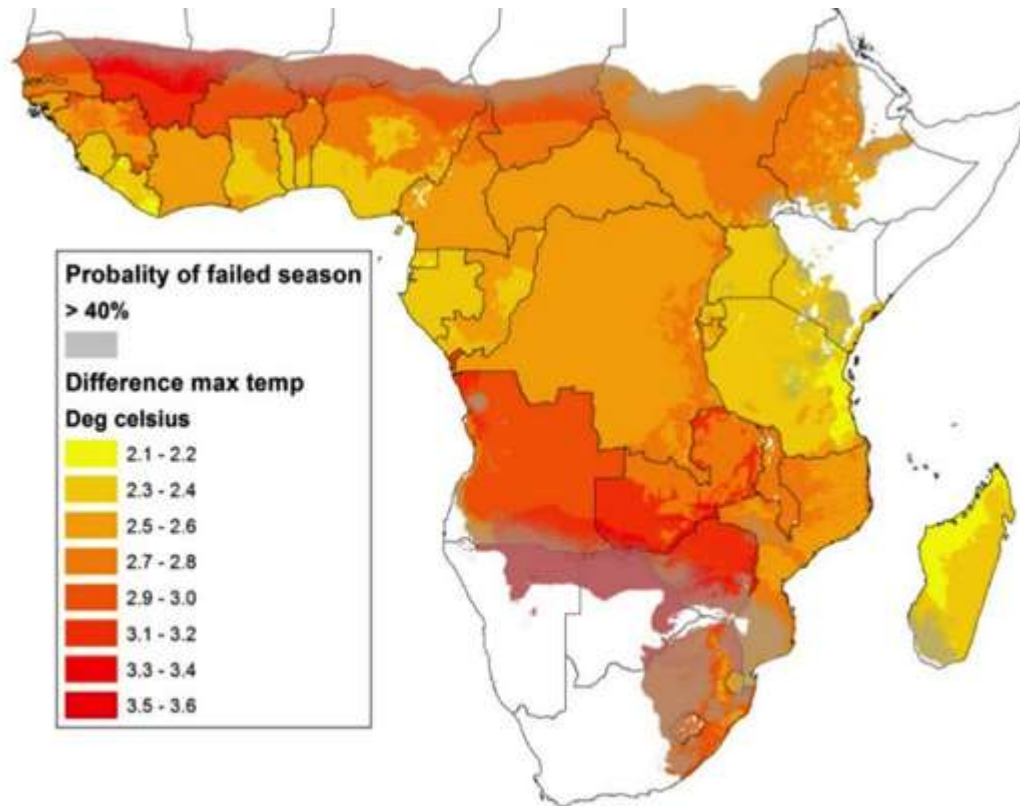


Soil degradation and erosion

- Mostly erodible sandy soils
- Exposed to soil degradation and soil losses through surface erosion
- Many soils have low productivity
- Pulverization and compaction through excessive cultivation



Additional Challenge: Climate Change



Cairns et al., 2012; 2013



Higher temperatures and greater chance of crop failure

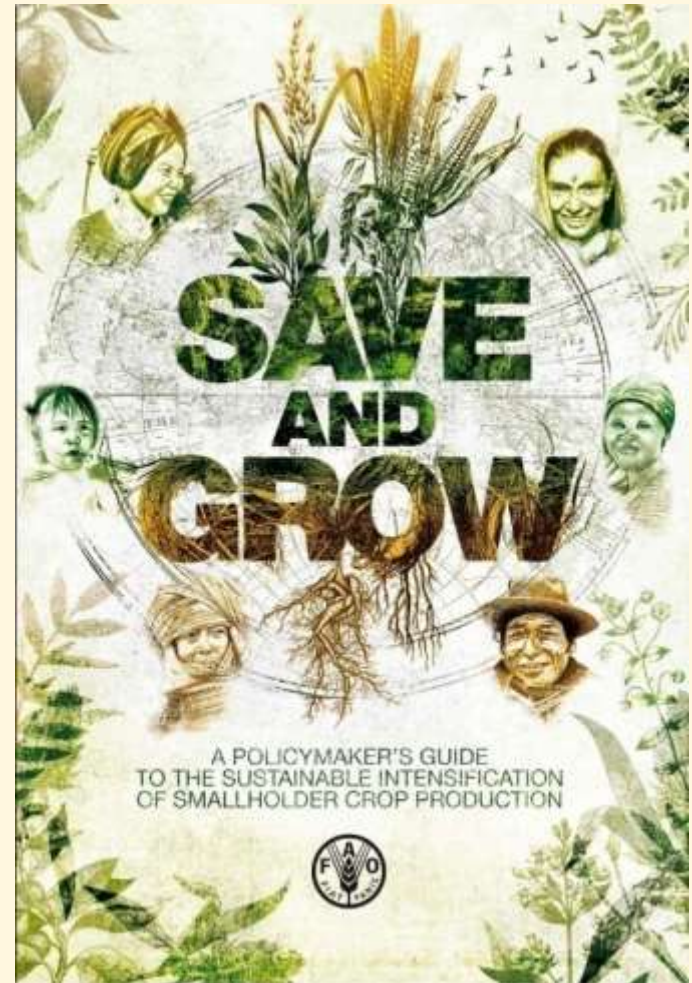
Consultative meeting on a Mechanization Strategy for Africa

Nairobi, Kenya, 30 November – 3 December 2016

Sustainable intensification

“Sustainable intensification means a productive agriculture that conserves and enhances natural resources. It uses an ecosystem approach that draws on nature’s contribution to crop growth and applies appropriate external inputs at the right time, in the right amount.”

