



**Food and Agriculture Organization
of the United Nations**

**Recommendations for Sustainable Development of Mountain Agriculture to enhance food security
and nutrition**

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Recommendations are based on the outcome of the deliberations of the Panel of Experts at International Workshop and Regional Expert Consultation on Mountain Agriculture Development and Food Security and Nutrition Governance, co-organized by FAO and UIR, in collaboration with the FAO Special Ambassador of the International Year of Pulses, the International Crops Research Institute for the Semi-Arid Tropics, the International Centre for Integrated Mountain Development, Mountain Partnership and Center for International Agriculture Research of Chinese Academy of Agriculture Sciences, Under Regional Initiative on Zero Hunger

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Mountains occupy 24% of the terrestrial surface of the earth and are the home of about one billion people. The livelihood of large segment of mountain population substantially depends on mountain agriculture. However, the challenges facing mountain agriculture are different than those facing plain agriculture and they require integrated multidisciplinary and holistic approaches to be resolved in order to improve the livelihoods of mountain women, men and children. Urgent attention is required to reverse the declining trend in traditional mountain agriculture systems and loss of biodiversity in the mountain ecosystem so that they could contribute effectively to global food and nutrition security as well as to mountain ecosystem health which would be important to those living upstream and down stream in mountain area.

The challenges facing mountain agriculture in Asia include variable harsh environment conditions, poor infrastructure and lack of services that prevail in the mountainous areas and natural disasters which have tremendous impact. Poverty, food and nutrition insecurity pose other challenge in mountainous areas affecting a large amount of people especially in remote mountain areas. In addition, due to the inaccessibility, fragility and seasonality of the mountain areas, there are lost economic opportunities, poor market access and weak institutional services. With the increasing awareness of the problems as well as the needs for agricultural diversification nutrition-enhancement and climate resilience in mountain areas, FAO and its partners timely organized an International Workshop and Regional Expert Consultation on Strengthening Mountain Agriculture Development and Food Security and Nutrition Governance for Zero Hunger and poverty reduction to review the key issues in mountain areas in the context of sustainable agriculture and food system in the mountainous and hilly areas.

Special attention and concentrated solutions targeting mountain and hilly areas in Asia are required to address poverty, food security and nutrition governance. As mountains play critical role in providing ecosystem services for sustainable development of downstream areas, however, large segment of the mountain people remains poor. Mountain ecosystem and mountain agriculture are interrelated and are interdependent.

Therefore, sustainable development of mountain ecosystem and mountain agriculture requires long-term investment in a holistic and integrated approach involving policy, socio-economic and institutional aspects; natural resource management and crop and livestock improvement. It is important to address economic, social, environmental, cultural and political issues in a holistic approach taking into account the contrasting situation of different farming systems to ensure sustainable development of mountain ecosystem and mountain agriculture that benefits both the mountain and lowland population.

In order to address the various challenges facing mountain ecosystem and mountain agriculture, the International Workshop and Regional Expert Consultation event offered a set of policy and programming recommendations for sustainable development of mountain agriculture to enhance food security and nutrition governance in Asia to contribute to the zero hunger initiative.

The Workshop and Regional Expert Consultation event provided various approaches/ modalities for the way forward for sustainable mountain agriculture to enhance food security and nutrition governance as well as improve livelihoods in the region. This will contribute to the eradication of poverty and hunger which are global and regional priority as specified in SDG 1 and SDG 2. It is therefore, an essential component of the FAO Regional Initiative on Zero Hunger Challenge, based on the country needs and regional priority, as well as all Strategic Programmes. It is important to fulfill the strong desire from countries to have knowledge sharing and lessons learned at the regional level in promoting sustainable mountain agriculture in practice for enhancing food security and nutrition in mountain areas to contribute to Zero Hunger Challenge and poverty reduction.

Workshop and the Expert Consultation concluded its deliberations by the following recommendations which are important to be implemented at the national and regional levels to contribute to the sustainable development of mountain ecosystem and mountain agriculture:

Policy, Socio-Economic and Institutional consideration:

