



WATERSHED MANAGEMENT IN ARVIND GAVALI COLLEGE OF ENGINEERING , SATARA WITH SPECIAL REFERENCE TO KHODJAIWADI KARAD

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ABSTRACT:

Scarcity and threats to resource from pollution, climate change, and overexploitation have made it increasingly important to have sound watershed management. The link between land, water, and people has further made it necessary to widen the scope of watershed management beyond the “water resource”. Overall ecosystem functions as well as the improvement of socioeconomic status of the local communities are of paramount management. Integral water resource management including stakeholder participation, livelihood improvement, flood risk management, and financing of watershed management is presented. Furthermore, the scheme of watershed planning process which is fundamental for the development and implementation of watershed management plans is stressed. Watershed assessment, a key component of watershed planning.

Key words: Integrated Water resource management, Flood risk management, Watershed management planning,

1. INTRODUCTION-

A watershed, also called a drainage basin, is defined as an area in which all water flowing into it goes to a common outlet. People and

livestock are the integral part of watershed and their activities affect the productive status of watershed 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.

Major impact of the watershed implementation are observed based base on impact evaluation studies are given below.

- Rise in ground water level.
- Drinking water scarcity in village has been overcome.
- Local employment generation has improved, reducing off season migration. Increase in agricultural productivity and production.

1.1 MATERIALS:

1.1.1 Geo-textile Coir: Geo-textile coir is made up of coconut. Soil erosion and degradation of nature resource are creating a great threat to the environment around us. Concerted efforts are now on to rejuvenate and restore degraded land with the help of geo-textile. This coir is commonly used in the India for reducing the infiltration losses in landfill area. This coir are place in the base and side of this area the thickness thickness of this coir is very thin. Durability of this landfill sheet is high.



1.1.2 Cetyl Alcohol and Stearyl Alcohol:

These chemicals are applied by using hand spreading from the bank of reservoir. The surface film method is good to save the water

from evaporation. This water can be used for domestic consumption. These chemicals are used for purification of water.



Cetyl Alcohol



Stearyl Alcohol (Ginol 18)

StearylAlcho

1.1.3 Bleaching Powder: Bleaching powder is a chlorinated lime containing about 33% of active or available chlorine. These are used for chlorination of water. They are available in

small packets. Their chlorine content not decrease with storage. They can be applied in dry condition or as in liquid condition.

