Growing India's agricultural exports through crop-specific, state-led plans

Submission to the XV Finance Commission

July 2020

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Preface

CONSTITUTION OF THE HIGH-LEVEL EXPERT GROUP AND TERMS OF REFERENCE

The XV Finance Commission has been constituted by the President vide notification no. S.O. 3755(E) dated 27 November 2017 **(copy enclosed)**. A copy of Terms of Reference (ToR) dated 29 November 2019 of the XV Finance Commission (FC-XV) is also enclosed below in **Exhibit 1**. The Commission has decided to constitute a High-Level Expert Group (HLEG) on Agriculture Exports in pursuance of its ToR (para 7), i.e., to recommend measurable performance incentives for States to encourage agri exports as well as to promote crops to enable high import substitution. The composition of the group is given below:

- Shri Sanjiv Puri, Chairman and Managing Director, ITC – **Chairman**
- Ms. Radha Singh, Former Agriculture Secretary – **Member**
- Shri Manoj Joshi, Representative of Ministry of Food Processing Industries – **Member**
- Shri Diwakar Nath Misra, Chairman, and Shri Paban Kumar Borthakur, Former Chairman, Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce and Industry – **Member**
- Shri Suresh Narayanan, CMD, Nestle India – **Member**
- Shri Jai Shroff, CEO, UPL Limited – **Member**
- Shri Sanjay Sacheti, Country Head India, Olam Agro India Ltd – **Member**
- Dr. Sachin Chaturvedi, Director General, Research and Information System for Developing Countries (RIS) – **Member**

The Committee is free to seek assistance of any other institution or entity as considered appropriate for completion of the work. It is requested that the Committee may submit its recommendations within 3 months for the further consideration of the Commission.

The Terms of Reference of the Group is shown in **Exhibit 1**.

This issues with the approval of the Competent Authority.

EXHIBIT 1

High Level Expert Group Terms of Reference to recommend measurable performance incentives for States to encourage agri exports as well as to promote crops for import substitution

1. To assess export & import substitution opportunities for Indian agricultural products (commodities, semi-processed, and processed) in the changing international trade scenario and suggest ways to step up exports sustainably and reduce import dependence

2. To recommend strategies and measures to increase farm productivity, enable higher value addition, ensure waste reduction, strengthen logistics infrastructure etc. related to Indian agriculture, to improve the sector's global competitiveness

3. To identify the impediments for private sector investments along the agricultural value chain and suggest policy measures and reforms that would help attract the required investments

4. To suggest appropriate performance-based incentives to the state governments for the period 2021-22 to 2025-26, to accelerate reforms in the agriculture sector as well as implement other policy measures in this regard

Source: High Level Expert Group Terms of reference from the 15th Finance Commission

Acknowledgement

The HLEG would like to thank the XV Finance Commission, for the privilege and opportunity to shape the narrative on a topic so critical to India's growth and wellbeing. We would like to thank Mr. N. K. Singh and Prof. Ramesh Chand for their insights and guidance. The recommendations could not have been crafted without the overwhelming support from several stakeholders across the Agriculture spectrum who generously gave their time and knowledge. We will hardly do justice to the hundreds of individuals, named in the annexure, who include leaders from the central and state governments, commodity boards, private sector across the value chain, agriculture research institutes and farmer collectives. We are very grateful to each one of them, who challenged, informed and shaped our thinking deeply. We would like to particularly thank Mr. Sanjay Agarwal, Agriculture Secretary, Ministry of Agriculture and his team for their contributions. Dr. Ravi Kota and the officers of the Finance Commission have enabled us with their logistics and coordination support.

We are thankful to McKinsey & Company for their inputs based on research and fact-based analysis, in particular Alex Bolano, Dwijo Goswami, Nitika Nathani, Avinash Goyal, Rajat Gupta and Namrata Dubashi. This report was made possible through the unstinted efforts of teams at ITC Ltd, in particular Nitin Sethi, Aswathaman Vijayan, Simanta Ghosh under the leadership of Mr. S Sivakumar and Mr. Sanjiv Rangrass and Nitin Gupta, Chandrasekar S at Olam India, whose tireless attention to detail has elevated the quality and depth of thinking. We hope this report reflects a measure of the energy and aspirations we encountered every step of the way.

Executive summary

India's stated aspiration of doubling farmer income by 2022-23 requires a commensurate increase in the output of the agriculture sector. This increase in output would necessitate a comprehensive transformation encompassing an increase in farm productivity, yield, crop intensity, share of high-value crops and realisation per acre, while ensuring suitable measures for climate resilience and conserving water. However, the resultant increase in production would only serve to increase pricing pressure and lower farmer remuneration in a balanced, self-sufficient agriculture market. It is in this context that the aspiration to increase agriculture exports from USD 40 bn to USD 100 bn becomes a national imperative.

India is fortunate to possess strong endowments in agriculture – India is the second highest agriculture producer in the world with gross agriculture production of USD 539 bn in 2018 and has the largest arable land of 156 mn hectares. India leads production worldwide in several commodities, including shrimps, spices, fruits such as mango, papaya, bananas, is the second largest producer of rice and has the largest population of buffaloes. India's agriculture exports at USD 38.7 bn in 2019, a mere 7% of India's production, have stagnated over the last 5 years, with processing having only ~15% share. Despite a strong starting position, India with a market share of 2.5%, ranks 13th globally, lagging several countries such as the Netherlands, Belgium and Italy, not just in exports but also in export realisation. At the same time, global population is growing with an expected ~2 bn additional people by 2050, which will greatly increase food demand. Therefore, a combination of growing global demand and India's strong endowments points to an opportunity for expanding both commodity and value-added exports.

Further, studying the global food and agriculture trends reveals three primary shifts that provide tailwinds to India's proposition – spiking consumer demand for health and wellness, renewed focus on food security with countries looking for new food bowls and changing regulatory geopolitical equations that could alter existing country sourcing strategy. The unfolding COVID-19 global pandemic has intensified concerns around national food security and wellness and therefore, heightened the impact of these trends. However, with the pandemic still evolving and multiple forces at work, the exact nature of impact is uncertain.

The Department of Commerce published the Agriculture Export Policy in December 2018 to create a 'paradigm shift from residual export after meeting domestic demand to targeted export according to the preferences of overseas market'. The policy identifies potential export crops and recommends a cluster focus. It outlines measures for infrastructure, brand India marketing, R&D and others. To realise this vision, the state governments must play a vital role in strengthening the competitiveness of agriculture, as also in attracting the private sector that has the capacity to build demand-driven value chains and value-added exports.

In this backdrop, the XV Finance Commission constituted a HLEG on Agriculture Exports through state incentivisation with the following 4 objectives: (i) assess export and import substitution opportunities for Indian agricultural products, (ii) recommend strategies and measures to improve farm productivity and sector's overall global competitiveness, (iii) identify impediments for private sector investments and (iv) suggest appropriate performance-based incentives to state governments.

In developing its recommendations, the HLEG has adopted a rigorous and fact-based approach, informed by multiple sources of insight including (i) data on trade flows, demand and competitiveness by value chains, (ii) detailed deep dives into 7 value chains, (iii) expert consultations with industry, farmers, think tanks, state and central governments and commodity boards and (iv) successful case examples of agriculture transformations such as the Vietnam's focused cluster approach, Morocco's province-led plans, Mahagrapes cluster and Chilli PPP in Andhra Pradesh.

Vietnam's success in agriculture is attributed to its relentless focus on 5 value chains of rice, cashew, coffee, fish and pepper, developed as geographic clusters that are globally competitive. Additionally, Vietnam attracted foreign direct investment and private sector participation through investment incentives and creating an environment where ease of doing business was extremely high (e.g., strong infrastructure, simplified regulatory procedures and ease of exports). These competitive value chains were in turn complemented by the subsequently negotiated FTAs with target markets such as the China-ASEAN FTA. As a result, it has increased its agricultural GDP by 4 times: from USD 10 bn in 1990 to USD 36 bn in 2018 and is the world's second largest producer of coffee, the largest producer of tilapia and the largest exporter of cashews.

Within India, Mahagrapes, formed in 1991, represents a public-private partnership (PPP), owned and governed by cooperatives (Maharashtra State Grape Growers' Association) set up with considerable public support. Mahagrapes provided common facilities for pre-cooling, cooling and storage of grapes, and reduced the cost of market linkage for all members of the cooperative. This demonstrated that solving for a single crop value chain in a geographic location can reduce transaction costs, improve quality and thereby increase farmer income. From 2003 to 2018, India's grape production grew from 1,473 metric tonnes to 2,920 metric tonnes and the total value of its grape exports swelled from USD 13 mn to USD 249 mn, with Maharashtra dominating this sector.

Morocco transformed its agriculture sector over the last decade through the Green Morocco transformation aimed at increasing value addition and smallholder farmer income. In a bid to improve revenue realisation, the government prioritised value chains such as olives, tomatoes, citrus fruits, almonds and figs and converted land dedicated to cereals to these high-value crops. Each of its 16 regions developed comprehensive province-led crop value chain plans that were then transformed into 700+ projects, each funded, tracked and monitored to completion. Provinces selected the most impactful projects that converged all existing schemes, attracted private sector investment and the gap funded from a central Agriculture Development Fund. The Green Morocco project had a W-shaped governance model that enabled enough top-down central direction coupled and bottom-up province-led detailed planning. The scheme has helped Morocco increase agriculture production by 30% and improve the livelihoods of smallholder farmers, while attracting private sector investment of approximately USD 12 bn. Its exports also received a boost and grew from USD 3.7 bn to USD 6.2 bn in this time frame.

For Chilli in AP, in 2016/17 a leading consumer goods company, the Horticulture Department, and the Government of Andhra Pradesh created a public private partnership (PPP) to jointly develop the chili value chain by disseminating best agriculture practices and provide advice in order to improve chilli crop productivity, quality, sustainability and better price realisation to ensure better farmer income on a sustainable basis. The programme resulted in an increase in farm productivity by 13% and additional realisation for the farmer to the extent of INR 23,000 per acre. In 2019-20, the MoU was extended to develop the chilli farm value chain to cover 1 lakh acres by year 5. The government will provide 65% of the project funding, with the rest funded by the private partner. The PPP programme converges existing State and Central schemes, including the Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana and Andhra Pradesh Micro irrigation Project. This illustrates how the state

can leverage private sector anchors and converge its resources to strengthen competitiveness in a prioritised crop value chain.

In addition to these 4 examples of success, the HLEG also studied case examples of projects that were unable to achieve the original aspirations, to discern clearly those factors that created the highest odds of success.

Based on these, 4 themes emerged that underpin the HLEG recommendations: (i) Focus resources and capital on demand hotspots, identified as a set of 22 crop value chains and target markets with prioritised 7 lighthouse crop value chains that are must-win for India, (ii) Solve for a crop value chain holistically, in an end-to-end manner from inputs, logistics, infrastructure and processing to markets with an aim to improve farm productivity, regulatory compliance, enhance cost efficiency, boost competitiveness and negotiate favourable trade terms with identified importing nations, addressed through a crop value chain cluster approach, (iii) Converge resources and schemes under the primary actor, in this case the state, that will orchestrate across all stakeholders, addressed by state-led export plans, anchored by the private sector players and enabled by the centre, including funding from the Finance Commission and (iv) Incentivise value chain stakeholders appropriately, enabled by governance at the state and centre that ensures the projects are financially viable and are executed well.

These themes, by themselves, are not new. For example, clusters exist today in fruits and vegetables under the national horticulture plan. PPP models have been implemented in the past. State-led plans are being developed under the Agriculture Export Policy, 2018. The HLEG recommendations aim to tie all these principles together in a single, cohesive approach that is demand-responsive, has an end-to-end perspective for a value chain, is state-led, converges resources/capabilities and is funded adequately. The intention is to convert islands of success into impact at scale.

The 4 themes outlined above form the crux of the HLEG recommendations and the remaining report is therefore, structured into 4 sections of crop value chains in focus, deep dives into value chain clusters, state-led plans and the institutional framework for implementation. These chapters aim to address the specific items in the ToR; ToR (i) is addressed by crop value chains in focus; ToR (ii) is addressed by deep dives into value chain clusters; ToR (iii) is addressed across 2 chapters, deep dives in value chain clusters and state-led plans and ToR (iv) is addressed by the chapter on the institutional framework.

FOCUSED CROP VALUE CHAINS

The HLEG employed a rigorous methodology to select value chains that were potentially competitive, currently exported in significant quantity, underpinned by global tailwinds and increasing global demand. This represents a critical step in the identification of demand hotspots that will drive crop selection vis-à-vis the traditional production surplus approach to exports.

The HLEG filtered over 100 commodities (340 tariff lines) and agricultural processed goods and arrived at a list of condensed 22 (100 tariff lines) crop value chains using these criteria, 20 of them driven by exports potential and 2 of them by import substitution. These 20 crop value chains have the potential to double, taking overall exports from USD 40 bn today to USD 70 bn in a few years of implementation, with an increase in share of processed and other forms of value added from the current 15% to as much as 40%. For these selected value chains, the top 20 growth markets were identified. The US and the EU present significant opportunity. The HLEG believes that focus is critical, has built a methodology for prioritisation of these crop value chains and recommends a phased approach for implementation for these 22 crop value chains.

Of these 22 selected for the initial phase, 7 crop value chains (rice, shrimp, spices, buffalo, fruits and vegetables for exports, and vegetable oils and wood for import substitution) were selected as lighthouses. These 7 lighthouses are “must win” value chains for India that represent the country’s diverse crop portfolio. The HLEG hopes that success in these lighthouse crops, will set an example for the rest. Many of these have momentum and the HLEG proposes building on this momentum to strengthen them.

Stakeholder consultations also revealed export potential in Medicinal Aromatic Plant Extracts (MAPE) and organics crops, fuelled by favourable health and wellness trends globally. Backed by India’s endowments in wellness, traditional medicine and healing systems, these nascent categories today represent a long-term opportunity for India to dominate. While MAPE will require pilots to develop the proposition and establish proof of success, before investing in scale-up, organic product opportunities are prevalent across value chains.

Any assessment of demand for India’s export strategy at this time will also have to factor in the long-term effects of COVID-19 at a global level. This is already leading to food system disruptions in the short term manifesting as food shortages and oversupply in different areas, consequent price fluctuations and uncertainty in planting decisions. As India copes with this situation, this might also offer unique opportunities for India. Some of these include: (i) reduced demand for a commodity causes spillover/ substitution effects in others resulting in food supply imbalances, (ii) countries with heavy dependence on food imports look to secure supplies in long-term contracts, (iii) the need for import substitution in India in a bid to become more self-reliant given supply chain disruptions and the need to become competitive, and (iv) demand for MAPE, organics and agricultural products governed by sustainable farming practices receive a boost. The actual impact will vary across commodities, products and markets and it is too early to say which way the demand patterns will settle across the crop value chains.

UNLOCKING GROWTH IN CROP VALUE CHAIN CLUSTERS

India is expected to succeed in these prioritised crop value chains by increasing global competitiveness, embedding sustainability, ensuring quality needs of the destination markets are met and therefore, creating a distinct position. Interventions for improving cost competitiveness and quality are needed at several points along the crop’s value chain, right from inputs, logistics, infrastructure to processing and other forms of value addition to the products. In addition, regulatory reform will also be required. Any weak link in the chain could lead to the entire value chain effort failing. For example, even if the issues pertaining to market linkages are solved, not having the right quality of inputs and appropriate crop management practices will result in downstream SPS rejections.

Examples of Vietnam and Mahagrapes point to the effectiveness of a value chain cluster approach. This is an approach where all the actions needed to make a single crop value chain competitive within a state are addressed. Such a value chain cluster is also supported by a comprehensive ecosystem of producers, FPOs, agribusinesses, financiers, corporates, commodity boards, state and central governments and agencies, and complemented by country-level interventions in destination markets. Past learnings indicate the sequence is important and an established path to cluster competitiveness is a prerequisite to trade agreements and mutual concessions with destination markets.

This approach solves for building competitiveness in the crop value chain. Making the cluster itself economically viable and boosting the farmer’s year-round income may require supplementing the primary crop of the value chain cluster with one or two additional crops in some clusters. Several elements of the infrastructure created for a value chain in the cluster can be shared across other value chains to amortise costs, especially for crops spanning across different seasons in the same year. This

has been successfully demonstrated by Baareh Mahine Hariyali, an ITC e-choupal initiative, that has combined multiple initiatives of cropping intensity (wheat, rice and summer moong), productivity enhancement and market linkages. It has been implemented by two lakh farmers who have seen an overall 30-75% increase in their annual incomes, with 35,000 farmers doubling their income in the very first year.

The crop value chain cluster serves to build “vertical” relationships, along the crop value chain, among input suppliers, processors, exporters and buyers. It also builds “horizontal” relationships, at every link, between producers and facilitating organisations such as technology providers, trainers and research institutes. These stakeholders come together along the entire value chain to reduce transaction costs, minimise the cost of doing business including regulatory compliance and factor costs of production, improve quality across production, processing, logistics, establish market linkages, thus benefitting farmers and agri-businesses alike. The cluster would also serve to converge the governments spends and schemes in terms of (i) building the necessary infrastructure at competitive costs, (ii) strengthening farmer capacity, (iii) promoting research and development and (iv) promoting “Brand India” in global markets.

In this context, Farmer Producer Organisations (FPOs) could serve as the link with individual farmers, especially the small and marginal. These organisations can engage in a wide range of activities such as bulk procurement of inputs, aggregation of produce, value addition and marketing in the value chain cluster. Alternatively, new digital models could tap into a network of village entrepreneurs, supported by schemes such as the Pradhan Mantri Mudra Yojna (PMMY). Each of these crop value chain clusters in every state should be duly anchored by one or more anchor private sector players to provide the transformative impetus required. It is also conceivable that production, processing and export legs of a value chain are spread across multiple states for reasons of economic scales. Anchor private sector players and commodity boards will provide the necessary linkages in such cases.

Farmer consultations conducted across 46 crops highlighted challenges from their vantage point across the crop value chain, starting with the need for clear demand-backed input on crop selection, all the way through to production, post-harvest practices and financing. Inputs from these consultations, as well as those with the specific commodity boards and private sector players have been factored into the design of the value chain cluster.

In order to inform our perspective on what it will take to unlock agriculture export growth in these value chains, the HLEG conducted a deeper analysis of 7 lighthouse value chains (shrimp, chilli, mango, rice, buffalo meat, wood and vegetable oil). This analysis identified pain points specific to each crop, along the value chain, to surface solutions and therefore, a portfolio of initiatives. We illustrate the approach and the insights that emerged by detailing one value chain (shrimps) in this executive summary.

India is the world’s largest exporter of shrimps and its lowest cost producer. Given growing global demand, shrimp represents significant total export potential of almost USD 10 bn, relative to current exports of USD 4.5 bn. The in-depth analysis surfaced 5 primary pain points.

The first one is promotion and branding – for example, Indian shrimp export associations barely register a presence in the target markets of US, EU and Japan and hence do not communicate anything distinctive about Indian shrimp. Ecuador on the other hand, has built a strong brand for its shrimp industry anchored on sustainable farming.

The second is productivity – for example, Indian shrimp productivity is significantly hampered by low stocking density and varying water quality. Further, shortage of cold storage infrastructure leads to shrimps losing freshness, especially during monsoons, leading to wastage of up to 30%.

The third is quality – Indian shrimps have high number of SPS issues and this stems from hatcheries and the inconsistent quality of seeds. Such quality issues have led to stringent quality testing protocols imposed by markets like EU.

The fourth is processing and value addition – Indian shrimps are largely exported in raw bulk form and this is associated with lack of investment in processing and limited understanding of customer demand, i.e., ready-to-cook and ready-to-eat shrimp exports.

The fifth is unfavourable trade conditions, both tariff and non-tariff, that render Indian shrimps uncompetitive in the destination markets. For example, unusually high duties in certain target markets make it more cost effective to route exports via Vietnam. In another instance, trade was constrained by EU's decision to test 50% of Indian shrimps for antibiotics due to repeated violations and increasing rejections. Trade is often constrained by impractical MRLs set by certain destination markets (e.g., tricyclazole limits for rice in EU[1]).

The HLEG suggests that each of these pain points be converted into specific supply and demand side initiatives, addressed by a relevant stakeholder. 6 specific solutions emerge that will more than double shrimp exports from the current USD 4.5 bn.

The first is building a brand for Indian shrimps in the target markets, maybe along the theme of sustainable agriculture or taste. Demand generation measures inspired by examples of Global Aquaculture Alliance developing international standards called the Best Aquaculture Standards to increase consumer trust, AGEXPORT investing in aquaculture biosecurity and genetic selection measure, and the American Shrimp Processors Association promoting health benefits and nutritional quality of shrimp through a media marketing campaign, will build a premium image for Indian shrimps. The efforts on branding should build on existing institutions and ongoing branding efforts, with clear accountability from a single stakeholder such as MPEDA, supported by the anchor private sector players.

The second is to enhance shrimp farm productivity through an increase in stocking density using technology investments such as pumping 2-5% water exchange, continuous aeration and increase number of harvests by utilising recirculating aquaculture systems and shortening harvest cycles. This support and know-how could be provided by the anchor private sector players to the shrimp farmers.

The third initiative should focus on improving shrimp quality and reducing SPS violations by enforcing standards on feed factories and hatcheries to implement the best practices for traceability. This can be achieved through end-to-end digitisation, technology enablement of the value chain and biosecurity through establishing testing labs that will provide the required certifications. It is critical to ensure that the laboratory tests fully align with the testing protocols of the target markets.

The fourth initiative is increasing levels of shrimp processing by attracting investments from the private sector. The unlock here could come from the state government significantly reducing the cost of doing business, reducing the factor costs of production especially infrastructure and utilities, by simplifying new farm registration process and updating coastal land allocation norms. States could include several of these measures into appropriate state incentive packages for export processing units to attract private sector investments. Such measures exist today for export processing units in some states and could be enhanced appropriately and expanded more broadly across states.

[1] Joshi, Shraddha, " EC lowers basmati fungicide tricyclazole's tolerance limit to 0.001ppm" FnB news. January 2018.

The fifth initiative is for the Ministry of Industry and Commerce to build bilateral trade and sectoral agreements to ensure favourable tariffs in identified target markets. Where relevant, the bargaining power of India's imports from those countries must be leveraged. This needs to be coupled with appropriate quality and testing protocols, fair trade certifications mandated by the target markets to address the non-tariff barriers that Indian exports face.

The sixth initiative is for the state government to ensure shrimp-specific farmer capacity building to be done in a targeted manner within the clusters to enable the farmer to access information and technical know-how that is critical to the success of this agricultural transformation. Andhra Pradesh and West Bengal are on this journey and have demonstrated appreciable progress.

These initiatives should each have specific measurable metrics against which progress can be tracked and monitored. This is especially critical for those enablers which make the project viable. The metrics can also be used to incentivise the adoption of the specific initiatives, which ensures desirable outcomes are achieved. Enabling metrics for the shrimp value chain could include growth in share of production from authorised hatcheries, stocking density, investment in form of subsidies for probiotics, investment in storage capacity building and share of value-added exports. In addition, each of the value chain clusters will have measurable outcome metrics against which progress can also be tracked.

The HLEG analysed 6 additional crop value chains, each of which has a distinct dynamic. For example, rice needs sustainable agriculture practices to minimise implicit water export; buffalo meat needs trade imbalances to be addressed by the government through negotiations and FTAs to minimise import duties in destination markets; mango would benefit from focused investments in packhouses for quality grading and processing (a process already initiated by APEDA through the Export Promotion Forum); vegetable oil needs incentives to boost attractiveness of oilseed crops and palm oil to increase area under cultivation (effort already underway by the Agriculture Ministry). These themes and initiatives have been reinforced in the stakeholder consultations conducted with industry players and commodity boards. Detailed case studies are included in the annexure.

The approach suggested by the HLEG aims to unlock growth in agricultural exports, with a strong emphasis on end-to-end execution in specific crops to get to the desired outcomes. The reforms in agricultural marketing laws announced by the Central Government in June 2020, together with the funds earmarked for post-harvest infrastructure, provide further fillip to deepening the engagement between farmers and the private sector. Similarly, other policy initiatives that are attempting to minimise distortion in markets will also go a long way in providing support to the proposed crop competitiveness building efforts. For example, restructuring the input subsidies as Direct Benefit Transfer to the farmers; or restructuring the government procurement at MSP into Price Deficiency Payment Schemes like Bhavantar Bhugtan Yojana. The HLEG acknowledges that despite the need for value-chain specific interventions by the state, certain cross-cutting enablers will need to be addressed centrally via policy reform. There are 4 types of interventions the centre could make, namely, government policy, trade relations, export incentives and common infrastructure. In addition to the enablers identified above, as part of an effort to attract private sector investment and FDI, the central government may pursue policies that support ease of doing business, faster resolution of commercial disputes and other areas which will improve investment in this sector especially in processing and value-added products.

STATE-LED EXPORT PLANS AND ATTRACTING PRIVATE SECTOR INVESTMENT

The HLEG study of case examples indicates that having individual states be owners of their agricultural transformation plans leads to a far higher probability of a successful transformation. States need

solutions tailored specifically for them – they diverge in their endowments, crop profiles and needs, with each having unique agriculture schemes and policies. Also, given that agriculture is a state subject, it is natural for the state to be the primary actor, while the centre provides critical and necessary enablement.

As mentioned in the previous section above, based on prior learnings and design principles that underpin the recommendations, the highest odds of success are created when all the initiatives are framed together and solutioned for holistically within a crop value chain cluster. Therefore, the HLEG recommends the creation of a business plan for a crop value chain cluster, that will lay out the opportunity, initiatives and investment required to meet the desired value chain export aspiration. The value chains are unique with divergent needs and so these business plans need to be custom-made for each.

The HLEG recommends that each state build its export plan for each crop value chain cluster which it has selected. The plan would have the following components: (i) opportunity definition for the chosen value chain, highlighting pain points, based on demand potential and supply side competitiveness, (ii) comprehensive list of projectised action items including (a) initiatives with hard, measurable RoI such as farm-related inputs, production and quality initiatives, processing initiatives, infrastructure initiatives, (b) support initiatives with soft RoI such as farmer capacity building, branding, demand generation initiatives and negotiations with target markets and (iii) regulatory, policy and procedural initiatives needed at the state/centre, (iv) map of the specific stakeholders who will execute these actions and their roles, specifically the private sector players who will anchor the value chain, (v) expected outcomes in revenue, farmer income, employment and other metrics, with clear implementation milestones, (vi) investment needed to fund the plan, linked to milestones, lead and lag indicator and (vii) governance model for implementation, tracking and monitoring. This should build on already existing plans and efforts underway at the state and centre.

A major prerequisite for success of this mandate is the quality and comprehensiveness of the state-led export plan. The state-led export plan, for each agri-cluster, must be co-owned by the state, private sector investor and the relevant commodity board. To aid this, the HLEG has also developed a guide to build a high-quality, comprehensive state-led export plan for a value chain cluster that includes checklists and templates for the different components of the plan. The value chain deep dives exemplify the nature of pain points and interventions to create a competitive crop value chain cluster.

The HLEG recommends that these plans be evaluated by a capable and experienced evaluation committee based on a set of detailed parameters such as comprehensiveness of the plan, project viability and return on investment, stakeholders who underwrite the plan, commitment of the private sector player and risk of regulatory hurdles.

Similar state export plans have been made in the past, including within the framework of the Agriculture Export Policy of 2018. State-led export plans should build on this. What is likely to be different when they are aligned to the elements of the Guide recommended by HLEG is (i) the plans are demand-driven, comprehensive, investable, (ii) the plans are built with input across the ecosystem of the value chain cluster, who also underwrite the plan, especially the commodity boards will bring technical expertise and (iii) one or more private sector players act as anchor investors, committed to achieve the plan outcomes.

All case examples and expert guidance received point out that the anchoring role of the private sector is a key success factor, especially when an important objective is to increase the share of processing across crop value chains. The private sector will serve as the focal point to drive a high-quality crop value chain business plan, push for financial viability of the value chain cluster, make required investments in modernisation, processing and value addition and provide urgency and discipline to

implementation. That said, the conditions will need to be made attractive for the private sector to participate at scale. Stakeholder consultations reveal several impediments in investing in the sector today. The primary ones include (i) uncertain government policies (e.g., export bans, policies that artificially impact the prices of commodities), (ii) value-added exports not competitive due to inadequate incentives, which are at times even lower than the incentive applicable to commodity exports (e.g., chilli powder is entitled for 2% vs. 3% for whole chilli[2]), (iii) competitiveness challenges vis-à-vis countries such as Vietnam around transportation, logistics, cost of capital and cost of power and (iv) need for higher investments in R&D, technology with regulatory clarity around IP issues.

Moreover, the private sector cannot do this alone. The complexity of the crop value chain cluster necessitates all stakeholders to work together and therefore, there is a need for an appropriate institutional set-up that will galvanise all of them and secure the requisite viability gap funding, including from the government, to make the crop value chain cluster fully viable.

INSTITUTIONAL FRAMEWORK

Following from the HLEG Terms of Reference (iv), the objective is to develop an execution approach that will incentivise states to boost India's agriculture exports from USD 40 bn to USD 70 bn in a few years, while attracting estimated investment of the USD 8-10 bn across inputs, infrastructure, processing and demand enablers. The additional exports could result in the creation of 7-10 mn jobs and boost farmer income, thus naturally aligning with the objectives of states[3].

As stated earlier, the primary instrument for growing agriculture exports is the state-led export plans. These plans, duly supported and incentivised to drive specific crop value chain initiatives, will also have spillover benefits beyond the value chain.

Therefore, the HLEG recommends an approach where the states are incentivised to implement and execute the state-led export plans in their entirety, across all types of projectised initiatives, i.e., one with hard measurable RoI, supporting initiatives with soft RoI; as well as regulatory, policy and procedural interventions. This incentivisation approach will require adequate funding, administered by an institutional set-up that will also evaluate the plan and execute the projects in a repeatable and scalable fashion.

All successful agriculture export stimulation projects, globally, have been able to address the issue of funding. The agriculture exports-linked state-led plans will comprise several sub-projects, each of which could be funded independently. Each project will have details of outcomes and investment needed. There will be multiple sources of funding spanning the Centre, States and Private Sector in the form of loans, grants or converged schemes, as well as funding from the Finance Commission. Funding needs to be designed in such a way as to make the state-led crop value chain cluster plan viable. For example, all investment in infrastructure-related sub-projects (e.g., logistics) that enable cluster competitiveness could be made by the government, investment in food processing could be through the private sector or a combination, i.e., infra-funding by the private sector with viability gap bridged by the government.

Funding will be done in multiple parts across the life cycle of the cluster implementation, in likely 5 stages, linked to plan development, institutional set-up once the plan is approved, achievement of project implementation milestones, implementation of regulatory policy and procedures and final

2 DGFD, Ministry of Commerce and Industries. Code wise list of products with reward rates under MEIS.

3 Estimates based on OECD Input/Output tables

outcome achievement. Non-achievement of milestones and outcomes could result in negative consequences such as claw-back. A certain proportion (e.g., 20%) of the project funding will be held back pending the implementation of the regulatory, policy and procedural interventions that have been committed in the state-led plans. This portion can be disbursed upon full implementation of these interventions. The exact measures will get defined in the state-led export plan.

The exact mechanism of funding needs to be worked out and is likely to take several forms including Direct Benefit Transfer (for example, to farmers for accessing extension services or encouraging water conservation measures), export incentives, viability gap funding and performance-linked incentives to the anchor private sector investor.

The institutional framework required to operationalise all of this will have a two-part set-up across the state and centre.

