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GROUND WATER RECHARGING BY UNCONVENTIONAL METHODS: A SIGNIFICANT APPROACH IN FIROZABAD (780 CR VS. SOME THOUSANDS)

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Abstract

The Present Investigation has been carried out in a city Firozabad (UP) (India) to find out the root cause for rapid ground water depletion in the last 15 years that has gone from 100 ft to 300 ft. The problem seems to be a study of a particular area but it is the big concern for whole of the world. The main motto behind the analysis is to provide a permanent solution with very less cost and simplicity that could be executed easily and effectively.

In the study, the affect of ground water quality on human health has also been discussed. 04 tube wells were chosen from different locations. Their ground water properties are discussed with human health issues.

In the present study, concept used to save the water is failed boring. It has been turned into a recharge pit instead of considering it as a NPA. This approach has been implemented at around 24 points. Now all of our effort is going on in the direction to implement the plan at all around 1200 failed hand pumps +10000 individual failed boring of submersible pumps in the city. So now the concept is failed boring is not a NPA but an opportunity to recharge.

This water conservation approach emphasizes on awakening of human being before it is too late. The vision behind the theme is to implement the ground water recharging plan at State then at national level.

Keywords: NPA, Rain Water Harvesting, Failed Boring

Introduction

Water, a precious natural resource, now has become a commodity for trading. Man is responsible for this anomaly. The natural blessing that was in abundance yesterday, becomes a rare treasure today. We have ruined all of our resources as well as our earth. The cost of development is excessive exploitation of environment. As a result, now we are facing the environmental crisis throughout the world. Usually it is said that 3rd world war will be for water.

Water scarcity is found in every corner of the world. Every city of the world is confronting with this problem. Ground water level is going deeper and deeper day by day. The present study deals with this concurrent issue. The study has been carried out for root cause analysis of the rapid ground water level depletion at Firozabad one of the city of Uttar Pradesh (India).

The District Firozabad is situated between 27° 24' north latitude and 77° 60' and 70° 04' east longitude in the south west corner of Uttar Pradesh. It is situated at about 40 km east of Agra district. The district comprise of an area of about 263.86 sq km.¹ The total population of the district is 20,81,752 of which 14,11,513 reside in rural areas while 6,70,239 in urban areas²....

Firozabad well known as 'Suhag Nagari' is famous for its glass industry throughout the world. Today Firozabad is a modern town with all of the amenities. But this urbanization and modernization leads the city to a drastic situation of water scarcity.

Statement of the Problem

Today city is at a dreadful end of water. Whole of the city is striving for water. Ground water has gone to the level of around 300 feet (for almost whole of the city). There is complete mess. The water supply is totally mismanaged. There is 20 Overhead Tanks and 228 tube wells. In place of supplying through OH Tank, usually there is a ill practice of supplying water directly through tube wells. There is also not a proper timing of tube well operations. The corporation is struggling with resources. Just 15 years back water level was around 100 feet but due to excessive exploitation of ground water, level is going deeper and deeper day by day. One could imagine about the stage after 10 years. Man is not only the culprit but also the victim for this situation. It is the time to awake and react.

Experimental

Among 237 tube wells, 04 were chosen for ground water study. These 04 tube wells are located at 04 corners of the city. Study has not done for research point of view but it has been done for the sake of implication of deeper ground water on human health.

Parameters

Among all of the parameters (Physical and Chemical) pH, TDS, DO, COD, BOD, Fluorides, Arsenic³ has been taken.

Parameter	TW1	TW2	TW3	TW4
pH	6.9	6.6	7.1	6.8
TDS (mg/l)	1469	1985	2053	1578
DO (mg/l)	0.9	0.6	02	0.7
COD (mg/l)	425	485	674	653
BOD (mg/l)	149	178	221	198
Fluoride (mg/l)	22	27	25	20
Arsenic (mg/l)	00	03	04	01

TW1: Tube Well Tilak Nagar, TW2: Tube Well Vibhav Nagar, TW3: Tube Well Indira Colony, TW4: Tube Well Ram Nagar

Result and Discussion

The study tells that arsenic is also getting found in TW3 at an alarming situation. Fluoride content is also a troublesome factor. DO is very low in all the 4 samples. The oxygen demand (both BOD and COD) is also very high in all the 4 samples. TDS is also showing larger values.

In a nut shell, we can say that TW3 is at a dreadful end but other Tube Wells are also not very good. People are drinking water directly that causes them many problems. People are getting sick due to this unhygienic water. The common disease seen in the area is arthritis, diarrhoea, cholera, osteoporosis, etc.

Root Cause Analysis of the Issue: The Findings

The present study has been carried out not for the paper work but for the ethics of civilization. Man's deeds should not destroy him. He should get awakened early so that future generation will not fight 3rd world war for water.

Going through the different phases of study, we have found out that it is not a specific problem of a city or a District or a state or even a country. It is a generalized problem prevalent everywhere in the world. These are some of the main reasons that generated the issue. These are:

- Excessive installation of House Hold as well as industrial Submersible Pumps/Tube Wells that causes 200 litre waste for the requirement of 2 litre.
- Human habits.
- Presence of very less effluent treatment plants (ETP) at industries that can recycle the water again in the industry.
- Negligible water conservation efforts in the world.
- Water management system is not well planned.
- Rejuvenation activities of rivers, ponds, lakes, etc., is not seen commonly. List can be enriched more but these are the basic things that need the attention of every one.

SOT Analysis of the Issue

Strength: Even today at around 300', the ground water is sweet and recommended for household use. It is a natural blessing for Firozabad

Weakness: Public awareness, non water conservation effort and above all the strong will to solve the issue is not found in the city. Some awakening has been started but it is very less compared to city area.