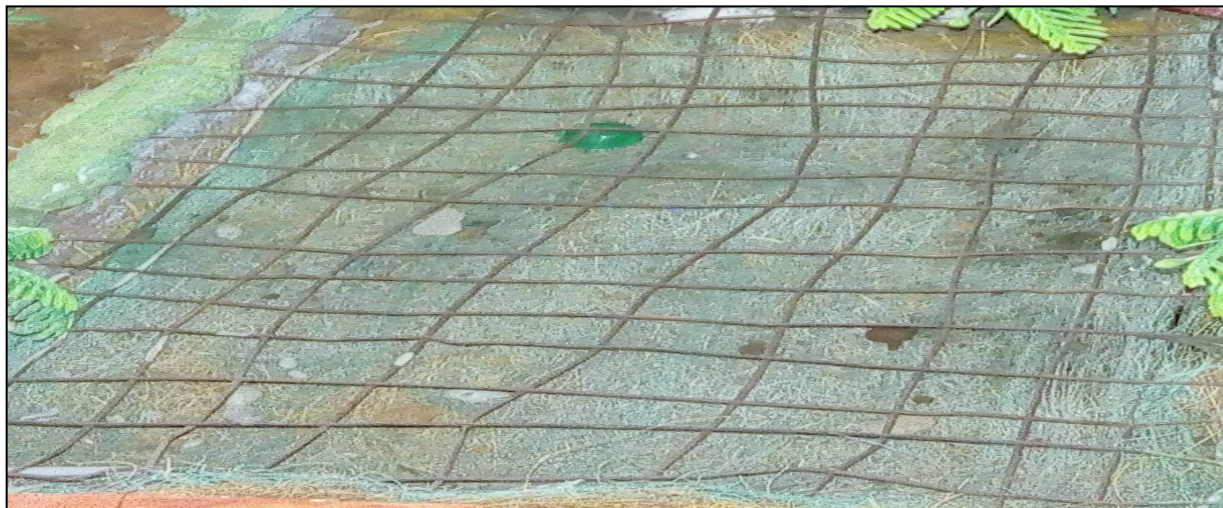


IndiaMART
Bleaching Powder at Rs 16 /kilogram(s) | Bleaching Powder | ID

1.1.4 Mechanical Mesh Cover:

If the total or partial surface Of the reservoir is covered, it will control the evaporation. It is very costly method and can be used, in case of

sizable small reservoir only. it is helps to avoid falling material in the reservoir like leaves of trees, plastic etc.



2. LITERATURE REVIEW:

2.1.1 S.P. Suryawanshi and Abhijeet Kamble watersheds for improved livelihoods through consortium approach in drought prone rain-fed areas. *Journal of Hydrological Research and Development*.23:55-77.

India occupies approximately 2.4% of the total geographical area of the world while it supports over 15% of the world population. Unprecedented population pressure and demand of society on scarce land, water and biological resources and the increasing degradation of these resources is affecting the stability and resilience of our ecosystems and the environment as a whole. Therefore, the productive agriculture lands in the country are in constant process of varying degrees of degradation and are fast turning into wastelands. It is precisely to restore this ecological imbalance by developing the degraded non-forest wastelands. To harness the full potential of the available land resources and prevent its further degradation, wasteland development is of great significance.

2.1.2 Jonson Creek Assessment of sustainable watershed management approach case study lenchediama, tsegureyesus and DIJIL watershed presented to the faculty of graduate school of cornelluniversity ,may2011

Implementation of solutions to problems of water quality and quantity in the basin has been hindered by political and social constraints. Reasons for the failure of previous management proposals are analyzed through application of institutional evaluation criteria. Alternative solutions are described and key considerations toward implementation of an effective basin

wide management scheme are found to be political coordination, an equitable funding program, and generation of public support.

2.1.3 Suhas P Wani and Kaushal K Garg 'Sustainable groundwater development through integrated watershed management of food security': organised by International crops research institute for the semi arid tropics (ICRISAT).

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. The criteria for selecting watershed size also depend on objectives of the development and terrain slope. A large watershed can be managed in plain valley areas or where forest or pasture development is the main objective. In hilly areas or where intensive agriculture development is planned, the size of watershed relatively preferred is small.

2.1.4 Karen L. Mora Trees and watershed management in koromoja, Uganda 'produced by department for international development (DFID) contracted through the climate

The effectiveness of land stewardship must be enhanced to meet a growing population's need for conservation, sustainable development, and use of natural resources. Ecosystems-based, multiple use oriented land stewardship is necessary when con-sidering the present and future uses of land, water, and other natural resources on an operationally efficient scale. Holistically planned and carefully implemented watershed management practices

will always be needed to meet the increasing demands for commodities and amenities, clear water, open space, and uncluttered landscapes.

3. METHODOLOGY:

In this project first up all we have study the watershed management concept. We have understood the watershed management concept in different types of references. We have searching the different reference papers in watershed management and watershed development concept. These searching papers are mention in this project. The conclusion of this paper authors are mentioned in literature review in this project. After this, we have searching the study area of watershed management and after discussion in our group we have select the study area related to watershed management. The name of the site is kolamba watershed (pasarTalav).

We have going to this place and observe this area. We have discussed the surpanch in this area and collect the detailed information of this watershed. Kolamba watershed is sixth

order stream covering an area of 88.693km² lying between latitude 17015_N and 17030_N and longitude 7400_E and 74015_E, is included with in the Survey of India (SOI) topographic sheet no.47 K/3 on the scale 1:50000. After this, we have going to PWD department and collect other information in this watershed for respective authority.

