PERSPECTIVE OF WATERSHED MANAGEMENT IN OUR MODERN SOCIETY

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Abstract: Watershed management is very important in our modern society. Basically watershed is a region delineated with a well-defined topographic boundary and water outlet. It is a geographic region within which hydrological conditions are such that water becomes concentrated within a particular location. The terms watershed, catchment, and basins are often used interchangeably. They have long been recognized as desirable units for planning and implementing developmental programmes. A watershed, also called a "drainage basin" in North America, is an area in which all water flowing into it goes to a common outlet, such as the same estuary or reservoir. Watersheds themselves consist of all surface water and include lakes, streams, reservoirs and wetlands, as well as all groundwater and aquifers.

1. Significance Of The Study:

Watershed management encompasses the simultaneous consideration of hydrological, pedological, and biological resources, necessitating the need for making better use of analytical tools and approaches, which address spatial and temporal variability, is critical. The cumulative impacts of human activities, which threaten the ecological, economic, and aesthetic integrity of many drainage systems and the strategies to mitigate these impacts, have explicit spatial dimensions. Watershed approaches in resource planning require timely and accurate data with spatial as well as statistical aspects. In this regard, GIS holds great promise with a provision to handle spatial and temporal data and aid as an integrative planning tool for watershed management.

2. OBJECTIVES:

To understand main importances of watershed management in our modern society.
Maintaining an adequate supply of water to meet demands for irrigation, agriculture, as well as domestic and industrial uses at acceptable levels of assurance.
Reducing vulnerability to natural disasters such as floods, droughts and landslides.
Improving the economic and social condition of the disadvantaged and those deficient in resources.
Distributing the benefits of land and water resources development more equally amongst the stakeholder.

3. METHEDOLOGY

The research work prepared in three stages which are as follows –

Pre-field work:

This stage includes - i) collection of districts map ii) collection of secondary information from district handbook, census report, others books and journals etc. iii) preparation of questionnaire statistical schedule for collection of primary data which are closely related with the research work.

Field work:

By questionnaire schedule primary data will be collected from the study area. Observation schedule also help to collect the information.

Post field work:

Collected data will be classified in a master table and various cartographic and statistical techniques will be made in support of the theoretical discussion.

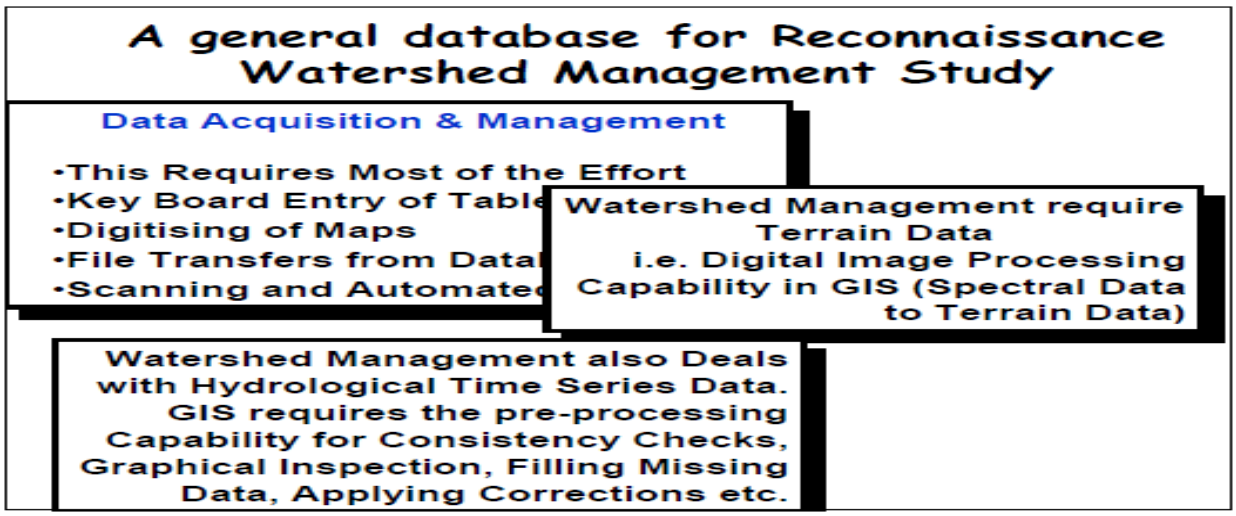
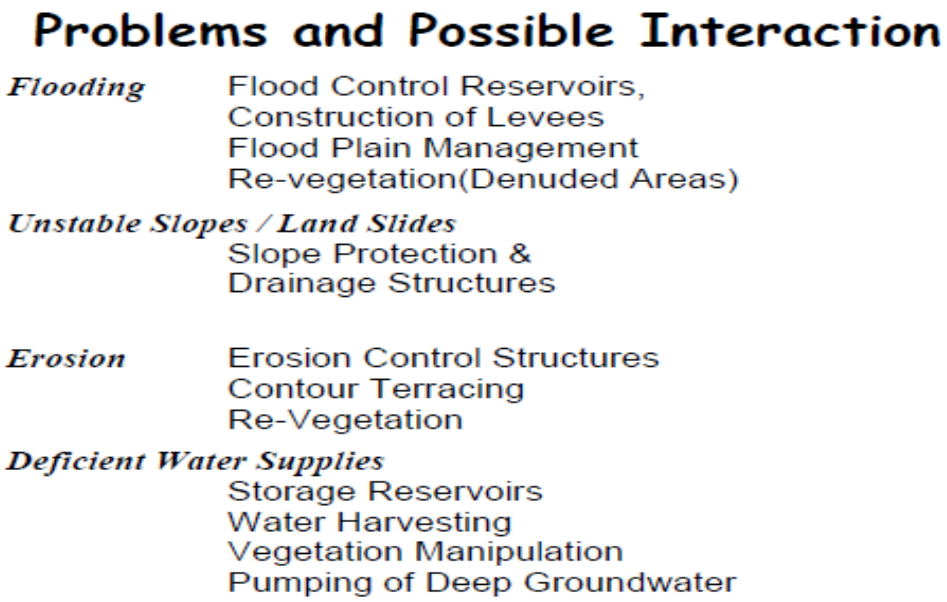


