(IJRSSH) 2024, Vol. No. 14, Issue No. II, Apr-Jun **e-ISSN: 2249-4642 p-ISSN: 2454-4671**

Role of NGOs in Horticulture Development in Karnataka

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DOI:10.37648/ijrssh.v14i02.005

[1] *Received: 21 January 2024; Accepted: 08 April 2024; Published: 05 May 2024*

ABSTRACT

Horticulture has emerged as a key component of agricultural transformation in Karnataka, offering promising avenues for income diversification, employment generation, nutritional improvement, and environmental sustainability. While government schemes have laid the foundation for horticulture development, the involvement of Non-Governmental Organizations (NGOs) has proven instrumental in deepening outreach, enhancing community participation, and ensuring the effective implementation of grassroots interventions. This paper examines the multifaceted role of NGOs in promoting horticulture in Karnataka, with a focus on capacity building, organic farming, market linkages, conservation of indigenous varieties, and infrastructure support.

Using field observations from BAIF Development Research Foundation's interventions in Koppal and Gadag districts, the paper presents evidence on the effectiveness of the WADI model in improving livelihoods and nutritional outcomes among small and marginal farmers. Graphical analyses highlight trends in income generation, intercropping practices, training reach, and livelihood diversification. The findings demonstrate that NGO-led models, when supported through convergence with public programs and community engagement, can significantly enhance the resilience and inclusivity of horticulture-based development. The study concludes with policy recommendations to strengthen NGO-government collaboration for scaling sustainable horticulture practices across rain-fed and tribal regions.

Keywords: *NGOs; Horticulture; Karnataka; WADI Model; Livelihoods; Organic Farming; Rural Development*

Introduction

Horticulture has emerged as a vital component of agricultural development in Karnataka, contributing significantly to rural income generation, employment opportunities, nutritional security, and export potential. The state's diverse agro-climatic zones provide a favorable environment for cultivating a wide variety of horticultural crops, including fruits, vegetables, spices, medicinal plants, and floriculture. Recognizing the potential of horticulture in transforming rural livelihoods, the Government of Karnataka has implemented various schemes and policies to promote sustainable horticultural practices.

Alongside governmental efforts, **Non-Governmental Organizations (NGOs)** have played an increasingly important role in advancing horticulture development across the state. NGOs bring grassroots knowledge, community trust, and a participatory approach to development, enabling them to work effectively with small and marginal farmers, women, and tribal communities. Their interventions span a wide range of activities, including capacity building, training in improved cultivation techniques, facilitating market linkages, promoting organic farming, conserving indigenous varieties, and supporting micro-enterprise development.

[1] How to cite the article: Bammanal S (May, 2024); Role of NGOs in Horticulture Development in Karnataka; *International Journal of Research in Social Sciences and Humanities;* Vol 14, Issue 2; 53-58; DOI: http://doi.org/10.37648/ijrssh.v14i02.006

In Karnataka, several NGOs have collaborated with government departments, research institutions, and private stakeholders to implement innovative horticulture-based livelihood models, particularly in underserved and rain-fed regions. Their role has become crucial in bridging the gap between policy and practice, ensuring that horticultural benefits reach the most vulnerable sections of the rural population.

This article explores the multifaceted contributions of NGOs to horticulture development in Karnataka, highlighting successful case studies, key challenges, and opportunities for strengthening partnerships between the state and civil society in promoting inclusive and sustainable horticultural growth.

2. Background: Horticulture in Karnataka

Karnataka is one of the leading horticulture-producing states in India, contributing significantly to the national output of fruits, vegetables, spices, flowers, and plantation crops. The state benefits from 10 agro-climatic zones and diversified cropping patterns. With over 20% of the gross cropped area under horticulture, the sector accounts for a substantial portion of agricultural GDP and rural employment.

Government initiatives like the **State Horticulture Mission**, **Rashtriya Krishi Vikas Yojana (RKVY)**, **Paramparagat Krishi Vikas Yojana (PKVY)**, and **National Horticulture Board** schemes have promoted area expansion, technology adoption, post-harvest management, and market access.

