



Rainwater harvesting

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RAINWATER HARVESTING HAS gained importance, especially during the last decade, since the shortage of water is the main problem in various sectors. This particular aspect is being discussed in various seminars, workshops, meetings and also being popularised through posters, leaflets etc. However, the expected momentum does not seem to have been gained since the psychology of mankind has not changed as desired. This is mainly related to the excessive use of water. Experiments on water harvesting are being carried out by the various agencies connected with water management. The structures so far created are left without further monitoring or repairs necessary. This has resulted in physical growth of the water harvesting structures but without the enhancement of this precious resource as expected. As such, it would be necessary to adopt appropriate rainwater harvesting structures, carrying out repairs of the old structures for augmenting both surface and groundwater resources to fulfil our needs.

This paper puts forth the attempts that are being made in Latur district of Maharashtra State to popularise the concept of rainwater harvesting.

Reasons for a shortage of water

The main reasons for the shortage of water can be attributed to the following:

- Erratic rainfall behaviour
- Over-exploitation of groundwater resources, especially for irrigation
- Growing demand for irrigating perennial crops (sugarcane) thereby increasing groundwater draft
- Tendency of cultivators to go for extra depth drilling (150m)
- No control over private drilling
- Lack of awareness amongst community as to how precious water is. They are exhausting it at no extra cost.

About Latur District

Latur district is located towards south east portion of the state. It is located between latitude 18° 05' N to 18° 07' N and 73° 25' E to 77° 25' E. The average annual rainfall is 814 mm. Deccan trap basalt is exposed in the district. With the weathering and fracture porosity being dominant, the intake capacity (accommodating recharge) is good. In general, the aquifer is capable to accept a quantity of water at 3 lps i.e. 10,800 lph. However, in spite of having good potential, the district has to face drinking water scarcity in

rural and urban areas, especially during summer, due to over-exploitation.

Status of handpumps/ power pumps

In order to solve the drinking water problem, GSDA created sources that are fitted with 6650 hand pumps and 1750 power pumps. However these are affected due to over-exploitation from private bore wells. The mindset of the cultivators is to construct deep bore wells up to 150 m or more. Thus the exploitation of groundwater from the aquifers at various depths is increasing day by day and the shallower aquifers are almost exhausted. In fact, there is practically no dug well irrigation in the district, but bore wells are functioning day and night, without consideration of the consequences in the future.

Field observations show that in each village there are minimum 100 to 150 private irrigation bore wells and 40 to 50 bore wells are being constructed every year. There are 914 villages in the district and accordingly a minimum of 80,000 to 100,000 private irrigation bore wells are functioning. The rate of undertaking private bore wells has increased particularly during the last 4-5 years. If this is considered, it will be seen that there are ten private irrigation bore wells behind each drinking bore well.

The situation has a serious impact on the availability of water. If this is continued, both urban and rural areas have to face a tremendous shortage of water, especially for drinking water purposes. Thus, the rainwater harvesting is inevitable.

Groundwater levels

The groundwater levels of observation wells and piezometers are being monitored by GSDA. It has been observed that in spite of good rainfall, the post monsoon water levels in the observation wells have gone down by 3 to 3.5 m from 1998 to 2001 (the year of 1998 was of excess rains). The data also shows that the status of drinking water bore wells prior to Killari earthquake of 1993 and post earthquake period has changed. In general, the water levels in the bore wells have gone down by 15 to 20 m.

The depletion of water levels in the dug wells and bore wells can be attributed to the effects of over exploitation of groundwater from private irrigation bore wells. As such it has become essential to utilize rainwater for artificial recharge and thereby augment the groundwater resource.

Rainwater harvesting

Efforts to popularise the concept of rainwater harvesting are being made in Latur district at various levels. This has gained momentum during the last 2 - 3 years and the mindset of the people is changing slowly. The technical and social aspects of this programme are:

Technical aspects

- Subsurface geology favours accommodating additional recharge through rainwater harvesting
- The intake capacity of the aquifer encountered in the bore well/ dug well must be tested before undertaking the projects
- The deep bore wells permit recharging deeper aquifers.
- Scope for roof top rainwater harvesting and diverting nullah (drainage canal) flow for recharge exists.

Social aspects

- The tendency to adopt rainwater harvesting techniques is slowly developing
- Public opinion demands that the government undertakes such schemes since they do not want to invest for infrastructure of the scheme.
- Main technical aspects are neglected when individuals undertake scheme on their own without consulting a technical authority
- The mindset says "Why should I undertake the rainwater harvesting through bore well or dug well if it going to benefit adjoining areas?"

Efforts made

- District Collector and Chief Executive Officer of Zila Parishad are constantly pursuing the importance of rainwater harvesting at District, taluka and village level.
- Leaflets, pamphlets, hoardings etc are prepared.
- GSDA is promoting the importance of rainwater harvesting at all levels and rendering technical advice, wherever necessary

Implementation

Apart from the conventional means of rainwater harvesting, viz. percolation tanks, Nullah bunds, gully plugging etc. the following schemes are being implemented in Latur district.

- Roof top rainwater harvesting, utilizing the rainwater for recharge through boreholes/ dug wells.
- Constructing filter trenches along slope direction
- Diverting flowing stream water towards filter trenches by the side of the bore well./ dug well.

Status of implementation

Under the guidance of GSDA, roof top rainwater harvesting experiments are carried out in the rural and urban areas; the results of which are encouraging. The experiments have been monitored and it has been observed that the roof top rainwater harvesting has helped the individual in sustain-

able water supply from their bore wells. A video cassette showing the benefits and the opinion of the beneficiaries has been prepared. This is being displayed at various workshops and seminars to popularise the concept on a wider scale.

During the summer of 2002, the projects undertaken were:

Agency	Type of project	Number
Agriculture department	Recharge trench	1100
Municipal Council Latur	Roof top rainwater harvesting	129
Individuals (Latur City)	Roof top rainwater harvesting	38

The effects of the above experiments will be monitored after the monsoon cycle.

Micro watershed assessment

It has been proposed that the rainwater harvesting programme be carried out on the basis of micro watersheds. Such an exercise is being carried out by GSDA.

Conclusion

Rainwater harvesting is the need of the time. Along with the natural groundwater recharge (10 – 12%), the induced recharge techniques of rainwater harvesting are necessary for future needs. Otherwise, under the circumstances of rising population and the tremendous race for irrigating perennial crops, we will have to face serious problems. In rural areas, the problem of drinking water may persist and even tankers will have difficulty in collecting their water. As such, it would be appropriate to adopt rainwater harvesting structures on a wider scale. The mindset of the community will have to be changed in this time by convincing them as not to go for perennial cropping, change in cropping patterns, adopting drip./ sprinkler irrigation practices etc.

The mindset of the people is changing slowly but surely. GSDA is constantly pursuing the importance of rainwater harvesting by means of various measures.

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