



SMALLHOLDER INNOVATION FOR RESILIENCE (SIFOR) in India

A five year project to strengthen biocultural innovation for food security in the face of climate change.



The SIFOR Concept

For centuries, small-scale farmers and indigenous people have developed new tools and strategies to cope with their harsh environments — resilient crop varieties, genetically diverse seed systems and resource-conserving technologies. Many of these could prove vital in the effort to adapt agriculture to climate change. Through participatory action-research, tools development and capacity building, SIFOR project will help: by nurturing smallholder advances and traditional knowledge, identifying innovations that enhance productivity; and linking small-scale farmers with crop scientists in four focal countries.

The SIFOR Programme

SIFOR is initiated by IIED with partners in the four countries of Peru, Kenya, China and India. The overall objective of the programme is 'Improved food security and resilience from thriving smallholder farmer innovations and traditional knowledge in developing countries'. The success of the programme will be determined by the following indicators:

- ◆ Research findings and policy options on improving the food security and productivity of smallholder farmers in the face of climate change delivered;
- ◆ Key issues of climate change, gender, indigenous peoples, good governance and environmental sustainability, and active smallholder participation, better installed in food security debates
- ◆ South-south and north-south partnerships between smallholder farmers, research and extension agencies, civil society, private sector and government on food security innovation systems fostered and sustained
- ◆ Capacity for supporting resilient smallholder farmer innovation systems, and engaging with policy processes, strengthened
- ◆ Policy responds to findings and implements them in practice in the 4 developing countries and in key international policy regimes
- ◆ Agriculture research and extension enhances support for farmer innovations and needs, and establishes more collaborative partnerships with farmers
- ◆ Household food security, incomes and local economic multiplier effects, derived from on-farm activities, improved
- ◆ Rates of loss of traditional knowledge (or language diversity) and agro-biodiversity reduced; initiatives to strengthen cultural identity and conservation enhanced.

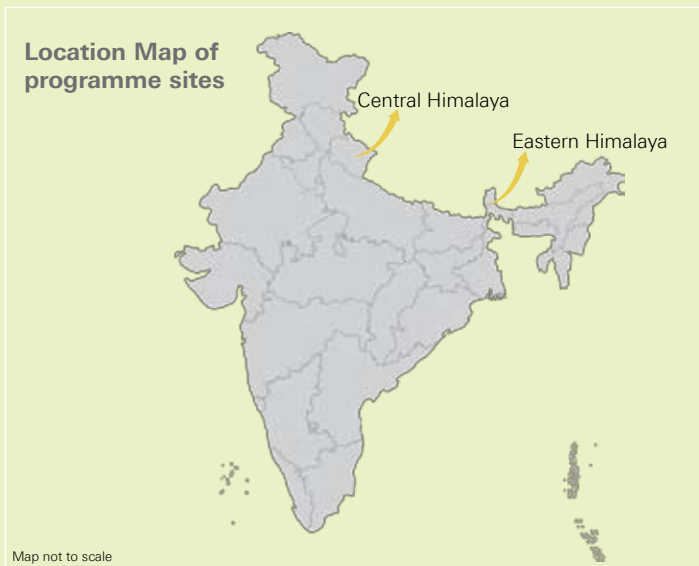
SIFOR in India

The SIFOR programme in India is being implemented by Lok Chetna Manch (LCM) based in Ranikhet, Uttarakhand, India. The SIFOR programme has two sites in India; Central Himalaya and the Eastern Himalaya. In Eastern Himalaya, work continues from an IIED supported earlier programme "Protecting community rights over traditional knowledge: Implications of customary laws and practices" on developing Bio-cultural protocols for ABS (Access and Benefit Sharing) and community-specific sui generis mechanisms for protecting genetic resources and associated community knowledge, innovations and practices. In all, 10 village communities are participating in the programme spread over the two regions. In the Central Himalaya these villages are primarily inhabited by traditional agrarian communities and located in Talla Sari area of Ramana Nyaya Panchayat of Hawalbagh block in District Almora, Uttarakhand. In the Eastern Himalaya work is going on mainly with the Lepcha and Limbu ethnic communities in a total of five villages lying in Kalimpong subdivision of West Bengal and in the bordering areas of the state of Sikkim.

Salient results expected from programme interventions

- ◆ Identification and dissemination of TK-based/biocultural innovations that enhance productivity and conditions which foster vibrant and resilient innovation systems;
- ◆ Development of tools that stimulate and increase resilience of smallholder farmer innovation systems, and improve rights security;
- ◆ Enhancement of knowledge, capacity and preparedness of farmers, including women and indigenous peoples, to sustain resilient innovation/TK systems and agro-biodiversity; and
- ◆ Improvement of policy through better understanding and commitment of scientists, opinion formers and policy makers at local, national, EU and international level.

