

ROLE OF WATERSHED MANAGEMENT IN ECONOMIC DEVELOPMENT OF THE NATION

Mrs. Shreya Vinay Patil,
Assistant Prof. of Accountancy,
Balwant College, Vita



ABSTRACT

The Watershed Development Programme (WDP) initially envisaged as a measure for poverty alleviation and improved livelihoods has gained even greater importance in light of the worldwide recognition of its effectiveness in opposing climatic change. Effective use of land and water is fundamental to growth and sustainable development. Integrated watershed management is a concept which is now universally accepted as a proper approach for managing watersheds. Originally, watershed management dealt only with the use and conservation of land and water resources, but because watersheds in developing countries are heavily populated, human resources and their conditions must also be seriously considered.

India struggles with water scarcity, a problem that poses especially huge implications for the country's food security and rural livelihoods. The country has long-battled its scarcity issues through Watershed Development, a participatory approach to improve water management through afforestation and reforestation, sustainable land management, soil and water conservation, water-harvesting infrastructure, and social interventions. But while watershed development has been employed in communities throughout India, its potential long-term costs and benefits have not been well-understood or studied. The present paper attempts to study the concept of watershed management, its objectives, components and approaches with the concluding remarks.

INTRODUCTION

Watershed management is the study of the relevant characteristics of a watershed aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs, and projects to sustain and enhance watershed functions that affect the plant, animal, and human communities within a watershed boundary. Features of a watershed that agencies seek to manage include water supply, water quality, drainage, storm

water runoff, water rights, and the overall planning and utilization of watersheds. Landowners, land use agencies, storm water management experts, environmental specialists, water use surveyors and communities all play an integral part in watershed management.

The main objective of the WDP was to improve water conservation, irrigation facility, and land use pattern leading to increased agricultural productivity in drought prone and desert prone areas. Poverty reduction, better livelihoods and improved bio-physical and socio-economic environment would bring about sustainable development. The concept of watershed management has evolved to ensure effective use of both natural and social capitals. Thus, the watershed development programme include land, water and human resources as essential components. The watershed programme is primarily a land based programme, which is increasingly being focused on water, with its main objective being to enhance agricultural productivity through increased in moisture conservation and protective irrigation for socio-economic development of rural people.

OBJECTIVES

1. To study the concept of watershed management
2. To study the objectives of the watershed management
3. To examine the Components of Watershed Management
4. To explore the approaches of watershed management

METHODOLOGY:

The present study is based on secondary data collected from books, journals, periodicals, newspaper cuttings and internet website & primary observations of the researcher.

OBJECTIVES OF WATERSHED MANAGEMENT

- To protect, conserve and improve the land of watershed for more efficient and sustained production.
- To protect and enhance the water resource originating in the watershed.
- To check soil erosion and to reduce the effect of sediment yield on the watershed.
- To rehabilitate the deteriorating lands.
- To moderate the floods peaks at downstream areas.
- To increase infiltration of rainwater.
- To improve and increase the production of timbers, fodder and wild life resource.
- To enhance the ground water recharge, wherever applicable.
- To reduce the occurrence of floods and the resultant damage by adopting strategies for flood management.
- To provide standard quality of water by encouraging vegetation and waste disposal facilities.

WHAT IS WATERSHED

A watershed, also called a drainage basin or catchment area, is defined as an area in which all water owing into it goes to a common outlet. People and livestock are the integral part of watershed and their activities affect the productive status of watersheds and vice versa. From the hydrological point of view, the different phases of hydrological cycle in a watershed are dependent on the various natural features and human activities. Watershed is not simply the hydrological unit but also socio- political-ecological entity which plays crucial

role in determining food, social, and economical security and provides life support services to rural people.

COMPONENTS OF WATERSHED MANAGEMENT

1. Entry Point Activity (EPA)

Entry Point Activity is the 1st formal project intervention which is undertaken after the transect walk, selection and finalization of the watershed. It is highly recommended to use knowledge-based entry point activity to build the rapport with the community. Direct cash-based EPA must be avoided as such activities give a wrong signal to the community at the beginning for various interventions. Details of the knowledge-based EPA to build rapport with the community ensuring tangible economic benefits to the community members are described here.

