



MODERN TECHNIQUES OF WATER CONSERVATION: A REVIEW

Dr. Tilekar Sharad B.- Head, Dept. of Geography, Shreemant Bhaiyasaheb Rajemane College, Mhaswad, Tal- Man, Dist- Satara- Email-sharadtilekar.1972@gmail.com

ABSTRACT: -

Developmental activities such as construction, manufacturing, agricultural as well as certain domestic activity requires large amount of water that leads to shortage of water as well as drought conditions. Today the growth of population increasing rapidly in the world and it leads to increasing in consumption of water resource. Today, in the world as well as in India more marginal areas are being used for agricultural activity. According to the India much of this land is located in drought prone area where rainfall is irregular and also less amount. The low rainfall has putting this region in the category of drought prone area. The recent years the droughts highlighted the need of water conservation for future use. The development of water resources through all possible devices and effective management is the necessary action against the drought. Therefore in this paper will indicate about the modern techniques of water conservation and remedies as a suggestion for reduce of intensity of drought. This paper concludes that the awareness can be taken about the water management for better future of coming generation.

KEY WORDS: - water conservation, resources consumption, domestic activity.

1. INTRODUCTION:-

Agriculture is important to human beings because it forms the basis for food security. It helps human beings grow the most ideal food crops and raise the right animals. India is mainly an agricultural country and agriculture is the most important occupation for most of the Indian families. In India, agriculture contributes about sixteen percent (16%) of total GDP and ten percent (10%) of total exports. Food is essential for life and we depend on agricultural outputs for our food requirements. Water has unique characteristics that determine both its allocation and use as a resource by agriculture. It is not easy to control or prevent water use. Irrigation is a vital component of agricultural production in many developing countries. Demand for water for non-agricultural uses is increasing in response to economic growth, rising populations and increased urbanization. All these discussion indicates that water conservation is immense significant.

2. OBJECTIVE: -

The present investigation devoted to the importance of water resources and identifies the water conservation for drought free area. This study also provides different techniques of water conservation which can applicable in grass root level.

3. DATA BASE AND METHODOLOGY:-

The present study is based on secondary data. The secondary data obtained from record of different sources like books, research journals, unpublished materials and internet. The data thus collected will be analyzed by using simple language techniques.

4. SIGNIFICANCE OF THE STUDY:-

The environment is an important factor influencing the health status of individuals. This includes characteristics of the natural and cultural environment. Factors such as clean air and water have play to contribute to good health. Especially water plays dominant role in living organs. Several studies have shown that a lack of fresh drinking water leads to different type



of ill. Facing water scarcity generates lot of issue related to human health, economic development, agriculture and politics. And it is necessary to study of their management. Therefore to the development of alternative solutions is immense significance.

5. Need of Water Conservation:-

We need water for not only drinking, cooking, washing and agriculture but also run our industries. In the world, water is an important element for all living organs. Water becomes our most precious resource because the growth of population and expansion in urbanization, industrialization and irrigated agricultural is growing demand and pressure on water resource. Irrigation play dominant role to the most obvious response of drought. But it has proved costly and can only benefit a fortunate few. A number of the social issues and challenges are directly related to the lack of adequate availability of water, likewise farmer's suicide. High dependency on monsoon rain is the biggest factor behind farmers taking this extreme step. According to Government 986 cases of farmer's suicide were reported from Maharashtra in 2014. In 2013, there were 11, 744 farmer suicides reported across the country out of which nearly 27% (3146) highest in Maharashtra. The main reason to suicide is water scarcity and loan, if the programme water conservation goes smoothly and result oriented, farmers from much hit area would be benefitted, and it shall increase the water level of villages, which has lowered more than 1000 ft. in some places of Maharashtra. According to the World Health Organization (WHO) of the United Nations, people have a minimum water requirement of about 20 liters per person per day. But India has always shortage of drinking water in drought prone areas. According to India Meteorological Department (IMD) India is third country of the world where received deficient rainfall. India being the monsoonal country, the rain falls only for 3 to 4 months in a year with high intensity, which results more runoff and soil erosion. In the rain shadow area drought occur in erratic and fails once in 3 or 4 years. This is very common picture in many parts of the country. Therefore the availability of ground water can be used during summer and make the empty for rainwater can be put into the, during rainy period. It was clear that water is one of our most precious resources and protecting our natural eco-systems from further damage is critical. Foregoing reason rain water conservation is necessary action against the drought in India.