The state will (i) identify clusters based on potential competitive advantage, (ii) attract private investors who can anchor these value chains, (iii) develop plans in conjunction with the anchor investors and Commodity Boards in line with the HLEG guide, (iv) operationalise plans, (v) ensure convergence of all state, central and Agricultural Export Policy schemes and resources (example, the Andhra Chilli PPP programme converges existing schemes both at the State and Centre such as Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana and Andhra Pradesh Micro irrigation Project), and seek any additional funding required and (vi) liaise closely with the Central body. In order to do this, a state-level body will be set up involving multiple stakeholders, including representatives from the centre, state, private sector (relevant to the primary cluster in that state), FPO, relevant commodity boards. The exact constitution of this body will vary by state based on the nature of the value chains and convergence needs. This can potentially be an Empowered Committee or state-owned department or SPV enabling a PPP model. This body needs to be sufficiently empowered, for example through a power of attorney, to make decisions and provide requisite approvals to ensure timely execution. Irrespective of the structure, there will be a dedicated project management cell led by a Project Director that will facilitate execution

Commodity boards will assist in harnessing synergies when multiple states build plans for the same crop value chain.

The central body will (i) align the states to the aspiration and national agriculture export strategy, (ii) support the states with central resources, (iii) evaluate and approve the plans, along with ongoing monitoring and tracking of execution, (iv) administer funds based on performance, (v) provide oversight and inter-ministerial coordination for cross-cutting enablers. The central body will likely be an Empowered Committee comprising representatives of all stakeholder groups with a dedicated secretariat. Inter-ministerial offices like Principal Secretary of the PMO or Member Agri of NITI Aayog could provide monitoring oversight to this set-up. In summary, this central body is critical to the achievement of these export aspirations.

These state-centre interdependencies and the above two-part set-up will be well-served by a W-shaped governance model to ensure the requisite balance between centre and state. Specifically, the 5 -steps include: (i) central aspiration-setting and national agriculture export strategy (demand prioritisation), (ii) state-level detailed project planning specific to agri-clusters, done comprehensively (iii) central validation of project plans, including their goals and milestones, (iv) state-level project implementation and (v) central monitoring and tracking. The central government will also play a critical role in implementing cross-cutting reform that will enable the state's value chain cluster implementation.

In order to get this started, the HLEG recommends inviting 3-4 private sector players to partner with states to launch 3-4 pilots for the lighthouse value chains.

CONCLUSION

India's aspirations regarding increasing agriculture exports from USD 40 bn to USD 100 bn are well-suited to capture the opportunity offered by global food and agriculture trends. The HLEG estimates that this will naturally influence the domestic agriculture market and result in meaningful job creation. The HLEG recommendations stand on the body of existing research and perspectives, Indian and global case examples and have been built after due consultation with all different stakeholders.

The HLEG believes that India can almost double its agriculture exports by:

- Prioritising 22 crop value chains with a potential competitive advantage and establish lighthouses in 7 crop value chains (rice, shrimp, spices, buffalo, fruits and vegetables, vegetable oil and wood), with a focus on the US, EU and the Middle East.
- Implementing state-led crop value chain clusters, dedicated to a single crop value chain within the state, designed as a comprehensive ecosystem of producers, FPOs agribusinesses, financiers, corporates, commodity boards, state and central governments and agencies, complemented by country-level interventions in destination markets
- Building high-quality, well-funded state-led value-chain specific export plans that bring all stakeholders together, converge resources and are anchored by the private sector. These plans should be demand-led, focused, comprehensive including value addition, investable, and built with inputs across the ecosystem, with one or more private sector players acting as anchor investors
- Setting up a two-part centre-state institutional framework with the right governance mechanism to evaluate, track and monitor these plans to completion. The state will identify clusters, attract private investors, develop and operationalise plans while ensuring convergence of all central, state and Agricultural Export Policy schemes to ensure adequate funding and provide residual funding. On the other hand, the centre can align with the states and support their efforts. It will also evaluate and approve the plans, while providing oversight and inter-ministerial coordination for cross-cutting enablers and provide any additional funding

The HLEG recommendations, anchored on these design principles, are meant to create the highest odds of success and if successful, will materially aid India's overarching goals of doubling farmer income.

1. Introduction

CHAPTER SUMMARY

- India's aspiration to double farmer incomes necessitates a commensurate increase in its agriculture output. This increase in output would require a fundamental transformation of the agriculture sector. However, the resultant increase in production would only serve to increase pricing pressure and lower farmer remuneration in a balanced, self-sufficient agriculture market. It is in this context that the aspiration to enhance agricultural exports from USD 40 bn to USD 100 bn becomes a national imperative
- India has strong natural endowments in agriculture. It is a leading producer of several commodities, including shrimps, spices, mango, papaya, banana, wheat and sugar. India ranks second in total agricultural production and has the largest population of buffaloes
- India exported USD 38.7 bn of agricultural commodities in 2019. Over 2013-18, its exports stagnated. Despite its agricultural advantages, however, India ranks only 13th in total value of agricultural exports, lagging countries such as Belgium and Netherlands. Vaulting India into an even more competitive export position globally will require changes in productivity, quality, non-tariff barriers, a continuing drop in all factor costs and a greater focus on processing and value addition
- The global food and agriculture trends provide strong tailwinds to Indian aspirations. While COVID-19 has amplified the impact of some trends, the situation is still unfolding and the exact impact is tough to ascertain just yet
- In December 2018, the Department of Commerce published the Agriculture Export Policy, which laid down the foundation for some states to develop export plans. Further supportive measures could accelerate the implementation of this policy

AGRICULTURE EXPORTS AS THE NATIONAL IMPERATIVE

India’s stated aspirations of doubling farmer incomes by 2022-23[3] requires a commensurate increase in the output of the agriculture sector. This increase in output would necessitate a comprehensive transformation encompassing an increase in farm productivity, yield, crop intensity, share of high-value crops and realisation per acre, while ensuring suitable measures for climate resilience. However, the resultant increase in production would only serve to increase pricing pressure and lower farmer remuneration in a balanced, self-sufficient agriculture market. It is in this context that the aspiration to increase agriculture exports from USD 40 bn to USD 100 bn becomes a national imperative.

The agriculture aspiration is important for India’s people and for its overall economic success. 47% of Indians derive their livelihood from agriculture[4] and thus increasing the earnings of such a large part of India’s population would have tremendous positive economic impact. Prime Minister Narendra Modi acknowledged this imperative by saying that creating an export-centric farming system has a key role to play in helping the country achieve its economic goal of becoming a 5-trillion dollar economy[5]. If India

4 Over the base year of 2015-16

5 APEDA.gov.in

is indeed able to fulfil its economic aspirations, then agriculture, which is ~15% of total GDP, must play a significant role in the growth story.

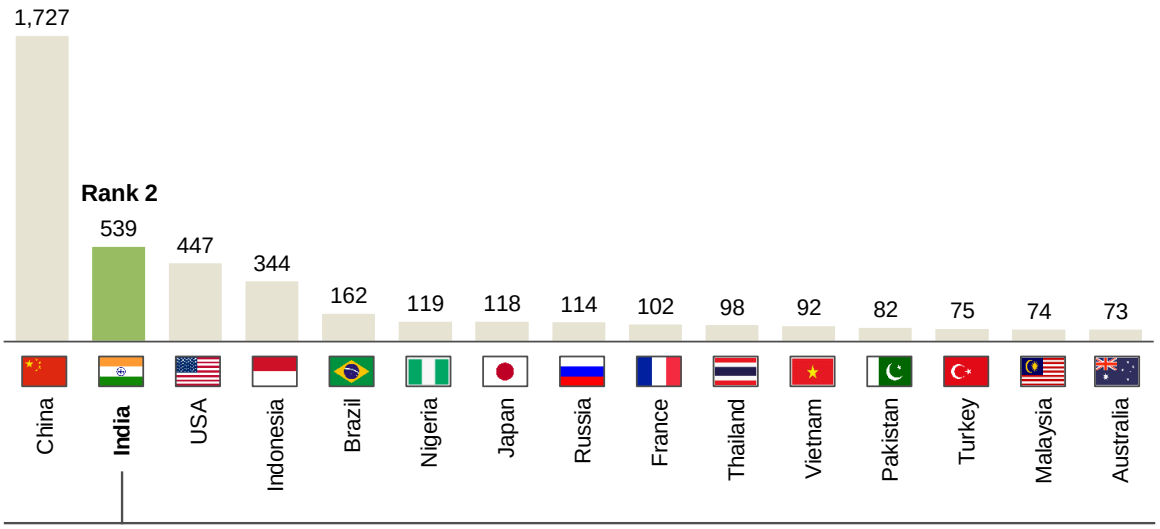
CONTEXT: CURRENT STATE OF AGRICULTURE AND EXPORTS

With its large arable land area and diverse agriculture sector, India is the second largest agriculture producer in the world with gross agriculture production of USD 539 bn in 2018. India has the largest arable land of 156 mn hectares[6]. India leads production worldwide in several commodities, including mango, papaya, banana and is the second largest producer of wheat, sugar and rice. India also has the largest population of buffaloes making it a significant presence in buffalo meat export. *Exhibit 2* below shows India's production in comparison to other top producing countries.

EXHIBIT 2

India is the second largest agriculture producer in the world and world leader in many significant agriculture categories

Gross agriculture production by countries, USD billion, 2018



Global leader in production of **mangoes** (21 million tons), **papayas** (6 million tons), and **bananas** (32 million tons)

Largest population of **buffaloes** (108 million)

Largest shrimp exporter in the world

Largest **pulses** producer in the world (23 million tons)

Second in the world in terms of **vegetable** production (186 million tons)

Largest producer of **cotton**

Second largest producer of **rice**

Key competitive advantages in agriculture

- **Largest arable land** of any country at ~156 mn hectares
- **Varied agro-climatic conditions** enable potential for a diverse crop portfolio
- **Relatively low-cost labour and manufacturing**

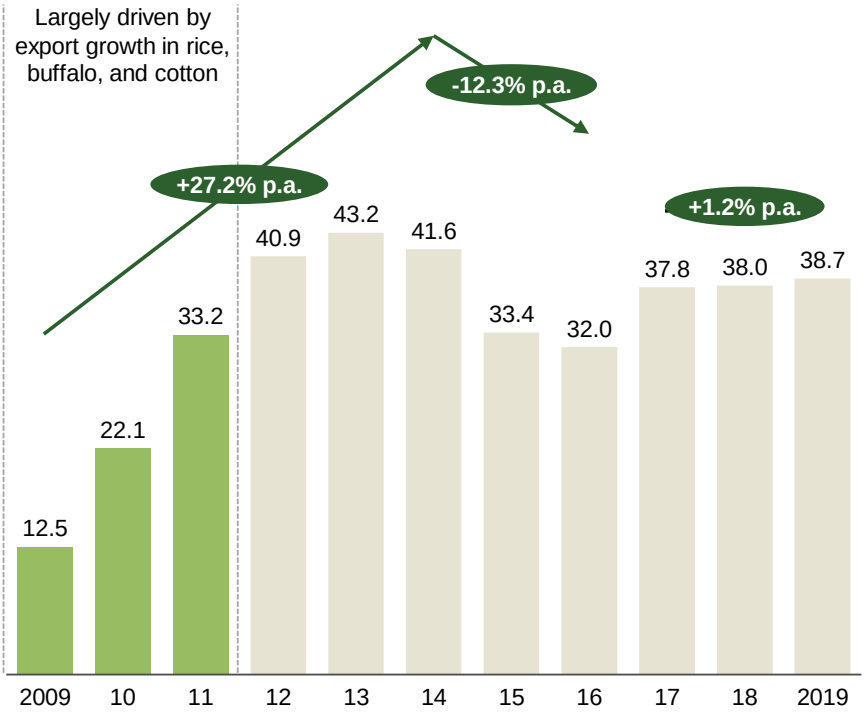
Source: IHS; IBEF; Investopedia

6 IHS Markit industry analysis, FAOSTAT tool – The Food and Agriculture Organization of the United Nations, IBEF, Department of Commerce, Ministry of Commerce and Industry

In 2019, India exported USD 38.7 bn of agricultural goods, which is only 7% of Indian agriculture production. From 2013 to 2018, growth has slowed down relative to the impressive growth of 2009 to 2011. *Exhibit 3* shows India's total agricultural exports from 2009-20019.

EXHIBIT 3

India's agricultural exports have fluctuated over the last 10 years, but have flattened more recently



Key insights

- Exports dropped by 10% CAGR due to a drop in global process and back to back drought in 2014, 2015 and 2016
- Recent growth rates show a faster rise in agri-food production than in domestic demand, and accelerated growth of surplus export volume

Source: DGCIS, Indian Ministry of Commerce & Industry; IBEF for 2019 value

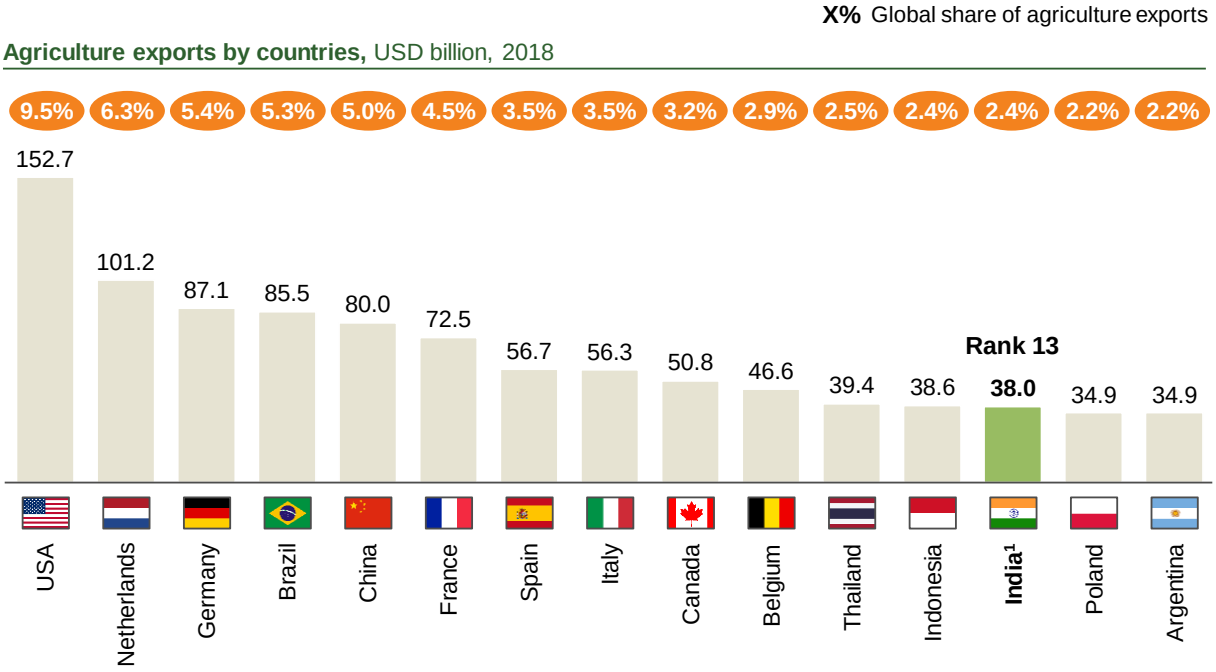
Yet India ranks 13th in the world in agriculture exports, behind countries such as Germany, France, Spain, Italy and Belgium[7]. The top 15 countries in terms of agricultural exports can be seen in *Exhibit 4*. One key cause of the discrepancy between rank in production and exports is the large domestic demand of a population of 1.34 bn people[8]. According to the Ministry of Commerce and Industry, recent growth rates show that production is growing faster than domestic agricultural demand, which would ordinarily yield greater surplus for exports. At the same time, global population is growing with an expected ~2 bn additional people by 2050 , which will increase food demand, pointing to an opportunity to expand both commodity and value-added export.

7 2018 United Nations International Trade Statistics Database

8 2018 World Bank open data tool

EXHIBIT 4

India ranks 13th globally in terms of agriculture exports



1. The export data for India is taken directly from DGCIS, remainder of country information is sourced from UN Comtrade

Source: UN Comtrade; DGCIS

BARRIERS TO INDIAN AGRICULTURE EXPORTS

5 critical challenges contribute to India's relatively low rank among global agriculture exporters:

- Low productivity and high logistics costs
- Limited value addition
- Export promotion and branding challenges
- Non-tariff barriers
- Quality issues

Low productivity and high logistics costs

India lags other large producers in yield/hectare for many crops, including spices, shrimp, mango and buffalo, to name a few. One reason is that Indian farms are smaller (1-2 hectares on average), making it harder to achieve economies of scale. In addition, mechanisation is relatively low and Indian farmers do not utilise many high-yield input varieties used in other agri-producing countries[9].

India's cost of logistics is currently around 14% of GDP – higher than developed country exporters like the US (9.5%). India's tremendous push to reduce logistics costs to below 10% will have a significant impact on its competitiveness in agricltural exports[10].

Limited value addition

India is a more prolific exporter of commodities than of value-added agriculture products – the country ranks 10th globally in processed meat, 18th in the export of processed fruits and vegetables, 35th in dairy and 61st in poultry and egg[11]. *Exhibit 5* shows India's market share in processed foods. Processed foods only constitute 16% of India's agriculture exports; in comparison, 25% of US exports and 49% of Chinese exports are value-added[12]. Reasons for low value addition include relative lack of private sector investment and adequate incentives. For example, the fragmented nature of exporters for some commodities, such as shrimp, make it easier to export a mass product to many markets as opposed to creating a processed product customised for the tastes of a few markets.

Improved infrastructure can also in some instances help with value addition. For example, limited packhouses and grading and sorting infrastructure for mangoes make it hard to discriminate between the high-quality mangoes required for fresh fruit vs. the mangoes best suited for processed goods (e.g., juices). This causes processers to overpay for mangoes and farmers to under-earn for mangoes sold as fresh fruits[13].

9 State of the Indian Agriculture (2015-16), Indian Chamber of Food and Agriculture

10 Khan, Shariq. "India can add 8% to its export if it puts its last mile connect in the fast lane." The Economic Times, April 22nd, 2019.

11 International Trade Centre, Geneva; Exim Bank Research, Export-Import Bank of India, Working Paper 61 (2014-15 data)

12 2018 Agri Export Policy

13 Expert consultation

EXHIBIT 5

India exports a lower volume of processed agriculture products than other world leaders

Category	Total value of world imports, USD bn	Total value of Indian exports, USD bn	Indian share of market, %	India ranking	World leader	World leader share of market, %
Processed fruits and vegetables	52.4	0.5	**0.9**	**18**	China	**15.6**
Processed fishery and seafood	97.2	4.4	**4.6**	**6**	China	**14.6**
Meat	101.8	1.7	**1.6**	**10**	USA	**12**
Dairy	77.9	0.2	**0.3**	**35**	New Zealand	**14.3**
Poultry and egg	24.7	0	**0.2**	**61**	Brazil	**22.2**

India lags behind in terms of exporting value-added and processed foods. However, a high rank in processed fishery and seafood suggests significant potential to become a global leader in other processed categories

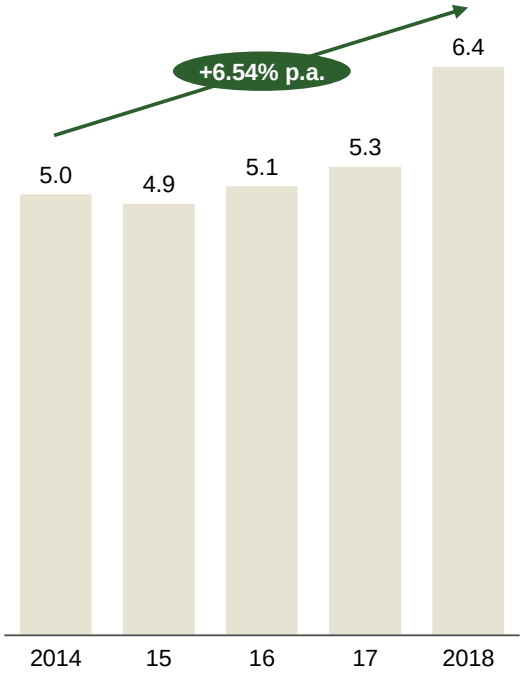
Source: International Trade Center Geneva; Exim Bank Research, Export-Import Bank of India, Working Paper 61 (2014-2015 data)

Although India lags other large exporters in terms of processed goods, it has recently been able to significantly enhance its exports. India's growth in exporting processed foods can be seen in *Exhibit 6* below. To further drive exports, India could benefit from innovating in productivity, mechanisation, fertilisation and other inputs, processing and value addition technology and infrastructure. Agriculture systems revolving around value addition have helped even countries without significant production to greatly raise exports. In India, value addition could be even more transformative considering India has large natural agriculture endowments.

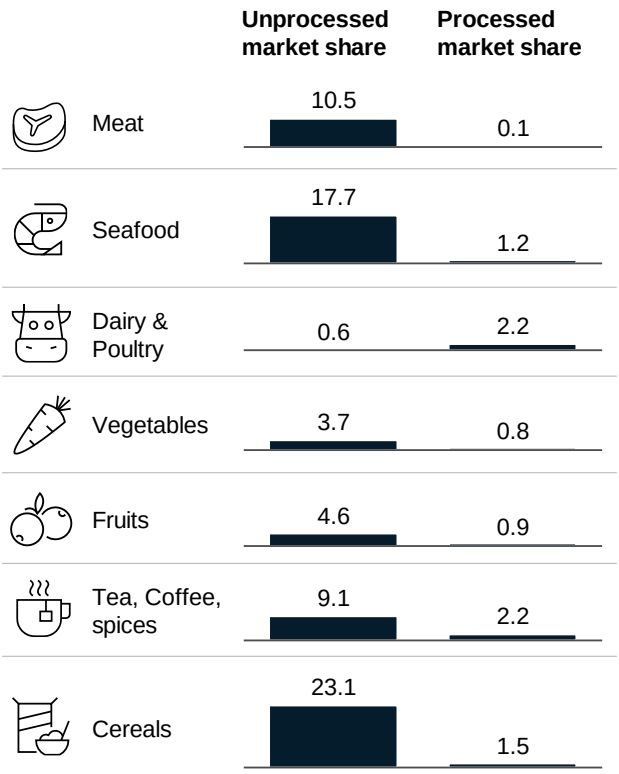
EXHIBIT 6

India's processed exports have been steadily improving, but it still has a higher global share of raw commodities than processed goods

Processed food exports, USD bn



Global market share in food exports, %



Source: Ministry of Food Processing Industries

Export promotion and branding challenges

While India has invested heavily in a broad range of export promotion schemes, India's export incentives have declined over time. As the country moves to respond to WTO compliance in export promotion, there is an opportunity to ramp up export incentives and to create a sharper, more coordinated investment strategy specifically for promotion of agricultural exports, with a focus on value addition.

Non-tariff barriers

Indian agriculture exports also face non-tariff barriers in attractive markets such as Europe (e.g., more stringent shrimp inspections than for other top exporting countries and barriers related to foot and mouth disease for buffalo, which is actually rare in India). Non-tariff barriers and lack of strong trade agreement with target markets are key inhibitors to dramatically increasing Indian agriculture exports.

Quality issues

Indian agriculture commodities meet the sanitary and phytosanitary (SPS) standards of the domestic market but encounter issues in US and EU. SPS issues lead to at-port rejections, especially for shrimps and spices and limit India's ability to significantly penetrate the European market. For instance, India

has the highest number of US notifications and refusals between 2014 and 2018, underscoring the quality challenges India will need to grapple with to grow exports.

SUCCESS IN INDIAN AGRICULTURAL EXPORTS

India has, however, seen success with exporting a set of value chains, including rice (USD 7 bn) and shrimp (USD 5 bn), which comprise a third of India's total agri exports.[14] India has a competitive advantage in these products and they were specified as value chains of opportunity by the Agricultural and Processed Foods Export Development Authority (APEDA) and the 2018 Agri Export Policy[15].

India is a significant exporter across a variety of commodities and agricultural products, exporting 40 commodities and agriculture products, each at over USD 100 mn of value in 2018 and 5 at over USD 1 bn. A view of India's top agricultural exports in 2018 can be seen in *Exhibit 7*.

14 2018 United Nations International Trade Statistics Database; FAOSTAT tool – The Food and Agriculture Organization of the United Nations

15 High-Level Expert Group Meeting, 12 March 2020; 2018 Indian Agriculture Export Policy

EXHIBIT 7

Top Indian agricultural exports in 2018

Commodities and products	2018 export value, USD bn	Commodities and products	2018 export value, USD bn
Rice	7.3	Onions and shallots	0.4
Shrimps, frozen	4.4	Ginger, saffron, turmeric (curcuma), thyme, bay leaves, curry and other spices	0.4
Meat of bovine animals, frozen	3.3	Cumin seeds	0.4
Cotton, raw	2.4	Grapes; fresh or dried	0.3
Cotton; not carded or combed	2.2	Extracts, essences and concentrates of coffee	0.3
Vegetable saps and extracts	1.0	Plants and parts of plants, of a kind used primarily in perfumery	0.3
Sugar	0.9	Dog or cat food	0.3
Fixed vegetable fats and oils	0.9	Maize	0.3
Cake, soybeans	0.9	Chick peas	0.2
Seeds of anise, badian, fennel, coriander, cumin, caraway or juniper	0.8	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies	0.2
Molluscs	0.8	Shrimp, preparations	0.2
Chillies and peppers, dry	0.8	Rapeseed meal	0.2
Tea	0.8	Mangoes, mangosteens, guavas	0.2
Fish, frozen	0.7	Butter and other fats derived from milk	0.1
Cashewnuts	0.7	Cocoa preparations	0.1
Tobacco	0.6	Cucumbers and gherkins	0.1
Oil seeds and oleaginous fruits, n.e.c	0.6	Soybeans	0.1
Sesamum seeds	0.5	Cotton waste	0.1
Coffee	0.5	Meat of sheep or goats; fresh, chilled or frozen	0.1
Ground Nuts	0.5	Fish Meal	0.1

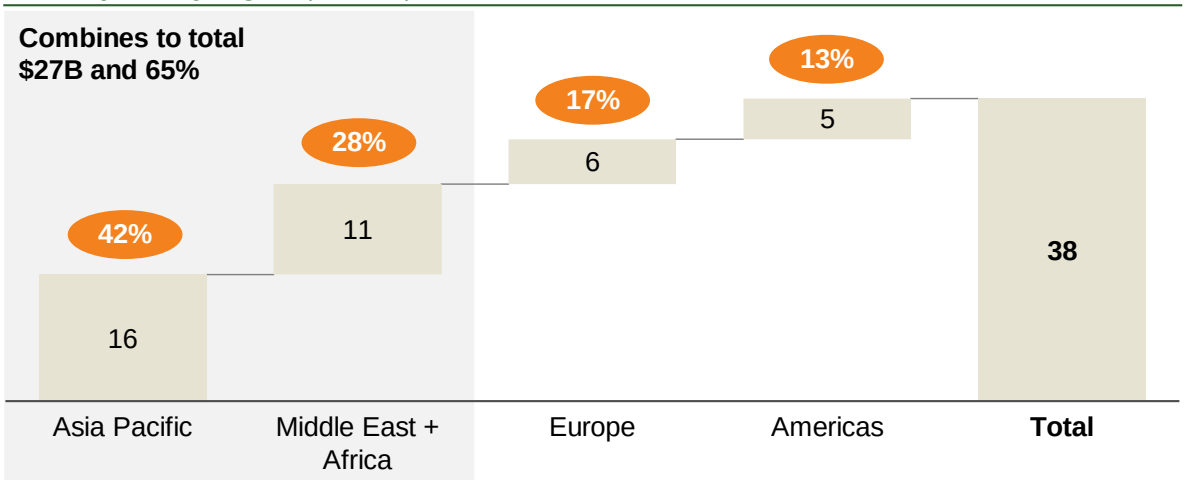
Source: UN Comtrade; DGCIS

Today, India exports 70% of its commodities and agricultural products to nearby geographies, including the Middle East, Africa and Asia Pacific, only exporting 30% to Europe and the Americas. *Exhibit 8* below provides a geographic break up of India's export markets.

EXHIBIT 8

~70% of India's agricultural exports goes to Asia Pacific and MENA

2018 exports by region (USD bn)



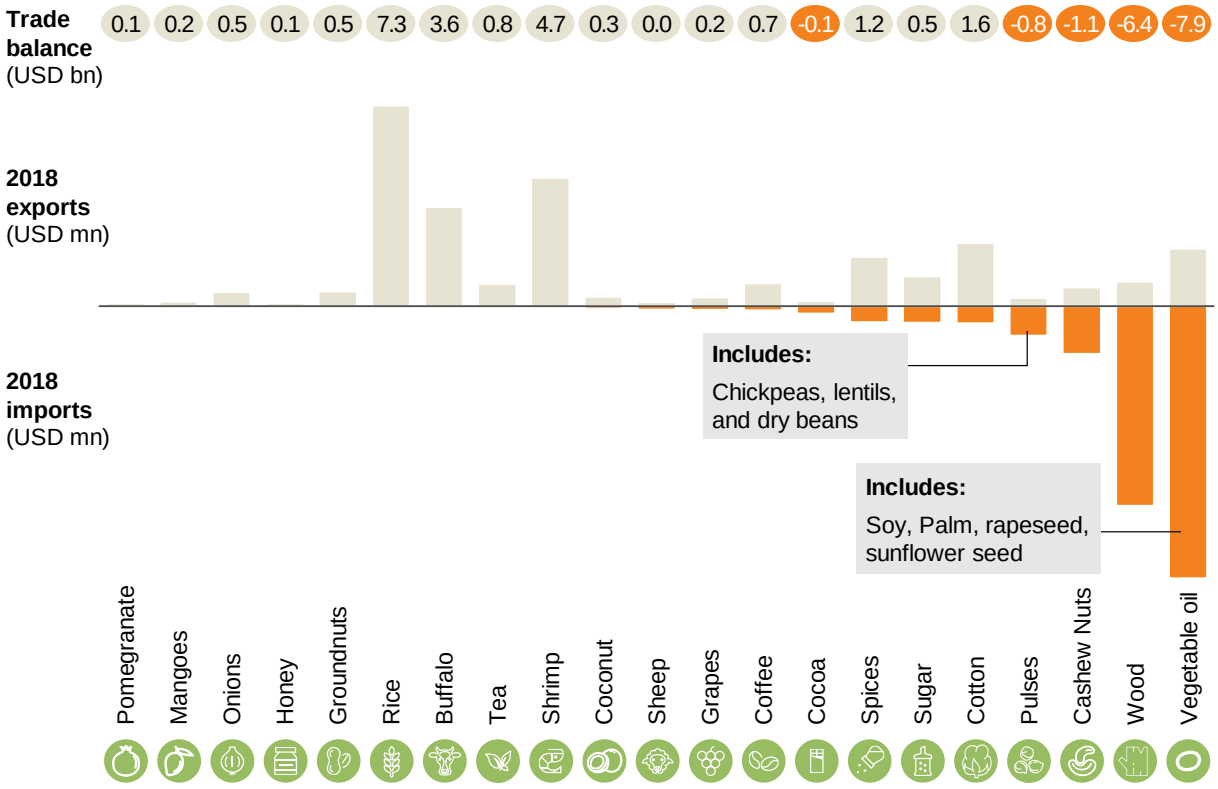
Source: UN Comtrade

However, despite the fact that India exports mostly to Asia Pacific and MENA, the US is India's largest agriculture export geography. Europe has been a challenging market due to its high sanitary and phyto-sanitary bar, limited agreements and non-tariff barriers. However, it also represents a significant market for India to increase penetration.

