Food and Agriculture Organization of the United Nations

Sustainable Agricultural Mechanization: A framework for Africa (F-SAMA)

Josef Kienzle [FAO], Joseph Mpagalile [FAO] and Geoffrey C. Mrema [SUA]

23 October 2018

Regional Synthesis & Research Dialogue on Appropriate Mechanization in Eastern & Southern Africa

ILRI Campus, Addis Ababa, Ethiopia

F-SAMA in Africa

- A result of **continuous and thorough consultations**
- **Informs** policy makers & decision makers in AU members states, RECs, development partners the significance of mainstreaming mechanization
- Presents **priority elements for developing national strategies**
- Officially launched in Rome, Italy on 5 October 2018 at a side event during FAO's Committee on Agriculture (COAG)

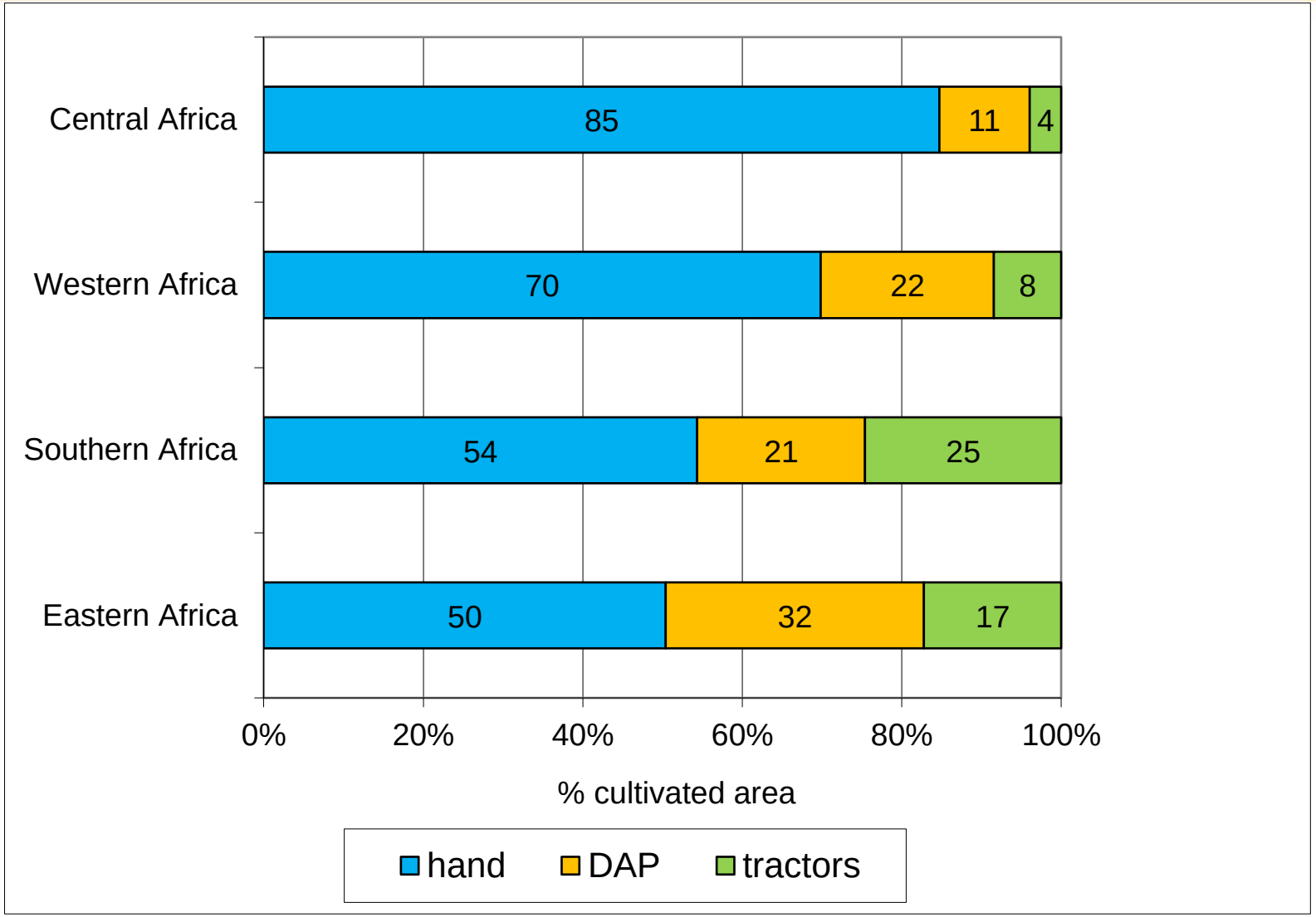




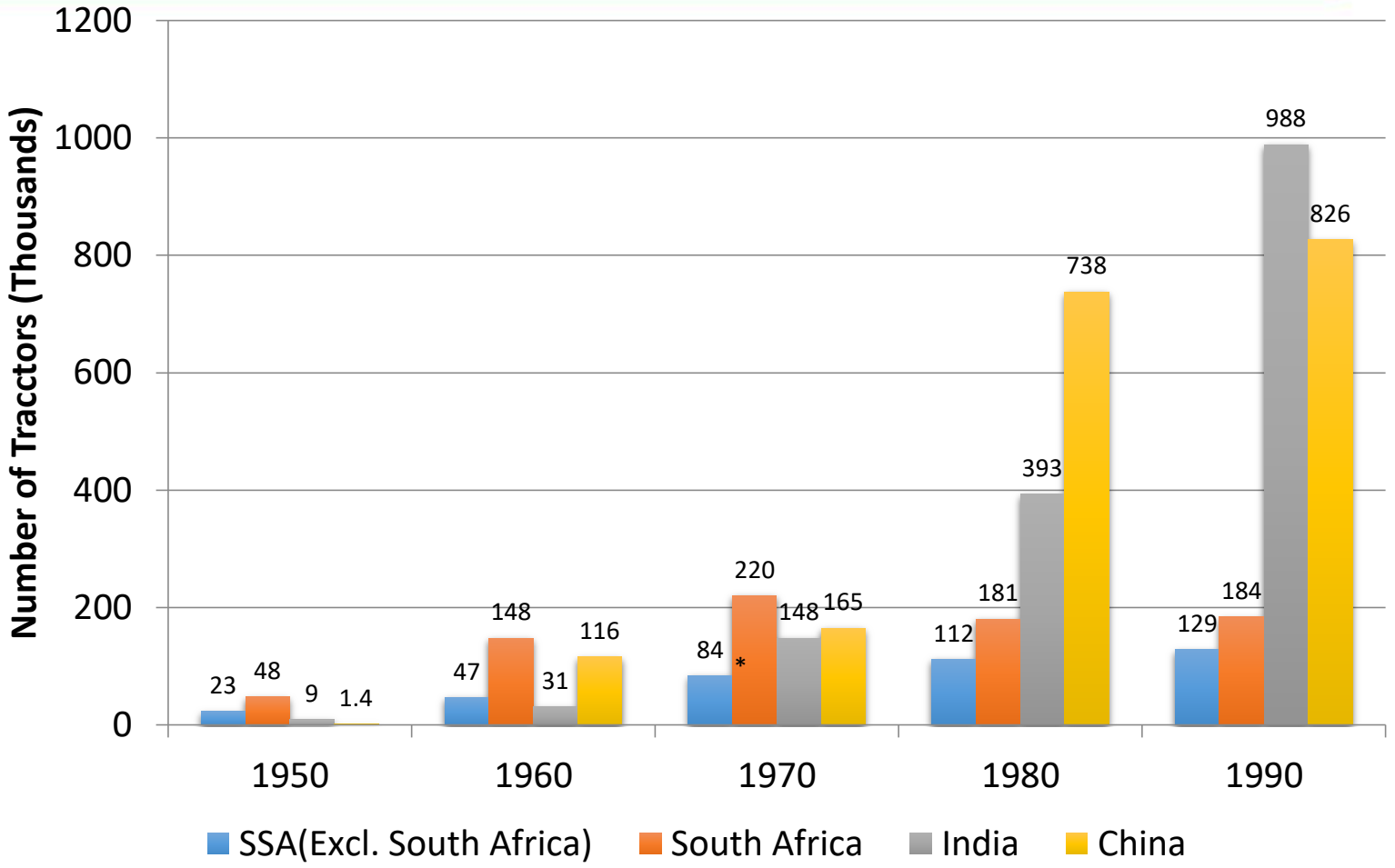
Past mechanization efforts in SSA failed largely:

