

Plantation Sector for *Viksit Bharat*: Nutrition, Empowerment, and Livelihood

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Introduction

The Indian plantation sector has the inherent strengths of varied agroclimatic conditions, huge domestic demand, the highest productivity, strong research and development, and technology dissemination systems. Currently, 30 million small growers rely on plantation crops for their sustenance. The gross value added by the sector annually amounts to Rs. 328,000 million, which is 6.71% of the total value added by the horticultural sector. The plantation crops generated a gross value output of Rs 257,000 million in 2012, and at present marks a significant increase of 28% over a decade. Furthermore, the growth exhibits significant diversification into non-traditional and North-Eastern states. Scientific farming methods, soil health management, and value addition are the practices to increase farmers' income and to meet the targets under SDGs. These practices can help farmers produce more crops and livestock, reduce production costs, and market their produce for a better price. The plantation crops such as coconut, arecanut, cocoa and palmyrah are the mandate crops of ICAR-Central Plantation Crops Research Institute (ICAR-CPCRI).

Coconut

Coconut, often called the "Tree of Life," is a crucial plantation crop for India. It plays a significant role in nutrition, rural empowerment, and livelihood generation—key pillars of the *Viksit Bharat* vision. India is one of the world's largest coconut producers, with states like Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Odisha leading in cultivation. By promoting sustainable coconut farming, value addition, and farmer-centric policies, India can harness this crop's full potential for national development.

In India, coconut contributed about Rs. 10,707 crores in crop output in 2020-21 and the coconut industry directly or indirectly employs about 12 million people. Coconut is a major plantation crop of coastal regions of Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh. These top four producers accounted for 90 per cent of total production and about 89.5 per cent of total acreage in the country in the year 2020-21. Other important coconut producing States in the country include West Bengal, Odisha, Gujarat, Maharashtra, Assam and Bihar, which account for nearly 8% of the production. Among the four major coconuts growing States, Andhra Pradesh had the highest productivity (13969 nuts ha⁻¹), followed by Tamil Nadu with 12280 nuts per hectare. While Kerala, which accounts for the largest share in production in the country, had average productivity of 9175 per hectare in 2020-21, marginally lower than the all-India yield of 9345 nuts per hectare. The productivity level in Karnataka (6892 nuts ha⁻¹) was significantly lower than all India average and other major producers.

Nutritional Benefits of Coconut

Coconut is a powerhouse of essential nutrients offering multiple health benefits across its various forms—water, flesh, oil, and milk. It is widely consumed in India and plays a crucial role in traditional diets, natural remedies, and modern health trends. Among the different products of coconut, the coconut

water which is also called natural hydrator is an excellent natural sports drink which is rich in electrolytes such as potassium, sodium and magnesium. It is used to avoid dehydration related fatigue. Coconut water is low in calories and free of cholesterol and fat. Copra and coconut flour is another product of coconut which is high in dietary fiber which improves digestion and promotes gut health. They are good sources of healthy fats including medium-chain triglycerides (MCTs). They are also rich in essential minerals like iron, manganese and copper which support bone health and immunity.

Coconut flour is gluten free which makes it a better option for people with gluten intolerance. Virgin Coconut Oil, which contains MCTs is a good source of energy, and it is known to help in managing neurodegenerative diseases like Alzheimer's. The oil also has antimicrobial and anti-inflammatory properties, and it increases good cholesterol when consumed in moderation. A dairy free alternative rich in healthy fats is coconut milk and cream. It contains lauric acid which has antibacterial and antiviral properties. It enhances skin and hair health due to moisturizing and nourishing properties. Coconut sugar is a natural sweetener which has low glycemic index making it a better option for blood sugar control. It is also rich in minerals like zinc, iron, and potassium that aid overall health. Hence, we can say that coconuts are not just a food ingredient but a nutritional powerhouse that supports hydration, energy, digestion, immunity, and overall well-being. By promoting the consumption of coconut and its byproducts, India can boost national nutrition, reduce dependence on processed foods, and enhance public health—aligning perfectly with the vision of *Viksit Bharat*.

