AGRI MAGAZINE
(International E-Magazine for Agricultural Articles)
Volume: 02, Issue: 09 (September, 2025)
Available online at http://www.agrimagazine.in
©Agri Magazine, ISSN: 3048-8656

Enhancing Surface Water Resources

*Bonthala Madhukar[1] and Dr. K. Kiran Kumar Reddy[2]
[1]PhD scholar, Department of Agronomy, Professor Jayashankar Telangana Agricultural University, Hyderabad, Telangana, India
[2]SMS (Crop Production), Scientist, Krishi Vigyan Kendra, Nellore, ICAR-ATARI Zone-X, India
*Corresponding Author's email: maadhukarb117@gmail.com

Land and water are the basic needs of agriculture and the economic development of any country. The demand for these resources is continuously increasing. Increasing the intensity of cultivation in lands by up to 300% or more is possible, as well as providing water and sunshine throughout the year in countries like India. Hence, rainwater is recognised as a vital resource for life and human/social development. Here are some examples of increasing surface water efficiency *viz*.,

Farm Pond

A farm pond must be located within a farm, drawing the maximum runoff possible. If average annual rainfall varies between 500 and 700 mm, the farm ponds with a 250-500 m3 capacity can be constructed. A depth of 2.5-3.5 may be generally suitable for the ponds. Soils with a low infiltration rate are most appropriate for pond construction. Square ponds are more economical than rectangular ponds. Seepage loss can be controlled by lining application through LDPE/HDPE/Silpaulin plastic film.

Check dams

Small barriers or dams constructed of stone, bagged sand or gravel, or other durable material across a drainage way to reduce erosion in a drainage channel by restricting the velocity of flow in the channel. The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. The maximum drainage area above the check dam shall not exceed two acres. Concrete check dams act as permanent gully control structures (reducing channel gradient to maintain velocities below erosive level).

Percolation pond

Flowing rivulets or big gullies are obstructed and water is ponded. A percolation pond stores rainwater to infiltrate it into the aquifers. Percolation tanks are usually designed for 2.26 to 5.66 M Cu m storage capacities- a minimum height of ponded water column of 3 to 4.5 m above the bed level. A land slope between 3 and 5 percent is ideal for constructing percolation tanks. The improved water level in the wells, lower down the percolation tanks, is used for supplemental irrigation.

Recharge shaft

A recharge shaft is dug manually/drilled using the reverse/direct rotary method. The diameter of the recharge shaft varies from 0.5 to 3 m, depending on the availability of water to be recharged. It is constructed where the shallow aquifer is located below a clayey surface. Recharge shaft is backfilled with boulders, gravel and coarse sand. It should end in more

permeable strata. The depth of the recharge shaft varies from 10 to 15 m below ground level. It should be cleaned regularly by scraping the top layer of sand and refilling it periodically.

Soak pit

It can be built and repaired with locally available materials. The technique is simple to apply for all users. A small land area is required. Low capital costs; low operating costs. Recharging groundwater bodies

Roof-top rainwater harvesting

Rooftop Rain Water Harvesting is the technique through which rainwater is captured from the roof catchments and stored in reservoirs. Harvested rainwater can be stored in a sub-surface groundwater reservoir by adopting artificial recharge techniques to meet the household needs through tank storage. The Main Objective of rooftop rainwater harvesting is to make water available for future use. Capturing and storing rainwater is particularly important in dryland, hilly, urban and coastal areas.

Model

Roof area – 1150 m^2
Number of drain pipes -26
Average rainfall area - 686 mm
Volume of water annually collected- 7 lakh litres
Soil type- Black soil with porosity of almost 15 % and infiltration rate of 5-10 mm/hr
Pit size - 3×3×3
Filter media – Boulders (>60 mm) - 1 feet
Gravel (45-60 mm) - 1 feet
M-sand (<20 mm) - 1 feet

Conclusion

Thus, the water scarcity is specific to a region or location and also by reason and needs. Although India is blessed with adequate water resources, about 55 per cent of the total cultivable land is at the mercy of rainfall. The overall challenge to improve water use efficiency and water productivity in dryland crop production can be contemplated with the above management strategies.