Rain Water Harvesting Basic Need of Present Urban Sector – Use of Digital Technology for Rain Water Harvesting

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ABSTRACT: *The use of every drop of water from the rain will be only solution to the water problem in the urban areas like metropolitan cities or cities with large population. Water from the rain can be very easily collected through apartments, housing societies and private homes in the cities. The Rivers in cities are already polluted and not useful for drinking. The authors have studied the means of water harvesting in the developed nations and have developed the model to implement the same in our country. The need of the water harvesting and its implementation at large level from Government, local bodies and awareness from all the people will be only possible to preserve the water falling from the sky in the form of rain.*

Keywords: Water Harvesting, Urban, Pollution, Water Recycling Management, Water Quality, Natural Resources

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1. Introduction

The urban population is increasing rapidly, people from rural areas are shifting to Urban area and the facilities of housing, water and play ground are vanishing from the cities. The development and management of groundwater resources, is to manage efficiently this depleting resource. The key to successful groundwater recharge and discharge processes. Under suitable conditions it is possible to supplement the natural recharge of an aquifer and so add to its safe yield capacity. This process is called artificial recharge. Precisely, artificial recharge is the process by which the groundwater reservoir is augmented at a rate exceeding that under natural conditions of replenishment. Any man-made scheme or facility with the objective to add water to an aquifer be considered as an artificial recharge system. Sustainability of drinking water sources has become one of the major issues of urban drinking water supply sector. In this endeavor, role of government sector is being shifted from actual implementing authority to that of a facilitator. Since rainwater harvesting and artificial recharge can play a major role in providing sustainability to drinking water sources, such activities can be taken up on a large scale by local communities as various kinds of rainwater harvesting structures through ages have been proved to be quite useful to the society constructed in different parts of the country worldwide. The proper planning and law to make the rain harvesting compulsory at the time of sanction of the plan for construction.

2. Rain Water Harvesting to Support Ground Water Resources

2.1 Rain Water Harvesting Technique

Rain water harvesting technique is of the collection and storage of rain water at surface or in sub-surface aquifers, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenish.

2.2 Need

To use the natural resource of rain in rainy season to collect the ample water from nature.

To overcome the inadequacy of waters to meet our demands.

To arrest decline in ground water levels.

To enhance availability of ground water at specific place and time and utilize rain water for sustainable development.

To increase infiltration of rain water in the sub-soil which has decreased drastically. In urban areas due to paving of open area.

To improve ecology of the area by increase in vegetation.

3. Advantages of Rain Water Harvesting

1. The Cost of recharge to sub-surface reservoir is lower than surface reservoirs.
2. The aquifer serves as distribution system also.
3. No land is wasted for storage purpose and no population displacement is involved.
4. Ground water is not directly exposed to evaporation and pollution.
5. Storing water underground is environment friendly.
6. It increases the productivity of aquifer.
7. It reduces flood hazards also we can reuse the same water and be self sufficient in water use.
8. Effects rise in ground water levels.
9. Mitigates the effects of drought.
10. Reduces soil erosion and conserves the soil.

4. Design Considerations for Rain Water Harvesting

1. The important aspects to be looked into for designing a rainwater harvesting
2. System to augment ground water resources are very effective and can be easily implemented.
3. Hydrogeology of the area including nature and extent of aquifer, soil cover, topography, depth to water level and chemical quality of ground water free from pollution.
4. The availability of source water, one of the prime requisite for ground water recharge, basically assessed in terms of non-committed surplus monsoon Runoff.
5. Area contributing run off like area available, land use pattern, industrial, Residential, green belt, paved areas, roof top area etc.
6. Hydrometer logical characters like rainfall duration, general pattern and intensity of rainfall.

5. Potential Areas for Rain Water Harvesting

1. The areas where ground water levels are declining on regular basis.

2. The area where substantial amount of aquifer has been de-saturated.

3. Where availability of ground water is inadequate in lean months.

4. Where due to rapid urbanization, infiltration of rain water into subsoil has decreased drastically and recharging of ground water has diminished.

5. At all places in the cities which are under development like hospitals, schools , govt. offices.

6. People Participation

Awareness creation in the minds of large population is a big issue and has to be well planned like Swatch Bharat Mission Started by the Prime Minister in the country. People living in a settlement, share common interests, common resource and feel that they belong to a singular community. Communities, as also groups within a community, differ greatly in the extent to which they influence decisions that affect the use of common resources available and, therefore, the extent to which they are sharing the common resources.

The provision of water supply requires money, materials, labor and time. Most importantly, it requires people to build, operate, and maintain for continued use by the options available, the relative advantages and disadvantages of each option, are capable of making the choice, and finally own up the responsibility of maintaining the facility created.

7. Participatory Approaches Aim to Achieve the Following

• Local support for programme including the involvement of local leadership.

• Voluntary generation of ideas and intervention by community members.

• Ownership of programme by community members.

• Participation in decision making by disadvantaged groups in society, particularly women.

• Community organizational structures for the management of intervention.

• Removal of obstacles to collaboration.

• Training of local animators and awareness by means of TV Channels, Radio and Internet.

8. Images of Rainwater Harvesting

Figure 1. Apartment Rain water Harvesting System

Figure 2. Home with Rain Water harvesting facility

Figure 3. Use of rain water for garden and other uses

9. Conclusion

The Rain water harvesting is going to be main player in development of the cities in the near future. The water has to be collected properly and systematically during the rainy season in order to save the expenses on water bill and make use of best natural resource available to us in the form of rain. Many developed countries have already made compulsory to use and construct the buildings with rain water harvesting facilities. The authors have done a decent contribution in creating awareness in rain water harvesting for the betterment of the society.

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