

# Investment in agricultural mechanization in Africa

## Executive summary



Conclusions and recommendations  
of a Round Table Meeting of Experts



Co-organized by:  
Food and Agriculture Organization of the  
United Nations (FAO)  
United Nations Industrial Development  
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# 1. Overview

Many African countries have economies strongly dominated by the agricultural sector. In some countries, agriculture generates up to 50 percent of the gross domestic product, and contributes over 80 percent of trade in value and more than 50 percent of raw materials to industries. It provides employment for the majority of Africa's people. Despite this domination, investment in the sector is still low in most African countries. In addition, Africa is the only region in the world where agricultural productivity is largely static. Yields of maize and other staple cereals have typically remained at about 1 tonne per hectare, which is about one-third of the average achieved in Asia and Latin America.

One of the key factors to the success in Asia and Latin America has been mechanization. By contrast, the use of tractors in sub-Saharan Africa (SSA) has shown barely any increase over the past 40 years and, compared with other world regions, tractor use in SSA today remains almost negligible. In Asia, tractor use over the same period has increased tenfold.

The situation in SSA can be illustrated by the extremely low number of tractors per 1 000 hectares (ha) of arable land. In 1980 there were 2; by 2003 this had sunk to 1.3. By comparison, in Asia and the Pacific region in 1980 there were 7.8 tractors per 1 000 ha, and this had risen to 14.9 by 2003. In 1960, Kenya, Uganda and Tanzania each had more tractors in use than India. However, by 2005, India had 100 times more tractors in use than all three countries combined.

Even though SSA started at a very low base, the trend over the past three decades has become even worse. SSA is also the only developing region where the number of agricultural workers per hectare is no more than half of the average for all developing regions, a situation even more dramatic because the number of tractors in use is also but a small fraction of the number in other regions.

The greatest source of power for land preparation in Africa remains human muscle power. In Central Africa an estimated 80 percent of cultivated land is worked manually. In eastern and southern Africa the figure is about 50 percent. Because of this not only does sub-Saharan Africa have an acute lack of human resources available for agricultural production, it also has very few tractors available as an alternative source of power.

Over the past two or three decades 'common wisdom' among development practitioners has been that African farming conditions do not justify investments in mechanization. Nonetheless these 'development practitioners' do not seem to have come up with any other effective solutions to increase food production! Unless something is done, the situation can only worsen. In most African countries there will be more urban dwellers than rural in the course of the next two to three decades. Although ensuring food security for the entire population is critical, feeding the increasing urban population cannot be assured by an agricultural system that relies almost entirely on human muscle power.

In order for Africa to climb out of agricultural stagnation, FAO, UNIDO and practising African experts are convinced that, just as has happened in Asian and South American countries, support is needed for investment in mechanization. Furthermore, mechanization is inextricably linked with agro-industrialization, and there is a need to clarify the priorities for supporting investment in mechanization in the context of a broader agro-industrial development strategy. This must, however, be done in the right way, taking into account critical factors for success and sustainability.

How can governments and the public sector set about ensuring an increase in investment in mechanization without making the same mistakes as in the 1960s and 1970s whereby most tractor hire schemes failed as did many large-scale mechanization schemes? This was





the question addressed by a Round Table held in Arusha, Tanzania in June 2009. This short summary is intended mainly for high-level policy-makers and advisors and examines the policy issues that came up at the meeting and the recommendations, as well as some practical proposals on how to deal with these issues.

The specific objectives of the roundtable were to make recommendations on three sets of interrelated issues:

1. The concrete action areas needed to increase the availability of mechanization.
2. The components of a programme to increase investments in mechanization.
3. The roles and responsibilities of FAO, UNIDO and other development partners in supporting investment in mechanization in Africa.