However, challenges such as low access to modern techniques, poor extension services, weak farmer-producer linkages, and inadequate infrastructure have necessitated the involvement of NGOs in filling critical gaps and mobilizing community-based solutions.

3. Role of NGOs in Horticulture Development

a. Capacity Building and Training

NGOs conduct training programs on sustainable farming practices, integrated pest management, organic farming, post-harvest techniques, and crop diversification. They also provide on-field demonstrations and exposure visits.

b. Promotion of Organic and Sustainable Practices

Many NGOs have introduced organic farming in horticulture, enabling farmers to reduce chemical inputs and fetch better prices through certification and branding.

c. Market Linkages and Livelihood Support

NGOs facilitate the formation of farmer producer organizations (FPOs), self-help groups (SHGs), and cooperatives that improve bargaining power and market access. Some have also helped in developing horticulture-based micro-enterprises such as processing, nursery management, and packaging.

d. Conservation of Indigenous Varieties

In tribal and rain-fed areas, NGOs have promoted the cultivation and preservation of traditional varieties of fruits and spices that are climate-resilient and nutritionally rich.

e. Infrastructure and Technology Support

Through convergence with CSR funds and government schemes, NGOs help create cold storage, drip irrigation, community nurseries, and composting units.

4. Review of Literature

The growing recognition of horticulture as a tool for rural transformation has led to extensive research on its development potential, particularly in semi-arid regions. Studies such as those by Singh and Sharma (2014) and Reddy et al. (2016) have underscored the role of horticulture in enhancing agricultural diversification, improving household nutrition, and creating non-farm rural employment. These findings are particularly relevant for states like Karnataka, which possess diverse agro-climatic conditions and a sizable population of small and marginal farmers.

The involvement of Non-Governmental Organizations (NGOs) in agricultural development has been a subject of interest in development literature. Farrington and Bebbington (1993) emphasized the comparative advantage of NGOs in community mobilization, participatory planning, and last-mile delivery of extension services. Similarly, Deshpande and Joshi (2009) observed that NGOs often complement state efforts by customizing solutions for local needs, especially in tribal and backward regions where state machinery is thinly spread.

In the context of horticulture, studies by the National Institute of Agricultural Extension Management (MANAGE, 2017) highlighted how NGO-led interventions in organic farming, nursery development, and FPO formation have contributed to increased productivity and improved market access. The success of the WADI model—implemented by organizations such as BAIF—has been widely documented (ICAR, 2015; BAIF Annual Reports), especially in dryland areas, for its integrated approach combining orchard development, soil conservation, and community capacity building.

However, challenges remain. Literature from the Indian Council for Research on International Economic Relations (ICRIER, 2018) notes that fragmented landholdings, poor infrastructure, and limited access to high-value markets often inhibit the scalability of such NGO-led models. Moreover, the lack of institutional convergence and sustainable financing mechanisms can impede long-term impact.

Overall, existing literature supports the hypothesis that NGOs play a critical bridging role in horticulture development, especially where state-led interventions alone are insufficient. This paper builds on such insights and contributes empirical evidence from Karnataka's rain-fed districts, where community-based horticulture models have demonstrated promising outcomes.

5. Observations and Findings:

1. **WADI Model Implementation:**
    - The WADI (small orchard) approach was introduced among **marginal tribal and smallholder farmers** with land holdings of 1–2 acres.
    - Each beneficiary developed a one-acre fruit orchard, primarily with **mango, guava, and custard apple**, combined with border plantations like **gliricidia** for windbreak and fodder.
2. **Soil and Water Conservation:**
    - Field bunding, trenching, and **farm ponds** were constructed through community labor under MGNREGA convergence.
    - The region, prone to drought, benefited from **micro-irrigation units** (drip systems), installed with partial NGO and government subsidy.
3. **Training and Capacity Building:**
    - Farmers received regular training on **pit preparation, pest management, pruning, mulching**, and **organic input preparation** (jeevamrutha, panchagavya).
    - SHG women groups also received orientation on nutrition gardening and orchard maintenance.
4. **Income Diversification and Intercropping:**
    - In the first 2–3 years, when trees were immature, farmers practiced **intercropping with legumes, vegetables, and millets**, improving food security.
    - Seasonal sale of leafy greens and vegetables supplemented income.

