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FICCI 100 YEARS OF BUILDING TOMORROW

Empowering the cocoa sector

A strategic roadmap for driving Atmanirbhar Bharat through sustainable farming

April 2026





Contents

Section	Page
Executive summary	4
Foreword	5
Cocoa landscape	9
Cocoa in India	13
Cocoa: Farm to market ecosystem	21
Research and development landscape	29
Policy landscape	39
Area expansion plan	50
Digital and data infrastructure	54
Trade scenario	58
Atmanirbhar Bharat in Cocoa	62
Recommendations	69
Annexure	71

Executive summary

India's cocoa sector is at a critical inflexion point. With domestic demand rising steadily and imports exceeding USD 866 million annually, the country currently meets only 25–30% of its cocoa requirement through local production. This imbalance presents both a challenge and a strategic opportunity to build a resilient, self-reliant cocoa ecosystem aligned with the vision of Atmanirbhar Bharat. This knowledge paper presents a comprehensive roadmap for sustainable cocoa development in India, drawing on agronomic insights, economic modelling, policy analysis, and global best practices. Cocoa has emerged as a high-potential crop for agricultural diversification, enhancing rural income, and promoting climate-resilient farming. It thrives as an intercrop with coconut, arecanut, and oil palm, offering long-term returns, low input costs, and ecological compatibility. Financial models demonstrate strong viability across intercropping systems, particularly in southern and northeastern states.

However, the sector faces several structural challenges, including fragmented policy support, limited access to quality planting material, underutilised processing capacity, and weak digital infrastructure. The absence of a unified policy framework and cocoa-specific schemes has constrained adoption and scale. Furthermore, the inverted duty structure favours finished goods imports over raw beans, discouraging domestic value addition and weakening India's competitiveness in global cocoa markets. To address these challenges, the paper recommends launching a National Mission on Cocoa to unify efforts across research, policy, and trade. Key interventions include expanding polyclonal seed gardens to meet demand for planting materials, establishing a Centre of Excellence (CoE) through a public–private partnership model, and digitising the cocoa value chain to enable traceability, farmer profiling, and targeted subsidy delivery. Rationalising import duties and promoting cocoa cultivation in tribal and rainfed zones are also critical to reducing import dependency and boosting farmer incomes.

A Cocoa Stewardship Forum is proposed as a vital mechanism to ensure coordinated action between government, industry, and academia. This platform would facilitate policy alignment, drive innovation, and promote sustainability across the value chain, while empowering farmers through capacity building and knowledge dissemination. Through strategic and collaborative efforts, cocoa can evolve from a niche intercrop into a strategic commodity, making meaningful contributions to India's agricultural transformation, enhancing rural livelihoods, and strengthening the country's position in global cocoa markets.



Foreword

Foreword by Horticulture Commissioner

Strengthening self-reliance in strategic agricultural commodities has become imperative, and cocoa has been designed as a sector requiring focused attention. With domestic demand rising steadily and import dependence remaining high, achieving Atmanirbharta in cocoa in the next decade has become both an economic and agricultural priority.



Building a robust domestic cocoa ecosystem is therefore essential to securing farmer incomes, supporting food processing industries, and reducing long-term import exposure.

Cocoa is emerging as a strategically important commodity for India, with demand increasing steadily across chocolates, confectionery, bakery, beverages, and other processed food segments. This expanding consumption base, alongside limited domestic production, has resulted in continued import dependence and highlights the need to strengthen the domestic cocoa ecosystem.

Cocoa in India is primarily cultivated as an intercrop under coconut, arecanut, oil palm, and rubber plantations, enabling scale without requiring significant additional land resources. Its relatively low input intensity, long productive life, consistent profitability, and stable market demand make cocoa a commercially viable and resilient crop choice. For small and marginal farmers in particular, cocoa offers an opportunity to enhance per hectare returns, reduce income volatility, and improve overall farm sustainability, while remaining aligned with climate appropriate production systems.

Despite these advantages, cocoa cultivation in India has not expanded at the scale required to meet rising domestic demand. Constraints such as limited availability of quality planting material, absence of region-specific climate resilient varieties and standardised fermentation and drying protocols; inadequate research and extension support, gaps in post-harvest infrastructure, and fragmented institutional coordination have slowed adoption and productivity growth. Collectively, these constraints have impeded the scaling of cocoa as a reliable domestic production base beyond its current supplementary role.
In this context, this Knowledge Paper titled 'Empowering the Cocoa Sector: A Strategic Roadmap for Driving Atmanirbhar Bharat through Sustainable Farming' presents an evidence-based assessment of India's cocoa sector. It examines demand dynamics, supply-side constraints, and value chain gaps, and outlines a strategic roadmap to scale production, strengthen processing and value addition, and enable a coordinated, ecosystem-based approach to sector development. It serves as a strategic reference to enable informed policy choices and support the adoption of future-ready, technology-enabled, and integrated ecosystem models across the cocoa value chain, fostering sustained public–private collaboration and shared value creation.

Cocoa has been recognised as a crop of both economic and strategic importance, with strong potential to enhance farmer incomes and support India's shift towards higher value agribusiness. This collective effort is intended to position Brand India in cocoa as globally recognised for quality, reliability, and leadership across the cocoa value chain.

Dr. Prabhat Kumar

Horticulture Commissioner,
Department of Agriculture, & Farmer Welfare,
Ministry of Agriculture & Farmers Welfare

Foreword by FICCI

India's cocoa sector stands at a defining moment—one that presents both a challenge and a remarkable opportunity. As highlighted in this knowledge paper, the widening gap between domestic demand and production underscores the urgency for a coordinated, forward-looking approach.



At the same time, it opens the door to building a robust, self-reliant cocoa ecosystem aligned with the vision of Atmanirbhar Bharat.

Cocoa, with its strong potential as a climate-resilient and income-enhancing intercrop, offers a viable pathway for agricultural diversification and farmer prosperity. Its compatibility with existing plantation systems such as coconut, arecanut, and oil palm makes it particularly attractive for scalable adoption across suitable regions in India.

However, unlocking this potential will require addressing structural challenges—ranging from access to quality planting material and policy fragmentation to value chain inefficiencies and limited digital integration. This report provides a comprehensive roadmap to overcome these barriers through targeted interventions, strengthening research and extension systems, enabling traceability, and fostering public–private partnerships.

We believe that with the right policy support, institutional mechanisms, and stakeholder collaboration, cocoa can transition from a niche crop to a strategic pillar of India's agricultural economy—enhancing rural livelihoods, reducing import dependency, and strengthening India's footprint in global cocoa markets.

We extend our sincere appreciation to all contributors and stakeholders who have supported this effort and look forward to continued collaboration in shaping the future of India's cocoa sector.

Syed Junaid Altaf

Chairman, FICCI Task Force on Horticulture &
Group Executive Director, FIL Industries Pvt. Ltd.

Foreword by Grant Thornton Bharat

India's cocoa sector is at a clear inflection point, as rising domestic consumption, growing import dependency, and increasing volatility in global markets elevate the urgency of building a stronger domestic production and processing base.



India's chocolate and cocoa-based products industry is experiencing sustained growth, driven by rising consumption across confectionery, bakery, beverages, dairy, and allied food segments. Cocoa demand is estimated to be expanding at a CAGR of 7–10%, reflecting strong momentum across downstream industries. However, domestic cocoa production currently meets less than 20% of this demand, resulting in a widening supply gap and increasing dependence on imports.

In India, cocoa is mainly grown as an intercrop alongside coconut, arecanut, oil palm, and rubber, allowing production to increase without extra land. Cocoa requires relatively low input, produces for many years, and has steady demand. It enables small and marginal farmers to earn higher income per hectare, reduce income uncertainty, and maintain sustainable farming systems aligned with agroforestry conditions. Expanding cultivation within traditional regions and into suitable non-traditional agro-climatic regions such as the North-East, Odisha, Chhattisgarh, and Telangana presents an opportunity for both farmers and industry — improving raw material availability for domestic processing.

To realise this potential, targeted efforts are required to address structural gaps. Priority areas include strengthening the supply of quality planting material, establishing a dedicated cocoa R&D framework for region-specific and climate-resilient varieties, improving adoption of Good Agricultural Practices, and standardising post-harvest processes such as fermentation and drying. Enhancing farmer aggregation, building FPO capacity, and improving coordination across institutions and industry stakeholders will be critical to developing scalable domestic cocoa supply chains.

India has an opportunity to position itself not only as a self-reliant cocoa producer, but also as a regional hub for cocoa processing and value addition. This Knowledge Paper presents a data-backed assessment of India's cocoa landscape and sets out a roadmap for achieving self-sufficiency while strengthening export competitiveness and value-added participation in global value chains. To advance this vision, India requires a dedicated cocoa-focused R&D institution in the form of a National Centre of Excellence, operating on a public–private collaboration model, to drive research and innovation, strengthen planting material systems, and build farmer and FPO capacity.

Enabling policy support will be critical, including strengthening Farmer Producer Organisations (FPOs), promoting partnerships and cluster-based development, and focusing on shared infrastructure. Establishing a single-window, digitally enabled subsidy system will help simplify access and ensure timely support across the cocoa value chain. On the trade side, creating an enabling environment for FDI, incentivising domestic processing and value addition, and rationalising tariff structures will be key to strengthening competitiveness.

The enforcement of national quality standards, establishment of robust testing and traceability infrastructure, accelerated adoption of technology across production and post-harvest processes, and credible certification frameworks together will form the foundation of India's pathway to premiumisation, shifting the sector towards quality-led and value-driven competitiveness.

Chirag Jain
Partner and Food Processing Industry Leader
Grant Thornton Bharat



Cocoa landscape

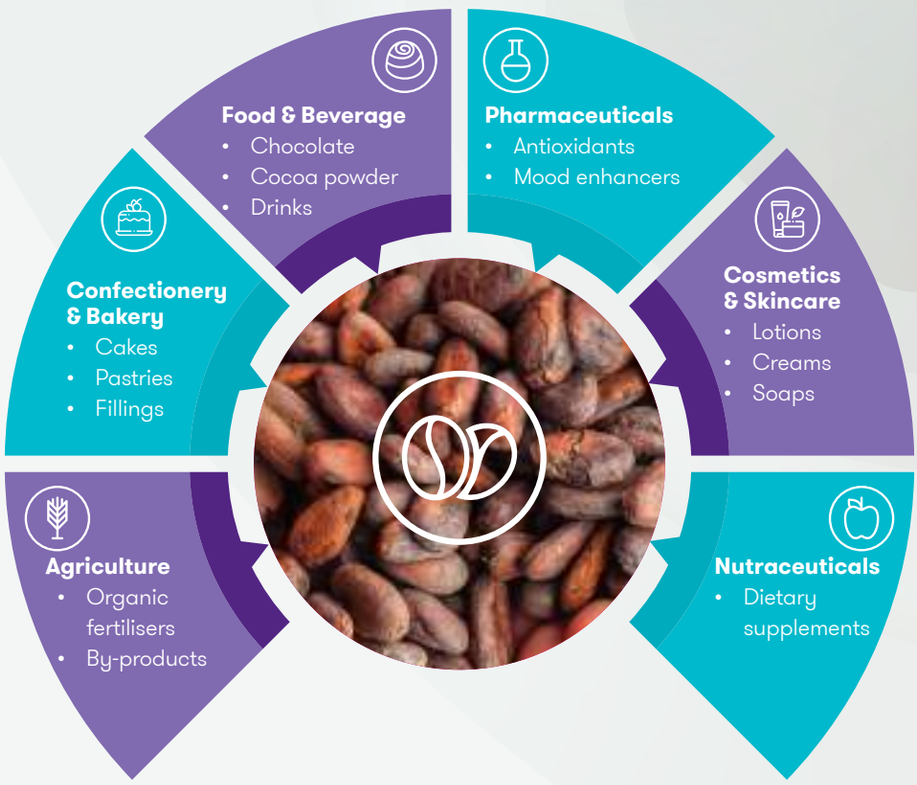
Cocoa: An overview

Cocoa, scientifically known as Theobroma cocoa, which means **"food of the gods"**, is a tropical crop of immense global importance, forming the backbone of the multi-billion-dollar chocolate industry. Cultivated primarily in equatorial regions, cocoa is valued not only for its rich flavour and versatility in food processing but also for its growing applications in cosmetics, nutraceuticals, and pharmaceuticals. The beans, extracted from cocoa pods, undergo fermentation, drying, and roasting to produce cocoa liquor, butter, and powder— each with distinct industrial uses.

Globally, cocoa is **a source of livelihood for more than 5 million smallholder farmers,** particularly in West Africa, Latin America, and Southeast Asia. It is a labour-intensive crop that thrives in warm, humid climates with well-distributed rainfall and fertile, well-drained soils. Beyond its economic significance, cocoa is increasingly recognised for its health benefits, including antioxidant properties, cardiovascular support, and mood-enhancing effects, which are driving demand in both traditional and emerging markets.

As global consumption trends shift toward premium, sustainable, and ethically sourced cocoa products, there is a growing opportunity for new geographies to enter the value chain. For countries like India, where cocoa cultivation is still limited to a few southern states, the crop presents a strategic avenue for agricultural diversification, rural development, and value-added exports. With the right policy support, institutional collaboration, and research, cocoa can become a high-potential crop in non-traditional regions, contributing to both farmer prosperity and national agri-export goals.

Diverse uses of cocoa

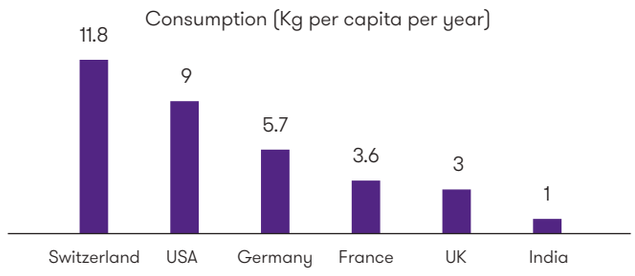


Cocoa: Global scenario

Cocoa production and consumption centres

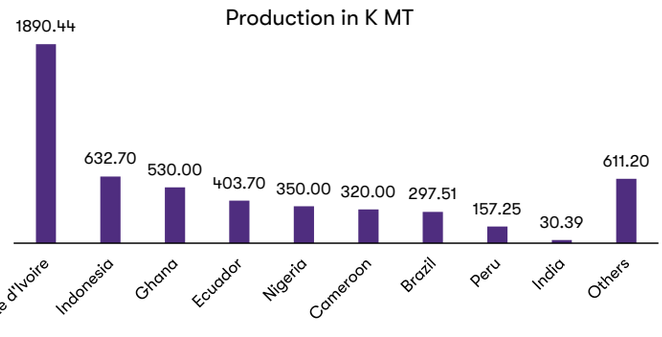
Cocoa cultivation spans across the tropical belt, with production concentrated in regions between 20°N and 20°S latitude. West Africa dominates the global supply, with Côte d'Ivoire and Ghana together contributing ~48% of the world's cocoa output. These countries benefit from ideal agro-climatic conditions — consistent rainfall, warm temperatures, and fertile soils — making them the epicentre of global cocoa farming. Beyond Africa, significant production also occurs in Southeast Asia (notably Indonesia and the Philippines) and Latin America (including Ecuador, Brazil and Peru), each contributing to regional diversity in cocoa varieties and farming practices.

Consumption centres



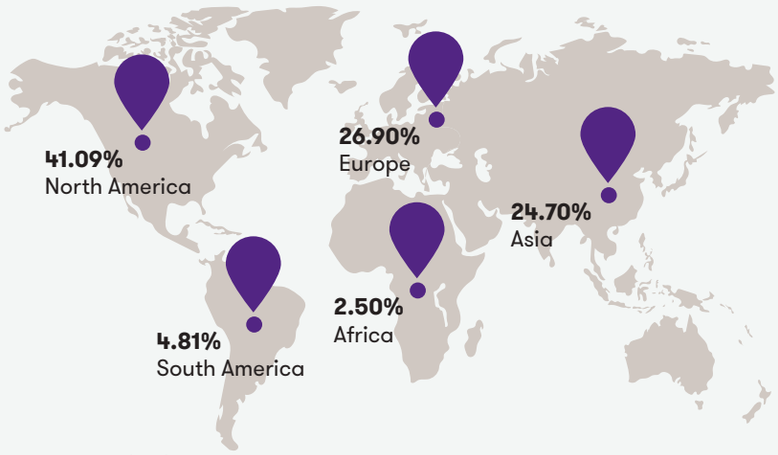
(ICCO 2023-24 Estimates)

Production centres



However, this geographic concentration also exposes the global supply chain to climate risks, socio-economic challenges, and sustainability concerns. Meanwhile, consumption is largely driven by countries in Europe and North America, with Switzerland, the US, and Germany among the top consumers per capita. This north-south divide in production and consumption highlights the need for more equitable value distribution, enhanced traceability, and diversification of production zones, including emerging regions such as South Asia—to foster resilience and inclusivity in the global cocoa economy.

Global cocoa market sales revenue: USD 15,653 million



Percentage Share in Global Cocoa Market Sales Revenue (2025)[1]

Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

The table reflects a **tightening global cocoa market,** with production dropping by **12.9%** in 2023-24, while grindings fell by only 4.8%, signalling sustained demand. This imbalance has widened the deficit and reduced stock levels by **28%**, pushing the stock-to-grindings ratio down to 26.4%, which leads to **higher prices** and **increased market volatility.**

Cocoa year	Revised estimates in thousand tonnes		Year on year change
	2022/23	**2023/24**	
World gross production	5016	4368	-12.90%
World grindings	5058	4818	-4.80%
Surplus/deficit	-98	-494	
End of season tocks	1764	1270	-28%
Stock/grinding ratio	34.90%	26.40%	

Source: ICCO



Cocoa in India

Globally, cocoa is a significant crop, supporting the livelihoods of more than 5–6 million farmers, predominantly smallholders. While India is not yet a major global producer, its cocoa sector is experiencing robust growth driven by rising domestic consumption and emerging opportunities. The recent global cocoa supply crisis, marked by a 13.1% production decline and a 45-year low in global stocks, has highlighted the urgent need for diversified and resilient production hubs. India, with its favourable agro-climatic zones and expanding cultivation footprint, is well-positioned to play a strategic role in stabilising global cocoa supply chains.

Cocoa cultivation in India is steadily gaining ground, driven by the rising demand for chocolate and cocoa-based products across both domestic and international markets. As of FY2023–24, India cultivated cocoa across approximately 1,11,000 hectares producing around 30,390 metric tons which comes from southern states of Andhra Pradesh**,** Kerala, Karnataka, and Tamil Nadu with **Andhra Pradesh** alone contributing around **40%** of this **national output**. However, this accounts for less than 20% of the domestic demand which stands at nearly ~1.87 lakh MT (in bean equivalents). To bridge this gap, India relies heavily on imports and more than 80% of its cocoa requirement is met through international sourcing. According to APEDA, India imported more than **USD 880 million** worth of cocoa and cocoa products in the last fiscal year, underscoring the urgent need to boost domestic production. India's agricultural sector is increasingly focused on enhancing farm income through diversification and sustainability. Traditional crops, while essential, often face diminishing returns due to climate variability, market saturation, and soil degradation. In this context, **plantation crops with high market value and ecological compatibility** are gaining attention. Cocoa has shown promising adaptability to humid tropical regions, particularly when cultivated as an intercrop under coconut and arecanut systems.

> "India is the only place where I really see big potential in terms of consumption volumes. It is the emerging hub for cocoa in Asia."
>
> **— Michel Arrion, Executive Director, International Cocoa Organisation (ICCO)**

Studies by the (DCCD) and various agricultural universities have highlighted cocoa's potential. Moreover, India's chocolate consumption is on the rise while domestic cocoa production remains insufficient, creating a clear **demand-supply gap.** The imbalance, coupled with cocoa's compatibility with agroforestry models and low input requirements, positions it as a **long-term investment crop** that can be monetised effectively supporting both ecological resilience and economic upliftment for smallholder farmers.

States	2019-20		2020-21		2021-22		2022-23		2023-24	
	A	P	A	P	A	P	A	P	A	P
Andhra Pradesh	36.5	10.4	39.70	10.90	41.87	11.45	43.9	12.14	44.99	12.38
Karnataka	14.10	3.50	14.20	3.70	14.25	3.91	14.34	4.06	14.41	4.14
Kerala	16.90	9.20	17.40	9.60	17.77	10.13	18.46	10.54	18.66	10.75
Tamil Nadu	30.10	2.70	32.10	2.80	32.08	2.94	32.58	3.06	32.98	3.12
India	97.60	25.80	103.40	27.00	105.98	28.43	109.29	29,79	111.04	30.39

Source: Horticulture Data (2023-24 Final Estimates): MoAF&W

Note: India's cocoa production currently lies in the range of **23–25k metric tonnes** only, according to industry estimates.

Regional cocoa production

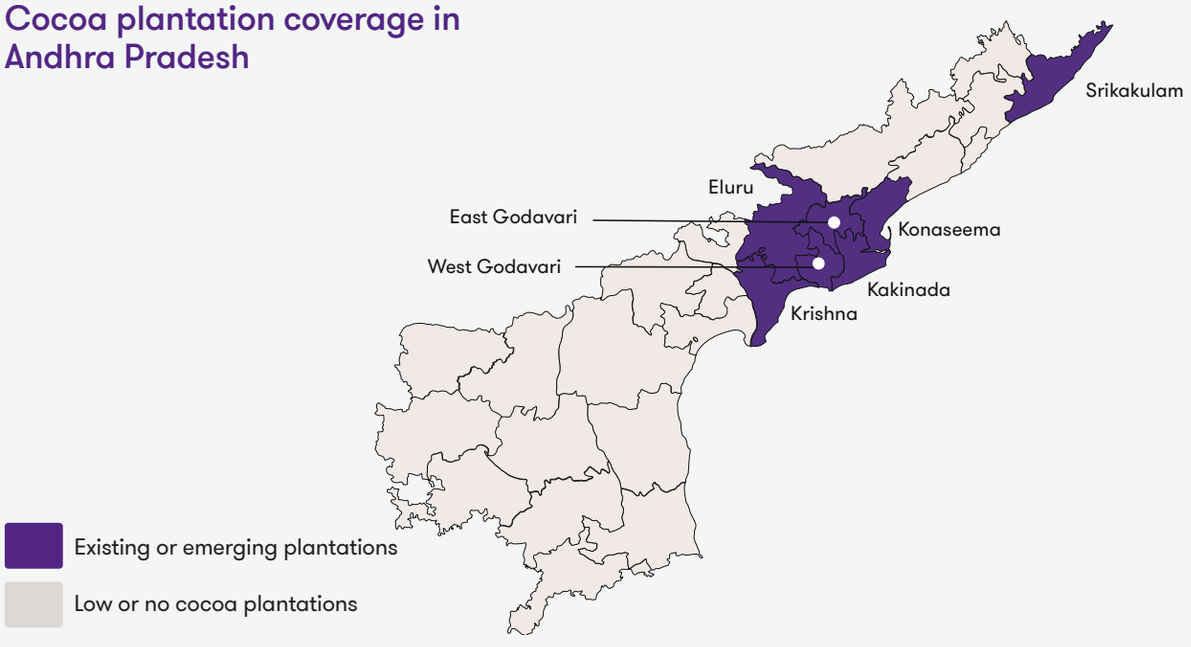
Andhra Pradesh

Andhra Pradesh holds the distinction of being India's largest cocoa producer, contributing approximately 40% of the nation's total cocoa bean output. With a cultivated area of 44.99k hectares and annual production of 12.38k metric tons, the state has established itself as a dominant force in the cocoa industry. Majority of the cocoa grown in India are hybrids of Criollo, Forestero and Trinitario varieties with predominately Forastero features. The major cocoa-growing districts in Andhra Pradesh include Eluru, East Godavari, West Godavari, Srikakulam, Konaseema, Kakinada and Krishna. These regions are particularly well-suited for cocoa cultivation due to their favourable agro-climatic conditions and existing coconut and oil palm plantations, which provide ideal shade and soil environments for growing cocoa. Nearly ~90% of the total plantation of cocoa is of matured plants, with mostly growing in intercrop with coconut and the remaining ~10% is newly established plantations intercropped with oil palm.