Empowering Farmers and Rural Communities Through Coconut Cultivation

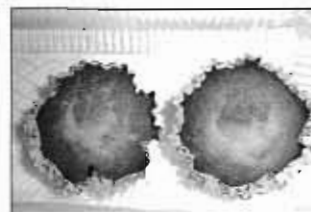
Coconut farming is a lifeline for millions of small and marginal farmers in India, particularly in states like Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Odisha. Strengthening this sector can lead to economic empowerment, social upliftment, and sustainable rural development, contributing to the vision of *Viksit Bharat*. Coconut cultivation and coconut-based industries create employment opportunities to youth and women. They play a major role in successful coconut-based industries such as VCO production, coir products, handicrafts, coconut-based food products etc. Coconut industry has potential to encourage women led SHGs which engages them in small scale coconut business and ensures financial independence and social empowerment. Farmers are empowered by forming coconut FPOs through which farmers can better price for their produce and technology backup from the research institutes help the FPOs to start coconut-based industries for enhancing the financial status of the farmers. Technologies on value addition to coconut help in increasing the income of farmers. Support from government to coconut farmers through Coconut Development Board, Technology Mission on coconut including subsidies and credit support helps farmers to overcome the unexpected losses in the crop due to weather vagaries and pest and disease attacks. Empowering coconut farmers and rural communities through better market access, women's participation, value addition, and government support can transform the coconut sector into a major driver of rural prosperity. By promoting sustainable and innovative farming practices, India can enhance farmer incomes, generate employment, and boost exports, aligning with the vision of *Viksit Bharat*.



Kernal based products



Kalparasa based products



VCO cake based muffins



Kalpa Bliz – Flavored coconut milk

Value added products from coconut

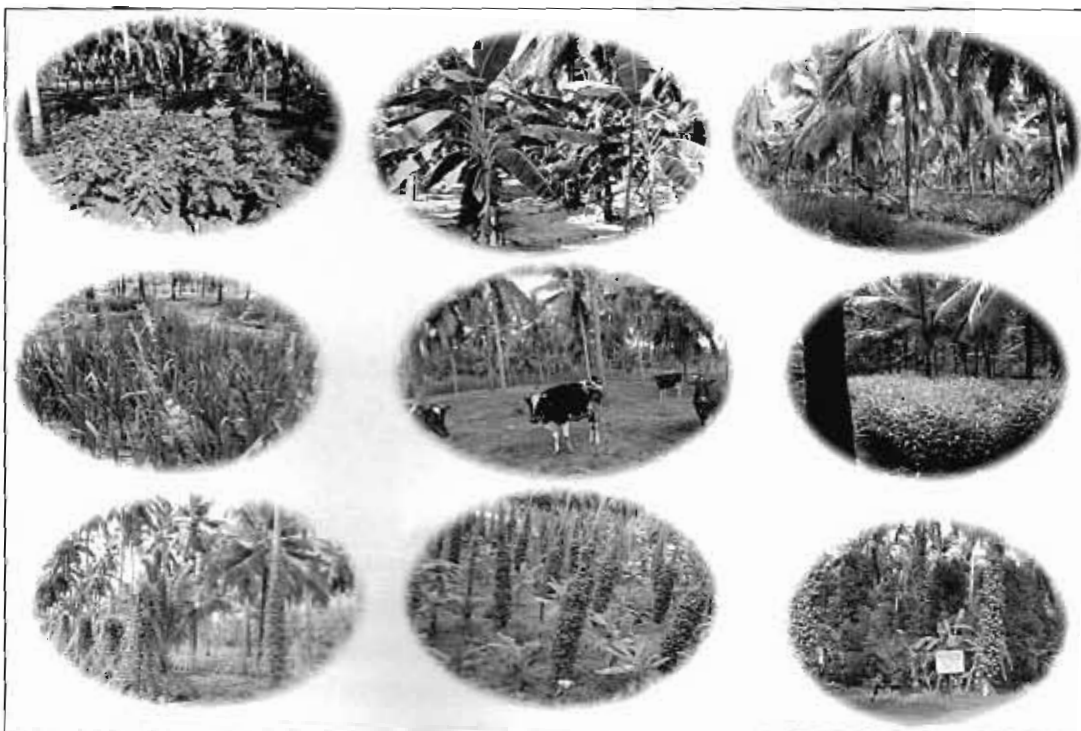
Coconut for Livelihood and Economic Growth

