



# The Role of Agriculture in Promoting Health and Nutrition

**Agriculture's role in promoting health and nutrition is more vital than ever as we face a complex web of global challenges. With thoughtful innovation and sustainable practices, agriculture can be transformed into a powerful force to combat malnutrition and non-communicable diseases while ensuring food security for all.**

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Agriculture is the backbone of human survival, providing food and nutrients that are vital in life. It encompasses more than being a source of food provision. With increased health challenges from malnutrition to obesity being faced by the growing global population, agriculture is increasingly being recognized as a powerful driver of health and nutrition outcomes. Agriculture feeds into the population and nurtures their well-being, both in the actual crops it produces for nutritional needs and furthering sustainable means of farming. It will also improve food safety, prevent non-communicable diseases, and ensure dietary diversity for regions commonly plagued by nutritional deficiency. Agriculture, within the context of this emerging public health crisis

of food scarcity and degraded environment, essentially holds the key towards a healthy, resilient future. This will let it realize its full potential in improving human health at a global level, nourishing and keeping the world population healthy and thriving.

## **Agriculture as a Source of Nutrient-Dense Foods**

Agriculture is the basic propellant for the production of nutrient-rich foodstuffs, which are very important for maintaining health and well-being. Nutrient-dense foods include fruits, vegetables, whole grains, and legumes, besides all foods of animal origin, which are powerhouses of the nutrients, vitamins, minerals, proteins, and good fats necessary for the proper functioning of the human body. Such nutrition not only provides energy but also actively helps to

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boost immunity, prevent chronic diseases, and develop physical and mental growth in general.

For example, fruits and vegetables contain high levels of vitamins A, C, and K, along with antioxidants and dietary fibre that, as a group, promote cardiovascular health, reduce the risk of certain cancers, and help to maintain healthy digestion. By contrast, whole grains are major sources of complex carbohydrates, essential B vitamins, and other important micronutrients whose energy is used by the body to maintain its basic functions.

Furthermore, agriculture is an instrumental means of farming biofortified crops, which are genetically altered plants to contain higher levels of micronutrients such as iron, zinc, and vitamin A. These biofortified crops play a very important role in addressing hidden hunger and deficiencies in micronutrients, particularly when access to a diversified diet is limited.

The amalgamation of agricultural practices with nutritional strategies is illustrated through international endeavours like the HarvestPlus initiative, which has effectively produced biofortified strains of fundamental crops such as rice, maize, and sweet potatoes to mitigate nutrient shortfalls in developing nations. This advancement exemplifies the substantial role that agriculture can play in worldwide initiatives aimed at improving nutritional results.

### Link Between Agricultural Practices and Dietary Diversity

Dietary diversity is inherent to India within the agricultural sector and has been one of the primary

reasons for optimum nutrition in the general well-being of its population. With a long agrarian background and different agro-climatic zones in each region, the country grows a wide range of crops like cereals and pulses to vegetables, fruits, spices, and livestock products that contribute toward meeting a healthy diet. Most specifically, agricultural practice and dietary diversity have particularly been linked to food security and nutrition, which remain some of the major challenges in rural areas of India.

Diversified agriculture such as mixed farming and crop-livestock integration has been shown to bring better dietary diversity. Farmers growing a diverse portfolio of crops, including cereals, pulses, vegetables, and fruits, or rearing livestock tend to have more nutritionally diverse diets. The NFHS-5 reports an improvement in the dietary diversity of households due to mixed farming practices, leading to improved nutritional status, especially among women and children.

Pulses, being one of the basic constituents of diet in India, are a rich source of plant-based protein, iron, and folic acid. The promotion of pulse cultivation in India through interventions like the National Food Security Mission has contributed to sustainable agriculture and improved nutrition.

Traditional Indian agriculture has contributed to the wide diversity of food items through multi-cropping and agroforestry. Agroforestry practices in states like Kerala and Karnataka, in which spices, fruits, and vegetables are grown concurrently with cereals, have been instrumental in ensuring that farming families have a steady supply of various kinds of food items throughout the year. This ensures better nutrition along with increased resilience to economic or environmental shocks.

Nutrition-sensitive agricultural policies, such as the promotion of horticulture through the Mission for Integrated Development of Horticulture, or MIDH, have considerably strengthened the linking between agricultural practices and dietary diversity. India is one of the world's leading producers of fruits and vegetables, and therefore, there is great potential to fill the nutritional gap by improving access to a wide range of foods.