2. Land and Water Conservation Practices

Soil and water conservation practices are the primary step of watershed management program. Conservation practices can be divided into two main categories: 1) *in-situ* and 2) *ex-situ* management. Land and water conservation practices, those made within agricultural fields like construction of contour bunds, graded bunds, field bunds, terraces building, broad bed and furrow practice and other soil-moisture conservation practices, are known as *in-situ* management. These practices protect land degradation, improve soil health, and increase soil-moisture availability and groundwater recharge. Moreover, construction of check dam, farm pond, gully control structures, pits excavation across the stream channel is known as *ex-situ* management.

3. Integrated Pest and Nutrient Management

Water only cannot increase crop productivity to its potential level without other interventions. A balanced nutrient diet along with adequate moisture availability and pest and disease free environment can turn agricultural production several folds higher compared to unmanaged land. Integrated nutrient management (INM) involves the integral use of organic manure, crop straw, and other plant and tree biomass material along with little application of chemical. Integrated pest management (IPM) involves use of different crop pest control practices like cultural, biological and chemical methods in a combined and compatible way to suppress pest infestations. Thus, the main goals of INM and IPM are to maintain soil fertility, manage pest and the environment so as to balance costs, benefits, public health, and environmental quality.

4. Crop Diversification and Intensification

The crop diversification refers to bringing about a desirable change in the existing cropping patterns towards a more balanced cropping system to reduce the risk of crop failure; and crop intensification is the increasing cropping intensity and production to meet the ever increasing demand for food in a given landscape. Watershed management puts emphasis on crop diversification and intensification through the use of advanced technologies, especially good variety of seeds, balanced fertilizer application and by providing supplemental irrigation.

5. Use of Multiple Resources

Farmers those solely dependent on agriculture, hold high uncertainty and risk of failure due to various extreme events, pest and disease attack, and market shocks. Therefore,

integration of agriculture (on-farm) and non-agriculture (off-farm) activities is required at various scales for generating consistent source of income and support for their livelihood. For example, agriculture, livestock production and dairy farming, together can make more resilient and sustainable system compared to adopting agriculture practice alone. Product or by-product of one system could be utilized for other and vice-versa. In this example, biomass production (crop straw) after crop harvesting could be utilized for livestock feeding and manure obtained from livestock could be applied in field to maintain soil fertility. It includes horticulture plantation, aquaculture, and animal husbandry at indivisible farm, household or community scale.

6. Capacity Building

Watershed development requires multiple interventions that jointly enhance the resource base and livelihoods of the rural people. This requires capacity building of all the stakeholders from farmer to policy makers. Capacity building is a process to strengthen the abilities of people to make effective use of resources in order to achieve their own goals on a sustained. Unawareness and ignorance of the stakeholders about the objectives, approaches, and activities are the reasons that affect the performance of the watersheds. Capacity building program focuses on construction of low cost soil and water conservation methods, production and use of bio-fertilizers and bio-pesticides, income generating activities, livestock based activities, waste land development, market linkage for primary stakeholders.

WATERSHED MANAGEMENT APPROACHES

1. Integrated Approach

This approach suggest the integration of technologies within the natural boundaries of a drainage area for optimum development of land, water, and plant resources to meet the basic needs of people and animals in a sustainable manner. This approach aims to improve the standard of living of common people by increasing his earning capacity by offerereng all facilities required for optimum production. In order to achieve its objective, integrated watershed management suggests to adopt land and water conservation practices, water harvesting in ponds and recharging of groundwater for increasing water resources potential and stress on crop diversilcation, use of improved variety of seeds, integrated nutrient management and integrated pest management practices, etc.

2. Consortium Approach

Consortium approach emphasizes on collective action and community participation including of primary stakeholders, government and non-government organizations, and other institutions. Watershed management requires multidisciplinary skills and competencies. Easy access and timely advice to farmers are important drivers for the observed impressive impacts in the watershed. These lead to enhance awareness of the farmers and their ability to consult with the right people when problems arise. It requires multidisciplinary proflciency in field of engineering, agronomy, forestry, horticulture, animal husbandry, entomology, social science, economics and marketing. It is not always possible to get all the required support and skills-set in one organization. Thus, consortium approach brings together the expertise of different areas to expand the effectiveness of the various watershed initiatives and interventions.

