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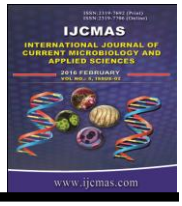

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Indigenous Knowledge of Local Communities of Malwa Region on Soil and Water Conservation

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A B S T R A C T

After half a century of failed soil and water conservation projects in tropical developing countries, technical specialists and policy makers are reconsidering their strategy. It is increasingly recognised in Malwa region that the land users have valuable environmental knowledge themselves. This review explores two hypotheses: first, that much can be learned from previously ignored indigenous soil and water conservation practices; second, that can habitually act as a suitable starting point for the development of technologies and programmes. However, information on ISWC (Indigenous Soil and Water Conservation) is patchy and scattered. Total 14 indigenous Soil and water Conservation practises have been identified in the area. Result showed that these techniques were more suitable accord to geographic location.

Introduction

Soil and water are the basic resources and these must be conserved as carefully as possible. The pressure of increasing population neutralizes all efforts to raise the standard of living, while loss of fertility in the soil itself nullifies the value of any improvements made. This calls for more systematic resource conservation efforts. It is well known to every farmer that it is the top soil layer, which sustains agricultural production. Once this layer is lost or eroded, nothing can be done to replace it within a short period of time. Climate and hydrology, soil topography, soil surface conditions and their interactions are major factors affecting erosion-sedimentation processes.

The semi–arid regions with few intense rainfall events and poor soil cover condition produce more sediment per unit area. But the man's intervention has disturbed the natural equilibrium and intensive and extensive agriculture has become a dominant factor in accelerating land degradation. The ever-increasing population pressure has brought intensive cultivation of land to the forefront through irrigated agriculture.

Fortunately, we have many indigenous techniques for conserving natural resources (Agarwal and narain, 1999). These have been in practice for number of years as presented in the write up. Therefore there is a need to enmesh these practices along with conventional soil and water conservation measures for promoting sustainable development of agriculture.

Traditional knowledge and practices have their own importance as they have stood the test of time and have proved to be efficacious to the local people. Some of these traditional practices are in the fields of agriculture such as crop production, mixed farming, water harvesting, conservation of forage, combined production system, biodiversity conservation, forestry and domestic energy etc. India is unique having a rich history of traditional systems of soil conservation and water harvesting in almost all the states

Study Area

Geographically, the state can be divided into regions- Malwa, Nimar, Bundelkhand, Chambal, and Baghelkhand, Mahakoshal and the central Vindhya and Satpura regions. The altitude varies from 300-1100 m ASL and temperature varies from minimum 0° to 45° C. The Malwa region occupies plateau in western Madhya Pradesh and south- eastern Rajasthan (between 21°10′N 73°45′E and 25°10′N 79°14′E), with Gujarat in the West. The region includes the Madhya Pradesh districts of Dewas, Dhar, Indore, Jhabua, Mandsaur, Neemuch, Rajgarh, Ratlam, Shajapur, Ujjain, and parts of Guna and Sehore, and the Rajasthan districts of Jhalawar and parts of Banswara and Chittorgarh. Malwa is bounded in the north-east by the Hadoti region, in the north-west by the Mewar region, in the west by the Vagad region and Gujarat. To the south and east is the Vindhya Range and to the north is the Bundelkhand upland.

Methodology of Study

The research work was carried out by staying in the midst of the local communities in their remote villages in Malwa, Madhya Pradesh. The study covered 30 villages falling under 3 representative districts (Agar, Dewas and Jhabua District) of the region. Every possible care was taken to ensure that the villages selected for the purpose of the study were representative of the whole district. It is sociologically confirmed that the entire region and to a larger extent even the surrounding areas have one homogenous traditions in terms of habits, practices, customs, beliefs and the overall worldview.

Questioning in villages was done in groups as well as in individual homes. During the research work, a variety of research techniques like, questionnaire -structured and semi-structured, informal interview, focal group discussions (FDG), direct observation and participant observation were employed. Photographic documentation was also providing a visual indication of the study.

Results and Discussion

Indigenous Technologies of Soil Conservation

Earthen Field Bunds

This is the most accepted soil conservation structure in the country. It is practiced at large scale all over India. Earthen field bunds are constructed on agricultural land with the aim of arresting soil erosion and improving the soil moisture profile.

Stone Bunds

In such type of terraces bunds are formed gradually by allowing erosion on the upper parts of sloping fields and arresting the soil by creating vegetative/ stone barrier on field boundary. By adopting this practice, land with limited depth of soil can safely be put under cultivation without further degradation in sloping areas.

Stone Wall Terraces (SWT)

In some of the highly sloping areas where soil depth is a limiting factor, stone wall terraces are very common particularly in those areas where stones are readily available in the area. Like stone bunds the stone wall barriers are also put across the slope for developing terraces on downhill slopes.

