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### A strategic initiative for enhancing nutritional security through Nutri-garden

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#### Abstract

Nutri-gardens have been recognized as an effective strategy to improve household food security and nutritional status. This review paper synthesizes findings from a range of published studies on the role and impact of kitchen gardens in various socio-economic and geographic contexts. The analysis focuses on the benefits of Nutri gardens in terms of enhancing dietary diversity, promoting sustainable agricultural practices, and contributing to economic resilience among households. The review highlights several key outcomes associated with kitchen gardens: increased availability of fresh and diverse produce, improved micronutrient intake, and positive health outcomes. Additionally, kitchen gardens have been shown to foster environmental stewardship through organic farming practices and efficient resource use. The evidence indicates that kitchen gardens can significantly reduce household food expenses and provide a source of supplementary income through the sale of surplus produce. Furthermore, the review identifies critical factors for the successful implementation and sustainability of kitchen gardens, such as community involvement, access to gardening resources, and education on horticultural practices.

**Keywords:** Kitchen garden, nutritional status, food security, Nutri-garden

#### Introduction

The world is at a point of realizing the importance of healthy and sustainable diets which may be at reach of all people and also identifying the ways to achieve the purpose. As per Global food policy report 2024 <sup>[8]</sup>, globally 14.6 % of alive newborns have a low weight at birth, millions of children under five years age are stunted, 29.9 % girls and women of reproductive age i.e. 15-59 years are anaemic. Nutritional Security remains a critical global challenge, particularly in developing regions where access to diverse and nutrient rich food is limited. Malnutrition, both in the form of undernutrition and micronutrient deficiencies, continues to impede the growth, development and overall health of populations, particularly among vulnerable groups such as women, children and the elderly. Nutrition security involves not just the quantity of food available, but also its quality, ensuring that individuals have access to a diverse array of foods that supply essential nutrients (Cole *et al.*, 2018) <sup>[3]</sup>. While efforts to address food security have traditionally focused on increasing food production, there is a growing recognition that ensuring nutritional quality is equally important. Nutritional security is basically the consumption of a balanced and varied diet that meets the essential dietary needs of individual. It emphasizes the importance of access to foods that provide essential vitamins, minerals and other nutrient, which are crucial for

maintaining good health and preventing diet-related diseases. Low consumption of fruit and vegetable is independently associated with higher odds of chronic lung disease, diabetes, hearing problems, and visual impairment, while showing lower odds for arthritis (Smith *et al.*, 2022) <sup>[18]</sup>. Nutrition Security refers to the availability and access to sufficient, safe, and nutritious food that meets the dietary needs and food preferences for an active and healthy life (Suneetha and NVVS, 2023) <sup>[20]</sup>.

#### Nutri Garden

A Nutri-Garden is designed to enhance nutritional security by growing diverse range of nutrient rich fruits and vegetables. It is a small-scale garden that grows a diverse range of vegetables and fruits to improve dietary diversity, nutritional security, and income, particularly for households in rural and peri-urban areas with limited market access (Sahu *et al.*, 2020) <sup>[19]</sup>. This garden is considered as a space from which people obtain nutritionally abundant fruits, vegetables and food from cattle sources (Selvarani *et al.*, 2024) <sup>[15]</sup>. Nutri gardens come in various forms which includes:

- **Kitchen gardens:** This garden is a small-scale garden designed to operate in limited space, typically in the backyards of a home. It aims to supply a variety of produce for the household, contributing to improved

overall nutrition.

- **Community gardens:** A community garden is a shared space where individuals from a community come together to grow plants, typically fruits, vegetables, and flowers. It can enhance local biodiversity.
- **School gardens:** A school garden is a small garden within a school campus where students, teachers and staffs come together to grow a variety of plants including fruits, vegetables and herbs. These gardens serve as an educational tool to foster a deeper understanding of nutrition and environment.

### Role of Nutri gardens

Nutri-garden is known as kitchen garden, home garden or nutrition garden. These gardens include cultivation of a variety of fruits and vegetables in small, easily accessible plots of land. It not only offers a sustainable, low- cost solution to improve dietary diversity and provide year-round access to fresh, nutrient rich foods but also contribute to household food security, economic empowerment and environmental sustainability. Home gardens offer multiple benefits, including improved family health, preservation of indigenous knowledge, and promotion of social justice and equity (Galhena *et al.*, 2013) <sup>[7]</sup>. Kitchen gardening has proved a feasible livelihood strategy for resource poor people in terms of nutrient as well as calorie intake and economic performances (Chayal *et al.*, 2013) <sup>[2]</sup>. The school nutrition garden initiative showed potential in improving children's dietary habits and combating micronutrient deficiencies, while also providing a hands-on learning experience that sparked children's interest in healthy eating and agricultural practices (Kammar *et al.*, 2017) <sup>[9]</sup>. It not only improves the nutritional status of rural households, but also provide a small and consistent source of income for women. There are many social benefits which have emerged from nutritional gardening practices like better health and nutrition, increased income, employment generation, food security within the household and enhancement in community social life (Singh *et al.*, 2019) <sup>[16]</sup>. The practice of Nutrition gardening directly provides nutritional security as it makes access to food that can be harvested and prepared whenever required (Singh *et al.*, 2019) <sup>[16]</sup>. Nutri-gardens provided numerous social benefits, including improved health and nutrition, increased household income and food security, job creation, and strengthened community ties, as families saved money by growing their own vegetables and earned extra income from selling surplus produce (Kumari *et al.*, 2019) <sup>[11]</sup>. These gardens are recognized as a practical solution for ensuring food security, dietary diversity, and self-sustainability, particularly during challenging periods (Patil *et al.*, 2020) <sup>[13]</sup>. Home gardening supports human health and well-being by supplying medicinal herbs and promoting physical activity. It also enhances the microenvironment surrounding the home and strengthens the local food production (Lal, 2020) <sup>[12]</sup>. Nutri gardens are seen as effective tools for preventing and managing chronic diseases, particularly in low-income urban households (Sahu *et al.*, 2020) <sup>[19]</sup>. Home gardening correlates with reduced food spending and increased produce intake, particularly in food insecure families, leading to improved overall nutrition (Saediman *et al.*, 2021) <sup>[17]</sup>. Nutri gardens provided year-round access to vegetables, fruits, and medicinal plants, enhancing dietary