- Develop and implement policies, strategies and programs to address the challenges including socio-economic and eco-system focused facing different farming systems and zones of sustainable mountain agriculture development;
- Increase attention to risk management and develop policies for prevention, mitigation and relief to cope with natural disasters;
- Strengthen existing and establish new national institutions to provide public services including extension and micro-credit to support sustainable mountain agricultural development;
- Involve representatives of mountain communities in decision-making and implementation processes of policies and in initiatives taken to support mountain agricultural development;
- Increase enabling environment for land tenure to consolidate land holdings to ensure investment in long term appropriate land management. Attention to be provided to develop farmers' cooperative to transfer subsistence agriculture to commercial agriculture for agricultural productivity and income;
- Develop infrastructure of mountain areas to support agricultural development and improve livelihoods;
- Increase the level of investment and financial support for sustainable development of mountain agriculture at national, regional and international levels;
- Increase resilience of mountain farmers and small agro-industrial enterprisers by linking them with markets, and providing subsidies for added values to mountain products especially Future Smart Food (FSF), other non-food products, to diversify income of mountain communities particularly women;

- Establish a mountain agriculture fund and a funding mechanism for both replenishment and support of agricultural services, activities, and added-value products in mountain areas.

Natural Resource Management:

- Promote the conservation and sustainable use of natural resources of regional and global importance which are also important to mountain agriculture namely water, biodiversity, soil, natural pastures and forests;
- Ensure the adaptation and mitigation measures to cope with natural hazards as a result of climate change and their pressure on natural resources;
- Preventing Land Degradation and Building up Soil Fertility through:
 - Considering different types of terracing for efficient farming. Planting along contour lines for better water catchment and more effective in reducing erosion;
 - Controlling grazing and conserving biodiversity;
 - Diversifying cropping system (including legumes), mixed and intercropping;
 - Promote conservation agriculture;
 - Promote/ increase rain water harvesting, conservation and its efficient use;
 - Promote agro-ecological practices;
 - Promote agroforestry landscape model.

Crop and Livestock Improvement and Integration:

- Ensure the development of integrated livestock/crops/rangelands farming system for effective utilization of natural resources;
- Develop improved varieties of crop plants adapted for the diverse mountain environments and climate change such as FSF;
- Promote cultivation of traditional crop varieties such as FSF and highlight the crucial role of mountain people as custodians of these varieties;
- Establish livestock community breeding with herders and pastoralists whereby unproductive animals are culled out to keep only productive animals which would improve livestock populations and herds;
- Diversify agriculture production and encourage the production of high-value crops including fruit trees, vegetable ornaments as well as value-added products in both crop and livestock production to improve nutrition, income and livelihoods;
- Promote protected agriculture (mulches, row covers, shade structures, greenhouses, etc.) to intensify production of high-value crops and increase water use efficiency and production efficiency per unit areas in mountain agriculture.

Research and Capacity Development:

- Increase long term investment for research programs in national research institutions and universities to enhance capacities and address the specific challenges facing sustainable development of mountain agriculture;

- Develop and support capacity building (mountain agriculture curriculum and web-based technology in relevant universities) and extension targeting different stakeholders including farmers programs to promote sustainable development of mountain agriculture;
- Establish farmers and pastoralists field schools as well as women empowerment programs to transfer/ exchange technologies and skills to address the challenges facing these important stakeholders;
- Develop and implement communication programs and audiovisual aids to promote advanced technologies and knowledge on sustainable mountain agriculture development;
- Make use of the opportunity of the International Mountain Day on 11 December to organize events and workshops to promote sustainable development of mountain agriculture.

Regional and International Cooperation:

- The challenges and problems facing mountain ecosystems and mountain agriculture are often complex, trans-boundary and are difficult to be resolved by a single country or single institution. A good example is demonstrated by the challenges and problems of the trans-boundary mountain ecosystems and river basins that originate from mountain areas. Therefore, inter-country regional cooperation should be established in areas of common interest.
- Furthermore, to address the challenges facing mountain ecosystems and mountain agriculture, It is essential to strengthen and develop cooperation with regional and international cooperation, particularly, FAO, Mountain Partnerships, ICIMOD, CGIAR Centers, universities and others relevant institutions.
- Strengthen Mountain Partnership considering that it as the only UN voluntary alliance of partners dedicated to improve the lives of mountain people and protect mountain environment around the region/ world, increase public-private sector attention, commitment, engagement and investment for the development of sustainable mountain agriculture.

These are very important recommendations that require to be adopted for implementation by national authorities as well as specialized regional, international and United Nations organizations where FAO can play an important coordinating role. The implementation of these recommendations would contribute greatly to ensure healthy mountain ecosystems and efficient productive mountain agriculture that will only contribute to global food security and nutrition but also to ensure the continued services and resources that contribute 70% of fresh water resources besides various sources of renewal energy to the world community. Both water and energy are critical to the water – energy – food nexus essential to food and nutritional security, environmental sustainability and poverty reduction.

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