

Rain water harvesting: Solution to water crises

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In fact water resources of India are not much less. The average annual rainfall over the plains of India is 117 cm as against the global average of 70 cm. This is sufficient rainfall to suffice water need of any *Kharif* crop. However, difficulties arise because our rainfall is highly seasonal, for

most part of the country more than 80% of the annual rainfall occurs during the monsoon season, June to September. Over a large part of the country, this season. Worse still, half the annual rainfall occurs in heavy spells of short duration *i.e.* 15 to 30 hours distributed within the rainy season. Most of this water (about 80%) runs off the surface, due to high intensities, with little penetration into the ground. When the runoff occurs it erodes precious soil and also removes important nutrients. For conserving such a peculiar type of rainfall, considerable skill and innovative efforts are required to harvest the rain water efficiently

Rain water harvesting is done by different methods.

- *In-situ* rain water conservation
- Drainage line treatments for ground water recharge and surface storage
- Surface water reservoirs like ponds, dams etc.

The best method of rain water harvesting and conservation is, "In-situ rain water conservation", because in this method the cost of recycling of harvested rain water is less. In other methods like ponds, dam recycling cost is high.

Methods of *in-situ* rain water conservation:

Contour cultivation or across the slope cultivation :

This is the most advisable low cost technology for *in-situ* rainwater conservation, simply one has to change the direction of sowing and other operations. If contour cultivation is not possible one should go for across the slope cultivation.

Vegetative barriers coupled with contour cultivation : In this method vegetative barriers are put along contour key-line at an V. I. of 0.8 to 1 m (H. I. 50 to 60 m). They filter out soil particles from run off water and also act as guide line for different field operations like ploughing, harrowing, sowing etc.

Strip cropping : When field slope is more, in medium to heavy type of soil, simply across the slope cultivation is not sufficient. Under such situation instead of sole cropping strip cropping should be practiced. In this method 12 to 15 lines of usual crop (cotton, tur etc.) followed by 3 to 6 lines of close growing crops (urid, mung etc.) be sown. Since, the density is more in close growing crop strip it reduces runoff and increases recharge.

Conservation tillage : In rainy season during dry spells, if proper interculturing is done, soil porosity increases leading to increase in infiltration rate. While hoeing, if a string is tied to hoe tynes it will form furrows within crop lines which will help in more water conservation as well as drainage in case of heavy rains. In addition deep ploughing should be done once in 3 to 4 years. To check formation of hard pan beneath soil surface and also to make soil porous.

Bunding : Bunds-small earthen barriers are provided in agricultural lands having land slope of 1 to 6 per cent for controlling the length of slope and thereby velocity of runoff flow to avoid rill and gully formations.

Types of bunds and specific site conditions:

Graded bunds: These are constructed in medium to high



rainfall areas having annual rainfall of 600 mm and above those having the crust formation tendency.

Contour bunds: These are constructed in relatively low rainfall areas having annual rainfall less than 600 mm, particularly in the areas having light textured soils.

Vegetative bunds: In heavy soils construction of earthen bunds causes formation of water pool on up side of the bund which creates water logging situation. Under such situation vegetative bunds are preferred. These can be formed by close planting of grasses like vetiver along contours at vertical interval of 0.8 to 1 m.

Bench terraces: In hilly terrain having slope more than 6% to check off and soil loss bench terraces of C.C.T.s should be practiced depending on depth of soil. If depth of soil is sufficient bench terraces are usually constructed for cultivating sloppy areas by converting the land in to series of platforms. These measures are popular in hilly areas.

Continuous Contour Trenches

(C.C.T.): when the depth of soil is less, C.C.T.s should be constructed. Trenches of 30 to 45 cm depth and 45 to 60 cm width be prepared on contours. Spacing between C.C.T.s will depend on plantation selected while digging trenches, upper good soil should be collected separately and used to form mounds in the trench at the spacing depending on plantation.

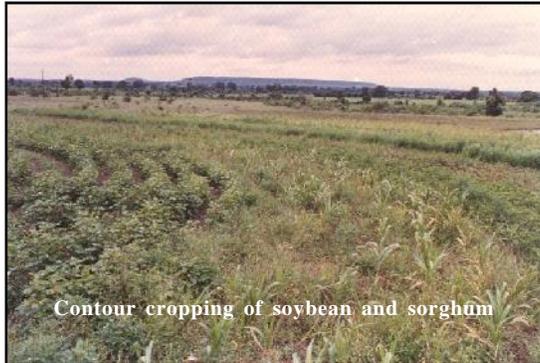
Temporary check dams on small gullies: Temporary check dams like brush wood dam, line check dam, loose bolder structure etc. be constructed across small gullies

in the field to check velocity of runoff water and in filter it. It also helps to deposit soil particles on up side of the dam which reduces grade of the gully.

Recharge pond or dug outs: Dug outs of small sizes be prepared in different pockets of the field depressions or low lying spots to collect excess runoff water and recharge it in the soil.

Practical advantages of rain water harvesting:

- Not subject to pipelines interruption (seismic)
- Quality is controlled by the consumer
- Available even when power is interrupted
- Reduces run off and erosion
- Available even when storms and disaster strike
- Available immediately for fire suppression
- Reduces mosquito breeding grounds (Dengue fever)
- Thermal mass can naturally cool buildings
- Ideal for people on low sodium diets or with health



Contour cropping of soybean and sorghum

concerns (Weakened immunity systems)

Qualitative advantages of rain water harvesting:

- Naturally pure
- Naturally soft (no dissolved minerals)
- Free for those who collect it
- Sustainable
- Free of chlorine and its byproducts
- Free of pesticides and other man made contaminants.

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