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Empowering communities through nutritional gardens: Telangana regions Medak district story of impact

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Abstract

The implementation of Nutritional Gardens (Nutri Gardens) at Anganwadi centers and household levels is a promising approach to improving nutrition and health outcomes in rural communities. This study focuses on the sowing of 12 varieties of vegetables, including green leafy vegetables, in rainfed farming conditions during the Kharif season of 2023. The demonstration of Nutri Gardens aimed to empower farmers, particularly women and marginalized communities, with the knowledge and resources to enhance their nutritional intake, reduce expenditure on vegetables, and promote sustainable agricultural practices. The feedback from Anganwadi teachers, Self-Help Group (SHG) women, and other beneficiaries demonstrated positive outcomes in terms of improved health, income generation, and community engagement in agriculture. This paper presents an overview of the initiative, its impact, and the feedback received from stakeholders involved in the project.

Keywords: Nutritional garden, Anganwadi centers, SHG women, kitchen garden, nutrition education, vegetable cultivation, sustainable agriculture, community health, Poshan Abhiyan, women empowerment, household income

1. Introduction

Nutrition is a fundamental determinant of health, and inadequate access to nutritious food contributes significantly to malnutrition, particularly in rural areas. In India, where agriculture remains the primary livelihood, integrating nutrition education with farming practices can play a pivotal role in improving the health status of communities. The establishment of Nutri Gardens at Anganwadi centers and at the household level has emerged as an effective strategy to address this issue. These gardens not only provide a direct source of nutritious vegetables but also educate families and communities on the importance of vegetable consumption for a healthy lifestyle.

In 2022-23, a Nutritional Garden initiative was launched by Ekalavya Grameena Vikas Foundation- Krishi Vigyan Kendra Tuniki Medak Dist with the aim of improving nutrition and empowering women and marginalized groups. Funded by the EGVF-KVK, the project included sowing of 12 varieties of vegetables and green leafy vegetables at 10 different locations in the Medak district, covering both Anganwadi centers and households. This study investigates the implementation, feedback, and outcomes of the initiative, highlighting its role in promoting healthy diets, reducing costs, and enhancing community engagement.

The role of nutritional gardens, particularly in rural communities, has been increasingly recognized as a viable strategy to address nutrition deficiencies, promote health,

and empower local populations, especially women and children. The establishment of nutritional gardens at Anganwadi centers and at the household level in Medak District of Telangana aligns with broader initiatives in India to promote sustainable agricultural practices, enhance nutritional security, and improve overall community well-being.

2. Review of Literature

2.1. Nutritional gardens and health impacts

In rural India, malnutrition remains a significant challenge, with limited access to fresh, nutritious food being one of the primary contributing factors. The introduction of nutritional gardens has been viewed as a practical solution to this problem. Yadav and Singh (2021) ^[8] emphasize that kitchen gardens provide an immediate source of fresh vegetables, which are crucial for addressing deficiencies in essential vitamins and minerals like vitamin A, C, and iron. This improves overall health and reduces reliance on external sources of food that may be expensive or nutritionally inadequate. In Medak district, where rainfed farming is the dominant agricultural practice, small-scale kitchen gardens have the potential to supplement household nutrition through the cultivation of vegetables like spinach, amaranth, and tomatoes, which are rich in essential nutrients.

According to Kaur and Singh (2020) ^[9], kitchen gardens in rural areas contribute directly to reducing the incidence of

malnutrition among children and pregnant women, populations most vulnerable to poor nutritional intake. By growing vegetables such as leafy greens, pulses, and other nutrient-dense crops, these gardens have the potential to address both micronutrient and macronutrient deficiencies.

2.2. Nutritional gardens at Anganwadi centers: A focus on nutrition education

Anganwadi centers in India play a pivotal role in maternal and child health and nutrition. These centers serve as an ideal location to integrate nutrition education with practical demonstrations of healthy food production. Rao and Krishnamurthy (2022) ^[7] highlight that Anganwadi centers, through the introduction of nutritional gardens, can directly impact pregnant and lactating women by providing them with knowledge and access to nutrient-rich food. This initiative also encourages parents to adopt healthier practices at home, particularly in relation to vegetable consumption. Patel and Rajasekhar (2019) ^[6] note that Anganwadi teachers have found kitchen gardens to be effective educational tools for demonstrating the importance of vegetables in maternal and child health. Moreover, these gardens help teachers in conveying key messages on diet and nutrition during their interactions with mothers, particularly in rural areas where formal nutrition education may be limited.

