UNIT 3  NEED AND SCOPE OF WATERSHED MANAGEMENT

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3.0 OBJECTIVES

After going through this unit, you should be able to:
• appreciate the concept of watershed management;
• describe the present scenario of watershed management; and
• outline the approaches and objectives of watershed management.

3.1 INTRODUCTION

In the Block Introduction, we have mentioned that nearly 35% of the cultivated area under irrigation contributes about 55% of total foodgrain production, whereas 65% of rainfed area accounts for only 45% of the output. In this connection, please read the second paragraph of the Block Introduction again and you will have the feel of the need and scope of watershed management. Having done that, you will study in detail about the need and scope in this unit.

In the next unit, we shall be dealing with the concept of participatory watershed management, approach of Participatory Rural Appraisal (PRA), watershed management planning and role of integrated watershed management.

3.2 CONCEPT

About two-third population of the country lives in rural areas. Agriculture is the backbone of Indian economy as farming is the main occupation employing nearly 60% of our labour force. As most of the agriculture in India is rainfed, top priority needs to be accorded for managing natural resources in the most optimal way to increase crop productivity.
Watershed management is essentially adoption of soil and water conservation practices such as proper land use, protecting land against all forms of deterioration, maintaining soil fertility, conserving water for farm use and increasing productivity, proper water management for drainage and flood protection (Fig. 3.1 to 3.5). All the natural resources in particular watersheds should be used as efficiently as possible with minimum watershed degradation. In watersheds besides development of new water resources, emphasis is laid on efficient utilization of existing water resources based on indigenous technologies. The watershed management is rational utilization and conservation of land, water and biodiversity of natural resources without further deterioration of environment. It is an integrated participatory approach for sustainable development of natural resources. People’s participation right from planning up to its implementation is the important element in its proper execution. Watershed is a single window approach where all problems of watershed area are addressed and solutions sought. Watershed management is an ongoing process. It is therefore, essential that original watershed plans should be revised in case of new challenges.
Fig. 3.3: Water harvesting structure

Fig. 3.4: Flood and salinity affected agriculture land

Fig. 3.5: Improved agriculture productivity
**Definition:** Watershed is entire geographic unit of particular land from where rainwater as run off is drained out from ridges along the slopes of land to single particular point outlet or common drain point (Fig. 3.6). It is an ideal planning unit for conservation of major natural resources of soil, water and biodiversity.

![Fig. 3.6: Conceptual diagram of a watershed](image)

**Check Your Progress 1**

**Note:**

a) Compare your answers with those given at the end of unit.

b) Use the space below for your answers.

1) Define watershed. List main watershed activities.

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   ..............................
   ..............................

2) Describe in brief the concept of watershed.

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   ..............................
   ..............................

Now that you have done Check Your Progress 1, we may take a look at the present scenario regarding watershed.

**3.3 PRESENT SCENARIO**

The watershed approach has been a crucial aspect of national planning and therefore, we shall discuss the present scenario against the backdrop of that. As a
matter of fact, an area of 16.5 m ha of land had been treated through watershed approach up to Eighth Five Year Plan. Similarly, targets of 10 and 12 m ha were set for IX and X Five Year Plan periods. Watershed projects are being implemented and monitored by various government departments and organizations for the overall socio-economic development of rainfed areas with a view to conserving and using natural resources such as water, soil and vegetation in a balanced and optimal way.

3.3.1 Watershed Programmes

Ministry of Agriculture

National Watershed Development Project for Rainfed Areas (NWDPRA) was launched during 1990-91 (VII Five Year Plan) on pilot basis. In the VIII Five Year Plan, the NWDPRA was extended to 25 States and 2 Union Territories (Andaman & Nicobar Islands and Dadar & Nagar Haveli). Up to the end of the X Plan, an area of nearly 9 m ha was expected to be treated under NWDPRA. Keeping in view, the importance and the urgency of development of rainfed areas, the Ministry of Agriculture, Govt. of India has set a target of nearly 45 m ha under watershed related programmes over a period of 10 years starting from the first year of the XI Plan as against the initial target of XI Plan was 30 m ha. The average unit cost of watershed treatment for less than 8% slope is Rs. 4,500 per ha and for higher than 8% slope is Rs. 6,000 per ha.

A “Common Approach for Watershed Development” was jointly formulated and adopted by the Ministry of Agriculture (MoA) and the Ministry of Rural Development (MoRD), Government of India, incorporating the strength of their earlier first generation-based watershed programmes. These guidelines have been developed for implementing the NWDPRA of the Ministry of Agriculture. The restructured NWDPRA provides for decentralization of procedures, flexibility in choice of technology and active involvement of the watershed community in planning, execution and evaluation of sustainable watershed programmes.

Externally Aided Projects for Watershed Based Development

The Ministry of Agriculture is also undertaking the externally aided watershed development projects for the development of degraded and rainfed areas with special emphasis on components like natural resource management, livestock, infrastructure and institutional development etc. Under the externally aided projects, an area of 1.81 m ha was covered till the end of the X Plan.