Lastly, while India imports over USD 20 bn in agricultural goods, comprising mostly vegetable oils, oil seeds and wood, it still maintains a significant trade surplus. Wood was raised as a priority for import substitution in consultations with the Finance Commission. As such, strategies to increase domestic production of heavily imported goods are also considered in this report. An analysis of India's trade balance across major agricultural goods can be found in *Exhibit 9* below.

EXHIBIT 9

The trade balance reveals potential value in substituting imports for a set of value chains, including vegetable oil, and cashew nuts



Key insights

- Rice is India's single largest commodity with USD 7.3 bn trade surplus followed by shrimp (USD 4.6 bn) and bovine meat (USD 3.6 bn)
- Largest trade deficits are in oilseeds, cashew nuts, pulses, and soybeans implying productivity headroom to reduce trade deficit

Source: UN Comtrade

GLOBAL FOOD AND AGRICULTURE TRENDS ACCENTUATED BY COVID-19

A study of global agriculture trends reveals 3 key shifts that could provide tailwinds for India to increase its agriculture exports if it can move now to capitalise:

1. **Increasing consumer demand for health and wellness** – Shift in consumer behaviour towards health and wellness is driving higher transparency (e.g., clean ingredients lists replacing artificial low-calorie ingredients, fresh produce and organics). Consumers are also increasingly making choices based on sustainability certifications and traceability.

2. **Changing regulatory environment** – Increased global and local regulatory scrutiny driven by political pressure (e.g., EU adopting new rules imposing harmonisation of quality and safety requirements for fertiliser). Consumers and other private stakeholders are increasingly involved and

taking direct action to increase scrutiny on quality of inputs (e.g., fertiliser and pesticides) and inputs management best practices.

3. **Renewed focus on food security** – The COVID-19 crisis has increased the threat of global food insecurity through a combination of job losses and food price volatility. Additionally, countries may begin to move to diversify their agriculture imports and move away from dependency on a single country.

No discussion of India's agriculture strategy can be complete today without considering COVID-19. In the short term, the current situation is disrupting supply chains and leading to greater uncertainty in planning. Depending on the ways in which the effects of the pandemic continue to persist, in the long term, these disruptions may reshape global demand and trading relationships. This may provide India with opportunities to establish new or deepen existing trading relationships. However, it is too early to forecast long-term demand trends, as actual impact may vary across commodities, products and markets. However, by boosting its competitiveness across crop value chains and crafting trade agreements selectively, India could position itself well to take advantage of any resulting opportunities.

AGRICULTURE EXPORT POLICY

In December 2018, the Department of Commerce published the Agriculture Export Policy to create a paradigm shift from residual export after meeting domestic demand to targeted export according to the preferences of overseas market. The policy identified potential export crops, recommended a cluster approach and outlined strategic and operational measures. To realise the aspiration, states must play a vital role in strengthening the competitiveness of agriculture and in attracting private sector investment to increase value addition and agriculture exports generally.

2. Guiding principles for HLEG recommendations

CHAPTER SUMMARY

- The HLEG drew inspiration for its recommendations from successful case examples of agriculture transformations such as the Vietnam's focused cluster approach, Mahagrapes cluster, Morocco's province-led plans, and Chilli PPP in Andhra Pradesh
- Based on these sources of insight, 4 themes emerge that underpin the HLEG recommendations:
  - **Focus resources and capital on demand hotspots**, identified as a set of 22 crop value chains and target markets with prioritised 7 lighthouse crop value chains that are must-win for India
  - **Solve for a crop value chain holistically** in an end-to-end manner with an aim to improve farm productivity, regulatory compliance, enhance cost efficiency, boost competitiveness and negotiate favourable trade terms with identified importing nations, addressed through a crop value chain cluster approach. Also create an institutional set-up to attract private sector participation with large value chain players playing anchor, with the right levels of ownership across all stakeholders
  - **Converge resources and schemes** under the primary actor, in this case the state, that will orchestrate across all stakeholders, addressed by state-led export plans, anchored by the private sector player and enabled by the centre
  - **Incentivise value chain stakeholders appropriately,** enabled by governance at the state and centre that ensures the projects are financially viable and are well executed
- These themes, by themselves, are not new. The HLEG recommendations aim to tie these themes together into a single, cohesive approach that is demand-responsive, has an end-to-end perspective for a value chain, is adequately funded, is state-led and converges resources/capabilities, with the intention of converting islands of success to impact at scale

SOURCES OF INSIGHTS

To arrive at its key recommendations for driving India's agricultural exports, the HLEG reviewed 4 case studies: Vietnam, Morocco, Mahagrapes and Andhra Pradesh. It corroborated the main insights from these studies with sector deep dives and interviews with over 100 experts in industry, academia, state and central government bodies and commodity boards to formulate 4 guiding principles that underpin its recommendations. It also analysed data on trade flows, demand and competitiveness and export potential across value chains to fine-tune its recommendation.

VIETNAM – FOCUSED EFFORT TO CREATE AGRICULTURE EXPORT CLUSTERS

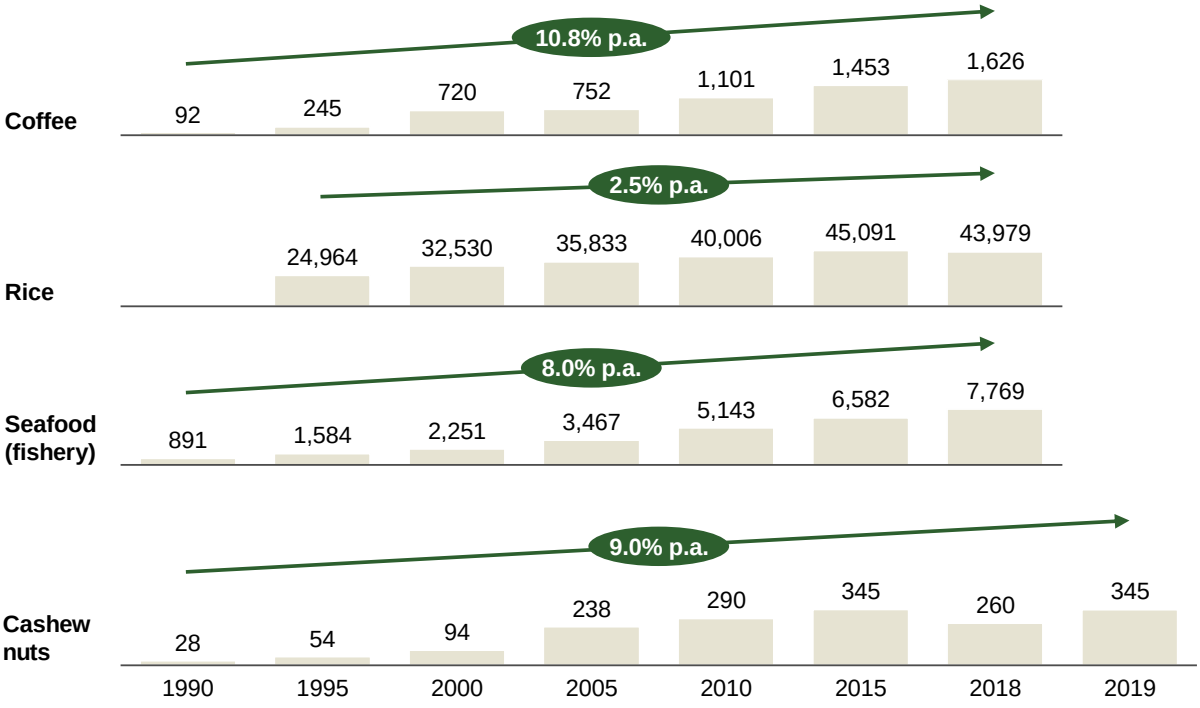
Transforming Vietnam's agriculture sector by shortlisting high-return value chains, promoting agri-clusters and attracting private investors

Over the last 3 decades, Vietnam has transformed its agriculture sector around a set of prioritised commodities, including rice, seafood, coffee, rubber, pepper and cashew nuts, while utilising a cluster-based approach. A summary view of Vietnam's growth in these value chains can be found in *Exhibit 10* below. On the back of a well-rounded strategy, it has increased its agricultural GDP by 4 times: from USD 10 bn in 1990 to USD 36 bn in 2018[16]. It is the world's second largest producer of coffee, the largest producer of catfish and the largest exporter of both black pepper and cashews.

EXHIBIT 10

Vietnam's prioritized value chains grew impressively from the 1990s to 2018-19

Production, Tons '000s



Source: World Bank, GSO.gov.vn; General Statistics Office of Vietnam; Vietnam Cashew Association

Vietnam's transformation had 2 objectives: creating food self-sufficiency and maximising exports. To achieve the former, the country focused on increasing its rice production. In 1990, it produced 19 mn metric tonnes of rice; today it produces over 44 mn metric tonnes.[17]

To maximise exports, Vietnam followed a three-pronged approach. First, through agronomic studies (soil, rainfall, weather, etc.), it shortlisted value chains in which it had a natural advantage, including

16 General Statistics Office of Vietnam

17 FAOSTAT Database

coffee, seafood, rubber and cashews. To enhance its competitive advantage in these 3 value chains, it sent its scientists on study tours to universities in India, France and Russia among others to learn technical best practices and improve seed varieties. It also established agricultural extension bodies at the village, district and national levels to disseminate best harvesting practices to farmers in a systematic manner.

Second, it adopted a cluster-based approach to drive production of key commodities. It created a cluster for coffee in the Central Highlands and for rice and seafood in the Mekong Delta. Such clusters yielded many soft benefits, such as shared mechanisation and greater access to infrastructure and bank capital. They also attracted private investors. Clusters mainly took the form of industrial parks where the Vietnamese government provided land and building availability, infrastructure and utilities and customs bonded warehouse to attract investment. Early success of clusters in fact had a snowball effect. They attracted foreign investors to set up new clusters through government-led joint ventures and these investors in turn proactively created markets for Vietnamese value chains in their home countries, which led to even more investments.

Third, to further drive private investments in the sector, it made ease of business very high by removing import duties for agricultural technologies, making it easier to import for re-exporting and participating in treaties to lower export duties in target markets. For example, by becoming a signatory to the China-ASEAN free trade agreement, it was able to significantly augment its exports of seafood, rice and spices to China. Similarly, Vietnam has signed a new free trade agreement with the EU[18].

MAHAGRAPES – SUCCESSFUL STATE-LED CROP CLUSTER

Establishing an export-focused grapes cluster in Maharashtra through PPP

Maharashtra dominates India's grape export industry. In 2016-17, Maharashtra's largest grape production area, Nasik, accounted for 49% of India's exports[19]. Mahagrapes has been a major enabler of the state's success. A summary view of Mahagrapes is captured in *Exhibit 11*.

18 "EU-Viet Nam free trade agreement - Joint press statement by Commissioner Malmström and Minister Tran Tuan Anh" Council of the European Union. Press release. June 2019.

19 National Horticulture Board

EXHIBIT 11

Mahagrapes is a cooperative of vineyard owners in Maharashtra and has become one of the largest exporters of seedless fresh grapes in India

The 6 objectives of Mahagrapes

1. Upliftment of farmers community
2. Growth of co-operative movement
3. Encourage and develop agricultural export
4. Maximize foreign exchange earnings
5. Update the farmers on the latest technology in farming
6. Acceptance of global challenge with a commitment to quality

Functions

- To source and develop worldwide markets
- To provide quality control in post harvest activities
- Provide extension services to members of co-ops for production of export quality grapes
- Supply and supervise branded packaging
- Provide logistical support
- Provide advance payment to farmers for their produce

Source: http://www.mahagrapes.com/

Formed as a PPP in 1991 to improve the quality and scale of grape production and exports in India, Mahagrapes is owned and governed by its members (grape cooperatives). It received considerable public support in its set-up, including by the Maharashtra State Agricultural Marketing Board (MSAMB) and the Maharashtra Government.

Together with the MSAMB, Mahagrapes has helped form 19 cooperatives in the state's major grape-growing regions. Mahagrapes clusters converge the efforts and investments of a range of stakeholders:

- The National Research Centre for Grapes, other Indian Council of Agricultural Research (ICAR) centres and many agricultural universities provide Mahagrapes with vital research and help to develop locally relevant preharvest, harvest and post-harvest technologies
- State marketing boards provide the firm loans and expertise as well as collect technical and market information for producers
- The Maharashtra Industrial Development Corporation (MIDC) promotes the sector through a residue monitoring programme, involving close to 6,000 vineyards
- A network of banks provides the cooperatives access to funding and finance, which are critical enablers in a capital-intensive value chain

MOROCCO – PROVINCE-LED PLANS TO TRANSFORM THE AGRICULTURE SECTOR

Boosting agricultural exports in Morocco by prioritising high-impact value chains and empowering provinces to develop tailored project portfolios

In 2008, Morocco launched the Green Morocco Plan to promote modern agriculture (by driving value addition and productivity) and enhance incomes of smallholder farmers. Each of the 16 provinces developed comprehensive plans that consisted of over 700 discrete projects.

The need for the Green Plan came at a time of significant opportunities for Moroccan agriculture. However, Morocco also faced a set of constraints that have similarities to the challenges India faces today. Examples include fragmented actors such as smallholder farmers, complex land right systems and water management challenges among others. A summary of Morocco's assets and challenges is detailed below in *Exhibit 12*.

EXHIBIT 12

4 assets to leverage and 5 challenges to overcome

Significant opportunities …

1. Domestic demand experiencing rapid growth
2. Global demand for Mediterranean basket of goods
3. Proven competitive advantage in certain products/ segments
4. Favorable logistic and trade arrangements with EU and USA

… but possible constraints as well

1. Fragmented actors
2. Complicated and complex land tenure system
3. Water policies challenges: poorly priced and over use
4. Regulatory environment inconsistent with market dynamics
5. Shift from cereals to high value crops across hundreds of thousands of small farmers challenging to complete fully through extension infrastructure

Under the Green Morocco Plan, the central government prioritised 9 value chains, starting with 7 and eventually adding 2 more. It shifted its focus from staples to a set of high-value crops, including olives, tomatoes, citrus fruits, almonds and figs. To increase the production of these prioritised crops, it set itself a target to move its cereal production to high-value crop cultivation across 300,000 hectares of farmland. A key decision was to target crops that were internationally competitive. This helped it attract private sector investment of USD 12 bn[20], augment its farm productivity by 30% and increase the earning potential of smallholder farmers[21].

20 https://borgenproject.org/tag/plan-maroc-vert/

21 Boettiger, Sara, Denis, Nicolas and Sanghvi, Sunil. "Successful agricultural transformations: Six core elements of planning and delivery" McKinsey & Co. Article. December 2017.

The overall transformation plan had 3 main pillars, detailed in *Exhibit 13* below, which attracted significant investment, upwards of USD 12 bn. Pillars of focus included high-value-added agriculture, social agriculture and infrastructure and industry. These projects targeted between 1.0 mn and 1.2 mn farmers.

EXHIBIT 13

Morocco – Agriculture transformation

	Description
Pillar I **High value added agriculture**	▪ High value added agriculture development master plan around 700-900 productive projects ▪ 7 sub-sector plans around private investment for all crops (e.g., olive, fruits & vegetables, cereals, milk, meat) ▪ Target: 400.000 farmers
Pillar II **Social agriculture**	▪ Social agriculture development master plan around 300-400 projects of 3 types – Reconversion of land (from cereals to olive/fig trees) – Intensification (yield/productivity improvement) – Diversification "Niche" markets ▪ Target: 600-800.000 farmers
Infrastructures & industry	▪ Major improvement of agriculture general conditions, around – A new water policy (major irrigation investment plans) – Easing of access to land – Institutional reforms (creation of a special Agency for Agriculture Development) – Subsidy programs for industrial investment and markets

Source: Morocco Green Plan

The Green Morocco Plan focused on attracting foreign capital through a focus on "aggregation" projects where the aggregator, domestic or international agriculture companies, could realise benefits in terms of securing more volume, developing of commercial capabilities to increase target market penetration and optimisation of logistics costs through cutting out middlemen. To achieve these benefits, the aggregators partnered with the states on projects such as nucleus farms, processing facilities, inputs supply, technical support and supervision and financing and execution in areas such as irrigation, other plants and equipment. To facilitate these projects, the aggregator would sign agreements with the state granting preferential access to property, financing and access to human capital and expertise[22]. To support these projects, the government created an Agriculture Development Fund.

The central government empowered the country's provinces to build their own unique portfolio of projects through inviting tenders as per the unique needs and realities of each province, as well as to manage this portfolio end to end[23]. The governance model enabled top-down central direction and also bottoms-up detailed project planning. Thus, the states fully controlled the development and execution of their own action plans.

22 "Green Morocco," Ministry of Agriculture, Fisheries, Rural Development, Water and Forests.

23 Ibid

CHILLI IN ANDHRA PRADESH – PRIVATE-SECTOR-LED CLUSTER DEVELOPMENT

Leveraging a PPP to offer agricultural extension services to chilli farmers in Andhra Pradesh

In 2016-17, a leading consumer goods company and the Horticulture Department of the Government of Andhra Pradesh entered into a public-private partnership (PPP) to jointly develop the chilli value chain in the state by disseminating best agricultural practices and providing advice to farmers on sustainably improving crop productivity, quality, sustainability, price realisation and farmer incomes.

The partnership has been successful at ensuring that risks are shared equally among stakeholders, funding and investments were available. It also ensured the required capabilities to execute the programme. Thus far, the impact of the PPP on the chilli value chain has been impressive, leading to a 13% crop productivity improvement, an 8% increase in high-grade production and a 27% rise in net returns per acre for the state's chilli farmers, to the extent of INR 23,000 per acre[24].

In 2019-20, the project was deemed such a success that the scale and scope of the programme expanded, covering 12,000 acres in 4 key chilli-producing districts (Guntur, Kurnool, Prakasam and Krishna), with the larger objective to reach 100,000 acres in the near future and to make Andhra Pradesh the global hub for food-safe chilli sourcing[25]. The Government will provide 65% of the project funding, with the rest funded by the private partner.

The partnership converges existing state and central schemes, including the Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana and Andhra Pradesh Micro Irrigation Project. This illustrates how the state can partner with private sector anchors and converge resources to strengthen competitiveness in a crop value chain.

GUIDING PRINCIPLES AND RECOMMENDATIONS

A combination of expert interviews, value chain analyses and learnings from the above 4 case studies led the HLEG to develop 4 guiding principles to inform its final recommendations.

1. **Focus resources and capital on a prioritised set of high-impact crop value chains:** The Vietnam and Morocco case studies demonstrate that focusing resources and efforts on a few high-impact value chains can be crucial to drive crop production and exports. Lessons learnt from investing in these value chains can also guide allocation for other commodities

2. **Solve for crop value chains holistically:** The Vietnam and Mahagrapes case studies show that agri clusters can solve value chain pain points in an end-to-end manner, offer easy access to knowledge, financing and infrastructure to all stakeholders as well as facilitate a convergence of resources and funds

3. **Converge resources and schemes under the state:** Vietnam and Morocco illustrate the success of state-led plans for each value chain cluster that converge resources and schemes, developed in conjunction with all stakeholders, anchored by relevant private sector participants

24 Expert consultations

25 "Best Practices in Horticulture – Andhra Pradesh," Department of Horticulture Government of Andhra Pradesh.

4. **Incentivise value chain stakeholders appropriately:** All case studies show the importance of incentivising stakeholders to act in a coordinated way, underpinned by a strong governance model at the state and the centre. Incentives such as viability gap funding are critical to actualise the plans and to mobilise stakeholders

These themes, by themselves, are not new. For example, clusters exist today in fruits and vegetables under the national horticulture plan. PPP models have been implemented in the past. State-led plans are being developed under the Agriculture Export Policy, 2018. The HLEG recommendations aim to tie all these principles together in a single, cohesive approach that is demand-responsive, has an end-to-end perspective for a value chain, is adequately funded, state-led and converges resources/capabilities, with the intention of converting islands of success to impact at scale.

The 4 themes outlined above form the crux of the HLEG recommendations and the remaining report is therefore structured into 4 sections of crop value chains in focus, deep dives into value chain clusters, state-led pans and the institutional framework. These 4 chapters also explicitly address the 4 points outlined in the Terms of Reference, as shown in *Exhibit 14* below.

EXHIBIT 14

Four chapters address the HLEG Terms of Reference

Chapter	ToR point addressed
3 **Focus on a prioritised set of value chains and target markets**	i. To assess export & import substitution opportunities for Indian agricultural products (commodities, semi-processed, and processed) in the changing international trade scenario and suggest ways to step up exports sustainably and reduce import dependence
4 **Unlocking growth in crop value chain clusters**	ii. To recommend strategies and measures to increase farm productivity, enable higher value addition, ensure waste reduction, strengthen logistics infrastructure, etc. related to Indian agriculture, to improve the sector's global competitiveness iii. To identify the impediments for private sector investments along the agricultural value chain and suggest policy measures and reforms that would help attract the required investments
5 **State-led export plans**	iii. To identify the impediments for private sector investments along the agricultural value chain and suggest policy measures and reforms that would help attract the required investments
6 **State plan incentivization approach**	iv. To suggest appropriate performance-based incentives to the state governments for the period 2021-22 to 2025-26, to accelerate reforms in the agriculture sector as well as implement other policy measures in this regard

3. Focus on a prioritised set of crop value chains and target markets

CHAPTER SUMMARY

- The HLEG evaluated a set of prioritised value chains for focus using a consistent seven-step methodology. Using this filtering criteria, the HLEG analysed over 100 crop value chains and arrived at a list of 22 recommended crop value chains. Of these 22 value chains, 20 were recommended for their export potential and 2 were recommended due to their import substitution potential. These 20 crop value chains recommended for export potential have the potential to double in exports, taking Indian exports from USD ~40 bn today to USD ~70 bn in a few years of implementation. Import substitution of vegetable oil and wood will have an additional favourable impact on trade balance
- The HLEG also identified 7 “must-win” lighthouse value chains using parameters of competitiveness, export potential, agricultural diversity, opportunity for import substitution and alignment with perspectives of key stakeholders. These are rice, shrimps, buffalo, spices and fruits and vegetables, vegetable oils and wood. Vegetable oils and wood were added as India has the highest trade deficit in those value chains and the opportunity for import substitution is significant
- To lend the overall effort greater focus, HLEG believes that it is important to shortlist target international markets for the priority value chains. Using a combination of value chain analyses, export consultations and the International Trade Centre’s Export Potential Map, HLEG has recommended export markets for each priority value chain. It has also identified and quantified the top 20 markets for aggregate additional penetration, discovering in the process that India has a significant opportunity to enhance agricultural trade with the US, Middle-East and Europe

VALUE CHAIN PRIORITISATION

Agriculture has been a state-level subject in India, as each state has its unique socio-economics, agronomics and farm infrastructure. Achieving a step change in agricultural exports will require prioritisation of a small set of value chains that allow room for state-level agronomic diversity and the flexibility to ensure that all states can participate.

To identify this set of value chains, the HLEG developed a screening methodology based on the following 3 principles:

- India must already be competitive and have high export volumes for the selected value chains
- Selected value chains should align with 2018 Agriculture Export Policy clusters and APEDA/MPEDA and other expert recommendations
- Global megatrends should provide support for growth expectations in the shortlisted value chains

These principles led to a 7-step screening methodology, using which the HLEG arrived at a list of 22 value chains from an initial list of ~100 value chains.

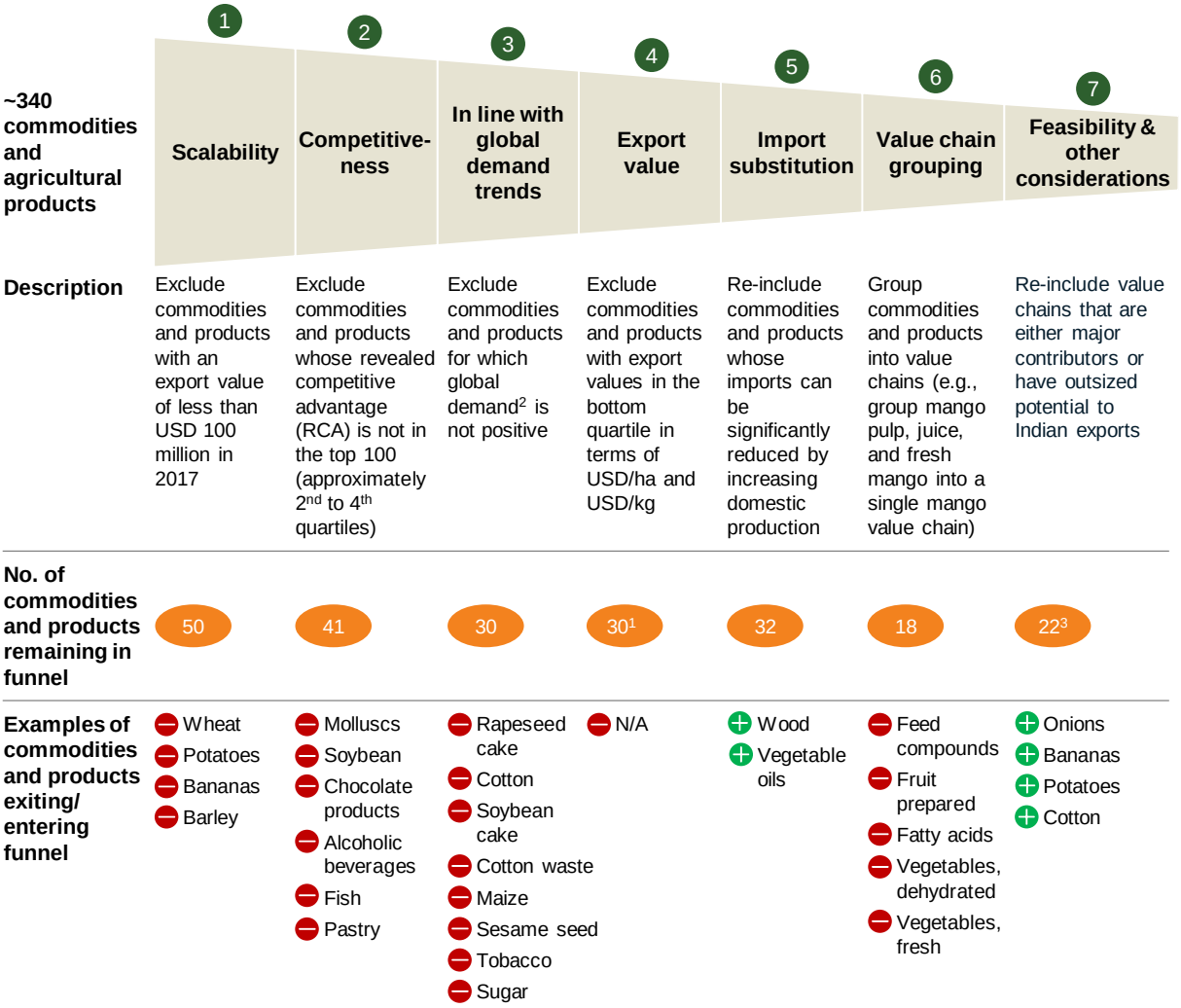
The screening process had 7 steps to arrive at the final list of 22 value chains:

1. **Scalability** – Excluded commodities and agricultural products with under USD 100 mn in exports.
2. **Competitiveness** – Utilised "revealed competitive advantage" (RCA) as a proxy for commodity and agricultural product competitiveness and excluded all commodities and agricultural products that were outside of the "top 100" (approximately all 2nd- through 4th-quartile scores).
3. **Global demand trends** – Excluded all commodities and agricultural products for which global demand, defined as global imports, was negative (<0).
4. **Export value** – Excluded all commodities and agricultural products in the bottom quartile for both USD/ha to produce and USD/kg in export price.
5. **Import substitution potential** – Added back commodities that were heavily imported and where India faces a trade deficit.
6. **Value chain grouping** – For the commodities and products that remain, absorb all related products to create a value chain. For example, if fresh mango remained, then include mango pulp, mango juice, etc., to create the full mango value chain.
7. **Feasibility and other considerations** – Based on expert consultations (including from APEDA/MPEDA and 2018 Agriculture Export Policy), added back value chains that have outsized potential in India but were filtered out on a prior step (e.g., bananas, potatoes and onions).

A summary of the value chains shortlisted through this methodology is detailed below in *Exhibit 15*.

EXHIBIT 15

A 7-step screening methodology led to a shortlist of 22 value chains from an initial list of 340 commodities and agriculture products



1. Soybeans, wheat, and maize already filtered out in prior steps
2. Defined as world import trends from 2014-2017
3. Of these 22 value chains, 20 are selected for export potential and 2 are selected on the basis of import substitution potential

Source: HLEG value chain prioritization methodology

These 20 value chains are representative of the diversity in Indian agriculture and include fruits, vegetables, grains, pulses, vegetable oil and meats. An assessment of the total export potential over the next few years reveals that together these value chains alone could boost India's agricultural exports by close to USD 30 bn, pushing the annual total exports in the sector to USD 70 bn. *Exhibit 16* can provide a detailed break up of this opportunity.

EXHIBIT 16

The 20 value chains prioritized for export potential can drive India's agricultural exports to USD 63-66 bn over 5 years

1. International Trade Center Export Potential tool assumes 5 year time horizon. Export potential represents recurring additional export revenue in 2025
2. CAGR for "other" value chains is -3.8% from 2013-2017. Thus no incremental value is assumed
3. Export margin calculated as: (export price – production costs)/Export price

Source: International Trade Center Export Potential Map; Expert interviews

Value addition will also need to play a significant part in increasing Indian exports. In 2018, only 17% of India's agriculture exports were from processed goods relative to ~25% for the US and ~49% for China[26]. India can make a step-change leap in its share of value added and processed agriculture exports to the tune of 30-40%. India's corporate sector would need to be a primary actor in any effort to greatly increase processed goods due to both the high capital expenditure required for additional processing capacity and the target market know-how needed to successfully export processed products. As such, the HLEG posits and recommends that the corporate sector must feature prominently in any plans to achieve India's agriculture export aspiration.

26 2018 India Agriculture Export Policy, Department of Commerce, Ministry of Commerce and Industry, Government of India.

MUST-WIN LIGHTHOUSE VALUE CHAINS

The success of other countries seeking to transform their agricultural sectors such as Vietnam in the early 2000s and Morocco in 2008**,** indicates that identifying an even smaller set of value chains for immediate attention could unlock greater value. In addition, lessons learned from investing in these "lighthouse" value chains could prove to be valuable to illustrate improvement opportunities prevalent in other value chains.

To further shortlist the prioritised value chains into a set of “must-win” value chains, the HLEG used parameters of competitiveness, export potential, agricultural diversity, opportunity for import substitution and alignment with perspectives of key stakeholders and the 2018 Agriculture Export Policy. It thereby arrived at 7 lighthouse value chains comprised of rice, shrimp, buffalo, spices, fruits and vegetables, vegetable oils and wood, detailed below in *Exhibit 17*.

EXHIBIT 17

Selected representative “lighthouse” value chains

A “lighthouse” value chain is a “must-win” value chain for India that can also shed light on the pain points and solutions of other value chains

Size of export potential	Provides heft to India’s agriculture exports
Representa-tiveness	Represent all major categories of commodities (e.g., aquaculture, meat, F&V) and can shed light on similar commodities
Focus	Provides focus to India’s Ag export strategy
Inclusiveness	Represents needs of multiple stakeholders, export as well as import substitutes
Import substitution potential	Include value chains where India runs a significant trade deficit and value chains have import substitution potential

PROPOSED LIGHTHOUSE VALUE CHAINS

Export potential

Rice | Shrimp | Buffalo | Spices | F&V

Import substitution potential

Vegetable oils | Wood

These lighthouse value chains carry an incremental trade benefit potential of USD ~25 bn over the next few years[27], as shown in *Exhibit 18* below.