Fig-1: A Model of Research Methodology

4. RESULTS:

MAIN PERSPECTIVE OF WATERSHED MANAGEMENT:

The degree to which people and civil society actively participate in conservation and resource management is one of the most critical factors that determines the success or failure of the process. Participation enables stakeholders to formulate their interests and concerns and integrate them into decision making, planning and policy development. Participation can take on a more passive form with a relatively low level of involvement as in the 'top-down' consultative model. Alternatively, the 'bottom up' approach promotes much higher levels of public and institutional involvement and can lead towards civil empowerment and self-mobilization. Modern watershed management attempts to combine both the 'bottom up' and 'top down' approaches through negotiation and dialogue. Watershed management facilitates the multi-sectoral and multi-stakeholder negotiation processes by providing the necessary platform to examine the interests of the different parties from the overall watershed perspective. This results in the formulation of guidelines or plans for the maintenance of watershed functions, as shown in the following model-



Energy Shortage	Fuel Wood Harvesting
	Hydro-Power Development
Food Shortage	Develop Agricultural Areas
	Develop Agricultural Practices
	Increase Livestock
Poor Quality Drinking Water	
	Develop Wells and Springs
	Treat Water
Polluted Streams / Reduced Fishery	
	Control Pollutant Entry
	Treat Wastewater
Sedimentation of Navigation Tracks	
	Erosion Control Structures
	Dredging and Mining
Timber Shortage - Timber Harvesting	

The water allocation amongst the basin states should be guided by a national perspective with due regard to water resources availability and requirement within each state and the river basin. Necessary guidelines should be formulated accordingly for allocation of water amongst the basin states. In planning operation systems, water allocation priorities should broadly be as below,

1.Drinking and domestic use
2.Sustaining livelihoods
3.Sustaining environment, maintaining river systems and aquatic conservation
4.Irrigation and hydro-power
5.Thermal power and industries
6.Recreation and religious uses
7.Navigation

The first three uses have the highest priority but within these, the allocation of water should be decided by the people at the watershed level. For allocation to other uses where bulk supplies are required and where supply to the first three categories is affected, people's agreement would be necessary.

