

# Concerns about Water Availability in PARDYP Catchments

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PARDYP Nepal

Shortage of irrigation water is an issue in all PARDYP catchments

**Adequate water resources for future generations are a great concern globally. The World Water Vision states that the global demand for water has increased six-fold in the past century and about half of the available freshwater is directly used for human purposes. More than a third of the global population lives in countries under severe water stress: Pakistan and Afghanistan in particular are of concern in the greater Himalaya region, as they have already exploited most of their available water resources.**

In 1995 water availability in South Asia was considered catastrophically low, indicating a further decreasing trend by 2025. This global view has a local dimension. PARDYP identified water availability as the main concern for residents in the middle mountains. Water for irrigation is in short supply, followed by drinking water shortage. Water pollution is becoming a concern in some catchments. Other studies by different authors in the greater Himalaya give a similar picture. In Changar, Himachal Pradesh, part of the Indian Western Himalayas, there is acute scarcity of water for drinking and irrigation. Access to drinking water was identified as a major problem in the Central Himalayan region. In the

Sikkim Himalayas drying up of springs and drinking water scarcity are placing considerable stress on the local population. In the Kumaon Himalayas, water scarcity is attributed to the drying up and decreasing yields of springs. Hill towns in Darjeeling and Shillong, the wettest corner of the Indian sub-continent, face water scarcity all year round. Local groundwater resources are drying up because of changes in local land-use patterns. Due to these changes, women and children are forced to walk longer distances to collect water. In the middle mountains of Nepal, it is reported that men find it difficult to find brides because of the drudgery caused by water supply shortages in certain areas.

While the people of the Himalayas have learned to cope with seasonality in the past, new pressures from decreasing water supplies may threaten the livelihoods, particularly of poor and disadvantaged people. The root causes of this crisis are due to both human as well as other natural factors. On the basis of lessons learned from five PARDYP catchments, suggestions for addressing these problems are given below.

## Key issues related to water scarcity

### *Irrigation*

Shortage of water for irrigation is a problem in all five PARDYP catchments, in terms of both local perceptions and according to the results of project research. The seasonality of rainfall and rainfall variability during critical months are major constraints. Whereas during monsoon there is no immediate constraint, during the dry season, particularly the months prior to the onset of the monsoon farmers face hardship. Mismanagement is another key reason for water shortages. When irrigation channels are used conflicts among different users often hamper equitable and timely water sharing. Maintenance of the systems is the ultimate hurdle and proper management structures need to be in place to ensure that maintenance is carried out in a timely and proper manner. The infrastructure built years ago is often not adequate for current demands and needs upgrading.

### *Recommendations*

In all PARDYP catchments trials with water harvesting were conducted and showed promising results. However, none of the catchments' farmers adopted the methods tested without some contribution from the project. In addition to improving the water supply, alternative irrigation methods were demonstrated to reduce water demand for both off-season cash crops and staple crops, and these included drip irrigation and sprinklers. Lining of parts or the entire canal was suggested as well as strengthening water users' associations and farmers' groups.

### *Drinking water*

Water shortage for domestic purposes is a pressing problem in all catchments. The situation is aggravated during the dry season towards the onset of the monsoon in June/July. Conflicts were also observed between castes in the case of the Indian catchment or among villages sharing the same water source in the case of the Chinese catchment.

Increasing population is the main factor reducing drinking water supplies as well as 'development', such as the introduction of flush toilets. Increased water demand must come from an already overstretched domestic water supply.

### *Recommendations*

All teams stress the importance of community involvement rather than government action to improve domestic water supply. This involvement starts in the planning phase of a water supply scheme, needs strengthening and contributions from the community during the construction phase, and is absolutely necessary during the management phase.

On the technical side, water harvesting, rainwater harvesting in particular, was mentioned in most of the catchments. In addition to providing limited water

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supply during the dry season, it can be used during the monsoon to avoid difficult and dangerous trips to the springs.

Increased water supply seems to be the most promising direction, while improved water quality would also show a beneficial impact. It is, however, not possible to reduce the demand for domestic use, which is already lower than the proposed human right to water according to Gleick (1996).

### *Water quality*

In only two of the five catchments was drinking water quality mentioned as a key issue. In the Yarsha Khola catchment, water quality was considered to be a problem for people living in larger settlements as well as during the monsoon when turbidity increased in the water sources. In the Hilkot catchment water quality is sometimes poor, mainly in the water supply system for the main village of Hilkot.

In the Bhetagad catchment, spring water is generally unsuitable for drinking due to microbiological contamination and increased levels of nitrate in springs close to agricultural land. The main reasons for this are considered to be high doses of fertiliser, particularly urea, in tea gardens and inadequate sanitation infrastructure.

**Water quality improvement should be tackled in the short term with immediate measures to treat water being used. Creating awareness focusing on water handling is a potential intermediate remedy in two catchments.**

In the Jhikhu Khola catchment, microbiological contamination is a major issue with hardly any water source used by people, be it spring box, natural spring, tap or dug well, above the guideline values of the World Health Organisation. Poor sanitary conditions leading to faecal coliform contamination is the main source of water contamination.

Another concern is high values of nitrate and phosphate in many groundwater sources: the origin of these contaminants being the intensive agriculture practised in the valley. Mineral fertiliser is being applied at many times the recommended rates, particularly on important cash crop such as potatoes.

