



POPULAR ARTICLE

Drought is not the end alternative crops are the path to income under El Niño Conditions in Telangana

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Intricacies of the topic

Agriculture in Telangana is largely dependent on monsoon rainfall, with a significant proportion of cultivated land being rainfed. Variations in rainfall distribution and intensity directly affect crop productivity and farm income. In recent years, climate change has increased the frequency and intensity of extreme weather events, including El Niño, which poses a major challenge to agricultural sustainability. El Niño is often associated with below-normal rainfall, prolonged dry spells, higher temperatures, and moisture stress conditions in many parts of India. Under such circumstances, farmers relying solely on water-intensive crops such as rice and cotton are exposed to greater production risks. Therefore, crop diversification through the inclusion of horticultural crops, millets, pulses, and oilseeds has become an important adaptation strategy for enhancing farm resilience and ensuring stable income.

Understanding El Niño and its agricultural implications

El Niño is a climatic phenomenon characterized by the warming of sea surface temperatures in the central and eastern Pacific. The major benefits of crop diversification include:

Ocean. This warming alters atmospheric circulation patterns and often weakens the southwest monsoon over the Indian subcontinent. Studies indicate that El Niño years may result in a 5–15 percent reduction in seasonal rainfall in several regions of India. In Telangana, the impact is often manifested through delayed monsoon onset, uneven rainfall distribution, reduced soil moisture, and increased evapotranspiration losses. Such conditions adversely affect crop establishment, growth, and yield, particularly in rainfed farming systems.

Need for crop diversification in Telangana

Rice and cotton dominate the cropping pattern in Telangana. While these crops contribute significantly to agricultural income, they also require substantial quantities of water. During drought years or monsoon failures, farmers often face severe yield losses and financial stress.

Crop diversification helps in spreading production risk and improving resource-use efficiency. Integrating drought-tolerant crops and horticultural enterprises can provide multiple sources of income while reducing dependence on a single crop.

- Reduced vulnerability to climatic risks.
- Enhanced farm income stability.

- Improved soil health and biodiversity.
- Better utilization of available water resources.
- Increased nutritional security for farm families.
- Greater market opportunities through diversified produce.

Fig 1: Suitable horticultural crops for Telangana



Suitable horticultural crops for Telangana

Horticultural crops generally provide higher returns per unit area and can be cultivated efficiently with micro-irrigation systems.



Vegetable crops

Okra (*Abelmoschus esculentus*): Okra is a short-duration crop that begins harvesting within 45–50 days after sowing. It requires comparatively less water and enjoys year-round market demand.

Cluster Bean (*Cyamopsis tetragonoloba*): Cluster bean is drought tolerant and well suited to semi-arid conditions. It serves both as a vegetable crop and as a source of fodder.

Bitter gourd, ridge gourd and ivy gourd: These cucurbitaceous vegetables perform well under limited irrigation conditions and fetch attractive market prices, especially during periods of reduced supply.

Chilli: Chilli is an economically important crop in Telangana. With proper nutrient and water management, farmers can obtain good yields and profitable returns even under moderate water availability.

Fruit crops for long-term income generation

Papaya: Papaya is one of the most remunerative fruit crops suitable for drought-prone regions when cultivated under drip irrigation. Commercial harvest begins within 8–10 months after planting, with yields ranging from 40 to 60 tonnes per hectare.

Guava: Guava is highly adaptable to diverse soil conditions and requires relatively less water. It is known for its regular bearing habit and strong market demand.

Custard Apple: Custard apple is naturally adapted to dryland ecosystems and performs well in marginal soils with minimal irrigation support. It offers a sustainable option for resource-poor farmers.

Pomegranate: Pomegranate is a high-value fruit crop with excellent drought tolerance and export potential. Adoption of scientific production practices can significantly enhance profitability.



Alternative field crops for water-limited conditions

Farmers who are unable to adopt horticultural crops may consider drought-resilient field crops.

- **Millets**

Millets are highly nutritious, climate-resilient crops that require less water than rice and maize.

Recommended millets include:

Pulses

- Sorghum (Jowar)
- Pearl millet (Bajra)
- Finger millet (Ragi)
- Foxtail millet
- Little millet
- Kodo millet

These crops mature within 60–100 days and are increasingly demanded due to growing consumer awareness regarding health and nutrition.

Pulses improve soil fertility through biological nitrogen fixation and provide additional income.

Suitable pulse crops include:

- Green gram
- Black gram
- Pigeon Pea
- Chickpea

Oilseed crops

Oilseeds offer another viable alternative under moisture stress conditions.

Recommended crops include:

- Sesame
- Castor
- Sunflower

These crops require relatively less water and possess good market potential.



Efficient water management practices

Water conservation is critical under El Niño-induced drought conditions.

Drip irrigation: Drip irrigation delivers water directly to the root zone, improving water-use efficiency and reducing losses through evaporation and runoff. Water savings of 40–60 percent can be achieved compared with conventional irrigation methods.

Mulching: Organic and plastic mulches help conserve soil moisture, suppress weed

growth, moderate soil temperature, and improve crop productivity.

Rainwater harvesting: Farm ponds, check dams, percolation tanks, and field bunding can effectively capture and store rainwater for supplemental irrigation during dry periods.

Improving soil health through organic inputs: Healthy soils possess greater water-holding capacity and resilience against drought stress.



Farmers are encouraged to apply:

- Farmyard manure (FYM)
- Vermicompost
- Jeevamrutham
- Green manures
- Crop residues

The regular incorporation of organic matter enhances soil structure, microbial activity, nutrient availability, and moisture retention.

Integrated pest and disease management

Dry weather conditions often favor the multiplication of sucking pests such as thrips, whiteflies, aphids, and mites.

The following preventive measures are recommended:

- Installation of 8–10 yellow sticky traps per acre.
- Installation of 8–10 blue sticky traps per acre.
- Use of pheromone traps for monitoring key insect pests.
- Regular field scouting and timely intervention.
- Adoption of integrated pest management (IPM) practices.

Recommendations for farmers

To minimize risks during El Niño years, farmers should:

- Avoid cultivating a single crop over the entire farm area.

- Allocate at least 30–40 percent of the cultivated area to alternative crops.
- Adopt drip irrigation and mulching technologies.
- Select drought-tolerant varieties and short-duration crops.
- Strengthen soil health through organic amendments.
- Utilize weather advisories and crop insurance schemes.
- Follow integrated nutrient and pest management practices.

Conclusion

Climate variability and recurring El Niño events are likely to become increasingly significant challenges for agriculture in Telangana. Sustainable farming under such conditions requires a shift from monocropping to diversified production systems. Integrating horticultural crops, millets, pulses, and oilseeds with efficient water management practices can substantially reduce production risks and improve farm profitability. Crop diversification is not merely an adaptation strategy for drought years; it is a pathway towards resilient, sustainable, and climate-smart agriculture. By adopting diversified farming systems, Telangana farmers can enhance income security, conserve natural resources, and build long-term resilience against climate uncertainties.

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