While cocoa is predominantly grown in intercropping, efforts are being made for monocropping of cocoa under high density planting, especially in the East Godavari region but is still in a nascent stage with less than ~250 Ha under cultivation. Each year, an additional 5,000 hectares are brought under cocoa cultivation, reflecting the growing interest among farmers in this high-value crop. Remarkably, the quality of cocoa beans produced in Andhra Pradesh is comparable to the finest beans grown in Ghana, one of the world's leading cocoa producers. However, the flavour profile is known to be different due to soil type and geographic growing conditions. The cocoa mass yield from beans is also typically lower than the best West African cocoa beans.

Among these districts, West Godavari has emerged as a hub for cocoa production, driven by increasing farmer participation and supportive infrastructure. To further boost the industry, the Andhra Pradesh Food Processing Society (APFPS) is actively establishing cocoa processing facilities aimed at producing flavour-rich beans suitable for premium chocolate manufacturers worldwide.

Cocoa plantation coverage in Andhra Pradesh



Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

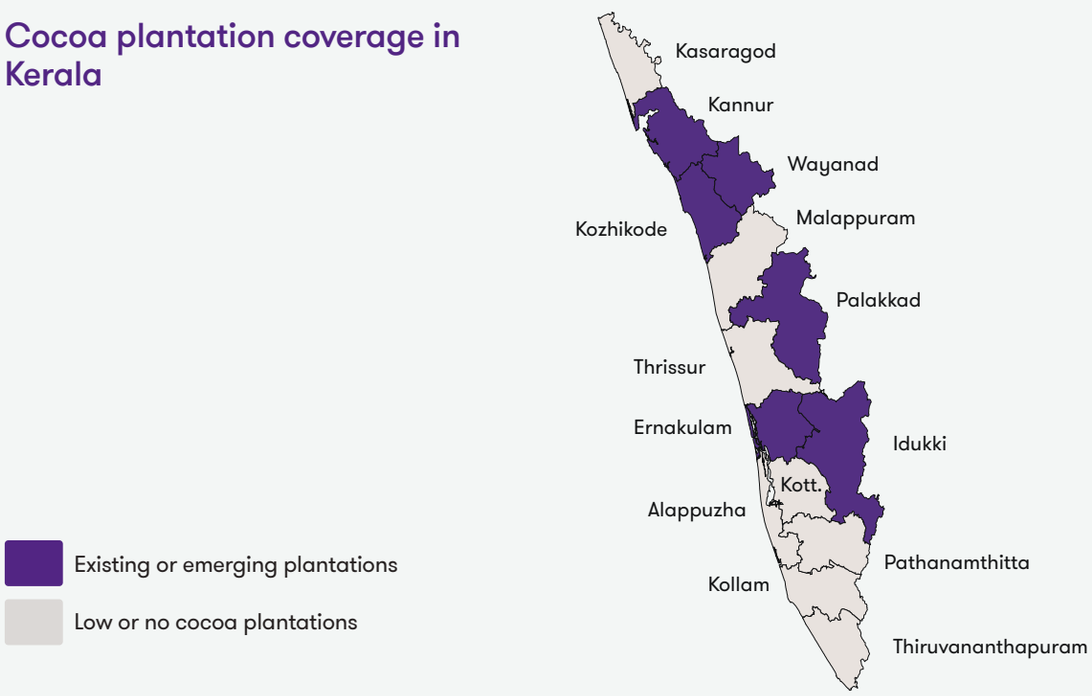
Kerala

Kerala has witnessed significant growth in its plantation sector, with cocoa cultivation emerging as a particularly promising industry. With 99% of its area under production being rainfed, and average land holding of ~1 acre, **Kerala ranks second in cocoa production nationwide**, after Andhra Pradesh, with an impressive output of **10.75k** metric tons. This high production numbers reflect the efficiency and potential of cocoa farming in the region adopting a mixed farming system.

Efforts are being made to promote cocoa cultivation by intercropping it with rubber plantations, targeting around 5 lakh hectares under rubber expansion initiative. The major cocoa-producing districts in Kerala include **Idukki, Calicut (Kozhikode), Wayanad, Ernakulam, Palakkad, and Kannur.** Idukki is home for the best bean with rich aroma, smooth and chocolaty texture and high-quality profile. Notably, the northern districts have shown remarkable progress in cocoa cultivation, largely due geographic location, climatic features, soil qualities and the extensive areas already under arecanut and coconut plantations. These existing crops provide ideal shade and soil conditions, giving farmers a strategic advantage in integrating cocoa into their agricultural practices.

To support and sustain this growth, institutions such as the **Kerala Agricultural University and the Directorate of Cashewnut and Cocoa Development** play a pivotal role by offering training programmemes and technical guidance. Additionally, specialised research centres like the **Cocoa Research Centre in Vellanikkara** contribute to innovation and best practices in cocoa farming, helping farmers improve yield and quality. Despite its promising trajectory, the cocoa industry in Kerala faces several challenges that need to be addressed to ensure long-term sustainability.

Cocoa plantation coverage in Kerala



Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

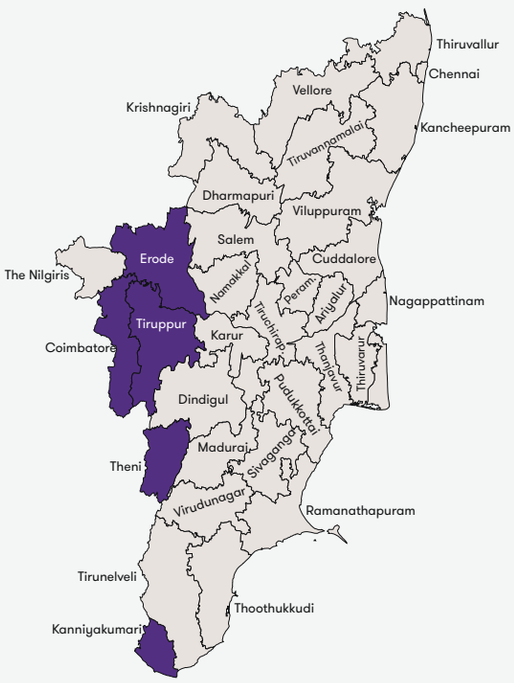
Tamil Nadu

Tamil Nadu stands as one of the key cocoa-producing states in India, with a total cultivated area of **32.98k** hectares and a contribution of **3.12k** metric tons to the national cocoa output. Despite having favourable agro-climatic conditions, Tamil Nadu currently records **lowest productivity** among major cocoa-growing states.

The western and southern regions of Tamil Nadu offer ideal conditions for cocoa cultivation. Temperatures ranging between 25°C and 32°C, combined with seasonal rainfall and supplementary irrigation, create a conducive environment for cocoa growth. These regions benefit from established **coconut and arecanut plantations**, which provide the necessary shade and soil conditions for cocoa to thrive. Cocoa also faces huge competition from nutmeg, which is also grown as an intercrop with coconut and arecanut. Districts such as **Coimbatore, Theni, Kanyakumari** (small landholders), **Tiruppur**, and **Erode** are prominent cocoa producers, largely due to these existing plantation systems.

In particular, areas like **Coimbatore**[2]**, Pollachi, Theni** and **Kanyakumari** areas have leveraged their extensive coconut and arecanut farms to integrate cocoa as an intercrop, enhancing land use efficiency. Additionally, the canal irrigation systems in the western districts help mitigate the impact of reduced rainfall, ensuring consistent water supply for cocoa cultivation. To promote and support cocoa farming, the Tamil Nadu Agricultural University (TNAU) has implemented several initiatives like research collaboration, intercropping promotion etc. aimed at improving farmer engagement and productivity.

Cocoa plantation coverage in Tamil Nadu



Existing or emerging plantations

Low or no cocoa plantations

Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

Karnataka

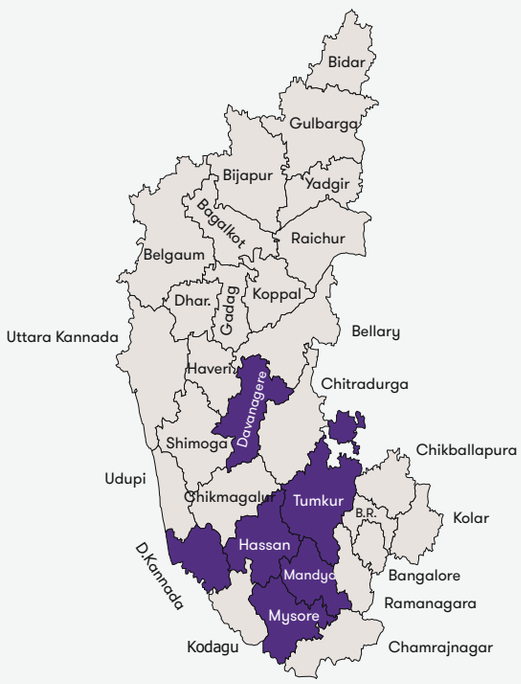
Karnataka is one of the top cocoa producing states in India, with significant untapped potential. The state has several regions where cocoa cultivation is steadily expanding. Currently it has a total cultivated area of **14.41k hectares**, producing around **4.14k metric tons** of cocoa annually and is the **second-most productive state in southern India, after Kerala**. Of the total area under production 1500 Ha of area is covered by immature plants, while the remaining mature area is intercropped with coconut (30%) and arecanut (40%) and mixed cropping (30%).

The major cocoa-producing districts in Karnataka include **Dakshina Kannada (old traditional area);** new plantations are coming up in **Mysore, Hassan, Tumkur, Mandya and Devangere**. These regions are characterised by laterite and red loam soils, which are ideal for cocoa cultivation, especially when they are well-drained. Additionally, the coastal and Malnad regions receive high rainfall, creating the humidity and shade necessary for healthy cocoa growth.

In contrast, the northern districts of Karnataka (temperature is high and humidity is low) are less suitable for cocoa farming due to their drought-prone conditions and lack of reliable irrigation infrastructure. Moreover, similar trials can be done in areas such as Kodagu, Udupi, which are around cocoa growing regions, where similar climate can be found, but the regions are mainly for coffee belts currently. As a result, the hilly and coastal districts remain the most favourable zones for cocoa cultivation in the state.

With its high productivity, diverse agro-climatic zones, and growing farmer interest, Karnataka has the potential to become a major contributor to India's cocoa industry. Strategic investments in irrigation, training, and post-harvest infrastructure could further unlock the state's capacity and improve farmer livelihoods.

Cocoa plantation coverage in Karnataka



Existing or emerging plantations

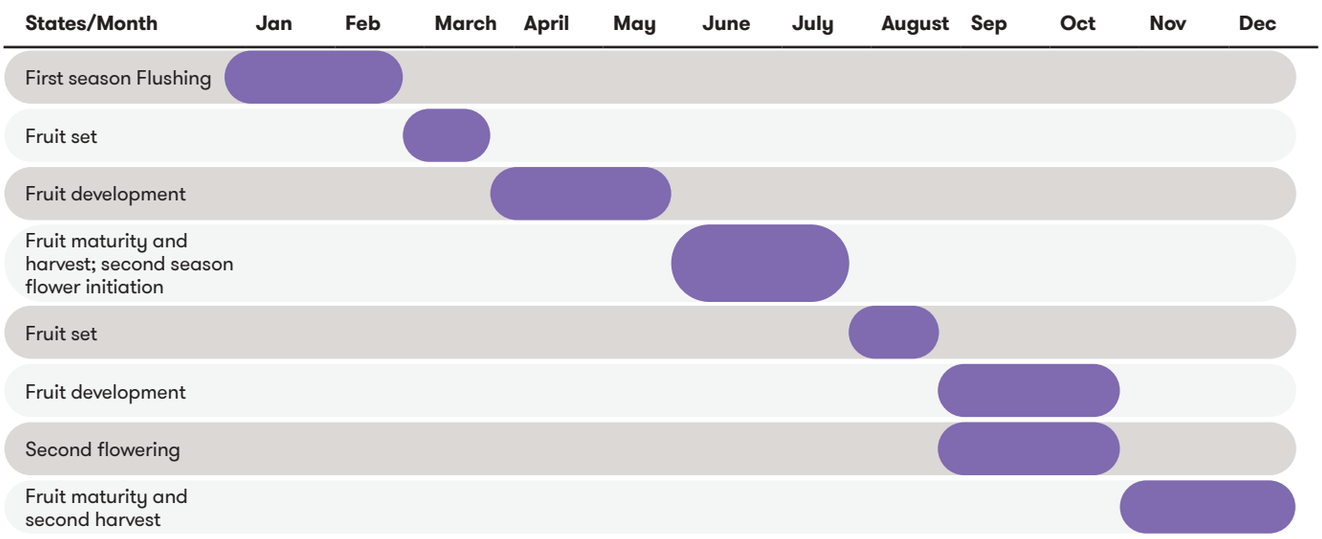
Low or no cocoa plantations

Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

Agronomy

Cocoa thrives in warm, humid climates with annual rainfall between 1,500–2,000 mm and temperatures ranging from 25°C to 32°C. It prefers deep, well-drained soils with a slightly acidic pH (5.5–6.5). Shade is essential, especially during the early growth stages, making cocoa ideal for intercropping under taller plantation crops like coconut and arecanut. The crop is sensitive to waterlogging and drought, requiring efficient irrigation and drainage systems. The cocoa crop in South India follows a bimodal cropping pattern, with two major flowering and harvest seasons annually. While the overall phases remain the same across all four states, minor variations in harvesting timing may occur due to local agro-climatic factors.

Bimodal crop cycle of cocoa: A southern regional seasonality chart



Source: Horticulture :: Plantation Crops :: Cocoa ; mapmycrop

Note: Cocoa harvested in Monsoon usually results in lower yield and quality due to humidity and disease, while the post -monsoon harvest gives higher yield and better-quality beans.

Cocoa (Theobroma cacao) is propagated through both **seeds and vegetative**[3] **methods** such as **softwood grafting**. While seed propagation is commonly practiced, vegetative propagation is increasingly encouraged to ensure uniformity in plant characteristics and to promote high-yielding traits. Seeds are extracted from fully mature pods, which take about **150 to 170 days** from pollination to ripening. The stage of maturity is visible from the change of pod color from green to yellow (Forastero) and red to yellow (Criollo). Collection of seeds from biclonal or polyclonal seed gardens involving superior self-incompatible parents is recommended to ensure genetic superiority of planting materials.

There are **three main varieties** of cocoa recognised globally and cultivated in India:

- **Criollos:** Red to orange pods, deeply furrowed, pointed apex, thin husk, white or pale violet, large, plump, round beans, less astringent, good flavour, quick fermentation (3- 4 days), low yield, less adaptive and susceptible to pests and diseases.
- **Forasteros:** Green to yellow pods, smooth surfaced, rounded apex, thick husk, purple, flat beans, astringent, 5-6 days for fermentation, high yield and highly adaptive.
- **Trinitarios:** Heterogenous, mixture of pod and bean characters, high yield and tolerant.

Among these, **Forastero** is the most cultivated in India, especially in intercropping systems with coconut and arecanut, due to its robust nature and suitability to Indian agro-climatic conditions.

For vegetative propagation, **softwood grafting** is recommended using elite clones to ensure uniformity and early bearing. Grafted plants are preferred for commercial cultivation as they offer better yield and are disease resistance compared to seed-propagated plants. **Patch budding** is another method used in cocoa, typically using 10–12 months old seedlings to promote healthy and uniform plant development.

For large scale planting, generally hybrid seedlings raised from polyclonal gardens of Kerala Agricultural University (KAU) and CPRCI has been the most successful method adopted, as this is faster and easier to multiply. Over 4 million seedlings can be planted each year through this process. Grafting or budding restricts large scale planting due to low availability of chupons for budding, trained work force and success rate due to transport of bud patches over long distance. Besides, based on research recommendation, hybrid seedlings are ideal for Indian conditions due to polyclonal nature of plants, which protects the cocoa population from any significant risk of widespread attack of pest and disease, which has been a major issue in West Africa and Latin American cocoa origins.

Cocoa is usually grown in areas where adequate amount of water is available. Cocoa plants are sensitive to drought, and in such cases irrigation becomes essential. Drip irrigation is widely recommended for its efficiency in conserving water and delivering nutrients directly to the root zone. During summer, as it exists in Southern India, the crop requires irrigation at weekly intervals. When it is grown as mixed crop with arecanut, the crop is to be irrigated once in a week during November-December, once in 6 days during January-March and once in 4-5 days during April-May with 175 litres of water.

Cocoa begins flowering from the third year after planting, with economic yields typically starting from the fifth year. Under proper irrigation and nutrient management, each tree can produce 1–2 kg of pods annually. Pods take approximately 140–160 days to mature, and cocoa generally yields two main harvests: September to January and June to August. Off-season fruiting may occur year-round, especially under irrigated conditions. The stage of maturity of the pod is best judged by change of color of pods. Pods that are green when immature turn yellow when mature and reddish pods turn yellow or orange. The change in color starts from the grooves on the pods and then spreads to the entire surface. The harvesting is to be done at regular intervals of 10 -15 days, avoiding over ripening of pods. Cocoa yields of 1.5 to 2.5 kg per tree have been successful achieved in large number of farms under irrigated conditions, which is one of the best yields compared to other cocoa origins where typical yields are at 0.5kg per tree.

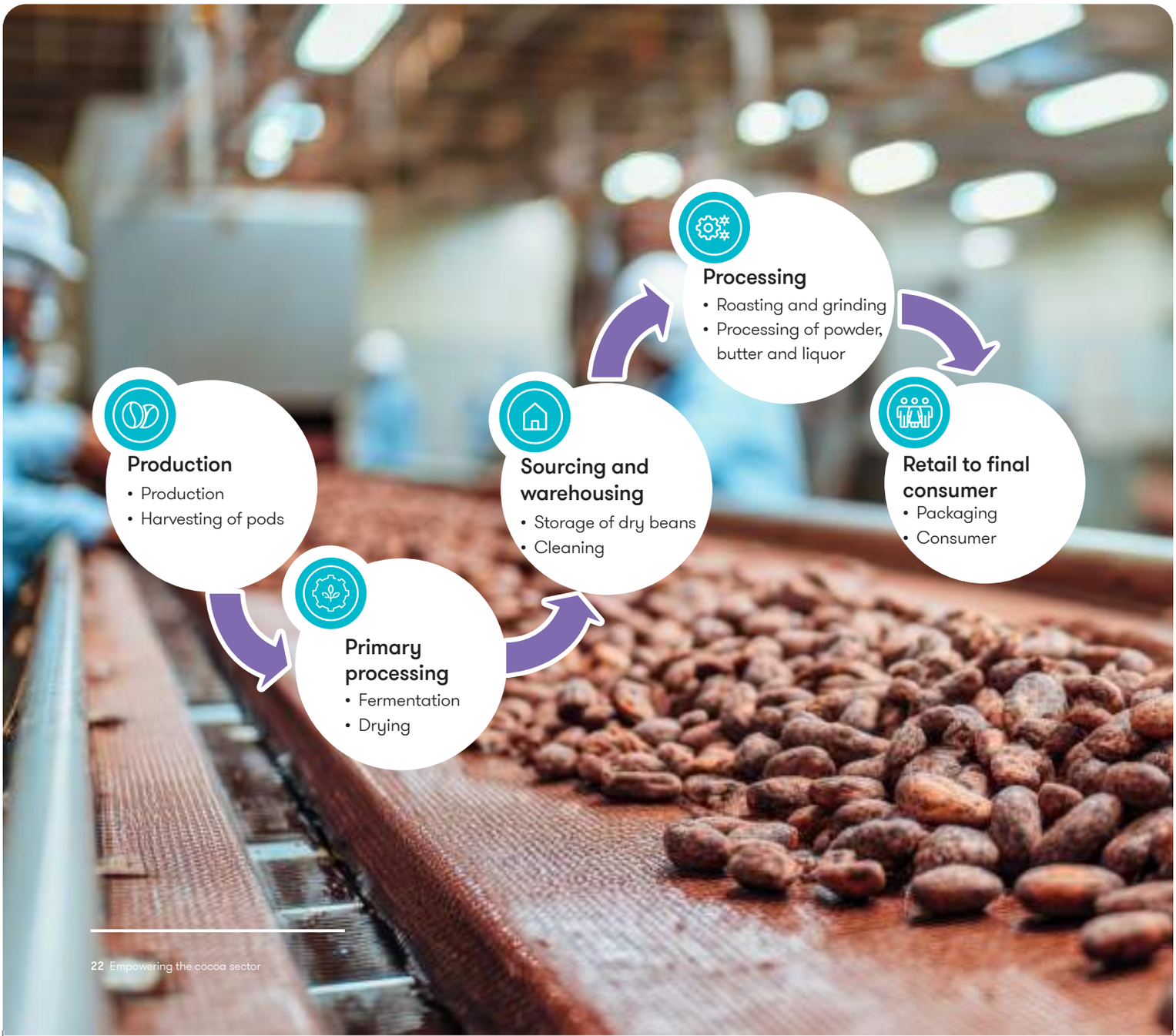




Cocoa: Farm to market ecosystem

The cocoa value chain in India begins with the cultivation and harvesting of cocoa pods by smallholder farmers. In regions such as Kerala and Karnataka, the prevalence of a double monsoon climate poses significant challenges for post-harvest processing, particularly sun-drying of cocoa beans. Consequently, farmers in these states typically sell wet beans to local traders. These beans are then transported to fermentaries and then to drying units, commonly located in Tamil Nadu.

