# Improve Ground Water Table At Manmad

[1]Prof. G A Mengal, [2]Prof. M.S.Dhomse, [3]Chavan Sujit, [4]DoshiHardik,
[5]Lalwani Girish, [6]Kondekar Amar, [7]Kondekar Amar
[1].Lecturer SNJBs COE Chandwad
[2]. Lecturer SNJBs COE Chandwad
[3].BE Civil Student SNJBs COE Chandwad
[4]. BE Civil Student SNJBs COE Chandwad
[5]. BE Civil Student SNJBs COE Chandwad
[6]. BE Civil Student SNJBs COE Chandwad
[7]. BE Civil Student SNJBs COE Chandwad

**Abstract -** *The supply of water in rural area is one of biggest challenge in India. Manmad is rural town in Maharashtra which have its own water source i.e. Waghdhardi dam. But the supply of water is very inconsistent throughout year and it get very severe in summer season to meet daily needs of town. They have to depend on water rotation which comes from Palkhed dam. So it's better to raise the groundwater table of the area. In this project we will work on various aspects of investigation techniques for selection of sites, planning and design of artificial recharge structures, their economic evaluation, monitoring and technical auditing of schemes and issues related to operation and maintenance of these structures.*

*The project focuses on improving groundwater table which will be effective and economical with reference to work done in previous year.*

## I Introduction

Groundwater is the underground water that occurs in the saturated zone of variable thickness and depth, below the earth's surface.Groundwater is water located beneath the ground surface in soil pore spaces and in the fractures of litho logic formations. A unit of rock or an unconsolidated deposit is called an aquifer when it can yield a usable quantity of water. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the water table. Groundwater is recharged from, and eventually flows to, the surface naturally; natural discharge often occurs at springs and seeps, and can form oases or wetlands. Groundwater is also often withdrawn for agricultural, municipal and industrial use by constructing and operating extraction wells. The study of the distribution and movement of groundwater is hydrogeology, also called groundwater hydrology. Imageof the entire surfacewaterflow of the Alpha River near Jennings, Florida going into a sinkhole leading to the Floridan Aquifer groundwater. Typically, groundwater is thought of as liquid water flowing through shallow aquifers, but technically it can also include soil moisture, permafrost (frozen soil), immobile water in very low permeability bedrock, and deep geothermal or oil formation water. Groundwater is hypothesized to provide lubrication that can possibly influence the movement of faults. It is likely that much of the Earth's subsurface contain some water, which may be mixed with other fluids in some instances. Groundwater may not be confined only to the Earth. The formation of some of the landforms observed on Mars may have been influenced by groundwater. There is also evidence that liquid water may also exist in the subsurface of Jupiter's moon Europe.

## II PROBLEM STATEMENT

The Water management is very critical for the growth and development of country.
In the context of accommodating growing need of urbanization and changing life standard and life style of the people is increasing the no. of housing complexes and apartment
As a result ground water has become the only source. Thus exploitation of the local ground water is increasing and will be increasing with unplanted urbanization in the area.
Maharashtra having large no. of drought prone region. MANMAD of Nashik district is one of them
In some region like manmad the instorage of static ground water resource are also limited and depletion in froing water level ids resulting in ground water drought scenario
So it is very important to increase ground water table so it can meet daily requirement of region

### OBJECTIVES

The objective of our project is,

1. To store excess water in underground aquifer during times of surplus
2. Storage of surficial water during flood period to maintain and improve supply in dry season
3. To reduce ground water salinity in agricultural area
4. Reducing subsidence caused by high pumping rate
5. To prevent from losses

## III STUDY AREA

Manmad is located in Nashik, 240Km from Mumbai and 100km from Nashik of Maharashtra State between 20°19'45" North and 74°14'40" East with a population of 80000. There is wagdardi dam near the town to address water demand of the town, but the dam is not self sufficient to meet the demand the town. In summer season population of manmad needs to rely on water rotation which comes from palkhed dam.
Thewater rotation occurs once in a month during summer season. So we selected manmad as our study area.

## COLLECTION OF REQUIRED DATA

1. **RALEGAN SIDDHI:-(Coordinates: 18.92°N 74.41°E)**
Ralegan Siddhi is a village in Parnertaluka of Ahmednagar District, Maharashtra state in western India. It is located at a distance of 87 km from Pune. The village has an area of 982.31 ha (1991). It is considered a model of environmental conservation.

