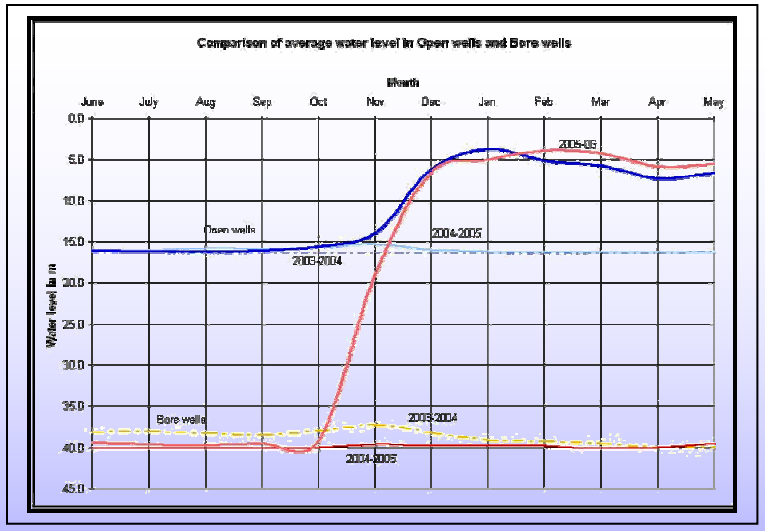
RGNDWM funded R&D project

RECHARGING THE FRACTURED AQUIFER THROUGH DEFUNCT BORE WELL FOR SUSTAINABLE DRINKING WATER DEVELOPMENT IN PUDUCHATRAM BLOCK,NAMAKKAL DISTRICT-TAMILNADU



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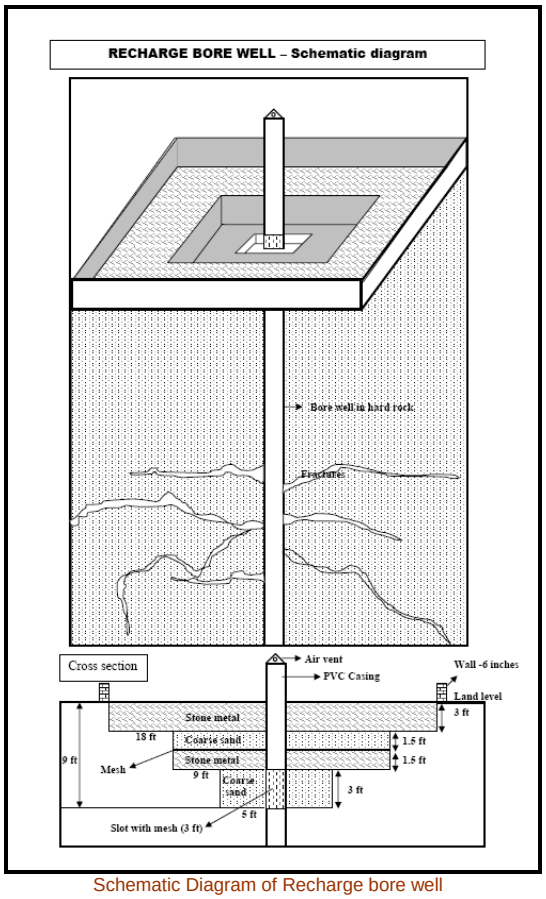
RECHARGING THE FRACTURED AQUIFER THROUGH DEFUNCT BORE WELL FOR SUSTAINABLE DRINKING WATER DEVELOPMENT IN KARUKURICHI VILLAGE PUDUCHATRAM BLOCK ,NAMAKKAL DISTRICT-TAMILNADU

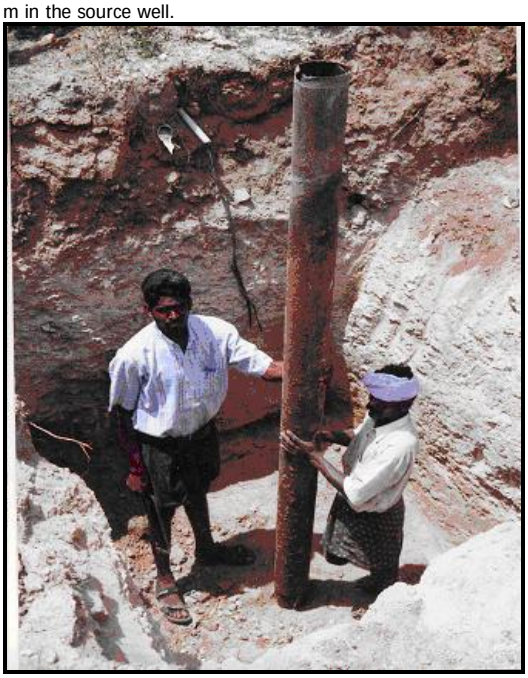
The main objective of the project is to improve the deeper aquifer to make the drinking water sources sustainable. The findings could be very much helpful in implementing recharge projects in hard rock area where the subsurface is heterogeneous, devoid of potential fractures in shallow and medium depth and surface recharge system techniques is not suitable. The right solution to enrich the fracture system is to divert or inject the runoff during monsoon in to the deep seated fractures directly through bore wells.



