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CONCEPT OF WATERSHED DEVELOPMENT AND MANAGEMENT WITH SPECIAL REFERENCE TO SANGLI DISTRICT (MAHARASHTRA)

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INTRODUCTION:

Watershed development consist of conservation, regeneration and judicious use of all the resources natural resources like land, water, plants, animals and human within the watershed area (Mani 2005) Watershed management envisages systematic and scientific approach towards conservation, harvesting, proper utilization and safe disposal of flowing water from the movement it falls on the land surface in a form of rain (Ranade, 2004).

Watershed development refers to the conservation, regeneration and judicious utilization of all the resources like land, water, plants, animals and human within a particular watershed (Govt. of Maharashtra, 2003),

Watershed development attempts to bring about best possible balance in the environment between natural resources on one side and man and grazing animals on the other. It requires people participation because conservation is possible only through the whole hearted involvement of the entire community.

DATABASE AND METHODOLOGY:

This research paper is entirely based on secondary data collected from the books, journals , reports, website etc.. The graphs or maps prepared by the cartographic techniques . This research paper is total based on secondary data.

TYPES OF WATERSHED:

The Government of Maharashtra, in its guidelines for watershed development, categorizes watersheds into four types. The All India Soil and Land

Use Survey Organization of the Government of India has prepared a Watershed Atlas of India, delineating the country into five stages: Region, Basin, Catchment, Sub-catchment, and Watershed. A watershed is a natural geo-hydrological unit that includes the catchment area of every stream. Importantly, watersheds do not conform to administrative boundaries such as villages, tehsils, districts, or states.

1. Micro watershed- up to 10 ha
2. Mini Watersheds- up to 200 ha
3. Sub Watersheds- up to 4000 ha
4. River valley- no limit of area

The Groundwater Survey and Development Agency (GSDA) has divided Maharashtra into 1,505 watersheds based on groundwater levels, categorized into:

1. White Watershed
2. Gray Watershed
3. Dark Watershed

In Maharashtra, there are a total of 42,778 villages, out of which 35,717 villages face water scarcity. Only 36.66% of these villages have been selected for watershed development. From 1992 to 2004, watershed development work was carried out in 11,143 villages (Dhamadhere, 2009).

The classification of watersheds based on area is as follows:

- Micro watershed: Up to 10 hectares
- Mini watershed: Up to 200 hectares
- Sub watershed: Up to 4,000 hectares
- River valley: Includes multiple sub watersheds, mini watersheds, and micro watersheds, with no area limit.

The Government of Maharashtra, with the assistance of the Maharashtra Remote Sensing Application Centre in Nagpur and the Groundwater Survey and Development Agency (GSDA), has categorized watersheds into sub-watersheds, mini-watersheds, and micro-watersheds for each district of Maharashtra. Based on groundwater exploitation relative to recharge capacity, watersheds are classified as follows:

White Watershed: Groundwater exploitation is less than 65% of recharge. In Maharashtra, 1,392 watersheds (92.55%) fall into this category.

Gray Watershed: Groundwater exploitation is near or equal to recharge capacity. There are 87 watersheds (5.78%) in this category.

Black Watershed: Groundwater exploitation exceeds 85% of recharge capacity. There are 26 watersheds (1.73%) classified as black watersheds.

In Sangli district specifically, the distribution of watersheds is as follows:

- 11 white watersheds
- 15 gray watersheds
- 10 black watersheds

This classification helps in prioritizing watershed management strategies and initiatives across Maharashtra.GSDA has divided Sangli district into two major river basins such as Krishna (KR) and Bhima (BM). The nomenclature method for watershed delineation is as follows:

GSDA Watershed- BM-1, 2, 3, 4 ...

Sub Watershed- I, II, III, IV, V ...

Mini Watershed- 1, 2, 3, 4, 5...

