



TRADITIONAL CROPS: THE FUTURE SMART CROPS

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Abstract:

Traditional crops, also referred to as indigenous or underutilized crops, have been central to Indian agriculture for centuries, providing essential nutrition, sustaining livelihoods, and enhancing ecological resilience. This paper explores the significance of traditional crops—such as millets, pulses, root and leafy vegetables, and fruits—in ensuring food security, promoting nutritional well-being, and supporting sustainable agriculture in India. These crops are rich sources of carbohydrates, proteins, fats, vitamins, minerals, and phytochemicals vital for human health. Millets like ragi and pearl millet, pulses such as tur and moong dal, root vegetables like sweet potatoes, and a diverse array of fruits including mango, jackfruit, and guava contribute significantly to dietary diversity and resilience against climate change. Traditional agricultural practices like mixed cropping, crop rotation, and agroforestry have further strengthened the adaptability and productivity of these crops, especially in regions with harsh growing conditions. As India faces emerging challenges of climate change, soil degradation, and nutritional deficiencies, promoting the cultivation and consumption of traditional crops offers a sustainable pathway toward achieving food security and improving public health. This paper underscores the need to revitalize traditional agricultural practices and integrate indigenous crops into modern farming systems to ensure environmental sustainability, economic viability, and enhanced nutritional outcomes.

Introduction:

Traditional crops also known as indigenous or underutilized crops that have been grown and used by local people. These crops are important as they can be combined well with staple(cereals) they can provide food nutrition that are essential to the body consisting carbohydrates, protein, fats and oils, vitamins and minerals.

Human civilization largely depends on agriculture, as it is unswervingly interconnected to food security, livelihood and sustainable development(1). Traditional and agricultural practices have been an integral part of food production in India since ages. These practices have the potential to mitigate adverse effects

of climate change with spatial and sequential diversity. This covers the aspects of Indian traditional crops. These crops have occupied areas where cultivation of any other crop is difficult. This has made them indispensable components in certain ecosystems where farmers have to depend on these crops for a substantial part of grain and fodder for his daily needs. Therefore millets and pulses are important crops grown by farmers in India for their nutritional security, ability to produce in harsh conditions, special characteristics for slow release of glucose, non glutinous and non acid forming food etc. They are recognised as one of the oldest foods known to humans and possibly the first cereal grain to be used for domestic purposes. Double cropping, mixed cropping, crop rotation, agroforestry, use of local varieties and resources with host-pathogen interaction are some of the prominent traditional agricultural practices in India which have to be strengthened in view of the environment and food security.

Common traditional and nutritious crops in india:

Millets: ragi, jowar and other millets are excellent sources of nutrients and are often grown in drought prone areas.

- **Barley** for feed purposes is given central attention and is compared with wheat, rye and oats. Barley is considered a low gastro-intestinal food. Barley is an excellent food choice for those concerned about type II diabetes or pre-diabetes because the grain contains essential vitamins and minerals and is an excellent source of dietary fiber, particularly beta-glucan soluble fiber.(1)
- **Pearl millet** is the most widely grown type of millet. The grain is equal or superior to grain of wheat, corn, sorghum, and rice in protein and oil content. It contains similar amounts of Calcium and Phosphorus and more iron than these cereals. Except for a lysine deficiency, pearl millet has an excellent amino acid profile. The starch properties of pearl millet, sorghum, and corn are similar(2).
- **Buckwheat** contains higher levels of zinc, copper, and manganese than other cereal grains, and the bioavailability of zinc, copper, and potassium from buckwheat is also quite high. Potassium helps to maintain the water and acid balance in blood and tissue cells, zinc helps to bolster the immune system, and copper deficiency leads to a number of really scary-sounding neurodegenerative diseases and disorders with terrifyingly long names. Buckwheat also provides a very high level of protein, second highest only to oats. Not only is buckwheat protein well-balanced and rich in lysine, its amino acid score is 100, which is one of the highest amino acid scores among plant sources as well(4).