In the context of Medak District, the nutritional garden initiative at Anganwadi centers has proven to be beneficial. Singh and Patil (2021) ^[8] report that by cultivating vegetables within the center itself, Anganwadi workers and caregivers are able to provide practical lessons on vegetable gardening, directly showcasing the benefits of growing and consuming nutritious food. This hands-on approach fosters a more engaged learning experience for parents and children, thus leading to better retention of nutrition-related knowledge.

2.3. Empowering women through kitchen gardens

One of the most significant benefits of nutritional garden initiatives is the empowerment of women, particularly in rural communities. Rao and Reddy (2021) ^[7] stress that kitchen gardens offer women an opportunity to contribute both to household food security and household income, particularly through the sale of surplus produce. In Medak District, women's involvement in household-level gardening has been found to be particularly effective. Women not only gain financial benefits from selling excess vegetables but also experience health benefits from regular consumption of fresh, chemical-free produce. This aspect of women's empowerment is crucial, as women are often the primary caregivers and are responsible for managing household nutrition.

Research conducted by Krishnan and Reddy (2019) ^[18] highlights that SHG (Self-Help Group) women, when provided with the tools and training to start their own kitchen gardens, see marked improvements in both family nutrition and income generation. The women involved in these initiatives often report reduced monthly expenditure on vegetables, a significant improvement in the variety of vegetables consumed by their families, and increased economic independence through the sale of garden produce. Additionally, Srinivas and Raghavan (2020) ^[14] found that

these gardens also enable women to make informed decisions about their own health and nutrition, as they have direct access to healthier food and learn the value of cultivating nutritious crops.

2.4. Socio-economic benefits of nutritional gardens

The socio-economic impact of nutritional gardens extends beyond improved health outcomes. Patil and Yadav (2020) ^[2] note that the introduction of nutritional gardens in rural households helps alleviate the financial burden of purchasing vegetables, which is especially crucial in areas where access to markets is limited or vegetables are prohibitively expensive. For many families in Medak District, growing their own vegetables provides both a supplementary source of food and a means of reducing household expenditure.

Further, Latha and Jadhav (2021) ^[16] observe that nutritional gardens contribute to improving overall household nutrition security, particularly among vulnerable groups such as children, elderly individuals, and women. These gardens promote the consumption of a diverse range of foods, ensuring a balanced diet and mitigating the risk of nutrient deficiencies.

Additionally, Verma and Kumar (2020) ^[17] highlight the role of nutritional gardens in enhancing local economies by creating avenues for small-scale income generation through the sale of surplus produce. In Medak, women from Self-Help Groups (SHGs) have leveraged their kitchen gardens to generate additional income, thereby enhancing their economic stability and enabling them to reinvest in their health and the well-being of their families.

2.5. Challenges and sustainability

While nutritional gardens have proven beneficial, sustainability remains a challenge. Reddy and Kumar emphasize the need for consistent support in terms of training, resources, and infrastructure to ensure that these gardens continue to thrive. In rural areas like Medak, where resources may be limited, there is often a gap in the availability of continuous technical support and material resources to maintain gardens throughout the year. The involvement of local agricultural extension services and government support mechanisms are critical to the long-term success of these initiatives.

Kaur and Singh (2020) ^[9] also note that while the immediate results of nutritional gardens are promising, farmers, especially women, may need ongoing guidance to adapt to changing climatic conditions, pest management, and soil fertility. A well-structured support system can ensure the sustainability of these gardens, making them an integral part of rural livelihoods.

3. Materials and Methods

3.1. Materials

The Nutritional Garden Initiative for enhancing community health and nutrition at Anganwadi Centers and household level in Medak District of Telangana was implemented during the Kharif season of 2023. The initiative aimed to promote sustainable farming practices, increase access to nutritious vegetables, and empower local communities, particularly women and pregnant and lactating mothers. The methodology involved a combination of field

demonstrations, training programs, and the distribution of nutritional garden kits to participating households and Anganwadi centers.