6. CONCEPT OF WATER CONSERVATION:-

In the world historically throughout the centuries, various forms of water conservation have been used. In scientific term, water conservation refers to collection and storage of rainwater and also other activities aimed at harvesting surface and groundwater, prevention of losses through evaporation and seepage. (Sharma N. K. 2010). The collection of runoff on the ground are from natural surface, man-made ground catchments and rock catchments for the use of industrial, agriculture and domestic use. The systems can be categorized as small, medium and large scale. Normally, the size of rainwater harvesting was based on the size of catchment area. Meanwhile Water conservation includes all the policies, strategies and activities made by use and management of water for the all consumers.

7. METHODS OF WATER CONSERVATION:-

Historical evidence indicates that the communities of India know the technique of constructing tanks as well as were aware of the importance of maintaining them i. e. bavadis. Ancient Indians are known about water conservation. Today there are different methods of water conservation of surface rain water is as follows.

1) Rain water harvesting 2) Ground water recharge 3) Plantation of trees 4) Modern farming method 5) Recycling and reuse of water 6) Legal restrictions of water use 7) Population control 8) Flood management 9) Education through arrange workshop, seminar, field visit etc.



I) Rain Water Harvesting:-

Today the term rain water harvesting frequently used. Rainwater harvesting means locally collect and stores rainfall through different techniques for future use to meet the demands of human activities and also agriculture. Broadly there are two ways of harvesting rainwater. a) Surface runoff harvesting. b) Roof top rainwater harvesting.

A) Surface Runoff Harvesting:-

In the rainy season rainwater flows away as surface runoff. This runoff water could be caught and used for drinking and agricultural activity. By using different methods of various layers like slope, land use, land cover, drainage, soil and suggested site, is as follows.

1) Stone Bunding (SB):-

The stone bunding is proposed methods in the area where locally available of stone. His is effective in reduce erosion.

2) Continuous Counter Trenching (CCT):-

The region having steep slope and less soil depth will be treated continuous counter trenching. This is useful for the water absorption, reduce runoff velocity and also pit plantation. All these land will be banned for grazing.

3) Gully Plug (Earthen Plugs):-

This will be construed on the suitable locations by using stone or earthen bund. This structure provides reduce velocity runoff which develops small gullies.

4) Farm Pond:-

Farm ponds are proposed mainly to harvest runoff water will help retain soil moisture longer duration and storage water for next crop season.

5) Loose Boulder Structure (LBS):-

This type of structure is proposed at the beginning of plain proportion and the end of sloping portion on moderate gullies where runoff velocity is more. The vertical interval between two structures will be minimum space. It helps to reduce runoff velocity and erosion.

6) Water Absorption Trench (WAT):-

This structure is necessary for removing excess runoff water from catchments and runoff velocity is higher. This will be work Absorption of water and as barrier to prevent entry of cattle in farm.

7) Gabion Structures (GB):-

This structure is proposed when the catchment area is more and loose boulder structure is not sufficient to handle the excess runoff velocity. There loose bolder with wire mesh and stones are wrapped in chain link to avoid damage. Such structure is useful to reduce runoff, water storage and soil conservation.

8) Small Run off Strips:-

Small run off strips are proposed in the area for requirement of reduce soil erosion and water velocity. It is also useful for water recharging.

9) Percolation Ponds:-

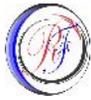
Percolation ponds are proposed mainly storage more rain water runoff for including recharge to ground water through percolation. This is useful on the suitable site.

10) Check Dam:-

This structure is a small barrier constructed of rock, sand bag and reusable products. Check dam reduce velocity of surface runoff, erosion and storage of water for the purpose of irrigation.

11) Cement Nala Bund:-

Cement nala bunding constructed by cement useful for lift irrigation, percolation under the well in surrounding area, reduce erosion and runoff.

**12) Earthen Nala Bund:-**

It is proposed to construct by earth, will be help in reducing runoff, erosion and ultimately percolation.

B) Roof Top Rainwater Harvesting:-

Roof top harvesting is a simple technique that can store large amounts of water from the rainy season for later use in the dry season. Although frequently used for domestic use, the stored water can also be used for small scale growing of high value horticultural crops which can be particularly drought sensitive. It works well in conjunction with drip irrigation. The roof of house or building becomes catchments and rain water collected from the roof can either be stored in tank or in the artificial recharge system. If the properly implementation of this method it became very effective and also expensive. It is helps direct use, storage, recharging pits, dug well and percolation tanks.

