The Reality of Polyhouse Adoption in India: Overcoming Capital and Skill Barriers

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India has roughly twenty-five thousand hectares under polyhouses, greenhouses, shade nets and low tunnels. Vegetable and flower cultivation in this country covers more than sixteen million hectares. Less than one per cent. That single number is both the promise and the problem of protected cultivation in India.

For a country where most farmers work less than two hectares, where the monsoon is harder to predict every year, and where prices punish the careful planner more than the lucky one, protected cultivation should be one of the most powerful answers we have. It often is. But adoption has been uneven, and the reasons are worth understanding.

WHAT IT ACTUALLY IS

Protected cultivation simply means growing crops inside a structure that controls the conditions. A basic polyhouse costs around Rs.800 to Rs.1,200 per square metre. A fully climate-controlled greenhouse will run several multiples of that. The aim, across the range, is the same. Keep the plant in a predictable environment so that it grows faster, more uniformly, and with fewer losses.

THE INCOME DRIVERS

Three things change when you move from the open field to a structure.

Yields go up. A capsicum grower in Nashik who used to harvest 8 to 10 tonnes per acre in the open field can routinely get 35 to 40 tonnes under a polyhouse. The same is true for tomato, cucumber, coloured peppers and most cut flowers. The harvest window also stretches, which helps cash flow.

Quality goes up. The produce is uniform, less bruised, and more attractive on the shelf. Organised retail, exporters and modern restaurant chains pay a premium for that uniformity. Add residue-free credentials and proper IPM records, and you are in a different conversation with the buyer altogether.

You can grow off-season. This is often where the real income comes from. A tomato that sells for Rs.15 a kilo in February can fetch Rs.40 in July if you can produce it. A strawberry farmer near Mahabaleshwar who extends his crop into May is selling into an empty market.

Water and pesticide use both come down. Drip and fertigation, which go hand in hand with protected cultivation, cut water consumption by 40 to 60% compared to flood irrigation. In states where groundwater is being mined faster than it recharges, that is not a side benefit. Insect-proof nets combined with proper IPM bring the pesticide bill down by 60 to 80 per cent.

WHY ADOPTION IS STILL SLOW

The reasons are familiar to anyone who has spent time in this sector.

Capital is the first one. A 1,000 square metre polyhouse with drip and fertigation costs Rs.10 to Rs.14 lakh on the ground. MIDH offers a 50 per cent subsidy, and 65 per cent

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in the North-East and the hilly states, but the paperwork is heavy and the approval cycle slow. Many farmers who would have benefited never get to the application.

Skill is the second. A polyhouse is not a field. Temperature has to be monitored, fertigation scheduled, pests scouted every week, and crop rotation planned six months ahead. A farmer who walks into a polyhouse without training will struggle in the first crop and often gives up before the second.

Market linkage is the third, and probably the most important. Premium produce is only premium if someone pays for it. Too many polyhouses have been built without anyone asking who will buy the output in the off-month, the rainy week, the festival glut. FPOs, contract farming and direct-to-consumer platforms are filling that gap, but the picture is still patchy.

WHAT NEEDS TO CHANGE

My honest view is that we have done enough with subsidies. The next phase will not be solved by writing bigger cheques. What is needed instead is an ecosystem. Clusters that share grading, packing and cold chain. Agronomists embedded in those clusters. Good planting material. Reliable inputs. Above all, assured markets with predictable prices. Where these have come together, the results show. The strawberry belt around Mahabaleshwar, the rose cluster of Hosur, and the capsicum farms around Pune were not built by subsidy alone. They are the product of patient, unrushed work over many years.

The other piece is manufacturing. If polyhouse components, plastic film, GI structures and fertigation kits were made at scale within India, capital costs would come down by at least a fifth. Make in India and the PLI framework have a clear application here that we have not yet exploited.

WHAT COMES NEXT

The next ten years will look very different. IoT sensors that read temperature, humidity, EC and pH now sell for a few thousand rupees each. Smartphone apps identify pests from a photograph. Within five to seven years, the kind of precision that exists today only in large export greenhouses will be within reach of a one-acre farmer near her own village.

Protected cultivation is not magic. Used with care, it can lift a small farmer's income two or three times in a handful of crop cycles. Used carelessly, it puts her into debt. The economics are sound and the buyers are there. What still has to happen is the slow work of building the system around the structure. We have built thousands of polyhouses already. The real work now is to make sure each one earns what it can.