BENEFITS OF A WATERSHED APPROACH

1. It provides a context for integration

- using practical, tangible management units that people understand
- focusing and coordinating efforts
- finding common ground and meeting multiple needs

2. It provides a better understanding and appreciation of nature

- understanding nature's interrelated processes
- helping answer the question, "What are we trying to protect?"
- linking human activities to nature's response
- appreciating how nature's processes can benefit people
- identifying ways we can work with watershed processes

3. It yields better management

- generating ecologically-based, innovative, cost-effective solutions
- forging stronger working relationships
- supporting consistent, continuous management

RECOMMENDATIONS

1. Adoption of a Compromise Attitude

First, we need to realize that watershed work is not only a long-term task but it is almost endless in nature. New developments, new problems and even new natural disasters will occur over time, regardless of how sound the plan and management are today. It is rather naive to think that once we obtain sufficient funds and resources we can solve these problems forever.

2. Emphasis on Objective-oriented Coordination

Integrated watershed management cuts across many sectors and institutions within a watershed. A close and effective coordination for pooling resources to achieve mutual objectives and goals is better than everything being done by the watershed agency itself. But coordination is not an empty agreement among institutions.

3. Priority Assigned to Agricultural Development

Since most of the watershed inhabitants in the developing countries are engaged in agriculture, the items to be integrated should concentrate first on developing this sector. Water harvesting or small-scale irrigation, feeder roads and transportation improvement, better marketing, storage for farm products, agro-industry, and cheaper fuel sources, etc. can be considered priority items.

4. Creation of a Minimal yet Stimulating Package

If funds are rather limited, which is the usual case in developing countries, watershed planners can still develop a stimulating package, with emphasis on generating income, to be integrated into the proposed watershed project or program. The package should be thoroughly discussed with the local community and used as an incentive. The package should satisfy urgent and basic needs of the local community, encourage them to adopt conservation measures and/or alleviate their constraints.

5. Seeking Alternative Resources

The budgetary resources of an agricultural or forestry ministry in a developing country are often limited. The watershed institution within these ministries should seek additional funds beyond the normal channel. For instance, major reservoir or highway construction projects in the watershed areas should contribute funds for watershed protection and slope stabilization.

CONCLUSION

From the above data it is clear that an integrated watershed management approach needs to be adopted and the soil and water conservation technologies and approaches need to be applied in field situations. Common property resources should be protected, conserved and utilized with community participation for their common cause and development. Commitment of villagers and officers towards watershed goal will make a difference in socio-economic transformation of people.

Watersheds sustain life, in more ways than one. More than \$450 billion in foods, fiber, manufactured goods and tourism depend on clean, healthy watersheds. That is why proper watershed protection is necessary to our community. Watershed protection is a means of protecting a lake, river, or stream by managing the entire watershed that drains into it. Clean, healthy watersheds depend on an informed public to make the right decisions when it comes to the environment and actions made by the community.

REFERENCES

1. Department of Land Resources. 2003. Guidelines for Hariyali. http://dolr.nic.in/Hariyali_Guidelines.htm. DOLR, Ministry of Rural Development, Government of India, New Delhi, India.
2. Erin Gray and Arjuna Srinidhi :India's Watershed Development Boosts Food Security, Improves Livelihoods, December 19, 2013
3. Erickson, J.D., Messner, F. and I. Ring, eds. (2007). *Ecological Economics of Sustainable Watershed Management*. Elsevier, Amsterdam, The Netherlands.
4. Joshi PK, Jha AK, Wani SP, Joshi L and Shiyani RL. 2005. Meta-analysis to assess impact of watershed program and people's participation. Research Report 8, Comprehensive Assessment of watershed management in agriculture. International Crops Research Institute for the Semi-Arid Tropics and Asian Development Bank. 21 pp.
5. Suhas P Wani and Kaushal K Garg: Watershed Management Concept and Principles *International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)* Patancheru 502 324, Andhra Pradesh, India
6. Sabatier, P. A. (2005). *Swimming Upstream: Collaborative Approaches to Watershed Management*. The MIT Press.
7. Wagner, W., Gawel, J., Furumai, H., De Souza, M. P., Teixeira, D., Rios, L., ... & Hemond, H. F. (2002). Sustainable watershed management: an international multi-watershed case study. *Ambio*, 2-13.rakshitarya98