

PARTICIPATORY WATERSHED MANAGEMENT EDUCATION AND TRAINING AT PAKISTAN FOREST INSTITUTE, PESHAWAR

R. M. Ashfaq and Mohammad Khan

Introduction

Pakistan is a sub-tropical country lying between 24° and 37° North latitudes and 61° and 75° East longitudes (Anon., 1996). The total land area of the country is 87.98 million hectares (Amjad and Shah, 1996) which can be divided into four physical sub-divisions of Northern and Western mountains, the Indus basin and the Coastal Zone. The Northern mountains constitute the major portion of the watersheds of the Indus and Jhelum river system. The land in these watersheds is mainly in private ownership. Wooded areas are interspersed with agricultural fields and often steep slopes are cultivated.

Out of about 88 million ha total land area of the country, 26.6 million ha comprise the uplands, where watersheds of various sizes are located (Ashfaq, 1991). Since there is only 1.27 million ha of productive forests in the country (Amjad and Shah, 1996), it is presumed that the remaining 25 million ha of watershed lands are cultivated, grazing and barren area, which are sources of siltation in Mangla and Tarbela reservoirs on river Jhelum and Indus, respectively.

Watershed Degradation

The fuelwood demand on the natural vegetation in the upland areas is high. The grazing pressure on this vegetation is also as heavy. Consequently, the vegetation has been disappearing resulting in barren hills.

The authors are Director General and Watershed Management Specialist, Pakistan Forest Institute, Peshawar respectively.

The Indus river is the fifth largest carrier of sediment load in the world. Geologic erosion occurs predominantly in the upper Indus, in the active monsoon zone, where massive landslides and ablation of seasonal glaciers contribute to the heavy silt load. The sediment production over the Indus basin is estimated at 4.49 tonnes/ha.

More than 70% of the mountain area is under severe pressure of faulty agricultural practices and incessant grazing. Disturbance of soil-water-plant relationship is the cause of accelerated soil erosion, mass movement of debris avalanches, earth slumps, soil creeps, and road block in the watershed areas. Their effects in the down-stream areas are tremendous. During the annual floods, over 8 million ha of irrigated lands are inundated, causing a loss of 70% of agriculture crops and destruction of infrastructure vital to the country's economy. As a result of upland degradation, annual loss due to floods is estimated at Rs. 3 billion (Ahmad, 1996).

The dry mountains, beyond the monsoonic influence, such as Balochistan Province and Suleiman Mountain Ranges, also have serious problems related to natural resource management. The over exploitation of resources has depleted the productive potentials to an extent that, in most cases, agricultural lands have been abandoned. The dry mountains suffer from severe rainfall erosion due to reduced surface vegetative cover.

Watershed Rehabilitation

Watershed management in Pakistan aims at reduction of silt loads in rivers feeding the water reservoirs; and Improvement in land use practices and productivity in watersheds.

Watershed development is a multi-disciplinary integrated development process to meet the community needs and improve the national economy. In this context a number of development programs have been initiated with the following interventions (Ahmad, 1996).

- * Protection of slopes by planting trees on uncultivable waste lands and farms. Local people are provided with incentives to plant fuel and fruit trees on their lands;
- * Stabilizing soils through conservation works on public and private lands;
- * Integrating agriculture and fish culture to generate economic activity;
- * Offering combined package of agriculture, forestry and livestock activities to the farmers to enhance productivity of their lands;
- * Introduction of genetically improved livestock;
- * Creation of marketing opportunities;
- * Training farmers, women and students to undertake package activities. Periodically workshops and seminars are organized for improvement of the project activities;
- * Developing Village Organizations for a participatory approach in management of public forests, communal lands and their own farmlands. Women are also involved in the development process at village level;
- * Involving NGOs and Voluntary Organizations in extension and training programs.

Restoration of rangelands in the mountains is difficult on account of the open access land use system, socio-economic and political factors. More sociological research is needed to develop training methodologies to approach the communities, whose lives are governed by tribal customs and traditions. Due to prevalent pneumatism, management of grazing on extensive areas covering millions of hectares has become considerably difficult.