Ministry of Rural Development

Drought Prone Areas Programme (DPAP) funded by the Central Govt. was launched in 1973-74 to tackle the special problems of areas affected by severe drought conditions. At present, the programme is being implemented in 972 blocks of 182 districts in 16 states. At the end of 2005-06, 12.3 m ha rainfed area has been treated (5.7 m ha since inception to 1995-2006 and 6.6 m ha between 1995-96 and 2005-06).

The Ministry of Rural Development is also servicing externally aided watershed projects for the development of degraded and wasteland areas. These programmes lay special emphasis on components like natural resource management, livestock
development, infrastructure and institutional development etc. Under the above projects, an area of 0.50 m ha was proposed to be covered till the end of the X Plan.

**Watershed Based Programmes with Planning Commission**

The Planning Commission of India has taken the Hill Areas Development Programme (HADP) and Western Ghats Development Programme (WGDP) from the V Plan onwards.

**Watershed Programmes Implemented by NABARD**

Watershed Development Fund (WDF) has been established at NABARD with a total corpus of Rs.200 crore which included Rs.100 crore by NABARD and a matching contribution of Rs.100 crore by the Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

The cost per ha for undertaking watershed programmes during XI plan is given in Table 3.1.

**Table 3.1: Cost per ha for Undertaking Watershed Programmes during XI plan**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Area (lakh ha)</th>
<th>Unit Cost (Rs. / ha)</th>
<th>Total Cost (Rs. crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Agriculture</td>
<td>67</td>
<td>15,000</td>
<td>10,050</td>
</tr>
<tr>
<td>Ministry of Rural Development</td>
<td>250</td>
<td>15,000</td>
<td>37,500</td>
</tr>
<tr>
<td>NABARD</td>
<td>4</td>
<td>15,000</td>
<td>600</td>
</tr>
<tr>
<td>Tribal Department</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Foreign funding organizations</td>
<td>5</td>
<td>15,000</td>
<td>750</td>
</tr>
<tr>
<td>Private organizations</td>
<td>20</td>
<td>15,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Non-government organizations</td>
<td>20</td>
<td>15,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Any other</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>366</strong></td>
<td><strong>90,000</strong></td>
<td><strong>54,900</strong></td>
</tr>
</tbody>
</table>

**Check Your Progress 2**

**Note:**

a) Compare your answers with those given at the end of unit.

b) Use the space below for your answers.

1) Which departments and organizations are undertaking watershed development programmes?

2) What are the major thrust areas under watershed programmes?
3.4 APPROACH AND GOALS

3.4.1 Approach

Watershed, an ideal manageable hydrologic unit of the area draining to a common outlet point is used for planning and development of natural resources (water, land and vegetation). In this approach, development is not confined to agriculture lands alone but covers all the area starting from the highest point (ridge line to the outlet of the nala or natural stream). By adopting watershed as a unit, different development measures are adopted and implemented carefully according to its capability. Watershed management aims at improving livelihood of rural people and conserving and regenerating their natural resources.

3.4.2 Goals

The goals of watershed can be aptly described by the expression POWER as given below.

\[ P = \text{Production of food ('fodder, fuel, fruit, fiber, fish, milk') on sustainable basis.} \]
\[ O = \text{Prevention of floods, soil and water erosion} \]
\[ \text{Poverty elimination} \]
\[ \text{People participation} \]
\[ W = \text{Operational practicability of all on farm operations} \]
\[ \text{Overall development of arable and non-arable land} \]
\[ E = \text{Wild animal's protection at convenient place} \]
\[ \text{Wasteland management} \]
\[ \text{Water harvesting for different purposes} \]
\[ R = \text{Eco-friendly system is to be maintained} \]
\[ \text{Economic stability} \]
\[ \text{Employment generation} \]
\[ \text{Empowerment of women in decision making} \]
\[ \text{Energy conservation} \]
\[ \text{Reduction of drought hazards} \]
\[ \text{Recycling of stored rainwater for different useful purposes} \]
\[ \text{Reduction of siltation in multipurpose reservoirs} \]
\[ \text{Reclamation of soil of fragile environment} \]
\[ \text{Reallocation of funds according to priority areas} \]
\[ \text{Resource management especially of persons below poverty line} \]
* Reduction in regional disparity between irrigated and rainfed areas
* Rainfed Farming system approach
* Restoration of ecological balance

In order to imbibe the different components of “POWER”, please read the above portion time and again. Once you feel that your perception is clear, go over to the next portion which deals with serious challenges being faced by the Indian Agriculture.