Quote: Graziano da Silva, Director General, FAO



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Climate resilient (smart) systems

Conservation Agriculture (CA) is an approach to managing agro-ecosystems for improved and sustained productivity, increased profits and food security *while* preserving and enhancing the resource base and the environment. CA is characterized by three linked principles, namely:

1. Continuous minimum mechanical soil disturbance.
2. Permanent organic soil cover.
3. Diversification of crop species grown in sequences or associations.



www.fao.org/ag/ca



Sustainable Agricultural Mechanization (SAM)

What is sustainable agricultural mechanization?

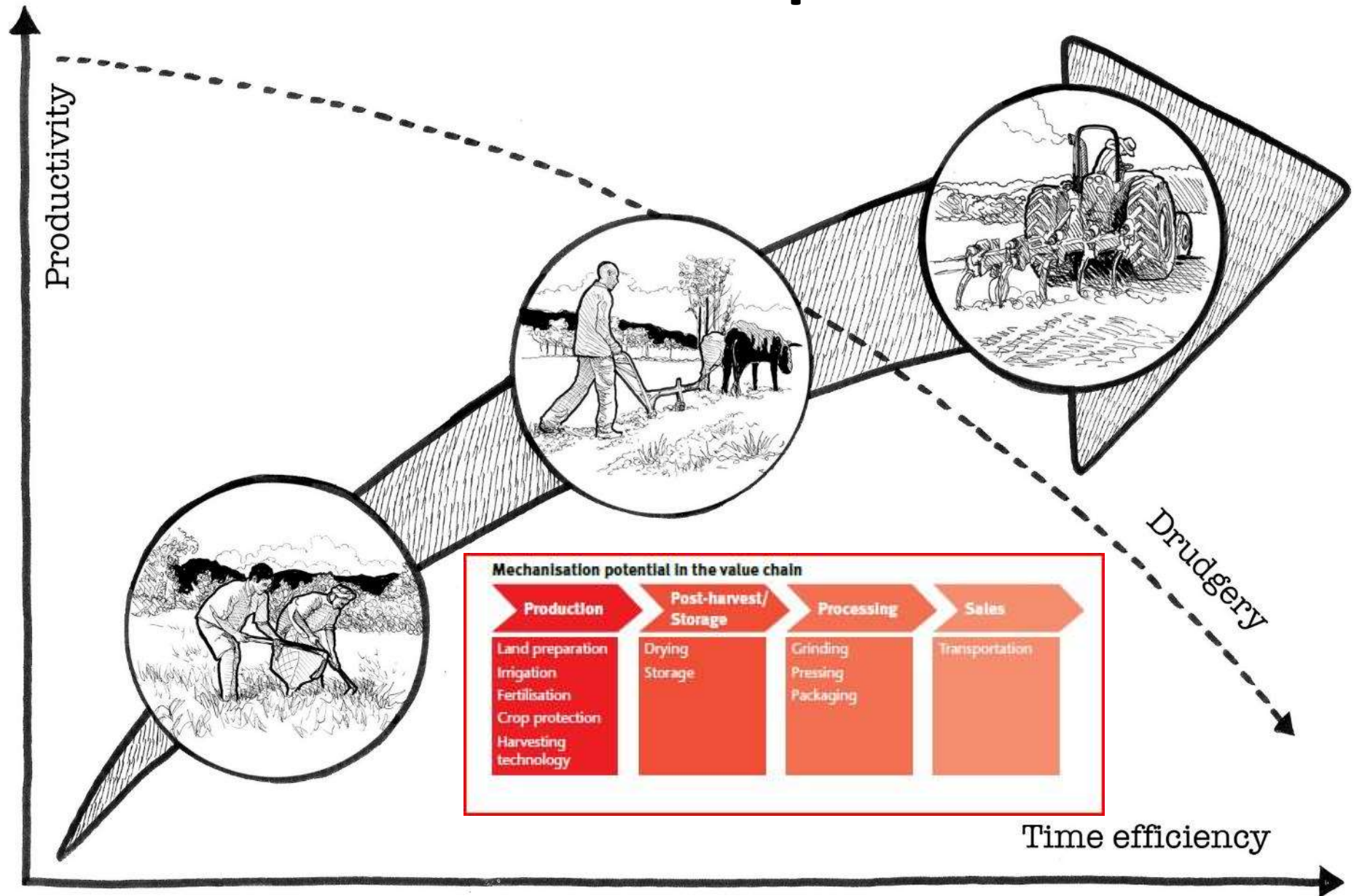
- Sustainable mechanization involves the **application** of different forms of power sources used in conjunction with appropriate tools, implements and machines to be able to do **useful work** in agricultural production and **along** the agri-food value chain



What is sustainable agricultural mechanization?

