Government of Nepal
Ministry of Forests & Environment
Adaptation for Smallholders in Hilly Areas Project
Hattisar, Kathmandu

Adaptation for Smallholders in Hilly Areas (ASHA)

Thematic Operational Strategy Paper

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Ministry of Forest and Environment (MoFE) is implementing Adaptation for Smallholders in Hilly Areas (ASHA) project with financial support from International Fund for Agricultural Development (IFAD) in the remote six hilly districts (Salyan, Rukum, Dailekh, Jajarkot, Kalikot, Rolpa). After the restructuring process of Nepal in 2017, Rukum district has been divided in two districts (East Rukum and West Rukum) which have by default increased the number of working districts to seven. The ASHA project intends to support vulnerable smallholders to improve their agricultural activities to climate resilience. ASHA seeks to reduce the increasing vulnerability of climate change related effects (such as erratic rainfalls, shifts in precipitation patterns, longer droughts, more severe floods and deficit in the recharge of groundwater) and shocks through supporting on planning and implementation of Local Adaptation Plan of Action (LAPA)to raise the resilience of highly vulnerable households defined under the National Adaptation Program of Action (NAPA) by strengthening the natural, physical, social, human and financial capital of its communities.

Based on field observation visits in the working districts, community interactions, farmers need and interest of field staffs and staying within the boundary of project design document (PDR), some major agriculture practices and technologies have been identified for the project areas. The aim of this paper is to provide smallholders and field staffs easy access to potential farming practices and technologies suitable to achieve project objectives but not limiting them to go beyond the list. Similarly, this paper provides the list of eight farming system identified to test in the project areas; and give the list of production beneficial models suitable in the project areas.

A. Farming systems

Testing and experimenting different farming systems requires a series of small, well planned and realistic steps. It requires that farmers take time to experiment, test and validate whether the small changes that they are adopting are bringing about positive results. Lead farmers with the support of Mid level technicians jointly can facilitate Farmer Field School approach in experimenting and testing some farming systems. Service provider/s can be consulted to facilitate testing some of the farming systems with the smallholders in the project areas. According to the field research carried out in FY 2017/18 following farming systems are recommended to test in the project areas;

A.1. Conservation agriculture

Conservation agriculture combines three practices: no-till or minimum tillage, retention of crop residues in fields and regular fallow periods. It is particularly useful in the farms where farmers cultivating crops on sloppy land.

A.2. Organic farming

The farming system ties together principles of sustainability and productivity. Organic farmers must consider how the various components of their system - rotations, pest and weed management, and soil health - will maintain both productivity and profitability.

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A.3. Bio-intensive farming

Bio-intensive farming is an agricultural system that focuses on achieving maximum yields from a minimum area of land, while simultaneously increasing biodiversity and sustaining the soil fertility.

A.4. Permaculture

Permaculture is "the development of agricultural ecosystems that are intended to be sustainable and self-sufficient." In other words, permaculture is design driven by nature and intended to support future generations. The name *permaculture* represents the creation of a *permanent culture*. Proponents of permaculture view the world as an "interconnected whole" and create spaces that allow for plants, animals and humans to form symbiotic relationships. While it has some similarities to organic farming, it's much different in many ways, too.

A.5. Integrated Farming

It is a farming system where high quality organic food, feed, fibre and renewable energy are produced by using resources such as soil, water, air and nature as well as regulating factors to farm sustainably and with as little polluting inputs as possible. The underlying three dimensions economic development, social development and environmental protection are thoroughly considered in the practical implementation of Integrated Farming. However, the need for profitability is a decisive prerequisite: To be sustainable, the system must be profitable, as profits generate the possibility to support all activities outlined in the (EISA Integrated Farming) IF Framework.