2. **HIWARE BAZAR:- (co-ordinates 19º47´N 74º36´4")**
Hiware Bazar is a village in the Ahmednagar District of Maharashtra, India. It is noted for its irrigation system and water conservation program, with which it has fought the drought and drinking water problems

## METHODOLOGY

1. **Basin Method**
Water may be recharged by releasing it into basins formed by construction of dikes or by excavation. This method permits water contact over 75-90 % of the gross area. Water from the stream is laid by a ditch into the uppermost basin. As the first fills, it spills into the second, and the process is repeated to the entire chain of basin. Any excess water is return to the stream channel.
Infiltration Rate = 10%, the long time infiltration rate W in meters per day is given by,

$$W=0.65+0.56i$$

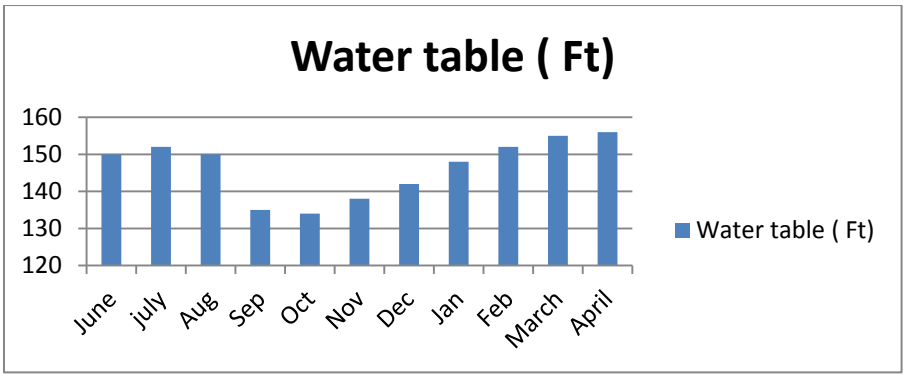
Where "i" is natural Ground slope in percent.

Individual rates were found to vary within a factor of two of this estimate.

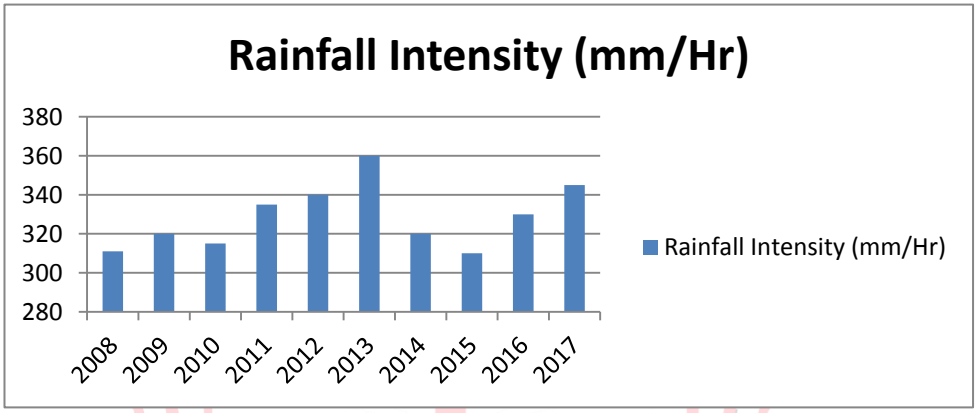
**Model to improve ground water table( Various methods used to increase ground water table )**

**Existing ground water Table around Manmad City**




**Rainfall intensity from 2008 to 2017**




**2. Ditch and Furrow Method**

In this method water is distributed to series of ditch that are shallow, flat bottom, and closely spaced to obtain maximum water contact area. Ditch width ranges from 0.3-1.8 m. On very steep slopes checks are sometimes placed in ditch to minimize erosion and to increase the wetted area. The method is adapted to irregular terrain. But seldom provides water contact to morethan about 10% of the gross area.

**3. Pit Method**

A pit excavated into a permeable formation serves as an ideal facility for ground water recharge, because the cost of excavation and removal of material is high. Use of abandoned, excavation such as gravel pits, is most economic. During thirteen season of operation, rates gradually decreases to about 12m per day. The reduction can be attributed to silt penetration into the upper portion of aquifer.

In this connection laboratories studies by the Illinois state water survey of the filtration efficiency of coarse media resulted in the equation,

$$SS_0=13.1H^{-0.25}d^{0.5}Q_0^{0.33}SS_i^{1.33}$$

Where $SS_0$ = suspended solid concentration(mg/lit)

H= Filter layer thickness (cm)

d= Diameter in mm

$Q_0$ = rate of recharge (m/day)

$SS_i$= suspended solids

**References**

Abdulaziz A-T (1991). "Effectiveness of recharge from a surface reservoir to an underlying unconfined aquifer" Hydrology of Natural and Manmade Lakes, Proceedings of the Vienna Symposium, August T991, IAHS Publ. No. 206.

Bhattacharya A K (2010). "Artificial ground water recharge with a special reference to India", Academic Research Publishing Agency Press, Vol 4(2).

Asano, T (1985). "Artificial Recharge of Groundwater", United Nations Environment Programme, Butterworth Publishers. United States of America. p.767. ISBN: 0-250-40549-0. British Geological Survey (2004).© Natural Environment Research Council, NERC, accessed online 30-8-2010, www.nerc.ac.uk.

Herman B (1978) Ground Water Hydrology, New York: McGraw-Hill, accessed 8 online, 28th july at www.iahs.info/redbooks/a222/iahs_222_0491.pdf CGWB (2000) "Central Ground water board ministry of water resources: A guide on the artificial recharge of aquifers" Government of India, accessed online, 28th july.