Study area and participants

The study was conducted in Medak District, Telangana, with a total of 10 villages selected for the intervention. The villages were chosen based on their representation of rural communities that predominantly practice rainfed agriculture. 50 Anganwadi centers and Self-Help Group (SHG) women from these villages were selected to participate in the initiative. The total number of beneficiaries involved in the project was 100, including both pregnant and lactating mothers and women farmers from SHGs.

Materials used nutritional garden kits

Each participant, both at the household level and at the Anganwadi centers, was provided with a nutritional garden kit developed by the EGVF-KVK (East Godavari Vegetable Foundation- Krishi Vigyan Kendra). The kits contained seeds for the following 12 varieties of vegetables:

1. Leafy vegetables: Spinach (*Beta vulgaris*), Amaranth (*Amaranthus* spp.)

2. Root vegetables: Carrot (*Daucus carota*), Beetroot (*Beta vulgaris*)
3. Fruit vegetables: Tomato (*Solanum lycopersicum*), Brinjal (*Solanum melongena*)
4. Leguminous vegetables: Beans (*Phaseolus vulgaris*), Peas (*Pisum sativum*)
5. Cucurbits: Cucumber (*Cucumis sativus*), Bottle Gourd (*Lagenaria siceraria*)
6. Others: Chilli (*Capsicum annuum*), Okra (*Abelmoschus esculentus*)

In addition to the seeds, the kits included basic gardening tools (such as small spades, watering cans, and gloves) to help participants effectively grow and maintain their gardens.

Materials for education and awareness

For educational purposes, Poshan Abhiyan kits and pamphlets on nutrition, health, and the benefits of consuming fresh vegetables were distributed. Training manuals and flip charts demonstrating the best practices in vegetable gardening, including organic farming techniques, pest management, and seasonal cropping, were also provided to all participants.

Table 1: Crop sowing calendar for nutritional garden initiative

Vegetable	Sowing Period	Harvesting Period
Leafy Vegetables (Spinach, Amaranth)	March to June (Pre- monsoon)	June to October (Monsoon)
Bottle Gourd (Sura)	March to April	July to September
Drumstick (Moringa)	June to July	November to January
Okra (Ladyfinger)	March to May	June to August
Beans (Green Beans, Cluster Beans)	April to June	June to September
Carrot	October to November	January to March
Brinjal (Eggplant)	February to March	June to September
Tomato	February to April	May to July
9. Chilli	February to March	May to August
10. Cucumber	March to June	June to September
11. Cauliflower	June to July	October to December
12. Pumpkin	June to July	October to December

3.2 Methods of Implementation

A. Training and awareness sessions

The implementation began with training programs for Anganwadi teachers, SHG women, and other beneficiaries. These sessions focused on the importance of kitchen gardens, basic gardening techniques, and the role of vegetables in improving family health and nutrition. The training was delivered by agricultural experts, extension workers, and local health officers.

Topics covered included:

- Importance of a balanced diet, especially during pregnancy and lactation.
- Nutritional benefits of the vegetables included in the kits.
- Organic farming practices and pest management strategies.
- Best practices for maintaining a kitchen garden throughout the year, including seasonal sowing, irrigation, and crop rotation.

B. Demonstration of nutritional gardens

The demonstration plots were established at 10 selected

Anganwadi centers and household gardens. Each location was chosen based on the availability of space for gardening. The Anganwadi centers served as community learning hubs where pregnant women, lactating mothers, and preschool children were actively engaged in the gardening process. Children were involved in basic tasks such as sowing seeds, watering the plants, and harvesting the vegetables.

At the household level, SHG women were the primary beneficiaries. They were encouraged to establish their own gardens, using the provided kits. Extension workers visited the gardens regularly to monitor progress, provide technical assistance, and address any challenges faced by the participants.