A.6. Commercial farming

Commercial farming can be defined as a system of farming where crops are grown for sale and or for exports to make profit. The benefits of commercial farming include increased *production, Lower prices of products, Lower cost of production, Job creation and Provides raw materials.*

A.7. Terrace farming

A terrace is a piece of sloped plane that has been cut into a series of successively receding flat surfaces or platforms, which resemble steps, for the purposes of more effective farming. Terrace farming is a type of **farming** that consists of different "steps" or terraces that were developed in various places around the world. As the project is running on the hills, majorities of the farm land are steep in slope. If this is the only land farmers have to grow crops on, farmers have built terraces to shore up a hillside, creating several levels of farms. In a small, seemingly inhospitable place, they can grow the crops they need to grow to survive.

A.8. Integrated Pest Management (IPM)

FAO defines IPM as "the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.

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B. Suitable agriculture practices

Crop-specific innovations complement other practices that aim to improve crop production under climate change, e.g. soil management, water management, nutrient management and pest and disease management. Crop-specific innovations include diversification, intensification and finding of more resilient crop varieties.

Field technicians and field facilitators can identify local alternatives that are based on the knowledge and practices of the communities themselves. Although they are not solution to all problems, they contain key insights that—when appropriately combined with scientific knowledge and modern technology.

B.1. Soil Management: Soil management is the application of operations, practices, and treatments to protect soil and enhance its performance. It includes soil conservation, soil amendment, and optimal soil health.

Soil conservation: Soil losses through floods, landslides and runoff during rainy season is the common issue throughout the project districts, due to majority of agriculture land are sloppy and majorities of smallholders have poor conservation awareness. Project will further focus through training, coaching, LF mobilization to increase the practice of terrace improvement, Cover crops and mulching.

Soil health: Soil health is a state of a soil meeting its range of ecosystem functions as appropriate to its environment. The term soil health is used to describe the state of a soil in: Sustaining plant and animal productivity and biodiversity (Soil biodiversity); Maintaining or enhance water and air quality; Supporting human health and habitation.

Some traditional skills of using ash on the soil and soil health prediction by observing soil color and textures are prevail in the project districts. Despite of these, project will facilitate and support soil test services to identify soil PH and nutrient status. Some Lead farmers will be supported with soil testing kits and training for this service.

B.2. Water management

Improved water management can be achieved through capture and retention of rainfall, and improved irrigation practices. Soil fertility and crop management innovations also improve water use efficiency. Water is the common issue identified to be scars throughout the year and there are many soil and environmental losses due to access of water during rainy season.

The project will promote practice of making conservation ponds on the forest, marginal land and some water conservation and recharge holes on the farmers' lands. Similarly, practice of rain water harvesting, plastic pond for water storage, and use of drip irrigation will be promoted in the project districts.

B.3. Nutrient management

Nutrient management is the science and practice directed to link soil, crop, weather, and hydrologic factors with cultural, irrigation, and soil and water conservation practices to achieve optimal nutrient use efficiency, crop yield, crop quality, and economic returns, while reducing off-site

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transport of nutrient that may impact the environment. It involves matching a specific field soil, climate, and crop management conditions to rate, source, timing, and place of nutrient application.

Green manure, liquid manure, compost, integrating legumes and non legumes, use of livestock urine as fertilizer through drip irrigation, mixed cropping/ inter cropping/ relay cropping are the major traditional climate resilient agriculture practices that have been using to manage nutrients for a long.

In addition to supporting and multiplying the use of above traditional practices, project will promote use of bio-char produces from invasive species as fertilizer and liquid manure in respect to nutrient management in the project areas.

C. Supportive practices

C.1. Community seed bank

Some native species and crop varieties those were popular for taste, aroma or medicinal value few years ago are not seen on the farmers' field in changing climatic condition. Efforts to conserve native plant genetic resources (PGR) will be made through establishing community seed banks.

C.2. Use of communication means

Information dissemination through information and communication technology (ICT) and farmer-to farmer dissemination can be scaled-up to make access to climatic information and extension effort more rapid and effective for instance, mobile apps for weather forecast, FM radio.

C.3. Crop and livestock insurance

Well-designed and targeted agricultural insurance can enable farmers to re-invest in inputs and technologies despite bad years. Index-based insurance in particular overcomes major obstacles to insuring poor smallholder farmers, such as high transaction costs and logistical challenges of verifying reported losses.