Rough Stone Slab Bunds

It is found to be very effective, adoptable, Low cost indigenous technology in moderately sloping (0-5%) arable lands where the small stone slabs are easily available at or near the site. In this system 30-45 cm high bunds of rough stone slabs (5-10 cm) thick and 45-60 cm long are put across the slope, uniformly all along the boundaries. Stone slabs are thoroughly embedded in soil one after the other in dug out furrows of 15-30 cm depth.

Rough Stone Bunds

In the absence of the slabs simple stone pieces of 10-20 cm thick, 45-60 cm long and of varying widths are also used. In due course of time the small gaps in between two slabs/ stones are being covered by naturally occurring grasses; also acting as filter strip. Some of the farmers prefer to have such bunds against smaller cross sectional earthen bunds because in this system only a narrow strip of land goes of cultivation and maintenance is almost nil.

Vegetative Peripheral Bunds/ Barriers

This is a commonly used indigenous conservation practice in semi-arid regions. Established bunds are found to be very effective. Barriers of lantana, Jatropha, and other small height plants are also very commonly used technique in many of the areas. Stabilize the periphery of fields situated on the banks of big nalla or rivers.

Temporary Sediment Detention Dams

In hilly areas of Malwa region to concentrate eroded soil at appropriate location is the construction of temporary sediment detention dams. In such areas most of the badly eroded lands are found in deep and narrow valleys, where due to high concentration of runoff the rate of soil erosion is very high. Under these situations construction of Temporary Sediment Detention Dams (TSDD) is adopted by the farmers. Suitable locations are those where the possibilities of sediment trapping is more.

Indigenous Technologies of Water Conservation

Stone Wall for Nallah Bank Protection

This practice is adopted in those conditions where bank erosion is a problem particularly in arable lands. This technique is primarily used only in those areas where stones are available at sites or very near to sites suitable cross sectional wall of loose stone is constructed all along the bank or only at vulnerable sites. Erection of such protection wall is done starting from the bed of nallah keeping appropriate foundation

MAP: ECO-REGIONS OF MADHYA PRADESH

Sand Bag Structure (Bori Bandhan)

It is easy to construct. Sand bag structures are constructed during peak flow across the drainage line of field with cement bags filled with soil/sand to check the flow of water. The runoff water is stored or checks without much seepage loss and stored water is utilized for growing of crops. This is practiced on individual basis. It was evolved from the creativity and experience of the farmers of the village.

Village Pond/ Talab

This is Common rural rainwater harvesting technology. Pond is constructed at suitable sites mainly for domestic use and also for recharge of groundwater. Suitable site for an economic viewpoint is selected by the villagers where the largest storage volume is obtained with the least amount of earth fill. Surface runoff is the major source of feeding the ponds/ talabs.

Talai - A Small Water Storing Structure

Talai is an indigenous water harvesting technique Creating water point for cattle. In this system an earthen embankment of very low height may be of 1-2 m is made at suitable location in a nallah/ natural drainage line, where natural depression exists. The earth required in making embankment is also taken out from the existing depression for increasing storage capacity.

Farm Pond (Small Pond)

These farm ponds are generally constructed by a farmers, whose land remain temporarily submerged and after monsoon. In rabi season crops are sown as tank bed cultivation, when the water has evaporated or percolated. Stored water is sometimes drained through some indigenously developed surplussing arrangements for sowing of Rabi crops.

Well

This is practiced by all categories of farmers on individual basis. It is an age-old practice. In this system 2 - 5 m diameter well is dug manually. The depth of the well varies from 5 - 12 m depending on the availability of groundwater in the superficial aquifer. The adoptability is very good and the users take water from the wells for domestic use and irrigation.

Indigenous Technologies of Soil and Water Conservation

Smaller Cross-Sectional Nali Structure

This is most suitable soil and water conservation techniques. In hilly areas moderately sloping land nali of about 30-45 cm depth are constructed across the slope almost on contours for enhancing in-situ moisture conservation and also for checking soil erosion from arable lands. As per the requirements of the area, a provision for safe disposal of excess runoff is also kept. In some of the areas these nali like structure are also established for controlling/ stabilizing drain.

Dry Stone Masonry Pond

In this type of structure the upstream and downstream walls are constructed 3-4 m apart by dry stone masonry after excavating a foundation of appropriate depth. The space in between these two walls is filled with locally available murrum or soil with proper compaction. The earth fill is kept 10-20 cm above the top of the wall to provide an extra provision for natural settling over a period of time.

Developmental activities that tend to ignore local technologies; local knowledge systems, and those which fail to formulate policies without a concern for local environment generally fail to achieve the desired outcomes. Today, many indigenous knowledge systems are at risk of becoming extinct because of rapidly changing natural environments and fast pacing economic, political, and cultural changes on a global scale. Practices vanish, as they become inappropriate for new challenges or because they adapt too slowly.

All these practices are based on indigenous knowledge. The finding of this study justify that farmers devise alternative technologies for increasing land productivity, as they are exposed to the risk of food scarcity due to shrinking per capita land holdings. The significance findings of the study have important policy implications for sustainable land management in the area. Any future land management initiative should aim at enabling watershed settlers to adopt practices conducive to increase income as well as to enhance land conservation.

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