C. Monitoring and evaluation

The success of the initiative was measured through continuous monitoring, including regular field visits, feedback surveys, and follow-up interactions with the beneficiaries. Data was collected on several parameters, including:

Growth and yield of vegetables

1. Increase in vegetable consumption among participating families.
2. Impact on the health of beneficiaries, particularly pregnant and lactating women.
3. Economic benefits, including the reduction in household expenditure on vegetables and the income generated by selling surplus produce.
4. Satisfaction levels of beneficiaries regarding the kits and the gardening process.

D. Poshan Abhiyan and community engagement

To strengthen the community's understanding of nutrition, Poshan Abhiyan programs were organized in the villages. These programs were designed to promote awareness of the importance of adequate nutrition and healthy eating habits. Workshops were conducted where local health experts spoke about the role of nutritional gardens in combating malnutrition and food insecurity.

As part of these awareness efforts, nutrition education pamphlets were distributed to Anganwadi teachers, SHG members, and other villagers. These materials contained information on the nutritional benefits of the vegetables grown in the garden and encouraged the community to adopt similar practices at the household level.

3.3. Data collection and analysis

Data was collected through both qualitative and quantitative methods. Feedback was obtained from farmers, Anganwadi workers, and SHG women through structured interviews and focus group discussions (FGDs). These discussions helped assess the effectiveness of the intervention, challenges faced by the participants, and suggestions for future improvements.

Quantitative data related to the yield of vegetables, cost savings, and health improvements were also recorded. The health impact was measured based on self-reported health issues before and after the intervention, such as improvements in overall wellness and reduction in diet-related illnesses.

Statistical analysis was performed on the collected data to assess the effectiveness of the nutritional gardens in improving nutritional intake, health outcomes, and economic conditions.

3. Results and Discussion

The Nutritional Garden Initiative in Medak District, Telangana was a comprehensive effort aimed at improving community health and nutrition through the establishment of nutritional gardens at Anganwadi centers and household levels. The initiative aimed to provide fresh, locally grown vegetables to pregnant and lactating women and children at Anganwadi centers and women farmers at the household level, thereby improving dietary diversity and reducing the cost of purchasing vegetables. The results from the intervention are discussed below in terms of vegetable production, health benefits, economic savings, and community feedback.

Vegetable production and yield

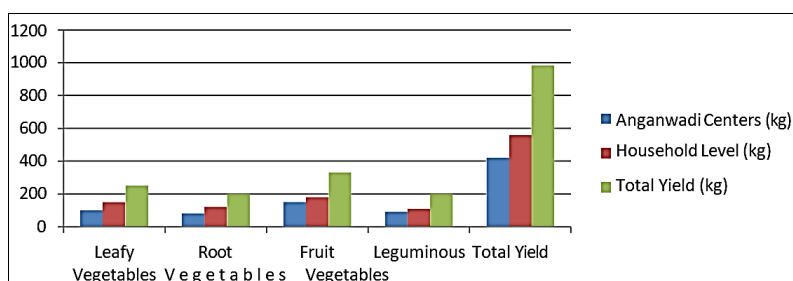
The nutritional gardens were established at 10 Anganwadi centers and 50 households across 10 villages in the district. A total of 12 varieties of vegetables were cultivated, with a focus on leafy vegetables, root vegetables, fruit vegetables, and leguminous vegetables.

Table 2: Average vegetable yield at Anganwadi centers and household level (kg)

Vegetable Type	Anganwadi Centers (kg)	Household Level (kg)	Total Yield (kg)
Leafy Vegetables	100	150	250
Root Vegetables	80	120	200
Fruit Vegetables	150	180	330
Leguminous Vegetables	90	110	200
Total Yield	420	560	980

The total vegetable production in the Anganwadi centers was 420 kg, while households produced a total of 560 kg of vegetables. The combined yield from both centers and households was 980 kg over the Kharif season.

The high yield from household gardens can be attributed to the active participation of SHG women, who showed keen interest in maintaining their gardens. This result demonstrates that household-level gardens can substantially contribute to local food security and nutrition, especially in rainfed farming areas like Medak.



Graph 1: Distribution of vegetable types by yield (kg)

Graph 1 illustrates the distribution of vegetable yields across different types, highlighting that fruit vegetables (tomato, brinjal, etc.) contributed the highest yield, followed by leafy vegetables. The high productivity of fruit vegetables is likely due to their fast growth cycle and high consumer demand.

