

DOI-10.53571/NJESR.2022.4.3.58-63

Poverty and livelihoods, Food Security**Veerendra Singh***, **A.K. Singh****, **A.J. Bhatt*****, **Naresh K. Mehta******
College of Fishery Science, Birsa Agricultural University, Gumla, Ranchi*

College of Fishery Science, Birsa Agricultural University, Gumla, Ranchi**

College of Fisheries Science, Kamdhenu University, Veraval, Gujarat***

College of Fisheries, CAU (Imphal), Lembucherra, Tripura****

(Received:20February2022/Revised:5March2022/Accepted:15March2022/Published:29March2022)

Successfully meeting development and sustainability goals and responding to new priorities and changing circumstances would require a fundamental shift in AKST [Agricultural Knowledge Science and Technology], including science, technology, policies, institutions, capacity development and investment. Such a shift would recognize and give increased importance to the multi functionality of agriculture, accounting for the complexity of agricultural systems within diverse social and ecological contexts. It would require new institutional and organizational arrangements to promote an integrated approach to the development and deployment of AKST. It would also recognize farming communities, farm households, and farmers as producers and managers of ecosystems. This shift may call for changing the incentive systems for all actors along the value chain to internalize as many externalities as possible. In terms of development and sustainability goals, these policies and institutional changes should be directed primarily at those who have been served least by previous AKST approaches, i.e., resource-poor farmers, women and ethnic minorities.¹ Such development would depend also on the extent to which small-scale farmers can find gainful off- farm employment and help fuel general economic growth. Large and middle-size farmers continue to be important and high pay-off targets of AKST, especially in the area of sustainable land use and food systems.

It will be important to assess the potential environmental, health and social impacts of any technology, and to implement the appropriate regulatory frameworks. AKST can contribute to radically improving food security and enhancing the social and economic performance of agricultural systems as a basis for sustainable rural and community livelihoods and wider economic development. It can help to rehabilitate degraded land, reduce environmental and

health risks associated with food production and consumption, and sustainably increase production.

Success would require increased public and private investment in AKST, the development of supporting policies and institutions, revalorization of traditional and local knowledge, and an interdisciplinary, holistic and systems-based approach to knowledge production and sharing. Success also depends on the extent to which international developments and events drive the priority given to development and sustainability goals and the extent to which requisite funding and qualified staff are available.

Important options for enhancing rural livelihoods include increasing access by small-scale farmers to land and economic resources and to remunerative local urban and export markets; and increasing local value added and value captured by small-scale farmers and rural laborers. A powerful tool for meeting development and sustainability goals resides in empowering farmers to innovatively manage soils, water, biological resources, pests, disease vectors, genetic diversity, and conserve natural resources in a culturally appropriate manner. Combining farmers' and external knowledge would require new partnerships among farmers, scientists and other stakeholders.

Policy options for improving livelihoods include access to microcredit and other financial services; legal frameworks that ensure access and tenure to resources and land; recourse to fair conflict resolution; and progressive evolution and proactive engagement in IPR [Intellectual Property Rights] regimes and related instruments. Developments are needed that build trust and that value farmer knowledge, agricultural and natural biodiversity; farmer-managed medicinal plants, local seed systems and common pool resource management regimes. Each of these options, when implemented locally, depends on regional and nationally based mechanisms to ensure accountability. The suite of options to increase domestic farm gate prices for small-scale farmers includes fiscal and competition policies; improved access to AKST; novel business approaches; and enhanced political power.

Food security

Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Food sovereignty is defined as the right of peoples and sovereign states to democratically determine their own agricultural and food policies.

Food security strategies require a combination of AKST approaches, including the development of food stock management, effective market intelligence and early warning, monitoring, and distribution systems. Production measures create the conditions for food security, but they need to be looked at in conjunction with people's access to food (through own production, exchange and public entitlements) and their ability to absorb nutrients consumed (through adequate access to water and sanitation, adequate nutrition and nutritional information) in order to fully achieve food security.

AKST can increase sustainable agricultural production by expanding use of local and formal AKST to develop and deploy suitable cultivars adaptable to site-specific conditions; improving access to resources; improving soil, water and nutrient management and conservation; pre- and postharvest pest management; and increasing small-scale farm diversification. Policy options for addressing food security include developing high-value and under-utilized crops in rain fed areas; increasing the full range of agricultural exports and imports, including organic and fair trade products; reducing transaction costs for small-scale producers; strengthening local markets; food safety nets; promoting agro-insurance; and improving food safety and quality. Price shocks and extreme weather events call for a global system of monitoring and intervention for the timely prediction of major food shortages and price-induced hunger.