27 “Export Potential Map,” International Trade Centre.

EXHIBIT 18

The lighthouse value chains could provide almost $25B in incremental trade benefit over the next few years

Projected total annualised trade benefit for priority value chains, (USD bn)

	Rice	Shrimp	Buffalo	Spices	F&V	Total export potential	Vegetable oil	Wood	Total trade benefit
Indian exports/ imports, 2018	$7.3B	$4.7B	$3.6B	$1.8B	$0.8B		($10.5[3])	($7.3[3])	
Global trade (USD bn)	25	19	50[2]	16	31		98	152	
Competitiveness[1]	High	High	Medium	High – Medium	Medium		Medium	N/A	
Global demand growth[7] (%)	6%	7%	10%	5-15%[4]	2%		4%[5]	3%	
APEDA list	✓		✓	✓					
2018 export policy	✓	✓		✓	✓		✓		

1. Competitiveness measured by RCA score and cost curves
2. Includes all bovine products
3. Import of vegetable oil for India
4. Demand growth depends on the spice
5. Using castor bean oil, which is India's largest oilseed export
6. Includes all fruits and vegetables featuring in the top 20 value chain – Onion, Grapes, Mangoes, Pomegranate
7. Used weighted average of individual commodities for value chain grouping

Source: Comtrade; International Trade Centre; FAOSTAT

To continue to grow its agricultural economy and exports, India should also maintain a view towards future phases of agricultural products from prioritisation. Two emerging categories for consideration are medicinal plants and organics.

The domestic Medicinal Plant sector in India has been steadily growing with a 2017 value of USD 750 mn and an annual growth rate of 14%[28]. India is currently the second largest exporter of medicinal plants after China and both countries together produce more than 70% of total global demand for herbal products. A major driver of exports of medicinal plants is alternative wellness tourism[29]. In 2019, India

28 "India 2nd Largest Exporter of Herbal Meds after China," Federation of Indian Chambers of Commerce and Industry, December 05, 2017.

29 Begum, S. S. 2013. Medical and Wellness Tourism: Opportunities and Challenges- Marketing 'Brand India'. Research Journal of Management Sciences. Vol. 2(1), pg: 1-6

exported USD 285 mn of medicinal plants. However, the export market is still relatively nascent with global exports at ~ USD 3 bn in 2018[30]. The growth in exports of wellness services can result in increasing the demand for herbal plants and related products in India and abroad.

Organic products cut across all crop value chains and represent a potential form of value addition. In 2017, India exported USD 500 mn worth of organic products to US, Europe, Canada, Switzerland, Australia, Israel, South Korea, Vietnam, New Zealand and Japan. In 2018, organic food exports rose by an impressive 50% to ~USD 750 mn. As of March 2019, over 3.56 mn hectares are registered with the National Programme for Organic Production for organic farming. Madhya Pradesh, Rajasthan, Uttar Pradesh and Sikkim are among the states leading the way in organic production[31]. Overall, India has thus far seen the most success with organic oilseeds, millets, dry fruits, tea, coffee and spices[32]. Production of organic produce may therefore be an important lever for increasing exports across a number of the prioritized crop value chains.

Medicinal plants and organic products will require pilots to develop the proposition and establish proof of success, before investing in scale-up. While both are relatively nascent in India, they are emerging quickly and could become areas of focus to continue to grow agricultural exports.

TARGET MARKETS FOR EXPORT

A critical step to boost India's agricultural exports will be to identify markets with high export potential for competitive value chains and sign beneficial bilateral or multilateral trade agreements with them, raising sanitary and phytosanitary production levels to meet their quality standards and negotiating with them to remove non-tariff barriers, if any. A summary view of India's top 20 agricultural trade partners in 2018 can be found in *Exhibit 19*.

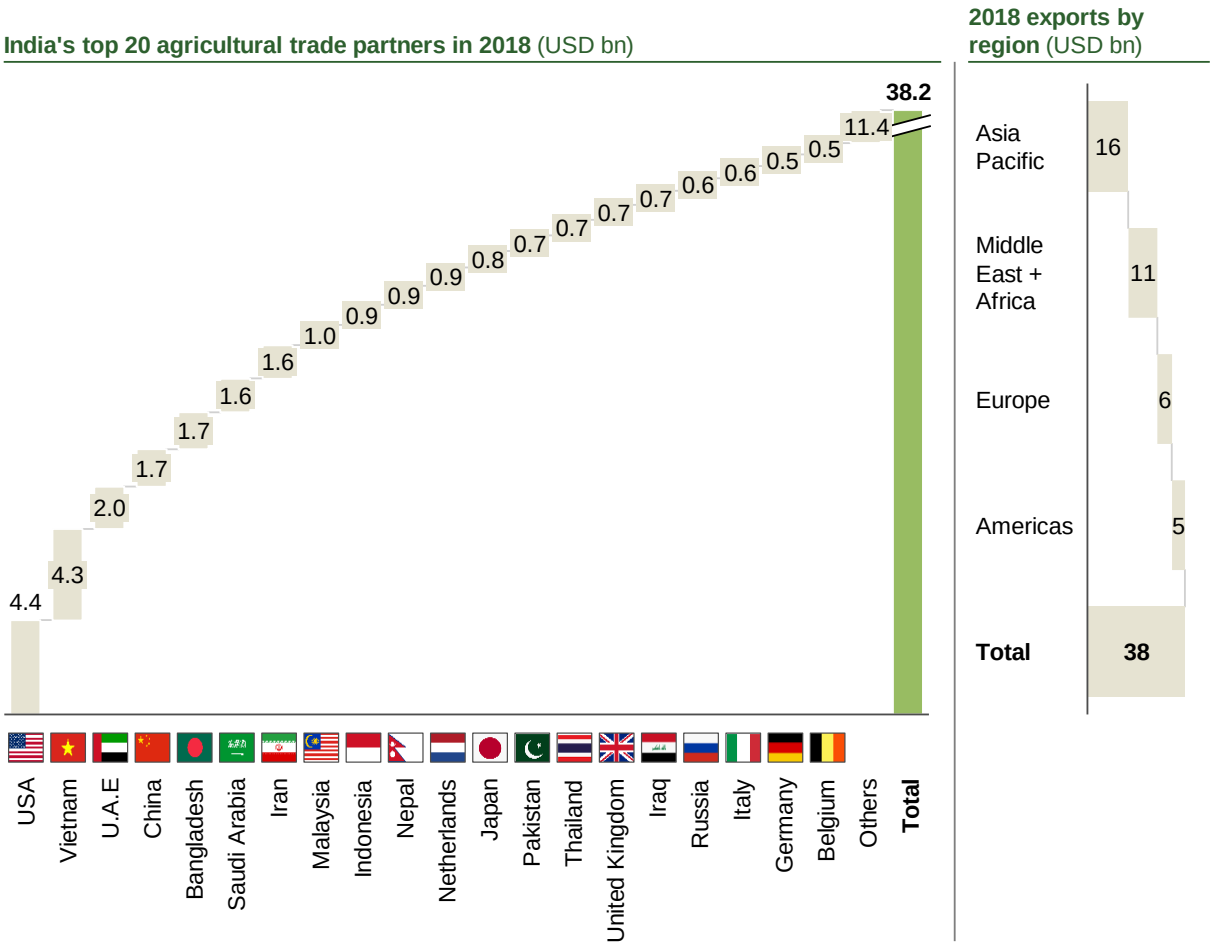
30 UN Comtrade; HS 1211 ("Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh, chilled, frozen or dried, whether or not cut, crushed or powdered") used as a proxy for MAPE

31 Kaur, Gurneel. "Organic Food Exports from India rise by 50% to INR 5151 Crore: APEDA," Grainmart India.

32 "Consolidated Organic Agriculture Statistics for the Year 2018-2019," APEDA.

EXHIBIT 19

~70% of India's agricultural exports is to 20 countries with an opportunity to export more to Europe and the Americas



India exports 70% of its total agricultural value to 20 countries

Source: UN Comtrade

The top 5 destinations for Indian commodities and agriculture products (37% of total) are the US (USD 4.4 bn), Vietnam (USD 4.3 bn), UAE (USD 2.0 bn), China (USD 1.7 bn) and Bangladesh (USD 1.7 bn)[33]. As previously mentioned, India exports the majority of its agriculture products to Asia Pacific and MENA region and exports a relatively small proportion to Europe and to the Americas. The analysis suggests significant opportunity in pursuing increased penetration in the US and in Europe.

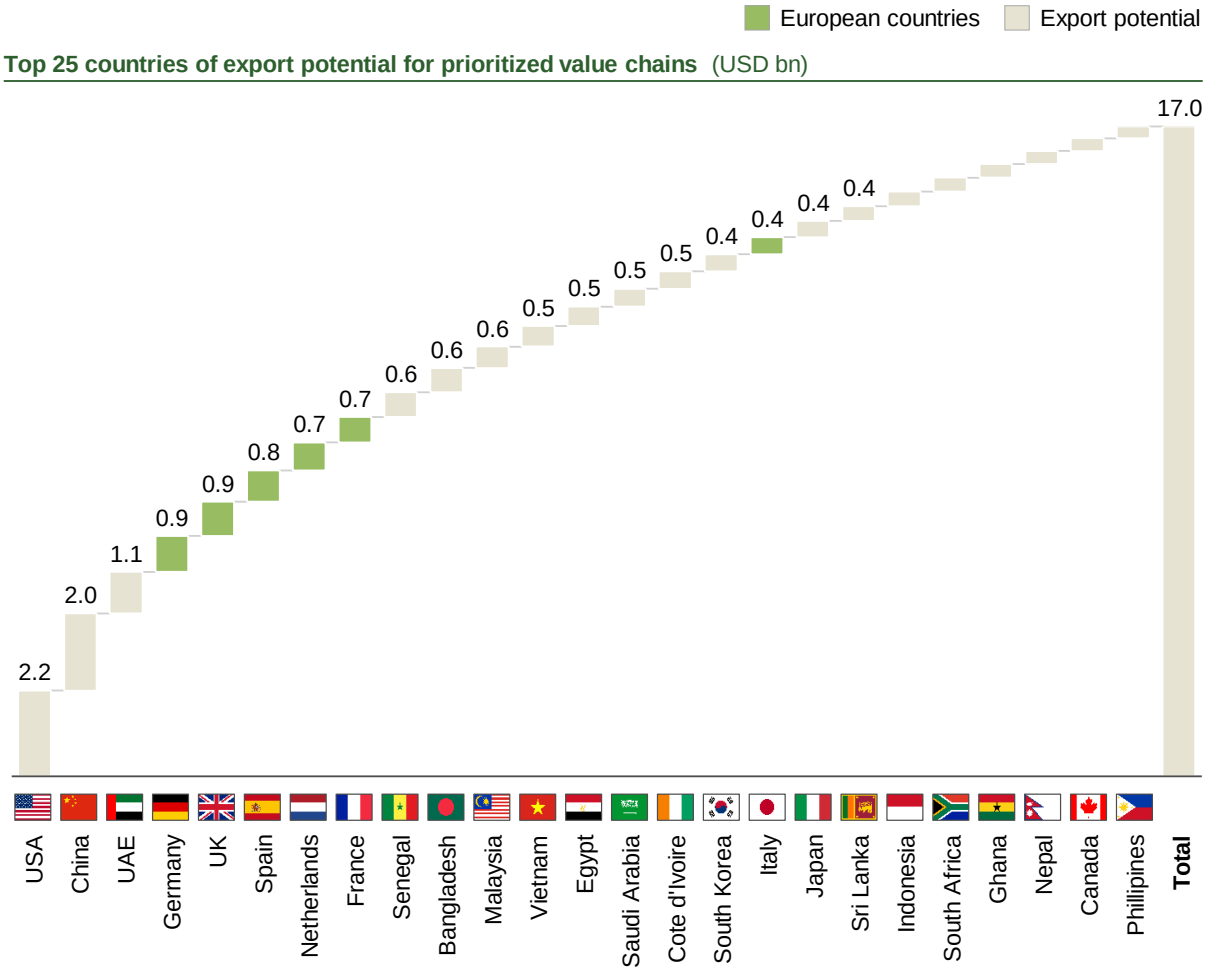
Using the International Trade Centre's export potential gravity model, a set of markets are recommended to pursue to increase exports[34]. The top 25 export potential countries for the prioritized value chains as per this model can be seen below in *Exhibit 20*. Additionally, using additional demand analysis and expert consultations, specific markets are recommended for each prioritised value chain.

33 FAOSTAT

34 International Trade Center Export Potential Map

EXHIBIT 20

The majority of opportunity can be captured by focusing on the US, UAE, and Europe



Europe contributes to $4.4B and 25% of total value from top 25 countries of incremental export potential

Source: International Trade Center Export Potential Map; FAO; Comtrade

Some of the regions India can target to drive its exports include the US, Middle East and Europe. To do so, it must build mutually beneficial trade relationships, as duties on Indian goods in Europe tend to be significantly higher than on goods from other exporters from Southeast Asia. This erodes the natural cost competitiveness of Indian products, making it challenging to compete with other exporters that enjoy preferential tariffs. India must also improve its on-farm quality control measures and traceability to ensure compliance with quality standards in the US and in Europe. India must also maintain its focus on exporting value-added processed goods as opposed to continuing business as usual and exporting mostly commodities.

India already enjoys strong trade relationships with each of the 25 recommended countries. India will need to deepen significant existing relationships instead of building entirely new trade relationships. For example, trade between India and Europe is governed by the 1994 EU-India Cooperation Agreement.

HLEG has also identified a set of target markets for each of the 20 export-focused value chains, based on demand projections[35], India's export capabilities and the "cultural distance[36]" between the 2 countries. A preliminary list of recommended target markets for each priority value chains can be seen below in *Exhibit 21*.

EXHIBIT 21

Recommend a set of target markets per priority value chain[1]

Basmati Rice	Iran, Saudi Arabia, Iraq, UAE, Yemen
Non-Basmati Rice	Nepal, Senegal, Bangladesh, Guinea, Cote D'Ivoire, UAE
Shrimp	France, Spain, USA, Vietnam, Canada, GCC, Japan, China
Buffalo	Algeria, Egypt Bangladesh, Indonesia, Malaysia, Nigeria, Vietnam
Spices	Bangladesh, Germany, Netherlands, Spain, UAE, USA
Coffee	Germany, Malaysia, Poland, United Kingdom, USA
Cashew nuts	Germany, Netherlands, United Kingdom, USA, Vietnam
Tea	Egypt, Pakistan, UAE, United Kingdom, China,
Ground nuts	Germany, Netherlands, Thailand, United Kingdom, China, Vietnam
Onions	Bangladesh, Malaysia, Sri Lanka, UAE, Vietnam
Coconut	Germany, Thailand, UAE, USA, China
Grapes	Germany, Indonesia, Netherlands, Pakistan, Thailand, United Kingdom, USA
Pulses (chickpeas)	Algeria, Pakistan, Spain, Turkey, UAE,
Mangoes	France, Netherlands, UAE, United Kingdom, China, USA
Sheep	Iran, Kuwait, Qatar, Saudi Arabia, UAE
Pomegranates	France, Germany, UAE, China, Vietnam
Honey	Belgium, Germany, Japan, Saudi Arabia, United Kingdom
Potatoes	Indonesia, Malaysia, Nepal, Sri Lanka, Vietnam
Bananas	Iran, Nepal, Saudi Arabia, UAE, United Kingdom,
Cotton	Turkey, Indonesia, Pakistan, Egypt, Vietnam
Castor beans	Germany, France, USA, Netherlands, China

35 "Market Access Map," International Trade Centre

36 Cultural distance can be defined as the degree of cultural similarities between 2 trade partners

Both state-level and central export promotion trade bodies should target the above markets for further export penetration for each commodity. However, in order to achieve further export penetration, it is necessary to address specific tariff and non-tariff trade inhibitors for each market (e.g., frequent seafood inspections in Europe and labelling and packing rules in the US).

COVID-19 AND IMPLICATIONS

Any assessment of global agricultural trade must factor in the long-term impact of COVID-19. The pandemic has led to short-term food system disruptions – manifesting as food shortages, oversupply and price fluctuations – and uncertainties in planting decisions.

As COVID-19 shapes the long-term trajectory of global food supplies, the resulting dynamics may create opportunities for India's export strategy. These could include:

- Reduced demand for specific commodities that could cause substitution effects in others, resulting in food supply imbalances
- Countries with heavy dependency on food imports look to secure supplies through long-term contracts, as explained in the section below
- Import substitution in agriculture becomes more of a priority as countries vie to become self-reliant
- Demand expected to grow for MAPE, organics and agricultural, products governed by sustainable farming practices

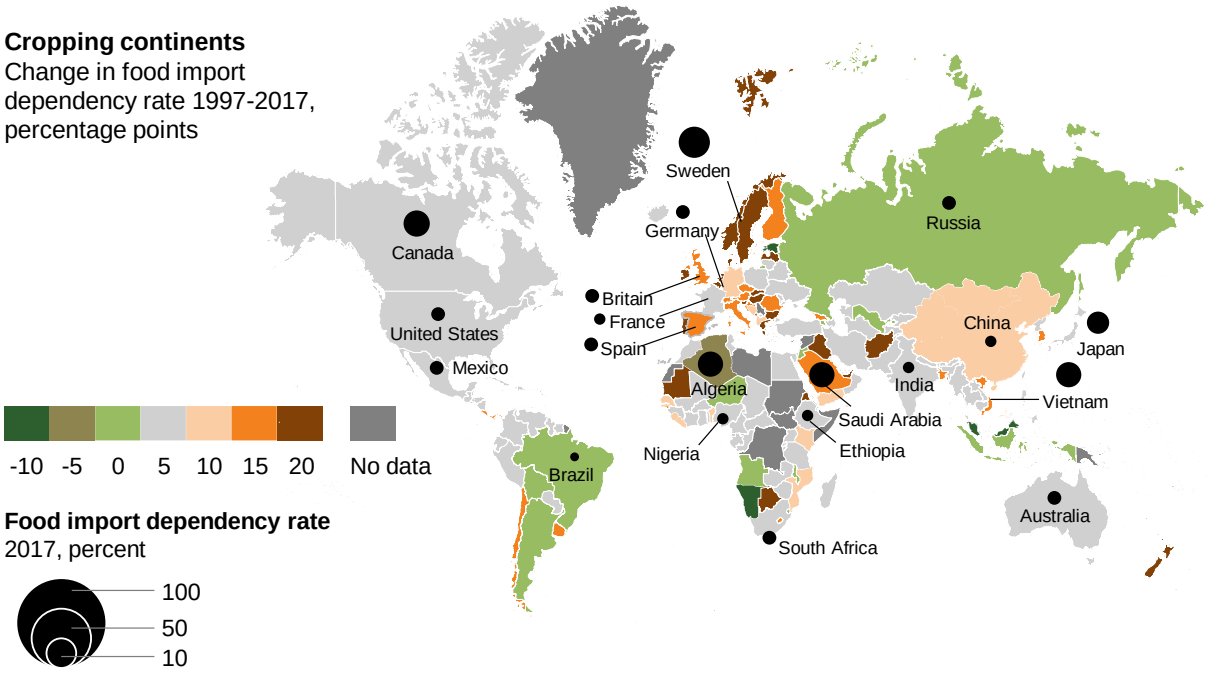
Long-term contracts

Over the past few decades, countries on average have become more dependent on food imports, as shown in *Exhibit 22* below. In an increasingly interconnected global food supply chain, disruptions in one part of the value chain may, therefore have impacts downstream. Trade flow disruptions may be further amplified by temporary measures to respond to COVID-19 by some countries. For example, Iraq, Romania, Myanmar, Philippines, Tajikistan and Vietnam have reduced exports to ensure food security and/or protect domestic markets[37]. During these uncertain times, large food importers may seek to enter into long-term contracts with exporters that can assure supply during crises also.

37 "Market Access Map," International Trade Centre.

EXHIBIT 22

The world is more dependent on food imports compared today compared to 20 years ago



Source: FAO, Economist

The actual impact will vary across commodities, products and markets. It is too early to say how demand patterns could be altered for crop value chains. By boosting its competitiveness across crop value chains and thereafter crafting trade agreements selectively (e.g., pursuing trade offset agreements with Indonesia and Malaysia for vegetable oils), India could position itself well to capitalise on these emerging opportunities.

4. Unlocking growth in crop value chain clusters

CHAPTER SUMMARY

- India needs to increase its global competitiveness, embedding sustainability, and ensuring quality to be able to succeed in these prioritised value chains
- Examples of Vietnam and Mahagrapes point to the superiority of a Crop Value Chain Cluster approach. This is an approach where all the actions needed to make a single crop value chain competitive within a state are addressed. The stakeholders come together along the entire value chain to reduce transaction costs, minimise the cost of doing business including regulatory compliance and improve quality across production, processing, logistics, establish market linkages, thus benefitting farmers and agribusinesses alike and serve to converge the government's spends and schemes
- Farmer consultations conducted across 46 crops highlighted challenges from their vantage point across the crop value chain, starting with the need for clear demand-backed input on crop selection, all the way through to production, post-harvest practices and financing. These inputs informed the design of the value chain cluster
- In order to inform our perspective on what it will take to unlock agricultural export growth in these value chain clusters, the HLEG conducted an analysis of 7 lighthouse value chains (shrimps, chilli, mango, rice, buffalo meat, wood and vegetable oil). We have chosen shrimps as an illustrative example in this chapter to identify value chain-specific pain points and solutions and therefore, a portfolio of initiatives to unlock the export potential of the relevant value chain. In order to showcase the diversity, rice and vegetable oil have also been described briefly. All value chains are covered in the Annexure
- The reforms in agricultural marketing laws announced by the Central Government in June 2020, together with the Funds earmarked for post-harvest infrastructure, provide further fillip to deepening the engagement between farmers and the private sector. Similarly, additional policy initiatives such as Direct Beneficiary Transfers that are attempting to minimise distortion in markets will also go a long way in providing support to the proposed crop competitiveness building efforts. The HLEG acknowledges that despite the need for value-chain specific interventions by the state, certain cross-cutting enablers will need to be addressed centrally via policy reform. There are 4 types of interventions the centre could make, namely, government policy, trade relations, export incentives and common infrastructure. In addition to the enablers identified above, as part of an effort to attract private sector investment and FDI, the central government may pursue policies that support ease of doing business, faster resolution of commercial disputes and other areas which will improve investment in this sector especially in processing and value-added products

VALUE CHAIN CLUSTERS – CONCEPT AND APPROACH

India will succeed in these prioritised crop value chains by increasing global competitiveness, embedding sustainability, ensuring quality needs of the destination markets are met and therefore,

creating a distinct position. Interventions for improving cost competitiveness and quality are needed at several points along the crop's value chain, right from inputs to processing and other forms of value addition to the products. In addition, regulatory reform will also be required. Any weak link in the chain could lead to the entire value chain effort failing. For example, even if the issues pertaining to market linkages are solved, not having the right quality of inputs and appropriate crop management practices will result in downstream SPS rejections.

Examples of Vietnam and Mahagrapes point to the superiority of a value chain cluster approach. This is an approach where all the actions needed to make a single crop value chain competitive within a state are addressed. Such a value chain cluster is also supported by a comprehensive ecosystem of producers, FPOs, agribusinesses, financiers, corporates, commodity boards state and central governments and agencies, and complemented by country-level interventions in destination markets. Past learnings indicate the sequence is important and an established path to cluster competitiveness is a prerequisite to trade agreements and mutual concessions with destination markets.

This approach solves for building competitiveness in the crop value chain. Making the cluster itself economically viable and boosting the farmer's year-round income may require supplementing the primary crop of the value chain cluster with 1 or 2 additional crops in some clusters. Several elements of the infrastructure created for one value chain in the cluster can be shared across other value chains to amortise costs, especially for crops spanning across different seasons in the same year. This has been successfully demonstrated by the Baareh Mahine Hariyali, an ITC e-Choupal initiative, that has combined multiple initiatives of cropping intensity (wheat, rice and summer moong), productivity enhancement and market linkages. It has been implemented by 2 lakh farmers who have seen an overall 30-75% increase in their annual incomes, with 35,000 farmers doubling their income in the very first year[38].

The crop value chain cluster serves to build "vertical" relationships along the value chain among input suppliers, processors, exporters and buyers. It also builds "horizontal" relationships at each link between producers and facilitating organisations such as technology providers, trainers and research institutes[39]. These stakeholders come together along the entire value chain to reduce transaction costs, minimise the cost of doing business including regulatory compliance and factor costs of production, improve quality across production, processing, logistics, establish market linkages, thus benefitting farmers and agri-businesses alike. The cluster would also serve to converge the government's spends and schemes, as well as seek any additional funding required, for (i) building the necessary infrastructure at competitive costs, (ii) strengthening farmer capacity, (iii) promoting research and development and (iv) promoting "Brand India" in global markets.

In this context, Farmer Producer Organisations (FPOs) could serve as the link with individual farmers, especially the small and marginal. These organisations can engage in a wide range of activities such as bulk procurement of inputs, aggregation of produce, value addition and marketing in the value chain cluster. Alternatively, new digital models could tap into a network of village entrepreneurs, supported by schemes such as the Pradhan Mantri Mudra Yojna (PMMY).

Each of these crop value chain clusters in every state should be duly anchored by one or more anchor private sector players to provide the transformative impetus required. It is also conceivable that production, processing and export legs of a value chain are spread across multiple states for reasons

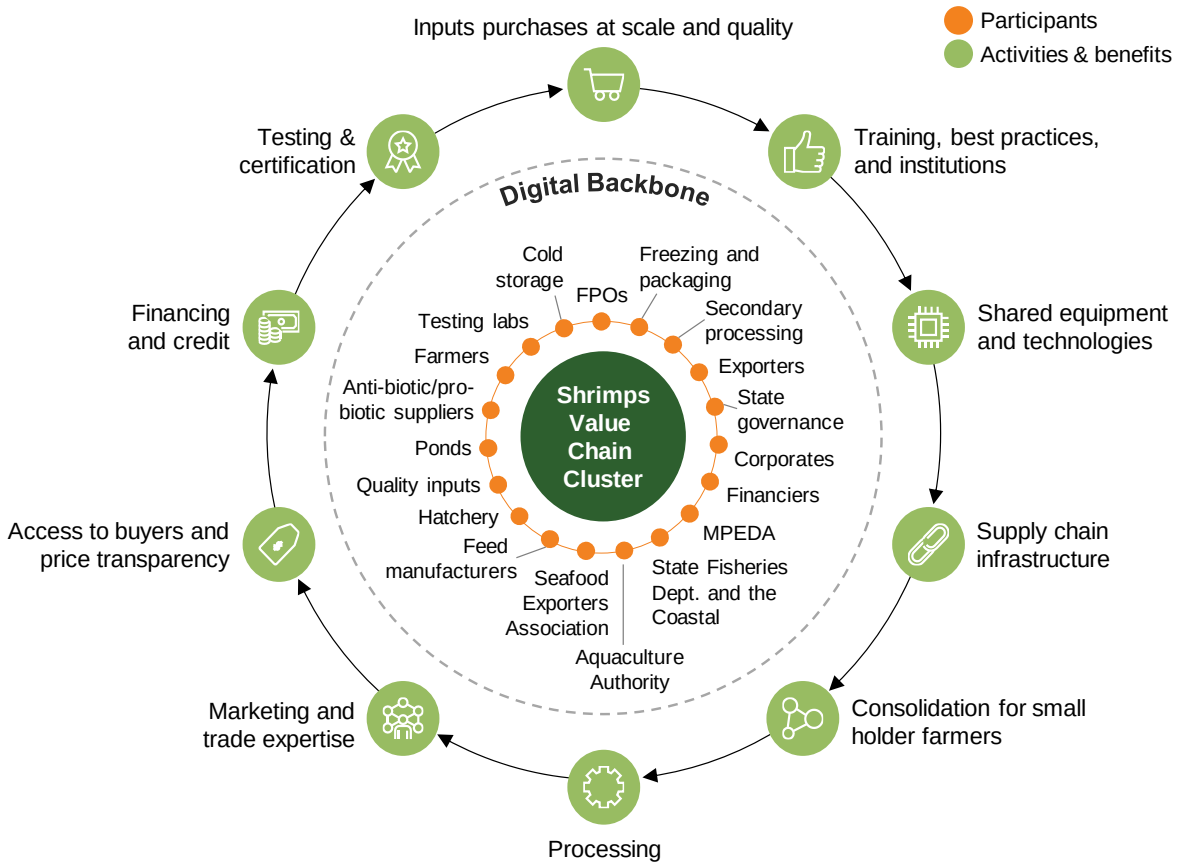
38 "Baare Mahine Hariyali – Multiplying Farmer Incomes Case Study". ITC Portal report. Accessed July 2020.

39 Gálvez-Nogales, Eva "Agro-based clusters in developing countries: staying competitive in a globalized economy". FAO 2010.

of economic scales. Anchor private sector players and commodity boards could provide the necessary linkages in such cases. *Exhibit 23* illustrates the concepts of a crop value chain cluster, using the shrimps value chain as an example.

EXHIBIT 23

Value chain cluster approach – Shrimps example



Value Chain Cluster approach

An approach where all the actions needed to make a single crop value chain competitive within a state are addressed.

A Value Chain Cluster is supported by a comprehensive ecosystem of producers, FPOs agribusinesses, financiers, corporates, commodity boards, state and central governments and agencies, and complemented by country-level interventions in destination markets.

The stakeholders come together along the entire value chain to reduce transactional costs, minimise the cost of doing business including regulatory compliance and improve quality across production, processing, logistics, establish market linkages, thus benefitting farmers and agri-businesses alike and serve to converge the governments spends & schemes

Source: MOFP; FAO

FARMER CONSULTATIONS

Farmer is the central stakeholder for achieving the country's stated aspirations of doubling agricultural exports and improving farm and farmer productivity. In this context, systematic consultations with farmers across geographies and across crop value chains were conducted to understand their perspective for designing the value chain ecosystem. These consultations highlighted challenges from their vantage point across the crop value chain, starting with the need for clear demand-backed input

on crop selection, all the way through to production, post-harvest practices and financing. Inputs from these consultations, as well as those with the specific Commodity Boards and private sector players have been considered in the design of the value chain ecosystem.

FARMER CONSULTATIONS

The farmer is the central stakeholder for achieving the country's stated aspirations of doubling agricultural exports and improving farm productivity. Systematic consultations with farmers across geographies and crop value chains were conducted to capture challenges, pain points and take their suggestions/inputs. The Farmer consultations highlighted challenges, starting with the need for clear demand-backed input on crop selection, all the way through to production, post-harvest practices and financing.

Inputs received across themes:

Seeds, inputs and R&D

There is a need for better quality seeds – high yielding varieties, hybrids, climate & drought resilient, pest & disease resistant & short duration crops. There is a requirement of regional research stations for local crops that can develop customized PoPs according to local crop varieties.

Soil and water (Irrigation)

At a village level, soil and water samples should be tested every season and the resulting reports should be shared with farmers along with corresponding agronomy advisory.

Extension & capacity building

By way of capacity building, trainings, farm meetings, workshops, exposure visits are required with a strong field staff strength.

Information

The different streams of information that would be primarily helpful are: (i) awareness on subsidies, insurance facilities & claim procedures along with hand holding (ii) advanced weather forecasts and crop-specific loss-management information and (iii) market information on demand and prices with latest updates on mandi prices.

Manual labour and farm mechanization

Skilling of MNREGA workers for agri operations shall ensure labour availability. Expansion of Custom Hiring Centres (CHCs) is required for the farming community where farm equipment and machinery on rent are made available.

