

## **RAIN WATER HARVESTING AROUND RAMTEK AREA (PERTAINING TO DUDHALA LAKE)**

Mr. Pawan Dilip Barhate  
Department of Civil Engineering  
Subharti Institute of Technology and Engineering,  
Swami VivekanandSubharti University,  
Meerut, India

Mr. Shankar Bimal Banerjee  
Department of Civil Engineering  
Subharti Institute of Technology and Engineering,  
Swami VivekanandSubharti University,  
Meerut, India

Mr. Amol Ashok Thakare  
Department of Civil Engineering  
Subharti Institute of Technology and Engineering,  
Swami VivekanandSubharti University,  
Meerut, India

### **Abstract:**

Dudhala Lake is situated at a distance of 2 km from Ramtek bus stand in the north east direction. The project work mainly includes to study the present situation of Dudhala lake and suggest the feasible measures to increase the storage capacity of Dudhala lake and give remedial measures so as to fulfill the water demand in that area. The study of Dudhala Lake revealed the major problem faced by the people regarding the storage of lake as it was not getting filled instead of sufficient rainfall in Ramtek.

### **Introduction**

#### **Analysis of Water Harvesting Structures around Ramtek**

A topographical sheet of the survey of India reveals a fascinating example of water harvesting structures around the township of Ramtek in Maharashtra: a series of ponds and tanks designed to harvest the seasonal rainwater available, based on the unique geographical, geological and climatic conditions. An analysis of these structure proved that there was some methods in the ways in which this structure were designed in terms of location, choice of structure and utility. Unfortunately, this outstanding water harvesting system, termed as the Ramtek model, is gradually disappearing, due to apathy, ignorance and maintenance.

Ramtektaluka in Nagpur district is spread over an area of 41000 hectares and is marked by narrow hills interrupted by plain country. The hills follow a north west to south west east trend descend suddenly down into the plains. The area is underlain by metamorphic rock that is very hard does not primarily possess any porosity, however, on weathering, develops secondary porosity and acts as a water bearing horizon. The thickness of such zone varies from only a few meters (m) to 20-30 m below the ground and is the major source of groundwater. Drainage is characterized by dendritic patterns nullahs (drains) of various sizes originate at higher grounds to flow down the slopes in numerous branches. This pattern develops typically in areas with rocks of uniform resistance and implies a noticeable lack of structural control.

### **Objective of the Project**

- To increase the ground water storage in Dudhala Lake which is important as per as increasing irrigation water demand.
- To conserve water and to make it available for present and future people.

### **SITE WORK**

#### **Study Area**

Dudhala Lake is situated at a distance of 2 km from Ramtek bus stand in the north east direction. The total area of the lake is 2.60 hectares which is surrounded by farmland of 5.86 hectare. This is lake facing the huge problem of water recharging due to less water supply in the catchment area. It remains dry most of the time in a year.

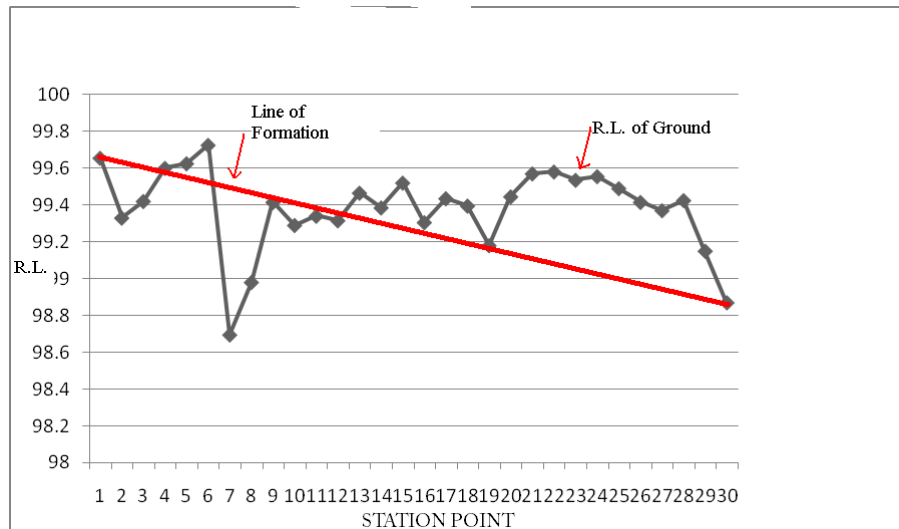
The soil in the study area varies in the thickness from 250-500 mm implying a shallow depth. It is excessively drained and has a sandy loam to sandy clay loam texture. Water availability varies from 140-170 mm of water per meter (mm/m) of soil and the water holding capacity of the soils falls under the medium category of 110-150 mm/m. There are 88 villages in Ramtek Township within the taluka. The landuse breakup of the study area shows 30 % land use with forest covering on the northern hilly area. The rest comprises 42% cultivated land 11.5% culturable wasteland and 16.6% uncultivable land.

#### **Graphical Representation of Data**

Based on the reduced level calculated by using differential levelling at various chainage point located. So the graph is plotted according to the readings so that chainage at 10 meter interval is plotted on the X – axis and reduced level is plotted on the Y – axis by following scale.

1) X axis : 1cm. = 10 meter. Y axis : 1cm. = 0.20 meter.

Thus the above graph shows the longitudinal section in which details of measurement of depression and elevation is as shown. The depression at the chainage point 60 m. is high because of the presence of the canal constructed across the channel.



**Fig- 1 Showing the Longitudinal Section (L- Section) of Channel Alignment**

### Findings of Survey Work

The reduced level at the different chainage point nature of the slope in the field is known. Structures and the appurtenances are located with the distances. Following are the results that obtained after the execution survey by differential leveling, calculation and the graphical representation of the calculated data:

1. The source point of the Dudhala Lake is found to be higher than the inlet by 1.3 meter.
2. Water from the conveying channel is not reaching to the lake due to various undulation and uneven surface along the channel.
3. Due to the presence of the canal constructed under the Upsah Project between the conveying channel heavy depressions is created which obstruct path of water to lake.
4. At every 10 meter chainage the depth and width of the channel is varying that causing non-uniform discharge.
5. Vegetations and the growing of the shrubs in the channel create an obstruction the catchment water flow.

### INTERPRETATION OF DATA

- i. The annual rainfall of Ramtek varies between 1100-1200 mm.
- ii. Total area of lake is 2.6 hectare.
- iii. Depth of water in lake is 2.5m.
- iv. Total volume of water stored 65000 cubic meter in lake.
- v. Total runoff of area is 3105.1 mm.

## Suggestion

- 1) To rise the height existing structure
- 2) To change in the gradient
- 3) To increasing the length of existing structure
- 4) To provide the drainage pipe as a medium of underground passage of water below the road
- 5) To make proper excavation of the channel and removal of the weed and grass in channel
- 6) To do the excavation of the lake to increase storage capacity
- 7) To replacing the water outlet of the main reservoir body.
- 8) To fix some water assessment charges on the farme

## Conclusion

The study of Dudhala Lake revealed the major problem faced by the people regarding the storage of lake as it was not getting filled instead of sufficient rainfall in Ramtek. It was also seen that due to scarcity of water the water from the Upsah project was diverted to Dudhala Lake and the people of the locality were using this water as per there need and no taxes were paid by them during this practice. Also the canal out let was damaged due to which much water was getting waste and unhygienic condition prevailed in the locality. Therefore after the detailed study report regarding the calculation of survey work, storage, runoff, capacity it can be concluded that the problem faced by the people about the scarcity of water during summer can be overcome by adopting the suggestion mention above.

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