Pulses: Tur dal, moong dal, and other pulses are important sources of protein and are widely consumed in India. Due to their inexpensive nature pulses earned the moniker of the poor man's meat, even recommended in mediaeval times

Root vegetables: sweet potatoes, yam and other root vegetables are good sources of carbohydrates and vitamins.

Leafy vegetables: spinach, fenugreek and other leafy vegetables are rich in vitamins and minerals.

Fruits: Mangoes, jack fruits and other fruits are important sources of vitamins and antioxidants.

- **Mangoes:** Mangoes are rich in vitamins A and C, antioxidants, and dietary fiber. They improve digestion, support eye health, and boost the immune system. Mangoes also help lower cholesterol levels and improve skin health.
- **Jamun:** Jamun, or black plum, boosts immunity, aids digestion, and helps control blood sugar levels, making it beneficial for diabetics. Rich in antioxidants, vitamins A and C, and iron, it promotes healthy skin and hair, improves heart health, and has anti-inflammatory properties that support overall wellness.
- **Wood apple:** Wood apple, or bael fruit, enhances digestion, boosts immunity, and supports liver health. Rich in fiber, vitamins A and C, and antioxidants, it helps regulate blood sugar, promotes skin health, and has anti-inflammatory properties. Its natural laxative effect aids in relieving constipation and improving overall gut health.
- **Jackfruit:** Jackfruit is high in vitamins C, A, and various B vitamins, along with dietary fiber. It boosts the immune system, improves digestion, and supports heart health. The fruit's antioxidant properties also help fight inflammation and reduce the risk of chronic diseases.
- **Guava:** Guava is high in dietary fiber, vitamin C, and antioxidants, which support immune function and digestive health. It helps regulate blood sugar levels and is beneficial for heart health. The fruit is also known for improving skin texture and boosting vision.
- **Apples:** Apples improve heart health, aid digestion, and help regulate blood sugar levels. Rich in fiber, vitamins C and K, and antioxidants, they boost the immune system, support weight management, and promote healthy skin. Apples also have anti-inflammatory properties and may reduce the risk of chronic diseases.
- **Amla:** Amla is rich in vitamin C and antioxidants, boosting the immune system and promoting healthy skin. It aids digestion and helps control blood sugar levels. Regular consumption can improve heart health and reduce inflammation(11).

Fruits and vegetables historically have been considered a rich source of some essential dietary micronutrients and fibers and more recently they have been recognised as an important source for a wide array of phytochemicals that individually and in combination may benefit health.

Preservation and Promotion of traditional crops:

The preservation and promotion of traditional food are intimately linked to cultural presentation and identity. Thus food is not just a source of substance; they have many stories and memories, and they create a sense of belonging, reviving and celebrating traditional foods can help communities reconnect with their roots, boost cultural pride and strengthen social bonds.

- **Improved nutrition:** traditional foods often have higher nutritional value than their modern counterparts, providing essential vitamins, minerals and antioxidants. Traditional foods are not just

a reflection of culture; they are frequently also a source of vital nutrients which in turn furnish the body with energy, regulate body processes and promote growth and repair of body tissues. When food is selected wisely and consumed in sufficient quantity, it provides all the nutrients which the body needs in the proportion required to function properly(6). These foods are rich in vitamins, minerals, antioxidants and dietary fiber contributing to overall health and well-being. Moreover, traditional diets have been associated with reduced risk of chronic diseases, such as heart disease, diabetes and obesity. By incorporating traditional foods into modern diets, we can promote healthier eating patterns and prevent diet related health problems(6).

- **Food security:** diversifying crops can enhance food security by reducing reliance on a few staple foods and making communities more resilient to climate change and other challenges. True security lies in diversity, however. Food policy should thus be broadly based, making provision for the adequate supplies of a wide range of foods(6).