- Assumed agricultural mechanization in Africa would happen automatically over time
- Focused early efforts on a shift from hand tool-dominated systems to draught animal technology or mechanical technologies
- Draught animal technology was not suitable
- Government operated schemes, which received the most research attention, were found to be unprofitable. Many schemes collapsed
- Most donor agencies lost interest in mechanization projects with tractor components from the 1980s

Farm Power in 2005 for Land Preparation



Growth in tractor numbers used in agriculture in different countries (1950-1990)



There is a need for a renewed effort

- The development of the Framework for SAMA responds to the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for shared Prosperity and Improved Livelihoods
  - **Specifically Commitment III on Ending Hunger in Africa by 2025,** creating and enhancing the necessary appropriate policy and institutional conditions and support systems to facilitate ***suitable, reliable and affordable mechanization and energy supplies, etc***
- Reinforces the campaign initiated by former AUC Chairperson of "sending the hand-held hoe to the museum"
- In line with Agenda 2063, the AU's economic development blueprint

Five Chapters of the SAMA Framework

1. **Mechanization** and agricultural **development**
2. **Evolution** of agricultural mechanization in Africa
3. Key **issues and constraints** to sustainable agricultural mechanization in Africa with examples from Asia & Latin America
4. **Elements of a Framework for SAMA**
5. **Agenda for action:** implementation mechanism

Elements of SAMA Framework

- Identify and **prioritize relevant and interrelated elements** to help countries develop strategies and practical development plans
- Key factors for success include:
  - Effective demand for the outputs of farm production
  - Economic utilization rates for agricultural machinery and equipment
  - Addressing the three **sustainability dimensions**: environmental, commercial and socio-economic
- Each country has **unique needs!**
- Therefore, the **Framework for SAMA is not prescriptive**; but, it provides **ten interrelated elements to guide agricultural mechanization** efforts

Elements of the SAMA Framework

1

Boosting farm power through appropriate technologies and innovative business models

- African countries are at **different stages** of development with regard to use of farm power
- Key objective of the Framework is to **increase farm power availability** to all farmers through **farmer's ownership** of machines or by **mechanization hire service providers**
- To **significantly reduce the use of hand tools**





Elements of the SAMA Framework

2

Promoting innovative financing mechanisms
for agricultural mechanization

- To succeed, mechanization requires a **long-term commitment**
- Supporting farmers financially through **credit or direct** grants
- The main investment effort must be made by the **private sector**
- The governments must **create conducive environment for financial institutions** to lend to farmers and entrepreneurs who can offer hire services



Elements of the SAMA Framework

3

Building sustainable systems for manufacture and distribution of mechanization inputs

- The agricultural **machinery and implements sector is quite small**
- Imports for agricultural machinery and implements **is dominated by a multitude of very small-scale** private-sector actors – need to consider sub-regional level enterprises
- Have traditionally opted to **use the government system** to directly import agricultural machinery due to low volumes
- **Establish and operate viable entities** to manufacture agricultural machinery and implements, set standards, carry out testing, support franchises for distribution, repair & maintenance – sub-regionally

Elements of the SAMA Framework

4 Sustainable mechanization **across agrifood value chains**

- In the past, was **confined to on-farm production** issues only
- However, it is critically important **to cover the entire agrifood chain**
- To adopt a **holistic view of agricultural mechanization** and examine it across the food value chain: from inputs to farm outputs including issues of reduction of post-harvest losses; marketing etc.
- Contribute to the **commercial sustainability** of agricultural mechanization in Africa

Elements of the SAMA Framework

5

Innovative systems for sustainable technology development and transfer

- Extension of mechanization done by both public (software) and private sector (hardware)
- **Enhance** research and technology development, testing, transfer and extension systems at national and regional levels - prototypes must not remain on the shelf
- **Sub-regional collaboration** for development and transfer of technologies - avoid duplication
- **Support for public and private sector** collaboration
- **Link** national and regional research efforts with what is being done elsewhere

