



Pomegranate-based horticultural diversification for higher and more stable income: A farmer interest group experience in Kachchh

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Abstract

In the saline and arid environment of Kachchh, heavy reliance on annual rainfed crops exposes farm households to high production and market risks. To achieve sustainable income growth, a farmers-oriented groups were supported by ICAR-CAZRI KVK, Bhuj, diversified into perennial horticultural enterprises, with pomegranate emerging as the most promising option. Through a coordinated sequence of on-farm trials (OFTs), frontline demonstrations (FLDs), and specialized training programs, improved pomegranate production technology was adopted by about 20% of the farmers. These coordinated activities successfully expanded knowledge-sharing and benefited collectively around 751 farmers across the region. This horticultural transition drove an approximate 21% increase in net returns—surging from ₹5,74,000 to ₹6,92,600 per hectare—while establishing a stable income stream that mitigated rainfall variability risks. Furthermore, integrating orchards with intercrops, vegetables, and livestock improved land and water use efficiency, proving that horticulture-based diversification grounded in local testing and participatory guidance offers a robust model for arid zone resilience.

Keywords: Pomegranate, horticulture, farmer groups, income, arid farming, climate resilience, crop diversification

Introduction

Background and Rationale

Agriculture in Kachchh faces persistent biophysical challenges, including saline and alkaline soils, saline water, low organic carbon, and highly erratic rainfall. In this arid setting, heavy reliance on annual rainfed crops exposes farm households to severe production and market risks. Recognizing that long-term income stability required moving beyond annual cycles, the farmers Group supported by ICAR-CAZRI KVK, Bhuj, pursued diversification into perennial horticultural enterprises. Pomegranate emerged as the most viable option due to its higher market value, better scientific adaptability, and capacity to generate multi-year revenue streams.

Horticultural Adoption within the Group

Among the fruit options, pomegranate became the dominant horticultural crop, adopted by eight of the twelve group members. Other fruit enterprises were also established, including mango (three farmers), banana, papaya, and date palm (one farmer each). To maximize success, the high-performance pomegranate variety Bhagwa was actively promoted through KVK's technical interventions in the Kachchh area.

Technical Support, Coordinated Activities, and Scientific Interpretation

The KVK Bhuj provided comprehensive technical backing through a structured and coordinated sequence of on-farm trials (OFTs), frontline demonstrations (FLDs), and specialized training programs based on the farmers demands on scientific cultivation of Pomegranate.

- **Collaborative Extension Outreach:** Through these coordinated activities, knowledge transfer went beyond core FIG members, collectively benefiting around 751

farmers who witnessed the scientific approaches firsthand.

- **Customized Orchard Management:** Training focused on scientific orchard management, precise nutrient application, micro-water management, and plant protection tailored specifically to saline and low-organic-carbon soils.
- **Participatory Validation:** Farmers observed the performance of recommended practices directly under their own field conditions before committing to wide-scale adoption.
- **Scientific Interpretation:** Perennial woody crops like pomegranate develop deep root architectures that bypass shallow upper-soil salinity layers, while Bhagwa displays strong physiological resilience under water stress. Micro-irrigation prevents localized salt-ring accumulation around root zones, and balanced secondary macronutrient applications (Ca) and (Mg) counteract sodium dominance in sodic soils.

Economic Impact and Data Interpretation

- **Adoption Level:** Pomegranate production technology was successfully adopted by approximately 60% of the farmers.
- **Income Effect:** Net returns escalated from ₹5,74,000 to ₹6,92,600 per hectare, marking an approximate 21% increase.
- **Risk Mitigation:** Because of its perennial nature, the crop provided a reliable, stable income stream that insulated households against seasonal rainfall variability.

Integration with the Farming System

Pomegranate orchards were not managed in isolation; they were intentionally integrated into the broader farming system:

- **Intercropping & Vegetables:** During the non-bearing establishment phase, orchards were intercropped with short-duration vegetables to generate interim cash flow and optimize land equivalent ratios.
- **Livestock Complementarity:** Horticultural enterprises were complemented by livestock maintenance, which supplied vital organic manure back to the orchards while improving overall land and water use efficiency.

Broader Outcomes

Beyond immediate financial gains, the adoption of advanced pomegranate technology yielded several secondary benefits:

- **Improved Resource Management:** Farmers adopted sophisticated soil and water conservation practices suited to arid conditions.
- **Heightened Confidence:** Visible success among early adopters built strong peer confidence and encouraged further expansion of perennial horticulture within the group.

Conclusion and Future Recommendations

Conclusion

Pomegranate cultivation has evolved into a cornerstone of income diversification for the Farmer Interest Group. Backed by structured variety introduction, advanced production technologies, and continuous technical guidance through coordinated KVK Bhuj activities reaching around 751 farmers, the enterprise delivered profound results:

- **Quantifiable Financial Growth:** Net returns escalated significantly from ₹5,74,000 to ₹6,92,600 per hectare, representing an approximate 21% increase.
- **Risk Resilience:** The establishment of deep-rooted perennial systems successfully mitigated seasonal rainfall and market volatility risks associated with traditional annual cropping.
- **Holistic Integration:** Combining fruit orchards with intercropping and livestock enterprises maximized land, water, and organic nutrient-use efficiency across local holdings.

Recommendations for Future References

- **Scale-Out via Cluster Models:** Future arid-zone development programs should replicate this FIG framework to expand cluster-based perennial horticulture across wider geographic talukas.
- **Institutionalized Micro-Irrigation Support:** Future policy frameworks should couple horticulture promotion with mandatory drip fertigation subsidies to effectively manage saline-alkaline water tables and prevent root-zone salt accumulation.

- **Expanded Capacity Building:** Future initiatives should institutionalize multi-stakeholder training programs to bridge technical knowledge gaps, ensuring higher adoption baselines among a greater volume of farming communities.

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