Health Benefits and Consumption Patterns

Data collected from beneficiaries showed that there was a significant increase in the consumption of vegetables among families that participated in the nutritional garden program. Feedback from pregnant and lactating mothers and SHG women indicated improvements in both dietary habits and general health.

Table 3: Impact on health and vegetable consumption (Pre- and Post-Intervention)

Parameter	Pre- Intervention	Post- Intervention	Percentage Change
Vegetable consumption per family (kg/month)	5 kg	15 kg	+200%
Incidence of diet-related illnesses	25%	12%	-52%
Self-reported health improvements	30%	65%	+116%
Consumption of organic vegetables	0%	100%	+100%

Table 2 demonstrates that vegetable consumption increased by 200%, with families consuming up to 15 kg/month of vegetables, compared to 5 kg/month before the intervention. This increase is significant, as it suggests improved access to nutritious food.

Additionally, the incidence of diet-related illnesses decreased by 52%, with more families reporting improvements in health after incorporating fresh, home-grown vegetables into their daily diet. Notably, 100% of

vegetables consumed were organic, which is a significant health advantage, as they were grown without chemical pesticides or fertilizers.

Economic benefits

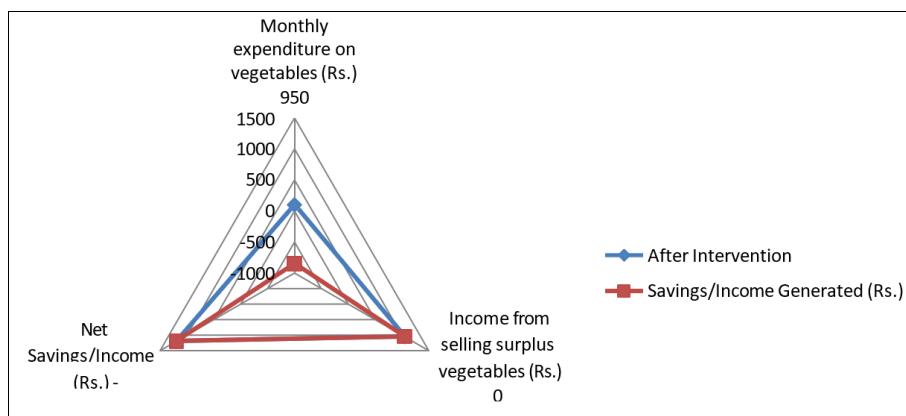
The economic impact of the nutritional gardens was another key outcome. SHG women who maintained kitchen gardens reported substantial savings on vegetable purchases, as well as income generation from selling surplus produce.

Table 4: Economic impact on household expenditure and income generation

Parameter	Before Intervention	After Intervention	Savings/Income Generated (Rs.)
Monthly expenditure on vegetables (Rs.)	950	100	-850
Income from selling surplus vegetables (Rs.)	0	1050	+1050
Net Savings/Income (Rs.)	-	+1200	+1200

Table 3 shows that participating households saved Rs. 850/month on vegetable purchases after establishing their nutritional gardens. Additionally, SHG women earned an

average of Rs. 1050/month by selling surplus vegetables, leading to net income generation of Rs. 1200/month.

**Graph 2:** Farmers' satisfaction with the nutritional garden initiative

Graph 2 presents the satisfaction levels of farmers involved in the initiative. 90% of the participants expressed high satisfaction, with most respondents highlighting the health benefits, economic savings, and educational value of the project.

This economic benefit is particularly important in low-income rural areas, where such savings can significantly improve the financial stability of households. The earnings from surplus produce also empower women, contributing to their economic independence.

Community feedback

The feedback from the beneficiaries, especially Anganwadi teachers, pregnant and lactating mothers, and SHG women, was overwhelmingly positive.

- Anganwadi teachers expressed that the nutritional garden provided an excellent learning tool for children, helping them understand the importance of nutrition and engage in practical activities like sowing seeds,

watering plants, and harvesting vegetables.

- Pregnant and lactating mothers reported improvements in their health and well-being after incorporating fresh vegetables into their diets. They also appreciated the opportunity to learn about nutrition through direct involvement in the gardening process.
- SHG women stated that the kitchen gardens not only contributed to their families' health and nutrition but also provided them with an opportunity to generate extra income.