II) Ground Water Recharge:-

Ground water can be recharged by kinds of structures to ensure percolation of rain water. Generally recharge methods are used e. g. recharging bore well, recharging dug well, recharge pits, recharge trenches, recharge shafts and recharging percolation tanks.

III) Plantation of Trees:-

Covers of plantation are grown to protect the soil erosion and increasing fertility. They build organic matter in the soil, reduce temperature. Different types of plantation are witnessing grater benefits in recharging in the ground water level.

IV) Modern Irrigation Method:-

The total annual rainfall in an area may be enough to sustain farm needs, but in dry season lack of water reflects dry farming. Some key principles on effective water management in irrigation are as follows. 1) Use rainwater effectively. 2) Take measures to avoid runoff 3) Avoid wasting water through evaporation 4) Reduce water losses through drainage 5) Plan your irrigation 6) contour farming 7) Contour Ploughing 8) Bench Terraces 9) Grass Strips 10) Stone lines 11) Retention ditches 12) Planting pits 13) Earth basins 14) Semi-circular bunds 15) Cover crops/green manures 16) Mulching 17) Drip Irrigation. 19) Sprinkler irrigation. 20) Chang in cropping pattern

V) Recycling and Reuse of Water:-

Population growth has made water reuse a necessary method for conserving water. For the purpose of water conservation waste water help us to use by recycling method. Waste water in industry, household applications is reuse for flushing in to toilets, garden and also use in agricultural activity by recycling method.

VI) Legal Restrictions of Water Use:-

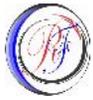
Government should effectively application of polices and laws about the use of water. To reduce wastage of water government develops action plan and its implementation. However provision of legal restrictions should be carefully through of need mobilization to effective solution

VII) Population Control:-

Today the growth of population increasing rapidly in the world and it leads to increasing in consumption of water resource. Developmental activities such as construction, transportation and manufacturing produce large amount of wastes that leads to pollution of air, water, soil, and land as well as global warming. Demand of fresh drinking water has increased due to expansion of urbanization. Population control is one of the strategy of reduce use of water resources.

VIII) Flood Management:-

A flood comes in high rainfall areas in India. There are various causes of floods. We can manage flood runoff water by strategy and turn this water towards the drought prone area. Therefore need of flood management.

**IX) Education:-**

One of the active strategies could include provision of education on the use of water, mainly during the period of scarcity. In the country arranging workshop, seminar, field visit to indicates water policy and directions of development and management of water resources.

8. CONCLUSION:-

Agriculture is back bone of Indian economy and more than 60% population engaged in agricultural sector. The demand of water in various sectors increasing rapidly. Today the growth of population increasing rapidly in the India and it leads to increasing in consumption of water resource. Water shortage has become an increasingly difficult problem to manage. More than 40% of the India's population lives in a region where the demand for water exceeds its supply. The imbalance between supply and demand, along with persisting issues rapid growth of population. There is need of water reuse and conservation of water and applications of different techniques of water conservation is immense significant. Finally it is concludes that the awareness can be taken about the conservation of water for better future of coming generation.

9. REFERENCES:-

1. Agarwal S. K. (1996): '*Biodiversity and Environment*' Rawat Publications, degradation, Pp. 1-13.
2. National Academy of Science (1986): '*Soil Conservation, Washington D.C. National Academy Press*'. 12-78. North America, Pp. 21-35.
3. Pimentel David (1995): '*Environmental and economic costs of soil erosion and conservation benefits, science, Vol, Pp. 117-1123*.
4. Rana S. V. (2006): '*Energy, Ecology and Environment*' Rawat publication, Pp. 1-167.
5. Report of Govt. India (2014): '*Central pollution control board ministry of environment & forests, govt. of India*', report on environmental issue. Pp. 1-47.
6. Samant J. S. (2005): '*Environment Studies*' published by shivaji university, Kolhapur, Pp. 5-42.
7. World Health Organization (2000): '*Environmental issue in developing countries: a major environmental and public health challenge*'. *Bulletin of the WHO*. Pp. 1-29.
8. World Health Organization (2006): '*The health effects Water pollution exposure in developing countries*'. based on the who consultation on the Geneva,
9. World Health Organization. *Www. Who*. '*Water Conservation*'.
10. *WWW. Google Search*.