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Nutri Garden; A Sustainable Choice for Food Security in India

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Abstract
In the world, where convenience often leads to have processed foods and unhealthy eating habits, the idea of growing our own nutritious food is more important than ever. A *Nutri Garden* is not just a garden—it is a way of reclaiming control over what we eat, ensuring that every meal is filled with fresh, nutrient-dense vegetables and fruits. Nutri Garden can flourish, provides a direct connection to healthy food and a healthier lifestyle. It is a sustainable, home-based gardening approach focused on growing nutrient-dense vegetables, fruits, and herbs to enhance food security and promote environmental sustainability. This practice not only reduces the reliance on commercial agriculture but also minimizes the carbon footprint associated with food production, transportation, and packaging. Nutri gardens contribute to biodiversity conservation through the cultivation of diverse plant species, supporting local ecosystems by attracting beneficial insects and promoting soil health. By incorporating eco-friendly practices such as composting, crop rotation, and rainwater harvesting, nutri gardens optimize resource use, conserve water, and reduce waste. Additionally, they provide economic benefits by reducing grocery expenses, offering a source of organic produce, and fostering local food systems. As a low-energy, low-cost, and highly adaptable method, nutri gardens offer a practical solution for individuals and communities aiming to achieve sustainable food production while improving nutrition, reducing environmental impact, and building resilience to climate change.

Key words: Nutri Garden, food security, health, diversity, sustainable

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What is Nutri Garden?

Nutri Garden/Poshan Vatika is more than the traditional home/kitchen gardening. It is the advanced form of kitchen garden, where much nutritious vegetables and fruit plants are grown for fulfilling the requirement of essential vitamins and minerals. Its major contributions in eradicating malnutrition and ensuring food security and diet diversity.

Rural Nutri Garden

Produce of Nutri Garden

Why should grow a Nutri-Garden?

In 2024, India ranked 105th out of 127 countries in the Global Hunger Index (GHI), which is considered a "serious" hunger level.

- 13.7% of India's population is undernourished
- 35.5% of children under five are stunted
- 18.7% of children under five are wasted
- 2.9% of children under five do not survive

Indeed, the country continues to contend with a high rate of undernutrition, and managing it continues to be a huge challenge. Food security continues to be a matter of grave concern for India. Despite being the second largest producer of food, India is home to the world's second

largest undernourished population (195.9 million). A review of studies examining the link between food security and malnutrition in children suggests a direct association with undernutrition in children in middle-income countries. Fruits and vegetables from the kitchen gardens are good source of micronutrients especially in the poor households. Rural areas have ample space and establishing a kitchen garden is far simpler as farm families are involved in agriculture.

Following features of nutri-garden make it perfect choice for balance and sustainable diet: -

i) Enhance nutrition through diet diversity
ii) Boost immune health
iii) Reduce carbon footprint
iv) Economic saving
v) Sustainable way

i) Enhance nutrition through diet diversity

In nutri -garden various types of vegetables i.e. Green Leafy Vegetables, Tubers, Leguminous, Cucurbitaceae, Root vegetables and fruits are grown. These diverse fruits and vegetables used by the rural families. Indeed, they contributes in fulfilment of requirement of micronutrient (water soluble vitamins and minerals).

S. No.	Vegetables and Fruits	Source
1.	**Green leafy vegetables;** Spinach, fenugreek, coriander, kale, broccoli, lettuce	**Vitamins;** Carotenoids (precursor of vit A), Ascorbic acid, vit B6 **Minerals;** Iron,

		Calcium, Sodium, Magnisum, Potassium etc.
2.	**Roots;** carrot, beet, radish, turnips, garlic, onions **Tubers;** potato, sweet potato, yams etc.	Rich source of antioxidant compounds. Tubers contain starch which contribute in energy. Good source of vit. A, B and C Good source of minerals i.e. iron, calcium, magnesium, potassium
3.	**Cucurbitaceae;** Cucumber, pumpkin, water melons, melons etc.	Good source of vitamin B and C
4.	**Leguminous;** Beans, chickpea, peas, fava beans, soyabean etc	Good source of protein in vegetarian diet, vit. A, B-complex, Vit. C
5.	**Citrus fruits;** Lemon, Orange, Lime, Amla (Indian Gooseberry)	Rich source of ascorbic acid (Vit. C)
6.	**Papaya**	Rich source of vit. A,

		C and minerals
7.	**Banana**	Rich source of potassium
8.	**Custard apple**	Rich source of potassium and vitamin B- complex

ii) Boost immune health

A balance diet with diversity is key for supporting and enhancing immune health. A varied, nutrient dense diet provides wide range of vitamins, minerals and antioxidant compounds which together strengthen immune system.