Coconut farming is a major source of livelihood for millions of people in India, especially in rural and coastal regions. It contributes significantly to employment generation, agro-based industries, and export earnings, making it a crucial driver of economic growth in the journey toward *Viksit Bharat*. By promoting value addition, cooperative models, and modern agricultural techniques, India can unlock the full economic potential of its coconut sector.

Coconut cultivation and processing provide direct and indirect employment to millions, including farmers, laborers, processors, traders, and artisans. Raw coconut sales yield limited profits, but processing and value addition can increase farmers' incomes by 2-3 times. Encouraging farmers and entrepreneurs to invest in small-scale processing units can significantly boost rural incomes. The coconut sector has immense potential to drive rural employment, increase farmer incomes, and contribute to India's economic growth. By investing in value addition, sustainable farming, and global market expansion, India can transform coconut farming into a high-income, employment-rich sector, helping achieve the vision of *Viksit Bharat*.

Sustainability and Climate Resilience in Coconut Farming

Coconut is often called the "Tree of Life", not just because of its nutritional and economic value, but also due to its environmental benefits and resilience to climate change. As India moves toward the vision of *Viksit Bharat*, adopting sustainable coconut farming practices will ensure long-term prosperity for farmers while mitigating the effects of climate change. Coconut farming is termed as climate resilient as they are drought tolerant and can withstand salinity to some extent. These palms are known to withstand extreme weather conditions like cyclones. Coconuts can sequester large quantities of CO₂ helping combat climate change. Practices like organic farming, intercropping and mixed farming, drip irrigation and fertigation, soil water conservation can improve productivity and environmental sustainability. All the parts of the palm are used for one or the other purpose. Thus, the crop can be called as eco-friendly and zero waste crop.