In contrast, in Andhra Pradesh and Tamil Nadu, where climatic conditions are more favourable, farmers are able to sun-dry the beans themselves, allowing for direct procurement of dry beans by traders or processors. Once dried and graded, the beans move through the supply chain to processors who convert them into cocoa liquor, butter, and powder. These intermediate products are then utilised by manufacturers to produce a range of cocoa-based goods, ultimately reaching consumers through retail and export channels.



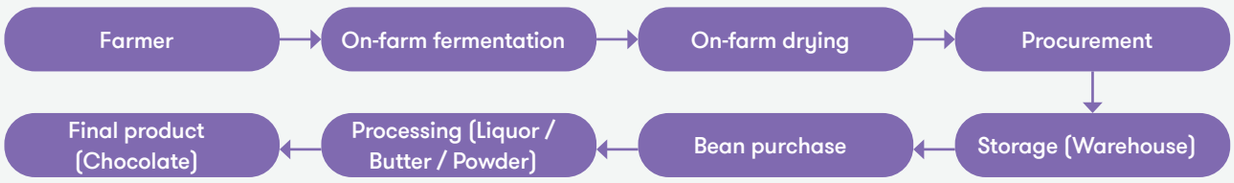
Processing models: Dry and wet beans

1. Dry processing of cocoa

The dry bean is the most common form of cocoa trade globally, particularly in decentralised farming systems such as those in West Africa, Latin America, and parts of South India (Andhra Pradesh and Tamil Nadu). In this system, cocoa farmers themselves or through primary cooperatives undertake post-harvest fermentation (typically 5–7 days) and sun drying (5–10 days) to reduce bean moisture content to optimal levels (≤7%).

Once dried, the beans are graded and sold to traders, cooperatives, or processors either directly or through auction/mandi channels. The dry beans are tested for cut test quality, moisture, mold presence, and bean count, before being sent for processing into cocoa liquor, butter, powder, and chocolate.

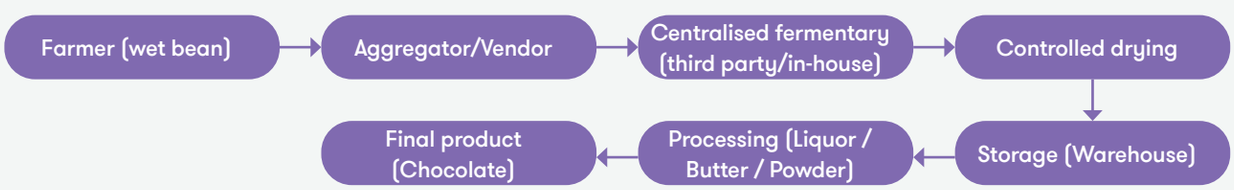
Process flow



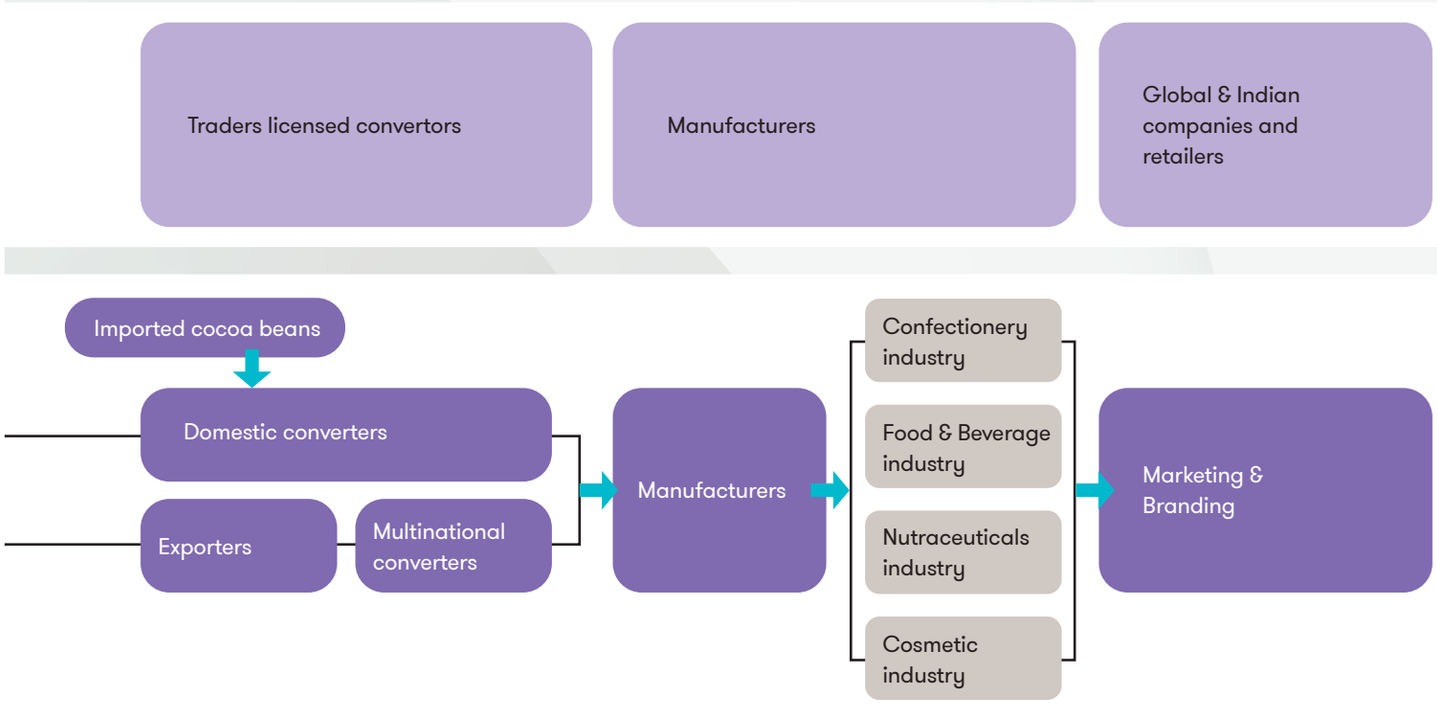
2. Wet cocoa processing

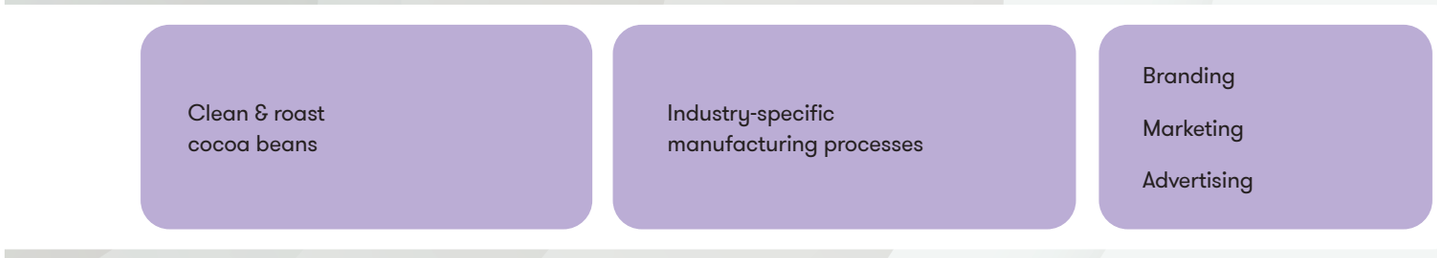
The wet bean model is emerging as an alternative to traditional systems, particularly relevant in India's industrial procurement model, such as in Kerala and Karnataka. Here, farmers deliver freshly harvested wet cocoa beans (pulp-covered) directly to vendors or fermentation centres on the same day of harvest. Fermentation and drying are undertaken in centralised fermentaries, often owned or operated by private processors or third-party processors. This allows uniform fermentation conditions, better flavour development, and traceability, aligning with flavour-grade standards.

Process flow

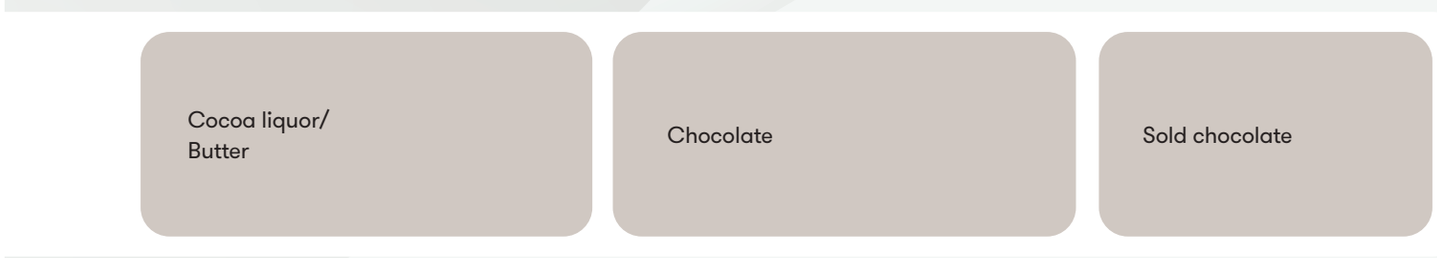


Players involved	KAU Credit organisations Cocoa convertor	Smallholder farmers Caretakers Labourers	Traders Collectors
Process	Pre-production →	Cocoa production →	Preliminary processing
Activities	Planting of seedlings Farmer's credit access Training farmers	Growing Harvesting	Collecting/Bulking Fermentation Drying/Cleaning
Input	Seeds (90% by KAU) Credit funds Agriculture know-how	Plantation	Raw cocoa beans
Output	Plantation	Raw cocoa beans	Fermented & dried cocoa beans


Traders licensed convertors
Manufacturers
Global & Indian companies and retailers
Imported cocoa beans
Domestic converters
Exporters
Multinational converters
Manufacturers
Confectionery industry
Food & Beverage industry
Nutraceuticals industry
Cosmetic industry
Marketing & Branding


Clean & roast cocoa beans
Industry-specific manufacturing processes
Branding
Marketing
Advertising


Fermented & dried cocoa beans
Cocoa Liquor/Butter
Chocolate

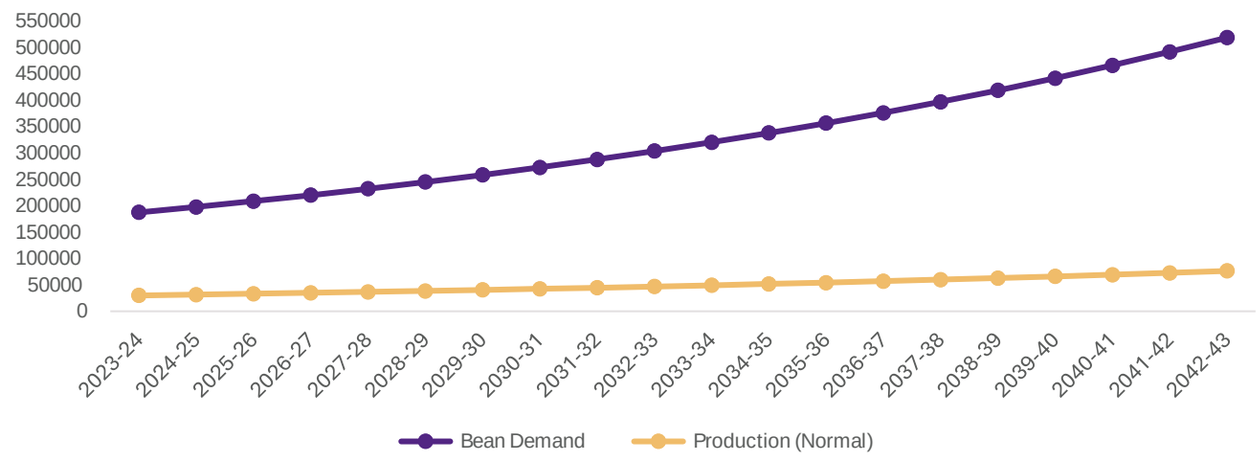

Cocoa liquor/ Butter
Chocolate
Sold chocolate

Cocoa processing in India

India continues to import substantial volumes of processed cocoa products — primarily cocoa powder, butter, and paste — to meet domestic demand. Trade data reveals significant negative net flows across all categories, with cocoa powder alone accounting for over **55,000 MT** in deficit. Even raw cocoa beans show a negative trade balance, indicating limited domestic availability.

While Indian cocoa beans are of acceptable quality at harvest, the absence of proper post-harvest protocols significantly affects the final quality of dry beans. As a result, the beans often fail to meet export-grade standards and are not traded in meaningful volumes internationally. This challenge is reflected in the negative trade flow for raw cocoa beans, indicating limited global competitiveness. Despite these limitations, India possesses a reasonably well-developed cocoa processing infrastructure. However, its potential remains largely untapped due to inconsistent supply of raw beans and economic inefficiencies across the value chain. Domestic production is insufficient to meet rising demand, and processors often operate below capacity.

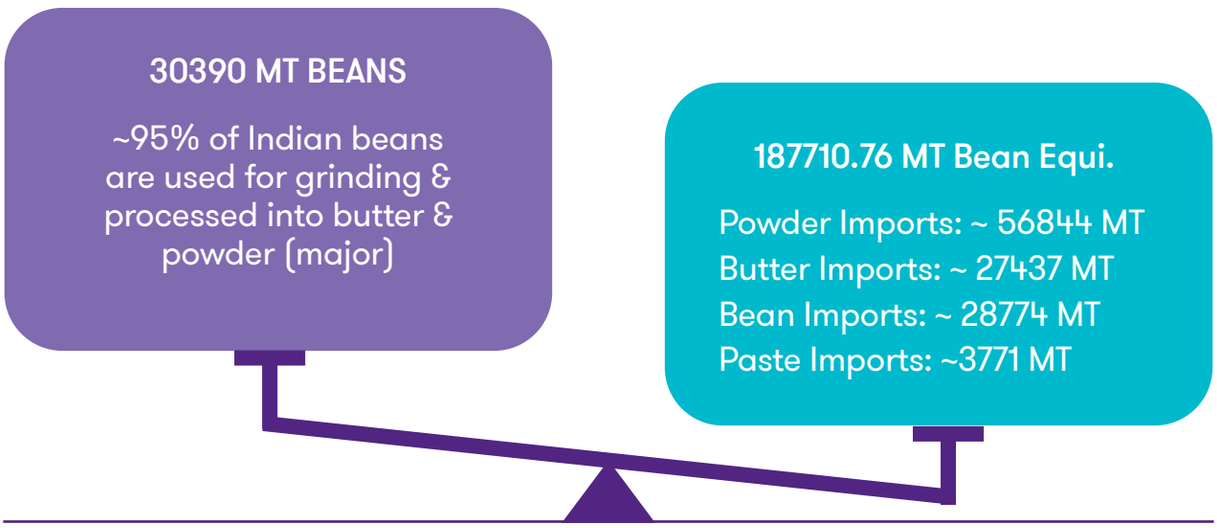
Deamnd Vs Production



GT Analysis

HS Code	Product	Net Trade Flow (MT)
18050000	Cocoa Powder Not cont. Added Sugar/Other sweetening matter	-55838.98
18040000	Cocoa Butter Fat & Oil	-17317.73
18010000	Cocoa Beans whole/broken, raw/roasted	-28730.61
18031000	Cocoa paste, excluding defatted	-2849.57
18032000	Cocoa paste, wholly or partly defatted	-685.70

As per Trade Data: 2023-24



India's cocoa processing infrastructure has an installed grinding capacity of nearly **~99,500 MT per year,** yet only **~61%** of this capacity is currently utilised with an idle processing capacity of approximately **~39,000 MT**, reflecting significant untapped potential across existing infrastructure. This underutilisation is not driven by lack of market demand, which continues to grow, but by inconsistent access to raw cocoa beans. Notably, utilisation rates vary significantly across processors, indicating that the issue is not uniform. Some facilities operate closer to full capacity, while others remain underused, pointing to a **structural bottleneck in upstream supply**. This bottleneck stems from limited domestic production and challenges in sourcing quality beans, which restrict the flow of raw material to processors. One of the main structural challenges is the **inverted duty structure**, which make it more cost-effective to import finished cocoa products—like powder and butter—than raw beans for domestic processing. This discourages local value addition and weakens the competitiveness of domestic processors.

Processor	Location	Installed capacity (MT/yr)	Capacity allocation		Sourcing		Capacity utilised (%)
			Own operations (MT)	Job Work/3rd Party (MT)	Domestic beans	Imported beans	
DP Cocoa	Andhra Pradesh	24000	2200	21800	12000	1000	54%
DP Cocoa	H.P.	12000	2000	-	500	1000	13%
CAMPCO	Karnataka	6000	2000	4000	5500		92%
Morde	Maharashtra	6000	6000	-	1000	5000	100%
Lotus	Telangana	4000	4000	-	2500		63%
JINDAL	J&K	45000	30000	-	2000	28000	67%
Ramya Foods	Andhra	2500	2000	-	2000		80%
Total		**99500**	**48200**	**25800**	**25500**	**35000**	**61%**

GT Field Insights: Based on the stakeholder consultation

The cumulative impact of these inefficiencies is reflected in India's growing cocoa import bill, which now stands at approximately USD 880 million annually. Addressing these gaps is critical to reducing import dependency, improving value chain integration, and positioning India as a competitive player in the global cocoa market. Strengthening domestic supply chains is not only essential for reducing import dependency but also for building long-term resilience in cocoa ingredient availability. A robust domestic networkwill help stabilise prices, ensure consistent quality, and position India as a competitive player in the global cocoa value chain.

Unlocking India's cocoa potential will require targeted interventions across the value-chain including targeted investment in research and development, training and capacity building of farmers, expanding cultivation in suitable regions, providing adequate input support, and developing region-specific fermentation protocols. Addressing policy-level barriers such as the inverted duty structure is equally critical to incentivise domestic processing and reduce reliance on imported finished goods.



Research and development landscape

India's cocoa Research and Development (R&D) landscape exemplifies a successful Public-Private Partnership (PPP), with collaborative efforts between academic institutions and industry leaders. KAU, through its Cocoa Research Centre, has spearheaded extensive research initiatives, including breeding for disease resistance, drought and heat tolerance, and quality enhancement. These efforts have been significantly bolstered by support from Mondelez (formerly Cadbury) , which has played a crucial role in funding and guiding research since 1987. This partnership has led to the development of high-performing hybrids, standardised cultivation practices, and the establishment of polyclonal gardens that now supply the majority of India's cocoa planting material. The Cocoa Coordinated Research Project (CCRP) under KAU, supported by Mondelez, has also advanced molecular research, including DNA fingerprinting and marker-assisted selection. Complementing this, the Central Plantation Crops Research Institute (CPCRI) has focused on pest and disease management, including biological control and integrated nutrient strategies.

Cocoa R&D at Kerala Agricultural University (KAU, Thrissur)

KAU, Thrissur, hosts India's pioneering Cocoa Research Centre (CRC) at Vellanikkara, which has been instrumental in advancing cocoa cultivation, breeding, and processing in the country. Established in 1979, the CRC marked the beginning of formal cocoa research in India. Its efforts were further strengthened in 1987 with the launch of the Cadbury-KAU Co-operative Cocoa Research Project. The CRC maintains one of the largest cocoa germplasm collections in India. It also provides training to farmers and entrepreneurs on cocoa cultivation and bean-to-bar processing.

Historical collaborations

World Bank project (1979–1984): India initiated cocoa research infrastructure and programmemes

Cadbury-KAU Co-operative Cocoa Research Project (1987): India's first PPP in agricultural research, significantly boosting cocoa R&D.

KERA partnership: Ongoing collaboration with Kerala-based agricultural bodies for annual crop research. Through KERA, KAU is facilitating the national adoption of climate-smart agriculture, sharing research outcomes and best practices with agricultural bodies across states.

National impact

KAU hosts India's largest cocoa germplasm collection sourced from 20 global origins and has established 11 dedicated polyclonal seed gardens for hybrid propagation & supporting its breeding programmeme that has yielded 21 high-quality cocoa varieties.

About 80% of India's cocoa gardens are reportedly established using planting materials from KAU's polyclonal gardens, making KAU a cornerstone of the national cocoa supply chain.

Breeding, genetics and disease resistance

The CRC boasts one of the strongest breeding programmemes globally, with the largest germplasm collection in India. It consists of 464 global genotypes, including 287 indigenous collections and exotic accessions. It underpins breeding efforts with 81 Phytophthora-resistant lines, 192 high-yield selections, and several disease-resilient accessions.

The CRC has developed thousands of hand-pollinated hybrids, including high-yielding lines like CCRP 1–15.

DNA fingerprinting and marker development: Tools such as markers linked to the laccase gene are used to track specific traits.

The CRC is the 1st in the world to produce sixth-generation inbred cocoa lines, overcoming natural incompatibility barriers,

Disease management

KAU's CRC has made significant progress in managing major cocoa diseases through innovative and eco-friendly approaches. Two hybrids have been successfully developed with strong resistance to Phytophthora, a devastating fungal pathogen that affects cocoa pods and roots. To combat Vascular Streak Dieback and Stem Cankers, the centre employs a combination of vegetative resistance and biological control using Trichoderma, a beneficial fungus known for its healing properties. Additionally, research into endophytic bacteria has identified two promising strains that help suppress Phytophthora[4] naturally, offering a sustainable alternative to chemical treatments and enhancing the overall resilience of cocoa plants.

Pest surveillance

The CRC has been actively monitoring and managing pest threats that impact cocoa cultivation. Pod borers, which account for ~19% of pest-related damage, feed primarily on the husk of cocoa pods, resulting in significant yield loss. Mealybugs and stem cankers are also on the rise, with climate change contributing to their spread. The fungal pathogen Lasiodiplodia has been identified as a major cause of black pod disease associated with stem cankers. In response, the centre has successfully identified five cocoa varieties resistant to the tea mosquito bug, a common pest in tropical regions. Additionally, new pests such as the citrus mealybug have recently emerged in Andhra Pradesh, prompting further research and surveillance to mitigate their impact.

Agronomic innovations

Fertigation and irrigation: Microjet systems standardised and found superior to drip irrigation.

Micronutrient formulation: Custom mixes being developed for cocoa.

Drought management

Use of Pseudomonas indica, a beneficial fungus, to enhance drought tolerance.

Compost-based root feeding systems are being trialled for resilience

Pollination and flowering studies

Pollinator breeding: Field studies to understand and enhance cross-pollination.

Flower induction trials: Conducted at NAAT-CAB, though initial results were not successful.

Value addition, training and outlook

Fermentation techniques: Standardised methods including trials with fermented wheat.

- By-product utilisation: Husk is used in cookies, while pulp is used for wine production.

Focus on high polyphenol content for health-oriented cocoa products.