The programme is specifically focussing on conservation of agricultural biodiversity, enhancing the use of traditional crops to improve household food and nutrition security, documenting and facilitating farm innovations for resilience and adaptation to climate change; and sensitising the scientists and policy makers to recognise and promote small farmers practices and knowledge systems for sustainable natural resource management and livelihoods. Under this programme we are focusing on traditional crops specifically in the Central Himalaya project area.



THE IMPORTANCE OF TRADITIONAL CROPS IN MEETING THE CHALLENGES OF CLIMATE CHANGE & FOOD SECURITY

Background

The tradition of agro biodiversity is a heritage in the hilly terrains. It ensured food security and nourishment for the society and in facing challenges posed by climactic uncertainties. Our traditional crops viz. *Madua* or Ragi/Finger Millet (*Eleusine coracana*), *Jhungra* or Barnyard Millet (*Echinochloa frumentacea*), *Cheen* or Proso Millet (*Panicum miliaceum*), *Kauni* or Foxtail Millet (*Setaria italica*), *Jaun* or Barley (*Hordeum vulgare*), *Ugal* or Buck Wheat (*Phagopyrum esculentum*), *Phaphar* or Bitter Buck Wheat (*Phagopyrum tataricum*), *Cholai* or Amaranth (*Amaranthus caudatus*) made human existence nutritionally viable in the inaccessible mountains. A major portion of our population could healthily survive by further supplementing their diet with lentils such as *Bhat* or Black Soybean (*Glycine max*), *Maas* or Black gram (*Vigna mungo*), *Masur* or Lentil (*Lens culinaris*), *Rains* or Rice Bean (*Vigna umbellata*) and *Gahat* or Horse Gram (*Macrotyloma uniflorum*) and Oilseeds such as *Als*i or Flax seed (*Linum usitatissimum*), *Bhangjeera* or Beefsteak Plant/Chinese basil (*Perilla frutescens*) and *Til* or Sesame (*Sesamum indicum*).

Despite increase in average income, malnutrition stays a crucial problem. Women and young children are the worst affected. The practice of enriching food with nutritional elements is effective. Coarse grains can play an important role in this but due to general ignorance, insufficient publicity and a traditional disdain, these coarse grains are still not too popular.