## 2. Main policy and strategic issues considered at the meeting



1. **Public-sector strategy development** and investment priorities to accelerate mechanization related to agro-industries, *including the following topics*:
  - agricultural mechanization strategies – recent experiences;
  - best practices and examples of investment priorities from Asia.
2. **Direct public-sector investment**, financial support, and examples of public-sector programmes, *including the following topics*:
  - purchasing strategies and programmes – tendering for mechanization inputs;
  - ‘code of practice’ for doing business with donors and other governments.
3. **Facilitating policies and programmes** to encourage private-sector investment in mechanization, *including the following topics*:
  - cost of doing business and risk management;
  - creation of effective demand.
4. **Public-private sector models** in support of mechanization, *including the following topics*:
  - ‘codes of practice’ – roles and responsibilities;
  - responsive business systems for sustained mechanization inputs;
  - criteria for appraising, designing and targeting investment programmes.
5. **Networking and South-South linkages**, *including the following topics*:
  - South-South technology supply and transfer;
  - global and regional networking among machinery suppliers.
6. **Financial-sector requirements**, *including the following topics*:
  - bringing the financial sector on board;
  - innovative funds, facilities and mechanisms such as leasing or contracting.

### 3. Conclusions

1. Mechanization is not just a question of supplying farmers with tractors and machinery or of making mechanization services available to them through the public sector. This has been tried and has failed.
2. The best way to mechanize is for farmers to own their own machines or for them to hire services from other farmers.
3. Tractors need service, repair and spare parts. A tractor or machine without these is more of a liability than an asset.
4. The best way to supply machinery is through the private sector, although this does not necessarily preclude public-sector participation. However, this must be done in the correct manner.
5. In many Asian countries where mechanization has expanded so greatly, agricultural pricing policy has been used as an instrument for this.
6. In many African countries today, numerous farmers cannot afford mechanization. This depends to a large extent on farm-gate prices, which in many countries are volatile and often too low.
7. The overwhelming reason why farmers do not purchase machinery is a lack of finance. Commercial banks are generally not interested in lending to farmers, and their interest rates are far too high for farmers to use loans effectively. Farmers lack collateral, in many cases because of land-ownership and registration problems.
8. There are too few rural banks.
9. Local manufacturers lack skills and investment. There are often high tariffs on imported steel and materials. Also, the cost of doing business is often high.
10. There is a general lack of technical skills and other human capacity. There are inadequate training facilities.
11. There are often stifling regulations against the use of farm tractors for operations other than farming.
12. Development agencies and financial institutions are still not convinced that increased investment in mechanization is required.
13. There is often a poorly coordinated approach to mechanization. Mechanization issues are not a concern of agriculture ministries alone. Industry, finance, education and other ministries are also involved.
14. There is little or no consumer protection for those investing in agricultural equipment – no financial protection and no codes of practice.
15. There is too little networking of interested parties at both national and interregional levels.





## 4. Main policy issues

1. Is it government policy to increase agricultural production, and is increased mechanization seen as an essential means to achieving this?
2. What is to be the role of the public sector in promoting agricultural mechanization?
3. Subsidies – should mechanization and/or the manufacture/importation of machinery be subsidized and, if so, how?
4. Should the pricing of farm products be used as an instrument to increase investment in agriculture and, if so, what mechanisms are needed?
5. Finance – How can farmers best gain access to finance? Should the public sector be involved in financing farmers through, for example, agricultural rural banks or funds?
6. What should be the policy towards donors who wish to use ‘aid in kind’ (e.g. the supply of tractors) as development aid?
7. What is the policy regarding protection of farmers against bad commercial and/or financial practices?
8. What are the land-ownership and registration policies? Can farmers use land as collateral?

## 5. Recommendations

The following recommendations that emerged from the meeting are intended to facilitate support of both public- and private-sector investment flows into the development of agricultural mechanization in Africa. One of the main objectives is to reduce primary land-preparation carried out by hand-tool technology from the current 80 percent to 40 percent by the year 2030, and to 20 percent by 2050. Increasingly, land should be prepared using a combination of draught animal power technologies and tractors.

