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Every Polyhouse Is a Catchment: Turning Roof Rainwater into a Farm Asset

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A polyhouse has a large, clean roof, and every monsoon pours water on it. Most farms let that water run away while they pump costly groundwater for the crop. This article explains how a polyhouse roof can be used as a rainwater catchment, what parts the system needs, and how the water can be used for irrigation and soilless farming. It also explains how IGO Group plans to include this in its polyhouse designs. Examples of rainfall and volume are for illustration only.



Introduction

Polyhouse farming gives high returns per square metre, but it depends on a steady supply of good-quality water. At the same time, the polyhouse roof is a large, smooth surface that collects rainwater very well. Using this roof as a catchment is a simple and low-cost way to add a water source to the farm. The basic rule is easy: one millimetre of rain on one square metre of roof gives one litre of water. So each millimetre of rain on a 1,000 square metre polyhouse gives about 1,000 litres. For this reason, every polyhouse should be planned as a catchment from the design stage, not added later.

Why Water Is the First Concern

A protected crop cannot wait for the next shower. Water supply is therefore the first concern in polyhouse farming. Three problems are common:

- **Falling groundwater.** Many borewells now give less water, or saltier water, than before.
- **Uneven rainfall.** In much of Tamil Nadu, most rain comes in a few months, mainly the northeast monsoon from October to December.
- **Poor water quality.** High salts in borewell water can block drippers and harm plants, especially in hydroponics.

How Roof Harvesting Works

The expected water is found with a standard formula:

V = A \times R \times C

V is the water in litres, A is the roof area in square metres, R is the rainfall in millimetres, and C is a loss factor. For a smooth roof, C is commonly taken as 0.8 to 0.9, and it is safer to plan with the lower value.

For illustration, a 1,000 square metre roof with 800 mm of rain and C of 0.8 gives about 640,000 litres. This is a method example, not a result from any IGO farm.

A good system has five parts:

- **Gutters and downpipes** with screens for leaves and dust.

- **First-flush diverter** to throw away the dirty first rain.
- **Filter** (screen, sand or disc) to protect drippers and pumps.
- **Covered storage** in a tank or lined pond, to stop algae, mosquitoes and evaporation.
- **Overflow to a recharge pit** so extra water goes back to the ground.

Storage size is the key design point. Rain is seasonal, so the tank must be matched to the dry months it has to cover. Roof water alone may not meet the full yearly demand everywhere. It is a strong first source that reduces dependence on the borewell, not always a full replacement.

IGO Group's Approach

IGO Group, through IGO Agritech Farms, works on polyhouses, shade nets, greenhouses, irrigation, hydroponics, vertical farming and integrated farms. Since we design these structures, we can plan water at the design stage.

- **Established:** our work in polyhouse and farm structure development, drip irrigation and soilless systems.
- **Proposed design standard:** a planned roof catchment with gutters, first-flush diverter, filter, covered storage and overflow, included in the project layout and cost from the start.
- **Future possibility:** tank-level sensors and automatic control, using stored rainwater first and the borewell as backup.

We will share measured results from our own sites separately. This article does not claim any figures we have not verified.

Practical Use and Benefits

Rainwater has very low salt content, which is a real advantage. In hydroponics and fertigation, the grower starts with almost clean water and adds only the nutrients the crop needs. The pH should still be checked. Where borewell water is salty, blending it with stored rainwater can bring the salt level down, but the ratio must be decided by testing. On integrated farms, stored water can also top up fish tanks. Water for animal drinking needs extra treatment and testing first.

The benefits are simple:

- Lower dependence on groundwater and lower pumping cost.
- Cleaner water, fewer blocked drippers and healthier plants.
- Less runoff and erosion, and more water returned to the aquifer.
- A steadier water supply during dry spells.

The saving depends on local rainfall, roof area, storage size and the cost of water, so each farmer should work out the numbers for their own site. Simple habits keep the system working: clean gutters before each monsoon, check the diverter, keep tanks covered, and test the water now and then.

Conclusion

Every polyhouse has a roof, and every monsoon brings water to it. Catching, cleaning, storing and using this water carefully can reduce the load on the borewell. It will not solve every water problem, but it is a practical and affordable step for modern farms. Our responsibility at IGO Group is to make such steps simple and honest, so farmers can adopt them with confidence. If each farm gives back to the water cycle as much as it takes, agriculture can be profitable for the farmer and sustainable for the next generation.