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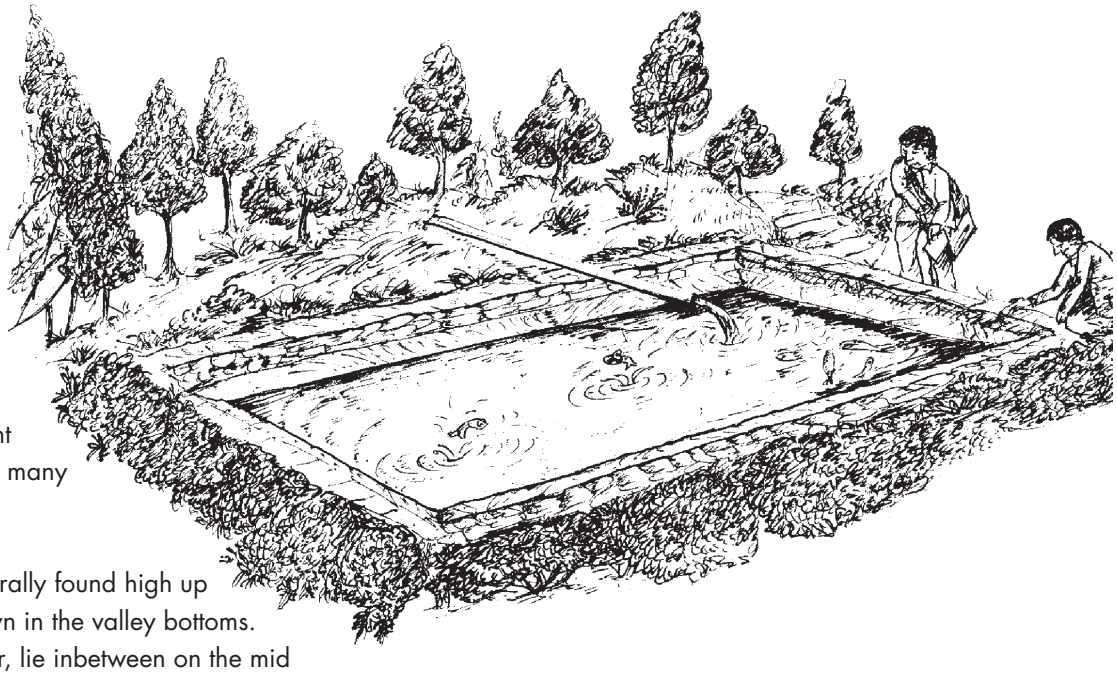
FOR MOUNTAINS AND PEOPLE

Water Management

Water is one of the basic necessities for life, and water scarcity is one of the most important limiting factors for sustainable development initiatives. Rural communities not only need clean water for drinking and basic hygiene, they also need water for growing crops and watering animals. At the same time, water has a destructive potential. Heavy rainfall over short periods can lead to massive erosion of soil, particularly on slopes where the soil is exposed. Rainfall over longer periods can lead to nutrient leaching as well as more catastrophic events like landslides. Surface erosion is a natural process, but soil erosion in the Hindu Kush-Himalayan (HKH) region has increased drastically as a result of inappropriate land use and management, and the current amount exceeds the natural rates many times.



In the HKH region, water is generally found high up (snow and glaciers) or deep down in the valley bottoms. Most human settlements, however, lie inbetween on the mid slopes. Rainfall, the main source of water, is both seasonal and erratic in distribution, duration, and intensity. Water scarcity is a problem in most parts of the HKH region, even in those areas where the total annual rainfall is high. Cherrapunji in the north-eastern Indian Himalayas is a good example: it is one of the world's highest rainfall areas, but is called a 'wet desert' because it still suffers from water scarcity. Similarly, in Godavari, a typical mid hill area, 80% of the total annual rainfall falls during the monsoon period, the remaining eight months are more-or-less dry. Poor land management has led to increased water problems in the region; deforestation has increased surface runoff and decreased groundwater replenishment. For the estimated 150 million people of the HKH, water is a scarce commodity and improved water management practices are critical for ensuring the availability of drinking water, production of food, meeting the need for biomass, and for improved living conditions.

Water-related activities at the Godavari site focus on methods of water harvesting (collection, storage, and use of the run-off of available sources of water), to provide water for household and agricultural use, and land management practices to decrease runoff and soil erosion and increase water uptake and recharge of aquifers. Various methods have been tested that are appropriate for different needs and conditions. Sustainable harvesting of water, including rainwater, can contribute markedly to resolving the challenge of water scarcity for hill and mountain households.

