

SUSTAINABLE WATERSHED MANAGEMENT – KANDALGAON.

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ABSTRACT

Water is limited vital natural resources, which is indispensable for the exance of all-living matter,plant,animal,and man.potable water which was once thought to be an infinite,is infact a fast depleting scarce commodity and at the present rate of consumption by mankind it would not last longer and become as dearer as fossil-fuels today.Although water cover 7/10th part of the globe surface, fills its atmosphere and lies unfathomed, beneath the earth crust, only less than 1% of its fit and available for the use and consumption by the mankind. There are serious apprehensions that greater part of the earth may go without water in the coming decades. Water table in several state Maharashtra, Punjab, Tamilnadu, Gujrat, Rajastan Hariyana have already gone significantly low. The further projections are that by year 2025 greater part of India may go without water unless suitable new sources are tapped and available water is conserved!

I. INTRODUCTION

Watershed management or protection implies the proper use of all land and water resources of a watershed for a optimum production with minimum hazard to natural resources.Proper planning is therefore absolutely necessary so as to obtain as many benefits as possible with minimum expenditure. Planning for water resource development, in its wider sense may therefore be defined as-thorough study of the pros and cons of various possible ways of harnessing this wonderful resource and finally bring down the means and ways of achieving the best and optimum benefits. Watershed management is the process of creating and implementing plans, programs, projects and activities to restore, sustain and enhance watershed functions. These functions provide the goods, services and values desired by the community affected by conditions within a watershed boundary.

A primary objective of watershed management is to increase and sustain a watershed's ability to provide for the diverse needs of the communities that depend on it, from local to regional to state and federal stakeholders.

Resource management using watersheds

as an organizing unit has proven to be an effective scale for natural resource management.“*Watershed management is the process of creating and implementing plans, programs, projects and activities to restore, sustain and enhance watershed functions. These functions provide the goods, services and values desired by the community affected by conditions within a watershed boundary.*”

II. LITERATURE SURVEY

1. Anna Hazare (The Pioneer of watershed development Programme): The “*Ralegan Siddhi*” Project is a case of village level comprehensive micro watershed development, located in a drought – prone area of Deccan plateau, carried out under the leadership of an ex-serviceman of Indian Army, by properly utilizing financial technical and organizational help provided by Maharashtra State Government Agencies, and Voluntary Agencies and by ensuring people’s participation in the process. This project has achieved the most comprehensive result of village level micro watershed development. Drastic increase in irrigation facilities, establishment of institutions for management and sharing of irrigation facilities, suitable change in land – use and cropping patterns, substantial increase in crop-yield and livestock productivity, provision of adequate income and employment opportunities are the outcomes of this project. Success of this project has gained a lot of publicity and several voluntary agencies are trying to replicate this in other villages nationwide. The state Government has formulated ideal scheme called “Adarsh Gram Yojana (AGY)” with the help of Shri Anna Hazare and other pioneers in this field. Under this scheme a committee headed by Shri Anna Hazare will develop 300 villages from various part of Maharashtra on these lines.

2. Shri Vijay Anna Borhade (Adgaon Watershed Development an Expertise in Water Resources)

This project is an ideal a case of village level integrated micro watershed development in a drought – prone area, located on Deccan plateau, and carried out by a regional voluntary agency – Marathwada Sheti Sahayak Mandal (MSSM) with the help of funds from a foreign agency, technical and financial support from various agencies of Maharashtra Government and by ensuring people participation. Government organization has achieved lot of favourable changes in the village. There is substantial increase in irrigation facilities, diversification in crop cultivation and horticultural plantation, increase in crop and livestock yield, generation of adequate income and employment opportunities, are the important outcomes of the project.

3. Shri Vilashrao Salunkhe (The pioneer of Pani Panchayat)

The Naigaon Project is a case of village level micro – watershed development carried out by 2 voluntary agencies with the help of fund received from Government agencies and foreign funding agencies and by organizing people to contribute, utilize and themselves manage, the water distribution project. This project has focused in effort on development of integrated watershed management of Naigaon village and on replication of informal co-operative lift irrigation scheme for equitable distribution of water in the surrounding areas. This project has been regarded as the earliest efforts made in India for the systematic development of village level Watershed and spreading the elements and principles generated by successful experiments.