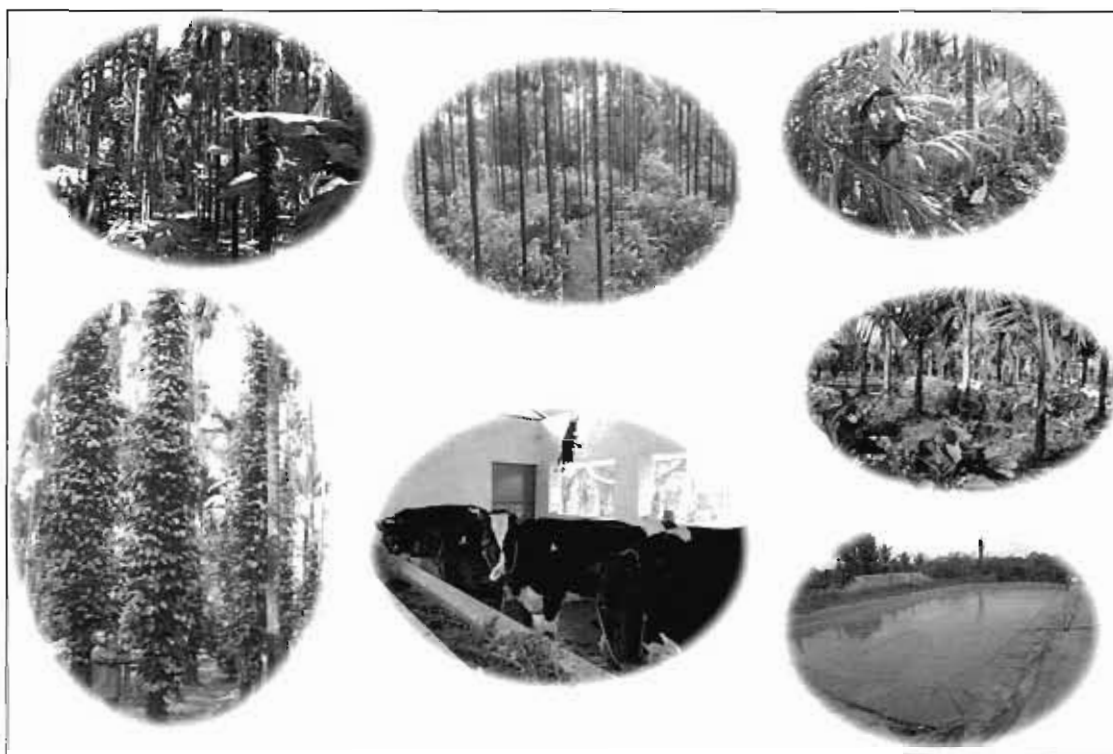


Coconut based cropping/ farming system

Arecanut

Arecanut (also known as betel nut) is a significant plantation crop in India, holding cultural, religious, medicinal, and economic importance. In India it is grown in an area of 8 lakh hectares with a production of 16 lakh tons. It is mainly grown in the states of Karnataka, Kerala, Assam, West Bengal, Tamil Nadu and Maharashtra. Karnataka is a major producer of arecanut with 60% of the total area and 69% of the total production. About 20 million people are dependent on arecanut for livelihood. In the context of Viksit Bharat (Developed India) 2047, arecanut cultivation and its industry can contribute to economic growth, rural prosperity, and sustainable agriculture. The arecanut industry, including processing, packaging, and trade, provides jobs in rural and semi-urban areas.

ICAR- CPCRI has been at the forefront of research and innovation in arecanut cultivation. Over the years, ICAR-CPCRI has made significant contributions to improving the productivity and sustainability of arecanut farming in India. ICAR-CPCRI has developed 11 improved varieties of arecanut, including three dwarf hybrids. These varieties/hybrids have been proven to enhance productivity, helping farmers achieve higher returns from their crops. In addition to developing new varieties, the institute has standardized a range of agro-techniques for the scientific cultivation of arecanut. These practices help optimize resource use, improve crop health, and enhance the yields, ensuring more sustainable farming practices.



Arecanut Based Cropping/ Farming System

To further enhance the economic viability of arecanut farming, ICAR-CPCRI has developed cropping models that integrate arecanut with other compatible crops. These models not only increase the income potential of farmers through diversified production systems but also contribute to soil health and environmental sustainability. The institute has also developed integrated disease and pest management (IDPM) strategies to address the various diseases and pests infecting arecanut. These comprehensive management strategies combine cultural practices, biological controls, and judicious use of chemical treatments, aiming to reduce the dependency on pesticides and improve long-term crop health. By integrating technology, sustainable practices, and farmer-centric policies, arecanut can contribute significantly to Viksit Bharat 2047, ensuring prosperity for cultivators while boosting India's agricultural economy.

Cocoa

Cocoa cultivation in India has the potential to play a significant role in Viksit Bharat 2047, contributing to the agricultural economy, rural development, and the growth of the domestic chocolate industry. With increasing demand for chocolate and cocoa-based products, India has an opportunity to become self-sufficient and a key player in the global cocoa market. Cocoa is cultivated in about 1.0 lakh hectares in India with a production of 28000 tonnes. The demand for cocoa is increasing and at present the demand is more than 1.0 lakh tonnes. Thus, there is high potential for growing cocoa in India. It is mainly grown as intercrop under coconut and arecanut as it needs partial shade.