4. Crop Improvement | Kerala Agricultural UniversityRevenue

Cocoa research at CPCRI

The CPCRI[5], headquartered in Kasaragod, Kerala, operates regional stations at Vittal in Karnataka and Kayamkulam in Kerala, along with research centres located at Kidu (Karnataka), Mohit Nagar (West Bengal), and Kahikuchi (Assam). The All India Coordinated Research Project on Plantation Crops, managed by CPCRI, spans 28 centres across 14 states, facilitating extensive research and development activities.

CPCRI is mandated to conduct research on four major plantation crops: coconut, arecanut, cocoa, and palmyra, with a focus on crop improvement, sustainable cultivation practices, and enhancing farmer livelihoods. Indian Council of Agricultural Research - Central Plantation Crops Research Institue (ICAR-CPCRI) commenced cocoa research in 1969 at its Regional Station in Vittal, Karnataka, with the introduction of select germplasm from Malaysia. Since then, the institute has systematically advanced its cocoa improvement programmes through selection, clonal selection, and hybridisation strategies. Currently, the station has over 400 germplasm collections, and using this germplasm, evaluation trials are focused on assessing cocoa genotypes for vegetative vigour, stability in yield, potential yield, compatibility, and quality attributes.

In 2000, CPCRI initiated a dedicated clonal selection programme focused on developing disease-resistant clones. To support large-scale propagation, polyclonal gardens have been established, facilitating the production of hybrid seeds and budded planting materials for distribution. The CPCRI has polyclonal gardens established at their stations in Vittal and Kidu to enable hybrid seed production of cocoa and clonal planting material.

Hybrid varieties				**Clonal materials**			
VTLCH-1	VTLCH-2	VTLCH-3	VTLCH-4	VTLCH-5	VTLCC-1	VTLCS-1	VTLCS-2

Sustainability in cocoa is achieved in the cropping system by optimising the production process through the efficient utilisation of inputs, improving soil fertility parameters, and safeguarding the environment. Cocoa is predominantly grown in agroforestry system in Africa and Latin America, and in palm-based ecosystem in Asia. In Indian conditions, monocropping and cropping systems are two contrasting ways to produce cocoa, and their impact on yields, contribution to farmers' livelihood, and cocoa quality is to be studied.

CPCRI collaborated with Mondelez in 2024 to assess the sustainability and performance of cocoa in intercropping systems and monoculture systems, directly addressing yield and quality performance that impact farmers' economic livelihoods. The trials on cocoa are undertaken in Karnataka under an arecanut intercrop model and monocrop, in Andhra Pradesh under oil palm and coconut intercrop and monocrop, and in Assam under an arecanut intercrop, covering studies on nutrient, irrigation, and shade management.

India's cocoa R&D has achieved global benchmarks in breeding, disease resistance, and sustainable cultivation. Innovations in pest surveillance, drought management, and agronomy have boosted productivity and resilience. Value addition and farmer training are driving a robust, health-focused cocoa framework across the nation.

5. ICAR-Central Plantation Crops Research Institute



Case Study: Kerala Agricultural University and Mondelēz International – A model for public-private collaboration in cocoa research

The partnership between Kerala Agricultural University (KAU) and Mondelēz International, initiated in 1987 through the Cadbury-Cocoa Research Project (CCRP), exemplifies a successful public-private collaboration in Indian agriculture. Building on KAU's foundational work since 1973, this alliance has significantly advanced cocoa research, breeding, and farmer outreach over nearly four decades.

KAU now hosts India's largest cocoa germplasm collection, sourced globally, which has enabled the development of 21 high-yielding and disease-resistant cocoa varieties. These innovations have translated into tangible field-level impact, with average yields in Indian farms reaching 1.5 kg per tree—three times higher than yields in traditional cocoa-growing regions like West Africa.

The collaboration has also emphasised farmer-centric research, with KAU conducting targeted training programmes and incorporating field feedback into its breeding and agronomic strategies. This has ensured that scientific advancements are aligned with practical challenges, enhancing adoption and productivity.

Looking ahead, the partnership is focused on developing trait-specific hybrids with improved resistance, quality, and climate resilience. A key initiative is the establishment of polyclonal gardens using elite planting material, in collaboration with Krishi Vigyan Kendras (KVKs), progressive farmers, and government agencies. These gardens will support the scalable expansion of cocoa cultivation across India. Additionally, the partnership is driving the development of region-specific Good Agricultural Practices (GAP), covering pruning, pest and disease management, irrigation, and varietal performance. The integration of biotechnology and digital tools is further accelerating research and field application.

This case demonstrates how sustained collaboration between academia and industry can drive innovation, improve livelihoods, and build resilient agricultural value chains. The KAU–Mondelēz model offers a replicable framework for other institutions aiming to scale impact through strategic partnerships. Active involvement of Mondelez's technical field team is vital to India's long-term cocoa development, bridging critical gaps in on-ground expertise. Their sustained engagement will strengthen farmer capacity and accelerate adoption of best practices.

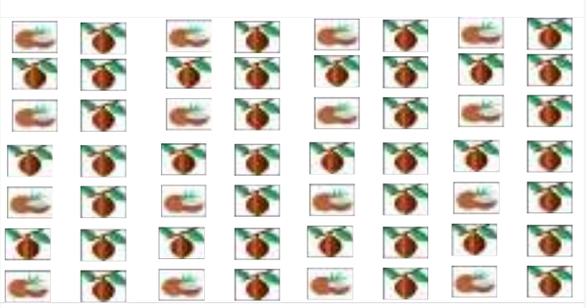
Planting systems

Cocoa is rarely cultivated as a monocrop in India due to its preference for partial shade and its superior performance when grown alongside perennial crops such as arecanut, coconut, and other plantation or agroforestry systems. However, under controlled shade and proper management, monocropping yields good returns. Its limited adoption is primarily due to economic risks, shade requirements, and better viability in intercropping systems.

Cocoa is widely intercropped under tall plantation crops such as coconut, arecanut, and oil palm, where it thrives in partial shade. This system not only optimises land use but also provides farmers with an additional income stream without requiring separate land or major changes in crop management. Intercropping also improves soil health and resource efficiency when each crop is managed with appropriate spacing and independent nutrient inputs. Some of the intercropping layouts used are discussed above:

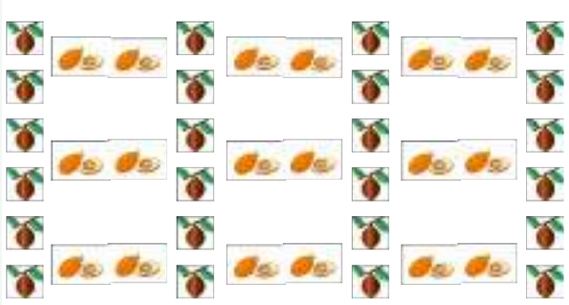
1. Cocoa with Coconut

Cocoa intercropped with coconut: This system employs a spatially optimised intercropping layout, where one row of cocoa is planted at 3-meter intervals between two rows of coconut, spaced 7.5 × 7.5 meters apart. Additionally, one cocoa plant is placed between two coconut palms along the row, optimising both vertical and horizontal space. This configuration accommodates approx. 500 cocoa plants/ha, ensuring efficient land use while maintaining adequate light and root space for both crops.



2. Cocoa with Arecanut

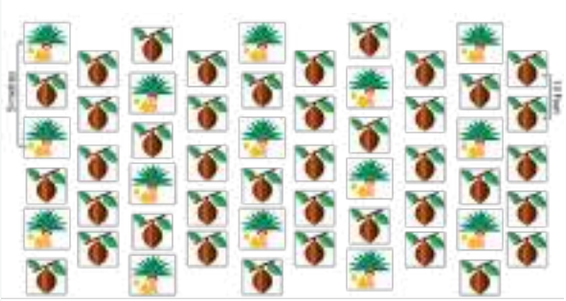
Cocoa intercropped with arecanut: In arecanut plantations, cocoa is intercropped using a paired-row layout, where two rows of arecanut (spaced at 2.7 m × 2.7 m) are followed by one row of cocoa. It is planted at a recommended spacing of 2.7 m × 5.4 m to ensure adequate light and root space. The paired-row layout ensures balanced shade and airflow, allowing cocoa to thrive under moderated light while maintaining efficient spacing for arecanut productivity.





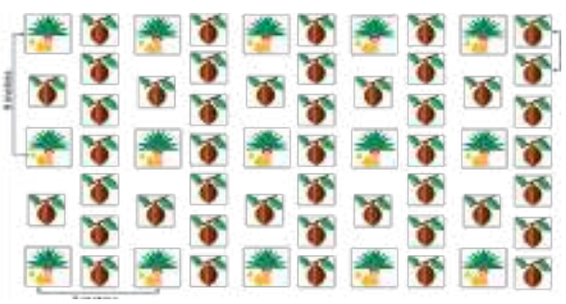
3. Triangular grid system

Triangular grid system: The triangular planting system for oil palm and cocoa enhances land use efficiency and light distribution, allowing for higher planting density without compromising canopy management. Oil palms are spaced 9 meters apart in a structured grid, while cocoa trees intercropped at 10-foot intervals benefit from improved microclimate and shade. This layout prevents overshadowing among trees and minimises competition for sunlight and nutrients. It promotes uniform growth, supports mechanised operations, and enhances overall resource efficiency.



4. Cocoa with oil palm

Cocoa under oil palm: In the oil palm–cocoa intercropping system, oil palms are planted at a spacing of 9 meters in a square grid, with cocoa trees intercropped at 10-feet intervals. This configuration creates a structured canopy that provides moderated shade without direct overshadowing, allowing cocoa to thrive under filtered light. The spatial arrangement ensures minimal root and canopy competition, supports uniform growth, and maintains a favourable microclimate. To sustain productivity, each crop must be adequately manured, considering its distinct nutrient requirements and growth dynamics.



In oil palm intercropping systems, a square grid layout is preferred over a triangular one. This allows for better spacing and canopy management, enabling a higher number of cocoa plants per hectare and improved growth conditions.

Cocoa is also cultivated as a mixed crop in diversified farming systems, typically interplanted with species such as banana, black pepper, coconut, and various fruit trees. This approach enhances land-use efficiency, stabilises farm income through multiple revenue streams, and contributes to ecological resilience. Companion crops, such as bananas, provide early shade and economic returns, while vertical layering with pepper and fruit trees optimises space and supports seasonal productivity. The integration of diverse species also improves soil health and reduces pest and disease incidence through natural biodiversity.

In more structured agroforestry systems, cocoa is grown under a canopy of shade trees and alongside other perennial crops, replicating the dynamics of a natural forest. These systems promote long-term sustainability by conserving soil, regulating microclimates, and enhancing biodiversity. Shade trees not only protect cocoa from excessive sunlight but also contribute to carbon sequestration and the stability of the ecosystem. By aligning agricultural productivity with environmental stewardship, cocoa-based agroforestry systems offer a holistic model for sustainable tropical agriculture.

Intercropping economics

Cocoa was evaluated under five cultivation systems: pure monocrop and intercropping with rubber, oil palm, coconut, and arecanut. These models are prevalent across southern and tribal India, shaped by local agro-climatic conditions, companion crop maturity, and existing farmer adoption. The analysis captures financial outcomes over a 15-year life cycle, accounting for gestation, stabilisation, and income maturity.

A discounted cash flow model (DCF) at a 12% rate was used to compare returns against the cost of cultivation. Costs included planting, inputs, labour and maintenance, among others, for both cocoa and intercrops. Revenue streams were projected using realistic yield assumptions and prevailing market prices across crop combinations.

Intercropping system	Payback period	Gross profit (in Lakhs)	IRR	NPV (in Lakhs)
Cocoa Monocrop	3.71	49	93.98%	18
Cocoa+Rubber	10.37	6	7.69%	-2
Cocoa+Oil palm	6.57	19	27.36%	5
Cocoa+Coconut	5.05	8	34.22%	4
Cocoa+Arecanut	7.02	24	22.16%	5

Indicative

Note: The intercropping economic analysis is based on cost parameters derived from field-level insights. It does not account for land lease costs or interest on capital and should be interpreted accordingly for financial modelling or policy decisions.



All five cocoa cultivation models evaluated over the 15-year horizon demonstrate positive financial returns in terms of IRR, making them viable options depending on regional context and companion crop availability. Cocoa monocrop stands out with the highest profitability and fastest payback, making it ideal for intensive cocoa clusters with post-harvest infrastructure.

Intercropping models with arecanut, oil palm, and coconut also show strong financial viability, offering diversified income and ecological benefits. These combinations are particularly relevant in regions where companion crops are already established or supported under horticulture schemes.

Despite its long-term ecological benefits, the cocoa–rubber intercropping model shows a slightly negative NPV and a low IRR, primarily due to rubber's extended gestation period and delayed income realisation. To offset this, it is imperative to intercrop with perennials, such as pineapple or banana, during the initial years. This not only enhances early cash flow but also improves land use efficiency and supports agroforestry integration.

We also assessed the financial feasibility of intercropping cocoa in mature plantations, starting from the sixth year, using key indicators such as payback period, total profit, and Net Present Value (NPV). The analysis focused on combinations with rubber, oil palm, coconut, and arecanut to understand profitability and return timelines.

As oil palm and arecanut plantations mature, they start generating substantial revenue by the time cocoa is introduced. This allows cocoa to seamlessly integrate into the system, adding incremental profit with minimal additional investment and enhancing overall farm profitability.

When cocoa is considered to be intercropped in rubber plantations starting from the sixth year, the model shows payback period at 4.08 years. This is because rubber begins generating returns around this time, and those initial earnings are primarily used to recover the costs incurred during its 6-year gestation period. As a result, cocoa adds value more slowly in this system, with its financial impact becoming visible only after the primary crop stabilises.

Financial performance of cocoa intercropping in mature plantations (starting Year 6)

Model	Payback period	Gross profit (INR in Lakhs)	NPV (INR in Lakhs)
Cocoa+Rubber	4.08 years	11	5
Cocoa+Oil palm	Within year	27	11
Cocoa+Coconut	3.02 years	10	6
Cocoa+Arecanut	Within year	28	12

Note: The intercropping economic analysis is based on cost parameters derived from field-level insights. It does not account for land lease costs or interest on capital and should be interpreted accordingly for financial modelling or policy decisions.



When cocoa is considered to be intercropped in coconut plantations starting from the 6th year, the model shows a relatively short payback period of 3.02 years. This suggests that coconut begins stabilising its returns around this time, creating a financially viable environment for introducing cocoa. Since cocoa starts generating returns after three years of planting, its contribution aligns well with the maturing phase of coconut, helping strengthen the overall income stream without disrupting the existing system.

Intercropping presents a financially viable and regionally adaptive approach to farming. Each model offers a unique blend of economic benefits, ecological compatibility, and practical implementation. While all intercropping systems help boost farmer income, incorporating productive companion crops during the early years is crucial for enhancing initial cash flow and ensuring overall farm sustainability.

To integrate the findings from early-stage companion crop models, we extended our analysis to include combinations that support cash flow during the initial years of plantation development. Specifically, we evaluated intercropping systems, including banana in cocoa monocropping, banana & cocoa in oil palm, and pineapple & cocoa in rubber.

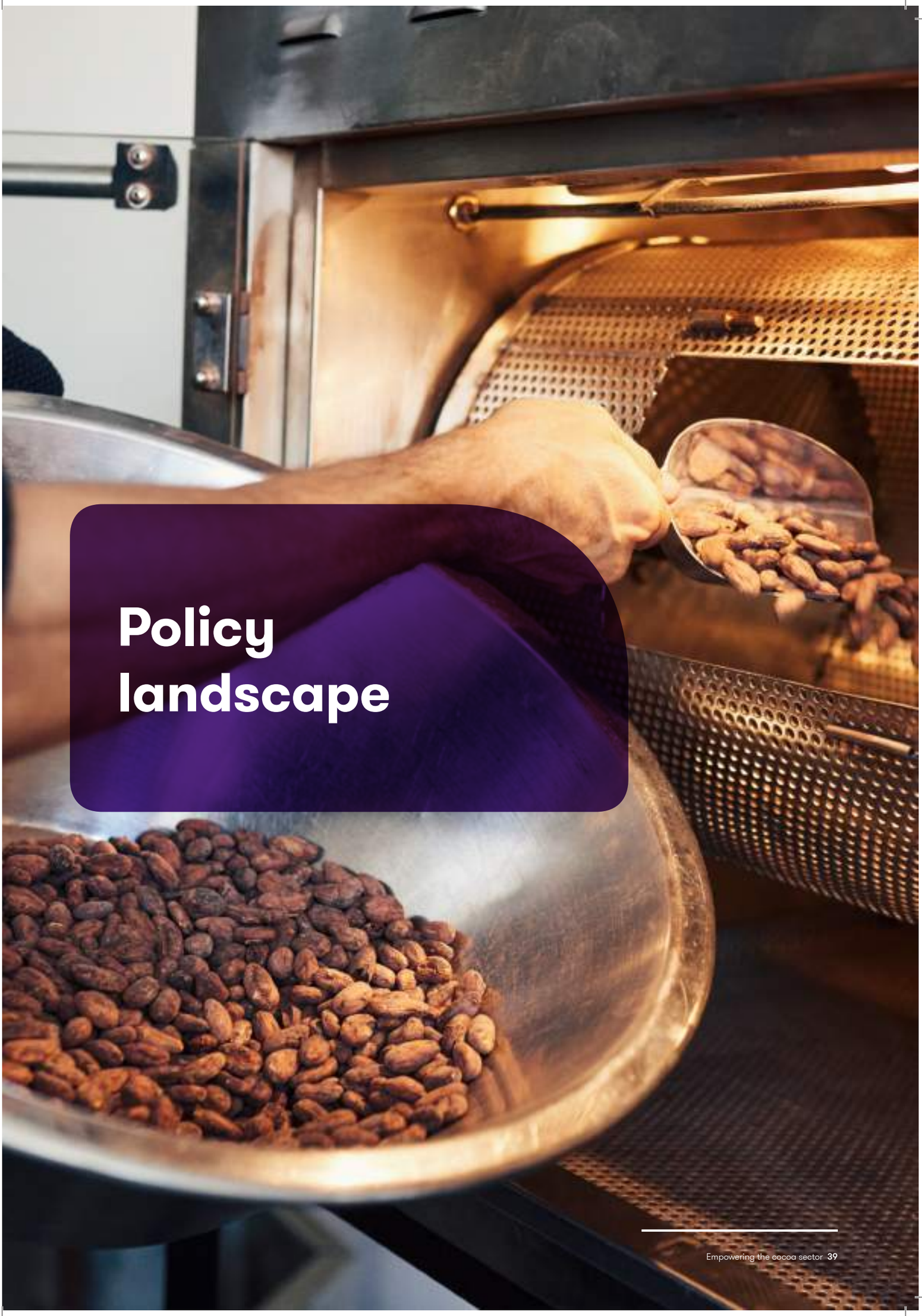
Model	Payback period	Gross profit (INR in Lakhs)	NPV (INR in Lakhs)
Banana in cocoa mono-cropping	1.56 years	52	21
Banana & cocoa in oil palm	2.26 years	19	6
Pineapple & cocoa in rubber	1.41 years	15	7

Note: The intercropping economic analysis is based on cost parameters derived from field-level insights. It does not account for land lease costs or interest on capital and should be interpreted accordingly for financial modelling or policy decisions.

In monocropping with cocoa, banana is assumed to be thrashed at the end of 3rd year. In the last two models, bananas and pineapples are assumed to be harvested after the 3rd year & then Cocoa is intercropped in the 4th year.

We found that integrating intercrops, such as banana and cocoa in oil palm, and pineapple and cocoa in rubber, can significantly enhance early-stage cash flows during plantation establishment. Their inclusion helps accelerate the payback period and strengthens the financial sustainability of diversified agroforestry systems. These combinations provide interim returns before the primary crop matures, supporting farmers financially in the initial years. Among the models, Banana in Cocoa monocropping demonstrates the most efficient early recovery, making it a strong candidate for generating income in the early phase.

Intercropping cocoa with regionally compatible crops presents a viable strategy for enhancing farm profitability and resilience. Early-stage combinations such as banana and pineapple significantly improve cash flow during the gestation phase, while integration into mature plantations strengthens long-term returns. To further support farmer adoption, especially during the initial years of establishment, there may be merit in exploring mechanisms that ease upfront investment — such as targeted financial assistance or input support — aligned with broader agroforestry development goals.



Policy landscape

The cocoa value chain is built on several essential stages, from cultivation to processing. Government provides targeted subsidies to support value chain players at these stages. These interventions aim to improve productivity, sustainability, and farmer incomes. The table below outlines key components and support mechanisms across each phase.

Stage	Components covered	Stakeholders/Mission/ Scheme	Support
Pre-production	Area expansion, Intercropping, Nursery setup	Mission for Integrated Development of Horticulture (MIDH), National Mission on Edible Oils - Oil Palm (NMEO-OP, Paramparagat Krishi Vikas Yojana (PKVY)	• INR 30,000–37,500 per ha (Area expansion) • INR 20,000–25,000 per ha (Intercropping) • INR 10–12 lakh per ha (Nursery establishment)
Production	Drip Irrigation, Canopy Management, Fertigation Automation	MIDH, State Horticulture Mission, PMKSY	• INR 46,023–66,959 per ha (Drip irrigation) • INR 2 lakh per unit (Fertigation automation) • INR 1.5 lakh maximum (Fencing)
Post-harvest	Solar Dryers, Packhouses, Storage Facilities	NHB, MoFPI, MIDH, MOVCD-NER	• INR 37.5 lakh (75% for FPCs, 50% for private) • INR 18.75 lakh (75% for FPCs, 50% for private) for Pre-cooling/cold stores/ ripening chambers
Processing	Micro- units, Agro Processing Clusters	PMFME, MoFPI, NHB	• INR 5 crore under CEFPPC • INR 10 crore under APC • NHB-CDP support up to INR 100 crore (average 40–45% subsidy)
Risk mitigation/ Organic production	Crop Insurance, Organic Inputs and Certification	Pradhan Mantri Fasal Bima Yojana (PMFBY), PKVY	• 5% farmer premium on INR 60,000 per ha crop insurance cover • INR 15 lakh (75% subsidy, INR 11.25 lakh) under MOVCD-NER Organic Infrastructure
Aggregation	Farmer Producer Organisations (FPO) Grants, Cluster Infrastructure	SFAC, CDP, State Horticulture Mission, MOVCD-NER	• INR 11 lakh per FPO (MOVCD-NER) • INR 20.375 lakh per FPC under MOVCD-NER

Source: MIDH, MoFPI, MOVCDNER guidelines

The table summarises the range of subsidy support available to individual cocoa farmers across key on farm interventions such as area expansion, drip irrigation, field implements, adoption of Good Agricultural Practices (GAP) and promotion of integrated methods, etc. It reflects the direct financial assistance accessible to farmers for establishing plantations, enhancing productivity, and strengthening day-to-day farm management.