4.1. Drinking and Domestic Use:

Adequate drinking water facilities should be provided to the entire population both in urban and in rural areas. Irrigation and multipurpose projects should invariably include a drinking water component, but these should only supplement locally developed sources of drinking water. Drinking water needs of human beings and animals should be the first charge on any available water. The community should have the first right to use rainfall directly, store and recharge groundwater wherever possible. The rights over water should not be restricted to only those who own land. Water should be allocated on per head basis and not on the basis of land area and heavy water consuming crops should not be allowed by consensus/agreement.

4.2. Sustaining Livelihoods:

There is a specific geographical concentration of backwardness and poverty in drought-prone areas. Continuous degradation of natural resources, severe erosion, depletion of ground-water reserves, low productivity, low wage rate etc. are some of the endemic problem in these areas. Any livelihood strategy meant for this region should encompass the

programme of arresting the process of degradation of natural resources, restoring ecological balance and, at the same time directly address poverty. One needs to understand poverty not only as a scarcity of cash or lack of purchasing power, but also as a lack of access to natural resources and its management because it is the biomass-based subsistence economy within which majority of people live.

4.3. Sustaining Environment, Maintaining River Systems and Aquatic:

A minimum good quality water flow should be ensured at all times as required for the life of the river and for sustaining livelihoods. This should include the allocation of water for various purposes including conserving the environment, preventing groundwater salinity and sea water intrusion, supporting livelihood based on aquatic life and other uses of water, recreation, and cultural activities like bathing and festivities. The requirement of water for these various purposes should be calculated scientifically. To begin with at least 50 per cent of the lean period flow before the structure was built (average of 1-2 months) over and above the committed use should be allowed to go downstream of all existing and new structures. Implementation of this would be possible only with the help of all communities involved with proper monitoring and also by allocating this quantity on a priority from new reservoirs.Traditional and natural wetlands and water bodies like tanks, jheels, chores and village ponds, etc. have been badly neglected in the last few decades. These structures should be restored, maintained and used properly and these water bodies should not be allowed to be encroached upon for any other land use.

4.4. Irrigation And Hydro-Power:

Irrigation planning either in an individual project or in a basin, as a whole should take into account the irritability of land, cost effective irrigation options possible from all available sources (including traditional ones). Wherever water is scarce, if economically advantageous, deficit irrigation may be practiced.

Fig-2: A Process of Irrigation

The irrigation intensity should be such as to extend the benefits of irrigation to as large a number of farm families as possible, keeping in view the need to maximize production and providing minimum sustainable income above the poverty level. Water intensive crops such as sugar cane and paddy should be strongly discous the areas of water scarcity. Irrigation efficiency in irrigation projects should be improved from the present average of 35 per cent to the maximum achievable, which is approximately 60 percent. Water allocation in an irrigation system should be done with due regard to equity and social justice. Disparities in the availability of water between head-reach and tail-end farms and between large and small farms should be obviated by adoption of a rotational water distribution system and supply of water on a volumetric basis to WUAs subject to certain ceilings. WUAs should have an important role to play in managing distribution, maintenance and recovery of service charges.

Canal irrigated areas have created some water-logged areas which need to be drained out to make the land fit for agriculture and other purposes. First attempt should be to avoid the supply of excess water and then wherever possible, bio-drainage, and vertical drainage should be preferred rather than surface drainage. The quality of surface drainage water should be improved so as to make it reusable for various purposes. The basic idea should be to store the water after proper treatment, so that water can be reused usefully rather than flow to the sea during the monsoon without use. A combination of drainage arrangements should be adopted to use the least amount of land and which can also be properly maintained at least cost on a regular basis.

4.5. Thermal Power And Industries:

Most of the thermal power houses and industries with heavy use of water should be located on the coast. They should be encouraged to use sea water/desalinated water, adopt processes with minimum use of water, recycle and reuse and discharge only treated and cooled water into the sea to maintain its ecology.

4.6. Navigation

In order to save energy and reduce our dependence on petroleum products, the major portion of which are imported, navigational transport in rivers is essential. This will require that minimum flow and depth in specific reaches of the river is assured.

5. Conclusion:

The people of these areas face a rapid decline in their standard of living as natural resource base become degraded and loses its ability to recover. Increasing number of environmental refugees migrate to other lands, which are then also endangered by over use. The programme should be such that first, they focus on the positive synergies between poverty reduction, economic efficiency, and environmental protection. Second, the projects are developed with the beneficiaries rather than for them. Third, they are based on an integrated approach to natural resource planning and management in consonance with an Environment Action Plan.

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