### 5.1 ESTABLISH NATIONAL COMMITTEES ON AGRICULTURAL MECHANIZATION (NCAM)

The national committees would comprise representatives of all major stakeholders, such as agriculture, finance, industry, trade and other ministries, farmers, together with financial, private sector and research and development institutions. The main functions of the committees would be to:

1. Assist the national government in reviewing national policy to include a strategy dealing with mechanization.
2. Develop and update the national agricultural mechanization strategy, including regional strategies, an area where FAO and UNIDO can assist.
3. Coordinate efforts between different ministries and institutions.
4. Develop more efficient procurement systems, an area where FAO, UNIDO and World Bank can assist.
5. Ascertain compatibility of donations with national standards and plans.
6. Prepare action plans for capacity building through formal education, research, extension and vocational training.

## 5.2 CREATE AN ENABLING ENVIRONMENT TO INCREASE THE UTILIZATION OF TRACTORS AND OTHER FARM EQUIPMENT

- a. Increase 'on-farm' use of tractors and machinery by promoting neighbourhood contracting.
- b. Review existing regulations on the use of agricultural tractors for 'off-farm' applications such as transport of materials, construction of rural infrastructure (roads, irrigation works, etc.) and land clearing.
- c. Intensify agriculture, including livestock production, by increasing irrigation.
- d. Facilitate cross-border use of farm equipment.
- e. Develop an enabling environment for a demand-driven mechanization process by developing agro-processing industries.



## 5.3 INCREASE INVESTMENT IN AGRICULTURAL MECHANIZATION (BOTH PRIVATE AND PUBLIC SECTORS), DRAWING FROM ASPECTS OF THE EXPERIENCE OF INDIA PRESENTED DURING THE MEETING

- a. Explore the possibility of central banks providing direct support to commercial banks for on-lending to farmers/entrepreneurs and to prescribe a minimum percentage allocation of bank lending to the agriculture sector.
- b. Explore ways to facilitate long term financing needed for agricultural mechanization. This could involve facilitation and access to long-term sources of finance such as bond funds, re-financing lines of credit or development trust funds.
- c. Establish or strengthen rural banking facilities to provide financial services to the agriculture sector.
- d. Ensure that financial service providers to the agriculture sector are consistently made aware of current best practices in the technical and economic use of agricultural mechanization technologies.

## 5.4 CAPACITY BUILDING

- a. Assess the current situation and identify the availability of centres offering education, research and extension services focusing on farm mechanization in Africa.
- b. Estimate the requirements for such centres, including the identification of their geographical locations and, based on the regional strengths of key centres, develop them as centres of excellence.



- c. Develop in each centre programmes of formal education, research and extension in agricultural mechanization. Explore possibilities for regional training, as not all countries have the capacity to establish training centres.
- d. Implement short-term training programmes for mechanics in the operation, maintenance and repair of agricultural machinery and processing equipment.
- e. Extend the training curriculum for motor vehicle mechanics to cover tractors and other agricultural machinery.
- f. Promote educational outreach programmes to create awareness on how to use mechanized equipment for other off-farm applications in order to increase utilization and effective demand for mechanization.
- g. Implement short-term training programmes promoting farming as a business, by means of training in farm management, entrepreneurship, business management and agro-processing.
- h. Establish and strengthen associations of contractors, manufacturers, processors, traders and others at local, regional and national levels.

#### **5.5 AGREE ON A 'CODE OF PRACTICE' FOR AGRICULTURAL MACHINERY SUPPLIERS**

At international level, under the lead of FAO and UNIDO, develop and agree on a 'code of practice' for agricultural machinery suppliers. This code should strengthen the role of the private agricultural machinery sector in supplying machinery, providing after-sales repair and maintenance services and building the capacity of machinery owners as part of their role.

#### **5.6 CREATE REGIONAL AGRICULTURAL MECHANIZATION NETWORKS IN AFRICA**

Membership should be encouraged from research and development institutions, professional organizations, manufacturers and distributors, with assistance from FAO and/or UNIDO if requested. This network will link up with existing thematic networks related to mechanization, including draught animal power and conservation tillage.



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The conclusions given in this report are considered appropriate at the time of its preparation. They may be modified in the light of further knowledge gained at subsequent stages of the project.

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