Subsidy for farmer with two hectares of land

State type	Operations	Subsidy amount (INR)
General states	Intercropping	42,775
	Monocropping	45,586
Northeastern states	With Intercropping	47,342
	Monocropping	50,486

Tentative*

Assumption: Each farmer is assumed to avail subsidy support for any given component only once over the project lifecycle of 15 years.

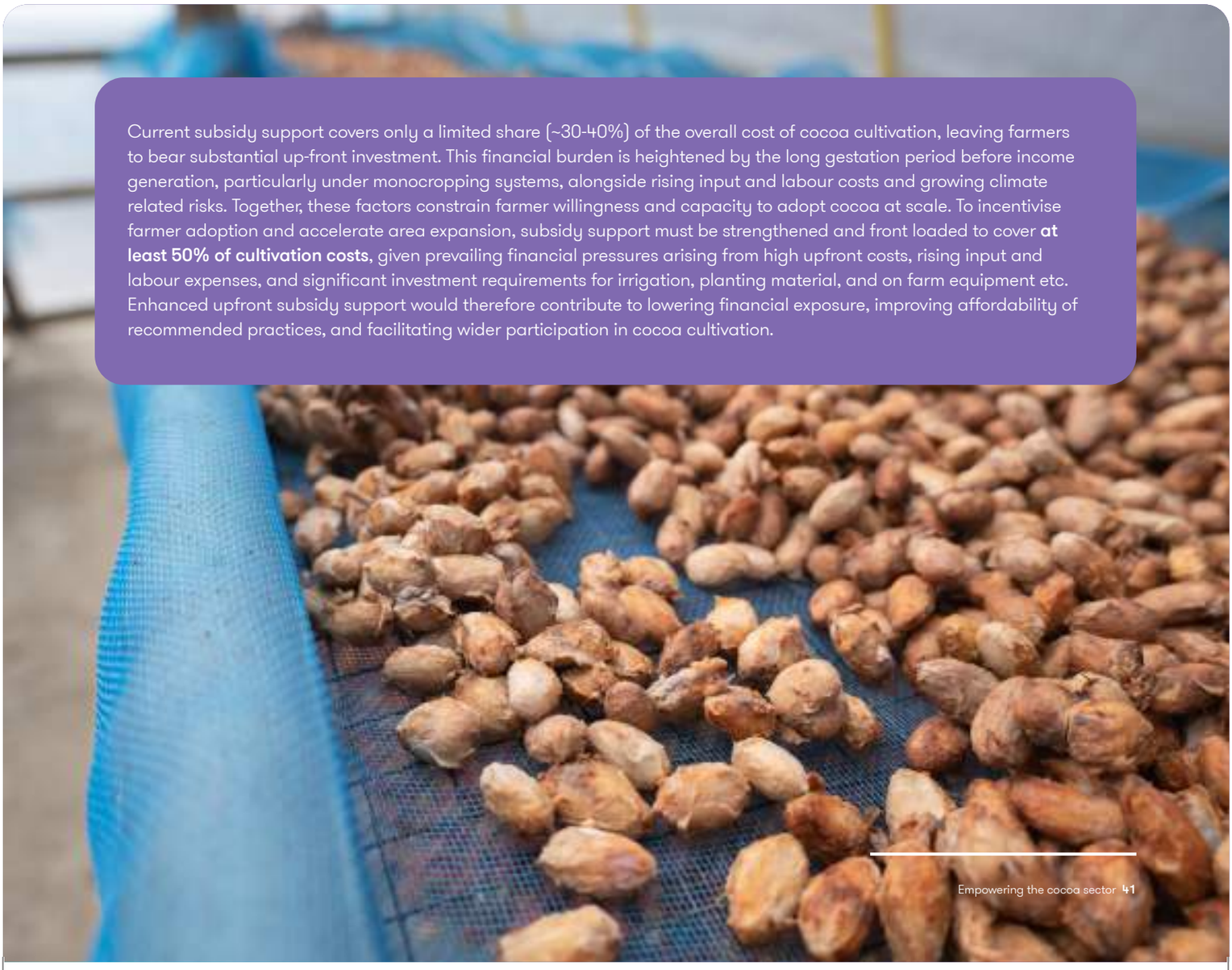
The calculations are based on applicable MIDH guidelines, PDMC norms, SMAM norms, and other relevant Central and State Government scheme provisions, as notified from time to time. Beyond individual level subsidies, farmers associated with Farmer Producer Organisations (FPOs/FPCs) and cooperatives indirectly benefit from aggregate incremental support through shared institutional interventions such as nursery development, custom hiring centres, farm machinery banks, community water structures, capacity building support, managements grants and other common infrastructure creation. The average value of this incremental support accruing to member farmers is detailed in the table below:

Subsidy for FPO with 500 Farmers (Per Year)

State type	Annual subsidy per FPO (INR)	Subsidy/Farmer (INR)
General states	59,05,000	11,810
North-eastern states	56,16,667	11,233

Tentative*

Assumption: The additional support is averaged assuming an FPO/FPC comprising 500 farmers, with common infrastructure and assets deployed and utilised over a 15 year operational life. It is further assumed that **each FPO/FPC may avail subsidy support for any given component only once** over the project lifecycle, to avoid duplication and ensure equitable coverage.



Current subsidy support covers only a limited share (~30-40%) of the overall cost of cocoa cultivation, leaving farmers to bear substantial up-front investment. This financial burden is heightened by the long gestation period before income generation, particularly under monocropping systems, alongside rising input and labour costs and growing climate related risks. Together, these factors constrain farmer willingness and capacity to adopt cocoa at scale. To incentivise farmer adoption and accelerate area expansion, subsidy support must be strengthened and front loaded to cover **at least 50% of cultivation costs**, given prevailing financial pressures arising from high upfront costs, rising input and labour expenses, and significant investment requirements for irrigation, planting material, and on farm equipment etc. Enhanced upfront subsidy support would therefore contribute to lowering financial exposure, improving affordability of recommended practices, and facilitating wider participation in cocoa cultivation.





Andhra Pradesh (AP)

In Andhra Pradesh, cocoa cultivation is supported through an area expansion subsidy of INR 12,000 plus INR 8,000 for up to two hectares, with the **second-year subsidy contingent upon seedling survival.** Micro-irrigation efforts have been **hindered due to delayed payments** in recent years. Additionally, the existing pack house infrastructure, crucial for protected storage and post-harvest handling, requires urgent revitalisation to support the growing cocoa sector.

From a value chain perspective, the **state possesses collection centres for other crops**, which present an opportunity to be extended to **cocoa for streamlined aggregation and logistics**. There is also a proposal to establish cocoa-specific processing units and human resource development initiatives, majorly focusing on fermentation and drying techniques.

Kerala

In Kerala, cocoa development is supported through schemes under MIDH, SHM, and Directorate of Cashew and Cocoa Development (DCCD). While an **area expansion subsidy** of INR 30,000 has been proposed for the current year, its formal approval is still pending. Historically, the subsidy structure included INR 12,000 plus INR 8,000 for up to two hectares. Water resource development receives robust support being critical for sustaining cocoa cultivation.

Pack houses, essential for post-harvest handling and quality preservation, are eligible for a **30–50% subsidy** based on detailed project reports. The promotion of **FPOs** is actively encouraged, with financial assistance of up to INR 60 lakh **over three years per FPO** to enhance collective bargaining and market access. Additionally, **vermicompost units** receive support of **INR 50,000 per unit,** although clarity on the scale and implementation mechanisms remains limited.

Tamil Nadu (TN)

In Tamil Nadu, cocoa cultivation is supported through a structured set of interventions aimed at promoting sustainable growth and farmer participation. Under the **area expansion initiative**, farmers are eligible for subsidies to cultivate cocoa as an intercrop on up to four hectares, with **INR 12,000 worth of seedlings provided** in the first year. Micro-irrigation is **strongly incentivised**, particularly for small and marginal farmers, who receive 100% subsidy up to INR 47,000 per hectare.

Pack houses are supported with a **50% subsidy, capped at INR 2 lakh per unit**; however, stakeholders have **raised concerns that the current financial ceiling may be insufficient to meet actual infrastructure needs**. To strengthen farmer collectives, the state provides INR 5 lakh in support for FPOs comprising at least 100 farmers. Additionally, vermicompost units are eligible for a 50% subsidy up to INR 50,000 per unit under the National Horticulture Mission (NHM), although the scale and reach of implementation remain limited.

Karnataka

In Karnataka, **cocoa cultivation currently lacks a dedicated area expansion scheme,** which presents a gap in targeted support for new growers. However, broader agricultural programmes offer indirect benefits. **Water resource development** is well-supported, with financial assistance of up to **INR 24 lakh per unit**, primarily directed towards community-level infrastructure.

Farmers are eligible for a 50% subsidy, up to INR 25 lakh, for pack house units measuring 9 × 6 m . This includes essential components such as sorting tables, trolleys, and cold storage, aligned with specifications approved by the **National Centre for Cold-chain Development (NCCD)**. For **processing infrastructure**, support is available **up to INR 35 lakh per unit, credit-linked with 35% financial assistance,** aimed at enhancing local value addition.

Institutional development through FPOs is limited to non-financial support, **primarily in the form of training and capacity building, with no provision for capital subsidies.** Organic input support **is available under the PKVY, which provides up to INR 30,000 per vermicompost unit and INR 50,000 per hectare. Karnataka has a strong foundation in infrastructure and resource support; however, the absence of cocoa-specific schemes and capital assistance for farmer collectives underscores the need for a tailored, integrated policy framework to unlock the sector's full potential. Major areas of implementation.**

Farmers cultivating cocoa often face significant challenges due to lack of clarity regarding the schemes available to them. Local agricultural departments frequently fail to provide proper explanations or targeted support for cocoa-specific initiatives, leaving farmers uninformed and unsupported. As a result, many are unable to access subsidies in a timely manner often requiring persistent follow-ups that add to their frustration.

- Subsidies for gestation period
- Strengthened agri-extension services
- Investment in quality input material
- Targeted financial support Mechanism
- Cocoa-specific institutional system

In the long run, such measures could help unlock the sector's full potential, enhance livelihoods, and contribute to agricultural diversification.

Challenges

Despite the growing potential of cocoa cultivation and its increasing demand in the ecosystem, the current landscape remains constrained by several structural and agronomic challenges.

Lack of quality planting material
Polyclonal gardens to meet farmer demand is needed

Limited government support
Minimal subsidies, incentives, or inclusion in policies

Weak R&D
Insufficient investment in cocoa-specific agronomic research

Poor extension services
Farmers lack access to timely technical guidance, training, and best practices

Fragmented supply chain
Inconsistent quality and traceability

Low awareness
Limited awareness & infrastructure for PHM and traceability

Lack of quality planting material

India's cocoa sector is struggling with a shortage of quality planting material, which hinders progress toward self-sufficiency and burdens the nation with import dependence.

Domestic demand is growing, but the country still relies on imports worth nearly USD 800 million each year. KAU has made significant contributions by developing 11 polyclonal seed gardens and 40 lakh seedlings, supporting 80% of India's cocoa production. However, only 22 hectares of seed gardens are currently available,far below the 250 hectares needed by 2028 to support expansion.

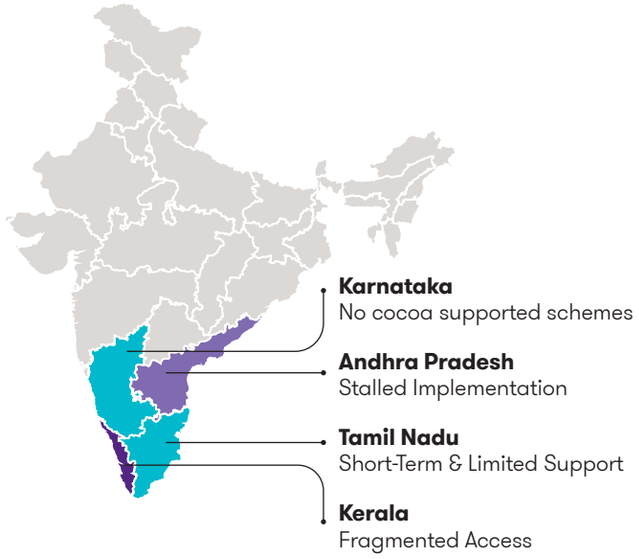
As cocoa cultivation extends into the Northeast and other non-traditional regions, logistical constraints and limited access to quality planting material underscore the urgent need for decentralised seed garden development, targeted policy support, and a robust extension ecosystem to enable scalable and inclusive growth.

	Trial plot	Seed garden	Nursery	Farm field
Supply Chain	Parents with best combining ability selected	Multiple self-incompatible parents in garden	Multiplication of elite clones into seedlings for distribution	Distribution of quality seedlings to farmers
Player	**Government:** CPCRI, CDB, SAUs – Kerala, Karnataka, Tamil Nadu, Telangana, Andhra Pradesh, Odisha, Maharashtra, Assam, College of Agriculture-Tripura, CAU Imphal		**Govt & Pvt Partners:** Regional nurseries through Govt dept & private players across clusters	**FPOs:** Scaling up of distribution through community seed gardens of FPOs

Limited government support

Despite cocoa's potential as a high-value intercrop for small and marginal farmers in India, government support remains fragmented and insufficient to drive scale. While over ten schemes across departments, such as MIDH, MoFPI, NHB, and SFAC,offer subsidies for pre-production, production, post-harvest, processing, and aggregation, the implementation is inconsistent and largely paper-based.

States like Andhra Pradesh, Kerala, Tamil Nadu, and Karnataka show varied uptake, with gaps in micro-irrigation funding, delayed disbursements, and limited cocoa-specific interventions. The absence of a unified policy framework, coupled with low awareness and weak institutional coordination, has resulted in underutilisation of available support, constraining the sector's growth and its ability to meet rising domestic demand.



Disclaimer:Maps are for graphical purposes only. They do not represent a legal survey.

Weak R&D and poor extension service

India's cocoa sector suffers from a weak R&D foundation, limiting its ability to scale sustainably and profitably. While institutions like the CPCRI and KAU have made strides in varietal development and seed garden establishment, innovation beyond planting material remains limited. Cocoa is commercially cultivated as an intercrop with coconut, rubber, arecanut, and oil palm, yet region-specific models and packages of practices tailored to diverse agro-climatic zones are lacking.

This gap restricts farmers from optimising yields and profitability. Compounding this challenge is the absence of a robust extension system,technical guidance, training, and field-level support are fragmented and often inaccessible to farmers, especially in emerging cocoa regions. This disconnect between research and field implementation hampers productivity, quality, and profitability. Strengthening R&D and building a decentralised, responsive extension network are critical to unlocking cocoa's full potential in India.

Fragmented supply chain and lack of awareness

India's cocoa supply chain remains highly fragmented, limiting efficiency, traceability, and value realisation for farmers. The sector is dominated by smallholder producers operating in silos, with limited access to organised procurement, post-harvest infrastructure, and market linkages. Aggregation mechanisms such as FPOs and cooperatives are underdeveloped, resulting in inconsistent quality and weak bargaining power.

Compounding this is a widespread lack of awareness among farmers regarding best practices in cultivation, fermentation, drying, and certification standards. In emerging cocoa regions, knowledge gaps around crop economics, available subsidies, and market opportunities further hinder adoption. Building integrated value chains and investing in farmer education and capacity-building are essential to unlock scale and competitiveness in India's cocoa ecosystem. Mondelez's unmatched footprint across India's cocoa zones, spanning GAP training and sourcing,positions it as the anchor player in the supply chain. Scaling long-term cocoa initiatives will hinge on deepening Mondelez's engagement and aligning new partners to its proven field model.

Despite these persistent challenges, cocoa remains a high-potential crop with the capacity to transform rural livelihoods. With the right interventions, ranging from quality planting material and policy support to robust extension services and market integration, cocoa can serve as a powerful vehicle for doubling farmer incomes, especially when integrated into diversified and sustainable farming systems.



Cocoa as a driver of doubling farmers' income

In recent years, grassroots models in India have demonstrated successful strategies for doubling farmers' income, as outlined in the Doubling Farmers' Income (DFI) roadmap. For example, in **Maharashtra**, cotton farmers[6] doubled their earnings by adopting precision farming, drip irrigation, and diversifying from sugarcane to vegetables and fruits, with FPO-led aggregation.

Similarly, in **Wayanad, Kerala,** black pepper and banana intercrops under coconut plantations led to significant income gains through multi-tier cropping systems. Within this framework, **cocoa emerges as a strategic enabler of income enhancement.** Though its cultivation area is limited nationally, cocoa aligns with multiple pillars of the DFI strategy. Grown under shade, cocoa integrates into agroforestry with oil palm, arecanut, and banana. It requires minimal input and, when processed, earns high price premiums. With rising demand and carbon credit potential, it enhances **farmers' income within diversified, climate-resilient models.**

01. **High long-term returns:** Cocoa begins yielding in 2.5–3 years and remains productive for up to 25 years, ensuring sustained income without expanding land area.

02. **Maximised land use:** As an intercrop, cocoa enhances per-acre profitability by utilising vertical space and complementing primary crops.[7]

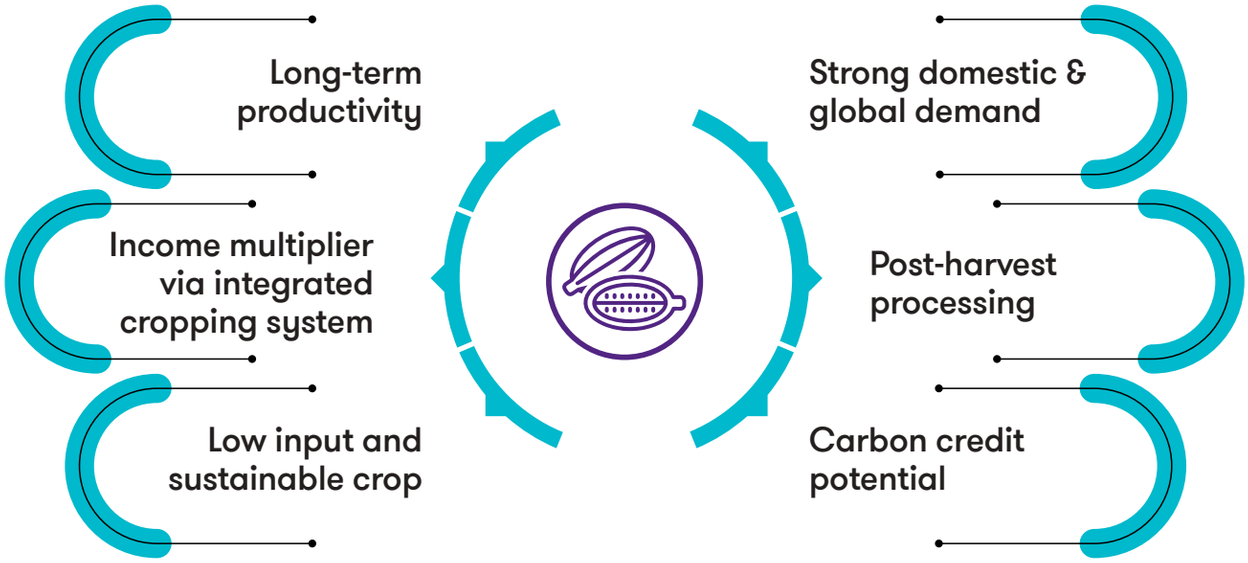
03. **Low input, high net income:** Cocoathrives in rain-fed, shaded conditions with minimal fertiliser and pesticide needs, making it cost-effective and sustainable.

04. **Value addition through processing:** Fermented and dried cocoa beans fetch premium prices, especially when supported by FPO-led post-harvest infrastructure.

05. **Import substitution opportunity:** With India importing cocoa and cocoa products worth approximately USD 866 million (2024), increased domestic cultivation can tap into a stable and growing market.

06. **Climate resilience and carbon credits:** Cocoa agroforestry improves soil health and microclimate, while enabling farmers to earn from carbon credit platforms like Varaha and EcoTrust.

Cocoa: Enabler of doubling farmer income



6. Towards Doubling Cotton Farmer Incomes in Maharashtra
7. Ready Reckoner on Cocoa, Coconut and Arecanut
India Imports of Cocoa and cocoa preparations - 2025 Data 2026 Forecast 1988-2024 Historical



Case Study: Cocoa Life: Strengthening cocoa farming systems in india

Overview: Since the 1960s, Mondelez (formerly Cadbury) has been at the forefront of cocoa development in India, introducing cocoa as an intercrop in Kerala, Karnataka, Andhra Pradesh, and Tamil Nadu. What began as a supply-chain initiative has evolved into the Cocoa Life programme (2012 onwards). A "sustainability-driven model" combining farmer income enhancement, post-harvest quality improvement, and community development. The programme's intercropping approach has enabled farmers to double or more their incomes, while supporting environmental conservation and building a resilient domestic cocoa supply base.

Strategic intervention:

Establishment of 10 cocoa nurseries with capacity for 4 million seedlings annually, developed in partnership with KAU and CPCRI, providing farmers with high-yielding planting material.

- GAP training and farmer awareness campaigns (on-farm, group meetings, cocoa vans, seminars, digital platforms) to promote adoption of cocoa as a profitable intercrop.
- Direct farm-gate procurement and digital payments ensuring transparency, faster transactions, and elimination of multiple intermediaries.
- Centralized fermentation and drying facilities across southern states, guaranteeing consistent bean quality and enabling farmers to secure premium prices.
- Community development programmes in tribal areas (school infrastructure, women's empowerment, nutrition, healthcare) integrated into cocoa-growing ecosystems.
- Agroforestry initiatives (since 2023) introducing non-cocoa tree species on farms, boosting biodiversity and additional farmer income.

Key enablers of success

- Public–Private research partnerships with Kerala Agricultural University (since 1983) and CPCRI (since 2024) releasing 21+ varieties adapted to Indian conditions, with yields of 1,500–2,500 kg/ha, among the highest globally.
- Strong farmer outreach and technical teams embedded across cocoa-growing regions, ensuring last-mile knowledge transfer and support.
- Over 30,000 farmers onboarded onto the Cocoa Life digital app for geo-tagging, weather alerts, pest prediction, and training content dissemination.
- Collaborations with State horticulture departments and DCCD, unlocking subsidies, building capacity of tribals, and ensuring convergence with government schemes.

Impact

- Farmers adopting cocoa intercropping have been able to double their income or more, while simultaneously improving resilience through diversified cropping systems.
- Creation of a farmer-centric, transparent supply chain with direct procurement and quality-linked feedback, reducing post-harvest losses and enabling better price realisation.
- Over 30,000 farmers directly connected through nurseries, training, procurement, and the digital platform, with expansion into new states like Assam, Meghalaya, Odisha, and Telangana.
- Social impact through women's empowerment, child education, healthcare infrastructure, and nutrition programmes, strengthening the broader cocoa-growing community.