Schematic Diagram of Recharge bore well

Defunct Bore Well in Karukurichi Village, Puduchatram block In Namakkal District

Natural recharge for 2005-06 worked out to 16280 m3.Had there been no intervention in the village with the assistance of RGNDWM project for the given amount of run off (37137 m3) only 5570 m3 (15%) would have been added to the deeper aquifer as natural recharge. Where as the influence of the project resulted in 16280 m3 of rainwater added to the natural recharge thereby raising the water level to an extent of 28-30 m in the source well.



A trench around the defunct bore well provided and the old casing pipe is removed.

A new perforated PVC casing pipe is inserted in place of the corroded casing pipe.

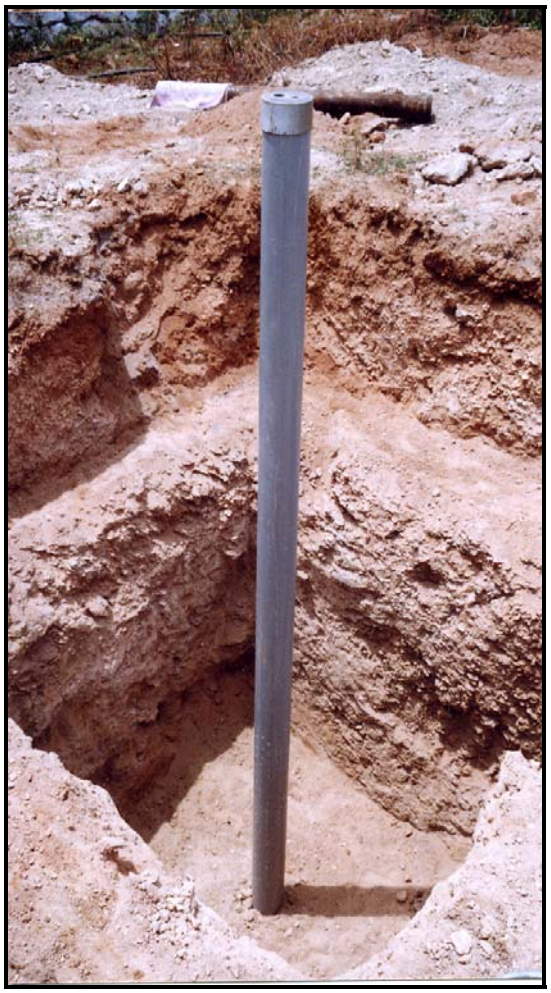
The water level fluctuation after the project found to be 28.2 m against 3.7 m during the non project period. The rainfall harvested reached the deep seated aquifer with out much interception or loss and effected considerable improvement in the potential as well as rise in water levels.

For the non project period the natural recharge ranges from 5 to 15 % and for the year 2005-06 it was 43.89 % .

The year 2005 experienced 52 % excess rainfall from the normal and the surface flow is properly impounded at vantage point with shaft arrangement resulted in 24 m and 15m difference with a rise mismatching with natural recharge condition.

Water level in the wells maintained with in 10-12 m bgl unlike 38 – 42 m in the earlier years. After construction the scenario

in water level fluctuation is totally changed. It was observed that 35.4 m rise during February 2006. The level during the same period in earlier years it was greater than 39 m and during 2006 it was only 4.0m from ground level.



1*1*1.5 The telescopic trench and the newly inserted perforated PVC casing pipe.

20 mm blue metal has been filled up for 0.5 m thickness and the perforated slot is wrapped up with nylon mesh.

Pumping hours have been considerably reduced since the aquifer parameters have been improved.

Round the clock water supply in the village is ensured. Agricultural wells are active since water level in the open wells stood around 12 m for a longer time facilitates agricultural activities.

Sand filter is provided over the metal filter with a thickness of 0.5M and both the trenches are connected with PVC pipe to facilitate passage of stored water in to both shafts.

Sand filter is wrapped with PVC nylon mesh that could facilitate smooth seepage of storage of rainwater in to the bore well.

The 12mm metal filter is wrapped up with nylon mesh to prevent the entry of finer particles that chokes the perforated slots in the long run.

Electricity charges have been considerably reduced there by making a savings to the local body.