Micro Watershed- a, b, c, d, e... (Source: Govt. of MH. 2003)

The district is drained by several rivers, including Krishna, Warna, Morana, Yerala, Agrani, and numerous smaller tributaries. Among these, Krishna and Warna are crucial rivers in the western region. In the eastern part of the district, important rivers include Agrani, Man, Korda, and Bor.

WESTERN REGION WATERSHED (KR):

Rivers like Krishna and Warna, which are significant in the western region, ultimately flow into the Krishna River.

Eastern Region Watershed (BM):

Rivers such as Man, Korda, and Bor in the eastern part of the district merge into the Bhima River. This classification into KR and BM watersheds helps in delineating management and conservation strategies tailored to the

drainage patterns and hydrological dynamics of each region within the district. (fig- 1.1)

SCENARIO OF WATERSHEDS IN SANGLI DISTRICT:

Here's a reorganized version of the information:

In Maharashtra, watershed management aligns with the AISLUS (All India Soil and Land Utilisation Statistics) system, particularly at the sub-watershed level. The state comprises 1,504 watersheds with a total catchment area of 307,180 square kilometers.There are 44,185 micro watersheds in Maharashtra, with 67% of their geographical area requiring soil and water conservation treatment. Since 1992, 26,713 micro watersheds have been initiated across the state, out of which 8,322 micro watersheds (about 32.15%) have been completed. Regionally, watershed development programs in Maharashtra are distributed as follows:

- Vidarbha region: 23%
- Konkan: 8%
- Drought-prone regions: 69%

Over the last two decades, approximately Rs 4,500 crores have been expended on various watershed development programs by both the central and state governments.

Sangli district covers a total geographical area of 861,000 hectares, out of which 601,720 hectares are available for watershed development efforts. Currently, watershed development work has been completed in 116 watersheds, encompassing an area of 207,906 hectares (34.55%). However, 393,814 hectares (65.44%) of the district's area remains untreated.The total expenditure incurred on these watershed development activities by the central and state governments amounts to Rs 513.3 million (Rs 5133 lakhs).Despite these efforts, the share of funds allocated to watershed development in Sangli district was only 1.14% up to the year 2002, compared to the total expenditure across the state.

This strategic allocation of resources aims to address specific soil and water conservation challenges in Sangli district, contributing to overall watershed management goals in Maharashtra.The Jat tahsil has 48 watersheds,

98 mini watersheds and 264 micro watersheds. It covers 116 villages and occupied 222495.00 hectare area. The Jat tehsil has highest number of watersheds in Sangli district. The Miraj tahsil includes 27 watersheds, 43 mini watersheds, 96 micro watersheds and covers the 73 villages. The unevenly, with cost incurred disproportional up stream, typically among poorer farmers and benefits realized disproportionately downstream, where irrigation is concentrated and the rich farmers own majority of land.

The objectives of each watershed development projects are as follows:

A) To promote the economic development of village community through,

1) Optimum utilization of the natural resources like land, water, vegetation etc. that will mitigate the adverse effects of drought and prevent further ecological degradation.

2) Employment generation and development of the human resource and promote them for saving money and water.

3) To aware the villagers about income generation activities.

B) To encourage restoration of ecological balance in village through,

a) Active participation of the people for maintenance and operation of assets created and further development of resources in a watershed

b) Use of Local resource, in-situ conservation of soil and water local technology and material must be used for watershed conservation.

C) Emphasis on economically weaker sections resource poor area and disadvantage sections of the 'watershed community' such as the asset less and the women through

More equitable distribution of the benefits of land and water resources development and the consequent biomass production. Greater access to income-generating opportunities and focus on their human resource development.

COMPONENTS OF WATERSHED DEVELOPMENT:

When the environment gets degraded, the quality of life of the human community within that region also deteriorates, watershed development thus

aim at the rejuvenation of the environment in an integrated and comprehensive manner. Watershed development involves the following components

1. Human resource development (HRD)
2. Soil and land management (conservation & use)
3. Water management (conservation & use)
4. Afforestation
5. Fodder development
6. Agricultural development
7. Livestock management and
8. Rural energy management.