In Kenya, traditional food crops play an important role in food and nutritional security, especially in the dry parts of Kenya. This study set out to document the most important traditional food crops in Kenya and highlight their production levels, production ecologies, as well as their nutritional value. The findings reveal that the relative importance of traditional food crops differs from one area to another and, while some are produced for subsistence use; others, like sweet potatoes, are grown for commercial purposes. Despite their potential contribution to food and nutritional security, production of traditional food crops is far below that of maize (the main staple food in Kenya). The authors recommend rigorous promotion to increase their production and consumption, since traditional food crops are grown in the arid and semi-arid parts of the country where maize does not perform as well(7).

- **Economic benefits:** local crops can support local farmers, create jobs and boost local economics. Traditional food plants form a ready source of essential nutrients, being cultivable on small plots with family labour and minimal inputs such as water or fertilizer(6). Several literatures show that traditional food plays an important role in the lives of the rural population. They are a source of nutrition as well as medicine. The rural population, after their own consumption, can sell the products to urban areas for income generation. Therefore, there is an urgent need to highlight the importance of traditional food crops especially those having commercial potential along with nutritional and therapeutic importance(8).
- **Cultural preservation:** traditional crops are often tied to cultural heritage and tradition and promoting them can help persevere these important aspects of local identity.

In recent decades, however, social and economic changes have militate against their prepagatum and use, for example in the development of modern agriculture and its great benefits, the value of traditional food plants has been eclipsed by the economic attraction of other food and food crops(6).

Various communities across the globe, especially in the rural areas, rely on the locally available traditional food products for their nutritional and health-related needs. The traditional food products are considered important because they are locally available alternative sources of food and nutrition. However, they remain largely neglected to date despite their huge nutritional importance and potential(8).

Traditional foods are often sourced from the local ecosystem and rely on indigenous crops and animal breeds. Pressing the traditional food system promotes biodiversity. Safeguards endangered species and supports sustainable agriculture in the face of unforeseen climate change. Typically, local people with traditional lifestyles incorporate various plants such as leafy vegetables and wild fruits into their planned diets, benefiting from both the nutritional and medicinal aspects of these plants.(10)

Food insecurity:

The limited availability of traditional foods has resulted in a shift from consuming locally procured food to relying more on market foods. Other factors responsible for changing dietary habits of Indigenous people are economic disadvantage, high equipment costs, government restrictions, loss of traditional knowledge, changing food preference, decline in harvesting activities, weakening of food networks, food safety issues and climate changes. Kuhnlein and Receveur(1996), several cultural and ecological factors have contributed to reduced engagement in traditional subsistence activities, including the poor transfer of cultural knowledge to youth, reduced plant and animal species, climate change environmental contamination, time and energy required for harvesting, land uses and harvesting practices(3). In Hindu Kush Himalayan region traditional food crops are gradually disappearing from local farming systems. This has serious implications for sustainability in the socio-eco system(1).

Dietary transition:

The intake of traditional foods, even in limited amounts, improves diet quality of Indigenous people. Kuhnlein et al.(2004) found that consumption of traditional foods was associated with consuming significantly less carbohydrate, sugar and fat and more protein, vitamin D, vitamin E, Vitamin A, riboflavin, vitamin B6, zinc, iron, magnesium, copper, phosphorus, potassium, manganese, and selenium. Therefore the proportion of traditional foods in the diet of Indigenous people decreases, so does the diet quality, which may lead to changes in physical health status and the development of chronic diseases. Thus maintaining or increasing the consumption of traditional foods is one of the primary strategies to achieving food security among Indigenous communities(3).

Conclusion:

Traditional food crops have a huge potential to be '*future smart food*' if they are revitalized in the local farming system. Traditional food crops have high nutritional values(*social sustainability*), and are key to improving the agrobiodiversity and resilience of farming systems(*environmental sustainability*). Moreover,

they are efficient in energy use, implying that they require less investment in inputs and have high potential to be income generation sources(*economic sustainability*). Though, the conservation of tradition at crop varieties, India can enhance agriculture sustainability, food security and cultural heritage perseverance.

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