Cocoa farming provides employment to thousands of farmers and laborers. The chocolate and confectionery industry, which depends on cocoa, employs lakhs of people in processing, packaging, and marketing. Encouraging farmer cooperatives and direct procurement models can improve income stability. The Indian chocolate market is worth Rs. 20,000+ crores, growing at 15-20% per year. Rising incomes and urbanization are driving higher chocolate consumption. Increasing local cocoa production can support Make in India and reduce dependence on imports from Ghana, Ivory Coast, and Indonesia.

The government is supporting cocoa for expanding the area under cultivation of cocoa. ICAR-CPCRI has been conducting research on cocoa for the last 60 years and released 3 improved clones and 5 hybrids for cultivation which can increase the production of cocoa. The scientific cultivation practices including canopy management, nutrient management, irrigation management and disease and pest management have been standardized for cocoa cultivation for sustainable production. Quality planting materials have been produced and distributed among farming community for increased production. Cocoa can be an integral part of the coconut and arecanut cultivation for sustainable production of both the crops.



Cocoa varieties

Cocoa has immense potential to contribute to Viksit Bharat 2047 by boosting rural incomes, strengthening the Indian chocolate industry, reducing imports, and promoting sustainable farming. With the right policies, technological advancements, and investment in value addition, India can become a major player in the global cocoa market while ensuring prosperity for farmers and entrepreneurs.

Nutritive value of some of the coconut products

<p>Virgin coconut oil Calories: 900kcal per 100 g Nutritive value:</p> <ol style="list-style-type: none"> 1. Total fat: 100g per 100g 2. Cholesterol: 0 mg per 100g 3. Total phenol: 2.9 mg GAE/ 100g 4. Total flavonoid: 6.6 (mg QE/100 g) 	<p>Coconut sugar</p> <table border="1"> <tbody> <tr> <td>Total calories per 100g</td> <td>380kcal</td> </tr> <tr> <td>Total sugars (g)</td> <td>92</td> </tr> <tr> <td>Protein (g)</td> <td>2.9</td> </tr> <tr> <td>Dietary Fibre (g)</td> <td>2.5</td> </tr> <tr> <td>Phenolics (mg)</td> <td>25</td> </tr> <tr> <td colspan="2">Minerals</td> </tr> <tr> <td>Potassium (g)</td> <td>1.0</td> </tr> <tr> <td>Phosphorous (mg)</td> <td>80</td> </tr> <tr> <td>Magnesium (mg)</td> <td>30</td> </tr> <tr> <td>Sodium (mg)</td> <td>50</td> </tr> <tr> <td>Zinc (mg)</td> <td>2.1</td> </tr> <tr> <td>Manganese (mg)</td> <td>0.1</td> </tr> <tr> <td>Iron (mg)</td> <td>2.2</td> </tr> <tr> <td>Copper (mg)</td> <td>0.2</td> </tr> </tbody> </table>	Total calories per 100g	380kcal	Total sugars (g)	92	Protein (g)	2.9	Dietary Fibre (g)	2.5	Phenolics (mg)	25	Minerals		Potassium (g)	1.0	Phosphorous (mg)	80	Magnesium (mg)	30	Sodium (mg)	50	Zinc (mg)	2.1	Manganese (mg)	0.1	Iron (mg)	2.2	Copper (mg)	0.2
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Conclusion

Plantation crops, when managed sustainably, can be a climate-resilient, environmentally friendly, and profitable sector for India. By promoting organic practices, efficient resource use, and zero-waste utilization, India can make plantation crop cultivation a model for green agriculture—paving the way for a sustainable and prosperous *Viksit Bharat*. In the plantation sector, crops like coconut and arecanut are not just crops—it is a symbol of prosperity and sustainability. For a *Viksit Bharat*, leveraging coconut's nutritional value, economic potential, and environmental benefits is essential. By investing in technology, value addition, and farmer welfare, India can transform its coconut sector into a global powerhouse, ensuring better livelihoods and a healthier future.