

COMBATING DESERTIFICATION THROUGH SCOPE'S WATER HARVESTING PROJECT

SCOPE
Malir, Pakistan

Introduction

The Khar dam was recently built in the district of Malir by local farmers with the help of the Society for the Conservation and Protection of the Environment (SCOPE), a Pakistani non-governmental organization working on implementation of the United Nations Convention to Combat Desertification (UNCCD). The purpose of constructing this small retention dam was to save the land and water resources of Gadap, an agricultural greenbelt in the vicinity of Karachi. It is a very small project on an economic scale. But it is a great endeavour on the part of the local community and SCOPE to work on a self-help basis to manage natural resources, on which thousands of families of farmers and herders depend. This is also an example of how desertification can be combated successfully.

Background

The Malir valley was once known for its abundance of arable land and water resources. Before independence, it used to cater to the demands of the Karachi market for fruit, vegetables, milk and honey. Thirty wells were dug by the Karachi Municipal Board at Dumloti in Malir to supply potable water to Karachi. Karachiites used to visit numerous green gardens in Malir for recreation. But later on, conditions changed altogether with the supply of water from Kinjhar Lake to Karachi. Malir rapidly became desertified due to:

- Excessive sand and gravel excavation from the Malir river bed to supply the construction of a raw materials market;
- Influx of migrants from inside and outside the country and a tremendous increase in population;
- Excessive water extraction from groundwater aquifers;
- Regular and prolonged spells of drought;
- Urbanization of rural Malir, particularly its southern region.

Situation

The Malir valley stretches over a vast area from Kirthar Mountain in the Balochistan dry region in its north. It is home to one million people in its 4,000 small villages and towns. It may be divided into three physiological zones.

The extreme northern zone is a mountainous region with a number of hillocks running parallel to each other in descending order. Between these hillocks, there are valleys of sandy, alluvial soils characterized as rainshaded area. Livestock raising is the mainstay of

the inhabitants. Water availability is the limiting factor and socio-economic activities depend on rain only.

The central Malir valley has fertile soils but cultivation depends on ground water and rain water harvesting. It is rural in nature, and farming and livestock raising are the mainstay of the population. The southern Malir valley is now urbanized.

The Malir river and its tributaries, the Konkar, Mol, Khadegi and Thaddo, run through the entire Malir valley, but only after seasonal rains. A good number of hill torrents also pass through the central Malir valley. The Khar river is one of these hill torrents, which passes through the Konkar and Gadap Union Council, with tremendous run-off after torrential rains. The farmers of the Gadap Union Council are engaged in the cultivation of fruit and vegetables and in raising small profits. There are about 300 dug and tube wells in the Gadap area alone.

The problem of rapid desertification

Owing to excessive excavation of sand and gravel from the beds of hill torrents and over-extraction of water in the valley, the ground water table has been declining year by year, causing a negative impact on the recharge of the wells and the economy of the area. The water table has gone down from 60-70 ft (in the 1960s) to 300-700 ft.

SCOPE's intervention

Since 1988, SCOPE has been focusing on the rehabilitation of the Malir valley. SCOPE has been striving hard to restore the greenbelt in the Malir valley. With technical guidance from researchers at the Geography Department of Karachi University, a research study was conducted. The study focused on the social, economical, ecological and physical impacts of sand and gravel excavation by comparing excavated areas with non-mining areas. The study revealed that the Malir is rapidly becoming non-productive, owing to soil loss and lack of ground water. Then SCOPE organized local people to stop sand and gravel excavation from the area. The government also imposed a strict ban on sand and gravel mining from specified areas of the Malir river-bed. Strict vigilance is now imposed to stop sand and gravel mining from the river-bed and from the greenbelt in the Malir valley.

In order to conserve the small quantities of water available, SCOPE in 1995 constructed a water reservoir to store rainwater for domestic and animal drinking purposes, at Haji Noor Mohammad Village. It introduced a sprinkling irrigation system by providing two mobile sprinkler units to economize irrigation water at two different farms in the Gadap Union Council.

Implications

The development of water resources is of vital importance for the sustainable socio-economic development of Malir district, which is rural with mainly an agrarian economy. Owing to the scarcity of water resources, only 2,600 hectares of land are cultivated

against 29,210 hectares, which could potentially be made available for agricultural purposes.

Though the area has great potential for developing its agricultural, livestock and poultry enterprises, the scarcity of water supplies is the hampering factor. The climate is moderate with good sunny days, offering favourable conditions for growing a good number of crops.

The soils are sandy alluvial and the local population is industrious and used to agriculture. With all these favourable conditions the agricultural sector should have developed on many fronts, but it is still at a low ebb, mainly because of limited supplies of water.