Elements of the SAMA Framework

6 To **transform** the tillage and crop husbandry techniques

- From current **conventional tillage** methods to **sustainable agricultural practices:** conservation agriculture (CA), and reduced and zero tillage adapted to local conditions
- Assessment and analysis of current land preparation and crop husbandry practices – regarding the types of implements used
- Short, medium and long-term planning is essential - Adoption of sustainable land preparation techniques requires cultural change by farmers – it takes time





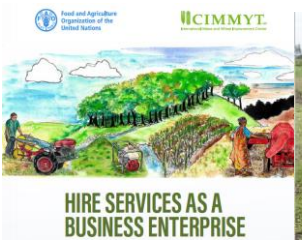

"Making agricultural mechanization in Africa socio-economically sustainable"

Elements of the SAMA Framework

7 Socio-economic sustainability and the roles of **small-scale farmers & their organizations**

Strategies for SAMA factor in institutional issues

- Promoting customer hire services and different models for farmer groups, organizations and cooperatives, marketing etc.
- Support business models involving interactions between medium and small scale farmers
- Developing policies (credit, land tenure, technology etc.)
- Welfare and industrial policies to facilitate adoption







Elements of the SAMA Framework

7 Socio-economic sustainability and the roles of **women**

Take into account mainstreaming of gender dimensions

- Collection, compilation and analysis of gender disaggregated data
- Legislative changes to assure property rights for women i.e. machinery & other assets
- Mechanization must contribute to women empowerment
- Design and development of gender friendly mechanization







Elements of the SAMA Framework

7 Socio-economic sustainability and the roles of **youth**

Use sustainable agricultural mechanization to empower more youths to embrace farming

- Provide targeted training/capacity building programs for youth
- Introduce vocational training to enable youth to take a control role in emerging competitive agricultural and value addition actions
- Encourage and develop a cadre of pioneering young farmers and entrepreneurs





Elements of the SAMA Framework

8 **Human resources development and capacity building** for SAMA

This element relates to **issues of human resources** relative to both hardware and software:

- **Investing in human resources** has helped develop mechanization
- Many university **training and programmes on mechanization** face competition with other sectors
- **New areas of knowledge, such as precision farming and conservation agriculture** are emerging and need to be mainstreamed
- **Capacity development** is essential, from farmers, artisans, technicians and professional managers, policy to planning experts

Overarching Elements of the Framework

9

Need for a **long-term vision**: policy and strategy issues

- **Capacity development** - both human resources and institutional set-up for SAMA
- **Establishment of subregional and regional training programmes** taking advantage of economies of scale and scope
- **Revision of curricula of programmes:** including refresher courses on innovative sustainable mechanization technologies
- **Implementation of targeted training programmes** - to build the capacity of stakeholders involved in mechanization supply chains
- **Establishment of centres of excellence** – endorsed by the public and private sectors- at sub-regional and regional levels

Overarching Elements of the Framework

10 Creating **sustainable institutions** for regional cooperation & networking

- The current market for agricultural machinery and implements in each individual country in Africa is relatively small
- Regional cooperation offers a mechanism to bring countries together to tackle common problems and learn from each other
  - **Review** capacity & resources of current institutions and organizations and of existing and past models
  - **Feasibility study** on establishing regional coordinating mechanism and developing **projects & programmes** involving RECs
  - **Strengthening of regional capacity** and **fostering** South - South collaboration

Implementation mechanism: Agenda for action

Key actions are:

1. Develop national sustainable agricultural mechanization strategies
2. Develop public - private partnerships
3. Increase national and regional cooperation and partnerships (training, manufacturing, testing etc.)
4. Prepare a concept note on establishing a Regional Network on Agricultural Mechanization in Africa –RNAM learn from Asian Experience
5. Prepare concept note on the modalities of increasing financial flows
6. Enhance advocacy for sustainable agricultural mechanization in Africa

Conclusion

- Africa needs to make **significant progress in mechanizing** its agriculture ***(along the Value Chains)***
- There is a need for a **long-term vision of mechanization**
- Efforts to accelerate mechanization **require substantial long-term political & financial commitments** (investments, innovations, technology transfer etc.)
- Both the **Malabo Declaration** and **AU Agenda 2063** make this a high priority in agricultural mechanization
- A new cadre of farmers is emerging capable of spearheading and catalyzing the sustainable mechanization effort

Thank you so much for your attention

www.fao.org/sustainable-agricultural-mechanization

Sustainable-Mechanization@fao.org