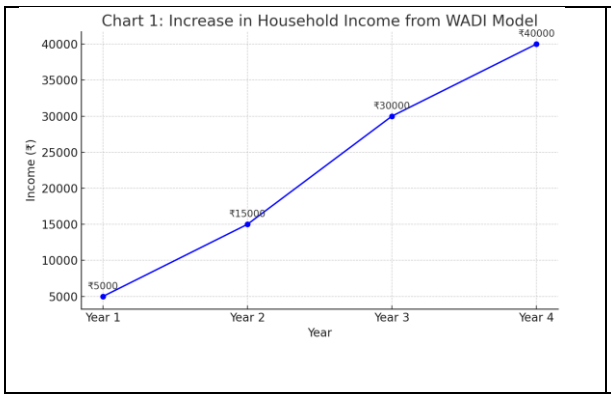
5. **Community Engagement and Ownership:**
    - Village-level committees formed for collective problem-solving, monitoring plantation survival rates, and sharing tools/resources.
    - A strong sense of ownership and pride was observed among farmers, especially in comparison to earlier rain-fed monocropping.
6. **Livelihood and Nutritional Outcomes:**
    - Households reported increased annual income (₹20,000–₹40,000 from orchard and intercropping combined) after 3–4 years.
    - Women expressed improved household nutrition due to access to fruits and kitchen gardens.
7. **Challenges Noted:**
    - Initial years required high commitment and labor—some dropout cases were reported due to migration pressures.
    - Access to nearby markets was difficult; NGO-supported linkages with FPOs and local vendors helped partially.

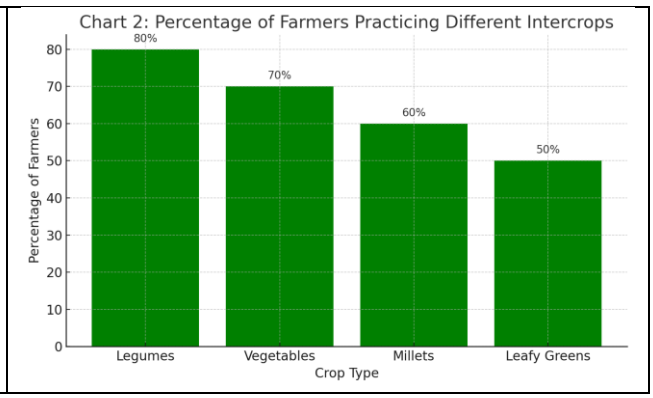
Voices from the Field:

- *"Earlier we used to wait for rain and grow jowar. Now with the orchard, we earn even in dry years."* — **Mallappa, Koppal**
- *"We use cow dung and jeevamrutha; no chemicals. My children eat mango from our own trees."* — **Laxmi, SHG member, Gadag**

Chart 1: Increase in Household Income from WADI Model: This chart illustrates the progressive rise in household income over a four-year period following the implementation of the WADI model. Starting from a modest ₹5,000 in the first year—mainly from intercrops and limited fruit yields—the income increases sharply to ₹15,000 in the second year and reaches up to ₹40,000 by the fourth year. This reflects the gradual maturation of fruit-bearing orchards, along with consistent support in training, soil conservation, and organic farming practices. The trend underscores the long-gestation but high-reward nature of the WADI model, making it a viable strategy for livelihood diversification in semi-arid areas.

Chart 2: Percentage of Farmers Practicing Different Intercrops: During the initial years of orchard development, intercropping served as a crucial strategy to ensure food security and income generation. The chart shows that 80% of farmers adopted legumes such as tur and green gram, while 70% cultivated vegetables like brinjal and tomato. Millets and leafy greens were also commonly grown, with adoption rates of 60% and 50% respectively. This diversification not only optimized land use during the orchard's gestation phase but also enhanced household nutrition and resilience to climatic variability.