Potential clusters for expansion of cocoa in India

South India holds immense potential for expanding cocoa cultivation. In Kerala, efforts are underway to promote cocoa as an intercrop in existing coconut and arecanut plantations in districts like Idukki, Wayanad, Kozhikode and Ernakulam. In Tamil Nadu, regions such as Coimbatore, Pollachi, Theni, and Kanyakumari are emerging as key intercrop zones with coconut and arecanut while Karnataka districts like Mysore, Hassan, Tumkur, Mandya, and Davangere are witnessing new plantations.

Andhra Pradesh, where nearly 90% of cocoa is grown as an intercrop with coconut, is also exploring high-density monocropping in East Godavari, though still in its early stages. With an additional 5,000 hectares being brought under cocoa every year, Andhra Pradesh presents a strong opportunity to scale up cocoa cultivation and meet growing demand. Telangana also provide great opportunity in terms of area availability & growing farmer interest for cocoa cultivation.

Northeast India, Odisha, and Chhattisgarh represent a high-potential frontier for cocoa cultivation, particularly when integrated with emerging plantation systems such as coconut, arecanut, rubber, and oil palm. These plantations are largely in their early or developmental stages with 80-90% immature areas of cocoa, offering a strategic window to introduce cocoa as an intercrop. Drawing from successful models in South India, where intercropping cocoa under coconut and arecanut generates an additional INR 30,000–50,000 per hectare annually (ICAR, NABARD),this approach is especially relevant in tribal and rainfed zones where sustainable agriculture and income diversification are critical.

The integration of cocoa not only enhances farmer income but also supports climate resilience and biodiversity, aligning with national sustainability goals.

State	Districts/Areas	Plantations	Growth stage
Assam	Kamrup and Chirang, Goalpara and Udalgiri	Rubber	80-90% immature cocoa
Meghalaya	North and West Garo Hills	Rubber	Young
Mizoram	Aizawl, Mamit	Oil palm	Expanding
Nagaland	Dimapur	Arecanut, Rubber	Young
Odisha	Koraput, Rayagada, Malkangiri, Nabarangpur	Oil palm, Rubber	Young
Chhattisgarh	Bastar, Kanker, Dantewada, Bijapur	Oil palm	Young
Tripura	Dhalai	Oil palm, Rubber	Expanding
Arunachal Pradesh	East Siang, Namsang and Lower Dibang Valley	Oil palm	Young

As per GT Field Insights

Key districts such as Kamrup, Goalpara and Udalgiri in Assam; North, East and West Garo Hills in Meghalaya, where the agroforestry model has been introduced; Aizawl in Mizoram; Dimapur in Nagaland; and tribal belts in Odisha (which have significant potential for monocropping) and Chhattisgarh are witnessing plantation expansion under state and national missions. In Meghalaya, the Department of Soil and Water Conservation has taken the lead in promoting cocoa cultivation, particularly in districts such as East and West Khasi Hills, Ri Bhoi and East Jaintia Hills.These areas offer ideal conditions for cocoa intercropping, supported by institutional backing and agro-climatic suitability. Additional promising zones include Kahikuchi and Jorhat in Assam, parts of Manipur, East Siang valley and Dibang valley in Arunachal Pradesh. With ongoing feasibility studies and **intercropping trials** already underway, these regions are well-positioned to replicate the success of South India and emerge as vibrant cocoa-producing hubs with the right policy and technical interventions.

The Rubber Board's active push to increase the area under rubber cultivation in the Northeast region presents a strategic opportunity to integrate cocoa as an intercrop. Given the compatibility of cocoa with rubber in terms of agro-climatic requirements, this integration can significantly enhance land productivity and farmer income. Leveraging the momentum of the Rubber Expansion Initiative in the Northeast not only supports sustainable diversification but also provides a ready framework for cocoa promotion, making it a high-potential area for targeted expansion efforts.



Area expansion plan

India's cocoa consumption is rising steadily, driven by rapid growth in the chocolate, confectionery, and bakery industries. Changing consumer preferences, increasing urbanisation, and rising disposable incomes have fueled demand for cocoa-based products across both premium and mass-market segments. As this trend continues, ensuring a reliable and self-sufficient supply of cocoa ingredients is not just an agricultural concern,it is a strategic imperative for India's food processing sector and overall value chain resilience.

To define a clear trajectory toward cocoa self-sufficiency by 2040-41, we undertook a comprehensive demand-supply analysis anchored in trade data from 2023-24. This helped establish the baseline consumption of cocoa beans and derivative products. Using a projected Compound Annual Growth Rate of 5.5% (quite anoptimistic consideration), we estimated the national demand through 2040.

In parallel, we assessed domestic production trends, which have historically grown at approximately 5% annually in the absence of major interventions,highlighting a widening structural gap between demand and supply. To address this, we applied a backward planning methodology to determine the acreage expansion required over the next 15 years.

Our model incorporates assumptions around yield enhancement, agro-climatic suitability, and phased regional rollout,providing a clear roadmap for bridging the supply-demand gap and achieving long-term self-reliance. The findings provide a strategic framework for guiding policy, investment, and implementation under the proposed National Mission on Cocoa.

	HS code	Product	Quantity in MT
Imports	18050000	Cocoa powder not cotaining. added sugar/other sweetening matter	56844.35
	18040000	Cocoa butter fat and oil	27436.84
	18010000	Cocoa beans whole/broken, raw/roasted	28774.21
	18031000	Cocoa paste, excluding defatted	2885.80
	18032000	Cocoa paste, wholly or partly defatted	884.99
Exports	18050000	Cocoa powder not containing. added sugar/other sweetening matter	1005.37
	18040000	Cocoa butter fat and oil	10119.11
	18010000	Cocoa beans whole/broken, raw/roasted	43.60
	18031000	Cocoa paste, excluding defatted	36.23
	18032000	Cocoa paste, wholly or partly defatted	199.29
		Domestic production (cocoa beans - India)	30390
		Total beans demand equivalent	**187710.76**

As per GT Analysis (Trade Data:2023-24)

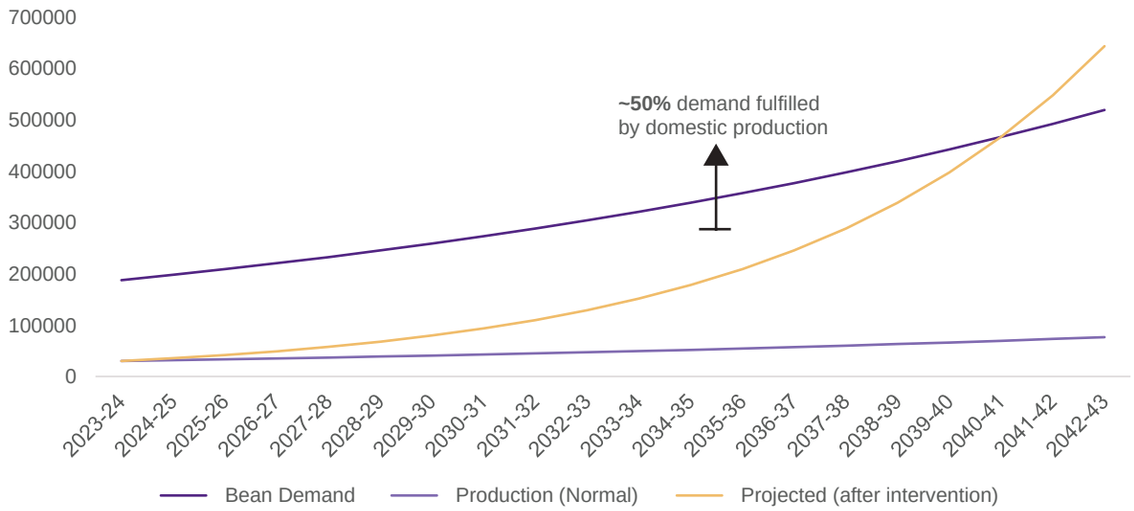
To estimate cocoa bean requirements based on processed product trade volumes, we applied industry-standard conversion ratios. Specifically, we used a factor of **0.35** for cocoa butter, **0.45** for cocoa powder, and **0.785** for cocoa paste, reflecting typical processing yields. These conversion factors enabled us to translate trade volumes of finished cocoa products into their cocoa bean equivalents, forming a critical input for demand estimation and supply planning.

The analysis reveals a significant structural gap in domestic supply. With an annual demand of approximately**1.87 lakh MT**[10] (bean-equivalents) in 2023-24, the country relied heavily on imports, which account for nearly **83%** of the total requirement. Domestic production stood at just **30 thousand metric tons** in 2023-24, underscoring the urgent need to scale up cocoa cultivation across suitable agro-climatic zones.

Based on projections, India's cocoa bean demand is expected to reach approximately 4.42 lakh metric tonnes by 2039-40. Assuming an average yield of 1.5 metric tonnes per hectare, driven by improved R&D and farming practices, this translates into a requirement for an additional 250 hectares for polyclonal garden expansion and about 2 lakh hectares to be brought under cocoa cultivation by 2040-41 to meet domestic demand and achieve self-sufficiency.

This will be achieved through a phased expansion strategy, with **three 5-year plans**, each targeting the addition of approximately **67,000 hectares**. These plans should be laid out clearly, ensuring systematic implementation across regions. The strategy should be **cluster-based** and **state-led**, with active support from central agencies and commodity boards such as the Rubber Board, Coconut Development Board, and Arecanut and Spices Boards

Target Projections to acheive Self Sufficiency by 2041-42



As per GT Analysis

~5.2 Lakh MT
Projected demand for 2042-43

~6.4 Lakh MT
Projected production for 2042-43

10. GT Analysis

To achieve the self-sufficiency target, the below proposed plantation programmeme roadmap prioritises both consolidation in established belts and diversification into new geographies. The foundation is laid in Andhra Pradesh and Tamil Nadu, which together represent the country's most mature cocoa clusters. With extensive coconut and oil palm bases, these states can absorb nearly 45% of the expansion programmeme. Andhra Pradesh has historically anchored India's cocoa production, while Tamil Nadu is increasingly contributing through its well-developed intercrop systems.

Foundation 2026-28

State	Potential area allocated for expansion (%)	Polyclonal garden initiation (Ha)	Lead	Phase 1 (2026-2030)	Phase 2 (2031-2035)	Phase 3 (2025-2040)	Total area expansion by 2040 (ha)
Andhra	37.5%	75	Leading hub	25000	25000	25000	75000
Tamil Nadu	7.5%	25	Regional spoke	3000	5000	7000	15000
Kerala	10%	38	Regional spoke	5000	8000	7000	20000
Karnataka	10%	25	Regional spoke	5000	8000	7000	20000
Northeast	12.5%	31	Regional spoke	6000	9000	10000	25000
Telangana	12.5%	31	Regional spoke	7000	8000	10000	25000
Other potential states	10%	25	Regional spoke	5000	7000	8000	20000
	100%	**250**		**56000**	**70000**	**74000**	**200000**

GT Field Insights: Based on stakeholder consultations

Kerala and Karnataka together contribute approximately another 20%, leveraging their strong bases in rubber, arecanut, and coconut. Both states already have farmer familiarity with cocoa as an intercrop, and ongoing institutional support from the Rubber Board provides additional momentum. The combination of Kerala's high-density coconut belts and Karnataka's arecanut dominance ensures a steady expansion pipeline over the next decade. Approximately 12.5% of the area shall be expanded across Telangana for cocoa cultivation, driven by its growing popularity, favourable agro-climatic conditions, and strong farmer engagement potential.

The remaining 22.5% of new area is planned for emerging regions, including the North-Eastern states, Odisha, and Chhattisgarh. An area of about 25,000 ha under cocoa is proposed for Northeastern region, which also boasts around 1.35 lakh ha of arecanut and around 26,000 ha of coconut, along with diversification potential across tea estates. Odisha, and Chhattisgarh present additional scope for piloting cocoa clusters in suitable agro-climatic zones. Together, these states represent the future frontier for cocoa cultivation, and their inclusion widens the geographic spread while reducing supply concentration in the South. Institutional programmes such as the Rubber Board's 5 lakh ha diversification drive can also be aligned with these regions to accelerate adoption.

In total, the programme will add 2 lakh hectares of new cocoa plantations by 2040-41, complementing the existing aproximate1.1 lakh ha, for a combined roughly 3.1 lakh ha under cocoa cultivation. With improved planting material, polyclonal seed gardens, and best-practice agronomy, an average yield of 1.5 MT/ha is considered achievable. This translates to around4.7 lakh MT of cocoa bean production by 2040-41, bridging India's structural supply gap, reducing import dependence, and enabling cocoa to contribute meaningfully to the Atmanirbhar Bharat vision.

The expansion plan not only optimises land use but also diversifies income sources for farmers. The coordinated effort - driven by government bodies, commodity boards, farmer cooperatives, and processing companies etc. is designed to reduce import dependency, strengthen domestic supply chains, and build a resilient cocoa ecosystem. By aligning with existing plantation expansion programmes and leveraging institutional support, India can accelerate progress toward cocoa self-sufficiency while promoting sustainable agricultural practices.

With strategic interventions and collaborative efforts, India can transition from being a net importer to emerging as a net exporter of cocoa within the next 20 years. By aligning domestic production with the global standards, through improved post-harvest practices, certification, and branding, India can unlock significant export potential and enhance farmer incomes.



Digital and data infrastructure

Challenges

Despite cocoa's rising relevance in India's agri-export narrative and value-added segment, its digital and data infrastructure remains severely underdeveloped. As global markets accelerate toward traceability, sustainability compliance, and digital-first procurement models, Indian cocoa is yet to find a place in national digital frameworks, market intelligence systems, or precision advisory platforms.

Unlike staple crops or plantation sectors with established tech and institutional support, cocoa remains trapped in a data vacuum: fragmented, under-recognised, and digitally invisible. This has cascading effects across the value chain from planning and pricing to traceability and trade readiness. Addressing these systemic gaps is imperative for positioning Indian cocoa in both premium domestic markets and future-ready global supply chains.

The following are the bottlenecks in the Indian Cocoa digital and data infrastructure ecosystem:

Low adoption of digital tools at farmer level

Digital payments and transaction

Geotagging and land digitisation

No real-time traceability framework

Under recognised in National Digital Systems

Fragmented & siloed data ecosystem

Lack of price forecasting and market intelligence

Lack of cocoa specific advisory

1 Crop visibility in national digital systems: Cocoa does not get digitised attention in planning, subsidy distribution, or market intelligence systems
   - Cocoa is under-recognised in government databases like Agri Stack, e-NAM, or PM-KISAN dashboards. Most state-level crop registration focuses on food grains or commercial crops like cotton, not perennial or intercrop-based crops like cocoa.

2 Fragmented and siloed data ecosystem: No interoperable platform exists to unify data from these stakeholders, leading to duplication, inefficiencies, and lack of real-time visibility.
   - Farmer and farm-level data is held across: DCCD (central nodal body), private players like processors, traders and cooperatives.

3 Low adoption of digital tools at farmer level: Limited smartphone access and digital literacy among cocoa farmers reduce efficiency, market opportunities, and traceability. Boosting access and training can bridge this gap.
   - Cocoa farmers are mostly smallholders or tribal cultivators with low smartphone ownership and limited digital literacy.

4 Lack of cocoa-specific advisory or decision support systems: Cocoa farming requires specialised guidance but often receives generic agricultural advisories. Private players offer capacity-building training, though mainly at key stages and usually due to mandates.

- Most digital advisory apps (like mKisan and IFFCO Kisan) don't provide cocoa-specific insights. No advisory exists on:
  - Fermentation monitoring
  - Disease/pest diagnosis (black pod, stem canker)
  - Post-harvest practices

5 No real-time traceability framework: Cocoa supply chain remains opaque and unverified leading to missed premium price realisation, limiting export potential, and emerging in premium international markets.
- No integrated system tracks cocoa: While we have Mondelēz via Cocoa Life, Olam via AtSource, and Cargill which maintains proprietary traceability systems, there is an absence of a standard national platform for digital traceability (as Coffee boards and Tea boards use).

6 Digital payments and transaction challenges: Farmers remain financially excluded, with poor access to formal credit, government schemes or insurance and other fin-tech led farmer support services.
- Despite UPI penetration, many cocoa transactions are still:
  - Involve middlemen or traders paying in cash.
  - Usually takes place outside formal FPO structures.
  - Many farmers still lack Aadhaar-bank linkage or access to bank branches.

7 Geotagging and land digitisation gaps: Without geotagging farm boundaries or land, cocoa remains excluded from traceability systems, land-linked subsidies and climate-smart planning solutions.
- Cocoa often grows as intercrop, thus, many surveys or land documents do not keep records.Farmers hesitate to allow mapping from fear of land ownership disputes, taxation, etc. At present, Mondelez is the only entity to initiate geo-tagging of cocoa farms in India that also holds the operational capacity to scale across a broad farmer base.

Solution architecture

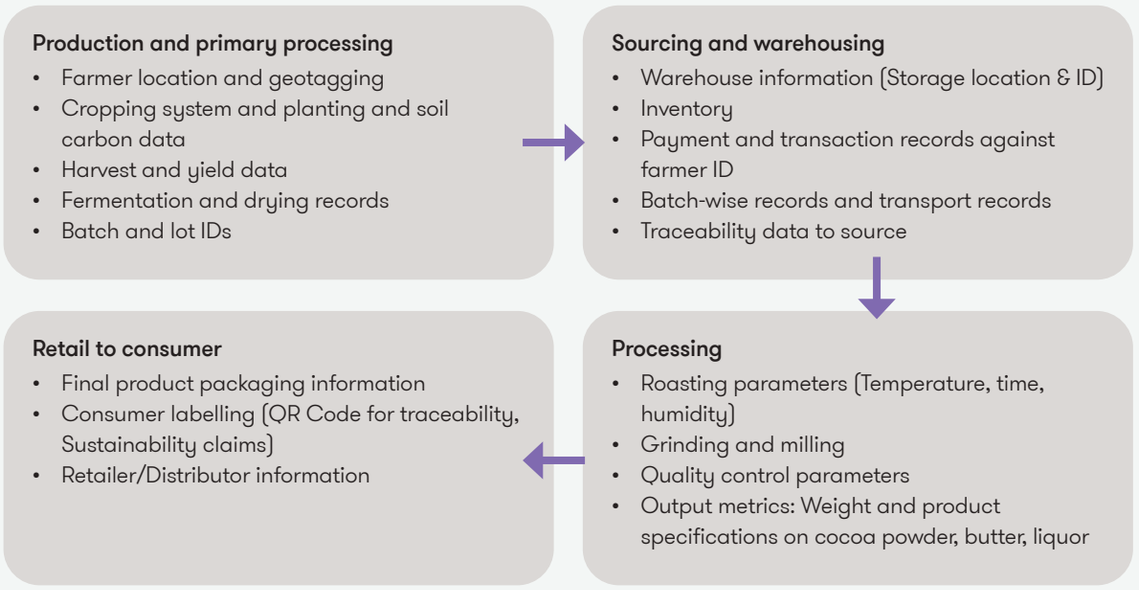
Cocoa in India suffers from a highly fragmented supply chain, with a combination of informal procurement, undocumented processing, and even low farmer visibility, making it unfit for premium buyers, certification agencies, and carbon markets. Thus, introducing digital traceability is not a value-addition,it is structural reform.

As we progress to expand the area under cultivation, instead of retrofitting traceability and sustainability to existing systems, new cocoa zones can adopt digital-first models that embed farm level data capture, sustainability tracking systems, and carbon baseline monitoring from the very beginning.



A stage wise blueprint for end-to-end cocoa traceability is represented below which shares a comprehensive approach to identifying critical data points.

Cocoa value chain traceability matrix



Emerging or new clusters can adopt foundational traceability practices such as farmer identification through FPO records, manual logbooks for harvest and fermentation data, batch-wise coding, and warehouse and payment tracking through basic registers or spreadsheets.

These low-cost, low-tech interventions provide an immediate starting point without overburdening systems. In contrast, mature/existing/export-oriented clusters are better positioned to integrate advanced mechanisms such as farm-level geo-tagging, digitally managed inventory and transport records, lab-certified quality control parameters, and consumer-facing QR codes for full product traceability. This tiered approach ensures that traceability systems remain both practically implementable and aligned with market and compliance expectations, paving the way for scalable sustainability adoption across India's cocoa ecosystem.



Trade scenario

India meets less than 20% of its domestic demand through local production, and the remaining demand is met by imports, which highlights a significant supply gap. This heavy reliance on global sourcing makes trade policies a critical factor in shaping the cocoa landscape in India,impacting everything - from pricing and availability to industry competitiveness and long-term sustainability.



Nearly ~83% of India's cocoa demand is met through imports of finished goods rather than raw material. Cocoa butter and cocoa powder are the primary products imported, with key sourcing countries including Indonesia, Malaysia and Singapore.

This trend is driven by two main factors. First, **India's domestic cocoa production is limited**, and cannot meet the growing demand from its chocolate and confectionery sector. Second, in the current **scenario importing finished products is more cost-effective and operationally efficient** than sourcing raw beans and processing them locally. Countries such as Indonesia, Malaysia, and Singapore offer competitive pricing, consistent quality, and reliable supply chains, making them preferred partners for Indian manufacturers.

Despite India's heavy reliance on imported finished cocoa products, there is minimal impact on domestic farmers. India consumes far more cocoa than it cultivates, and demand continues to grow. Imports, whether of finished goods or raw beans,are essential to bridge this gap and do not displace domestic production. In fact, as cocoa cultivation expands within India, **local consumption is expected to absorb the entire domestic yield**, ensuring that farmers benefit from rising demand without being undercut by imports. Thus, imports complement domestic supply, supporting both industry growth and farmer welfare, while maintaining a balanced and inclusive cocoa ecosystem.

While importing finished cocoa products is currently more cost-effective, **raw cocoa beans,even with import duties removed,are expected to remain 3–5% more expensive**[11]. This modest cost differential ensures that Indian-grown cocoa remains competitive and continues to be the preferred choice for processors, even under a rationalised duty regime.

Role of FTAs in the Indian cocoa industry

India's cocoa trade is shaped significantly by its Free Trade Agreements (FTAs), particularly with The Association of Southeast Asian Nations (ASEAN) nations. Agreements such as the **ASEAN-India Trade in Goods Agreement and Comprehensive Economic Cooperation Agreements (CECAs)** with Singapore and Malaysia have enabled preferential access to finished cocoa products like cocoa butter and cocoa powder. These products often enter India at reduced or zero duty[12], making them more cost-effective for domestic manufacturers.

However, raw cocoa beans do not benefit from similar duty concessions, resulting in a substantial cost differential compared to processed imports. This disparity has led to a skewed import pattern, where manufacturers increasingly prefer finished products over raw beans, limiting opportunities for domestic value addition.