3.4.3 Challenges Pertaining to Per Capita Land and Water Availability

Per capita land availability will decrease from 0.91 ha in 1951 to 0.17 ha by 2050. Presently, 80% farmers have less than 1 ha land. Similarly, per capita water availability is likely to be reduced from 5300 m$^3$ in 1955 to 1140 m$^3$ by 2050. Due to this scenario, Indian Agriculture is faced with serious challenges of sustaining agricultural growth in years to come. The existing surface and sub-surface have already been exploited and there is very little possibility to harness more water for agriculture as well as competing users like public health, industry etc. Due to increasing population food production needs to be stepped up with less amount of water available as the share of water for agriculture (presently 80%) will be drastically reduced for meeting demand of other important sectors. Even at present the country is importing oilseeds, pulses and even cereals. This trend needs to be reversed by increasing yield of all important crops with the existing land and water resources.

It is therefore, imperative that adequate emphasis is laid on watershed development programmes based on rainwater harvesting in rainfed areas of the country. In watershed projects, different farming system such as horticulture and forestry, livestock, mushroom cultivation, honey bee, fish farming are integrated for all round socio-economic development and the rural masses.

Check Your Progress 3

Note: a) Compare your answer with those given at the end of unit.
b) Use the space below for your answer.

1) Describe in brief the approach and goals of watershed programme.

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3.5 LET US SUM UP

- Watershed is an ideal planning unit for conservation of major natural resources of soil water and biodiversity. Rainfed farming still constitutes about two-third cultivated area of India. Most of the departments which are related directly or indirectly with agriculture are associated with watershed programmes.
• Watershed development programmes are being undertaken by the Ministry of Agriculture, Ministry of Rural Development, Planning Commission, Govt. of India and NABARD.

• Watershed Development Fund (WDF) has been established at NABARD with a total corpus fund of Rs. 200 crore which includes Rs.100 crore by NABARD and a matching contribution of Rs. 100 crore by the Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.

• Watershed programmes are implemented through village level institutions and Project Facilitating Agencies (PFA). A uniform cost of Rs.15,000 has been earmarked for development of each unit. In this way, the total cost of development would be Rs.54,900 crore for development of 366 lakh hectares by all concerned departments/organizations in XI Five Year Plan.

3.6 KEYWORDS

Agro-forestry: Raising food crops, trees and animals together.
Biodiversity: Diversity of plant and animal life.
DDP: Desert Development Programme especially launched in desert areas.
DPAP: Drought Prone Area Programme.
HADP: Hill Areas Development Programme.
NABARD: National Bank for Agriculture and Rural Development.
NWDPRA: National Watershed Development Project for Rainfed Areas.
Rainfed: Crop cultivation depending on rainfall for meeting water requirement.
Replenschable: Refers to restoration of water availability.
Silvi-pasture: A variety of high yielding nutritive and palatable tree species in forests and farm lands for meeting fodder requirement.
Watershed: Watershed is entire geographic area of particular land from where rainwater as run off is drained out from ridges along the slopes of land to single particular point/outlet or common drain point. It is an ideal planning unit for conservation of major natural resources of soil, water and biodiversity.
WGDP: Western Ghats Development Programme.

3.7 SUGGESTED READING

Anonymous WARASA - JAN SAHBHAGITA Guidelines for National Watershed Development Project for Rainfed Areas (NWDPRA). Published by Ministry of Agriculture, Govt. of India.
Check Your Progress 1

1) Watershed is entire geographic area of particular land from where rainwater as run off is drained out from ridges along the slopes of land to single particular point outlet or common drain point. It is an ideal planning unit for sustainable development.

2) Watershed is sort of single window approach where all problems of watershed are addressed and solutions are sought. Participatory approach is very important for sustainable development of natural resources.

Check Your Progress 2

1) a) Ministry of Agriculture: NWDPRA and externally aided watershed projects.

b) Ministry of Rural Development: DPAP and externally aided watershed projects.

c) Watershed Based Programmes with Planning Commission.

d) Watershed Programmes implemented by NABARD.

2) The major thrust areas under watershed programme are:

- Protection of natural resources i.e. land, water and biodiversity.
Rainfed farming.
• People participation in all activities of watershed.

Check Your Progress 3

1) Watershed development and management is based on Participatory Rural Appraisal (PRA) based on active involvement of the watershed community in planning, monitoring, execution, evaluation post project maintenance of the created assets of watershed. The planning is made following bottom-up instead of top-down approach.

The objectives of watershed as described under the expression POWER in the text should be thoroughly grasped and be achieved.

P = Production of food fodder, fuel, fruit, fiber fish, fat, prevention of foods, soil and water erosion, Poverty elimination, people participation.

O = Overexploitation of resources be avoided. Over all development of arable and non-arable land ensured.

W = Water harvesting, wild animal’s protection, wasteland management.

E = Ecosystem friendly, economic stability, employment generation empowerment of women, energy conservation.

R = Recharge of ground water, recycling of stored rainwater, reclamation of soil, reallocation of funds, resource management, rainfed farming reduction of drought, reduction of siltation in reservoir, reduction of regional disparity etc.