Building Smallholder Farmers' Resilience under Climate Change through Value Chain Management in Nepal

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Nepal at a glance

- 75 districts, 217 Municipalities, 3200 VDCs
- Population 28 millions, 10 religions
- 125 caste/ethnic groups, 123 languages spoken as mother tongue
- Predominantly an agrarian country
- About 22% people still below poverty line
- Agriculture contributes one-third to GDP
- 21% of the land is cultivable (57% rain-fed)
- Average land holding 0.68 ha
- Major crops Paddy, Maize, Wheat and Horticulture
- Livestock: Cattles, Buffaloes, Sheep/Goat, Pigs and Poultry

Composition of GDP/AGDP



Source: MoAD

Major Weather System

- Climatic condition is strongly influenced
- by the monsoon circulation.
- On the basis of monsoon phenomena, there are four seasons in Nepal.

- Winter (Dec-Feb)
- Pre-monsoon (Mar-May)
- Monsoon (Jun-Sep)
- Post Monsoon (Oct-Nov)

average mean temperature is around 15° C



Source: DoMH

Overall baseline problems of climate

climatic characteristics varying from tropical to alpine conditions within a lateral span of less than 200km

- 4th most climate-vulnerable country in the world
- rise in the maximum temperatures at an annual rate of 0.04 – 0.06° C
- 64/75 districts prone to a variety of recurring natural disasters
 - floods, landslides, snow avalanches, GLOF, hailstorms, thunderstorms, cold waves, hot waves, drought, epidemics and earthquake
- 49/75 prone to floods and/or landslides
- 23/75 to wildfires, and 1/75 to windstorms

Overall baseline problems of climate

climate related hazards in Agriculture

Floods, Drought, Hailstorms, Heat and cold waves, Pests and diseases, Soil erosion, Deforestation, Desertification



Floods in Terai





Loss of agricultural land & crop by climate related extreme events in Nepal (1971-2007)

• The climate induced natural disaster causes severe threats to agricultural sector and thereby to food and nutrition security, lives, property, and livelihoods.

Events	Loss of agricultural land & crop(ha)
Drought	329332
Flood	196977
Hail storm	117518
Rains	54895
Strong wind	23239
Cold waves	21974
Others (forest epidemic, snow storm, firestorm, thunderstorm, avalanche, plague etc)	83336
Total	847648

Source: Global assessment of risk ,Nepal Country Report, ISDR, Global assessment report on poverty and disaster risk,2009 Sudden onset disasters-especially floods-have increased from 14% of all natural disasters in the 1980s to 20% in the 1990s and 27% since 2000 (FAO,2008)

Agricultural Area affected by Disasters (in ha)

Agricultural Area Affected by Natural Disaster (in Hectares)



Paddy Maize Millet — Total

Constitution of Nepal 2072 (2015):

Article 51. State policies: The State shall pursue the following policies: section (h) Policies regarding the basic needs of citizens:

Point (12) Increasing investment in the agricultural sector by making necessary provisions for sustainable productivity, supply, storage and security, while making it easily available with effective distribution of food grains by *encouraging food productivity that suits the soil and climate conditions* of the country in accordance with the norms of food sovereignty.

Agricultural Development Strategy (ADS) 20 years strategic planning 2015-2035 4 STRATEGIC FRAMEWORK

4.4.1 Food and Nutrition Security

184. Component 2 of the ADS on Productivity has an impact of food and nutrition security by (i) increasing the volume of food production in Nepal in a sustainable way through higher productivity and sustainable use of natural resources; and (ii) reducing vulnerability of farmers through improved food/feed/seed reserves, improved preparedness and response to emergencies, and climate smart agricultural practices.

- ➢National Adaptation Program of Action to climate change (NAPA)-2067 (2010)
- National Strategy for Disaster Risk Management (NSDRM – March 2008)
- >Nepal climate change policy 2067
- Climate Resilience Planning (2011)
- Local Adaptation Plan for Action-2011 (LAPA)
- Environment-Friendly Local Governance
- Framework-2070
- >National Agriculture Policy-2061
- >Agriculture Biodiversity Policy-2063

Agricultural Mechanization Promotion Policy, 2014 Approved by the GoN on 29th. August 2014 Vision

"To contribute national development through agriculture mechanization in present agriculture system to transform to modernization and commercialization."

