

The Glacier Trust

Enabling Himalayan communities to adapt to climate change

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Unimaginable a year earlier: A farmer irrigating kitchen garden crops in the Himalayan foothills. He can now concentrate on producing food all year round instead of having to spend the spring as an outworker in another country.

The Trust is nearly five years old. It was founded with the help of Southampton University to mitigate the impacts of climate change on Nepal's mountain communities. The Trust works with Nepali NGOs providing expertise, education and funding for climate change adaptation programmes. We have designed projects both in the Himalayan foothills and Middle Mountains and seen them to a successful conclusion. These small scale projects have succeeded in turning major problems to positive advantage.

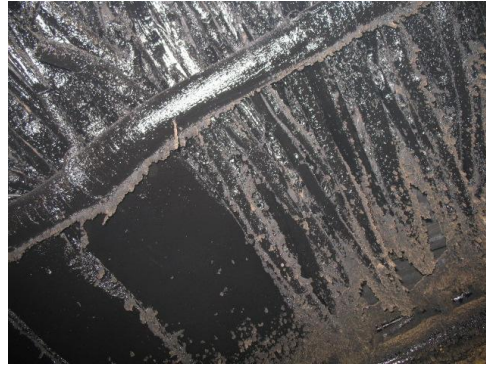
Over recent decades, dramatic increases in temperature have brought increasing variability to what had been relatively stable seasonal weather patterns. Changes in the timing, intensity and length of monsoon cause drought, flooding, crop failures and/or substantially reduced yields. For hill farmers, many of whom live below the poverty line, the common problem is 'too little or too much water'. As a result, malnutrition is visibly increasing among the poorer families. This is particularly serious for children, who will either die young or have their development permanently retarded. The scale of the problem is enormous: In the mountains, nearly 15 million people live a largely subsistence-based existence and malnutrition affects nearly one third of children.

The effects of climate change are not understood by local communities who usually see crop failure as divine retribution. Abetted by this fatalistic attitude, malnutrition increases poverty. Inertia results in poorer forest and crop management with negative consequences for soil fertility and the water table. A vicious circle develops.

There is a consensus of opinion among scientists that rapid increases in temperature will continue in the Himalayas through this century. So children born into Nepal's mountain communities today will need to adapt their farming practices continuously throughout their lives. Failure to do so will result in starvation or mass migration to a squalid existence in the cities. It is happening already.

Cooking stoves restore the ecological balance

In the Middle Mountains, forests are the key resource for the whole ecology. Forests not only provide stability for the water table, but the fodder for livestock, mulches and green manure for the fields and timber for construction. They provide the only viable fuel source. Our programme introduced over 500 improved cooking stoves and this has reduced the fuelwood demands on the forests by up to 50%. Time freed from gathering timber can be invested for other economic benefit: for example in animal husbandry, agro-forestry or producing cash crops, providing additional food and cash security. Benefits to health from the reduction of kitchen smoke are immediate and save dramatically on doctors' bills. This programme was implemented by Eco Himal, Nepal



(Above:) A typical Nepali kitchen. Despite open windows and doors ventilation is very poor. Smoke builds up and circulates as can be seen from the rafters. (Below:) Training in stove making and a finished clay stove.



(Left:) Thousands of trees have been planted. This provides an opportunity for children to be educated in the importance of reforestation. (Right:) Cardamom growing under a forest canopy. Understory plants such as these reduce landsliding, benefit the water table for the catchment and produce good income. Just 1kg of cardamom is nearly the equivalent of a week's labour wages.

Water transfer: A community inspired project

In the Himalayan foothills (Siwalik Mountains) our Water Management programme has been effective in dealing with the spring drought. Here 70% of the population live below the poverty line. The community did the groundwork to import surplus water three quarters of a mile across the catchment into a storage and distribution tank. Much greater crop diversification is now possible on the higher rain-fed terraces. Kitchen garden crops, unviable before, have improved nutrition dramatically and villagers are now testing the markets for their produce. A road building programme will soon connect their village with nearby towns. Crop surpluses and some spare cash are the best weapons against malnutrition. The project was implemented by Practical Action, Nepal, with the help of a local NGO.



(Upper left:) The pit dug for the tank on land donated by a local landowner. (Upper right:) Community input. Rock breaking for concrete -with immaculately painted finger nails. (Lower left:) Over a mile of transfer and distribution pipe carried up to 1315 meters (over 4,000 feet) by porters. (Lower right:) The finished distribution tank.

Loss of groundwater is becoming a major problem for Himalayan mountain communities. A number of factors contribute to this. One of them is the work of the major aid agencies, which tend to see the tapping of groundwater resources as an easily deliverable 'single fix' solution. But because of lack of follow up, training and maintenance many of these sources have now run dry. Poor forest management (often resulting from the inertia of malnutrition) increases rainwater runoff. Therefore less water is absorbed into the mountain aquifers. Winters are increasingly dry and summer monsoons shorter and heavier. None of this bodes well for groundwater recharge.

Both these projects had to go back to the drawing board at least once. Any intervention in the highly sensitive environment of a geologically new mountain catchment will have knock-on effects. It takes time and patience to think through what the unintended consequences (externalities, as they are known) might be. So far these projects have worked well beyond our best expectation. Even so, we have not always achieved everything we hoped. For example we were determined that women should predominate on the committee that manages the water resources because, when the system breaks down, it is the women who have to walk for hours to get the water. So far we have only scored three out of nine on the committee. According to colleagues, we should be pleased with that for the moment and take a step by step approach by training more women to manage the system.

Detailed reports of these projects are available on our website under [Research Article & Reports](#)

Next: Our village level climate change education programme and why small is beautiful

While working with these Himalayan communities, we have begun to understand the strength of their social cohesion and their willingness to engage with the problems that beset them. What they lack is any understanding of the underlying problems and, while the will to resolve them is seldom in question, the means to do so is usually absent. In the light of this it seemed possible to devise a much more holistic programme for solving these problems and one which could reach a much larger number of people.

We therefore devised a 'hands on' practical climate change education programme at village level. The pilot programme took place last year and enabled villagers to plant a wider range of crops to cope with seasonal changes, and to improve livestock (reducing animal numbers). The programme also promotes better use of existing resources, for example rainwater harvesting, managing animal waste products for use as pest control, improving the soil's fertility and massively increasing its capacity to store carbon and water. Lucrative agro-forestry improves forest and watershed management, reducing fuelwood demands.



(Upper left:) Glacier Trust representative meeting a community to discuss the village level climate change education programme. (Upper right:) Community members in Deusa give land for an agricultural resource centre as part of this programme. (Below:) 'Hands on' education in propagation and planting out of new crops.

Because of the success of the pilot programme and our other work, we have been asked to implement this programme by several neighbouring communities (with populations of up to 5,000). We anticipate that this demand will increase although finding ways to make the programme work for the villagers themselves (*i.e.* giving them the bottom up 'ownership' of the programme that makes it work) will always be a challenge. It will need several years of follow up to make it effective. Problems of climate change may have some regional commonality but variations of topography, culture and, in particular, the social capital of communities demand a detailed level of understanding and patience seldom achieved by larger organisations. Small is now more beautiful than ever.

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