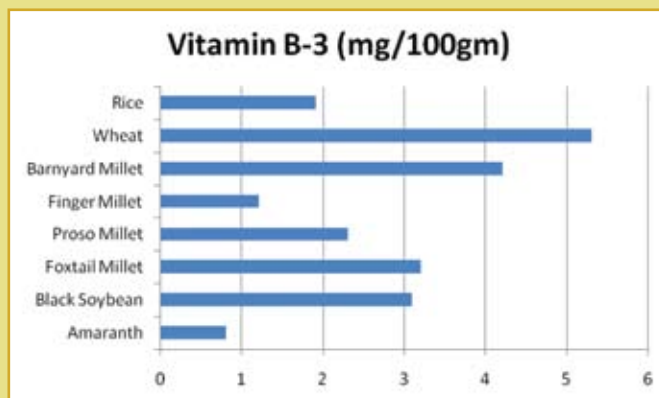
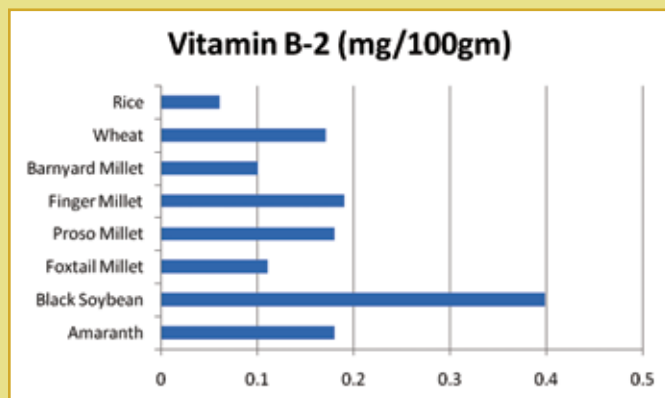
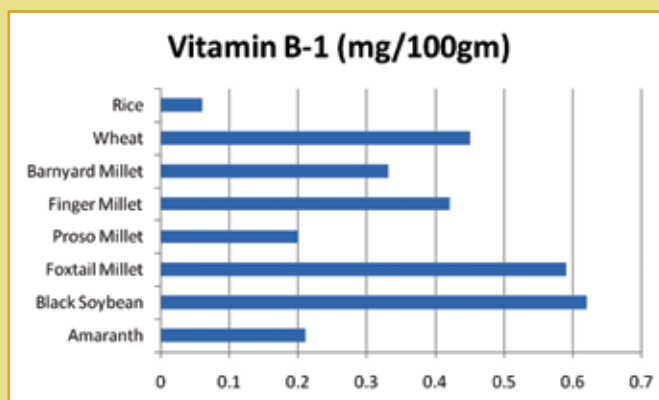
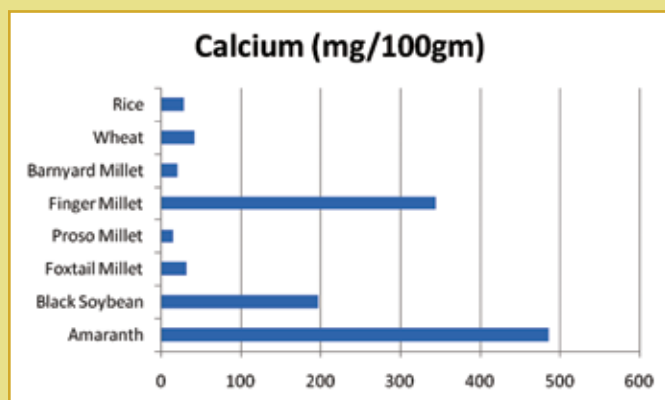
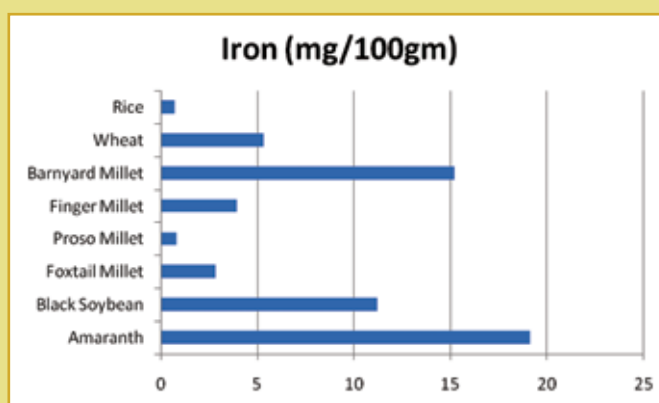
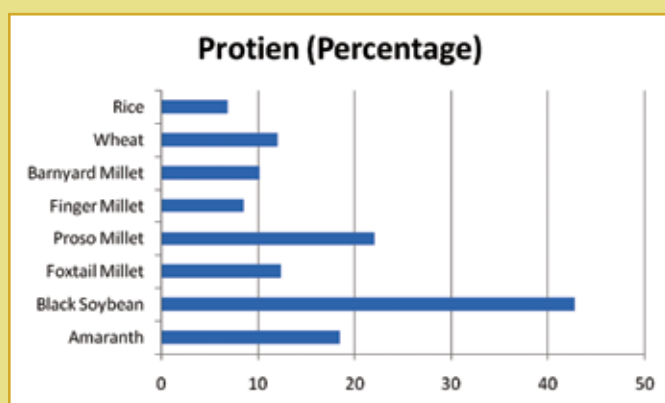
It is a remarkable fact that the abundantly grown coarse grains in the mountains do not need special irrigation, except *Cheen* or Proso Millet (*Panicum miliaceum*) which is grown during the Kharif (winter) harvest in *talaaon* (low lying fields with greater moisture regime or irrigation). The other coarse grains are a result of 'Barani' agriculture. Protection and expansion of these grains would on the one hand eradicate malnutrition from the hills, while their excess production and presentation to tourists in the form of local recipes would provide opportunities to generate extra income. Demand for coarse grains is rising in both the national and international markets since they are easy to digest and are rich in nutrition.



Nutritional Value of Coarse Grains

The mainly consumed coarse grains in the hills are Ragi or Finger Millet (*Eleusine coracana*), Barnyard Millet (*Echinochloa frumentacea*), Foxtail millet (*Setaria italica*) and Proso Millet (*Panicum miliaceum*). Among these Finger Millet is grown and consumed most. People tend to look down at coarse grains in comparison to wheat and rice and as a result their consumption is decreasing day-by-day. The statistics on the other hand show that the nutritional value of coarse grains is far higher than that of wheat and rice as they are good sources of proteins, mineral salts and vitamins. Generally energy contained in coarse grains is as much as in wheat and rice while the former contain much more protein. The content of Calcium, Phosphorus, Iron, Magnesium, Potassium and Zinc in coarse grains is several times more than other food grains as also of calcium and Vitamin B. Researches carried out in Govind Ballabh Pant Agriculture and Technological University, Pantnagar, Dist – Udham Singh Nagar, Uttarakhand, has also emphasized the nutritional value of coarse grains. Coarse grains are rich in fibre which is helpful in diabetes, heart-ailments and cancer and they are also found to be rich in antioxidants, which are a key to good health and longevity.