Clause 9. <u>Objective</u>: 4 main point to achieving AgrilMech

Identification and promotion of women and environment friendly agriculture machineries

Program for Climate Change

- ✓ Nepal Climate Change Support Program
- ✓ Pilot Program for Climate Resilience (PPCR)
- Nepal Climate Change Support Programme (NCCSP)
- Community based Flood and Glacial Lake Outburst risk reduction project (CFGORRP)
- Himalayan Adaptation, Water and Resilience (HI-AWARE)
- Nepal Climate Change Knowledge Management Centre (NCCKMC) www.climatenepal.org.np
- ✓ Initiative for Climate Change Adaptation
- Building Climate Resilience in Mountain Eco-Regions
- ✓ Hariyo Ban (green forest)

Major Climate Change Funds

A. Funding within the Convention Regime

Special Climate Change Fund (SCCF)

- Least Developed Countries Fund (LDCF)
- Adaptation Fund (AF)

Green Climate Fund (GCF)

B. Funding outside convention regime

- ***UN REDD Programme**
- Climate Investment Fund
 - Forest Investment Programme
 - Forest Carbon Partnership Facility (FCPF)
 - Pilot Programme for Climate Resilience (PPCR)
 - Scaling up Renewable Energy Programme (SREP) in low income countries

EU Global Climate Change Alliance (GCCA)

- Climate and Forest Initiatives (support to REDD+)
- International Forest Carbon Initiative
- Hatovama Initiative

CSA and Mechanization Technology Water Smart:

- Drip & Sprinkler
- Rain water harvesting
- Low cost water storage (Thai jars, Soil-cement tanks)
- Solar lift irrigation
- Papa & Barsha pump lift
- Mulching

- Precision Land Levelling
- Raised bed
- Direct Seeding
- Alternate wetting and drying
- linking tap to irrigation /conservation ponds
- zero waste of water by behavior change,

Market Access and Water Technologies for Women Project (MAWTW, 2013-16) USAID supported iDE-Nepal



Small Scale Drip Irrigation



Thai Jar for MUS



Solar Lift Irrigation (Renewable World)

Papa Pump (Hydraulic Ram)







Barsha Pump (Spiral)



Workinng principle of Spiral Pump



Developed by aQysta and promoted and implemented by Practical Action and distributed by NAFSeeds



Weather Smart:

- Weather Forcast
- Insurance
- Weather index based insurance
- Weather based agroadvisory,
- Plastic Tunnel for hailstorms and rains
- Crop Diversification
- Agroforesty



Climate and weather information

Nutrient Smart:

- Green Manuring
- Legume Integration
- Bio- fertilizer
- Bio-pesticide
- Cattle-Shed mgmt

Carbon Smart:

- No-Tillage
- Minimum Tillage
- Residue Management
- Planting perennials,
- Agro-forestry
- Fruit orchard

Energy Smart:

- No-Tillage
- Minimum Tillage
- Residue Management
- Direct Seeded Rice
- Biogas (CDM), Bio briquet and renewable energy
- Solar Pumping
- Papa & Barsha Pump





Knowledge Smart:

- ICTs
- Mobile Apps & SMS
- Call Center
- Toll Free Number
- Gender Empowerment
- Capacity Development
- Behavior Change
- Exposure visit



Haulage Smart:

- Gravity Goods Rope Ways
- Cable Ways (Tow-in)







Building Resilience of Smallholder Farmers

- Improving knowledge management
- Supporting incomes through a value chain approach
- Supporting improved agril mechanization and technologies
- Transforming the extension service

Issues and Challenges

- Limited the application of technologies such as mechanization
 Economies of scale in agriculture
- •Aggregation of product and lack of information about the value chain
- Traditionally focused on production of subsistence crops
- Lack of an effective marketing chain
- Lack of product standardization and inadequate quality assurance systems
- Insufficient knowledge of appropriate technology
- Lack of awareness about the climate change adaptation and mitigation

Issues and Challenges

- Geographical setting
- •Weak infrastructure (rural roads and access to highways,
- collection centres, cool and cold stores)
- Inefficient water resource management
- Crop variety selection
- Difficulty accessing inputs and credit
- Energy supply
- Youth migration to urban and aboard leaving old age and women.
- Limited access to machineries, spare parts and after sales services of the machines used to add value chain of the commodity
- Monsoon dependent agriculture
- Unavailability of weather forecast (Weekly, Monthly, Seasonal, Annual)
- Natural calamities; Floods, Land Slides, Cold & Hot Weather,
- **Drought and Earthquakes.**
- Recurrent climate related hazards

Need of Cooperation and Conclusion

- Capacity Development
- Promotion of Low carbom technology
- Exchange of resources, technology and knowledge
- Promotion of sustainable agricultural mechanization
- •Exchange of best practices and solutions for vulnerable to climate change risks and the impact of global warming
- Facilitating knowledge sharing at the institutional level:such as study-tours, training, and knowledge sharing platforms
- Foster partnerships among the Global South in the areas of renewable energy, climate resilience
 Partnering to achive SDG

Thank you

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