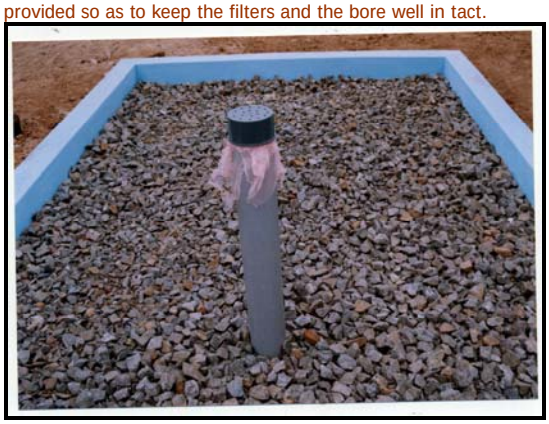
Quality of the source water has been considerably improved in respect of TDS and other parameters.

Recommendations:

Deep bore wells found to be dry or with insufficient yield need not be abandoned and protective measures have to be taken up from the initial stage itself by necessary official instructions.

Priority may be given to convert the defunct bore wells in to recharge bore wells when ever recharge programs are implemented for groundwater development especially for the sustainability of drinking water sources.

Blue metal is provided over the sand filter and a brick wall is provided so as to keep the filters and the bore well in tact.



The casing pipe is wrapped up with nylon mesh and closed with an end cap that acts as an air vent.

The shaft is provided with a reverse drainage that facilitate intake of stored water from the pond through a narrow raised channel with a metal filter to filter coarse materials.

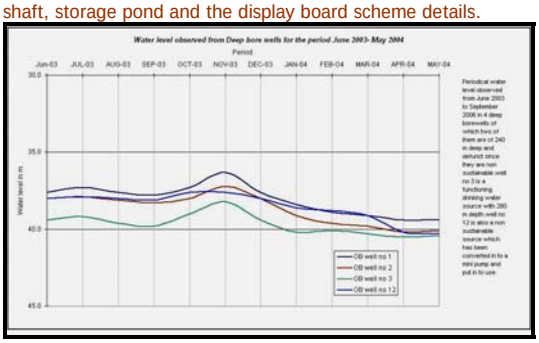
The location and the volume of the storage pond need to be designed in such a way that even if there is minimum runoff that should find its way in to the storage pond and in to the recharge bore well.

Necessary brake in gradient has to be provided so as to allow the shedding of mud load in the source water.

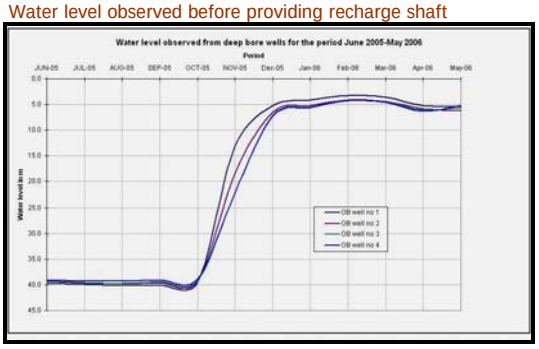
The filter arrangement should invariably be separated by polythene nets and easily the clogging with fine sediments could be removed before monsoon.

Design, Development and management of this kind of recharge program must involve Public participation or the total involvement of the local body since post operative maintenance is very much important to keep the infra structure operational for a longer period.

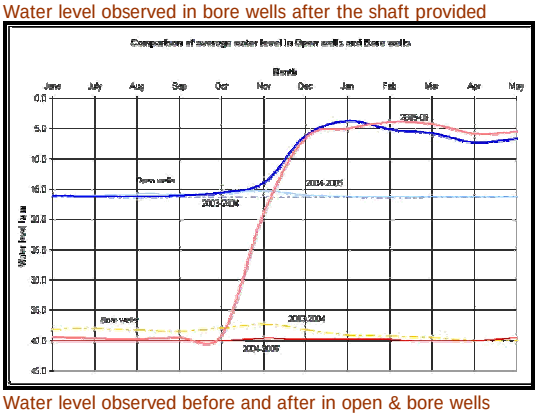
Pump room with functioning borewell, newly provided recharge shaft, storage pond and the display board scheme details.



Water level observed before providing recharge shaft



Water level observed in bore wells after the shaft provided



Water level observed before and after in open & bore wells

This project is funded by RGNDWM, Department of Drinking water supply Ministry of Rural Development Government of India for an Amount of Rs.5.070 Lakhs. The work has been executed with the involvement of the people of Karukurichi Panchayat under the supervision of Rural water supply Division TWAD Board, Namakkal and the officials of the R&D Cell of Hydrogeology wing TWAD Board Head office Chennai.