- Thus mechanization must **meet farmers' needs** efficiently and effectively and **result in improved farm productivity** and **reduced drudgery**, as well as **contributing** to the **development** and **competitiveness** of the food supply chain
- To be **sustainable**, mechanization must take **economic, social, environmental, cultural, and institutional** issues fully into account

Mechanization potential



SAM in sub-Saharan Africa



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Agricultural mechanization

A key input for sub-Saharan African smallholders

Mechanization provides opportunities for intensifying production in a sustainable manner, value addition and food systems development, and improved local economies and livelihoods. It also plays a key role in enabling the growth of commercial agrifood systems and improving the efficiency of post-harvest handling, processing and marketing operations. It can have a major influence on the availability and accessibility of more nutritious food, contributing to increased household food security.

The application of farm power to appropriate tools, implements and machines – “farm mechanization” – is an essential agricultural input in sub-Saharan Africa with the potential to transform the lives and economies of millions of rural families.



www.fao.org/sustainable-agricultural-mechanization

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Integrated Crop Management

Vol. 23-2016



Key elements of SAM

1. Sustainable agricultural practices for smallholders:

- Mechanization technologies should **enable** smallholders to increase yields through the adoption of **intensification, conservation agriculture**, and other climate-resilient, **labour-** and **energy-efficient**, and **gender-friendly** practices
- They also should enable rational and efficient farming in the **long term**, leading to **sustained profitability, increased ecosystem resilience** and result in the long-term sustainability of **smallholder systems**

Key elements of SAM

2. Specific models for smallholder upscaling

- **Identification and specification** of appropriate **business models** for smallholder mechanization



Key elements of SAM

3. Economic, social and gender advantages of mechanization for smallholders

- **Identify** models that provide economic benefits to farmers, which can be **independently sustainable** in the development of the smallholder sector, and also deliver **social benefits**

Key elements of SAM

4. Institutional and organizational arrangements:

- Identifying **appropriate** models for smallholder **aggregation** that are **formal** and can be **institutionalized** internally as well as with other external institutional frameworks and systems

Key elements of SAM

5. Private sector development

- Increases the **manufacturing and service provision base** for agricultural mechanization
- Provides opportunities for **more South-South Cooperation** among manufacturers, dealers and institutions

Key elements of SAM

6. Integration of smallholders into agri-food value chains

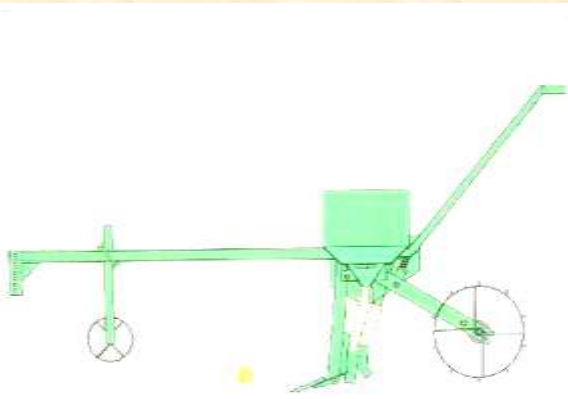
- Mechanization applies at **farm level**, and it has an important role in **value addition**, for example in **improved post-harvest operations**, processing and **marketing** activities
- Mechanization enables smallholders to **increase** their **production** as well as **incomes**



Key elements of SAM

7. Field-based capacity development

- Field-based methods of **capacity building** and **capacity development** for agricultural mechanization need to be integrated with proven and well tested training methodologies



Key elements of SAM

8. Regional Centres for SAM (CSAM)

- Centres **focused** on stakeholders' **needs** and **interests**
- **Leading Mechanization Centres:** for policy and strategy development, data and information, standards and protocols, capacity building, **facilitating private sector involvement** in SAM based agribusiness and trade

Key elements of SAM

9. Integration of agricultural mechanization into pan-African policy frameworks:

- It is **essential** to develop **appropriate policies**, **supra-national** in nature and **refocused** at **regional level** and ensure **complementarity** with other agricultural development thrusts



Key elements of SAM

10. Increasing and strengthening South-South Cooperation

- **Common** lessons learned during development and the **sharing of experiences** within the context of South-South Cooperation can create a **knowledge sharing platform**



Key elements of SAM

11. SAM strategies

- For a consistent and coherent change in the use of agricultural mechanization, it is necessary to **formulate** and **implement** a **plan**, especially since **major changes** are required for sustainable agricultural mechanization

Progressive steps in the formulation of a national agricultural mechanization strategy



The action...



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WORLD BANK GROUP
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AGRA
Growing Africa's Agriculture

CEMA



European
Agricultural
Machinery



Theme 1: New collaborative models of Private-Public Partnerships (including finance for demand-enhancing models of sustainable mechanization)

Theme 2: Modalities, approaches for establishing a global sustainable mechanization knowledge exchange platform

Theme 3: Discuss the establishment of a Regional Centre for Sustainable Agricultural Mechanization in Africa (CSAM)

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Thank you for your attention



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