4. Comrade Datta Deshmukh (The pioneer of the eight months water distribution policy) Occurring to Datta Deshmukh instead of supplying water in abundance to the agricultural land, priority must be given to the research in which dry agricultural land should produce more without much water. Large dams should not be built. Our need of water can be fulfilled only by watershed development programme and small dams. The planning should be made by setting an objective of bringing 6 to 70 percent land under water in Maharashtra. Every acre of land should be provided guaranteed water at least for one season / crop and if it is so, the needs about health the needs of industrial, civil and rural life are likely to be satisfied and it must be done. Until today, there was consideration of the water on the surface of the earth only. The water inside the earth was not

considered so much. The stock of water on the surface is reduced due to evaporation but the collection underneath the surface remains protected. The need cannot be fulfilled by "*Block water, Absorb water method*" in the watershed management programme only. Because watershed management programme can be successful in certain situation only where there is barren land, the area under agriculture is less, where water flows down the slope to the following streams. In such type of land only, this programme will be successful and useful. Out of the whole agricultural area in Maharashtra only 10 percent area comes under this category.

5. Mohan Dhariya (The Promoter of Vanarai - An institution, related to environment) The president of Vanrai, an institution working for environment related tasks, has recommended to create accumulation of water by building weirs with empty sacks of cement for 2/3 months from place to place. Right of public on water:- Water is a natural gift and the public has equal right on it. The government should manage the public contact from the point of view of social justice by playing the role of trustee. As well the central government has announced National water policy in 2000. In that policy it was recommended that drinking water should be the first the priority and then agricultural water and water needed for industries. The rain water in a particular area should be blocked in the same area. Only then, every village will be free from tankers. The villages depending on tankers should form "water-brigade" to block the water in the same area where it falls and the water falling in the fields should be blocked in the same fields. More trenches, and wells should be dug and sediment should be drawn out from the dams / lakes / ponds old wells to block more water. Constructing the dams with empty cement bags should block streams, brooks. As well as the rain water falling on the tops roofs of the buildings, temples, schools should be turned the nearby wells. The determination of the water-brigade should be tanker free village.

III.OBJECTIVES

For planning a particular watershed, the planner must a basic objectives or multiple objections and keeping in these mind should then proceed with the formulation and evolution of various alternatives. The objectives of water shed management programmes are :-

To study the problems in the area.

1.To collect the data by :

- a) socioeconomic survey
- b) Technical survey
- c) Hydrological survey
- d) Geological survey

2. To analyze the data.

3.Find out measures to overcome the problems.

The objectives can be achieved by :-

- 1) Bringing about improvement in a physical condition of a soil through a proper manuring and cropping with a view to increase water infiltration and holding capacity .
- 2) Ensuring good crop growth by adopting the recommended agronomic practices for each crop .
- 3) Adoption of conservation practices to improve agriculture control, water management for irrigation and drainage and all other types of erosion control measures could be considered as the parts of watershed management programmes

IV. PROPOSED WORK

DETAILS OF THE VILLAGE SELECTED FOR STUDY

LOCATION Kandalgaon is situated 8 km away from Kolhapur district. Tal : karveer Dist : Kolhapur.

POPULATION PARTICULARS

PARTICULARS	POPULATION
No. of families	513
Population	3183
Male	1396
Female	1031
Boys	394
Girls	362

CLIMATE: tropical humid climate ,occasionally also known as a tropical wet climate or tropical mansion and trade wind littoral climate. Monthly temperature during this season is above 18⁰ C .Pleasant winters : 12 to 30⁰
Tolerable summer : 22 to 38⁰

RAINFALL DATA: To calculate the total runoff we firstly collected the year wise data of rainfall from year 1998 to 2011.

SOIL AND TERRAIN:

Colour : - Brownish red

Hills and hill slope :- 3% - 8% AND 8% - 15%

Slope :- 0% - 1% AND 1% - 3%

Soil type :- Clayey soil and Sandy soil

PRACTICAL WORK CARRIED OUT THE SITE

1) SOCIO-ECONOMIC SURVEY

(door to door questionnaire):

A socio economic survey was carried out for the whole village in which the information about the village was gathered by the villagers in which form of set of questionnaires which were asked at each and every door so as to gain knowledge about villagers thinking.