Opportunity: Failed Boring of Submersible pumps and Hand Pumps that refused to work due to water level depletion could be the readymade source for recharging.

Threats: Government support, basic infrastructure of municipality, rigidity of natives is the common threats that could be faced out during recharging execution part.

The Solution: Government Plan vs. Ideal Plan

Government Plan: UP Government granted Rs. 780 crore for lifting water from 60 km away town named *Jeda Jhal*. At that place there is a river Ganga canal. So all of the government official is not planning for rejuvenation of the city ground water but planning for a temporary relief that might work or not. How the money is wasted!

Ideal Plan for Execution: As earlier said that it is a ground work that provides some solution for the problem. In place of doing complex things at complex level, simple things are required to be done but with a visionary approach and in a well planned and organized manner. The solution for this problem is rain water harvesting/ground water recharging.

This is a very traditional and old approach but still very successful. The basic point we should remember that if we take some thing from the earth/environment, it is our duty to return it in equal proportion so that ecological balance is maintained.

In place of digging at 800 or 1000 ft in the earth or carrying water from 60 kms (that cost also too much), we could do it with very less efforts and very less cost. It is too much effective also for enhancing the water level.

Action Plan

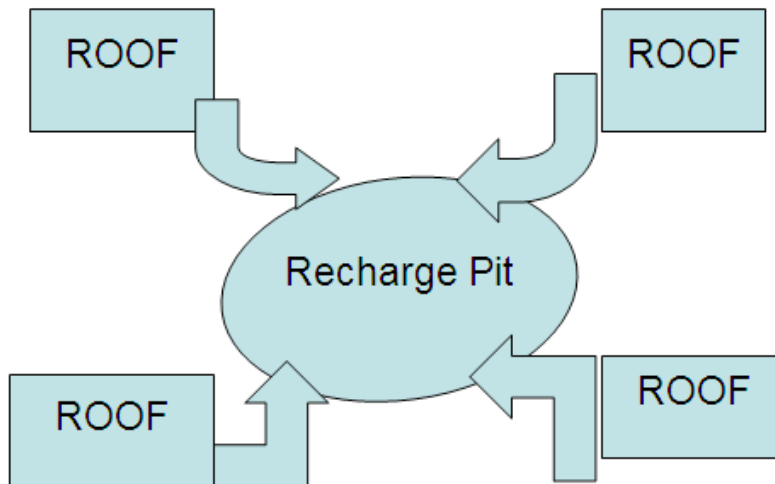
Water recharging is required to be done at macro + micro grounds. For it recharge points are needed. New recharge points could be generated easily while the old ones are easily identified. These could be

- Failed boring of submersible pumps
- Hand pumps that refused to work due to water level depletion
- Ponds that have disappeared due to urbanization
- Deep disappeared wells
- Reservoir could be constructed

All these are the best source for recharging. If serious efforts could be made in this area, not only the water level would be enriched but also earth would be a better place for living. For it a PPP (public private partnership) model is the best one. NGO, Govt., people and participation of common man would be a better way.

Implementation

For Household: Water recharging is a totally practical aspect. If it is applied with a visionary approach, much of the problems related with water can be sorted out.



This is the most easy and basic concept for rain water harvesting in which roof water of house is attached with the recharge point. If only this is done in every street of the city, there would be no problem for generations to generations.

My Efforts

I have tried to implement the whole plan in such a way. Here, failed boring firstly marked as recharge points (either it is of hand pump or submersible pump), then the nearby houses' roofs are connected with this failed boring. A illustration is giving below.



Failed Hand Pump



Houses' Pipe Line¹



House Pipe Line²



Connecting Recharge Pit

Second type of illustration is also given below:



House's Roof Pipe Line Connecting Failed Hand Pump that turned into recharge Pit

This type of practice has been done at around 24 points. Now all of our effort is going on in the direction to implement the plan at all the 1200 failed hand pumps + 10,000 individual failed boring of submersible pumps in the city. So now the concept is failed boring is not a NPA but an opportunity to recharge.

For Industry/At Macro Level

For industries, for government organizations at macro level work is needed to be done with broad, careful and serious attitude. Either the small reservoir could be made or different approaches could be taken to preserve the colorless gold. As a whole we could say that there is no fixed technique to conserve the water but approach is to be made accordingly with the geographical and demographical perspective.

The Ongoing Process and Vision

Our delegation now has met with District magistrate and Municipal Corporation to implement the project at broad concern. The administration is also finding out the ways by which the whole theme could be executed before the next rain in the whole city.

Workshops are also going to be organized to make people more concerned and sensitive to rain water harvesting. The individual participation is also our endeavour.

Our effort is to highlight the project at state level so that at least a state policy could be made for ground water recharging. If it would be done the water crisis issue could be sorted out with much ease and with very low cost and simplicity.

Conclusion

The problem of water scarcity can be resolved not only in Firozabad but also anywhere in this world but only with a listening to own conscience. A inner voice is needed to be heard when it murmurs 'Conserve the water. Don't waste it'.

Appendices



Figure 1: Firozabad District ⁴



Figure 2: The OH Tank



Figure 3: The Tube Well

References

- 1 and 2. Courtesy: <http://updes.up.nic.in/spatrika/engspatrika/tab7.asp?formd=21+Firozabad+++++++&formy=0910>
3. Standard methods of examination of water and wastewater 14th editions (1975) APHA, WWW, WPCF
4. <http://updes.up.nic.in/spatrikagraphicaldist21.asp>