



Smallholder Innovation for Resilience (SIFOR)

Biocultural innovations to confront climate change



Our project:

Traditional knowledge, crops and livestock all serve to build communities' resilience to climate change. But, with the spread of modern agriculture and development models, they are fast disappearing. SIFOR is working to stem the loss by strengthening communities' capacity to innovate through participatory action-research.

Our methods:

Our approach is guided by the concept of biocultural heritage — a complex system of interdependent parts centred on the relationship between indigenous peoples and their environment. **Biocultural innovations** are new ways of doing things, which emerge from interactions between these parts, or between traditional knowledge and science.

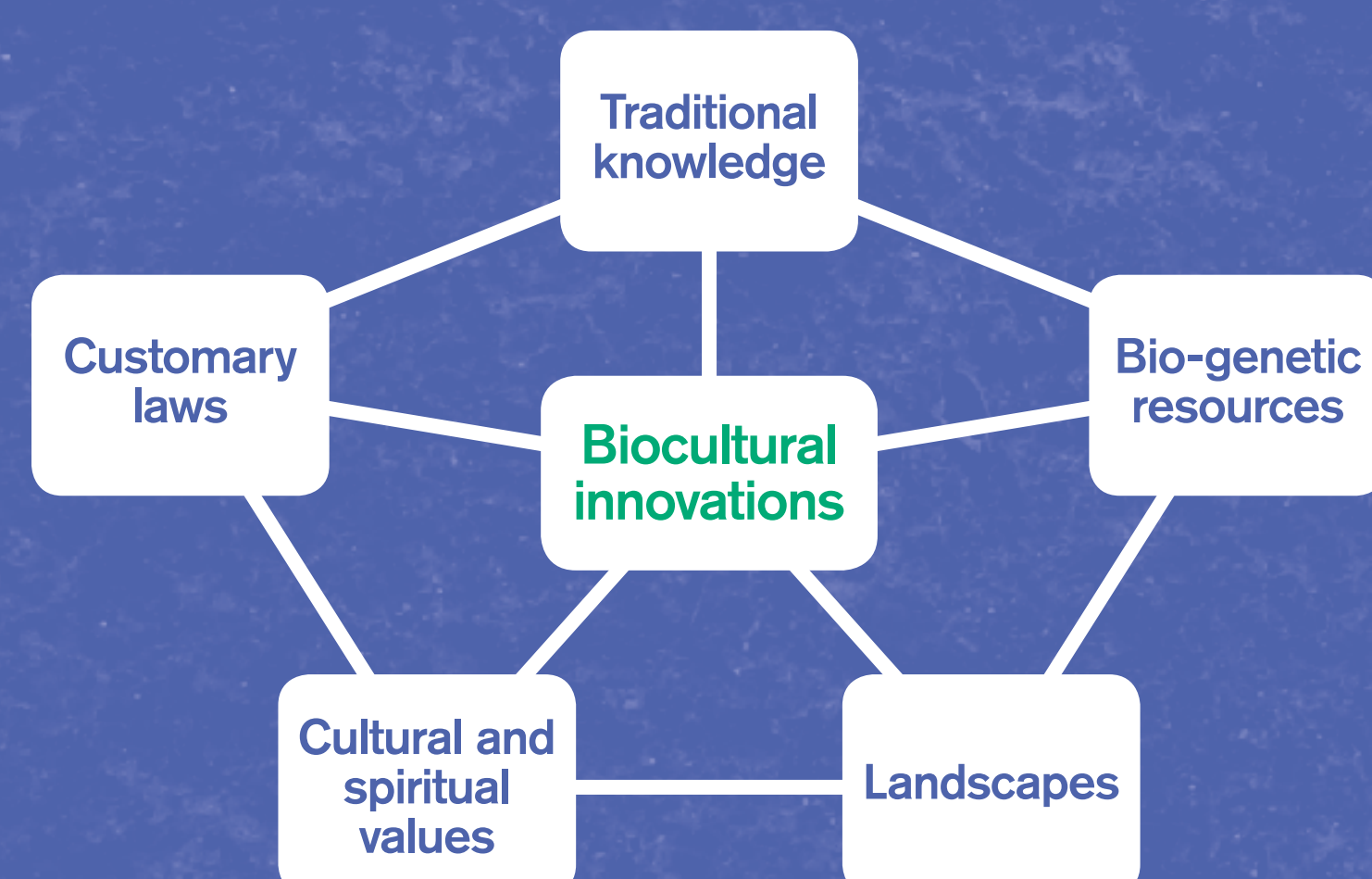


Figure 1. Biocultural heritage is made up of interdependent parts. Interactions between these result in biocultural innovations.