D. Research and extension

D.1. Participatory Action Research

Action research involves actively participating in a change situation, researchers work with others to propose a new course of action to help their community improve its work practices. Project will support carrying out participatory action researches as the basis to get participating vulnerable people exposed on the realities of tested practices and technologies; and realize the real needs to change. As the participatory action research is effective means of change, the project will support carrying out the researches on the identified farming systems and the climate resilient farming practices.

D.2. Lead Farmer approach

Lead farmers are the local experienced farmers who have got knowledge and skills on different farming practices and are able to deliver required farming knowledge and skills in the community. The project has taken Lead Farmers an important element of a development program for sustainable and effective delivery of services required at the local level. The LFs are assumed to act as a bridge between local authorities and the farmers for people centered development program. On a diversified cultural society and adverse situation, working through the LFs enhances the local ownership of the program and create

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the healthy environment avoiding the difficulties that may arise in the communities and also ensuring project sustainability. There will be a total of 400 Lead farmers, at the rate of at least two per LAPA. The project will provide different training and capacity development activities for the LFs, who will then mobilize in extension of climate resilient farming practices to their neighboring farmers.

D.3. Farmer Field School

Farmer Field School and community knowledge center will be the main approach multiplying the farming system learning, climate resilient farming practices and other effective soil and water conservation and management, nutrient management and integrated pest management technologies to the wider beneficiaries.

D.4. Extension through other communication means

Electronic communication means like use of mobile Apps, FM radio, audio visual aids, printed posters, pamphlets, drawings, and local media extension will be used in extension of information and climate resilient farming practices.

D.5 Social Mobilization

Social Mobilizers are the key extension agents who can have day to day access and interactions with vulnerable community people. Social mobilization will focus on building community resilience through motivating people to unite in groups, adapting climate resilient farming practices, assist people participating participatory action researches, engagement in producing and marketing of beneficial products and more importantly ensures each and every activities to be climate resilient.

E. Profitable production models suitable in the project areas

Production profitablewill involve investment by vulnerable household groups (representative of the gender and ethnic mix in the community) in forestry, agriculture and livestock production, resource management systems adapted to CC impacts, labour efficient farm equipment, on-farm renewable energy technologies, and collective marketing, particularly for new climate adapted products that significantly increase household income. Some important profitable production models are given below;

- **Commercial vegetable production**: Minimum requirements- Business plan for at least three years, market based production model, use of proven technologies of certified seeds, wise use of water and fertilizers, no use of hybrid seed and harmful chemicals. Area at least two ropani, and the farmer must have at least one cow or buffalo, and this activity complements farmers existing livelihoods.
- **Organic vegetable production**: Minimum requirements -Business plan for at least three years, market assurance, zero chemicals, organic assurance mechanism, use of organic fertilizers, no hybrid seeds. Area at least two ropani, and the farmer must have at least one cow or buffalo, and this activity should complements farmers existing livelihoods.
- **Bee keeping:** Minimum requirements-Business plan for at least three years, minimum of six beehives per family, availability of sufficient grazing species, community assurance of chemical free during bee grazing, market assurance and this activity complements farmers existing livelihoods.

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- **Goat keeping**: Minimum requirements-Business plan for at least three years, assured grass cultivation at least three or more recommended species, market linkage, at least eight goats per family, provision of insurance, packaging of breeding, feeding, management and health and this activity complements farmers existing livelihoods.
- **Multipurpose nursery**: Minimum requirements- Business plan for at least three years or more, integrated plan for seedlings of fruits, vegetables, fodder and forest species, market based production system, minimum half ropani effective area and this activity complements farmers existing livelihoods.
- **Multipurpose Amliso plantation:** Minimum requirements- Business plan for at least five or more years, plantation on sloppy and degraded land, integrated with farmers existing livelihood options of livestock or goat keeping, benefits getting broom, grass and soil stabilization.
- **Agriculture Products outlet**: Minimum requirements- Business plan for at least three years or more, agriculture products collection from farmers in the project areas, participatory decision mechanism for price rate and others together from participating farmer groups and outlet .