The current duty structure inadvertently discourages investment in local processing infrastructure, which could

11. Stakeholder Consultation

12. Indian Trade Portal – https://www.indiantradeportal.in

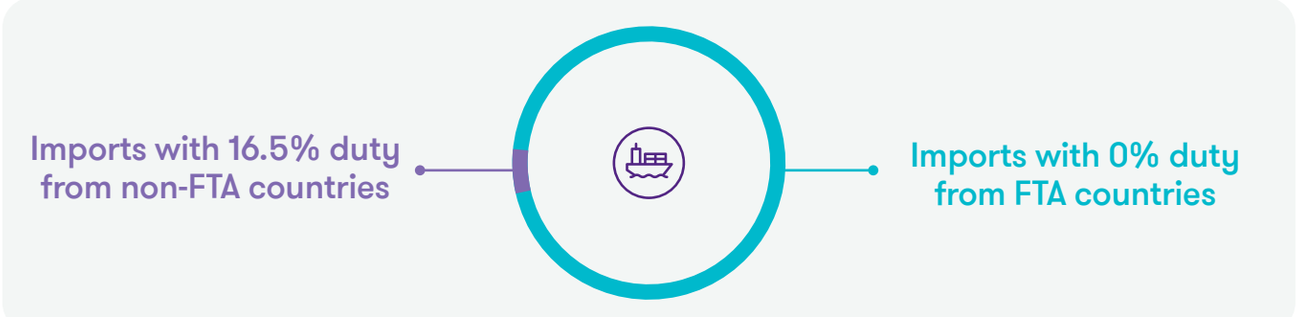


otherwise generate employment, enhance value chains, and support rural economies. In several regions, existing processing capacity remains underutilised due to limited access to raw material and high import duties on inputs. Moreover, with India's chocolate and confectionery sector growing rapidly, the demand for cocoa is expected to rise further making it imperative to reassess trade policies that influence sourcing decisions.

Inverted duty structure

India's cocoa industry is constrained by an inverted duty structure, where raw material i.e. cocoa beans attract higher import duties than finished products, making domestic value addition economically unviable. Out of the total imports, **95%** are brought in duty-free under FTAs, while the remaining **5%** is sourced from non-FTA countries such as Ivory Coast, Ghana, Ecuador, Brazil, Nigeria, and Colombia. These imports are majorly the finished goods and not the raw materials.

Imports breakdown[13]



16.5% Import duty on raw cocoa bean
(HSN 18010000 i.e. 15% duty +10% surcharge)

33% Import duty on finished products
such as cocoa powder and cocoa butter (HSN 18040000) imported from non-FTA countries but **no duty on finished products while imported from FTA countries**

13. GT Analysis: Stakeholder Consultation



It is cheaper to import finished cocoa products than to import raw cocoa beans and process them domestically, due to this structure. This discourages local value addition and makes cocoa processed in India more expensive. Further, India is dependent majorly on the imports from FTA countries considering the benefit of no import duties on finished cocoa products vis-à-vis 33% import duties from non-FTA countries. As a result, Indian processors struggle to compete globally, burdened by higher raw material costs. Farmer cooperatives and rural processors also have no incentives to engage in value addition, weakening the domestic cocoa supply chain and limiting rural economic development.

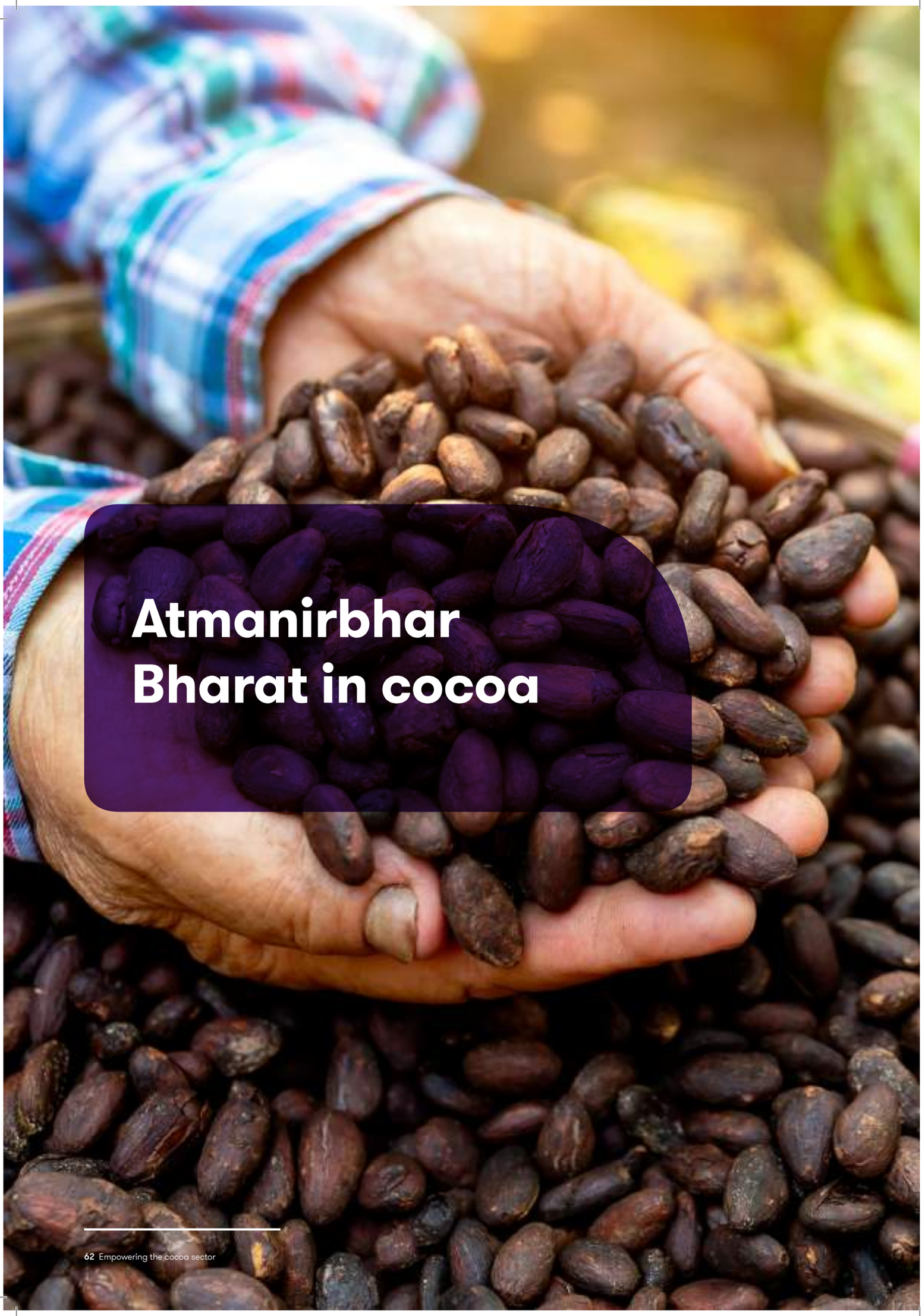
This imbalance contributes to an annual import bill of approximately USD 866 million, undermining the potential of Indian processors and weakening local supply chains. India's high dependency on imports exposes the industry to external risks, including global supply chain disruptions, currency fluctuations, and geopolitical tensions. This over-reliance creates strategic vulnerabilities and undermines the long-term resilience of the sector. India also lacks the systems required to position its cocoa products competitively in global markets. The absence of robust quality standards, traceability mechanisms, and certification frameworks limits access to premium export segments.

With better utilisation of the processing capacity, quality standards, and certification frameworks, India could position its cocoa products competitively in premium export markets, particularly in Asia and the Middle East. These regions are witnessing rising demand for high-quality chocolate and confectionery, offering a significant opportunity for Indian producers to expand their global footprint.

Promoting domestic processing also contributes to environmental sustainability. It reduces the carbon footprint associated with transporting finished goods over long distances and supports sustainable farming practices. Strengthening local value chains in this way enhances both economic and ecological outcomes, making the cocoa sector more inclusive and future ready.

Rationalising the duty structure could unlock meaningful economic value and support inclusive growth in India's agro-processing sector aligning with India's broader policy goals under initiatives like **Atmanirbhar Bharat**.

A more balanced policy would not only reduce import dependencies but also enable Indian cocoa products to meet international benchmarks, opening doors to high-value global markets and strengthening India's presence in the global cocoa value chain.



Atmanirbhar Bharat in cocoa

Rationale

India's cocoa sector stands at a critical inflection point. Domestic demand is expected to rise at a CAGR of 5.5%, with consumption expected to reach 4.67 lakh MT bean by 2040, while India currently meets less than 20% of its total requirement, creating a widening supply–demand gap. This structural shortfall has pushed India into heavy reliance on imports, with annual inflows exceeding USD 866 million (2024). This growing trade deficit presents both a challenge and a strategic opportunity to build a resilient, self-reliant cocoa ecosystem aligned with the Aatmanirbhar Bharat vision.

Vision

To transform India into a globally competitive, self-sufficient cocoa producer by 2035 through integrated policy, institutional innovation, and farmer-centric value chain development.

National mission on cocoa

To realise the vision of Atmanirbhar Bharat in the cocoa sector, the establishment of a **National mission on cocoa encompassing policy reforms, scaling R&D efforts, and simplification of trade measures**, is not just timely, it is essential. Under the policy framework, the mission should focus on increasing subsidies, strengthening post-harvest support, and scaling up planting material infrastructure to empower farmers and improve productivity.

To scale up R&D efforts in the cocoa sector, establishing a dedicated institution like a CoE is imperative. A CoE, driven by collaboration between private companies with global expertise and institutions like ICAR, should facilitate inter-institutional knowledge transfer, promote region-specific research, and enhance farmer training. Trade simplification measures should aim to rationalise tariffs, streamline export procedures, and improve market access, enabling Indian cocoa to compete globally. A dedicated national mission would unify fragmented efforts and create a self-reliant, high-value cocoa ecosystem capable of reducing import dependency and boosting farmer incomes across India.

Strategic pillars

- Enabling growth through policy
- Powering innovation through strategic R&D
- Trade simplification & market access

Policy advocacy

Policy reform is central to driving sustainable growth in India's cocoa sector, empowering farmers with targeted support while creating a conducive environment for industry expansion under the National Mission on Cocoa. To translate policy intent into tangible impact, targeted interventions are needed across planting material infrastructure, financial access, and farmer-centric service delivery. Addressing these foundational gaps will not only improve productivity but also ensure equitable participation across regions.

The following policy mechanisms have been identified as critical enablers to drive sustainable growth in the cocoa sector,ensuring targeted support for farmers, strengthening industry linkages, and calling for coordinated action from stakeholders across government and industry.

- Polyclonal seed garden expansion: Increase seed garden area from 22 ha to 250 ha by 2028 to meet planting material demand.
- Single-window subsidy platform: Consolidate over 10 existing schemes (MIDH, MoFPI, NHB, SFAC, etc.) into a unified digital interface for streamlined access. To streamline access to cocoa-related government schemes, a unified digital Single Window Subsidy System is proposed. This farmer-first platform integrates scheme discovery, application, verification, and disbursement through a seamless interface, leveraging geo-tagged validation and e-RUPI vouchers to ensure transparency, efficiency, and timely support across the cocoa value chain.

Layer	Function	Supported by
Farmer profile	Central registration of farmers with land, crop and cluster details	CDP Suraksha
Scheme display	Auto-matched list of eligible schemes with check boxes for selection	Backend logic and MIS
Unified application	Single digital form submitted for multiple schemes	Single window interface
Verification	Geo-tagged field validation and real time progress tracking	CDP Suraksha (photos/videos)
Benefit delivery	Digital vouchers disbursed post verification	eRUPI
Status tracking	Farmers can track their application and disbursement status via dashboard	Mobile/Common service centers frontend

- **R&D acceleration:** Strengthen CPCRI and KAU's mandate to develop region-specific agronomic models, climate-resilient varieties, and post-harvest innovations. Facilitating structured inter-institutional knowledge transfer is vital to accelerate innovation, harmonise research efforts, and ensure region-specific solutions. Active involvement of private sector players is crucial to bring global expertise, drive innovation, and scale market-ready solutions across India's cocoa ecosystem.
- **Cluster-based development:** Promote cocoa as an intercrop within oil palm, rubber, coconut, and arecanut clusters to leverage shared infrastructure and farmer networks.
- **FPO facilitation and incentivisation:** Support the formation and scaling of cocoa-focused FPOs through capital grants, training, and market linkage support.
- **Subsidy enhancement:** To improve farmer economics and drive wider adoption, cocoa must be strategically aligned with mainstream horticulture and plantation crop programmes.

Phase	Focus area	Critical support points
Year 1–3	Establishment and uptake	• Input subsidies for planting material • Drip irrigation systems • Post-harvest support (to avoid upfront infrastructure cost)
Year 4 onwards	Value addition and supply chain strengthening	• Investment in farm-level processing infrastructure • Support for decentralised fermentation and drying • Strengthening grassroots supply chains

Scaling R&D efforts

Scaling R&D is critical to unlocking the full potential of India's cocoa sector. Strategic investments in innovation can drive breakthroughs in breeding, agronomy, climate resilience, and post-harvest practices, tailored to diverse regional conditions. To achieve this, India must invest in institutional capacity, foster collaboration across public and private stakeholders, and build platforms that translate research into scalable field-level impact. To unlock this potential, R&D efforts should be organised into three strategic focus areas:

Breeding and multilocation trials

Developing high-yielding, climate-resilient cocoa varieties is essential for sustainable growth. This requires:

- Strategic breeding programmes to enhance productivity, disease resistance, and bean quality.
- Multilocation trials across diverse agro-climatic zones to ensure adaptability and performance consistency.
- Establishment of polyclonal seed gardens to produce genetically diverse planting material, reducing vulnerability to pests and diseases while supporting large-scale adoption.
- Deployment of biotechnology tools to fast-track breeding cycles and integrate targeted traits efficiently.
- Development of tolerant varieties suited for dry climates (low rainfall, non-irrigated zones), shade-loving systems (intercropping with rubber), and open cultivation (monocropping).
- Integration of farmer feedback and field-level performance data to refine selection criteria and accelerate adoption.

Good Agricultural Practices (GAP) and Pest and Disease (P&D) trials across new areas

As cocoa expands into non-traditional regions, GAP and P&D management protocols must be localised. Key actions include:

- Conducting field-level trials in emerging cocoa belts such as Karnataka, Tamil Nadu, Odisha, and the Northeast.
- Developing region-specific agronomic packages to optimise inputs, improve yields, and mitigate risks.
- Building farmer awareness and capacity for sustainable intensification through integrated crop management.

Centre of Excellence: Connecting lab to land and GAP training at scale

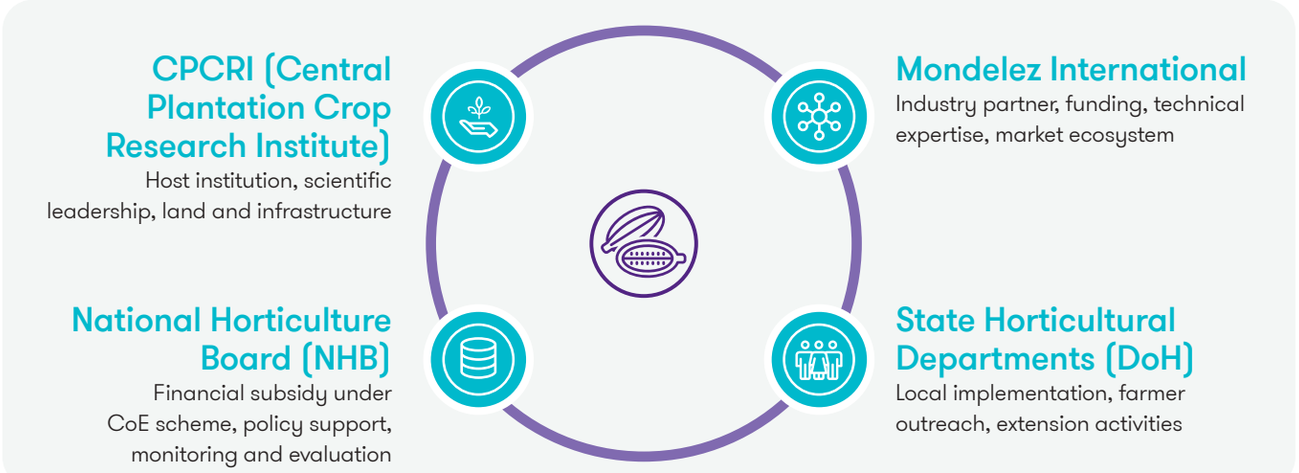
The (CoE) represents a pivotal institutional framework capable of driving strategic R&D, fostering collaboration, and delivering region-specific innovations essential for transforming India's cocoa sector. To accelerate India's transition toward cocoa self-sufficiency, CoE needs to be designed as a decentralised, yet integrated platform anchored in a **hub-and-spoke model.** The central hub, located in a leading cocoa-producing state, will serve as the nucleus for advanced research, elite planting material development, and farmer training (GAP). Surrounding this hub, regional spokes in key cocoa-growing and expansion areas,such as Karnataka, Tamil Nadu, Andhra Pradesh, Odisha, and the Northeast, will deliver localised extension services, distribute planting material, and implement region-specific agronomic packages.

At the heart of the CoE's sustainability strategy is the **establishment of polyclonal seed gardens**, which will produce genetically diverse, climate-resilient cocoa varieties. These gardens not only support large-scale cultivation but also serve as revenue-generating assets through the sale of high-quality seedlings to farmers, cooperatives, and state agencies. This income stream will be reinvested into R&D, training programmes, and certification services, enabling the CoE to operate as a **self-sustaining institution**.

The CoEshall function on a **Public-private partnership (PPP) model,** combining research leadership from CPCRI, financial and policy support from NHB, industry expertise and funding from Mondelez International, and on-ground implementation by State Horticulture Departments. This collaborative framework ensures innovation, farmer outreach, and market linkage, while operating on a self-sustaining model through revenue from seed gardens, training, and certification services.



Private sector participation is key to bringing global expertise, advanced technologies, and market-driven insights into the CoE ecosystem. Equally important is fostering structured **inter-institutional knowledge exchange** to harmonise research efforts, accelerate innovation, and ensure scalable impact across regions. ICAR should play a central role in this effort by coordinating varietal development, agronomic research, and technology dissemination. This will help reduce regional disparities in access to improved cocoa varieties and farming technologies, ensuring uniform progress and inclusive growth across cocoa-producing zones.



By integrating scientific innovation, regional outreach, and financial viability, the CoE will play a pivotal role in reducing India's import dependency, enhancing farmer incomes, and building a globally competitive cocoa network aligned with the vision of Aatmanirbhar Bharat.

Trade simplification

Tariff rationalisation: Review and simplify import duties on cocoa inputs, machinery, and intermediate products to reduce production costs. This will lower barriers for domestic processors, improve cost-efficiency, and encourage investment in value-added manufacturing. A **phased reduction in tariffs on cocoa beans** can promote local processing and reduce dependence on imported cocoa products. This gradual approach will allow industry adaptation while boosting competitiveness in the global cocoa supply chain.

Export enablement: Build robust quality assurance, traceability, and certification systems to elevate Indian cocoa's credibility and competitiveness in premium global markets. This will ensure compliance with international standards, improve buyer confidence, and enable access to high-value export segments. Strengthening these systems will also support sustainable sourcing and enhance India's reputation as a reliable cocoa supplier.

Execution enablers

To unlock the full potential of cocoa as a strategic crop, India must move beyond pilot initiatives and adopt a structured, ecosystem-driven approach. This requires aligning institutional efforts, leveraging technology, and fostering collaboration across stakeholders.



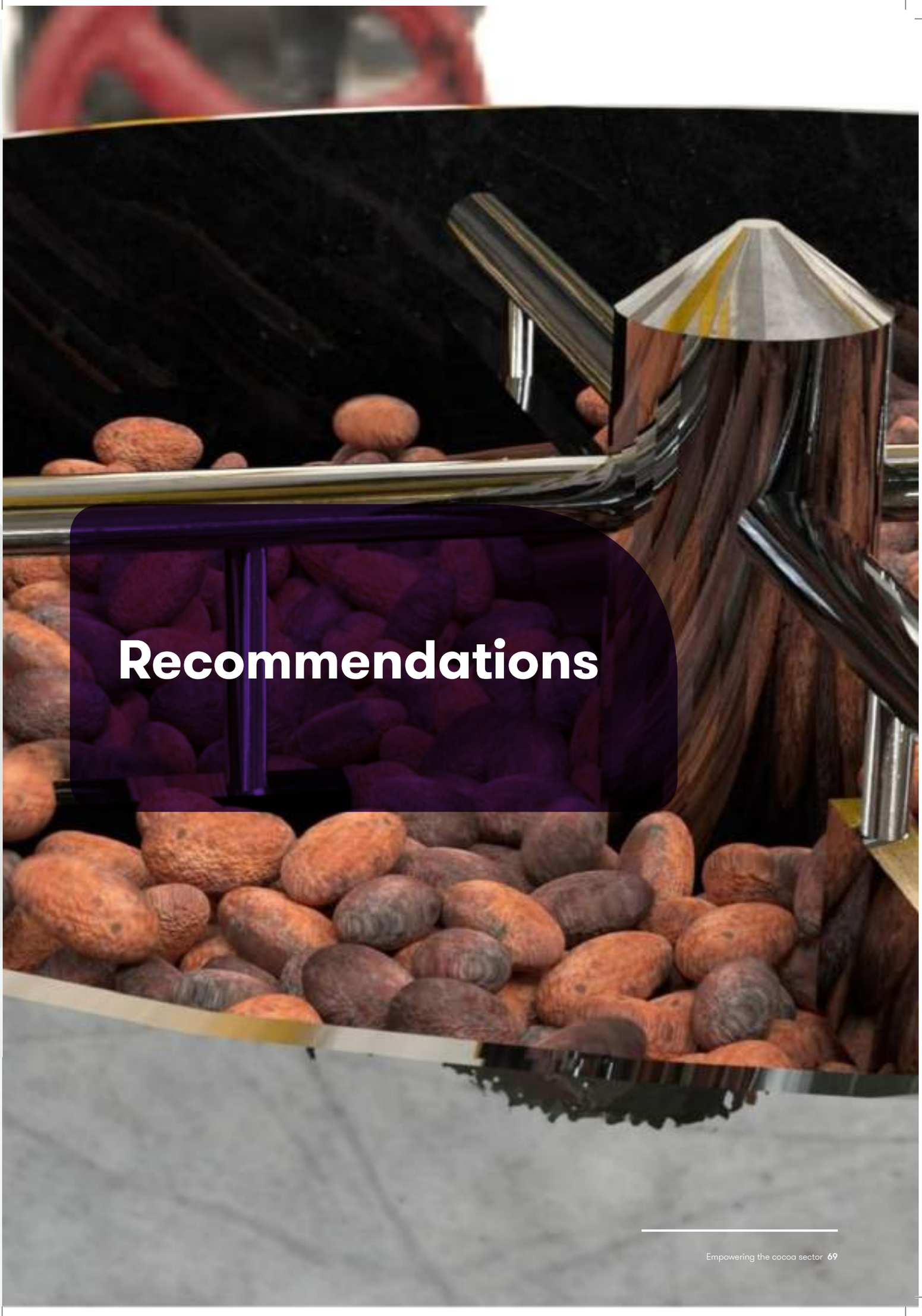
India possesses the agro-climatic diversity, institutional capacity, and a strong farmer base to become self-reliant in cocoa production. With rising domestic demand and growing opportunities in global markets, cocoa stands as a strategic commodity with the potential to drive rural incomes and support industrial growth. Realising this potential requires a coordinated, data-driven, and mission-mode approach, transforming cocoa from a niche intercrop into a strategic commodity under the Aatmanirbhar Bharat framework.

