



Sustainability of ground water of sonewadi village, Tehsil Bhoom, District Osmanabad, Maharashtra.

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Abstract:

This project aims to use the techniques like Rain-water harvesting, contour tanks, check dams, percolation tank, sub surface dams, Stream channel modification, contour bunding and mainly bore-blasting techniques. To improve the ground water level of Sonewadi village, Tehsil Bhoom, District Osmanabad, Maharashtra. which has declined a lot. And is affecting the crops and cattles badly. we have carried out a case study of Hiware bazar village, District ahemadnagar i.e how they improved the ground water level of their village and adopted few of their methodologies, Rules and regulations. Thus after the implementation of a proposed plan the sonewadi village will be enriched with water for all their requirements and will improve the living conditions of the villagers.

Index Terms - HB:-Hiware Bazar, MH:-Maharashtra, BBT:-Bore Blasting Technique, GWL:-Ground Water level.

I. INTRODUCTION

Nowadays, 'drought' is emerging out as a hazard in several parts of India. The records say that nearly 17% draught years in India during 1901 to 2012 were associated with severe impacts over water resources, agriculture, food, security, livestock, economy and social life. In recent history, India has faced three major draughts caused 0.5% reduction in India's gross domestic product (GDP) (manipadma journal, 2013) (which is equivalent to US \$ 9 billion). Unlike the countries like united states of America and Australia, around 49% of the total labor force in India depend upon agriculture and agriculture related firms for livelihood (thus 0.7 and 3.6% in USA and Australia respectively) (the world factbook, 2013); this shows that in India context, even a relatively moderate draught can have a widespread impact causing hardship to enormous number of people.

Maharashtra state of India has experienced recurring several draughts in past few decades affecting thousands of villages, lakhs of cattle and crores of people. The worst draught in Maharashtra has made water supply in the state a scary issue. The agriculture sector is badly affected; people had to migrate from their native places for water, livelihood and fodder for cattle. Not only loss of cattle and other livestock is a major issue but also increase in farmer suicide is a serious concern. From the year 1995 to 2004, farmer suicides in Maharashtra, Marathwada region is the worst hit area that media has referred as 'Graveyard of farmers...' (THE HINDU 2007). Sonewadi village of Marathwada region is selected as study area for this research work as it is recognised as the region of dry drought impacts. It is one of the important regions in central India is infamous for its recurring drought situation.

It is repeatedly affected by the scanty rainfall, this region is included in Drought Prone Areas (DPA) of India. Keeping this in view, the present study focuses on the time series analysis of historical monthly rainfall in Marathwada so as to analyse historical drought events and to predict the future drought events.

To analyse and increase the ground water level of Sonewadi village, which is a small village in Osmanabad district suffering from severe loss in ground water level, so by using various techniques we intend to improve the ground water level of the village to its best.

Paper is organized as follows. Section II describes case study of Hiware Bazar village, district Ahemadnagar and carrying out study of Sonewadi village. Section III describes the Bore blasting technique proposed for village. Section IV presents the points on which BBT is to be implemented for improving ground water level and finally, Section V presents conclusion.

II. RELATED WORK

A case study of village Hiware Bazar, Ahemadnagar is carried out in reference to how the village has achieved the water sustainability in this period of water scarcity, we got a chance to interact with Padma Shri Dr. Popatrao Baguji Pawar. We studied the following aspects:-Crops cultivated in village, Climate change, Water level Techniques used to improve ground water level i.e water shed management & water conservation.

The work in this paper is divided in two stages. 1) Studying the map and geographical features of Sonewadi village 2) Application various ground water level improvement techniques mainly Bore blasting technique.

III. METHODOLOGY

BORE BLAST TECHNIQUE is been used for improving the ground water level of Sonewadi village, Maharashtra.

“(BBT)”, an unconventional method developed by Ground Water Surveys and Development Agency, Govt. of Maharashtra in the village to increase groundwater In 2006-07 after budget gram Sabha decided to implement “Bore well Blast Technique storage and recharge, to improve strengthen source of drinking water exists along downstream side of watershed. Geophysical study of village indicated that area above gaathan is favorable for BBT to interconnect the upper and lower fractures to improve ground water storage aquifer system in the area. These bore wells are charged by ammonium nitrate based explosives and blasted to create artificial fractures and cracks in hard massive basalt formation. The borehole blast technique was selected for artificially deviating shallow aquifer after of micro watershed Blasting, process of reducing a solid body, such as rock, to fragments by using an explosive. Conventional blasting operations include (1) drilling holes, (2) placing a charge and detonator in each hole, (3) detonating the charge, and (4) clearing away the broken material. Also known as Rock blasting.