In essence, India's agricultural diversity, when aligned with nutrition-focused policies, has the potential to improve both food security and dietary diversity,

Ministry of Agriculture  
Farmers Welfare  
Government of India

## NATIONAL FOOD SECURITY MISSION

INCREASE FOOD PRODUCTION: ENHANCE FOOD SECURITY

### Important Points

- NFSM provides 'Cropping system based Training' to farmers.
- Crop/Subject matter specialists of ICAR Institute/SAUs /KVKs train trainers/farmers.
- Focus is on crop management practices and awareness about high yielding varieties/hybrids and practices.
- Central assistant of Rs.14000/ training (Rs.3500/session) is provided.
- Under NFSM, at least 30% funds allocated for women farmers.



rising obesity rates.

The National Food Security Mission launched by the Ministry of Agriculture to promote the production of nutrient-dense crops by facilitating farming for pulses, millets, and biofortified varieties represents a progress toward making this national imperative a reality.

There are also steps by the FSSAI in the form of the Eat Right India campaign to address public health through emphasizing sustainable agricultural practices. This includes promoting organic farming, reducing injurious pesticides, and consuming locally produced foods to reduce exposure to contaminants and enhance nutritional quality.

Furthermore, policies related to sustainable agriculture, such as the Paramparagat Krishi Vikas Yojana for organic farming, have a direct consequence for public health by reducing the portion of chemical inputs. Organic farming not only preserves soil health but also produces chemical-free, healthier food. A 2021 study, for instance, found that organic foods in India have lower pesticide residues, thereby reducing risks from long-term exposure to chemicals.

Fundamentally, the agricultural policies of India, when integrated with public health goals, possess significant potential to enhance nutritional outcomes, mitigate disease prevalence, and cultivate healthier communities. Through the advancement of nutrient-dense crops, sustainable farming methods, and food safety measures, these policies can play a crucial role in tackling the escalating public health issues facing the nation.

### Sustainable Agriculture and Food Security: Securing the Future of Global Nutrition

Agriculture forms a core of long-term food security attainment, which has become a major concern for India and the rest of the world in view of the increasing population, degradation of the environment, and changes in climate. With the food demand projected to increase by 60% over the year 2050, developing a robust and sustainable agricultural structure has become a dire need for feeding future generations.

It gives more prominence to land productivity improvement methodologies, combined with the protection of natural resources and the environment. In fact, in India, for economic stability and food security, sustainable farming assumes prime importance

ensuring healthier, more nourished populations.

### Agricultural Policies and Public Health: A Crucial Intersection

Agricultural policies influence public health to a great extent, especially in countries like India, whose economy is based on agriculture and where agriculture provides food security. These policies influence the means of production and types of crops produced, thereby affecting food availability, access, and quality, hence nutrition and health status of millions of people.

In India, several governmental efforts are focused on aligning agricultural production with public health goals.

A glaring example is the National Food Security Act, which aims to provide subsidized grains to over 800 million people. The programme has significantly reduced hunger and undernutrition, thus ensuring that the vulnerable groups have access to staple foods. However, it also highlights the need to adopt a more nutrition-sensitive approach as large portions of foods being distributed are calorie-rich but nutrient-poor in proteins, vitamins, and minerals. Another very important initiative is the National Nutrition Mission or POSHAN Abhiyaan, which focuses on integrating agriculture with nutrition to address malnourishment conditions among children and pregnant women. Production and consumption of pulses, fruits, and vegetables will help to increase nutritional value in diets to fight India's 'double burden' of malnutrition-undernutrition, and

because more than 58 percent of its population derives their livelihood from agriculture. Under this principle of sustainability in agriculture, several programmes are involved—Zero Budget Natural Farming (ZBNF) is being promoted in states like Andhra Pradesh and Karnataka as the highly effective method of sustainable agriculture. ZBNF minimizes chemical inputs and encourages the use of organic fertilizers, reducing production costs for farmers and improving soil health.

This is all very important for food security in a country quite prone to severe weather events. India's National Action Plan on Climate Change has a National Mission for Sustainable Agriculture, which includes drip irrigation methods that are water-conserving and drought-resistant crop varieties. Food and Agriculture organization (FAO) estimates that the climate-resilient practices can hike productivity by up to 50% in rainfed areas where a majority of smallholder farmers are resident in India.

Sustainable agriculture protects the environment while addressing food security through availability, accessibility, and stability of food supplies. For example, agroecological practices like rotation of crops and agroforestry have been able to enhance biodiversity, reduce soil erosion, and promote long-term productivity. In India, for example, with over 30% of its arable land

degraded, sustainable practices revive soil fertility and, therefore, enhance food production capability.