The questionnaires carried out was as follows :

- i. Name :
- ii. Address :
- iii. Occupation :
- iv. Monthly income :
- v. Other family members :
- vi. Their occupation and education :
- vii. Village population :
- viii. Own farm, if yes how many :
- ix. Own wells :
- x. Own bore wells :
- xi. Own animals :

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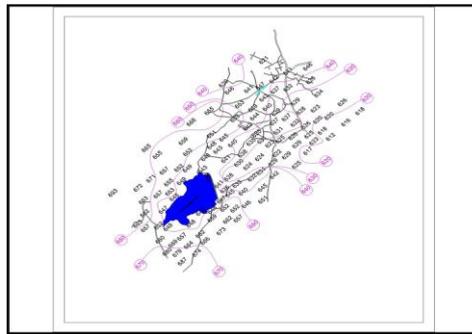
- xii. Drinking water resource :
- xiii. Crops grown in farm :
- xiv. Any such scheme started earlier or not ?

On the basis of the above questionnaire, following information have been obtained :

- 1) Gram panchayat : established in 1985
- 2) No.s of wards : 3
- 3) Total no.s of houses : 594
- 4) population distribution:
 - i. Total population : - 3183
 - ii. females : 1031
 - iii. males :- 1396
- 5) Per capita annual income : 50,000 – 75,000 per year
- 6) Electricity : available in every house
- 7) occupation (general) : farming
- 8) total no.s of animals :
 - i. buffalols : 109
 - ii. cows : 10
 - iii. goats : 18
 - iv. hens : 88
 - v. cocks : 34
- 9) total agricultural land : 634.98 hectare
- 10) Public well : 3
- 11) Private well : 12
- 12) Communication facility : nil
- 13) Transportation facility : K.M.T and own vehicals.
- 14) Road condition : bitumen road (main roads)
Cement road (internal roads) – not in good condition.

2) TECHNICAL SURVEY :-

After socio-economic survey next step is technical survey of existing land and preparation of a detailed map on a suitable scale depending on the extent for appreciating the disposition in respect of natural drainage. Based on the land survey map and physical appreciation on the ground , a layout is to be prepared considering the physiological factors like slope, wells, lakes and limits of the land.



3) GEOTECHNICAL ANALYSIS

A detailed investigations of the land use pattern and general topographical surveying was carried out by walking down all the way through the village and noting down the required information. Basically, geotechnical investigation are performed by geotechnical engineers or engineering geologists to obtain informations on the physical properties of soil and rock. Firstly, we communicated with the people living over there and found the basic status and condition of the soil. Secondly, for more technical and accurate information about the physical geography of the area, we visited the soil testing department in Kolhapur.

4) HYDROLOGICAL DATA ; -

We have collected the rainfall data from 1998 to 2011. To calculate the total run off of every year. The rainfall data collected is shown in above table. The total runoff was calculated using the SCS (Soil Conservation Service) curve number method for abstractions. This service developed a method for computing abstractions from storm rainfall.

Management Strategies to Reduce Soil Losses

Having obtained an estimate of the potential annual soil loss for a field, you may want to consider ways to reduce this loss to a tolerable level. Table 7, Management Strategies to Reduce Soil Losses, outlines management strategies to help you reduce soil erosion.

TABLE :

Factor	Management Strategies	Example
R	The R Factor for a field cannot be altered.	--
K	The K Factor for a field cannot be altered.	--
LS	Terraces may be constructed to reduce the slope length resulting in lower soil losses.	Terracing requires additional investment and will cause some inconvenience in farming. Investigate other soil conservation practices first.
C	The selection of crop types and tillage methods that result in the lowest possible C factor will result in less soil erosion.	Consider cropping systems that will provide maximum protection for the soil. Use minimum tillage systems where possible.
P	The selection of a support practice that has the lowest possible factor associated with it will result in lower soil losses.	Use support practices such as cross slope farming that will cause deposition of sediment to occur close to the source.

V. CONCLUSION

The water shed approach is therefore, increasingly being employed in various development programmes like soil conservation, command area development, drought prone area programme, shifting cultivation, reclamation or ravenous areas, erosion control in catchments of river valley projects etc. The watershed approach is more rational because the inherent potential of soil and water resources in a particular area is governed by various factors, most important of which are the physiography, geological base, soil characteristics, climate, present land use, socio-economical and legal aspects and other relevant factors. It has been observed that there is an optimum interaction between the natural factors of physiography, soil and climate on watershed bases for their optimum utilization and output.

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