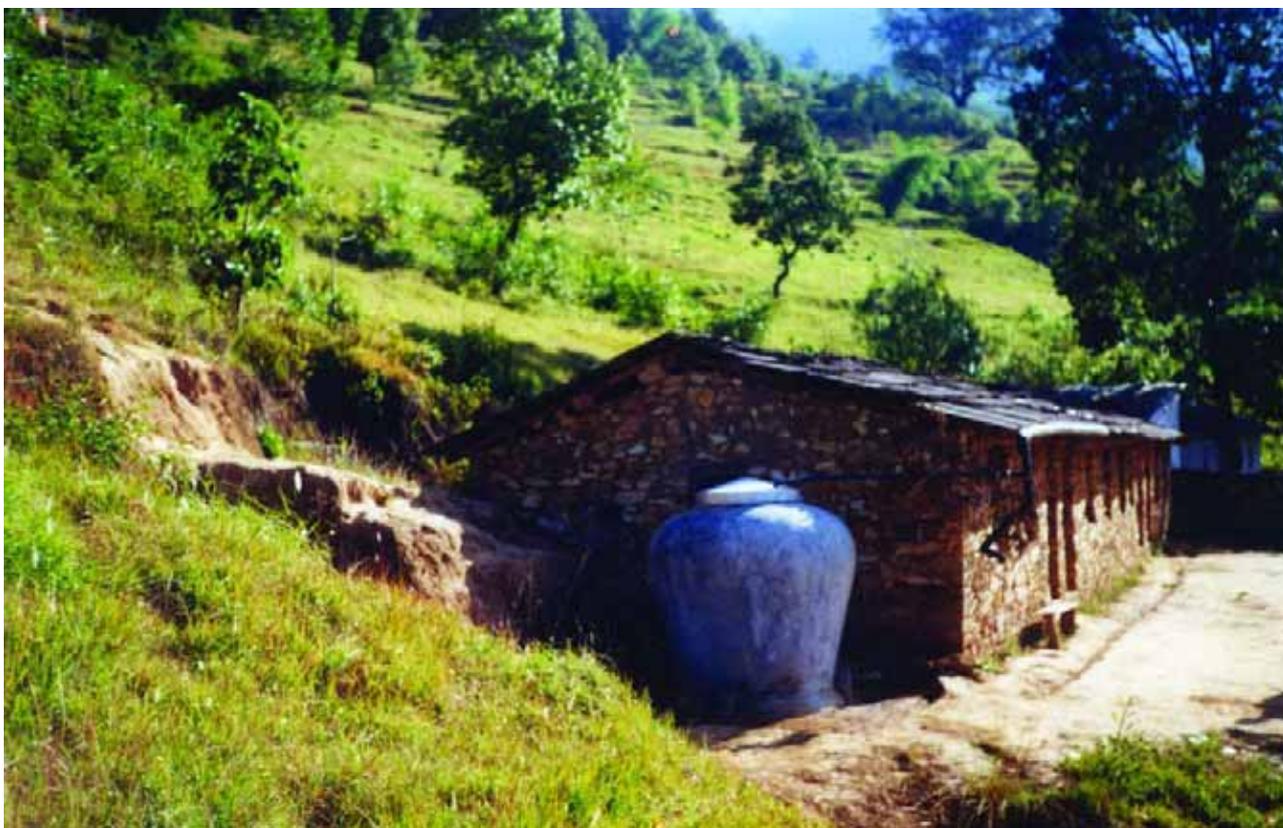
*Recommendations*

Water quality was only a key issue in two PARDYP catchments - the Bhetagad catchment in India and

the Jhikhu Khola catchment in Nepal. There are, however, water quality hot spots in other catchments. Water quality improvement should be tackled in the short term with immediate measures to treat water being used.

Creation of awareness, focusing on water handling, was stressed as a potential intermediate remedy in both catchments, as well as people's role in water contamination, effects of water contamination on the human body, and various, inexpensive ways of contamination control.

The importance of water source management was also stressed with reference to improved rules and regulations about water handling, extraction, and tap stand use.



PARDYP Nepal

Rainwater harvesting using ferro-cement jars in a PARDYP Nepal watershed

# Rehabilitating Common Property Resources: Experiences from PARDYP

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Rehabilitation of common property resources, as has been done in Begnas village, Kaski District, Nepal, requires an integrated and holistic approach

**In the Hindu Kush-Himalayan region, common property resources provide water, fodder, fuelwood, timber, medicinal plants, fruits, nuts, and so on – all of which are essential for sustaining rural livelihoods. Common property resources (CPRs) play a pivotal role in sustaining the productivity of mountain farming systems. Many of these vital resources have undergone degradation because of human-induced and other natural factors – some have reached a point of extreme degradation and substantial investment and motivation are needed to revive them.**

Degradation of the commons is known to have many adverse effects: it undermines the hydrological functions of watersheds, thus affecting environmental benefits for upstream and downstream communities and eventually increasing economic, social, and environmental vulnerability among smallholder farmers and poor households. It is important, for vulnerable mountain communities especially, to ensure the sustainable management of mountain commons.

## PARDYP studies

One of PARDYP's objectives was to understand the processes of natural resource degradation in the middle mountains of the Himalayas. Initial baseline surveys of watersheds helped to understand major socioeconomic and biophysical constraints to sustainable crop production and improved livelihoods, thus providing an opportunity to explore sustainable use of natural resources, including use of CPRs.