- A rainbow of vegetables and fruits (Yellow, Red, Orange, Purple and Blue) provides wide spectrum of vitamins and minerals which support immune function in human body.
- Diverse sources of healthy fats play a vital role in maintaining strong immunity. Omega-3 fatty acids, found in foods like fatty fish (salmon, mackerel), chia seeds, flaxseeds, and walnuts, are especially beneficial for reducing inflammation and regulating immune responses.
- Proteins are essential for building and repairing tissues, and the immune system relies heavily on proteins to create antibodies and immune cells.
- Fibrous foods (Prebiotic), such as whole grains, legumes, vegetables, and fruits, also help nourish gut bacteria (Probiotic), keeping the gut microbiome diverse and robust.
- Diverse sources of hydration, such as water, herbal teas, and fresh fruit-infused water, are essential for maintaining healthy cells, tissues, and immune

functions. Staying hydrated helps the body flush out toxins and supports lymphatic flow, which is crucial for transporting immune cells throughout the body.

iii) Reduce carbon footprint

A Nutri Garden can significantly reduce carbon footprint in several key ways. By growing own food and focusing on sustainability, reduces the environmental impact associated with food production, transportation, and waste.

- One of the largest contributors to carbon emissions in the food industry is transportation. Food is often grown in distant locations, then shipped long distances to grocery stores, requiring energy-intensive transportation methods, including trucks, ships, and planes. By growing own food, eliminate the need for transportation altogether. This cuts down on greenhouse gas emissions, as food doesn't need to be transported from farms far away.

- Packaged food products contribute to carbon emissions during production and disposal. Plastic, cardboard, and other materials used for packaging are energy-intensive to manufacture, and they create waste that often ends up in landfills, further contributing to environmental pollution. In a Nutri Garden, fresh produce directly from nutri garden harvest, minimizing or eliminating the need for plastic packaging and single-use containers.
- Store-bought produce is often refrigerated, requiring energy to keep it fresh during transport and storage. A significant portion of the food bought may need to be kept in refrigerated warehouses or transported in refrigerated trucks, all of which require a considerable amount of energy. Homegrown food, on the other hand, is picked and consumed much faster, reducing the need for refrigeration.

- By growing own food, local food system supported, rather than relying on industrial agriculture, which often depends on fossil fuels, large-scale transportation, and chemical fertilizers and pesticides. Small, local food production typically uses fewer resources and has a smaller carbon footprint than large-scale, industrialized farming.
    - Plants absorb carbon dioxide (CO_2) from the atmosphere during photosynthesis. Growing plants in your Nutri Garden not only helps reduce CO_2 levels in the air but also stores carbon in the soil, a process known as carbon sequestration. Healthy, well-maintained garden soils are excellent carbon sinks, helping mitigate the impact of climate change.

i) **Economic Saving:** A nutri-garden—a small, home-based garden focused on growing nutritious, edible plants—can help with economic savings in several ways:

- By growing own fruits, vegetables, and herbs, lower your grocery bills. Fresh produce can be expensive, especially organic or specialty items.
- Eating fresh, home-grown produce can improve overall health by providing better nutrition. When we eat a nutrient-rich diet, it can reduce the risk of diseases, leading to fewer healthcare expenses over time.
- A nutri-garden encourages self-sufficiency, especially in times when food prices are unpredictable due to external factors (e.g., inflation, supply chain issues).

ii) **Sustainable way:** A nutri garden can be a highly sustainable way to grow vegetables because it promotes environmentally friendly practices while supporting long-term food security.

- Nutri gardens can employ sustainable watering methods like drip irrigation or rainwater harvesting, using water more efficiently compared to large-scale commercial farming that relies on heavy irrigation.
- Native and Drought-Tolerant plants that are more suited to local conditions, requiring less water and fertilizers.
- By growing a diverse range of plants, you create habitats for beneficial insects like pollinators (bees, butterflies) and natural pest predators (ladybugs, birds), which support biodiversity.
- Unlike large-scale industrial farms that often grow single crops (monocultures), nutri gardens support a variety of vegetables, increasing soil health and resilience.
- Nutri gardens often require minimal energy or fossil fuels. With organic practices and low-tech approaches, the energy cost is significantly lower than industrial farming that relies on machinery, chemical inputs, and irrigation systems that consume large amounts of energy.

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