Post-harvest practices technology

There is a need for community drying yards, poly house drying, ripening chambers, pack houses, reefer vans, cold/cool storages with extended government subsidies. Measures around localised marketing, road connectivity and storage facilities will help reduce wastage.

Financing

There is a need for interest subsidies, simpler documentation and procedures and minimum account maintenance charges. Crop loans with EMI cycles in line with crop seasons will also be helpful.

Challenges with FPO Formation

There is lack of knowledge on the FPO model**.** The government needs to disseminate information –and create platforms to link FPOs with food processing companies.

Demand backed production plan

The demand-specific cropping pattern (Crop Regulation) needs to be done on the basis of demand and supply. Information on alternate crops can help the farmer fetch higher returns.

In order to inform our perspective on what it will take to unlock agricultural export growth in these value chains, the HLEG conducted a **deeper analysis of 7 lighthouse value chains** (shrimps, chilli, mango, rice, buffalo meat, wood and vegetable oils). This analysis identified pain points specific to each crop, along the value chain, to surface solutions and therefore, a portfolio of initiatives. We illustrate the approach and the insights that emerged by detailing shrimps, rice and vegetable oils while others are covered in the Annexure.

SHRIMPS – CONTEXT AND STARTING POINT

India has already established a strong position as a global leader in farmed shrimps. India is the world's largest shrimp exporter, meeting ~20% of global demand, which represent ~10% of all agri exports from India[40]. India is also placed at a competitive position on the cost curve, with significant cost advantage for small size shrimps primarily, as shown in *Exhibit 24*. Other countries competing in global shrimps' market are Vietnam, Thailand and Ecuador, all together accounting for ~55% global production[41].

The production for shrimp in India is concentrated with over 60% of shrimp being produced in Andhra Pradesh, with emerging states such as West Bengal, Odisha and Gujarat[42]. Much of India's success in global shrimp trade is caused by the decision to invest heavily in vannamei production, a new variety of shrimp in India. Andhra Pradesh has seen particular success due to this decision. Top destination markets for Indian shrimp currently include US, Vietnam, Japan and EU. 93% of the exports are unprocessed (frozen)[43]. Processed output is small but growing and needs to be further scaled and strengthened.

Given the current endowments, shrimp value chain is well placed for driving overall agri exports from India. However, certain challenges and enablers exist that need to be put in place to realise the potential.

40 mpeda.gov.in – Ministry of Commerce and Industry; United Nations International Trade Statistics Database

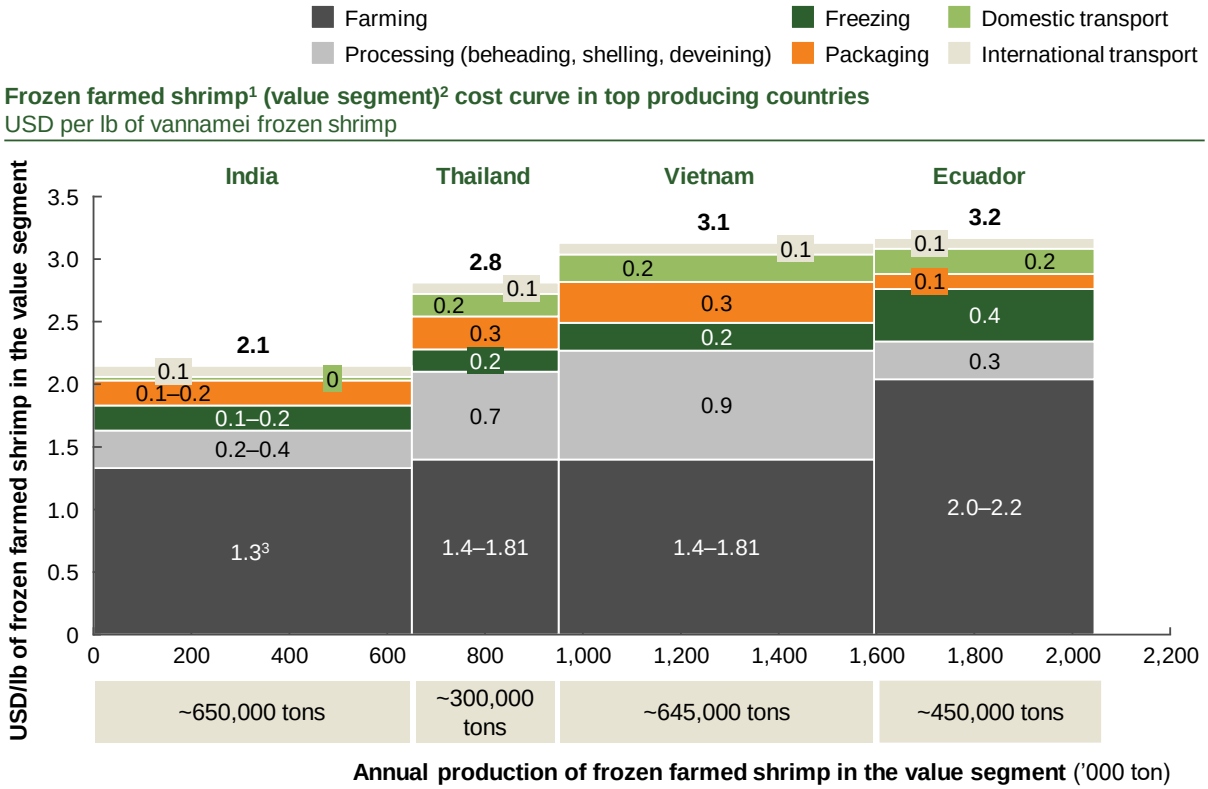
41 FAO World Fisheries – The Food and Agriculture Organization of the United Nations, FAO Globefish; Journal of the World Aquaculture Society

42 mpeda.gov.in – Ministry of Commerce and Industry

43 mpeda.gov.in – Ministry of Commerce and Industry; United Nations International Trade Statistics Database

EXHIBIT 24

Shrimps cost curve for the 4 largest producers of Shrimps globally



Key insights

- India, Vietnam, Thailand and Ecuador account for ~55% global production, with Vietnam and India the largest producers
- India, Vietnam and Thailand are overall more cost-competitive due to lower farming cost (low labour cost) but suffer from farm fragmentation
  - Shrimp farmers are highly fragmented and sell weekly to the highest bidder within processing agents
  - Processors are consolidated and vertically integrated upstream (not in farming)
- Indian processing cost is lower as a large portion of exports is lightly processed, versus a trend towards higher value-adding processing in other markets
- Ecuador commands a price premium due to higher quality of established farm practices
- Given India's cost advantage, ramping up production is likely to lead to higher export volume

1. Specifically for white leg shrimp (55% global production)
2. Value segment is between USD 3/lb to USD 3.7/lb;
3. Cost relative to smaller frozen vannamei shrimps (10g) while 2.5+ USD/lb for higher value shrimps (20g+ shrimp)

Source: Expert interviews, sustainablefish.org, FAO Globefish; Journal of the World Aquaculture Society; California Environmental Associates;

Key issues and challenges in Shrimps Value Chain

The shrimp industry faces a range of challenges across the value chain, predominantly faced by smallholder farmers. The pain points can be categorised into 5 main areas

- **Global demand generation, promotion and branding** – Indian shrimp export associations barely register a presence in some of the key markets like US and EU. Shrimp associations around the world have taken a more active role in demand generation (e.g., American Shrimp Processors Association has run marketing campaigns on health benefits of shrimp). Lack of active promotion has resulted in no unique value proposition for Indian shrimp. For example, Ecuador has built a strong brand for its shrimp industry anchored on sustainable farming and has built a strong presence in China's growing market segment for sustainable shrimp[44].
- **Productivity and cost** – Compared to India, countries like Philippines and Thailand are 2x more productive due to a strong focus on intensive farming of shrimp[45]. India's most productive states (i.e., Andhra Pradesh and Gujarat), are still significantly less productive than these countries. We also see a huge variation in productivity in India across states, with Andhra Pradesh and Gujarat being ~2x more productive compared to states like Goa and Karnataka, as shown in *Exhibit 25* below[46]. This is primarily driven by differences in natural endowments (like water quality, climatic conditions) as well as varying farming practices across states. Indian shrimp productivity is significantly hampered by low-quality seeds, low stocking density, inability to deal with variances in weather conditions and water quality. Further, there are several unauthorised hatcheries who do not follow best hygiene practices leading to lower quality seed, and higher disease incidence and mortality rates[47]. Another challenge is access to quality inputs, e.g., hatcheries are mostly reliant on imports from US, Mexico and Indonesia for broodstock, and there are only 14 CAA-authorised broodstock suppliers exporting to India[48]. Further, shortage of cold storage infrastructure (from ponds to processors) leads to shrimp losing freshness, especially during monsoons, leading to wastage as high as 30%[49].

44 Craze, Matt. "Ecuador ready to challenge global shrimp industry with sustainability metrics" Undercurrent News. October 2018.

45 Shrimp Aquaculture Landscape, mpeda.gov.in – Ministry of Commerce and Industry

46 mpeda.gov.in – Ministry of Commerce and Industry

47 mpeda.gov.in – Ministry of Commerce and Industry; Expert consultations; The Hindu Business line; Times of India; CIFA (Central Institute of Freshwater Aquaculture)

48 Coastal Aquaculture Authority. "Empanelment of Overseas Suppliers of SPF shrimp broodstock". 17th February 2020.

49 Expert consultations; United Nations International Trade Statistics Database, mpeda.gov.in – Ministry of Commerce and Industry; Yes Bank Cold Chain Perspective, 2015

EXHIBIT 25

State productivity variances for shrimp are driven by a mix of differences in farming practices and natural endowments

Other factors to be considered

Hatchery ease of access	Most hatcheries located in AP and Tamil Nadu. Delays in getting seeds could lead to delayed harvests and non-optimal temperatures
Aggregation efficiency	States vary in aggregation mechanisms (e.g., FPOs, contract farming, larger farms) causing lack of scale efficiencies
Cost of labour	Labour costs are higher in some states (e.g., Kerala and Tamil Nadu) leading to smaller workforces
Government subsidies	AP and West Bengal state governments have strongly supported shrimp production relative to other states
Market development	Some states have more developed markets, which incentivize enhanced productivity

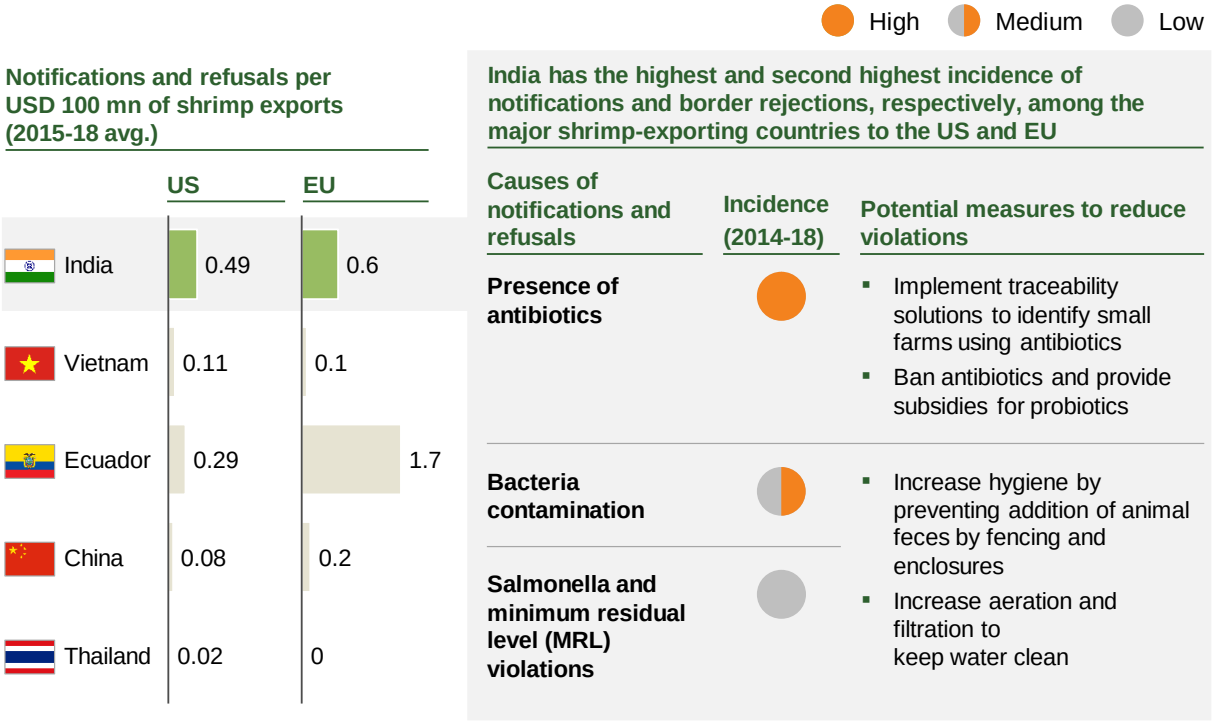
1. Refers to vannamei shrimp production

Source: MPEDA; Expert interviews; USDA; Shrimp Aquaculture landscape, California Environmental Associates; Best Aquaculture Practices (BAP); Station-wise weather data

Quality – Indian shrimps face significant quality issues[50]. India has high incidence of notifications and border rejections amongst the shrimp exporting countries to the US and EU, as shown in the exhibit below. The top 3 most frequent causes of rejections are presence of antibiotics, bacteria contamination and salmonella and Minimum Residual Level (MRL) violations. Quality violations have led to stringent quality testing protocols imposed by markets like EU (e.g., 20 shrimp refusals from the EU and 83 from the US in 2018 due to presence of antibiotics and salmonella)[51]. The resulting increase in controls from these violations increase the cost of compliance for all the shrimps' exporters, rendering them uncompetitive. While exporters are aware of SPS changing standards, they do not have strong backward linkages to influence farming practices. Therefore, Indian shrimps are unable to capture a commensurate global market share.

EXHIBIT 26

India's SPS issues indicate a need to improve farming practices



Source: FDA; RASS Tool; press search; expert interviews

- **Processing and value addition** – Indian shrimps are largely exported in raw bulk form and this is associated with lack of investment in processing and fragmented market structure. Indian exporters have not focused on branding ready-to-cook and ready-to-eat shrimp and have not yet developed a target market for these value-added products. The fragmented nature of the Indian export landscape also makes it relatively easier to export a mass product to many markets, as opposed to creating a processed product customised for fewer markets. Thailand, which leads the processed

50 Import Refusal tool – FDA, RASFF Tool: European commission, expert consultations

51 Ibid.

shrimp market, has a significantly consolidated market with ~10 major players, who have invested in the branding and equipment required to produce and market processed products.[52]

- **Registration of Ponds** – New farm registration and expansion process is quite tedious and takes at least over a year. Experts mentioned that in few cases, the requests for approvals have been pending for 3-4 years. This has led to emergence of many unregistered ponds. Simplification of pond registration process and institutionalising "Single Window Clearance" can significantly unlock the growth potential of Shrimp.

Steps for shrimp farm registration	Stakeholders
Obtaining application from Fisheries Department	Fisheries Department
Submission of application with land documents and ID proofs to Village Revenue Officer (VRO)	Village Revenue Officer (VRO)
Obtain NOC from Village Revenue Officer, Mandal Revenue Officer (MRO) and Regional Revenue Officer (RO)	VRO, Regional Revenue Officer (RO) and Mandal Revenue Officer
Submit NOC, application and land documents to Fisheries Department Officer (FDO)	Fisheries Department Officer (FDO)
Application Assessment Mandal Level Committee, FDO, Pollution Department and Agriculture Officer	Mandal Level Committee, FDO, Pollution Department, Agriculture Officer
Physical verification and Inspection of site Recommendation to District Level Committee (DLC) if it meets the standard check list	District Level Committee (DLC)
Authorisation and Check by DLC DLC: Collector, JD of Fisheries, JD of Agriculture, JD of Irrigation (fresh water), Pollution Dept.	DLC involves Collector, JD-Fisheries, Agriculture, Irrigation, Pollution Department
Authorisation and Check (after DLC it will go to CAA, Chennai)	DLC, Coastal Aquaculture Authority (CAA)
CAA issues the license to farmers, dispatches over courier	CAA
The process is quite tedious and takes at least over a year. Experts mentioned that in few cases, the requests for approvals have been pending for 3-4 years	

- **Investment in R&D and technology –** Ecuador has made significant investments in R&D and technology, for instance digitally-enabled automatic feeders, aerators, real-time feedback from IoT for hatcheries and farm management, high-quality feeds, which has established a stable foundation enabling future growth for Ecuador shrimps. India lags behind in terms of R&D investment and adoption of advanced technologies in the value chain which leads to lower productivity and higher number of quality issues

- **Trade conditions for some markets –** Exports to Europe are relatively limited, at about USD 500 mn total (to UK, Belgium, Netherlands and France combined), as compared to US where India exports USD 2.1 bn worth shrimps. Europe trade was further constrained by EU's decision to test 50% of Indian shrimp for antibiotics, increasing rejections and decreasing India's export cost

52 United Nations International Trade Statistics Database and Seafood trade intelligence portal

competitiveness[53]. Exports to China from India are low (USD 75 mn) and mostly gets re-exported via Vietnam because of the duty differential.[54]

Key interventions needed to unlock value in Shrimps Value Chain

The HLEG suggests that each of these pain points be converted into specific supply and demand side initiatives, addressed by a relevant stakeholder. 6 specific solutions emerge that could more than double shrimp exports from the current USD 4.4 bn.

1. **Brand building focused on large global demand hotspots**

   The first is for MPEDA along with the Seafood Exporters Association and private sector anchor investors to focus on building a brand for India in the key target markets by investing in targeted branding campaigns, co-branding activities with major retail chains, etc. They can also undertake demand generation measures inspired by, e.g., Global Aquaculture Alliance developing international standards called the Best Aquaculture Standards to increase consumer trust, AGEXPORT investing in aquaculture biosecurity and genetic selection measure and the American Shrimp Processors Association promoting health benefits and nutritional quality of shrimp through a media marketing campaign. The efforts on branding, e.g., the creation of a Shrimp Export Promotion Council, should build on existing institutions and ongoing branding efforts.

2. **Improve hatchery operations to drive higher survival rates and better quality**

   Authorised hatcheries utilise aquaculture best practices that greatly increase seed quality and therefore, shrimp survival rates (5x) relative to unauthorised hatcheries. A few such best practices include[55]

   a. Daily water exchange to ensure high water quality
   b. Strict protocols for using disinfecting agents
   c. Utilising disease management best practices (e.g., fence in shrimp pond, protect ponds from birds)
   d. Voiding antibiotic and unwanted chemical treatment
   e. Keeping proper records of each action involved in hatchery operations to identify root causes of failures and rejections

   Enforcing these standards on the currently unauthorised hatcheries and getting them authorised can significantly improve the survival rates, enable ease of monitoring, as well as reduce export rejections, leading to opening of new markets.

3. **Improve shrimp farmer productivity by improving stocking density and increasing number of harvests**

   Shrimp farm productivity can be improved through 2 key initiatives

   a. **Increasing stocking density** using technology investments such as pumping 2-5% water exchange, continuous aeration, etc. Andhra Pradesh and Gujarat have used these techniques

53 http://agriexchange.apeda.gov.in/news/NewsSearch.aspx?newsid=25072

54 UN Comtrade

55 mpeda.gov.in – Ministry of Commerce and Industry; Expert consultations; The Hindu Business line; Times of India; CIFA (Central Institute of Freshwater Aquaculture)

to increase their density up to 5-10x of most other Indian states[56]. A summary of the range of stock density and technical requirements is detailed in *Exhibit 27* below. However, there are trade-offs in terms of disease risks (i.e., requires greater use of antibiotics which could increase SPS violations) and environmental risks (i.e., acid build-up and removal of mangrove trees) need to be carefully evaluated and right practices need to be followed to manage these risks.

b. **Increase number of harvests** by utilising recirculating aquaculture systems and shortening harvest cycles by understanding shrimp size demand and sell smaller shrimps where possible.

EXHIBIT 27

Increasing density is a key lever to increase shrimp output, but there are tradeoffs

Density Units/m2	Country examples	Harvest weight[1] Kg/Ha-year	Technical requirements	Operational implications
Super-Intensive (150-500)		40,000-340,000	▪ Closed culture ▪ Pumping to 2-5% ▪ Continuous aeration ▪ Fertilization ▪ Sinking feed	▪ Highest shrimp yield per hectare ▪ Feed conversion will increase ▪ Shrimp stress requires monitoring of water and operational conditions
Intensive (30-150)	**Andhra Pradesh and Gujarat**	10,000 40,000	▪ Closed culture2 recommended but not necessarily required ▪ Pumping to 5-20% water exchange ▪ Partial aeration ▪ Fertilization ▪ Sinking feed (advanced feed that increases feed conversion)	▪ Requires more seed and feed ▪ Requires better water management practices and monitoring ▪ Shrimp stress will increase mortality, but disease can be mitigated with the right technologies ▪ Higher density could lower overall shrimp health due to more organic matter in water
Semi-intensive (15-30)	**Most Indian states**	1,000-3,000	▪ Pumping to 5-20% water exchange ▪ Partial aeration ▪ Fertilization ▪ Regular feed	▪ If technology improvements are made, shrimp stress should not increase from extensive farming
Extensive (8-15)		1,000-2,000	▪ Pumping under 5% water exchange ▪ Regular feed	▪ Low stress in shrimp: higher survival rate and weight per shrimp ▪ Lowest shrimp yield per hectare

10x boost[3]

Tradeoffs in increasing density include

- **Antibiotics –** Increasing density calls for greater use of antibiotics to prevent spread of disease, which could harm SPS
- **Disease –** Increased density also increases risk due to greater prevalence of disease. Larger farmers are better able to manage the enhanced risk than smallholder farmers
- **Environmental –** Could lead to environmental impact including pollution and acid build-up in ponds, and removal of mangrove trees

Barriers to shift to intensive farming

Intensification requires:

- Capital for tech investments and more seed and feed
- Knowledge and training to implement operational requirements

> "It's not possible for a farmer to expand his pond. The only lever to pull is production to get India to be more competitive with the rest of Southeast Asia. Migrating from semi-intensive to intensive farming will create a significant production increase and will not necessarily increase the risk of disease if managed properly
>
> **– Director, Indian Aquaculture Co.**

1. Figures are not specific to any given country and should be considered general heuristics
2. Cut off shrimp production ponds from river or sea
3. Another potential strategy could be to increase density over time as the shrimp mature, as they are less susceptible to disease. Additional advantage from utilizing a nursery

Source: Expert consultations

4. **Invest into infrastructure like land, storage and testing facilities**

Infrastructure-related investments will be required across 3 key areas – testing labs, storage and logistics infrastructure, and land for capacity expansion.

a. States will need to appropriately demarcate land for expanding aquaculture ponds for the required capacity expansion (after accounting for the increase in intensity). E.g., one state government pledged to expand an additional 16,000 hectares in 2018 for developing new aqua zones, and allotted 30 acres and provided INR 68 crore to create state-of-the-art facility for broodstock multiplication facility[57]

b. Antibiotics' presence contributes to a significant majority of India's SPS violations. Strengthening of authorised testing lab close to farm gate to conduct screening test for the shrimp for the use of antibiotics will significantly help in avoiding violations and quality rejections at a later stage

c. Strengthening of cold storage infrastructure is required to reduce wastage especially during monsoons with high wastage levels of ~30% primarily in post-harvest stages[58]

Some of the state governments have been leading the way in incentivising shrimp industry, and there are several examples of infrastructure development in past few years, e.g., West Bengal government invested in cage aquaculture development; Fisheries Investment Policy of 2015 extends fiscal incentives to encourage entrepreneurs for micro, small, medium and large enterprises in aquaculture[59]. However, to unlock the disproportionate growth aspiration, states will need to create an end-to-end value chain investment plan linked to it and drive concerted efforts to bridge infrastructure gaps across the value chain.

5. **Traceability**

With a growing global demand for sustainable practices, there is a need to introduce greater transparency and traceability in the shrimp supply chain ecosystem, to drive coordinated data tracking of disease, water pollution, waste discharge, use of antibiotics and other issues that need to be traced. This will be through end-to-end digitisation, technology enablement of the value chain and biosecurity through establishing testing labs that will provide the required certifications. It is critical to ensure that the laboratory tests fully align with the testing protocols of the target markets. This can be further enabled by strengthening of industry consortiums and FPOs. E.g., in March 2018, 7 of Ecuador's largest shrimp producers launched the Sustainable Shrimp Partnership (SSP), a certification programme guaranteeing zero use of antibiotics, full traceability and zero negative impact on the environment (as shown through a water quality measure)[60].

6. **Bilateral trade and sectoral agreements to ensure favourable tariffs**

The Marine Products Export Development Authority (MPEDA), within the Ministry of Commerce and Industry, needs to engage with target markets like US and EU to define bilateral sectoral trade agreements to ensure favourable tariffs. This needs to be coupled with appropriate quality and

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57 https://www.ap.gov.in/wp-content/uploads/2018/12/White-paper-on-Agriculture-Horticulture-Animal-Husbandry-Sericulture-Dairy-Development-Fisheries-Agricultural-Marketing-Departments.pdf; https://www.thehindu.com/news/national/andhra-pradesh/aquaculture-set-to-get-major-boost-in-state/article23411444.ece

58 Expert Consultations; Comtrade; MPEDA; Yes Bank Cold Chain Perspective, 2015

59 Government of West Bengal, Department of Fisheries

60 https://www.seafoodsource.com/news/aquaculture/ecuadors-sustainable-shrimp-partnership-moves-forward-with-creating-shrimp-farming-standards

testing protocols. For example, trade with Europe is constrained by EU's decision to test 50% of Indian shrimp for antibiotics[61]. To unlock the value from markets like Europe, the Ministry of Commerce and Industry will need to work with target markets like Europe to define trade agreements with well-defined testing protocols, enabled by traceability solutions.

7. **Drive towards value-added processing**

While India is a leader in shrimp exports, it lags global competitors Indonesia and Thailand in value-added processing. Ready-to-cook, ready-to-eat, and other further processed shrimp command a significant price premium (30-35% price premium) over frozen shrimp in the global export market[62]. India will require private sector actors to anchor investments in processing facilities for shrimp products. States could combine several measures into appropriate state incentive packages for export processing units to attract private sector investments. While some states already incentivise exports, there is a need for targeted incentives to encourage private sector investment in value added processing.

8. **Farmer capacity building**

To drive this transformation, we need to ensure shrimp-specific farmer capacity building to be done in a targeted manner within the clusters. Enabling farmers to access information and technical know-how is important to help unlock their potential. It is critical to drive good aquaculture practices (GAPs) and better management practices (BMPs) in shrimp aquaculture. This can be achieved through public and private channels, by organising small holder farmers into clusters (societies/ aquaclubs), by developing targeted and effective training programmes, and institutionalising incentive-based training that link farmers to markets/buyers where changes in practices are also rewarded with increased income for better practices. Andhra Pradesh and West Bengal are on this journey and have demonstrated the transformation of the shrimp value chain.

9. **Investment into R&D and technology**

Many countries like Ecuador have pioneered the adoption of R&D and technology in shrimp farming to unlock productivity. A summary of Ecuador's approach can be found in *Exhibit 28*. The transformation of Shrimp value chain in India will need significant investment in R&D and technology – for instance investment in high-quality inputs specific to Indian climatic conditions and species, investment in technology like sensor-enabled auto-feeder and precision farming, use data analytics for improving farm efficiency and disease management.

Many of the interventions mentioned above might have been tried in the past and are known to the stakeholders in the value chain. However, to unlock the disproportionate growth aspiration, states will need to create an end-to-end/integrated value chain plan linked to the growth aspiration and drive concerted efforts to bridge the gaps across the value chain. Many of the interventions listed above will also involve high capital investment required by farmers in quality inputs, technology and the know-how to implement operational requirements. This support and know-how could be provided by the anchor private players and FPOs to the shrimp farmers. Private sector involvement will be critical to unlock this value and also bring in the required investment into R&D and technology. Research institutes will also play an important role in contributing to technology advances and must

61 RASFFTool–European Commission; "Troubled Waters," The Hindu Business Line, March 09, 2019.

62 United Nations International Trade Statistics Database; FAOSTAT tool – The Food and Agriculture Organization of the United Nations

be integrated with specific value chains. States will need to focus on developing mechanisms to attract private sector investment and support the research community.

These initiatives should each have specific measurable metrics against which progress can be tracked and monitored. This is especially critical for those enablers which make the project viable. Enabling metrics for the shrimp value chain could include share of production from authorised hatcheries, stocking density, investment in the form of subsidies for probiotics, investment in storage capacity building and investment in processing. In addition, each of the value chain clusters will have measurable outcome metrics against which progress can also be tracked.

EXHIBIT 28

Ecuador has become a global giant in shrimp exporting, known for quality and growing exports by 25% per year since 2013

How did they do it?

Invested in deep capacity for traceability and sustainability

Built industry consortium for exports. In 2018, Ecuador's seven largest shrimp producers launched the Sustainable Shrimp Partnership (SSP), guaranteeing no antibiotics, full traceability and zero environmental impact (based on water quality measures)

Joined IBM Food Trust for integration of distributed ledger traceability technology

Strategically focused on the right segment

Chinese consumers prefer whole shrimp, compared to US and EU where there is greater preference for value-added shrimp products and Ecuador is more cost competitive in head-on, shell-on (HOSO)

China has a growing segment for sustainability/traceability, in which Ecuador has invested heavily

Invested in disease prevention

Learning from the disease outbreaks that decimated the industry in the past, producers in Ecuador reduce the likelihood of disease outbreaks and lower need for antibiotics by using semi-intensive farming methods with only 10-15 shrimp per sq m (Asian farmers can stock 100-1,000 shrimp per sq m)

Ecuador has introduced new genetics, species diversification, multiplying brooders within the country

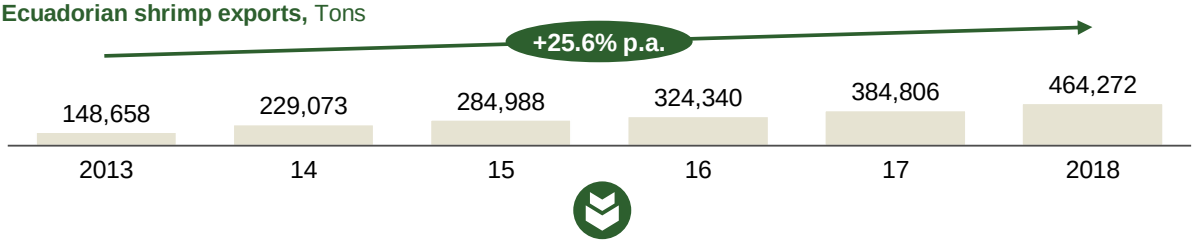
Built on foundations that enable future growth

Significant investments in high-quality input sector – developed feed industry, more formulations, better nurseries, automatic feeders, aerators, real-time feedback from IoT

Relatively low farm level production costs, but higher labor costs for packers than India

Three production cycles per year

Ecuadorian shrimp exports, Tons



Ecuador's success

>20% of global shrimp export market, ranked 2nd in the world

21% shrimp export CAGR from 2013-2018

"Geography is key and Ecuador has a geography that is unique to shrimp farming. The temperature is perfect and they can produce 5 cycles per year. They also have natural mangrove areas that are excellent for shrimp farming because they don't require a ton of investment to convert into shrimp ponds.