diversity and quality. This intervention proved to be a sustainable and cost-effective model for ensuring food and nutrition security at the household level in rural communities (Bhavana *et al.*, 2021) <sup>[1]</sup>. Nutri-gardens were emphasized as a cost-effective approach to reducing malnutrition and improving the health of girls, particularly in rural areas with limited vegetable consumption (Tiwari and Tomar, 2021) <sup>[23]</sup>. kitchen gardening in backyard areas in tribal locality not only decrease expenditure on vegetables but also increase the availability of varied vegetables and green leafy vegetables in the diet along with increase in community connection after starting kitchen gardening activity (Rana *et al.*, 2021) <sup>[14]</sup>. Nutri-gardens are vital for enhancing food security by boosting the availability and consumption of fresh, pesticide-free vegetables at home, thereby improving the nutritional status of rural families. (Sharma *et al.*, 2022) <sup>[21]</sup>. Home Gardening interventions have been associated with positive psychological outcomes, including increased well-being, stronger community bonds, and a deeper emotional connection to food production (Dominguez-Hernandez *et al.*, 2022) <sup>[5]</sup>. Home gardening is very beneficial in Generating income to address immediate family needs (Deesh and Bai, 2023). Nutrition gardens promote community engagement and empower families, especially women and children, to take control of their nutritional needs, while also creating local employment opportunities as families collaborate in cultivating their gardens (Diwan and Lal, 2023) <sup>[4]</sup>. Nutrition gardens showed a favourable B:C (benefit-cost) ratio, suggesting profitability and enhanced livelihoods for participating families (Suneetha and NVVS, 2023) <sup>[20]</sup>. Nutri-garden is considered as the cheapest strategy to maintain health (Selvarani *et al.*, 2024) <sup>[15]</sup>. Community gardens contribute to food security by increasing access to fresh produce, particularly in urban areas, and can enhance overall mental health and well-being among youth and community members. Community gardens foster social interaction and create a sense of community.

### Challenges

Despite the positive outcomes, challenges still remain. Major constraints reported by Nutri gardeners were water scarcity, and damage of garden by animals. (Sharma *et al.*, 2022) <sup>[21]</sup>. The challenges faced by those managing Nutri gardens are as follows:

- Initial Investment:** The establishment of Nutri-gardens requires initial investment in terms of inputs such as seeds, organic materials, and other resources. Ensuring a consistent supply of these inputs can be a challenge for farmers.
- Knowledge and training:** Insufficient resources for continuous learning and skill development.
- Water availability:** Limited access to water resources hampers the effective maintenance of the gardens.
- Economic constraints:** Economic limitations hinder access to nutritious diets and essential gardening resources.
- Sustainability of Practices:** Maintaining organic practices over time can be challenging due to factors such as limited resources for maintaining organic methods, not fully committed growers, climate variability etc.
- Cultural and Attitudinal shift:** Encouraging families

to increase their vegetable consumption and adopt new dietary habits can be difficult, requiring shift in attitudes and community engagement.

- g) **Pest and Disease Management:** Organic gardens can be susceptible to pests and diseases, which may require careful management strategies that farmers may not be familiar with.

### Conclusion

Nutri garden is a strategic and impactful initiative for enhancing nutritional security. This review paper has highlighted the significant roles of Nutri-gardens in improving dietary diversity, fostering self-sufficiency, and contribution towards overall health and well-being of households. However, their long-term success relies on addressing challenges. The path forward involves scaling up Nutri-gardens by increasing awareness and broadening their adoption across different regions. Continuous education and training are essential for maximizing the effectiveness of home gardening programs, promoting knowledge sharing, and addressing limitations in existing interventions (Dominguez-Hernandez, 2022) [5]. To ensure the successful implementation and sustainability of Nutri gardens, it is essential to establish thorough support systems that include training, resource provision, and community involvement. The review concludes with recommendations for future research, emphasizing the need to optimize garden practices, evaluate long term impacts, develop strategies for broader adoption. These efforts are crucial for contributing to global food security and nutrition goals.

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