Watershed Management Education and Training

Watershed Management and soil conservation practices in Pakistan were initiated in 1956 with the investigations for construction of Mangla dam. These practices gained far greater importance with the signing of Indus Water Treaty with India in 1960. The same year, an Agricultural Commission was appointed by the Government of Pakistan to look into specific requirements of watershed management besides other assignments.

The realization of the importance of upland watersheds led the Government of Pakistan to launch a number of projects and create watershed management branch in the Pakistan Forest Institute in 1966. This organization is responsible for conducting research and imparting training in the field of forestry including watershed management and allied disciplines. It has been training and educating manpower for the forest service at two different levels leading to the award of B.Sc. and M.Sc. Forestry degrees. Until recently only nominees of provincial forestry departments were admitted for these courses but now admission has been opened to self financing students as well. In addition female students are also admitted.

There has been a gradual development of courses in forestry including watershed to manage new disciplines emerging with increase in demand of products and services in the forestry sector over the years. Diploma-in-forestry awarded to Assistant Conservator of Forests (ACF) from 1947-1957, had a course in Soil Conservation and Land Management whereas there was no such course in Certificate-in-Forestry for RFO. The course of Soil conservation and Land Management was revised to Soil Conservation, Land and Range Management in the upgraded course of B.Sc. Hons.-in-Forestry from 1958 to 1966 for ACFs and also introduced in Diploma-in-Forestry for RFOs. The courses in Soil Conservation, Land and Range Management were further upgraded to Watershed Management and Soil Conservation at B.Sc. Hons.-in-Forestry and Diploma-in-Forestry levels from 1967-73. These courses were upgraded as independent courses in Watershed Management at B.Sc. Forestry and M.Sc. Forestry levels in 1972 and 1974, respectively

(Ashfaq, 1991). At present 42 courses are being taught at M.Sc. Forestry level and 31 courses at B.Sc. Forestry level (Anon., 1973 & 74).

Realizing the importance of Watershed Management in the national economy, development projects in Watershed are being implemented in the catchment areas of Tarbela and Mangla with the help of donor agencies since 1960's. For the proper implementation of these projects, trained manpower was considered of prime importance and hence PFI was made a nucleus for research, education and training in the field of Watershed Management. Accordingly, in addition to regular course in watershed management, four special courses prepared with the assistance of FAO experts were introduced as follows at M.Sc. Forestry level in 1985.

1. Design of Soil Conservation Works.
2. Forest and Range Hydrology.
3. Forest Meteorology.
4. Watershed Planning and Analysis.

Besides, the contents of existing courses in Watershed Management have also been revised and updated. The contents of existing and proposed Watershed Management courses as well as those of special courses are given in appendices. Alongwith study of general and special courses in Watershed Management, the students are required to write thesis also as a partial requirement for the award of M.Sc. Forestry degree with specialization in Watershed Management.

Although Forest Education Division of PFI offers 42 diversified courses in forestry and allied disciplines including Sociology, Social Forestry and Forestry Extension, it remains a purely forestry college strongly oriented to train manpower for managing public forests. These courses, no doubt, qualify them to become social foresters and extension workers, able to reach farmers and entrepreneurs effectively. But actual involvement and participation of the local communities in Watershed

Management and Natural Resources Management demands addition of new courses on participatory approaches including Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), Participatory Learning and Action (PLA) and Gender Aspects at both the M.Sc. and B.Sc. Forestry levels.

Other weakness or constraint faced by the institute is insufficient number of faculty. This problem has become more serious due to the retirement of its two qualified and experienced faculty members responsible for teaching watershed management specialized courses. It is very essential to improve the faculty through the recruitment of additional members or establishing a faculty development programme. Moreover, considerations need to be given to the fact that competent faculties are difficult to retain if the employment environment does not promise advancement or self-fulfillment.

Suggestion for Support from Donor Agencies

Donor agencies like, ICIMOD, Asian WATMANET and PWMTA can serve as an umbrella organization for supporting national efforts on participatory Watershed Management and Natural Resources Management. These organizations through establishing a faculty development programme and providing long and short-term training facilities.

References

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