Moreover, sustainable agricultural practices advocate for nutrition-sensitive farming, prioritizing not only the volume of produce but also its nutritional quality. Initiatives such as the National Food Security Mission (NFSM), which highlight the importance of cultivating pulses and millets—crops rich in nutrients and requiring minimal water—enhance food security while improving nutritional outcomes. Millets, previously overlooked, are experiencing a resurgence through government programmes, with India recognized as the leading global producer. Their reintroduction into mainstream agriculture helps address malnutrition while promoting climate resilience due to their drought-resistant nature.

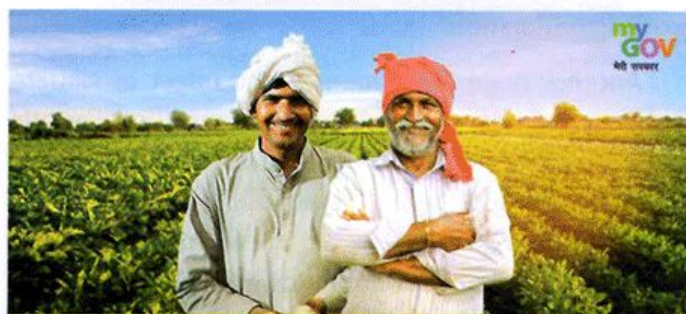
Sustainable agriculture is a key solution to both current and future food security challenges. By integrating ecological preservation, climate resilience, and nutrition-focused farming, sustainable practices ensure that agriculture can meet the needs of the present without compromising the ability of future generations to feed themselves.

### Agriculture's Role in Combating Non-Communicable Diseases

Agriculture plays a critical role in the global response to NCDs diabetes, cardiovascular diseases, cancers, and chronic respiratory diseases—that collectively account for 71% of all deaths in the world, according to the WHO. The kind of foods we produce and consume determines our health; hence, it places agriculture in a strategic position to provide the diversity of nutrient-rich crops needed to address these health challenges.

A shift in production and promotion toward healthy, nutrient-dense foods, such as fruits, vegetables, whole grains, and legumes, can reduce the risk of NCDs very significantly. For example, diets rich in fruits and vegetables are abundant in vitamins, antioxidants, and fibre that have been associated with decreasing risks of heart disease, stroke, and certain kinds of cancer. The World Health Organization recommends at least 400 grams per day of fruits and vegetables, but in many parts of the world, including India, access to these foods is limited due to farming practices that emphasize a few high-calorie, low-nutrient crops such as rice and wheat.

India, which faces a growing burden of NCDs alongside malnutrition, is taking steps to address this



## The 'Panchamrita' of Zero Budget Natural Farming

### Jivamrita

Boosting microorganisms & earthworms in the soil

### Bijamrita

Protecting young roots from fungus & soil-borne diseases

### Acchadana

Covering plants to suppress weed growth & retain moisture

### Whapasa

Encouraging reduced irrigation

### Intercropping

Growing one crop alongside another to attract variety of beneficial insects



trouble via its agricultural guidelines. The promotion of biofortified plants, inclusive of iron-wealthy pearl millet and zinc-enriched rice, underneath the National Food Security Mission (NFSM), has helped combat micronutrient deficiencies, which contribute to sicknesses like anaemia and stunted growth, each of which might be risk elements for NCDs later in life. Additionally, Mission for Integrated Development of Horticulture (MIDH) targets to reinforce the manufacturing of end result and vegetables, crucial for a coronary heart-healthy food regimen.

Beyond increasing the manufacturing of healthful ingredients, sustainable agricultural practices that reduce harmful inputs additionally make contributions to combating NCDs. The immoderate use of chemical fertilizers and pesticides has been linked to long-term health troubles, along with cancer and breathing illnesses. Organic farming, supported via projects just like the Paramparagat Krishi Vikas Yojana (PKVY), minimizes the use of artificial inputs and guarantees the production of more secure, toxin-free ingredients that sell better fitness consequences.

Agriculture's contribution to stopping NCDs is likewise glaring in selling traditional meals systems. In India, millets—referred to as nutri-cereals—are making a comeback as a part of country-wide nutrition techniques because of their low glycemic index and excessive fibre content material, which help control diabetes and reduce the hazard of cardiovascular illnesses. The Indian government has declared 2023 the International Year of Millets, highlighting the importance of these ancient grains in fighting modern-day health challenges.

