Alternative Development for Sustainable Development of Mountain and Highland Areas

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Characteristics of Mountains and Highlands

- **Limited Accessibility** - Isolation, remoteness, difficult terrain
- **High Fragility & vulnerability** - steep slope, high altitude
- **Poor infrastructure**, high transportation cost
- Sparse population, small production - low economies of scale
- **Marginality** - socio-economic & environmental
- **Poses Environmental & economic constraints**
Niche & Comparative advantage of Mountains & Highlands

- Climatic, biological & natural resource diversity - unique products & services
- Significant comparative advantages to
  - Hydropower, Tourism
  - Horticulture, Timber, medicinal herbs
  - Biodiversity, Indigenous knowledge
- Mountains are the water towers of the world
Niche & Comparative advantage of Mountains & Highlands

Biodiversity

- Mountains support 25% of the planet’s biodiversity, have 50% of the world’s biodiversity hotspots
- 32% of global Protected Areas (PA) are in mountains
- Himalayan has 488 PAs covering 39% of the region’s terrestrial area

Agrobiodiversity

- Six of 20 plant crop species that supply 80% of the world’s food originated in the mountains

Mountains: a source of cultural, spiritual & recreational resources
Niche Products for Agribusiness from Mountain Agroforestry
Mountain and Highlands are home to many tribal & indigenous peoples: Langue's & Cultural Diversity
Growing Environmental & Social Risks

- Conventional economic model failed to sustain economic growth, reduce poverty, protect environment
- High carbon emissions, climate change, accelerated melting of glaciers, Sea Level Rise
- Resource depletion, loss of biodiversity, energy crisis, water shortage, food insecurity
- Persistent poverty & growing inequality
- Economic inequality reinforces inequalities between regions, ethnicity, race, caste- leading to protracted conflicts
Multidimensional poverty: Mountain vs National

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>National</th>
<th>Mountain</th>
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<td>China</td>
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<td>Nepal</td>
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<td>Afghanistan</td>
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China - Rural Mountain Poverty

The chart above illustrates the percentage of rural mountain poverty across various regions in China. Each bar represents a different region, with the height of the bar indicating the percentage of poverty. The regions listed from left to right are: Zhangye, National, Dali, Aba, Kezilesu, Wuwei, Gannan, Liangshan, Qinghai, Ganzi, Kashgar, Tibet, Diqing, Nujiang, and Hetian.
China - Mountain Poverty

- Poverty is a mountain phenomenon
India – Mountain Poverty (Income)
Myanmar – Multidimensional Poverty

Multidimensional Poverty rate% 2016

- (0.68, 0.78)
- (0.51, 0.68)
- (0.43, 0.51)
- [0.29, 0.43]
Challenges to sustainable development

• How to overcome mountain environmental challenges & harness niche products & services for sustainable development?

• How to integrate mountain/ highland communities to mainstream economies & societies?

• How to increase productivity without degrading resources?

• How to adapt with stress, shocks (scarcities/floods/droughts) and rising pressure on fragile resources?

• What pathways are available?
Pathways to sustainable development

• Understanding biophysical, socio-economic, & cultural context & specificities

• Adopting Site-specific strategies & approaches

• Recognizing and addressing the trade-offs between the immediate economic gain & long-term risks

• Integrated solution
A few examples from different countries of the Himalaya Regions
Harnessing Hydropower for Clean Energy: Bhutan

- Bhutan Rich in water resources - 30,000 MW of hydro-electricity potential
- Currently, it generates 1,600 MW electricity
- More than 98% of households in Bhutan have access to electricity
- 80% exports to India
- Power exports generates 25% of GDP & expected to increase by 56% by 2025
- Hydropower is the major source of export earning
- Hydropower is the backbone of Bhutan economy
- Bhutan - carbon negative, 70% land under forest
Horticulture based development in Himachal Pradesh, India

Himachal Pradesh suitable agro-climatic for growing subtropical & temperate fruits

Government supported horticulture development

Horticulture revolution in Himachal

About 500,000 farmers are engaged in Horticulture

Himachal - Fruit Bowl of India

Employment Generation- livelihood diversification- high economic growth, low poverty
India – Mountain Poverty (Income)
Organic agriculture in Sikkim, India

- Sikkim is not suited for intensive agriculture
- Sikkim moved to organic agriculture for health & ecosystems
- Sale & use of chemical fertilizers & pesticides are banned
- Productivity of a few fruits reduced slightly, but many crops has remained stable
- Premium price for organic food
- New organic image - New attraction for tourists
- Carbon neutral- First organic state in the world
High value nutritious crops: High Mountain of Nepal
Trout farming in Terraces in Nepal
Large cardamom-based agroforestry - marginal lands

Cash-crop, high value, low-volume, low-input, not labor intensive, non-nutrient exhaustive, non-perishable

Fulfilling Mountain Specificity

Nitrogen fixing Himalayan Alder shade tree with large cardamom
Resource use efficiency: Byproducts from Cardamom
Diversification of high value cash crops
Diversifying livelihoods: Off-farm activities

Diversifying Livelihoods of CHT Hill Tribes
Tourism
Trophy Hunting in Chitral, Pakistan

- Mountain goats (Markhor) were at the verge of extinction in Chitral due to illegal poaching.
- Community based conservation introduced in 1999.
- A hunting trophy license is issued after a proper auction.
- Annually, four hunting trophy licenses are issued for Markhor hunting.
- 80% of the money collected is distributed among the local community, 20% is kept by the wildlife department.
- Trophy hunt tourism.
Integration of REDD+ in forest management

• REDD+ : Forestry for prosperity
• Community based forest management & carbon storage
Community Forestry in Nepal
Thank you

Protect the pulse.