We have surveying the college area and select the suitable site for the watershed management. We have surveying the topographic area near the area. We have finding the stream lime of this topographic area. The following procedure is carried out in this area:

1. Finding out the suitable site.
2. Finding out the measurement of this site.
3. Finding out the area of this site.
4. Total volume of catchment area.
5. Collect the rainfall data of this site.
6. Finding out the run-off of this site.
7. Stored water
8. Total storage capacity of this catchment area.

4. RESULT AND DISCUSSION:

Sr. No.	Contents	Values
1	Small width of catchment area	9 m
2	Large width of catchment area	16.5 m
3	Length of catchment area	28 m
4	Avg. width of catchment area	12.75
5	Area of catchment area	357 m ²
6	Volume of catchment area	1428 m ³
7	Run-off of catchment area	0.22 m
8	Yield	80.325 m ³

Assessment of given watershed area

4.2 METHODS OF REDUCTION OF EVAPORATION LOSSES

1) Surface Area Reduction:-

The rate of evaporation depends upon extent of the exposed surface area. If the exposed area is the reduced the evaporation can be under control. This is can be done by using the following methods:

- 1) By reducing the done by meandering length of a river.

- 2) By selecting the size of the dam in such area. Where the ratio of surface area to the storage capacity of the reservoir is minimum.

- 3) By storing the water under closed surface.

2) Mechanical Cover:-

If the total or partial surface of the reservoir is covered, it will control the evaporation. It is a very costly method and can be used, in case of sizable small reservoir only.

3) Wind shields -:

The velocity of the wind is directly proportionate to the rate of evaporation. i.e. if the wind velocity is high the rate of evaporation also will be high. So if the velocity of wind near the surface of the reservoir is reduced by creating obstruction therefore, in this project the plant are provided around the banks of the reservoir the wind velocity will be reduced, and the rate of evaporation will be put under control. This method very eco-friendly. This can be used for small lakes or reservoir only.

4) Surface Film-:

By using same chemical, a surface film can be spread over the surface of a reservoir. The

film obstructs the movements of the water molecules on the surface to the layer of the air, above the reservoir and controls the rate of evaporation. This film is called as monomolecular film because the thickness of the film on molecular thick.

It gives results up to 40 to 70% in the laboratories and about 25 y in the open area of the reservoir. It should not be too costly and must be easily available in large quantities. It must be eco- friendly. The chemicals used to form the films are:-

- Cetyl Alcohol(C₁₆H₃₃OH) : Hexadecanol
- Stearyl Alcohol (C₁₈H₃₇OH) : Octadecanol

Sr. No.	Contents	Values
1	Water requirement in our college (sanitary purpose)	8 lit/head/day
2	Area of given Watershed	357 m ²
3	Population of college	1500
4	Quantity of college	12 cu. m
5	Total quantity of water in the catchment	1428 m ³
6	Utilization Period	119 days

Utilization Period of given watershed

5. CONCLUSION:

- Water is a prime natural source, a basic human need and a precious national asset. Watershed development consisting of conservation, Regeneration and judicious use of all the resource natural resource. Watershed development attempts to bring about test possible balance in the environment between natural resources on one side and man and grazing animals on the other.
- The climate of proposed watershed is included in the subtropical temperature category, Characterized by medium rainfall and moderate temperature. The maximum temperature range is 45⁰C to 50⁰C. And the minimum temperature range is 20⁰C to 25⁰C. The averagely 850mm rainfall occurs in the rainy season.
- In this work, we have studied the advanced technique of watershed management by using advanced geosynthetic materials like geotextile

coir, Black sheet and also chemicals to prevent Evaporation losses.

- In this way it reduces percolation losses as well as evaporation losses.
- Mechanical covers, Floaters, Chemicals like Stearyl Alcohol and Cetyl Alcohol, etc are used for reducing the evaporation losses.
- This proposed method enhances rainwater storage capacity for utilization.
- Irrigation status of region is assessed on the basis of irrigation facility, types of irrigation used for our college purposes.

6. REFERENCES:

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