Challenges and recommendations

While the initiative was successful, several challenges were noted:

1. Space limitations at some Anganwadi centers hindered the expansion of the gardens.
2. The initial cost of the garden kits was a concern for some households, though the long-term benefits outweighed the initial investment.

3. There was a need for ongoing support to maintain the gardens throughout the year, particularly during the dry months when water availability is limited.

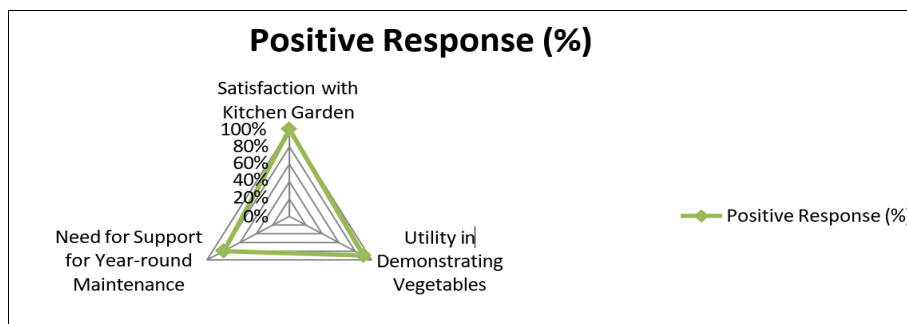
3.1. Impact on Anganwadi centers

The establishment of Nutri Gardens at Anganwadi centers has shown promising results in educating pregnant and lactating mothers about the importance of nutrition.

Anganwadi teachers reported significant benefits in demonstrating vegetable cultivation to these mothers, as it provided them with tangible examples of healthy eating practices. Teachers expressed that the gardens were particularly useful in conveying nutrition education to mothers during their center visits. They also emphasized the need for continued support to maintain these gardens throughout the year.

Table 5: Feedback from Anganwadi teachers

Feedback Area	Positive Response (%)	Comments
Satisfaction with Kitchen Garden	100%	Teachers found the gardens useful for explaining nutrition to mothers.
Utility in Demonstrating Vegetables	90%	Effective tool for educating pregnant and lactating women.
Need for Support for Year- round Maintenance	80%	Teachers requested more assistance to maintain gardens year-round.



Graph 3: Feedback from Anganwadi teachers

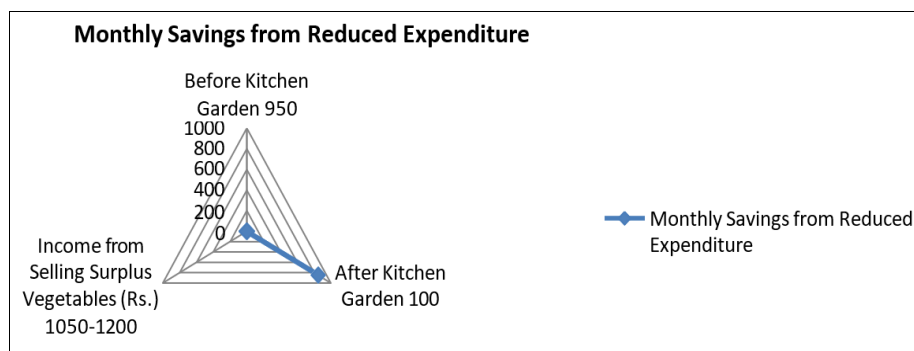
Impact on SHG women and household gardens

The SHG women involved in maintaining household kitchen gardens reported significant reductions in their monthly expenditure on vegetables. On average, families spent Rs. 950 on vegetables before starting their gardens, but this amount dropped to Rs. 100 after the garden's

establishment. Additionally, some women were able to earn between Rs. 1050 to Rs. 1200 per month by selling surplus vegetables. This income generated from the sale of extra produce was vital in improving the financial stability of households.