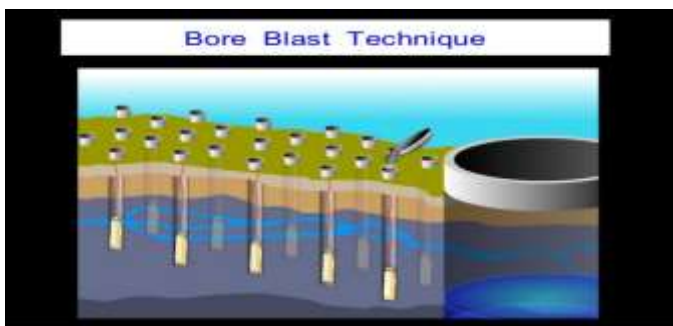


Fig 1. Bore Blasting Technique.

IV. EXPERIMENTAL IMPLEMENTATION AND RESULTS

Figures shows the route map of Sonewadi village and how the boreblasting technique is being used at particular locations in village to increase the ground water level of village and satisfy villagers daily needs.

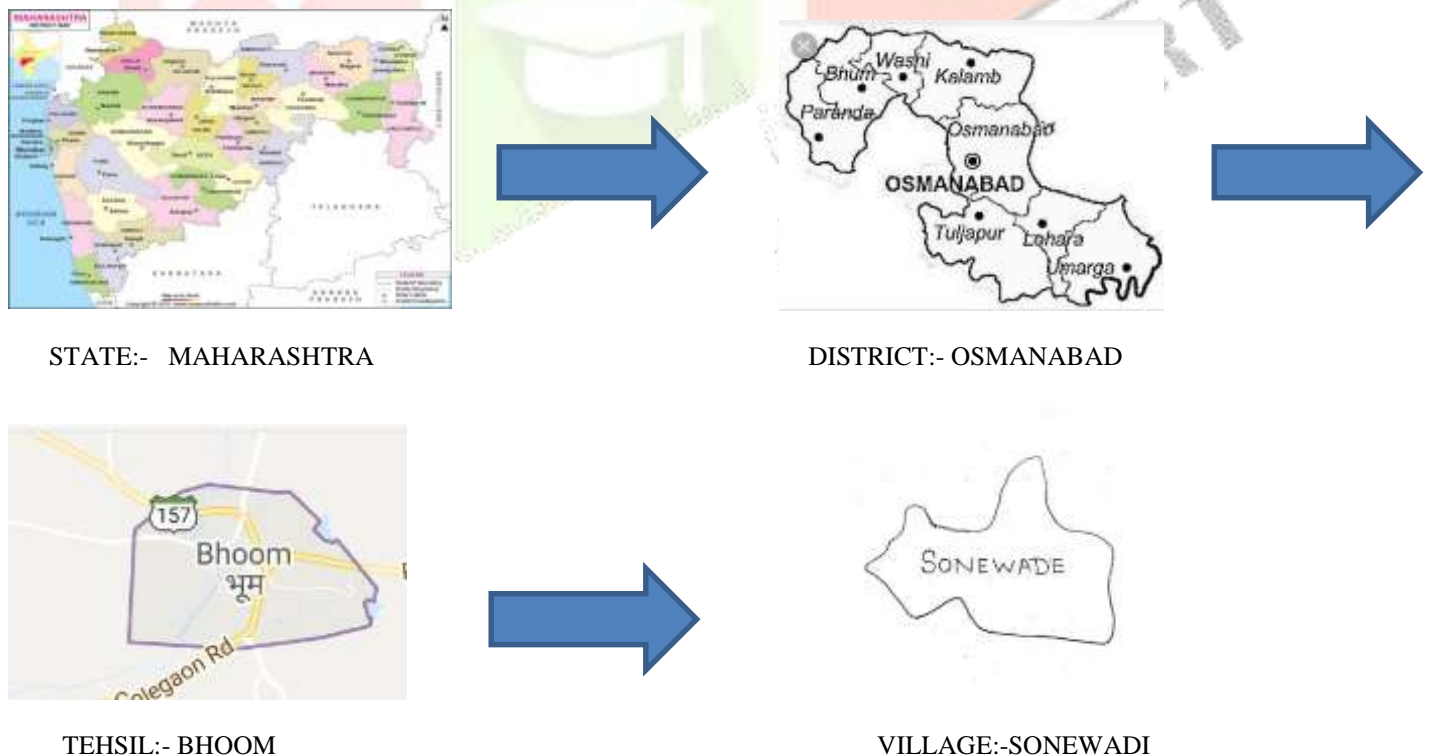


Fig. 2. Flow chart of sonewadi village location from entire map of Maharashtra.