AKST can increase sustainable agricultural production by expanding use of local and formal AKST to develop and deploy suitable cultivars adaptable to site-specific conditions; improving access to resources; improving soil, water and nutrient management and conservation; pre- and postharvest pest management; and increasing small-scale farm diversification. Policy options for addressing food security include developing high-value and under-utilized crops in rain fed areas; increasing the full range of agricultural exports and imports, including organic and fair

trade products; reducing transaction costs for small-scale producers; strengthening local markets; food safety nets; promoting agro-insurance; and improving food safety and quality. Price shocks and extreme weather events call for a global system of monitoring and intervention for the timely prediction of major food shortages and price-induced hunger.

Environmental sustainability

AKST systems are needed that enhance sustainability while ecological provisioning of agricultural systems. Options include improving nutrient, energy, water and land use efficiency; improving the understanding of soil-plant-water dynamics; increasing farm diversification; supporting agroecological systems, and enhancing biodiversity conservation and use at both field and landscape scales; promoting the sustainable management of livestock, forest and fisheries; improving understanding of the agroecological functioning of mosaics of crop production areas and natural habitats; countering the effects of agriculture on climate change and mitigating the negative impacts of climate change on agriculture.

Policy options include ending subsidies that encourage unsustainable practices and using market and other mechanisms to regulate and generate rewards for agro/environmental services, for better NRM [Natural Resource Management] and enhanced environmental quality. Examples include incentives to promote IPM [Integrated pest management] and environmentally resilient germplasm management, payments to farmers and local communities for ecosystem services, facilitating and providing incentives for alternative markets such as green products, certification for sustainable forest and fisheries practices and organic agriculture and the strengthening of local markets. Long-term land and water use rights/tenure, risk reduction measures (safety nets, credit, insurance, etc.) and profitability of recommended technologies are prerequisites for adoption of sustainable practices. Common pool resource regimes and modes of governance that emphasize participatory and democratic approaches are needed.

Investment opportunities in AKST that could improve sustainability and reduce negative environmental effects include resource conservation technologies; improved techniques for organic and low-input systems; a wide range of breeding techniques for temperature and pest tolerance; research on relationship of agricultural ecosystem services and human well-being; economic and non-economic valuations of ecosystem services; increasing water use efficiency

and reducing water pollution; biocontrols of current and emerging pests and pathogens; biological substitutes for agrochemicals; and reducing the dependency of the agricultural sector on fossil fuels.

Human health and nutrition

Inter-linkages between health, nutrition, agriculture, and ASKT affect the ability of individuals, communities, and nations to reach sustainability goals. These inter-linkages exist within the context of multiple stressors that affect population health. A broad and integrated approach is needed to identify appropriate use of AKST to increase food security and safety, decrease the incidence and prevalence of a range of infectious (including emerging and re-emerging diseases such as malaria, avian influenza, HIV/AIDS and others) and chronic diseases, and decrease occupational exposures, injuries and deaths. Robust agricultural, public health, and veterinary detection, surveillance, monitoring, and response systems can help identify the true burden of ill health and cost-effective, health-promoting strategies and measures. Additional investments are needed to maintain and improve current systems and regulations.

- **Increasing foodsecurity** can be facilitated by promoting policies and programs to diversify diets and improve micronutrient intake; and developing and deploying existing and new technologies for the production, processing, preservation, and distribution of food.
- **Increasing food safety** can be facilitated by effective, coordinated, and proactive national and international food safety systems to ensure animal, plant, and human health, such as investments in adequate infrastructure, public health and veterinary capacity, legislative frameworks for identification and control of biological and chemical hazards; and farmer- scientist partnerships for the identification, monitoring and evaluation of risks.
- **The burden of infectious disease** can be decreased by strengthening coordination between and the capacity of agricultural, veterinary, and public health systems, integrating multi-sectoral policies and programs across the food chain to reduce the spread of infectious diseases, and developing and deploying new AKST to identify, monitor, control, and treat diseases.

- **The burden of chronic disease** can be decreased by policies that explicitly recognize the importance of improving human health and nutrition, including regulation of food product formulation through legislation, international agreements and regulations for food labeling and health claims, and creation of incentives for the production and consumption of health- promoting foods.
- **Occupational health** can be improved by development and enforcement of health and safety regulations (including child labor laws and pesticide regulations), enforcement of cross- border issues such as illegal use of toxic agrochemicals, and conducting health risk assessments that make explicit the tradeoffs between maximizing livelihood benefits, the environment, and improving health.