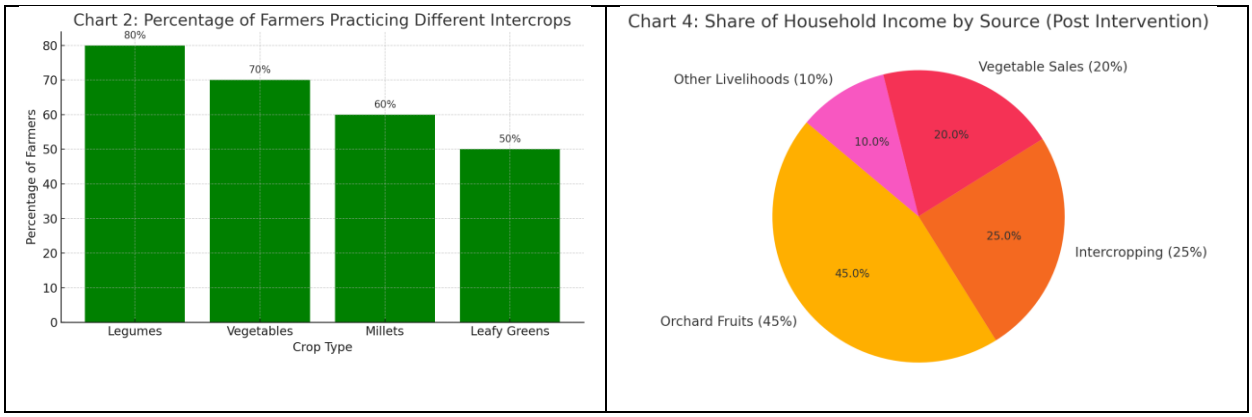


Chart 3: Number of Farmers Trained in Key Topics: Capacity building played a central role in the success of horticulture interventions. The highest participation was seen in training on pit preparation and pruning techniques (120 farmers), followed closely by pest management (110) and organic input preparation methods like jeevamrutha and panchagavya (100). Nutrition gardening, largely targeted at SHG women, also engaged 90 participants. These trainings enhanced farmers' technical know-how, encouraged adoption of sustainable practices, and fostered a sense of ownership in orchard maintenance and productivity.

Chart 4: Share of Household Income by Source (Post Intervention): This pie chart highlights the diversification of income sources after the WADI intervention. Orchard fruits contributed the largest share at 45%, indicating the long-term benefits of horticulture. Intercropping provided 25% of household income, especially valuable in the early years. Vegetable sales accounted for 20%, supported by SHG-managed kitchen gardens and market linkages facilitated by NGOs. Other sources—including labor, livestock, and seasonal work—made up the remaining 10%. This diversification contributed significantly to livelihood security and reduced dependence on rain-fed monocropping.

5. Conclusion

The experience of Karnataka highlights the critical role that Non-Governmental Organizations (NGOs) can play in transforming the horticulture sector into a driver of inclusive rural development. By working closely with marginalized communities, NGOs have effectively introduced sustainable and diversified farming practices, strengthened community-based institutions like SHGs and FPOs, and filled key gaps in extension services and infrastructure. Interventions such as the WADI model demonstrate that even in semi-arid and resource-constrained regions, horticulture can offer resilient and income-enhancing livelihood opportunities when supported by long-term engagement, technical training, and participatory planning.

The field observations from districts like Koppal and Gadag illustrate how integrated models—combining orchard development with soil and water conservation, intercropping, and nutrition-focused home gardening—can significantly improve both income and food security. NGOs have also played a vital role in promoting organic farming, conserving indigenous crop varieties, and facilitating access to markets, thus reinforcing ecological sustainability alongside economic gains.

However, the success of such models depends on sustained support, convergence with government schemes, and capacity building at the grassroots. Challenges such as market access, labor migration, and initial adoption hurdles must be addressed through stronger state-NGO partnerships, targeted infrastructure investments, and scalable livelihood models.

Going forward, policy frameworks should recognize and institutionalize the role of NGOs as co-actors in agricultural development. Leveraging their local networks and social capital can enhance the reach and impact of public programs, ensuring that horticulture not only contributes to GDP growth but also uplifts the most vulnerable rural households.

Strengthening such collaborations holds the key to building an inclusive, sustainable, and farmer-centered horticultural economy in Karnataka.

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