Through the production of nutrient-rich, chemical-free, and health-promoting foods, agriculture serves

as a powerful tool in preventing and managing non-communicable diseases, contributing to healthier populations and reducing the global burden of disease.

### **Challenges and Opportunities in Agriculture for Health and Nutrition**

Agriculture's role in promoting health and nutrition is plain, but it faces a complicated net of challenges and opportunities so one can form its future impact on global well-being. As the arena grapples with problems like weather change, population increase, and dietary shifts, the agricultural zone should navigate these hurdles whilst capitalizing on rising innovations to make certain food security and stepped forward nutrition for all.

#### **Challenges**

One of the most common challenge is the degradation of herbal sources. Soil erosion, water shortage, and loss of biodiversity threaten the productivity of farmlands international. According to the Food and Agriculture Organization (FAO), approximately 33% of the world's soils are already degraded, lowering the ability to grow nutrient-dense crops. This is especially regarding for areas like India, wherein smallholder farmers depend on the land for his or her livelihood and for imparting food to a growing population.

Another huge assignment is the effect of climate exchange on agriculture. Rising temperatures, erratic rainfall, and multiplied frequency of severe weather activities disrupt crop cycles and reduce yields. Climate exchange exacerbates meals insecurity and hampers efforts to develop a diverse array of crops that are essential for combating malnutrition and non-communicable sicknesses. By 2030, it is far predicted that agricultural productiveness could decline by way of 10-25% in a few areas because of weather-related demanding situations.

In addition to environmental worries, monetary and social factors including market get admission to, fluctuating prices, and rural poverty preserve to plague farmers. Many smallholders who lack the sources and infrastructure had to diversify their crops and adopt sustainable practices, proscribing their capacity to contribute to higher nutrients consequences.

## Opportunities

Despite those challenges, agriculture is rife with opportunities to transform worldwide health and nutrients consequences. Technological improvements—along with precision farming, biotechnology, and virtual gear—offer exceptional ways to enhance agricultural performance and sustainability. Precision agriculture, as an instance, lets in farmers to optimize the usage of water, fertilizers, and pesticides, ensuring higher yields at the same time as minimizing environmental damage.

The upward push of biofortification additionally presents an interesting opportunity. By growing crops which can be enriched with vital nutrients which includes nutrition A, iron, and zinc, agriculture can directly combat micronutrient deficiencies. Programmes like HarvestPlus have already tested fulfilment, with biofortified plants improving vitamins for over forty million people globally.

Another key possibility lies in promoting conventional and climate-resilient vegetation like millets and pulses, which aren't simply rich in nutrients but require fewer assets to grow. India's consciousness on reviving millet cultivation via government projects highlights how conventional crops can address each malnutrition and the challenges of climate change. The International Year of Millets 2023 underscores their capacity as a sustainable and nutritious alternative to aid-extensive staple plants.

Public-private partnerships and worldwide collaboration additionally provide a pathway to overcoming agricultural challenges. With elevated funding in research and development, as well as higher extension offerings for farmers, the rural area may be empowered to innovate and scale up solutions for

health and nutrients. Initiatives like the National Food Security Mission and the Eat Right India campaign illustrate how coordinated efforts can align agriculture with public fitness desires, growing a win-win for each meals manufacturers and consumers.

In brief, whilst agriculture faces considerable demanding situations, it is also on the cusp of wonderful possibilities that could redefine its function in promoting worldwide health and nutrition.

## Conclusion

Agriculture's role in promoting health and nutrition is more vital than ever as we face a complex web of global challenges. With thoughtful innovation and sustainable practices, agriculture can be transformed into a powerful force to combat malnutrition and non-communicable diseases while ensuring food security for all. The Indian government deserves praise for its visionary policies and initiatives aimed at aligning agriculture with public health goals. Programmes like the National Food Security Mission, Paramparagat Krishi Vikas Yojana, and the promotion of biofortified crops and millets reflect a deep commitment to fostering a healthier, more resilient population. These initiatives are helping not only to enhance agricultural productivity but also to ensure that the food produced is rich in essential nutrients, benefiting millions of citizens across the country.

By prioritizing sustainability, nutrition-sensitive farming, and technological innovation, India is setting an inspiring example for the world, demonstrating that agriculture can be a key pillar in building a healthier, more prosperous future. With continued dedication and collaboration, the opportunities for agriculture to uplift public health are immense, and India is well-positioned to lead the way in this transformative journey. □

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