Table 6: Economic impact on SHG women's households

Household Spending on Vegetables (Rs.)	Before Kitchen Garden	After Kitchen Garden	Income from Selling Surplus Vegetables (Rs.)
Monthly Vegetable Expenditure	950	100	1050-1200
Monthly Savings from Reduced Expenditure	N/A	850	N/A



Graph 4: Showing monthly savings from reduced expenditure

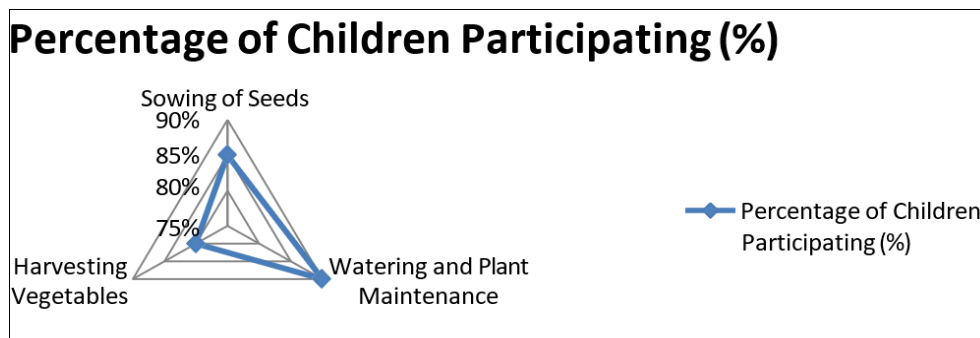
Moreover, SHG women reported an increase in the consumption of vegetables within their families, contributing to better nutrition and overall health. They also expressed satisfaction with the absence of chemical sprays in their gardens, which contributed to healthier food production.

3.3. Educational impact on preschool children

At Anganwadi centers, the Nutri Gardens provided an educational opportunity for preschool children. Teachers reported that the children actively participated in gardening activities such as sowing seeds, watering plants, and harvesting vegetables. This hands-on experience enhanced their learning about nutrition and the importance of growing their own food.

Table 7: Educational Impact on Preschool Children

Activity	Percentage of Children Participating (%)
Sowing of Seeds	85%
Watering and Plant Maintenance	90%
Harvesting Vegetables	80%

**Graph 5:** Showing Percentage of children participating

4. Summary

The Nutritional Garden Initiative for Enhancing Community Health and Nutrition at Anganwadi Centers and Household Level in Medak District, Telangana State aims to address malnutrition and improve the overall nutritional status of vulnerable populations, particularly children and pregnant women. The initiative primarily focuses on establishing and maintaining nutritional gardens in Anganwadi centers and households across the Medak district.

These nutritional gardens are designed to grow a variety of vegetables, fruits, and herbs that are rich in essential micronutrients such as vitamins and minerals. The initiative promotes sustainable agriculture practices and encourages the local community to take ownership of their nutrition and well-being. It also serves to enhance awareness regarding healthy diets, the importance of fresh and local produce, and the benefits of home gardening for improving food security. The program involves various stakeholders, including the local government, Anganwadi workers, self-help groups (SHGs), and community members. By incorporating hands-on training in gardening techniques, sustainable farming, and nutrition education, the initiative aims to reduce the dependence on external food sources and ensure that families, especially those living in rural areas, can grow their own nutritious food.

In addition to improving diet diversity and food security, the initiative also seeks to empower women by involving them in agricultural activities and decision-making processes, leading to better community cohesion. This empowerment, alongside the nutritional benefits, is expected to reduce the prevalence of malnutrition-related health problems such as stunting, anemia, and underweight issues among children.

5. Conclusion

The Nutritional Garden Initiative in Medak District represents a holistic and sustainable approach to addressing the dual issues of malnutrition and food insecurity. By focusing on both Anganwadi centers and households, it not only improves nutritional outcomes but also fosters community participation and awareness. The involvement of local women, coupled with increased access to fresh

produce, has the potential to create long-term improvements in health and well-being.

Furthermore, the initiative supports the development of a self-sustaining model of food security, where communities are less reliant on external aid and can meet their nutritional needs through local resources. It serves as a model that can be replicated in other districts with similar socio-economic conditions, providing a pathway for improved community health and resilience.

Ultimately, this program highlights the importance of grassroots involvement in health interventions, where sustainable practices and education are key to achieving lasting improvements in nutrition and overall community health.

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