– Aquaculture entrepreneur

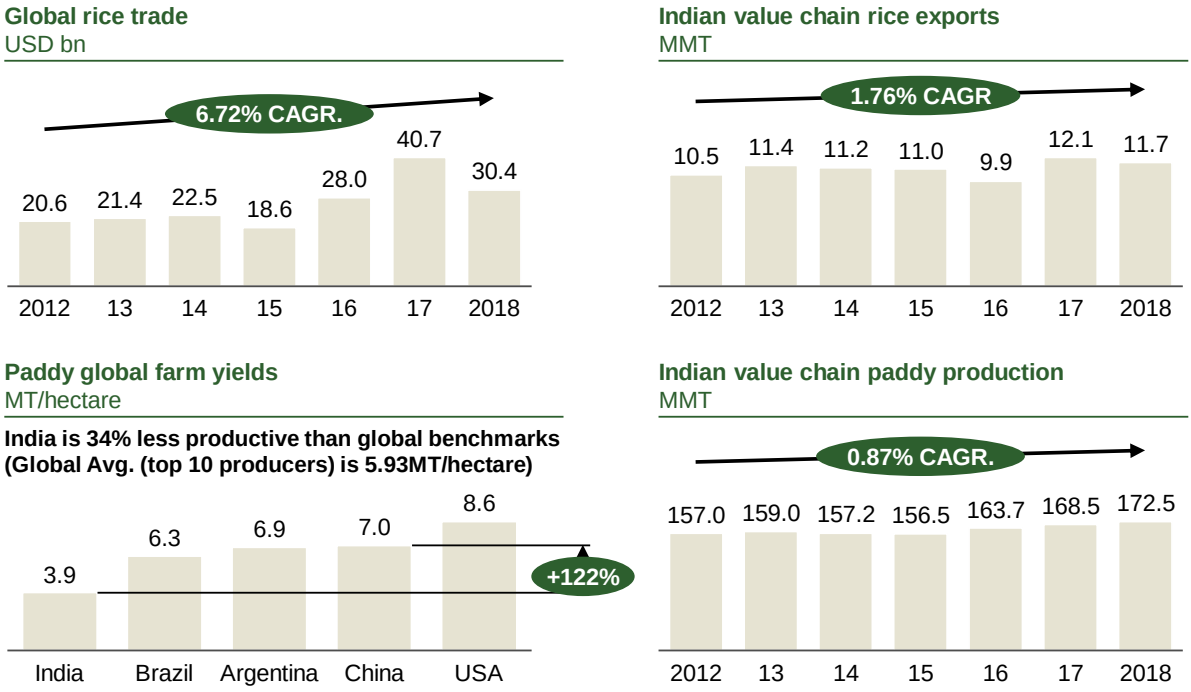
Source: Press search; Comtrade

RICE – CONTEXT AND STARTING POINT

India is the second largest producer of rice after China. While China is the biggest producer, consumer and importer of Rice, India is the top exporter of rice with over 30% global market share.[63] Indian rice industry is broadly classified under Basmati and Non-Basmati. Basmati rice is an indigenous variety of the Indian subcontinent making India and Pakistan the only producers and exporters for the variety globally. In 2018-19, India produced 115 MMT of rice, of which only 5-6 MMT was Basmati[64] [65]. Of this 115 MMT, 44 MMT was procured by the government under PDS (Public Distribution System)[66]. Since 2012 however, India's production and rice exports have stagnated, as shown in *Exhibit 29* below.

EXHIBIT 29

India's rice production and export volumes have stagnated since 2012



Source: UN COMTRADE (Import and Exports); FAOSTAT (Production/Yield)

63 UN Comtrade

64 The Hindu Businessline." Agri Ministry projects record rice, wheat output for 2018-19". June 2019.

65 Agriwatch. "Basmati Rice Production in down in MY2018-19". November 2018.

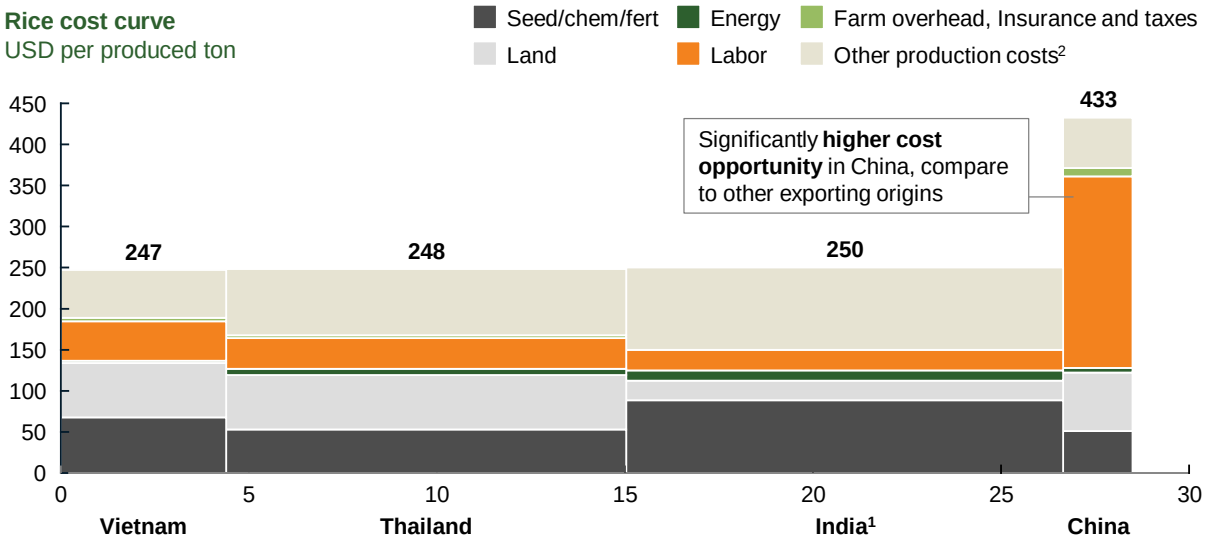
66 Food Corporation of India. State-wise procurement of Rice 2018-19,

KEY PAIN POINTS AND CHALLENGES IN RICE VALUE CHAIN

Over the past years, India has been facing stiff competition from competing origins such as Thailand, Vietnam, China, Myanmar, Cambodia and Pakistan. This has been driven by cost parity between main rice exporters, as shown in *Exhibit 30*. India is thus slowly losing market share on account of export restrictions, price competitiveness, inconsistent government policies and pesticide MRL issues.

EXHIBIT 30

Cost parity between main rice exporters sustain a high level of competitiveness in the region



Key insights

Production cost levels are similar between the 3 leading rice exporters

In 2019

- **India fostered its leading position as main exporter of rice** in the international (notably in the **Middle East**, contributing to ~65% (Mn 4.2 MT) of the total imported rice); following successive exceptional harvests and increasing minimum support prices **boosting the production level**
- **Thailand faced** difficult growing conditions and a continued stronger Thai baht currency affecting negatively rice exports. The persisting currency risk could continue affecting local competitivity
- **In Vietnam,** it was noticed a slight decrease of rice cultivated area due to an increasing uncertainty on weather conditions and water supply and lower paddy prices, encouraging farmers in the Mekong Delta (~55% of national production) to switch to other crops; this decreasing trend should continue as the Ministry of Agriculture aim to further reduce rice area and number of harvests

Focus on India

- Overall production costs are expected to decrease in the coming years with continuously improving yields due to the new varieties, better agronomic practices, and expansion in irrigation facilities
- India could remain the leading supplier of rice in the international due to absence of export restrictions on rice and Minimum Support Price sustaining high production levels, well above domestic consumption
- Several public and private sector organizations are working to develop transgenic rice varieties/hybrids to incorporate resistance to various pests, diseases, and abiotic stresses. However, approval and commercialization are still years away

1. Mn ~8.0 MT coarse rice and Mn ~4.0 MT Basmati rice
2. Machinery, other contractor, unallocated costs

Source: Agri Benchmark; USDA-FAS; UN ComTrade; Indian Department of Agriculture; WTO; expert interviews

Key challenges in the rice value chain include:

1. **Low productivity and stagnant production**

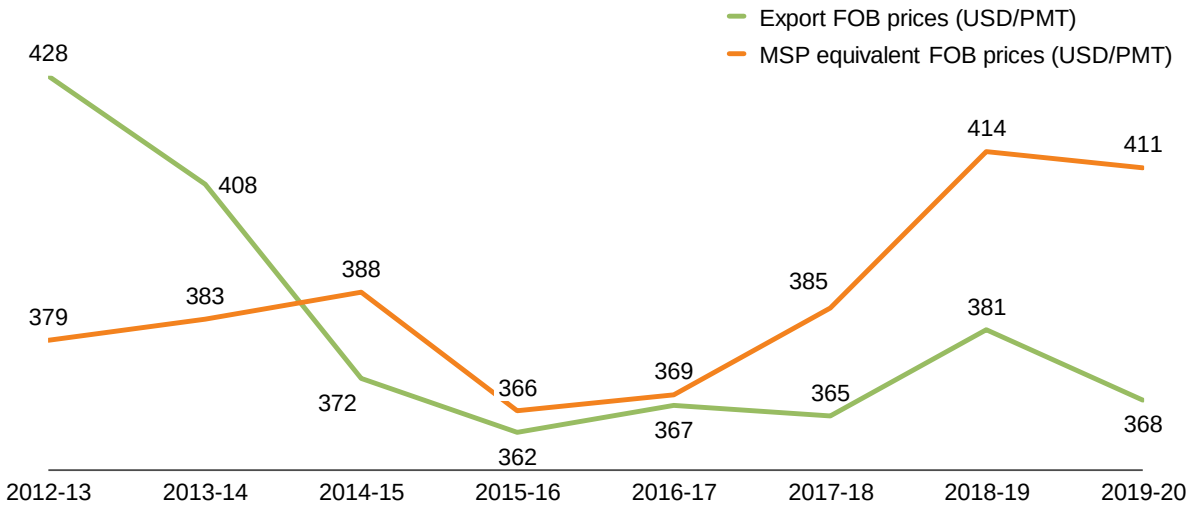
   India is 34% less productive (3.9 MT/ha) than global benchmarks of 5.93 MT/ha (global average of top 10 producers). US is the global leader in paddy farm yields at 8.62 MT/ha which is 122% higher than India. Production has also been stagnant between 2012-18

2. **Lack of Exportable Surplus due to FCI Procurement**

   Ever-increasing MSPs (Minimum Support Prices) backed by aggressive FCI (Food Corporation of India) Procurement, beyond the buffer stock norms for food security, removes a significant chunk of the country's surplus from export potential. This distorts the markets thereby making Indian prices uncompetitive for exports. This also traps the true exportable surplus of the country in stocks held by FCI which are increasing every year[67]. *Exhibit 31* shows how MSP and export have tracked export prices since 2012-13.

EXHIBIT 31

Export prices vs. MSP equivalent



Source: Food Corporation of India; DFPD

3. **Maximum Residue Level (MRL) Issues due to pesticide usage**

   Till 2017, India shipped ~10% of its total Basmati consignments to Europe. However, in 2018-19 India's rice export to Europe plunged by 40% over the issue of recently revised maximum residue level (MRL)[68]. The revised MRL is significantly more stringent, for e.g., the limit for tricyclazole has

67 Food Corporation of India; DFPD

68 Krar, Prashant. " Rice exporters seek ban on pesticides unregistered in the US, EU". The Economic Times. December 2019.

been reduced from 1 to 0.01 parts per million, while the permissible limit for the US remains 3 parts per million[69]. There is a risk of the market shrinking further if rice samples fail mandatory testing.

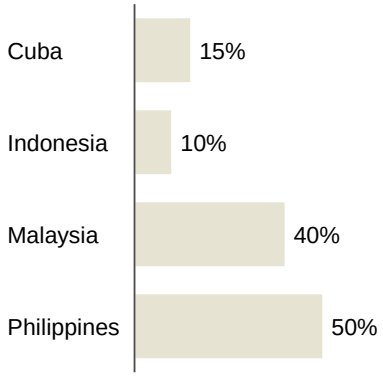
4. **Trade Barriers (Duties) and Non-Tariff Barriers**

There are several tariff and non-tariff barriers which restrict Indian rice to capture its full potential. For instance, Indonesia levies 10% import duty on rice from India, while Pakistan has an import duty-free access[70]. The import duties for top markets are detailed in Exhibit 31below.

EXHIBIT 32

Trade relationships, duties and non-tariff barriers

Import duties for Rice value chain for top import markets, %



Known issues with Indian exports for Rice Value Chain

Indonesia levies a 10% import duty **for Indian rice**, while Pakistan has an **import duty free** access.

In **Philippines**, consignments from India incur a 50% duty, while it is 35% for **rice** from other ASEAN (Association of Southeast Asian Nations) countries.

Malaysia: ASEAN countries are having lower import duties through a **Preferential Trade Agreements (PTAs)** with Malaysian govt. for rice exports. Given higher oil imports, India needs to leverage the same for favourable bilateral agreements.

China: Despite India's significant import bill from China, Rice exports are negligible to China. A sectoral agreement for Indian rice exports is required to allow access to Chinese Market.

Source: Secondary Research

KEY INTERVENTIONS TO UNLOCKPOTENTIAL IN RICE VALUE CHAIN

In order to achieve the export potential, India must increase its yield and strategically alter FCI buying and MSP trends. The resulting increase in surplus will then need to be met by demand created in new markets (such as Iraq, Yemen, Latin America, Russia and South East Asia) and strengthening market shares of existing markets like Africa, Middle East and Europe. Negotiating the right trade terms on tariff as well as non-tariff matters would be critical for capturing new markets in Asia. India also needs to focus on branded exports over bulk exports to capture higher premiums.

Following key interventions are required to significantly unlock rice exports for India:

1. **Improvement in crop yields**

India's overall rice yields are still well below the world average, with wide variations in productivity among the major producing states and across the country. There is significant room for increasing rice productivity in the country by expanding irrigation facilities and further improving the development and adoption of newer varieties and technology. Agricultural universities thus need to

69 Joshi, Shraddha, " EC lowers basmati fungicide tricyclazole's tolerance limit to 0.001ppm" FnB news. January 2018.

70 Krar, Prashant. "Indian rice exporters seek parity in import duty". The Economic Times. August 2019.

focus on developing high-yielding, insect pest resistant varieties with shorter cycles and lower irrigation needs.

Higher productivities can directly add to exportable surplus for India. The government needs to focus on productivity of states which are lower than the national average. Among other measures, crop rotation should be promoted to improve productivity by state agricultural departments. States should also focus on soil health through crop residue management and green manure usage.

2. **Amendments in FCI procurement strategy and MSP**

Beyond buffer stock requirements, a price-differential scheme (Bhavantar scheme) should be introduced where the price differential between MSP and Open Market Prices gets credited into farmers account as DBT (Direct Benefit Transfer). This would release substantial volumes for the open market thereby increasing the available exportable surplus. Additionally, excess FCI stocks over their buffer stock norms should be offered in the open market through an Open Market Sale Scheme (OMSS) within the same season at appropriate market-based pricing to release this surplus for exports.

3. **Adherence to export market standards**

India is losing market share on Basmati rice exports to EU due to port rejections of Indian rice. US-led MRL norms are also catching up fast in countries like Jordan, Qatar and Lebanon. Adoption of PPP models need to be encouraged to grow rice sustainably and in compliance to export standards. Pesticide-free clusters need to be developed with yield drop compensation to farmers.

4. **Increased ease of exports – Tariff and Non-Tariff barriers**

Formation of an International Standards Adherence Facilitation Body at the Ministry of Commerce and Industry will aid negotiations and signing of bilateral treaties on Indian pesticide norms. This needs to be taken up on an urgent basis with MENA (Middle East and North Africa) countries as "US-led" pesticide norms are catching up fast. Additionally, India should negotiate with EU for approval of pesticide use in agricultural products for mutually agreed products and their residue limits. This would help it overcome non-tariff barriers like the impractical residue limit (0.01 PPM) laid down for tricyclazole in EU.

An independent Export Promotion Body for rice should be constituted to solely focus on driving exports. It would also strive to enter into Free/ Preferential Trade Agreements (FTAs/PTAs) with major destination countries to create favourable environment for rice exports from India. The body should leverage India's Palm Oil imports from Malaysia and Indonesia for better trade terms including tariff levels. India currently is less cost competitive than Pakistan and ASEAN Countries for the Indonesian Market.

Counter-party/ collection risk for exporters needs to be mitigated by creating alternate payment mechanisms in coordination with designated banks for markets such as Yemen, Sudan which either suffer from US sanctions or USD shortages. Work with NCDEX/MCX needs to be done for developing derivative contracts on commodity exchanges to provide price risk mitigation for exporters.

5. **Improved cost competitiveness of Indian exports**

Interest subvention of 3-5% on export credit should be extended to all enterprises regardless of size rather than only to MSMEs as a large chunk of rice exports are through large export houses. Subsidies for brand building expenses need to be given to recognized trade houses under the Foreign Trade Policy to support overseas brand building initiatives which can facilitate higher value

capture by these enterprises. Registered Indian Brands may be even considered for MEIS at an appropriate rate (Merchandise Exports from India Scheme).

6. **Water management for sustainable rice exports**

The receding water table is a challenge and a huge threat to the sustainability of Indian Rice Production. Rice being a water-guzzling crop, can consume from a range of 2,600 to 5,400 litres for 1 kg of production, depending on seed variety and production practices[71]. Incentive structures and farmer capacity building initiatives need to be introduced for controlling irrigation in rice via adoption of technologies including but not limited to:

- Laser land levelling
- Drip irrigation
- Alternate wetting and drying (AWD) method
- Direct Seeding of Rice (DRS) method

R&D in low irrigation varieties should be a key focus area to ensure sustainability of domestic water resources while enabling growth in rice exports.

The government also needs to consider diversification of its crop mix away from rice in areas where the water table is critically threatened such as in Punjab (annually receding by 0.7-1 metre) and towards areas which are agro-climatically suited for rice production such as Bihar, Chhattisgarh and Jharkhand.

VEGETABLE OILS – CONTEXT AND STARTING POINT

India's vegetable oil economy is the 4th-largest after the US, China and Brazil. India consumes 25.9 MMT of Oil, of which ~60% comes from imports. Vegetable Oil is the top agricultural import item for India accounting for USD 10 bn. Of this basket, 55% is accounted for by Palm Oil. With increasing population and per capita consumption of vegetable oils in the country, the import bill is expected to reach USD 22 bn by 2030[72] if it continues to grow at the current rate of 7-8%[73].

India produces 10.5 MMT of vegetable oils – primarily from 9 oilseed crops (7 MMT). These oilseeds are largely grown under rain-fed condition (>85%) over an area of about 24.5 mn. ha. Amongst these, rapeseed & mustard (42%), soybean (32%), groundnut (22%) contribute to more than 90% of the total oil production. In addition, 3.5 MMT of oil comes from perennial crops like oil palm, coconut and secondary sources such as rice bran and cottonseed. Oil palm is the highest oil yielding crop (3-4 MT/ha) and has a potential area of 1.93 mn. ha in India of which only ~0.35 mn. ha has been covered (mostly in Andhra Pradesh). *Exhibit 33* illustrates India's vegetable oil production, and imports from various sources in the year 2018-19.

71 Nibber, Singh Gurpreet. "Punjab 'emptying' reservoirs to grow water-guzzling rice". Hindustan Times. January 2016.

72 United Nations International Trade Statistics Database, DGCIS Data dissemination tool – Ministry of commerce and industry and Expert consultations

73 Import CAGR from 2009-2019. DAC&FW, Ministry of Agriculture

EXHIBIT 33

Source (Crop)	Area under Cultivation (Mn ha)	Production (MMT)	Imports (MMT)
Primary – Annual Rapeseed & Mustard (42%), Soybean (32%), Groundnut (22%), Sesame (3.4%), Sunflower (1.1%), Niger (0.3%), Safflower (0.1%)	24.45	7.00	5.60
Primary- Perennial Coconut (56%), Oil palm (27%), Olive, Mahua, Edible TBOs (17%)	2.36	1.04	9.8
Secondary Sources Rice Bran (48%), Cottonseed (41%), SEO (11%)	-	2.46	-
TOTAL (2018-19)	**26.81**	**10.50**	**15.40**

Source: DAC&FW, Ministry of Agriculture

While one could argue that India should rely on imports of low-cost vegetable oils available globally, instead of allocating the limited land resource for growing more expensive oils locally, such large dependence on imports does pose a high risk from the perspective of food security. In this context, reducing the import intensity to ~30% is a more balanced approach. With targeted policy support to deal with the challenges of the sector, it is also possible to increase domestic production competitively over the medium term.

Key pain points and challenges in Vegetable Oils value chains

1. **Low productivity compared to global standards**

   Productivity for large crops like soybean, mustard and groundnut is significantly lower than global averages. For instance, soybean yield in US is ~3,501 kg/ha while India stands at only 1,235 kg/ha[74]. Several factors contribute to this low productivity, including input management (i.e., seeds, irrigation) and limited adoption of best management practices.

2. **Relative unattractiveness of Oilseed Crops compared to wheat or rice**

   While the government declares MSP (Minimum Support Prices) for oilseeds also, public procurement infrastructure is better geared for food grains like wheat and rice. Even the yields are volatile, given that oilseeds are largely grown under rain fed conditions, unlike grains which are mostly grown on irrigated lands. Thus, on both production and price counts, oilseeds are not as attractive for farmers as grains are, because some of the implicit costs incurred in growing grains are externalised through subsidies on water, fertiliser and food. The comparison is captured in the table below.

74 National Food Security Mission. Status Paper on Vegetable Oils in India. URL: https://www.nfsm.gov.in/StatusPaper/NMOOP2018.pdf; Statistics tool – ICAR: Indian Institute of Soybean Research

Season	Crop	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	Relative net return (%)	Income loss over rice-wheat (Rs/ha)
Kharif	Paddy	43,462	61,136	17,674	100	-
	Soybean	28,652	34,366	5,714	32	11,960
	Sunflower	20,704	27,834	7,130	40	10,544
	Sesame	18,412	31,083	12,671	72	5,003
Rabi	Wheat	32,644	63,642	30,998	100	-
	Mustard	26,327	51,298	24,971	81	6,027
Whole year	Rice-rice	86,924	1,22,272	35,348	100	
	Oil Palm	37,480	50,000	12,520	35	

Source: DAC&FW, Ministry of Agriculture

3. **Long gestation and high upfront investment needed for oil palm**

   Oil palm is a perennial crop (30 years) with a long gestation period (4 years) and high upfront investment requirement. Indian farmers predominantly have small landholdings and lack the financial strength and/or risk appetite to invest in such long term crops, without policy support.

4. **Low remuneration for Oil palm growers**

   Oil palm crop produces Fresh Fruit Bunches (FFBs), having a low shelf life (<24 hrs) post-harvest. Oil palm prices are regulated by the government, and procurement is done by designated local mills (private or public). The pricing is decided by a pre-determined formula which is a function of landed prices of imports. Competitive imports from Malaysia and Indonesia affect the farmers' remuneration, affecting their profitability. Market trends show a variability of up-to 50% over the past 15 years, with instances of prices falling below farmers' cost of production. This even leads to farmers uprooting their plantations during such distress years.

5. **Duty structure for crude and refined oils**

   The current duty difference between crude and refined oils is only ~7.5% in palm oil. Further to this, to protect their local industry, Indonesia has imposed export duty of USD 50 on crude palm oil and substantially lower USD 30 on refined palmolein which works out to be nearly 5% on CPO value, thus effectively reducing the duty difference to only 2.5%[75]. This low duty differential between crude and refined oils, makes it more attractive to import refined oil than crude, affecting domestic refineries in respect of their capacity utilisation and potential loss of employment and a higher import bill for the country.

Key interventions to unlock the potential in Vegetable oils

In order to reduce the over-dependence on imports in vegetable oils, India must strategically select the high oil-yielding crops to focus on and raise their farm productivity. Five key interventions are proposed to unlock the vegetable oil production in India.

75 Sally, Madhvi. "Palm Oil Import Duty Reductions Disappoints Industry." The Economic Times, January 1, 2020.

1. **Driving productivity improvement in oilseed crops**

   Indian oilseeds have significant yield gap compared to the national potential, varying from 37% to 71% for groundnut, soybean and mustard. For sunflower, this gap is as high as 160%.[76] Targeted interventions ranging from bringing in new seed technology, improving seed and varietal replacement, to creating farmer awareness on Best Management Practices are required to improve productivity and cost competitiveness. Following are few examples:

   – **Increasing Seed Replacement Rate (SRR) and Varietal replacement rate:** Current SRR is as low as 6%[77] in oilseeds such as Groundnut – which can be improved by providing direct benefits to farmers for seed replacement and strengthening the seeds supply chain[78]

   – **R&D investment to come up with improved varieties:** Productivity enhancement can be achieved by adopting new high yielding varieties/ hybrids suitable to local agro-climatic conditions

   – **Credit and investment support for irrigation mechanisms:** Promotion of irrigation infrastructure and techniques (such as micro irrigation) shall help reduce the volatility of crop yield, thereby ensuring consistent returns to farmers

   – **Farmer capacity building:** Increasing adoption of existing improved technologies available in India and best management practices (such as Broad Bed and Furrow, SHC-based fertilisers, soil amendments, plant protection measures, bio-fertilisers and micronutrients, Adoption of recommended soil and moisture conservation measures) shall result in improved farm productivity and farmer net returns

2. **Improving Crop Attractiveness of Oilseed Crops**

   Ensuring remunerative prices to farmers at MSP levels, yet without distorting market, through schemes such as price differential payments (e.g., Bhavantar Bhugtan Yojna), or alternate compensation mechanisms to mitigate farmer risk, will enable acreage shifts towards oilseed crops. Further, state governments will need to work towards identifying potential catchments for oilseeds cultivation and implement a variety of initiatives, such as utilisation of rice fallow areas for short-duration crops like Mustard, inter-cropping of oilseeds with major crops of the region like sugarcane, pigeon pea, maize & cotton, and incorporate the advisory in agricultural extension services.

3. **Unlocking palm oil production in the long term**

   India is the top importer of Oil Palm, accounting for almost 17.5% of the total global trade worth ~USD 5.5 Bn. annual imports. India meets majority of its palm oil requirements from Indonesia and Malaysia. Oil palm costs 20% less than most other vegetable oils and can achieve significantly higher oil yield compared to other annual oilseeds (8-10 times),[79] making it an attractive option for import substitution focus. Oil palm is grown on ~0.35 mn. ha of the total available potential of ~1.93

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76 XV Finance Commission Expert Consultation with Ms. Shubha Thakur, Joint Secretary, Ministry of Agriculture

77 National Food Security Mission. Status Paper on Vegetable Oils in India. URL: https://www.nfsm.gov.in/StatusPaper/NMOOP2018.pdf

78 Directorate of Oilseeds Development, Ministry of Agriculture. URL: http://oilseeds.dac.gov.in/StatusPaper/StatusPaper.pdf

79 United Nations International Trade Statistics Database; FAOSTAT tool - The Food and Agriculture Organization of the United Nations, DGCIS dissemination tool – Ministry of commerce and industry; https://www.downtoearth.org.in/coverage/agriculture/palm-oil-consumption-increased-230-in-almost-2-decades-yet-india-imports-most-of-it-61040

mn ha. By increasing the area cover under oil palm cultivation to even 50% of this potential, together with improving FFB Yields and Oil Extraction Ratios (OERs) to match global averages, India can produce an additional 2.7 MMT (~USD 1.7 bn equivalent) of Palm oil.

The following interventions are required to unlock the Palm oil value chain in India:

- Cost of palm oil production in India is 25-30% higher compared to Indonesia and Malaysia[80]. To make India's Palm oil cost competitive, productivity improvement efforts are needed - investments in drip and sprinkler irrigation, R&D on high-oil yielding varieties and farmer incentives for adoption of best practices in production, harvest and post-harvest aspects
- To achieve the required scale, respective state governments will need to craft focused strategies to increase the area under oil palm cultivation by converting land from other crops from within the identified 1.93 mn ha
- Increasing the attractiveness of Oil Palm for farmer adoption through a loan cycle aligned to the gestation period and necessary price support. A mechanism to link pricing to the cost of cultivation of farmers can ensure farmer profitability and ensure increased adoption of the crop. Until the domestic crop stabilises at the desired scale, the price competitiveness vs global market could be managed through tariffs, especially the difference between crude and refined oil import duties
- Given the high upfront investment and substantial gestation period, India could declare Oil Palm as a plantation crop (currently under Horticulture) to enable private sector investments. Similar models exist in Indonesia and Malaysia. These further need support in the form of land lease reforms to enable corporates to enter while protecting farmer rights

4. **Unlocking the full potential of secondary oil sources (Rice Bran and Cottonseed)**

   India is the largest producer of cotton and second largest rice producer globally. Hence, there is significant untapped potential for oil production from these secondary sources. India is producing only 0.98 MMT of rice bran oil of its total potential of 1.62 MMT[81] (2017). Similarly, Indian Cotton seed oil production is 1.4 MMT, against the total potential of 2.6 MMT (2019). Leveraging the untapped potential from these secondary sources, India can produce an additional 1.84 MMT of oil (resulting in savings of USD 1.1 Bn). These efforts need to be coupled with awareness campaigns on the benefits of Rice Bran and Cotton Seed Oil to create a shift in consumer preferences in India.

5. **Changing the duty structure between crude and refined palm oil**

   Maintaining higher duty differential (at least 15%)[82]. will encourage domestic production and boost the utilisation of domestic refineries and avoids price and employment injury to the industry.

SUMMARY OF CROP VALUE CHAIN ANALYSES

The HLEG analysed 4 additional crop value chains, each of which has a distinct dynamic. For example, buffalo meat needs trade imbalances to be addressed by the government through negotiations and FTAs to minimise import duties in destination markets; mango would benefit from focused investments in packhouses for quality grading and processing (a process already initiated by APEDA through the

80 Oil Palm: Pricing for Growth, Efficiency & Equity report by Commission for Agricultural Costs and Prices

81 Times of India. " Scope to boost rice bran oil output, demand: SEA". August 2017.

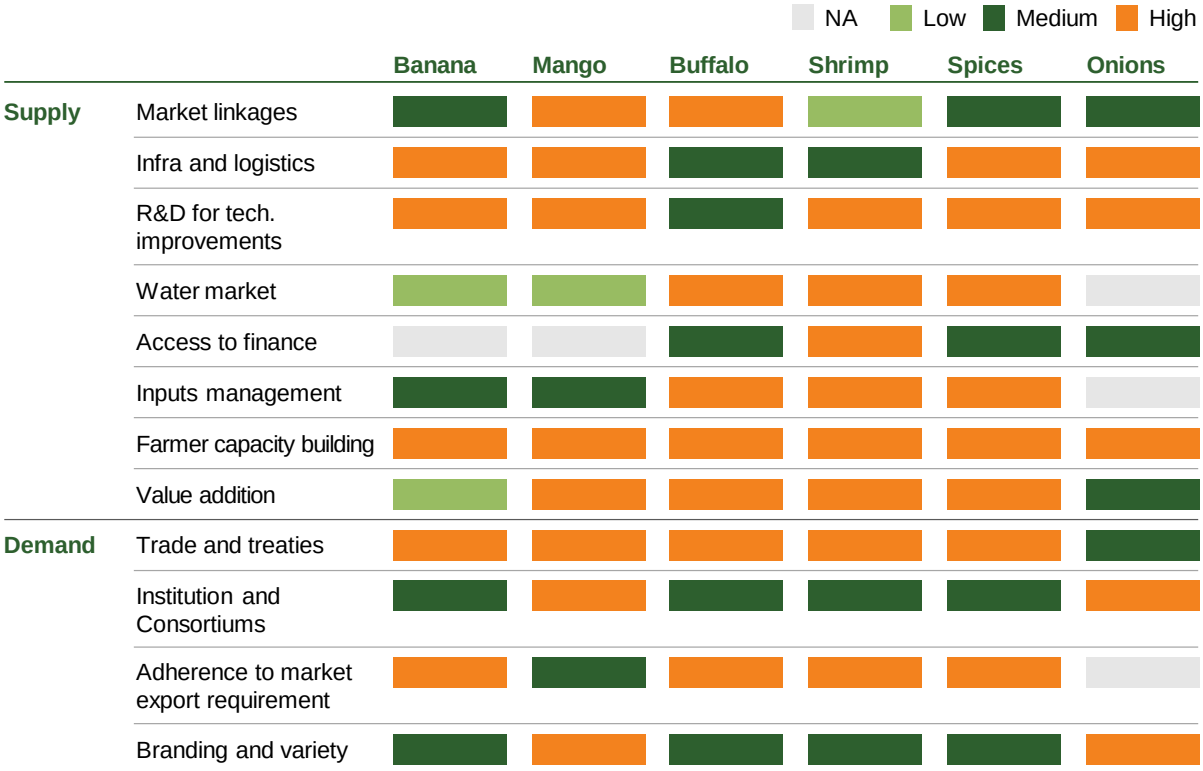
82 Economic Times. " Palm oil import duty reduction disappoints industry" January 2020

Export Promotion Forum); Banana and other horticultural crops from focused effort on non-tariff barriers. These themes and initiatives have been reinforced in the stakeholder consultations conducted with industry players and commodity boards. Detailed case studies are provided in the annexure.

