



Food and Agriculture
Organization of the
United Nations

Sustainable Agricultural Mechanization



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Mechanization covers all levels of farming and processing technologies, from simple and basic hand tools to more sophisticated and motorized equipment. It eases and reduces hard labour, relieves labour shortages, improves productivity and timeliness of agricultural operations, improves the efficient use of resources, enhances market access and contributes to mitigating climate related hazards.

What FAO does

Sustainable mechanization is a means to an end. Farmers who have access to improved agricultural tools and powered technologies can shift from subsistence farming to more market-oriented farming, making the agricultural sector more attractive to rural youth. Sustainable mechanization supports the development of food supply chains through improved agricultural practices for increased production and enhanced food security.

FAO works with governments and institutions to develop national and regional strategies in support of sustainable mechanization. Defining the roles of all stakeholders is key: public sector institutions, private sector organizations and companies, and hire services. Developing strategies includes strengthening public sector capacity for informed decision making; fostering public-private dialogue to implement models defining their roles, upscaling mechanization practices and improving access to equipment; guiding financial investment in mechanization; training farmers, extension officers and mechanization hire service providers; and facilitating the development of small-scale enterprises, cooperatives and local organizations to ensure access and uptake of mechanization services, especially for smallholder farmers.

FAO helps farmers to identify appropriate business models to set up hire service businesses (offering animal and/or motor powered mechanized services) through capacity building,



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related training materials, and enabling private sector involvement and development.

FAO ensures that equipment used or required by its programmes and projects meets quality standards, is appropriate for the type of intervention safe and durable.

FAO has also been involved in activities emanating from emergency situations for many decades: providing beneficiaries with basic kits – containing seeds, fertilizer and a hand tool, usually a hoe, a sickle or other – means enabling them to start up farming operations as soon as possible.



Sustainable Agricultural Mechanization

FAO facilitates south-south collaboration to increase knowledge exchange on agricultural equipment and sustainable practices; fosters partnerships with public and private sector institutions to promote innovation and build on existing technology (often commercially available); and provides technical assistance to projects and programmes to implement sustainable agricultural mechanization practices in a local context.

Background

Sustainable mechanization is applied to agricultural land preparation, supports timely seeding and planting, weed control, integrated pest management, precise fertilizer application, harvesting, preparation for storage, and value addition operations along the food supply chain in terms of on-farm processing, transport and marketing.

Increasing levels of mechanization does not necessarily mean big investments in tractors and other machinery. Farmers need to choose the most appropriate power source for any operation depending on the work to be done and on who is performing it. The level of mechanization should meet their needs effectively and efficiently. Women play an important role in many farming based communities, and in some countries, **up to 80 percent of the total farm labour comes from women.** This implies that power sources (human, animal or motor-based) need to be adapted to such necessities from an ergonomic, social, cultural and economic point of view.

When developing mechanization strategies, FAO takes into consideration the pillars of sustainability:

Economic. Adequate investment in agricultural mechanization ensures increased crop yields and added



value. Some farmers can develop hire service business enterprises – to hire out agricultural machinery services to other farmers. FAO addresses commercial as well as financial links between farmers and other stakeholders such as retailers, distributors, manufacturers, importers and service providers in building a sustainable agricultural and food sector.

Social. Benefits from the application of and access to mechanization include a reduction in the drudgery of farm work implying more time to engage in other activities, the improvement of a farmer's status in a local community, and renewed attractiveness of the agricultural sector to rural youth. Increased crop yields can reduce the vulnerability of smallholder farmers to socio-economic and environmental crises. The impact of mechanization on rural employment actually develops new employment opportunities such as manufacturing, repair, and provision of mechanization services.

Environmental. Productivity and food security need to be improved while preserving and enhancing natural resources and the environment. Physical limits to land and water availability within ecosystems is often worsened by climate change. By including sustainable mechanization in its projects, FAO promotes conservation agriculture practices which contribute to soil conservation and water use efficiency.

Partners

CEMA, World Bank, ACT, AGRA, AfricaRice, CIMMYT, UNIDO and UN-CSAM

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