In 2013, we used focus groups, semi-structured interviews and household surveys to develop a baseline on biocultural innovations in three main areas:

- agrobiodiversity,
- livelihoods and food security, and
- social capital.

Our findings

The baseline study covers 64 communities across four countries. In each country we have identified the challenges posed by climate change alongside the biocultural innovations that have been developed to tackle these.

Peru

Asociacion ANDES:
5 Quechua communities,
The Potato Park, Cusco



The challenge

Rising temperatures and pests and diseases have forced potato cultivation up by 200m in 30 years. Late and erratic rainfall has reduced yields.

Biocultural innovations for enhancing agrobiodiversity

- 410 potato varieties repatriated from the International Potato Centre
- a group of farmer-researchers act as 'potato guardians';
- a community seed bank;
- on-farm potato gene reserve.

Biocultural innovations improving livelihoods and food security

- Planting diverse potato varieties that mature earlier or are drought-, disease- or pest-tolerant to reduce risk;
- modifying traditional planting methods and tools;
- women's economic collectives;
- a collective trademark;
- a culinary sanctuary;
- an inter-community benefit-sharing agreement;
- barter revival.

Innovations strengthening social capital

- Collective governance based on Andean worldview and customary laws;
- revived traditional institutions.

China

Centre for Chinese Agricultural Policy: 18 ethnic villages, Karst mountain areas, Guangxi and Yunnan



More frequent and extreme drought; more pests and diseases. Around 60% of crop diversity has been lost since 1995. High youth out-migration.

- Conservation and improvement of drought-tolerant maize, wheat and rice landraces;
- return to traditional walnut and maize (instead of rice);
- annual farmers' seed fairs;
- benefit-sharing agreements and seed repatriation.

- Revived traditional farming methods;
- Participatory Plant Breeding has developed 43 maize and rice varieties that are better suited to local conditions and 15–30% higher yielding;
- supply to organic restaurants has tripled rice incomes, increased maize incomes by 30%, reversed biodiversity loss, and revived traditional practices of duck in rice and intercropping.

- Women's groups and farmer cooperatives;
- youth returning to villages;
- revived customary laws.

Kenya

Kenya Forestry Research Institute: 31 villages, 5 Mijikenda communities, Kenyan coast



Crop yields are falling in the face of: reduced and more erratic rainfall, frequent drought, increased pests and diseases, and a drop in soil fertility.

- 10–25% increased reliance on livestock, using traditional drought- and disease-tolerant breeds;
- use of traditional maize and cassava varieties that tolerate pest, disease and water stress
- revived traditional cowpea and sweet potato crops.

- Planting improved, hybrid and traditional varieties together;
- switch from maize to cassava;
- planting of pruned cassava tops for high productivity;
- effective traditional treatments for livestock disease;
- wild forest plants (including fruit and medicinal trees) domesticated for income;
- a cultural village in a kaya forest for tourism income.

- Cultural village strengthens culture, inter-village networking and seed exchange;
- herbal groups and women's groups.

India

Lok Chetna Manch: 10 traditional, Lepcha and Limbu villages, Central and Eastern Himalayas



Rainfall has declined and become erratic, prompting a sharp drop in productivity. Crop raiding by wildlife. Youth out-migration is rising.

- Conservation of traditional millet varieties;
- planting of traditional pest- and drought tolerant crops (mustard and finger millet);
- mixed cropping is now intensively practiced for increased productivity and reduced crop raiding.

- Crop breeding by farmers to develop improved, higher-yielding radish, cardamom and black rice bean;
- planting fodder trees on-farm for soil moisture;
- cardamom production moved from forest to farm to avoid pests;
- early uprooting of maize to avoid impacts of erratic rain;
- broomstick grass domesticated as a cash crop after landslide.

- Traditional labour sharing practice adapted;
- crop protection committees;
- community nursery for paddy.



Common ingredients that support biocultural innovation: Elders and women; traditional values, beliefs, institutions and ceremonies; community organisations; capable and committed leaders; inter-village networking and seed exchange; interaction with scientists; innovative external partners.

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