The nutritional value of coarse grains can be used to eradicate malnutrition. Several delicious and healthy dishes are made with them that are useful for people of any age or income group. Apart from the staple diet of rice and wheat, the comparative nutritional elements found in coarse grains are presented through bar charts.





A New Role for Wild Hill Fruits

The wild fruits that grow naturally in the heights of Central Himalayas and are generally not available in the markets/shops, can also serve the purpose of solving the problem of malnutrition. It is quite possible that people residing in urban areas are unfamiliar with them, but the rural people do have free seasonal access to their flavour. They are traditionally informed about the nutritional and medical qualities of these fruits and make full use of them. The main such fruits are – *Kafal* or Box Myrtle (*Myrica esculenta*), *Hisalu* or Yellow Himalayan Raspberry (*Rubus ellipticus*), *Kilmora* or Barberry (*Berberis asiatica*), *Timil* or Roxburgh Fig (*Ficus auriculata*), *Bedu* or Wild Fig (*Ficus palmata*), *Darim* or Pomegranate/Grenadine (*Punica granatum*), *Mehal* or Wild Himalayan Pear (*Pyrus pashia*), *Jamir* or Kaffir Lime (*Citrus hystrix*), *Bhamor* or Dogwood Tree (*Benthamidia capitata*) and *Chyura* or Indian Butter Tree (*Aisendra butyracea*).

These can be grown in degraded or infertile lands since these are hard, tolerant species that can face the climatic up and downs of local hill ecology. Some of these species also fix atmospheric nitrogen, add biomass to soil, increase humus and organic carbon; and enhance greater moisture retention in the soil making it more fertile in the long run. More than 600 fruit bearing trees and shrubs have been identified by the Govind Ballabh Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, District Almora. Taking proper measures in this direction would result in –

- ◆ Fresh and Nutritional fruits would be locally available at no extra cost.
- ◆ Sale of these fruits would provide opportunities for local income.
- ◆ Assimilation of Carbon Dioxide would check the Green House effect responsible for global warming.
- ◆ Soil structure would improve and erosion would be brought under check.
- ◆ Degraded or infertile lands would turn greener, thus enriching the landscape improving eco-system services.
- ◆ Improving the prospects of eco-tourism.

It is the need of the hour that these possibilities should be appropriately underlined and a drive to give a fresh breath of life to wild fruits is taken up extensively.

Partnership for Protecting the Heritage

Rearing of cattle with other livestock and maintaining the health of forest are key to sustenance of hill agriculture. Cultivation of coarse grains not only provides better nutrition to human beings but its biomass also ensures better and high quality feed for the animals. Homemade natural fertilizers on the one hand increase the fertility of land and enrich nutritional value of food on the other. Coarse grains not only provide nutrition to humans, they also give high-quality feed for livestock. It is worth mentioning that measures are being taken up for persistent agriculture and re-establishment of traditional methods worldwide. Having acknowledged the utility of coarse grains, the national and state governments have granted high priority to these grains in the Mission Mode programmes such as National Food Security Mission and Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP). The Vivekanand Parvatiya Krishi Anusandhan Sansthan (VPKAS), Havalbagh, Almora has been working in the field of development and propagation of new species of these coarse grains. The National Bureau of Plant Genetic Resources (NBPGR), Niglat, Bhowali has taken up appropriate steps towards conservation of these and other grains facing extinction. Progressive farmers have generated and conserved this bio diversity for centuries. In this era of abruptly changing climate there is a need for combined research between traditional knowledge and modern science. In this SIFOR Project, the participation of all related departments, officials, policy makers, public representatives, social organizations and scientists is a joint effort to give a fresh life to the bio diverse heritage of our hills.



About Us

Lok Chetna Manch (LCM) is one of the oldest NGOs of Kumaon, Uttarakhand and was started under the aegis of Sarla Ben (Katherine Mary Heilman), the famous Gandhian. Our major activities include Environmental Conservation, Afforestation, Promoting and Conserving Diversified Agriculture Systems in Hills, Health, Water & Sanitation, Disaster Management, Solid Waste Management and Capacity Building activities. We have executed various programmes on the mentioned issues in our working area with the support of State Government, Central Government, Foreign Funding agencies, Private and Individual donors since the last three decades. Our efforts have been well recognised by our partners.

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Project Funders



Project Partners