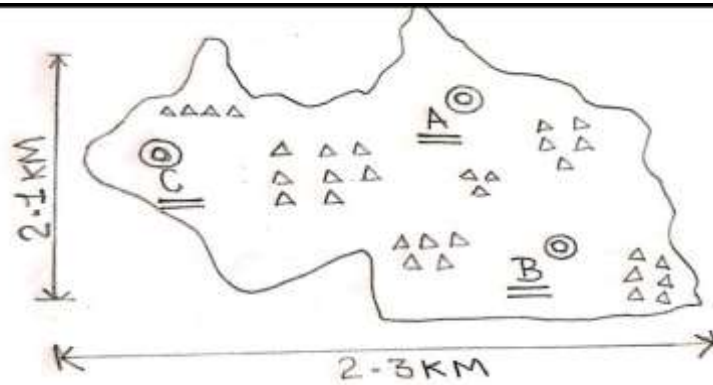


Fig. 3. Diagram representing the map of Sonewadi village and the proposed points/location for bore blasting to be used.

Sonewadi is a village of approximately 5sq.Km in area i.e 2.3km*2km. we have identified few 2 percolation tanks, few Contour trenches, 4 check dams, 2 bore blocks in village. Our plan proposed consist of using bore blasting technique to be used at 3 locations at points A,B,C as shown in figure So that whenever the rainfall takes place this water will directly go down and will get mixed with already existing underground water.

Hence this will take approximately few years around 5 years to completely take up the ground water level of 5 sq.Km village area with average annual rainfall received by village being 2.4mm/hr in rainy season for around 45 to 50 days annually. The boreblasting technique used will improve the ground water level to an exponential extent, and will soon the water level will rise upto more than the desired level, And will satisfy the daily requirement and crop water requirement of the villagers.

The potential aquifer zones have been encountered from 4.06 to 162.20m bgl. The deepest water level is recorded in osmanabad district. i.e 98.10 m bgl. Deeper aquifer zones have been encountered in many wells beyond 50m depth, Deepest being at 166m at osmanabad exploratory well osmanabad taluka.

V. CONCLUSION

We have proposed a plan for implementing bore blasting technique in the village named Sonewadi, Tehsil Bhoom, District Osmanabad, State Maharashtra, Country India. where the village is facing a large problem of depletion in ground water level, after implementation of bore blasting the level of ground water will improve to a lot and all the handpumps will come under working condition. It will increase the yield of crops, Also it will increase the economy of village and hence inturn will save the village from future draught codition.

REFERENCES

- [1] N Ramarao, Girija S, Gokul Manikanta T, Shiva Kumar K R, "Design & Development of Water Management System", IJERT Vol. 9 issue 03, March 2020.
- [2] Anjali Maheshwari, Neha M. Joshipura, Indra Prakash, Khalid Mehmood, "Assesment and Management of Groundwater Resource of Gandhinagar District Using Geo-Informatics", IJERT Vol.5 issue 05, May-2016.
- [3] Ayushman Mathur, Dipti Mathur, "Ground Water Management", IJERT, ETWQQM-2014.
- [4] Deepali Patil, Shakib Badarpura, Abhishek Jain, Aniket Gupta, "Rainfall Prediction Using Linear approach & Neural Network and Crop Rrcommendation Based on decision Tree", IJERT vol. 9 Issue 04, April 2020.
- [5] Dr. Patil N.A, "Water Availability and Crop Sutability in Drought-Prone Tahsils in Jalgaon District of Maharashtra state, India", vol. 8 Issue 07, July-2019.
- [6] Shekhar Kumar, "Status of Ground Water in Punjab- A temporal Analysis", The international quality journal, Discovery Agriculture, 2015.
- [7] Dr. Achiransu Acharyya, "Economic Instruments for Groundwater Management", Indian Ground water, Vol. XIV, January, 2020.
- [8] Cameron Holley, Jean-Daniel Rinaudo, Steve Barnett and Marielle Montginoul, "Sustainable groundwater management in France and Australia: setting extraction limits, allocating rights and realocation", Springer, 2000.
- [9] Hussain, Majid, "Systematic Agricultural Geography", Rawat, Jaipur, 213-273, 2006
- [10] Raman, C.A.V and Murthy, Srinivasa, "Water Availability period for crop growth." I M D Publication no. 173,1971.
- [11] Thornthwaite, C.W, and Mather, J.R, "The Water Balance", Publication in climatology. Centerton,(New Jersey), 8(1), 104, 1955.