People's perception

The local population has been rightly demanding assured water supplies for the survival of the human and animal population in the area. At present, ground and rain water are the only sources in the area. Ground water also depends on precipitation. Yet rain is scanty and uncertain. To increase the ground water table, it is imperative that rainwater run-off be checked at suitable sites to allow it to replenish the aquifers.

The District Council, in collaboration with the Sindh government, is building the Thaddo dam to recharge groundwater aquifers. However this project is progressing very slowly and will take a couple more years to be completed, provided funding is always available from the government.

Aware of this perception held by the people, SCOPE has started working in that direction.

Delay action check dam- a solution identified by the farmers

A number of potential sites are available, particularly in the northern Malir district, which is a partially hilly region. A good number of hill torrents descend from the dry hillocks of the Kirthar range and carry the run-off from the rainwater. Among these, the Khar river, which is a non-perennial hill torrent, flows through the Lat, Gadap and Konkar Union Councils of the central Malir district. On the left bank of this hill torrent there is a plain fertile valley. The Gadap Union Council is the main agricultural area located in this valley.

Khar valley is a watershed area. The sources of irrigation and potable water are dug, as are tube wells to extract ground water and ponds to store rain water. The total level area of the Khar valley is estimated to be 15,000 hectares. The existing agricultural area is mainly located on a sub-recent flood plain. The total arable land is estimated to be about 9,000 hectares, which could potentially be brought under an agricultural enterprise by exploiting ground water resources.

The Khar river is full of water after precipitation, but owing to fast run-off, dries up quickly. Since the main recharge source to the aquifer is the Khar river in the valley, the wells and tube wells erected in the Gadap Union Council are fed by the Khar river.

Conception of the Khar dam

The Khar valley has a significant comparative advantage in the production of fruit, vegetables, commercial crops and medicinal plants in view of its location, warmer climate, physical conditions and access to potential factor and product market. In order to make use of all these advantages, the development of water resources is necessarily required to ensure sustainable agricultural, forestry and livestock enterprises, which are the only sources of income and employment in the area. It involves:

- Increasing ground water recharge through the construction of delay action check dams at appropriate sites;
- Expanding irrigated arable land areas through augmentation of artificial ground water recharge;
- Sustaining ground water resources through monitoring and management;
- Maintaining a greenbelt at the north-eastern side of Karachi;
- Enhancing the supply of fruit, vegetable and livestock products to the metropolis of Karachi;
- Providing employment opportunities to the local population and thereby improving their socio-economic conditions;
- Increasing farm incomes and agricultural production.

Facing acute shortages of water, the farmers and pastoralists of the Khar valley, through their organization “Kisan Committee Gadap” pressurized their local government to build a check dam at Khar, which would increase the ground water table. Though the District Council in Karachi accepted people’s request, it kept the project pending because of a shortage of resources. The farming community of the area was getting more frustrated by the day.

Aware of the people’s grievances, SCOPE, which is committed to rehabilitating the degraded land, decided to take up the project on a participatory basis and initiated motivational work. It held several meetings with groups of farmers, pastoralists and members of the Kisan Committee, and motivated them to build the desired check dam on a self-help basis. A large number of farmers gathered at Gadap on 14 March 1999 and agreed to construct the dam on a self-help basis. They started collecting donations for the purpose. At SCOPE’s request, the Baanhan Beli - another non-governmental organization working on the development of Thar desert - had an irrigation engineer survey the site. He gave advice for the construction of the dam.

Then SCOPE and the Kisan Committee constituted teams for the collection of funds from farmers, as well as stone, sand, water, skilled and non-skilled labour, cement, etc. SCOPE undertook to supply 1,000 bags of cement. The foundation stone was laid by Mr. Yonus Dhaga, the deputy commissioner of Malir District, on 4 June 1999. The construction was started and a 12 ft high check dam had been erected by 10 August 1999.

The result

Since the construction of the weir, run-off water has been successfully stored in a 400m x 100m x 15m lake. This lake is able to hold water for most of the year and the groundwater level in the adjacent agricultural area within a 20 km radius has risen sharply. Many completely dry wells and water holes have come to life again and farmers are able to irrigate their fields happily. Roughly 300 acres of land, which were lying idle owing to lack of water, have been brought under cultivation again. After every monsoon rain, water percolation increases and water aquifers are being replenished.

Conclusion

There is an acute need for the construction of a number of flood retention check dams in the arid zones of Sindh and Balochistan provinces to ensure the survival of the local population and improvement of the country's agrarian economy. It will help to build confidence among communities and bring economic stability.