



Sustainable agricultural mechanization



©FAO/B.G. Sims

Sustainable agricultural mechanization reduces manual labour time, relieves labour shortages, improves the productivity and timeliness of agricultural operations and creates new employment opportunities. It improves resource use efficiency in agriculture, and thus helps mitigate the effects of climate change by reducing greenhouse gas emissions. Farmers who have access to improved agricultural tools and powered technologies can shift from subsistence farming to more market-oriented farming, strengthening the performance of the agricultural sector and making it more attractive to rural youth.

What we do

Mechanization covers all levels of farming and processing technologies, from simple hand tools to sophisticated motorized equipment.

FAO works with governments and institutions to develop national and regional strategies in support of sustainable agricultural mechanization. These strategies include strengthening capacity for informed decision-making at public sector level, fostering public-private dialogue and collaboration, upscaling mechanization practices, improving smallholder farmers' access to equipment, and encouraging financial investment.

The training of farmers, extension agents and mechanization hire service providers, who offer animal- or motor-powered mechanized services, is an important component of these strategies. FAO also works with small-scale enterprises, cooperatives and local organizations to ensure smallholder farmers' access to and use of mechanized services.

FAO facilitates south-south collaboration to increase knowledge exchange on agricultural equipment and sustainable practices. This includes fostering partnerships among public and private sector



Mechanized on farm, post-harvest operations can save time in preparing the grain for sale or consumption, while reducing losses and drudgery.

institutions to promote innovation and to build on existing practices and technologies.

FAO also provides technical assistance through projects and programmes to implement sustainable agricultural mechanization practices and technologies tailored to local conditions.

Finally, FAO ensures that equipment used by its programmes and projects meets acceptable quality standards.

Understanding the context

Sustainable agricultural mechanization can be applied along the entire food supply chain – from land preparation, seeding, planting, weed control, integrated pest management, precise fertilizer application, harvest, storage, on-farm processing (value addition), transport and marketing.

Increasing levels of mechanization does not necessarily mean big investments in tractors and other machinery. Farmers need to choose the power source most appropriate for their farming operations. The chosen level of mechanization should meet their needs effectively and efficiently. In many farming-based communities, women play an important role, providing **up to 80 percent of the total farm labour**. Power sources (human, animal or motor-based) must be selected according to ergonomic, social, cultural and economic conditions.

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

Economic. Investment in agricultural mechanization enables farmers to intensify production, improve their quality of life and create jobs. Farmers can develop hire service business enterprises – that provide agricultural machinery services to other farmers. Adequate investment in agricultural mechanization ensures increased crop yields and added value. In Brazil, China, India and Turkey, for example, the rapid increase in demand for farm machinery has stimulated the growth of local machinery manufacture to the point that now these



It takes 60 days to cultivate a hectare of land using a hand hoe, compared to about 3 days with draught animal power or less than a day if using a powered direct seeder.

countries are major producers and world leaders in farm machinery exports.

Social. Smallholder farmers' benefits from mechanization include more free time due to a reduction in the drudgery of farm work, improved status in local communities, and a more attractive sector to rural youth. In Zambia, for example, labour savings from the adoption of draught animal power have been estimated to be from 25 to 35 percent. Mechanization also spurs new opportunities for rural employment, such as manufacturing, repair and provision of mechanization services.

Environmental. Sustainable mechanization adopts conservation agriculture practices to enable agriculture to be productive and profitable for farmers while preserving and enhancing the resource base and the environment. It protects the soil, conserves water, uses less energy, improves input-use efficiency and reduces post-harvest losses.

Partners

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

CONTACT US

Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla, 00153 Rome, Italy
E-mail: AGP-Director@fao.org

MORE INFORMATION

www.fao.org/sustainable-agricultural-mechanization