The deep dives revealed that while the supply and demand side enablers are similar across all crop value chains, they require specific interventions in the specific context of the value chain. The need for such specific interventions in the deep-dives underlines the need for states to take a value-chain lens in promoting exports. However, in addition to these state value-chain enablers, the central government also has a role in driving cross-cutting enablers that are relevant across states or value-chains (e.g., trade agreements, infrastructure). We have categorised the emerging themes into 8 supply side and 4 demand side enablers. The relative importance and applicability of these enablers varies across value chains and is showcased in *Exhibit 34*.

EXHIBIT 34

Four enablers have an outsized impact; variations in impact levels indicate the need for different solutions for each value chain



Key takeaways

The following demand and supply enablers have an outsized impact:

- Infra and logistics
- R&D for tech improvements
- Inputs management
- Farmer capacity building
- Trade and treaties
- Adherence to market export requirements

However, pain points per enabler vary by value chain, implying that solutions need to be **value chain-specific**

Source: HLEG expert consultations

While the specific interventions required for each value chain is detailed further in the annexure, the HLEG also recognizes the important role of the centre in cross-cutting enablers.

ROLE OF THE CENTRE

The approach suggested by the HLEG aims to unlock growth in agricultural exports, with a strong emphasis on end-to-end execution in specific crops to get to the desired outcomes. The reforms in agricultural marketing laws announced by the Central Government in June 2020, together with the Funds earmarked for post-harvest infrastructure, provide further fillip to deepening the engagement between farmers and the private sector. Similarly, other policy initiatives that are attempting to minimise distortion in markets will also go a long way in providing support to the proposed crop competitiveness-building efforts. For example, restructuring the input subsidies as Direct Benefit Transfer to the farmers; or restructuring the government procurement at MSP into Price Deficiency Payment Schemes like Bhavantar Bhugtan Yojana. Some of these initiatives are value chain and state agnostic and thus need to be addressed by Centre. They are mainly classified into 4 broad categories as described below.

1. Government policy

Cross-cutting policy reform issues are complex and multi-faceted and need further deepdive and consultation. Here are three examples:

a. Issues pertaining to Seed IP (Intellectual Property), fertiliser & pesticide subsidies, and approvals of agro-chemicals and fertilisers need central intervention based on national priorities and export quality standards

b. Creation of an Agri Stack is a national priority for Digitalisation and it is imperative that a Central IT Infrastructure be developed and rolled out across states (e.g., setting up a National Farm Registry for traceability of produce) and

c. Excess government buying of rice for FCI stocks leaves little surplus for exports; Increasing MSPs year-on-year distort the market making export prices uncompetitive. Enablers such as Bhavantar Scheme and Open Market Sale Scheme (OMSS) fall under the purview of Central Government

2. Trade relations

It is imperative that India takes a comprehensive view of imports and exports in all trade-related forums for negotiations. The central government has an important role to play in negotiating with other governments whose trade barriers are presenting a challenge to exports for priority value chains. For example, opening up new markets where Indian exports are banned is crucial (e.g., US has banned India's pomegranate arils[83], Mexico's blanket plant quarantine certification requirements have effectively closed the market for Indian chilli[84]). Philippines imposes higher import duties on rice from India (50%) compared to 35% for other ASEAN countries[85]. ASEAN countries have zero duty for China unlike India, making Indian Chillies export uncompetitive.

3. Export incentives

The Central Government needs to instate WTO-Compliant export promotion incentives across the value chain to help improve value chain competitiveness. Targeted incentives in logistics and transportation can also support value chains in specific markets (e.g., Indian mangoes are costlier

83 Business Standard. "India urges United States to lift ban on import of pomegranate arils." October 2018.

84 Economic Times. "Blanket plant quarantine norms may hit red chilli exports." December 2018.

85 Krar, Prashant. " Indian rice exporters seek parity in import duty" The Economic Times. August 2019.

in the US due to transportation costs[86]). The Central Government may also consider registered Indian Brands for RoDTEP/ MEIS (Merchandise Exports from India Scheme).

4. **Common Infrastructure:**

Central government needs to invest in infrastructure common across states:

- **Destination Market Infrastructure:** Investment in destination markets needs support from the central Government. For example, investments in terms of branding and distribution centres can help improve the reach of Indian spices companies and reduce time to market. Cold chains and warehousing are crucial for value chains such as Shrimp, Mango, Chilli and Buffalo Meat
- **Domestic Infrastructure:** Investments in domestic supply chains can ease up the logistics and induce efficiencies for the export industry making India competitive globally. For example, poor infrastructure at ports like Kakinada (which handles significant rice export volumes[87]) is a considerable barrier. Focus could be on improving infrastructure to increase efficiency and turn-around times via improved berthing facilities, warehousing and roads (there is a need to build capacity for a loading volume of 4 MMT Rice p.a.). Specific focus also needs to be given for the strengthening of logistics supply chain in terms of equipping the exiting ports with right kind of infrastructure. Similarly, freight and highway infrastructure and digital infrastructure needs to be developed for national competitiveness.

In addition to the enablers identified above, as part of an effort to attract private sector investment and FDI, the central government may pursue policies that support ease of doing business, faster resolution of commercial disputes and other areas which will improve investment in this sector especially in processing and value-added products.

86 Expert Consultations; Vora, Rutam. “Mango Shipment Turns Sour on High Price, Freight Costs.” The Hindu Business Line, January 23, 2018.

87 Seair. Indian Rice Export Data for Kakinada port. URL: https://www.seair.co.in/rice-export-data/indian-port-kakinada.aspx. Accessed July 2020.

5. State-led export plans and attracting private sector investment

CHAPTER SUMMARY

- Agriculture is a state subject and given the heterogeneity across them, states will be the primary actor
- The HLEG recommends that states develop a comprehensive and customised business plan for every crop value chain cluster. This plan should clearly lay out the opportunity, initiatives and investment required to realise the export aspirations of the value chain
- The plan would have the following components: (i) opportunity definition for the chosen value chain, based on demand potential and supply side competitiveness, (ii) comprehensive list of projectised action items, (iii) regulatory, policy and procedural initiatives needed at the state/centre, (iv) map of the stakeholders who will execute these actions and their roles, specifically the private sector players who will anchor the value chain, (v) expected outcomes in revenue, farmer incomes, employment and other metrics, with clear implementation milestones, (vi) investment needed to fund the plan, linked to milestones, lead and lag indicator along with the potential funding plan and (vii) governance model for implementation, tracking and monitoring
- Similar state export plans have been made in the past, including within the framework of the Agriculture Export Policy of 2018. What is likely to be different when they are aligned to the elements of the guide recommended by HLEG, is that the plans are demand-led, focused, comprehensive including value addition, investable, the plans are built with input across the ecosystem and one or more private sector players act as anchor investors
- The quality of these plans is critical and the HLEG recommends that these plans be evaluated by a team of experts based on a set of detailed parameters such as project viability, return on investment, stakeholders underwriting the plan, commitment of the private sector, and risk of regulatory hurdles
- The anchoring role of the private sector would be a key success factor, especially given the thrust on processing. Consultations revealed several impediments to attracting private sector involvement and the state/centre should act decisively to unlock the potential of this sector

STATE PLAN FRAMEWORK

Agriculture has historically been a state subject in India, and states have the responsibility to craft and implement regional agriculture programmes. Similar to crop value chains, states also need solutions tailored specifically for them – they diverge in their endowments, crop profiles and needs, with each having unique agriculture schemes, policies, and political environments. It is, therefore, natural for the state to be the primary actor as it addresses heterogeneity and establishes ownership squarely.

As mentioned in the previous chapter, based on prior learnings and design principles that underpin the recommendations, the odds of success are highest when all the initiatives are framed together and implemented holistically within a crop value chain cluster. Therefore, the HLEG recommends the creation of a business plan for a crop value chain cluster, that will lay out the opportunity, initiatives and investment required to meet the desired value chain export aspiration. The value chains are unique and so these business plans need to be custom made for each.

In order to provide a high-quality output, states must create an action-oriented, time-bound and outcome- focused plan. The plan should include clear details on each initiative in terms of planned actions, impacted stakeholders, implementation milestones and timelines. To aid states in creating a comprehensive and high-quality plan, the HLEG has developed a template guide which includes the following components:

- **Identify target projects and opportunities for the selected crop value chain:** Deep-dive into prioritised value chains by assessing current pain points and competitiveness, by benchmarking against other export players and exporting countries to identify opportunities for improvement. Identify target markets to prioritize by sizing market, current penetration levels and competitiveness. Create a comprehensive list of projects (divided into specific action points) both on the demand and supply side in response to identified pain points. Projects can be prioritised by impact and feasibility. States must also specifically evaluate opportunities to increase value-addition and processing for each prioritised value chain
- **Create a comprehensive list of projectised action items:** Create detailed action plans for each project. Group projects and action items into 2 categories: (a) those with hard, measurable ROI (such as increase in export revenue, productivity, farmer income, employment) and (b) those with soft ROI (such as farmer capacity building, branding, demand generation initiatives and negotiations with target markets). Projects will also need metrics to measure success. Develop a clear implementation plan for each project. See *Exhibit 35* for illustrative projects and their KPIs.

EXHIBIT 35

Illustrative list of KPIs for tracking implementation of state-led plans

	Potential focus areas	Illustrative projects	Illustrative KPIs
Hard ROI	1 Infrastructure	▪ Establishing Export Zones ▪ Improving cold-chain storage infrastructure ▪ Providing state support in utilities	▪ # of export zones established ▪ Cold storage capacity
	2 Irrigation	▪ Convergence of existing state and central schemes ▪ Subsidies for Irrigation Technology	▪ Scheme fund utilization ▪ % of land with access irrigation
	3 Input management	▪ Converting forest wasteland to productive farmland ▪ Providing state support for quality inputs (e.g., HYV seeds)	▪ Seed Replacement Ratio ▪ % of farmers using certified seeds
Soft ROI	4 Digitization	▪ Digitizing Land Records ▪ Geo-tagging of Farms	▪ % of records digitized ▪ % of farms with Geo-tagging
	5 Farmer Capacity Building	▪ Knowledge Handbook for State Value Chain Cluster ▪ Farmer workshops and skill projects	▪ # of trainings conducted ▪ # of farmers reached
	6 Compliance and quality	▪ Enforcing quality standards of target markets ▪ Aligning sustainable farming practices with global certification standards	▪ # of farms certified ▪ # Testing Labs established ▪ Testing Lead Times
	7 Research & Development	▪ Supporting research institutes in developing HYV seeds	▪ # of research grants ▪ # of seed varieties developed

EXHIBIT 36

Illustrative list of KPIs for tracking implementation of state-led plans

	Potential focus areas	Illustrative initiatives	Illustrative KPIs
Regulatory policies and procedures *(Shrimp value chain perspective)*	1 Input Regulation	▪ Regulate seed sales from hatcheries to registered farmers ▪ Regulating brood-stock sales to authorized hatcheries	▪ Number of hatcheries certified ▪ Number of registered farms
	2 Farm Registration	▪ Set up a single window, simple and shorter process for Farm Registration ▪ Setup guidelines for geo-tagging	▪ Number of days to register farms
	3 Resource Skilling	▪ Implementation of a skilling scheme for Shrimp Processing – convergence with private anchors and National Rural Livelihood Mission to be ensured	▪ Percentage of state skill training scheme funds used for processing
	4 Improve Ease of Processing	▪ Introduce Collateral Free Loans for value add processing ▪ Duty-free import of equipment	▪ Number of processing facilities in the state ▪ Investments in processing facilities in state

- **Regulatory, policy, and procedural initiatives:** Identify regulatory, policy and procedural initiatives needed at the state or central level for each prioritised value chain. Assess the impact of each change and develop a roadmap for implementation. Please refer *Exhibit 36* for illustrative details.
- **Map stakeholders to action points:** Map all stakeholders in the cluster to each action point and codify their roles and responsibilities. Identify private sector players who could anchor the projects and address constraints along each value chain. Additionally, identify mechanisms to attract and partner with these anchor investors
- **Investment needed to fund the plan and link to milestones:** Determine funding requirements for each project and develop funding requests to the Finance Commission. Clearly indicate upfront funding required for capital expenditures and suggest metrics and milestones for further fund disbursement
- **Establish a governance model for implementation and monitoring:** Design an empowered governance structure to enable decision-making and collaboration across public and private sectors and define accountability for implementation, tracking and monitoring

A major prerequisite for success in achieving India's agricultural export aspiration is the quality and comprehensiveness of the state-led export plan. The HLEG guide to build a high quality and comprehensive state-led export plan for a value chain cluster, therefore, includes detailed checklists and templates for each of the above plan components, with further details in the Annexure. The deep dives into select crop value chains provide examples of the kind of analysis required to inform state-led plans.

EVALUATION

To ensure that plans are holistically designed, the Centre could establish an expert committee to systematically and rigorously evaluate plans. The committee will need to create a structured and transparent evaluation process and criteria and provide feedback for revisions, wherever required. In the Annexure, we have included a sample evaluation methodology that can be tailored as required by the proposed committee to evaluate plans.

Similar state export plans have been made in the past, including within the framework of the Agriculture Export Policy of 2018. The HLEG recommends that the states should build on these plans. The HLEG recommendation also emphasises the following differences from previous planning efforts:

- Be "investable" and have clear ROIs
- Crop selection is demand-driven based on global food and agri trends, vs. a production-surplus-driven approach
- Contain inputs from across the ecosystem (especially the commodity boards for their technical expertise and the corporate sector) as well as be underwritten by all stakeholders
- Include one or more private sector player as anchor investors, committed to co-fund the plan and achieve outcomes

ATTRACTING PRIVATE SECTOR INVESTMENT

The private sector "anchor" is both a key differentiator and a critical success factor for the state-led plans, especially given the thrust on processing. Private sector involvement will ensure that projects are

feasible, robust, implementable, and appropriately funded. This will also impose the required urgency and discipline during the implementation phase.

Current challenges faced by private sector players

The HLEG held numerous private sector consultations with players across the prioritised value chains. Private sector players consistently discussed the importance of the following factors:

1. Predictable policy environment with a long-term view on priority value chains that need to be supported with administrative procedures and structural reforms
2. Need for structural reforms to promote greater efficiency in agriculture ecosystem (e.g., DBT vs. MSP to minimise market distortion)
3. Role of strong domestic market in processed food to win in export markets (through GST rationalisation between commodities and processed)
4. Need for trade policy reforms to support Indian exports (e.g., free trade/sectoral agreements to make Indian exports cost competitive, rationalise import restrictions on inputs required for processed food production)
5. R&D support to improve productivity and quality with right crop varieties, and induction of new technologies
6. Build 'Brand India' with Government/Industry-level campaigns, and financial support to product-level brand building in target markets
7. Infrastructure and other support to lower transaction costs (freight, power) and factor costs of production, especially compared to competitors such as Vietnam
8. Need to plan for exports strategically

How to attract private sector players – what is in it for them?

In the past, low returns, high-factor costs and regulatory uncertainties (among other factors) have inhibited private sector involvement in agricultural projects. There has to be a concerted effort to attract private sector investors and ensure several of them participate at scale. Some of the initiatives could include:

- **Focus on value addition and states to incentivise private sector players**: States and private sector players must particularly focus on projects and opportunities for value addition as these are optimal areas for private sector involvement due to capital intensity and opportunity for the country as a whole to earn premiums on the export market. A state incentive package for the set-up of processing units could provide a huge boost to processing capacity in the state and higher realisation per acre. Such incentive packages must also help improve the competitiveness of production costs (e.g., reduce factor costs through utility subsidies). Further, value-added exports not competitive due to inadequate incentives, Further, the quantum of incentives is particularly inadequate for value added exports, which are at times even lower than the incentive applicable to commodity exports (e.g., chilli powder is entitled for 2% vs. 3% for whole chilli[88])

[88] DGFD, Ministry of Commerce and Industries. Code wise list of products with reward rates under MEIS.

- **Create an ecosystem of convergence**: States need to make each project a part of a larger crop value chain cluster to generate economies of scale and get access to inputs, equipment, producers, technology, and buyers
- **Provide viability gap funding and encourage the PPP governance model**: State and/or Centre could ensure critical enablers such as infrastructure, R&D, logistics are funded and therefore, help to develop projects that would otherwise not have been financially viable. Additionally, many projects will have PPP governance models, which will help to de-risk projects and make them more attractive
- **Ensure ease-of-doing business:** States could improve ease-of-doing business for participants in their plans through single-window governance and fast-track regulatory compliance procedures
- **Address the last mile with the target markets:** The Centre could ensure dialogue with the target markets to create favourable trade conditions and supporting infrastructure via sectoral agreements and a level-playing field through addressing tariff and non-tariff barriers. Strong branding will also aid demand generation in these markets

Most of these points mentioned above are captured in the state-led value chain plan guide that will require concerted action by both the state and centre. While the private sector will play a key role in state-led plans, by no means can the sector do it alone. The complexity of the value chain cluster necessitates that all stakeholders (e.g., private sectors, government, commodity boards, FPOs, farmers, research institutions) work together and that an appropriate institutional set-up is created to galvanise them and secure the requisite viability gap funding, including from the government, to make the value chain cluster fully viable.

6. State plan incentivisation and institutional set-up

CHAPTER SUMMARY

- Following from the HLEG Terms of Reference (iv), the objective is to develop an execution approach that will incentivise states to boost India's agricultural exports from USD 40 bn to USD 70 bn in a few years, while attracting estimated investment of USD 8-10 bn[89]. A rise in exports is likely to be accompanied by creation of 7-10 mn jobs[90] and an increase in farmer incomes, outcomes naturally aligned to the states' objectives
- State-led export plans will also need to be duly supported and incentivised to implement specific value chain initiatives that will catalyse a virtuous cycle within and can generate spill-over benefits beyond the value chain
- The HLEG recommends, in line with the Terms of Reference (iv), an approach where the states are incentivised to execute the state-led export plans in their entirety. The agricultural export-linked state-led plans will comprise several sub-projects, each of which could be funded independently. There will be multiple sources of funding spanning the Centre, States and Private Sector in the form of loans, grants or converged schemes, as well as funding from the Finance Commission
- Funding will need to happen through the lifecycle of the cluster implementation, in likely 5 stages, linked to plan development, institutional setup once the plan is approved, achievement of project implementation milestones, implementation of regulatory policy and procedures and final outcome achievement. Non-achievement of milestones could result in negative consequences such as claw back. A certain proportion (e.g., 20%) of the project funding will be held back pending the implementation of the regulatory, policy and procedural interventions
- The institutional framework required to operationalise all of this will have a 2-part set-up across the state and centre. The exact constitution of the state body will vary by state based on the nature of the value chains and convergence needs. The state body needs to be sufficiently empowered, to make decisions and provide requisite approvals to ensure timely execution
- The role of this central body is critical to the achievement of these export aspirations. The implementation of these state-led export plans will need the right trade policies and charter, appropriate regulatory reform, shared infrastructure and oversight using a common frame that spans across states. The central body will also evaluate the state-led plans, and release appropriate funding based on the quality of the plan, and achievement of project milestones

89 Estimates derived for exports based on investments quantified in the "Report of the Committee on Doubling Farmers' Income" in September 2018, by Ministry of Agriculture and Farmer's Welfare

90 Estimates for converting incremental export-led agricultural output to jobs created based on OECD Input-Ouput table 2018 edition.

- To begin with, the HLEG recommends that the Finance Commission invite 3-4 private sector players to partner with states to launch 3-4 pilots for the lighthouse value chains

STATE INCENTIVISATION APPROACH

Following from the HLEG Terms of Reference (iv), the objective is to develop an execution approach that will incentivise states to boost India's agriculture exports from USD 40 bn to USD 70 bn in a few years. These additional exports will result in the creation of 7-10 mn jobs after incorporating enhanced productivity. This will likely need investments of USD 8-10 bn across inputs, infrastructure, processing capabilities and demand enablers such as branding. These estimates leverage existing, published, detailed bottom-up investment estimates done while estimating investments for Doubling Farmer Income. This implies approximately USD 3 incremental export revenue for every USD 1 invested (1:3 capex to revenue ratio) and includes investment in food processing capacities and demand enablers like branding, beyond the DFI work.

The additional jobs created and investment unlocked by the export-led plans, align naturally with the incentive of States. As stated earlier, the primary instrument for growing agriculture export is the state-led export plans. These plans, duly supported and incentivised to drive specific crop value-chain initiatives, will also have spill-over benefits beyond the value chain.

Therefore, the HLEG recommends an approach where the states are incentivised to implement and execute the state-led export plans in their entirety, across all types of projectised initiatives, i.e., one with hard measurable ROI, supporting initiatives with soft ROI; as well as regulatory, policy and procedural interventions. This incentivisation approach will require adequate funding, administered by an institutional set-up that will also evaluate the plan and execute the projects in a repeatable and scalable fashion.

FUNDING

Lack of funding can stall the best-laid plans, as has been the case with several agricultural projects in the past in India. To make the proposed state-level plans viable, both the central and state governments will need to incentivise private investors as well as provide viability gap funding, wherever necessary.

All successful agricultural export stimulation projects, globally, have been able to address the issue of funding. The agricultural exports-linked state-led plans will comprise several sub-projects, each of which could be funded independently. Each project will have details of outcomes and investment needed. There will be multiple sources of funding spanning the Centre, States and Private Sector in the form of loans, grants or converged schemes, as well as funding from the Finance Commission. Funding needs to be designed in such a way as to make the state-led crop value chain cluster plan viable. For example, all investment in infrastructure-related sub-projects (e.g., logistics) that enable cluster competitiveness could be made by the government, investment in food-processing could be through the private sector or a combination, i.e., infra-funding by the private sector with viability gap bridged by the government.

Funding will be done in multiple parts across the plan lifecycle. Funding will need to happen through the lifecycle of the cluster implementation, in likely 5 stages, linked to plan development, institutional setup once the plan is approved, achievement of project implementation milestones, implementation of regulatory policy and procedures and final outcome achievement. Non-achievement of milestones could result in negative consequences such as claw back. A certain proportion (e.g., 20%) of the project funding will be held back pending the implementation of the regulatory, policy and procedural interventions that have been committed in the state-led plans. This portion can be disbursed upon full

implementation of the regulatory, policy and procedural interventions. The exact measures will get defined in the state-led export plan. Please refer *Exhibit 37*.

EXHIBIT 37

Overview of funding across stages of state-led plans

Stage	Key actions
1 **Pre-plan**	For developing the state-led plan as defined by HLEG
2 **Post-plan setup**	For funding the institutional setup at the centre and the states, staffing the secretariat and project management cells
3 **Project implementation**	For achievement of project implementation milestones and/or movement in associated operational KPIs[1]
4 **Policy and procedural changes**	Holdback; Released on implementation of identified policy interventions and procedural reforms, as prioritized in the value chains
5 **Outcomes**	Holdback; Released on achievement of outcomes or lag indicators (e.g., increase in overall production, increase in farm productivity, increase in % share of value addition, increase in agri exports from state)

1. Detailed in Chapter 5

The exact mechanism of funding needs to be worked out and is likely to take several forms. Funding must also be earmarked separately to operationalise the institutional set-up and state plan preparation to begin with. State-level plans should be funded at the sub-project level, with the centre directing funds to the state and the state in turn distributing them to last-mile project implementation agencies or private sector actors. Once funds are transferred to state-level agencies, the mechanism to transfer funds to individual beneficiaries and private sector actors is likely to be project-specific. For individual beneficiaries, these could include Direct Benefit Transfers or subsidised provision of goods and services. For private sector actors, these could include subsidies, and performance-linked incentives to anchor investments (e.g., incentives for exporting value added goods). In each case, it will be crucial that state agencies ensure incentives are targeted to the right actors and aligned with the intended project outcomes.

INSTITUTIONAL FRAMEWORK

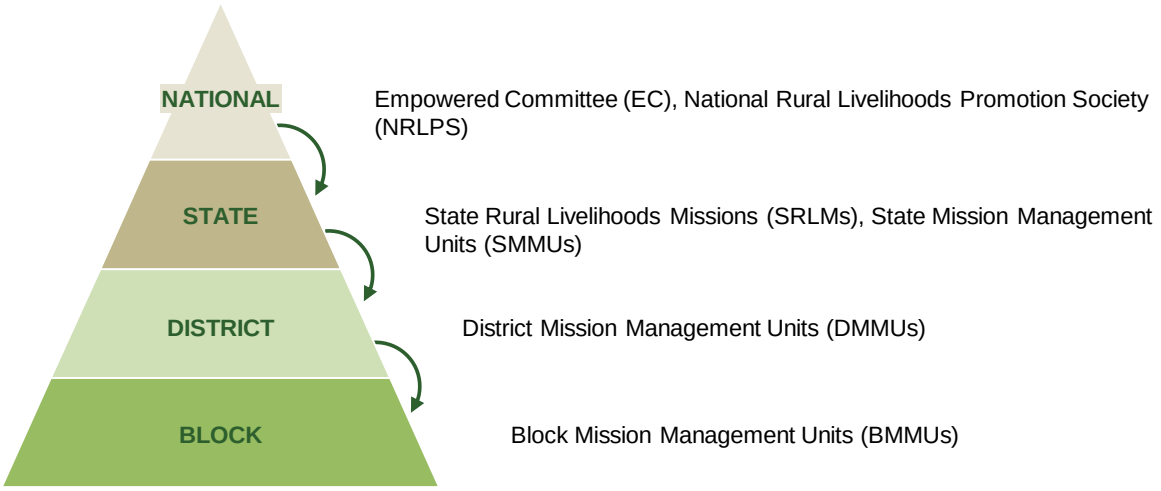
The institutional framework required to operationalise all of this will have a 2-part set-up across the state and centre. The HLEG studied several examples to inform the design of this set-up between the state and centre. These examples are detailed below and each of them have specific takeaways that have shaped the recommendations.

1. **Cascading governance model of the Ministry of Rural Development:** The National Rural Livelihoods Mission (NRLM) is a national poverty alleviation programme under the Ministry of Rural Development funded partially by the World Bank. It is run by a National Empowered Committee and the National Rural Livelihoods Promotion Society at the centre, a State Mission Management Unit at the state level, District Management Mission Units at the district level, and joint block consultation committees at the sub-district level. The programme architecture is an example of a project

management structure cascading all the way from the centre to the sub-district level.[91] An overview of the NRLM governance structure is provided in *Exhibit 38* below.

EXHIBIT 38

NRLM governance structure



2. **State-owned execution in Punjab:** The Government of Punjab has incorporated many state-owned entities (e.g., Punjab Agri Export Corporation and Punjab Agro Foodgrain Corporations) to promote agricultural production and foster private-sector collaborations in the state. In the 1990s, the state government added Punjab Agro Industries Corporation Limited (PAIC) to the list of these entities, with the mandate to create, fund and execute public-sector projects in the agricultural processing sector. Since its inception, PAIC has funded more than 100 agricultural projects. PAIC is a good example of a state-owned execution body with a CEO who can be held accountable for promoting investments in agriculture and agricultural processing.[92]

3. **Special purpose vehicles of the Smart Cities Mission:** Under Ministry of Urban Development's Smart Cities Mission, each participating city is required to set up a special purpose vehicle (SPV) to execute the objectives of promoting sustainable and inclusive cities that provide a high quality of life and utilise "smart" solutions.[93] In Pune, the Pune Municipal Corporation and the Maharashtra State Government jointly set up an SPV, with both parties splitting ownership equally. Under this SPV, sub-SPVs can be created to execute individual projects, and private sector partners can be included in the equity structure.[94]

4. **Terminal Market Complex – PPP between a producer association and a private sector player:** The Terminal Market Complex was created to ensure free trade access from APMCs, which were not functioning transparently in some instances, leading to high marketing costs. To address these challenges, the National Horticulture Mission developed a PPP approach involving 4 participants: a

91 https://aajeevika.gov.in/en/content/support-structure

92 http://www.punjabagro.gov.in/pajl-heading16.html

93 "Smart Cities," Government of India Ministry of Housing and Urban Affairs

94 Pune Municipal Corporation, "Framework and Principles of the Special Purpose Vehicle for Pune Under Smart Cities Mission"

private player, the producer association, the state government, and the central government. As part of the approach, a successful private sector bidder had to constitute a company, in which producer organisations were given 26% equity. The states ensured timely licenses and clearances and the centre provided a floor subsidy of 25-40% (or maximum INR 50 crore) of the project cost to the private sector. This scheme reduced post-harvest losses and improved farmer incomes. This is an example of a successful PPP structure between a private sector player and a producer association, supported by both the state and central governments.

The exact design will depend on the state and the HLEG aims to lay down guiding principles based on these case studies and several expert consultations.

Role of the state body and private sector players

The state will (i) identify clusters based on potential competitive advantage, (ii) attract private investors who can anchor these value chains, (iii) develop plans in conjunction with the anchor private sector investors and Commodity Boards in line with the HLEG guide, (iv) operationalise plans, (v) ensure convergence of all central, state and Agricultural Export Policy schemes and resources (example, the Andhra Chilli PPP programme converges existing schemes both at the State and Centre such as Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana and Andhra Pradesh Micro irrigation Project), and seek any additional funding required and (vi) liaise closely with the Central body for additional funding requirements.

In order to do this, a state-level body will be set up involving multiple stakeholders, including representatives from the Centre (including commodity boards), State, Private sector (relevant to the primary cluster in that state), and FPOs. One of the cornerstones of this set-up is the involvement of one or more private sector players along the crop value chain. The private sector players will be involved from the start, i.e., development of the state-led export plan, participate in overall governance and fund relevant projects such as processing. As past successes have shown, this will be a win-win proposition for the states and the private sector, as everyone works towards delivering financially-viable projects that will lead to growth in agricultural exports, state revenues and farmer incomes.

The exact constitution of this body will vary by state based on the nature of the value chains and convergence needs. This can potentially be an Empowered Committee or state-owned department or SPV enabling a PPP model. This body needs to be sufficiently empowered, e.g., through a power of attorney, to make decisions and provide requisite approvals to ensure timely execution. Irrespective of the structure, there will be a dedicated project management cell led by a Project Director that will facilitate execution.

Commodity Boards will assist in harnessing synergies when multiple states build plans for the same crop value chain.