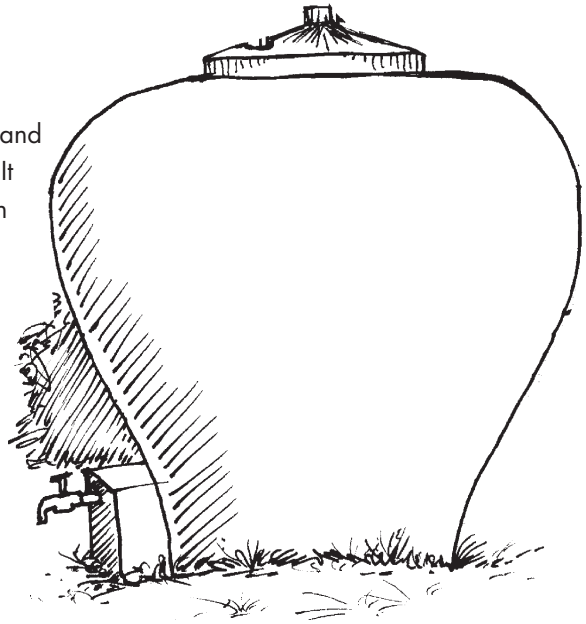
The following methods are demonstrated at the site.

Water Harvesting (Map Site 4.1a,b)

Natural spring water harvesting

There is a natural spring on the site at the Sungure Khola Chiso Pani Dhara. The spring discharges at a minimum rate of 86,400 litres of water per day. This is collected in a stone cement masonry intake structure, filtered through fine sand, and taken through HDPE pipes to the training centre and field nursery area for drinking purposes.

Roof top rain water harvesting (Map Site 4.1a)



Rainwater is collected from the rooftop of the Training Centre and training room buildings and stored in ferro-cement jars. Each jar has a capacity of 2,000 litres and costs approximately NRs 5,000 (in 2004, approximately equivalent to US$ 70). It provides a useful source of drinking water and/or water for irrigation of a kitchen garden. The method is suitable for scattered houses in mountain areas where there are seasonal rains followed by long dry spells and no nearby perennial sources of potable water. It reduces the time spent by women and children (in most cases) in fetching water, and minimises the risks of collecting water in the rainy season when paths are often slippery and difficult to negotiate.

Water collection reservoirs (Map Site 4.1b)

Water collection reservoirs have been constructed that take advantage of the site topography and the presence of perennial water sources to provide a simple and cost effective system of irrigation. Three water collection reservoirs have been constructed with HDPE sheet and SILPAULIN (multi-layered, cross-laminated, UV-stabilised plastic sheet) linings at suitable locations above the cropping plots. Water reservoirs can also be used for fish farming (see Sheet 6: Livestock and Fish)

Irrigation (Map Site 4.2a,b)

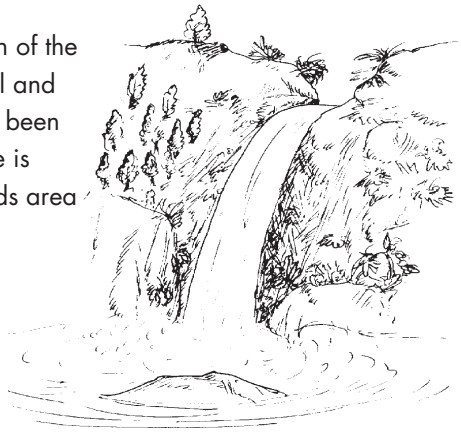
Gravity sprinkler irrigation (Map Site 4.2a)

Water from the reservoirs passes through high-density polythene pipes laid-out with hydrants in different experimental plots and nurseries covering approximately five hectares of land. The force of the gravitational flow is sufficient to activate simple sprinklers without additional power. These are used to irrigate different field plots. The sprinkler irrigation system helps reduce run-off and soil loss.

Drip Irrigation (Map Site 4.2b)

Drip irrigation is a method that aims to provide only as much water to plants as they need, and only where they need it, thus reducing losses from run-off and evaporation. Drip irrigation is demonstrated off-site in a farmer's field in Tripeni village.

Stone-Lined and Grass-Lined Waterways (Map Site 4.3)



Lining waterways is one way of reducing soil losses through seepage and preventing erosion of the waterway bed. Stone or grass lining is cheap and effective, and does not destroy the animal and plant habitat in the same way as a cement lining. A stone-lined bed for a natural stream has been constructed on the eastern side of the site through the citrus groves to the nursery area. There is another, older, stone-lined waterway taking the overflow from the stream through the wetlands area to the Botanical Garden.

Contour Hedgerows of Nitrogen-fixing Plants and Shelter/ Protection Belts to Reduce Runoff and Soil Loss

These methods are both soil management and water management methods. They are described in Sheet 3: Soil Management.

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