Case Study: Vietnam – advancing cocoa processing through circular economy reforms

Vietnam's cocoa sector, previously limited by low productivity and minimal domestic processing, faced challenges in integrating into global value chains. Farmers relied on traditional cultivation methods, and small processors lacked access to sustainable technologies and market linkages. The absence of value addition and environmental inefficiencies further constrained sectoral growth.

In 2022, Vietnam launched the "Circular Economy Cocoa: From Bean to Bar" initiative. The programme focused on non-tariff interventions to promote domestic processing. Key reforms included reducing fossil energy and water use, phasing out hazardous chemicals, introducing bio-based packaging, and recycling cocoa waste. The initiative also supported MSMEs in adopting resource-efficient practices and integrating into global green supply chains.

These reforms led to increased local processing capacity, improved farmer incomes due to better yields and rising global cocoa prices, and growing interest from international chocolate brands. The success of the initiative was driven by strong government commitment and collaborative efforts across public and private stakeholders. Vietnam's model demonstrates that sustainability-focused reforms, backed by institutional support, can effectively strengthen domestic cocoa ecosystems—offering strategic lessons for India's efforts to boost domestic value addition and global trade integration.



Recommendations

To accelerate India's journey towards cocoa self-sufficiency and reduce import dependency, a comprehensive and integrated strategy is essential. The following priorities focus on expanding cultivation, strengthening research and innovation, building farmer capacity, and fostering a supportive policy environment for sustainable sector growth.

Roadmap towards Atmanirbhar Bharat in cocoa and beyond

2026-28

- Launch of national mission on cocoa and CoE established
- Initiate ~250 Hectares polyclonal seed garden across states

2028-30

- Set up regional CoE hubs
- 1,00,000 farmers trained
- 25 million+ seedlings supply
- Pilot digital farmer registry and traceability

2030-35

- R&D scale up and yield increase Add 1 lakh Ha area of cocoa
- Promotion of cocoa processing
- 50% demand met through domestic production

2035-40

- Self-sufficiency achieved and promotion of India as processing hub
- Programme towards India's cocoa net exporter status
- 100% digital traceability
- Farmer income doubled

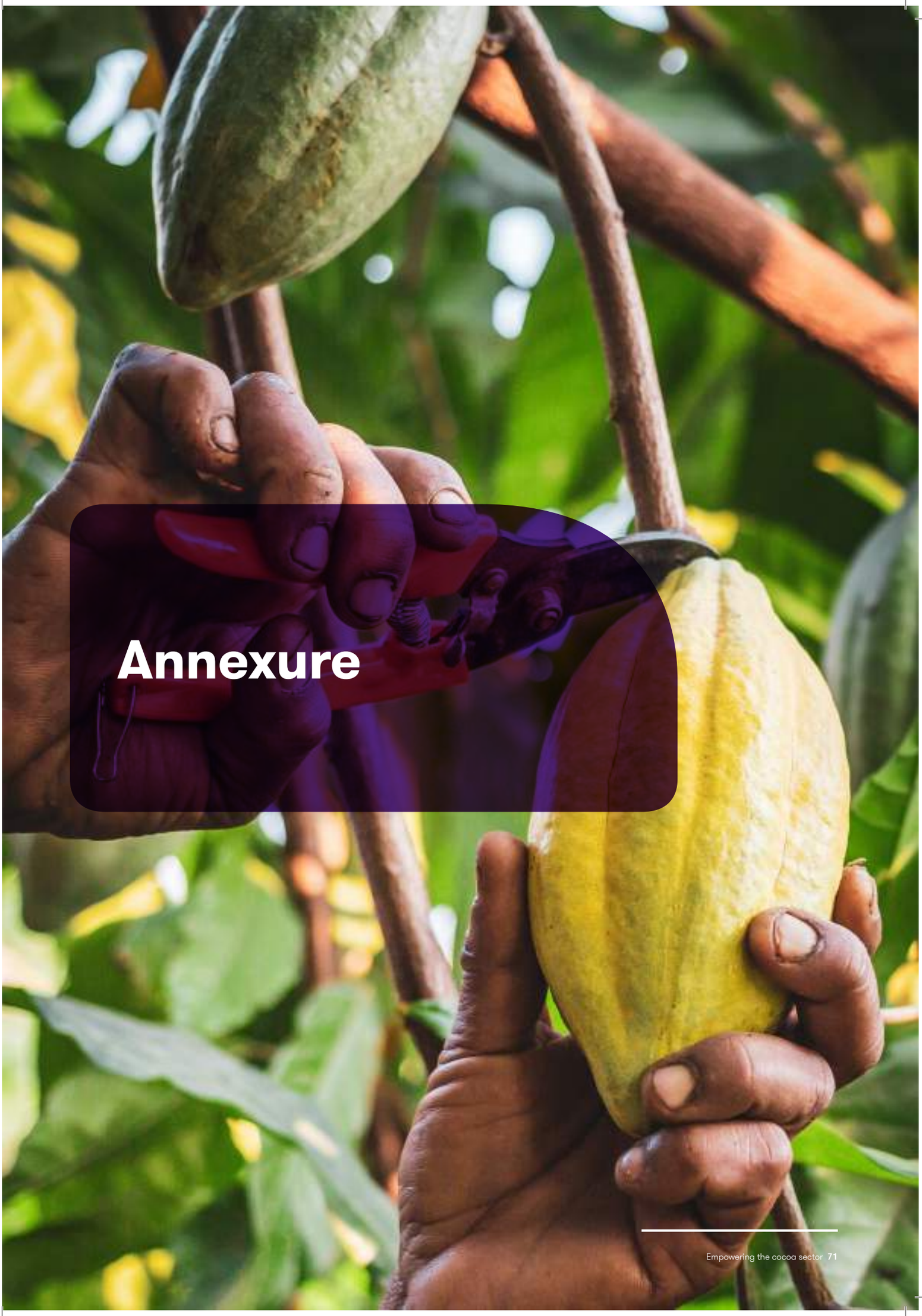
Figure: Roadmap to Atmanirbharta

India's pursuit of cocoa self-sufficiency represents a strategic opportunity to strengthen rural livelihoods, reduce import dependency, and position the nation as a competitive player in the global cocoa market. Achieving this vision will require coordinated action and sustained commitment from all key stakeholders, central and state governments, research institutions, farmer producer organisations, private sector companies, and industry associations. By implementing a **phased roadmap that emphasises scientific research, robust policy support, and farmer empowerment,** India can transform its cocoa sector into a model of sustainable and inclusive growth.

The active involvement of research bodies such as KAU and CPCRI will be crucial for driving innovation and developing region-specific solutions. Government agencies must ensure enabling policies, targeted subsidies, and infrastructure development, while the private sector and FPOs play a vital role in value addition, market access, and capacity building.

With a shared vision and collective effort, India is well positioned to realise the goal of Atmanirbhar Bharat in cocoa, delivering lasting economic, social, and environmental benefits for farmers and the nation.

"India's cocoa sector stands at a turning point. The time to act is now. We urge all stakeholders—government, industry, research institutions, and farmer organisations—to join hands and implement this roadmap with urgency and commitment. By working together, India can become self-reliant in cocoa, double farmer incomes, and emerge as a global leader in sustainable, high-quality cocoa production."



Annexure

Policy, incentives, and institutional gaps

India's cocoa sector is poised for transformation, supported by a robust policy framework under the Government of India's Mission for Integrated Development of Horticulture (MIDH) and the Pradhan Mantri Fasal Bima Yojana (PMFBY). These schemes offer targeted subsidies and infrastructure support across the cocoa value chain, from planting material to processing.

India's cocoa sector benefits from a robust policy framework under central and state schemes aimed at enhancing productivity, sustainability, and farmer welfare. Key initiatives include:

Mission for Integrated Development of Horticulture (MIDH)

Scope: Supports cocoa as a plantation crop through area expansion, rejuvenation, technology adoption, and nursery development

Subsidy highlights

- **Up to 50% subsidy for new gardens (higher in NE/ Himalayan states).**
- **Drip irrigation support under PDMC norms (up to 55% for small/marginal farmers).**
- **Rejuvenation of senile plantations with 40–50% subsidy.**
- **Technology interventions like fertigation automation and fencing (30–50% subsidy).**
- **Nursery development: 40-100% subsidy depending on sector and region.**

Pradhan Mantri Fasal Bima Yojana (PMFBY)

Offers crop insurance for cocoa against natural calamities and pest and/or disease outbreaks with a capped premium of 5%.

Directorate of Cashew and Cocoa Development (DCCD)

- Provides INR 20,000 per ha for new plantations and replanting in phased disbursements.
- Organises awareness events like Cocoa Melas and national conferences with 100% funding.

State-level initiatives

- Andhra Pradesh: Strong support for intercropping with oil palm, infrastructure (e.g., water resources, processing units), and FPO promotion.
- Kerala: Subsidies routed through Krishi Bhavans under MIDH norms, especially in the Idukki district.

Other schemes

- MOVCD-NER: Promotes organic cocoa in Northeast states with support for FPOs, certification, and infrastructure.
- NHB Cluster Development Programmeme: Offers up to INR 100 crore in support for integrated horticulture clusters.
- MoFPI Schemes: Provide up to INR 10 crore for agro-processing clusters and INR 5 crore per unit under CEFPPC.

Farmer level subsidy calculation details

Component	General states		North-east	
	Intercropping	Monocropping	Intercropping	Monocropping
Area expansion	40,000	60,000	50,000	75,000
Drip irrigation	50,625	72,797	50,625	72,797
Fertigation automation	200,000	200,000	230,000	230,000
Canopy management (Fencing)	150,000	150,000	172,500	172,500
Vermibed (10 HDPE Beds considered for 2 Hectare)	32,000	32,000	32,000	32,000
Adoption and Certification of GAP	20,000	20,000	20,000	20,000
Mulching	40,000	40,000	46,000	46,000
Power weeder (Engine operated 2 BHP and below 5 BHP)	40,000	40,000	40,000	40,000
Post hole digger	40,000	40,000	40,000	40,000
Battery operated sprayer	1,000	1,000	1,000	1,000
Brush cutter (Electric/Engine powered)	25,000	25,000	25,000	25,000
Promotion of IPM/INM	3,000	3,000	3,000	3,000
Total per farmer (Over the assumed project life cycle of 15 years)	**6,41,625**	**6,83,797**	**7,10,125**	**7,57,297**
Total per farmer per year	**42,775**	**45,586**	**47,342**	**50,486**

Tentative*

The calculations in the table are based on farmer-level assistance, assuming two hectares of land per farmer and cocoa cultivation over an estimated project life cycle of fifteen years. Cost norms and subsidy patterns have been applied as per prevailing guidelines under the Mission for Integrated Development of Horticulture, the Sub Mission on Agricultural Mechanisation, and the Per Drop More Crop programme, with variations across intercropping and monocropping systems and between general and Northeastern states. Per-farmer annual values have been derived by annualising total assistance over the project life cycle.

14. Department of Agriculture and Farmers Welfare

Average incremental spport for a farmer associated with FPO/FPCs

Specific activity	General states		North-east	
500 farmers per FPO assumed	Intercropping	Monocropping	Intercropping	Monocropping
Large nursery (1-2 Hectares)	28,00,000	28,00,000	28,00,000	28,00,000
Water harvesting structure	18,00,000	18,00,000	22,50,000	22,50,000
Plant health clinic	12,50,000	12,50,000	12,50,000	12,50,000
Setting up of functional infrastructure for collection, aggregation and grading unit	-	-	11,25,000	11,25,000
Creation/Expansion of food processing and preservation capacities	5,00,00,000	5,00,00,000	5,00,00,000	5,00,00,000
Vermi-compost permanent structure (50 Units for 1 FPO)	25,00,000	25,00,000	25,00,000	25,00,000
Cluster development and Formation/ Maintenance of FPOs/FPCs (MOVCD-NER)	-	-	20,37,500	20,37,500
Management grant	18,00,000	18,00,000	18,00,000	18,00,000
SFAC equity grant	10,00,000	10,00,000	10,00,000	10,00,000
Quality control/Analysis lab	1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000
Farm machinery banks	24,00,000	24,00,000	28,50,000	28,50,000
Solar dryers	7,00,000	7,00,000	9,62,500	9,62,500
Custom hiring centres	1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000
Total (For FPO for 15 Years)	8,42,50,000	8,42,50,000	8,85,75,000	8,85,75,000
Total (Per year per FPO)	**56,16,667**	**56,16,667**	**59,05,000**	**59,05,000**
Total (Per year per farmer)	**11,233**	**11,233**	**11,810**	**11,810**

Tentative*

The assessment of financial assistance has been calculated based on prevailing unit cost norms and subsidy guidelines prescribed for each component under relevant central government schemes, including the Mission for Integrated Development of Horticulture, the Sub-mission on Agricultural Mechanisation, the Mission Organic Value Chain Development for North-eastern Region, and support mechanisms of the Small Farmers' Agri Business Consortium. Estimates assume a standard farmer producer organisation size of 500 farmer members, with costs aggregated accordingly across production, mechanisation, post harvest, processing, quality, and institutional strengthening interventions. Assistance levels reflect scheme specific eligibility conditions, differentiated support across geographies where applicable, and convergence of norms across schemes to present a realistic and implementable financial framework.

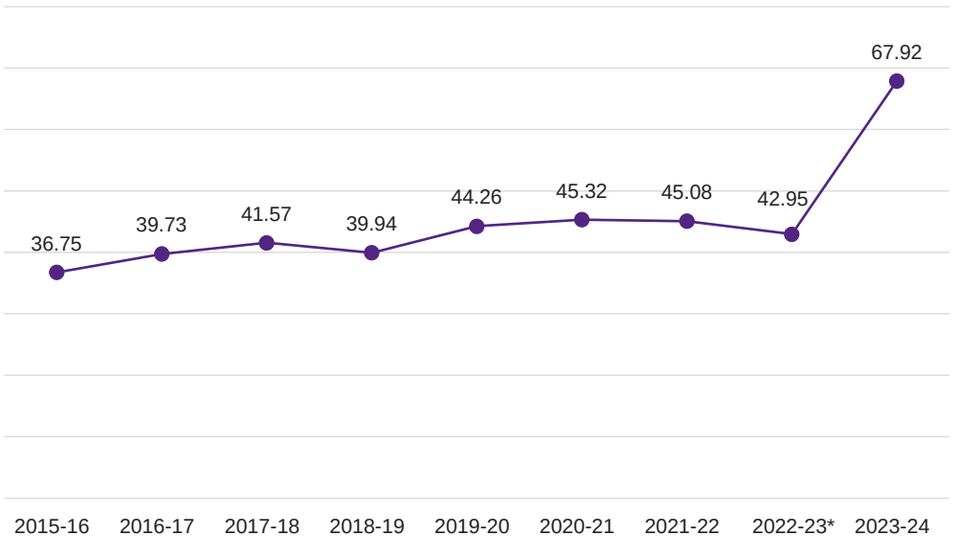
Success stories

We have identified a few success stories that demonstrate how targeted policy interventions, financial support, and shared infrastructure have created value and efficiency in sectors previously constrained by high import dependency: National Mission on Edible Oils – Oil Palms[14]

The **National Mission on Edible Oils – Oil Palm (NMEO-OP)** was **launched in 2021** by the Government of India due to the country's growing dependence on edible oil imports and the underutilisation of its domestic production capacity. The **strategy for implementing NMEO-OP** involves **enhancing domestic seedling** availability by establishing seed gardens and nurseries and **improving the productivity of fresh fruit bunches (FFBs).**

- A potential area of **28 lakh hectares** across 284 districts in 20 states, primarily in the **southern and northeastern regions**, has been identified for implementation.
- Farmers received **financial assistance** for purchasing planting material and 100% central funding for the **establishment of seed gardens and nurseries** ensured healthy seedling growth.
- **Support for intercrop inputs** during the gestation period further **enhanced soil health** and plantation maintenance through fertilisers and irrigation.

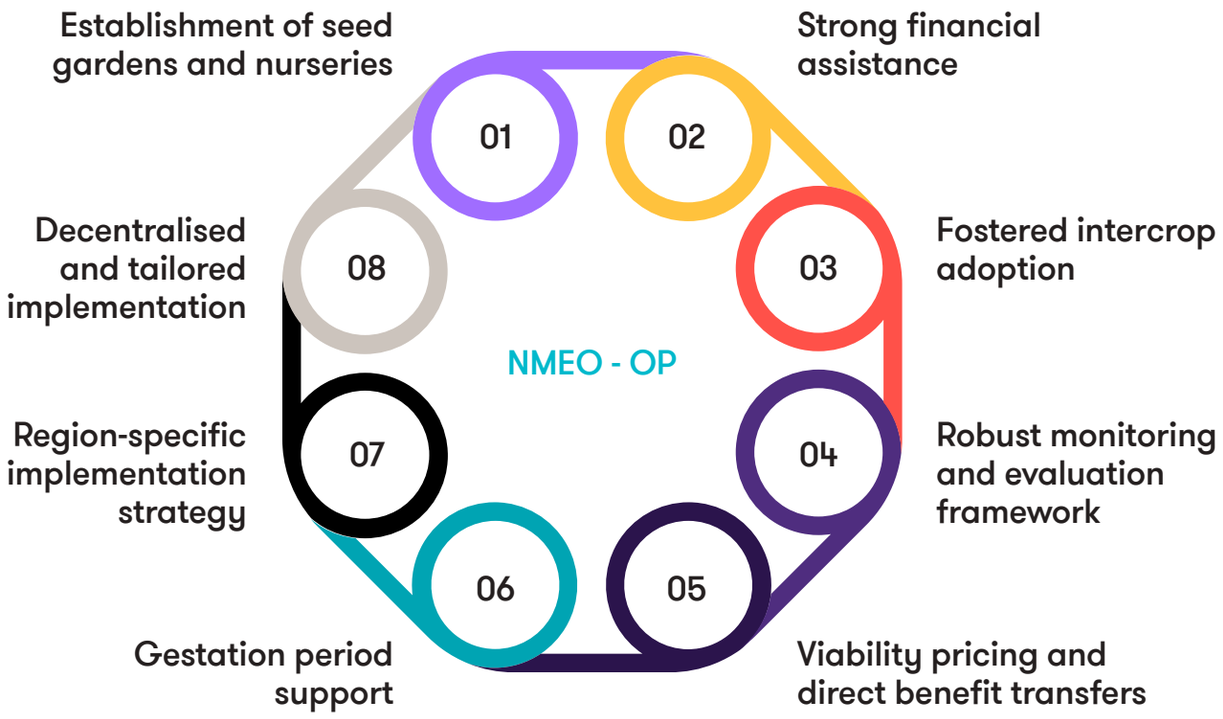
% Self Sufficiency in the production of edible oils



Key drivers behind the success of NMEO - OP

NMEO-OP is anchored in a strategic framework aimed at fostering sustainable and inclusive growth of the oil palm sector in India. Core drivers of the mission include **comprehensive financial assistance** and **gestation period support**, which alleviate initial investment pressures and encourage long-term farmer participation.

The mission ensures **viability pricing** and **direct benefit transfers**, promoting transparency and equitable returns. It also advocates for **intercrop adoption** to generate interim income during non-productive phases. A **robust monitoring and evaluation system** underpins accountability and performance tracking, while **region-specific strategies** and **decentralised, tailored implementation models** enable context-sensitive interventions. Furthermore, the **establishment of seed gardens and nurseries** ensures consistent access to high-quality planting material, reinforcing the mission's commitment to long-term productivity and resilience.



To boost cocoa cultivation, a decentralised policy should begin by identifying strategic cocoa-growing regions, offering financial incentives for plantation and upkeep, and implementing risk mitigation tools like viability pricing to encourage farmer participation.

Spice Board of India

India, often hailed as the **"Spice Basket of the World,"** produces 75 out of the 109 spices recognised by the International Standards Organisation (ISO), thanks to its diverse agro-climatic zones. As one of the world's largest producers, consumers, and exporters of spices, India's spice industry is poised for rapid expansion, with the market projected to grow at a CAGR of 10.56% by 2033.

The Spices Board of India plays a pivotal role in elevating the global stature of Indian spices. Through targeted initiatives, the Board has helped boost spice export volumes by approximately 40% between 2018-19 and 2023-24. Its vision is to position India as a global hub for spice processing and a leading supplier of clean, value-added spices and herbs across industrial, retail, and food service segments.



Source: Annual Report, Spice Board, 2019-24

Spice Park

A key initiative is the development of Spices Parks, which offer shared infrastructure for drying, cleaning, grading, grinding, sterilisation, packing, and warehousing. Under a DBFOT (Design, Build, Finance, Operate, Transfer) public-private partnership model, the Board **provides up to INR 400 lakhs as a grant, covering 20% of project costs**. These parks empower growers to sell directly to exporters, ensuring premium prices, while enabling exporters to build reliable supply chains with farm-fresh produce. This model fosters inclusive growth, sustainability, and global competitiveness.

01 Educative services

Training programmemes on Good Agricultural Practices (GAP), post-harvest operations, advanced processing practices etc.

02 Better pricing

By shortening the channels in the supply chain system.

03 Facilitate traceability

Through centralised processing and warehousing.

The Spices Board's integrated approach to sectoral development offers valuable lessons for emerging crops like cocoa. The establishment of shared infrastructure through Spice Parks, covering drying, grading, processing, and warehousing, under a DBFOT public-private partnership model, demonstrates how centralised facilities can enhance value addition and market access. Providing capital grants and enabling direct linkages between growers and exporters ensures better price realisation and supply chain reliability. Adopting a similar model for cocoa could foster inclusive growth, improve post-harvest quality, and position India as a competitive player in the global value-added cocoa market.

About FICCI

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