Characteristics Preferred for Inclusion of Villages in the Watershed Development Programme:

The Budget announcement envisages coverage of 100 districts in three years. The districts will be selected in consultation with the concerned state government. For selecting districts, preference is given where the percentage of irrigation is less than 30%, where there is a concentration of SC/ST population and where the extent of rainfed farming and potential for watershed development is large. Priority will be given to the districts having the lowest proportion of irrigated area in the state, subject to the availability of basic ingredients needed for successful implementation of watershed development projects.

Watersheds covering villages with the following physical and socio-economic characteristics are preferred for inclusion in the programme:

Physical Characteristics > Dry and drought prone villages. In any case the proportion of

irrigated area may not exceed the average for the state or 30% whichever is lower.

➢ Villages with noticeable soil erosion, land degradation, resource depletion or water scarcity problems.

➢ Villages in the upper part of drainage systems.

- The size of a watershed project should be around 1000 ha. (but not less than 500 ha).

➢ Well defined watersheds with the village boundaries coinciding to the greatest extent possible with the watershed boundary. As far as possible, Watershed encompassing one village is ideal.

Villages where the general cropping sequence does not include high water demanding and long duration crops like sugarcane, banana etc. and if such crops are grown in small pockets in the watershed, the villagers should agree that the area under such crops will not be extended during implementation or after completion of the watershed development project (www.planningcommission.nic.in/reports).

Socio-economic characteristics predominantly poor villages. High proportion of SC/ST in the total population holdings. There should not be much difference in the size of the land causes. Villages with a known history of coming together for common villages that have shown concern for resource conservation. Villages with alternative source of employment must be selected as the past experience indicates that the programme in such areas would not pick up (www.planningcommission.nic.in/reports).

ROLE OF NGO's IN WATERSHED DEVELOPMENT IN SANGLI DISTRICT:

The NGOs for implementing watershed development projects will be identified based on the following criteria:

a) Reputation and financial management capacity.

b) Method of operation and rapport with people and local government agencies.

c) Perspective on watershed development.

d) Nature of project handled in the past.

e) Technical and managerial capability.

f) Sensitivity towards group action/conflict resolution and equity for poor and women.

g) Ability to motivate the community for providing (voluntary work) in the village where they propose to work.

The NGO should have been active in the area for a significant period before proposing a watershed project for the area. NGOs and watershed communities willing to implement a watershed project, if selected have to go through a proofing stage and meet the qualifying criteria before they undertake a large scale project.

There are 5 NGO's workings in watershed development in Sangli district. These NGO's are viz. Om Adinatha Sanstha, Mallewadi; Haritkranti Pratishthan, Miraj; Bharati Vidyapeeths Gramin Vikas Pratishthan, Sangli; Dr.Ambedkar Shikshan, Sheti, Sanshodhan Vikas Sanstha, Manjarde; Late Vishnuanna Patil Sanstha, Manjarde. Each NGO has 10 watershed allotted for development excluding Bharati Vidyapeeths Gramin Vikas Pratishthan, having 12 watersheds allotted for development.

CONCLUSION:

Watershed management involves the comprehensive management of natural and human resources within a defined land area that channels water to a common outlet, such as a reservoir or bay mouth along a stream. In Maharashtra, watersheds are categorized into four types based on their land area: - Micro watershed, - Mini watershed, Sub watershed, River valley.

The Groundwater Survey and Development Agency (GSDA) categorizes watersheds based on groundwater exploitation levels. Sangli district in Maharashtra spans 861,000 hectares, with 601,720 hectares available for development efforts. The primary goal of watershed development here and across villages is to enhance overall village development. Special emphasis is placed on economically weaker sections, natural resource management, and women's empowerment through self-help groups.

The role of Non-Governmental Organizations (NGOs) is pivotal in facilitating effective watershed development initiatives, contributing to sustainable water management practices.

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