



During Climate Change, Farmers Should Choose 'Risk', Not Just 'Crops'!

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Agriculture in Western Maharashtra is diverse in terms of rainfall, soil, irrigation, and cropping patterns. Some parts of Kolhapur and Satara face challenges such as excessive rainfall, floods, and poor drainage, while Sangli, Solapur, and rain-shadow regions experience breaks in rainfall and water scarcity. In addition, rising temperatures, changes in rainfall distribution, and extreme weather events are increasing uncertainty in agriculture. Climate studies in Maharashtra have also clearly indicated trends of rising temperatures and local variations in rainfall. Climate change does not affect only crop production. It also affects irrigation costs, pests and diseases, product quality, labour, and market prices. Therefore, while selecting a crop, the question "Which crop will give higher profit?" is no longer sufficient. Along with this, the question "Which crop will cause comparatively less loss under adverse weather conditions?" has become important. This can be referred to as Risk-based Crop Planning.

Changes in Temperature and Rainfall: Increasing Production Risk

If there is an adverse change in temperature during the germination, flowering, pollination, and grain-filling stages of a crop, it can have a major impact on production. In long-duration crops such as sugarcane, an increase in temperature may increase evapotranspiration and water requirements. In rice, pulses, and oilseeds, heat and water stress during sensitive stages can reduce production. In fruit crops, irregular temperature conditions can affect not only production but also quality and market value. In the case of rainfall, it can be misleading to look only at the total amount of rainfall. Lack of rainfall at the time of sowing, a dry spell after sowing, heavy rainfall within a short period, or unseasonal rainfall during harvesting can cause crop losses. Therefore, rather than asking "How much rain falls?", the more important question is "When does the rain fall and with what intensity?" The impact of climate varies from place to place in Western Maharashtra. In high-rainfall areas, drainage needs to be prioritized, whereas in low-rainfall areas, water storage and irrigation efficiency need greater attention. Therefore, a uniform cropping pattern will not be suitable for every region.

Risk of Pests, Diseases, and Production Costs

Changes in temperature and humidity can alter the rate of growth of certain pests and the incidence of diseases. Therefore, instead of spraying pesticides only after pests appear, it is more useful to estimate the possibility of pest incidence by using weather forecasts, crop growth stages, and field observations. This can help reduce unnecessary spraying and

production costs. Climate risk is not limited to a reduction in production. If additional irrigation is required due to a break in rainfall, the cost of electricity, diesel, and labour increases. When production declines, the cost of production per unit increases further. If excessive rainfall reduces product quality, the market price may also decline. Therefore, while selecting crops, income stability is more important than the maximum possible production.

Short-Duration and Climate-Resilient Crops

When the distribution of rainfall becomes uncertain, short-duration crops can provide greater flexibility to farmers. The crop can be harvested on time by utilizing the available soil moisture, allowing farmers to make decisions for the next season. However, a short-duration crop does not automatically mean low risk. Although vegetables have a short production period, their market prices can fluctuate significantly. Therefore, while selecting a crop, it is necessary to consider crop duration, water requirement, climate resilience, production cost, and market conditions together. The use of varieties that are comparatively tolerant to drought, heat, or irregular rainfall is also important.

Crop Diversification: A Simple Way to Distribute Risk

If the entire farm income depends on a single crop, a single climatic event can cause major economic losses. By including different crops, the loss of one crop can be partially compensated by income from another crop. Therefore, crop diversification is an effective tool for climate risk management. This does not mean completely abandoning sugarcane or rice. Depending on available water, soil, drainage, and market conditions, a portion of the farm area can be allocated to pulses, oilseeds, cereals, vegetables, or fodder crops. In low-water regions, crops such as sorghum, pearl millet, pigeon pea, and chickpea can be considered; whereas in areas receiving excessive rainfall, proper drainage and crops suitable for local conditions are essential.

Water Conservation and Crop Insurance: Two Tools for Risk Management

In the era of climate change, water management does not simply mean storing water. Both the safe drainage of excess water during heavy rainfall and the efficient use of available water during breaks in rainfall are necessary. Farm ponds, field bunding, drainage-line treatment, soil-moisture conservation, and drip and sprinkler irrigation can be used according to local conditions. Crop insurance is also an important component of financial risk management. However, insurance does not prevent losses; it reduces the financial shock after a loss occurs. Therefore, appropriate crop selection + water management + diversification + insurance should be viewed as complementary measures.

Risk-Based Crop Planning: From Crop Selection to Risk Selection

In future crop planning, along with the idea of selecting a “high-profit crop,” the concept of selecting a “risk-adjusted profitable crop” will become important. Although a crop may provide high income under normal conditions, if it is highly sensitive to rainfall, temperature, or excessive rainfall, it may cause significant losses in an adverse year. A crop that provides comparatively lower income but has stable production may, under certain circumstances, be a safer option. For this purpose, it is necessary to consider the soil, rainfall, drainage, irrigation, breaks in rainfall, temperature, crop duration, pests and diseases, production costs, and market conditions of each farm.

Conclusion: Not ‘Maximum Production,’ but ‘Maximum Resilience’

Successful farming in the era of climate change does not simply mean achieving maximum production in a good year. It is more important to keep fluctuations in income low under good, normal, and adverse conditions alike.

Therefore, the formula for the future of agriculture is clear—

“Identify the risk before selecting the crop; select the crop after identifying the risk.”

Farmers now need to think not only about “What should I grow?” but also about “How much risk should I accept, and how can I reduce it?” This approach can make agriculture in Western Maharashtra more climate-smart, economically secure, and sustainable.

References

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