Role of the central body

The centre will (i) align the states to the aspiration and national agriculture export strategy, (ii) support the states with central resources, (iii) evaluate and approve the plans, along with ongoing monitoring and tracking of execution, (iv) administer funds based on performance, (v) provide oversight and inter-ministerial coordination for cross-cutting enablers. The central body will likely be an Empowered Committee comprising representatives of all stakeholder groups. There will be a dedicated secretariat. Inter-ministerial offices like Principal Secretary of the PMO or Member Agri of NITI Aayog could provide monitoring oversight to this set-up.

In summary, while the states will lead the charge on implementation, the role of this central body is critical to the achievement of the overall export aspirations.

Governance model between state and centre

There are intricate interdependencies between the state and the centre. The 2-part set-up will be well-served by a W-shaped governance model to ensure the requisite balance between centre and the states. Specifically, the 5-point model would include: (i) central aspiration-setting and creation of a national agriculture export strategy through demand prioritisation, (ii) comprehensive state-level project planning tailored to agri-clusters, (iii) central validation of project plans and of their goals and milestones, (iv) state-level project implementation; and (v) central monitoring and tracking. The central government will also play an important role in implementing cross-cutting reform and initiatives (e.g., trade agreements, infrastructure) that will enable the states' value chain implementation.

In order to get this started, the HLEG recommends inviting 3-4 private sector players to partner with states to launch 3-4 pilots for the lighthouse value chains.

The HLEG believes that the recommended institutional set-up, combined with an efficient funding mechanism will be an important ingredient for the success of the state-led action plans. These institutions must be set-up and funded to create the right conditions for success, i.e., ensuring competitiveness, convergence of resources and regulatory aid to enable agriculture exports for India.

Annexure

Contents

I. LIST OF EXPERTS CONSULTED

List of High Level Expert Group Consultations

Annexure

List of experts consulted (1/3)

S. No.	Name	Designation	S. No.	Name	Designation
1	Dr. A. K. Singh	Director, Indian Agricultural Research Institute (IARI)	21	Sh. D Sathiyan	Secretary, Spices Board
2	Mr. A S Mehta	President and Director, JK Paper	22	Ms. Delna Rose	Associate Manager (Agri Services) - ITC Agri Business
3	Dr. A. Vishnuvardhan Reddy	Director, IIOR	23	Col. Deric Sebastian	Executive Director, AISEF (All India Spices Exporters Forum)
4	Mr. Ajit Kumar Seth	Non-Executive Independent Director, ITC Limited; ex-Cabinet Secretary of India	24	Dr. Devika Pillai	HoD, Kerala University of Fisheries
5	Dr. Alka Bhargava	Additional Secretary, DAC&FW	25	Ms. Dolly Chakrabarty	Additional Secretary, DAC&FW
6	Mr. Amar Desai	Partner, Konkan Agro	26	Mr. DVR Rajiv Mohan	Vice President (VAAP Business) - ITC Agri Business
7	Mr. Anil Mittal	Owner/Promoter, KRBL (India Gate Basmati)	27	Mr. Feroz Allana	Founder and Chairman, Allana Group
8	Mrs. Antara Roy	Senior Manager (Food & Agribusiness Strategic Advisory and Research)	28	Mr. Geemon Korah	CEO, Kancor Ingredients Ltd.
9	Dr. Arabinda Kumar Padhee	Director (Country Relations and Business Affairs), ICRISAT	29	Mr. Ghannashyam Patel	Chairman, APMC Mahuva
10	Mr. Arjun Gadre	MD, Gadre Marine	30	Mr. Giridhar R	Business Manager (F&V) - ITC Agri Business
11	Sh. Arun Kumar Ray	Deputy Chairman, Tea Board	31	Dr. Gokul Patnaik	Ex-APEDA Chairman
12	Sh. Ashish Kumar Bhutani	JS (Credit), DAC&FW	32	Mr. Himanshu Agarwal	Owner/Promoter, Satyam Balajee
13	Dr. Ashok Gulati	Infosys Chair Professor, ICRIER; ex-CACP; ex-Chairman, CACP	33	Mr. Hitesh Thakkar	Promoter, M/s Gautam Onion Exports
14	Mr. Ashwani Arora	Owner/Promoter, LT Foods (Daawat)	34	Mr. Jaideep Bhatia	Vice President - Postharvest business & Food value chain
15	Mr. Aswathaman Vijayan	Manager (Sustainability) - ITC Agri Business	35	Sh. Jasvinder Singh	Director (UF & Coordination/FAA) – Fifteenth Finance Commission
16	Sh. Atish Chandra	JS (Extn. & PP), DAC&FW	36	Mr. Jehan James	Branch Manager, Kadalkanni Seafoods
17	Mr. Bhupender Singh Negi	Trader (Rice Desk) - ITC Agri Business	37	Sh. K S Srinivas	Chairman MPEDA
18	Mr. Chandra Sekhar S	Business Head (Spices) - Olam Agro India Limited	38	Mr. Kirandip Swani	CEO, Swani Enterprises - SWANISPICE
19	Mr. Cherian Xavier	COO, Plant Lipids	39	Mr. Kozhikotte Pranoy Gopal	Associate Manager (Aqua Business) - ITC Agri Business
20	Mr. D Narain	Managing Director & CEO, Bayer CropScience Limited	40	Mr. Krishna Srinivas	Owner/Promoter, Pattabhi Agro Foods

List of experts consulted (2/3)

S. No.	Name	Designation	S. No.	Name	Designation
41	Mr. Madhukar Sethi	Vice President, Ballarpur industries Ltd.	61	Mr. Prakash Jhanwer	Global Head (Private Label & Food Service Business) & Former Regional Head (South East Asia & Greater China Region), Olam International
42	Dr. Mani Muthiah	Retd. Chief Scientist, ITC Limited	62	Mr. Praveen A	Associate Manager (Coffee Business) - ITC Agri Business
43	Mr. Mark Kahn	Managing Partner, Omnivore	63	Mr. Preethi Chintakindi	Associate Manager (Digital Projects) - ITC Agri Business
44	Mr. Martin Wittwer	Executive Partner - Operations, Pioneering Ventures	64	Mrs. Purnima Khandelwal	Co-Founder & CEO - INI Farms
45	Mr. Mayank Shah	Business Manager (Coffee Business) - ITC Agri Business	65	Dr. R.S. Sodhi	Managing Director, GCMMF Ltd (Amul)
46	Mrs. Meetu Kapur	Executive Director, CII-FACE	66	Mr. Rahul Jain	MD, Capricorn
47	Mr. Mukesh Kumar Khemuka	Owner, Uma Exports	67	Sh. Rajbir Singh Panwar	JS (MIDH), DAC&FW
48	Mr. Munish Soni	Head (Strategy) - Bayer CropScience	68	Sh. Rajeev Kher	Ex-Commerce Secretary of India
49	Mr. Murtuza Badami	MD, Murtuze Foods	69	Mr. Rajiv Kumar	Representative, The Rice Exporters' Association
50	Mr. N Gopalaratnam	Chairman, Seshasayee Paper & Boards Ltd	70	Mr. Rajiv Palicha	Director, Nedspice
51	Mr. Nasim Ali	CEO - Oil Palm Plantation, Godrej Agrovet	71	Mr. Rajnikant Rai	Divisional Chief Executive, ITC Agri Business
52	Smt. Neerja Adidam	JS (INM), DAC&FW	72	Mr. Ram Kumar Menon	Chairman, WSO (World Spice Organization)
53	Mr. Nikhilesh Alluri	Executive Director, Avanti Feeds	73	Mr. Ramesh Mall	Chief Advisor, Orient Paper & Industries Ltd.
54	Mr. Nitin Gupta	Vice President - Olam Agro India Limited	74	Mr. Raza Vakil	MD, King Dehydration
55	Mr. Nitin Puri	Senior President, Yes Bank	75	Mrs. Ritoja Basu	Deputy Director, CII-FACE
56	Mr. Nitin Sethi	Assistant Manager (eChoupal 4.0) - ITC Agri Business	76	Mr. Rohit Pandit	Secretary General, IPMA
57	Sh. Noyal Thomas	Inspector General of Forests, MoEF	77	Mrs. Roli Pande	Lead Policy - Agriculture, CII-FACE
58	Mr. Pankaj Khandelwal	Co-Founder; Chairman and M&D -INI Farms	78	Mr. Sagar Kaushik	COO, UPL
59	Mr. Pawan Agarwal	Managing Director, Naini Papers & Naini Tissues Ltd.	79	Mr. Sakkargi	CEO, Royal Foods
60	Mr. Piruz Khambatta	Chairman, Rasna International	80	Mr. Salil Singhal	Chairman, CII National Council on Agriculture

List of experts consulted (3/3)

S. No.	Name	Designation	S. No.	Name	Designation
81	Mr. Sameer Tandon	Regional Director - India, UPL	98	Mr. Simanta Ghosh	Manager (Projects) - ITC Agri Business
82	Mr. Sampath Krishnan	FPO President, Hi Tech Mango - Krishnagiri	99	Mr. Simon-Thorsten Wiebusch	COO, Bayer Crop Science (India, Bangladesh & Sri Lanka)
83	Mr. Sandeep Kumar Siram	Assistant Manager (Digital Projects) - ITC Agri Business	100	Mr. Siraj BK	Business Manager (Aqua) - ITC Agri Business
84	Dr. Sangeeta Ladha	VP, Jain Irrigation	101	Mr. Siraj Chaudry	MD & CEO, NCML; Ex-Chairmam, Cargill India
85	Sh. Sanjay Agarwal	Secretary (DAC&FW) - Ministry of Agriculture	102	Mr. Siraj Hussain	Visiting Senior Fellow - ICRIER
86	Mr. Sanjay Singh	Group Head - Paper & Packaging, ITC Limited	103	Mr. Sivakumar S	Group Head - Agri & IT Businesses, ITC Limited
87	Mr. Sanjeev Asthana	Founder & Managing Partner, iFarms	104	Sh. Srivatsa Krishna	Secretary, Coffee Board
88	Mr. Sanjeev Bisht	Business Head (Spices & Aqua) - ITC Agri Business	105	Dr. Sudhanshu	Secretary, APEDA
89	Mr. Sanjiv Kanwar	Country Manager, Yara International	106	Mr. Suneel Pandey	Vice President - ITC PSPD
90	Mr. Sanjiv Rangrass	Group Head (Designate) – R&D, Sustainability & Central Projects, ITC Limited; Former CEO – ITC Agribusiness	107	Mr. Surbhit Lihala	Vice-President, Keventer
91	Mr. Sarabpreet Singh Matta	GM, Devi Sea Foods	108	Dr. Tarun Bajaj	Director - APEDA
92	Mr. Sarat Chandra Sanka	Associate Manager (Spices Business) - ITC Agri Business	109	Mr. Tejas Gandhi	Secretary, Federation of Indian Spice Stakeholders
93	Mr. Savji Thanth	MD, Maahir Foods	110	Mr. Vamsi Krishna	Exports Manager (Coffee Business) - ITC Agri Business
94	Mr. Seenivasan Ramanathan	GM, Plantations - Tamil Nadu Newsprint and Papers Limited	111	Mr. Varun B	Associate Manager (F&V) - ITC Agri Business
95	Mr. Shailesh Krishna	Business Manager (Rice Business) - ITC Agri Business	112	Mr. Vinod Jobanputra	MD, LD Foods
96	Ms. Shubha Thakur	JS (Crops and Oilseeds), DAC&FW	113	Sh. Vivek Agarwal	JS (Coop. & FW), DAC&FW
97	Ms. Shubhra	Adviser (Trade), DAC&FW			

II. NOTES FROM FARMER CONSULTATIONS

Scope of Survey

Number of Farmers	Crops grown
141	Rice, Millets, Red gram, Green Gram, Gram, Mango, Oil palm, Red Chilli, Cotton
27	Red Chilli
57	Rice, Ginger, Maize, Coffee, Black Pepper, Arecanut, Red Chilli
28	Turmeric
3	Tea, Coffee, Black Pepper, Arecanut, Rubber, Coconut, Cardamom, Nutmeg, Cloves
169	Soybean, Red Gram, Cotton, Gram, Wheat, Green Gram, Sugarcane, Rice, potato, cashew
102	Wheat, Soybean, Gram, Potato, Onion, Garlic, Peas, Paddy, Green Gram, Maize, Sugarcane, Cotton, Banana
40	Wheat, Rice, Banana, Sugarcane, Maize, Potato, Pointed gourd, Tomato, Cauliflower, Broccoli, Gram, Watermelon, Peas, Onion, Bottle Gourd, Bittergourd, Mango, Guava
10	Wheat, Paddy, Maize, Soybean, Vegetables, Green Gram
10	Cabbage, Cauliflower, Tomato, Brinjal, Cowpea, Bitter Gourd, Pointed Gourd, Carrot, Radish, Okra, Maize, Mustard, Leafy vegetables, Chilli
60	Okra, Brinjal & Paddy, Soyabean, Guar gum, Wheat, Chilli, Tomato, Cumin
24	Wheat, Rice, Cauliflower, Tomato, Potato, Carrot, Maize, Celery
30	Rice

FARMER RECOMMENDATION CATEGORIES

1. Seed & Seed Varieties

- Need for better quality seeds - High yielding varieties, hybrids, climate & drought resilient, pest and disease resistant & short duration
- Coffee: White stem borer resistant - Arabica and Robusta (clonal) varietals compatible with native weather pattern

- Ginger: Disease resistant (Soft rot of Ginger) and HYV need to be developed and seeds supplied to farmers at subsidized rates.

2. Soil, Water (Irrigation) and R&D

- At village level, samples of soil and water should be tested in each season and report should be shared with associated actionable guidance and agronomic advisory to improve Fertilizer Use Efficiency**.** Rapid Testing kits for Soil and Water at village/Mandal level.
- There is a requirement of regional research stations to create customized PoPs according to local varieties of crop.
- Tank rehabilitation to improve ground water levels. Water canals to be designed properly for irrigation & as well as drains.
- R&D – keeping up with new developments in other major producing countries such as China, Brazil, Colombia and Vietnam. Example: Oil palm - Transfer of technology on harvesting from Malaysia which can replace current manual harvesting & reduce the cost

Crop Nutrition

- **Suggestions:** Availability of quality of organic manure (vermicompost, Neem cake etc.) at the right time and at affordable prices. Promotion schemes for increasing area under use of organic fertilizer. Fertigation systems at subsidized rates and handholding for operation.
- **Manure**: Need infrastructure support and manpower to run animal husbandries that produce high quality manure at low costs

Crop Protection

- The pesticides available in the local market are not authentic and efficient. Govt. need to regulate sale of low-quality and banned molecules. Ban of pseudo bios and mislabelled and misbranded illegal pesticides. Training on judicious and safe usage.
- **Sustainability:** Need to develop organic pesticide, fungicide and other chemicals which are soil and human friendly

Extension: Special Agronomic Practises & Information

- Technical support from field officers on better cultivation practices suited for that location - Drip irrigation, fertigation, Mulching for water conservation; support on integrated crop management practices and diagnosis for Disease and nutrition deficiencies and support on new practices (Zero tillage farming, Happy seeder)
- Chilli: Encourage IPM practices and techniques - adoption by the farmers thereby targeting exports to ‘Food Safe’ markets.
- Paddy: System Rice Intensification method (SRI) - useful to improve productivity; support required in weed & water management.
- **Information needed:**
  - **Inputs:** farmer usually buys seeds as per recommendation of shop keeper/local dealers.
  - **Subsidies, Insurance facility & Claim procedures:** Subsidies and hand holding in availing the same.

- **Weather forecasts:** Advanced weather forecasts and crop-specific loss-management information and
- **Market information:** Information about demand and prices. Latest update on local mandi price through IT use on mobile phones.
- **Capacity Building, trainings, farm meetings, Workshops, Exposure visits are required with a strong Field Staff strength. Collaborations between Government, Private companies and NGOs is required.**

Manual Labour & Farm Mechanization

- Employing MNREGA workers for agri operations shall ensure labour availability. Skill development by training of the labourers in various specialized operations (protected cultivation, mulching, operating fertigation or drip units, cold storage operation etc.) needed
- **Custom Hiring Centres:** Expansion of scope of Custom Hiring Centres (CHCs) for the farming community with variety of farm equipment and reduced cost of agri equipment's such as sprayers, seed-drill, zero-till, etc.

Financing

- Need for interest subsidies, simpler documentation & procedures and minimum account maintenance charges. Crop loans with EMI cycles in line with crop seasons can ease the farmer Credit history of farmers should help for loan eligibility. Bank maintenance charges and & loan sanction and disbursal lead times to be reduced. Village level customer service points need to be strengthened and farmer should get crop loan with minimum documentation

Collectivization

Challenges of FPO formation:

- Farmers don't have the complete knowledge on FPO model**.** Information dissemination required
- Market linkages to FPOs: platform to link these FPOs with food processing companies to get the benefit of price realization
- Lack of facilitators to manage group dynamics, to write documents, minutes & body to ensure compliance to the guidelines by group members. Handholding during the incubation period

Demand Driven Approach

- Farmers should be market demand driven; currently production is done basis prevailing mandi prices, leading to over production
- Demand Specific Cropping Pattern (Crop Regulation): Regulation of crops based on demand and supply scenario via a Domestic and Export Market Intelligence Cell. Through local agriculture department, farmer should get information about alternate crops which will help him to get more returns
- Geographical clusters to be made for each crop and farmers to be given hand holding from seed to sales
- Diversified Cropping system - Clusters for commercial crops need to be identified based on suitable agro ecological conditions

- Specialized advisory team to suggest “which crop to grow” before commencement of season depending specific to the region
- **Product Quality:** Quality improvement is the key for better marketing and fetching best price. Example: 10% export incentive for ‘food safe’ spice production. Facilitate farm-gate buy

III. STATE-LED EXPORT PLAN GUIDE

This guide can be used to understand the components of a state-led agriculture export plan and how to create a plan

Is

- An overview of the objectives, rationale, and expectations of a state-led plan
- A summary of the main chapters and workstreams to design a state-led plan
- A detailed charter, workplan, and sample deliverables by chapter as an illustration of the state-led plan and analysis needed

Is Not

- A sample state-led agriculture export plan
- An exhaustive overview of all analysis required or factors to be considered in creating an individual state's plan

This document is designed to answer 3 questions on state-led plans

	Key topics	
1 **Why** should state plans be created?	▪ Overview of benefits ▪ State-Centre Institutional framework	Detailed in main HLEG report
2 **What** should a state-led plan consist of?	▪ Details on plan components ▪ Checklist for comprehensive planning ▪ Sample templates and analysis	
2 **How** should a state plan be developed?	▪ Steps for developing a plan	

Detailed further in this document

Contents

Each state-led plan should consist of 7 chapters

Chapters	Objective	Description
1 Identify target projects	Deep-dive into prioritized value chains	Assess current pain points and competitiveness, by benchmarking against other export players to identify opportunities for improvement. Create comprehensive projects lists to address pain points, and prioritize the same based on impact and feasibility. Identify markets to target.
2 List of projectized action items	List of initiatives to be undertaken under the plan	3 key elements to be detailed to build a holistic list (a) initiatives with hard, measurable RoI (Return on Interest) such as farm-related inputs, infrastructure initiatives etc. (b) support initiatives with soft ROI such as farmer capacity building, branding, demand generation initiatives and negotiations with target markets and (c) regulatory, policy and procedural initiatives needed at the state/center
3 Policy and Procedures	List of policy and procedural initiatives to be undertaken	Identify key regulatory, policy and procedural changes required to support project plans, and unlock state potential to increase agricultural exports, with details on the engagement strategy for instituting these changes
4 Stakeholder mapping	Identify stakeholder roles and responsibilities to execute plan	Map the specific stakeholders who will execute these action points and codify their roles and responsibilities. Specifically, identify private sectors players that could anchor the projects and address specific constraints in the value chains. Identify mechanisms to attract and partner with private sector players.
5 Expected outcomes	Detail project KPIs and implementation plan	Create detailed expected outcomes in terms of export revenue, productivity, farmer income, employment, and other metrics against portfolio of projects for prioritized value chains. Develop a clear implementation plan for each project.
6 Investment requirement	Create milestone-linked funding requirements	Determine the funding requirements for action plans and create fund request to the Finance Commission. Develop required upfront capital expenditures and to suggest metrics and milestones for further fund disbursement.
7 Governance model	Detail governance structure to enable decision-making and track progress	Create governance structure that enables decision-making and collaboration across public and private sectors, and creates accountability for progress including implementation, tracking, and monitoring.

Checklist for building out comprehensive chapters (1/2)

Non-Exhaustive

Chapters	Key questions to be addressed	
1 Identify target projects	What are the pain points for the priority value chains? How competitive are they to other exporters?	☐
	What projects can help improve competitiveness? How will they be sequenced and prioritized?	☐
	What markets should the value chain target?	☐
2 List of projectized action items	What are the list of actions being undertaken in each project?	☐
	How do these initiatives come together as a project plan?	☐
	Which of these initiatives will generate a hard measurable ROI? Which will generate a soft ROI?	☐
3 Policies and procedures	What the regulatory, policy and procedural initiatives required to support the project plan?	☐
	Who needs to be consulted to understand the impact of these changes?	☐
	Who can drive these changes and what is the strategy for engaging them?	☐

Checklist for building out comprehensive chapters (2/2)

Non-Exhaustive

Chapters	Key questions to be addressed	
4 Stakeholder mapping	Who are the likely stakeholders across value chain?	☐
	Who are the owners for each initiative? Who are the other impacted stakeholders?	☐
	What is the engagement strategy for each of the stakeholders?	☐
5 Expected outcomes	What are the outcome metrics for each project?	☐
	What is the current baseline for these metrics and what is the target value?	☐
	What is the process for tracking each metric and how regularly will they be refreshed/reviewed?	☐
6 Investment requirement	How much funding is required to implement the action plans successfully?	☐
	What are the likely sources of funding? What is the strategy for securing funding?	☐
	What are the right metrics and milestones for further funding disbursement?	☐
7 Governance model	What will be the members of the state body and how will it be structured?	☐
	Who will be staffed on the dedicated project cell?	☐
	What are the mechanisms to ensure progress and implementation course correction?	☐

Chapter 1: States could diagnose the current pain points of priority value chains to identify target projects

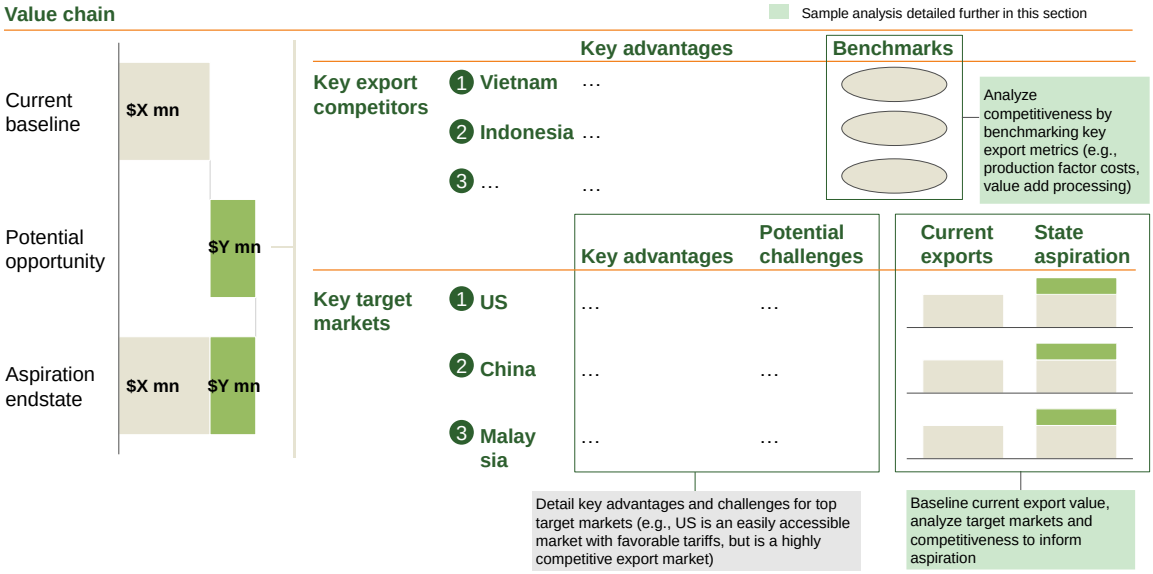
Chapter 1:

Identify target projects

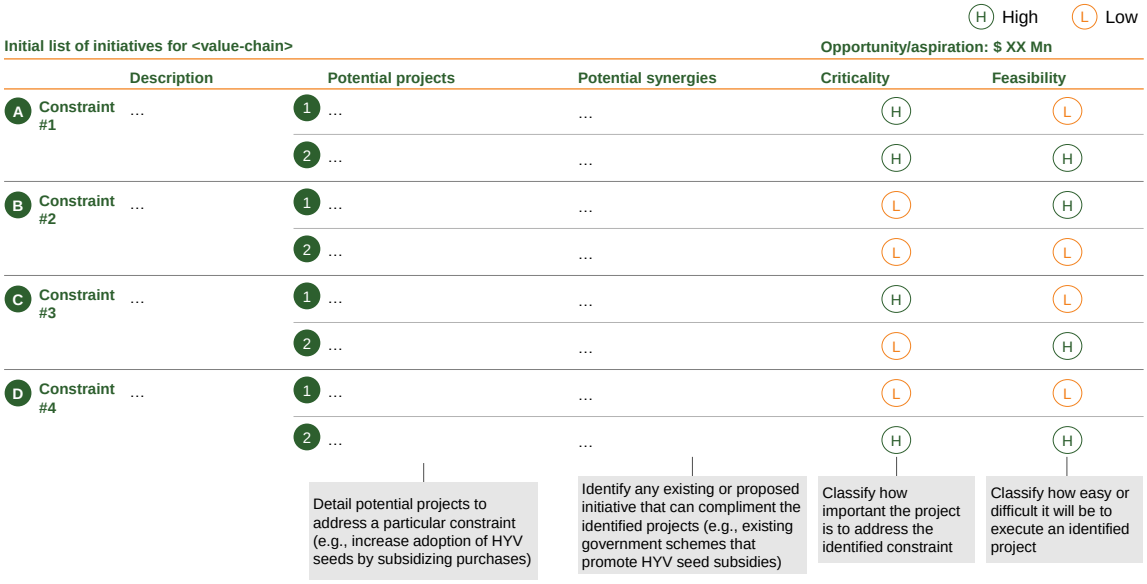
Key questions answered in this chapter

- What are the pain points for the priority value chains? How competitive are they to other exporters?
- What projects can help improve competitiveness? How will they be sequenced and prioritized?
- What markets should the value chain target?

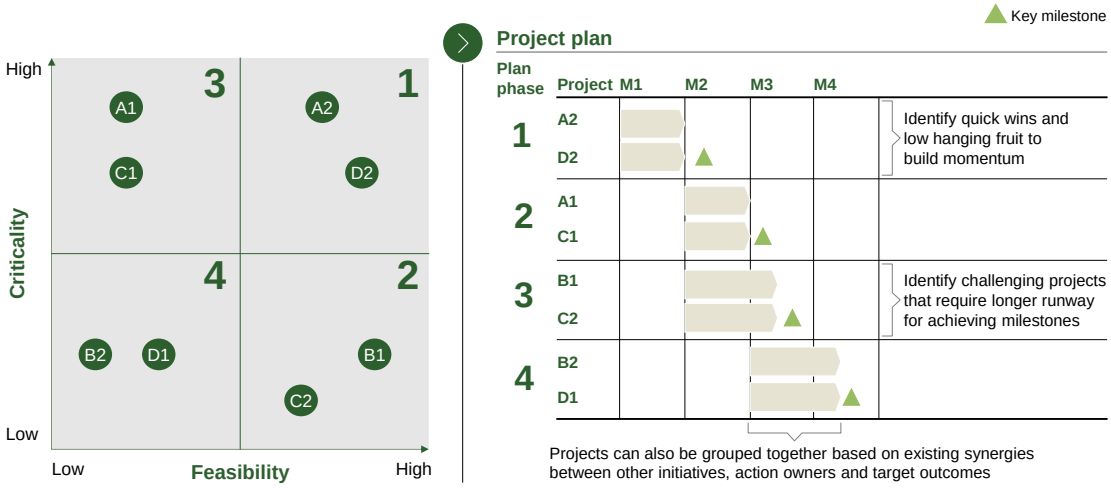
Sample template: Detail opportunity for each value-chain by detailing state advantages, target markets and aspiration end-state



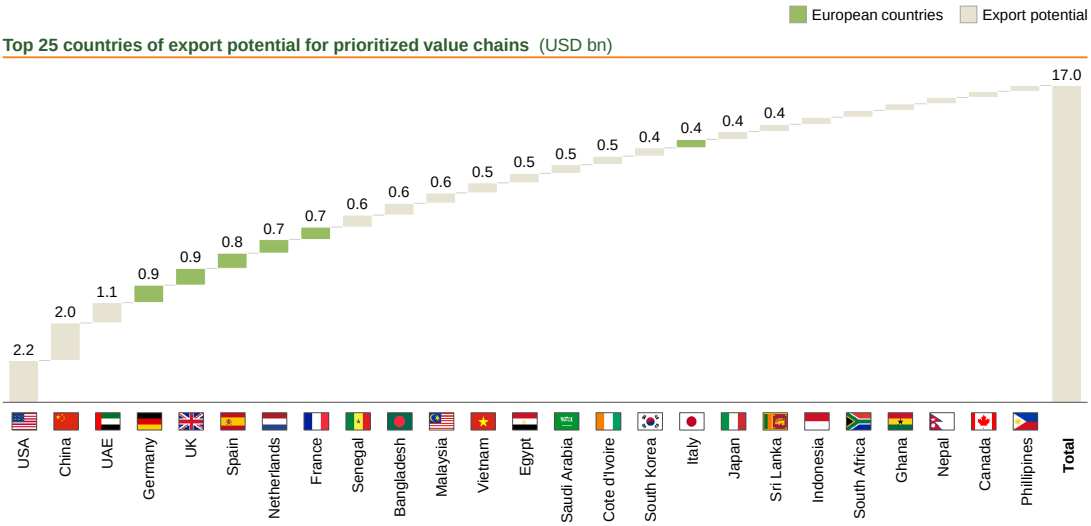
Sample template: analyze current export constraints to begin identifying target projects for a specific value chain



Project planning: Projects for each value-chain could be sequenced based on synergies, criticality and feasibility



Sample analysis: Quantify potential of target markets to increase exports



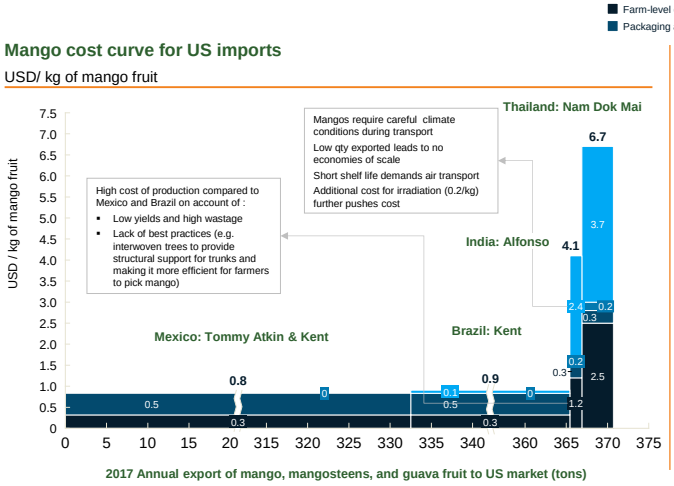
Source: International Trade Center Export Potential Map; FAO; Comtrade

Sample analysis: Analyze competitiveness of target markets - US landed cost for Indian mango is 4x cost of mangos from Mexico

Preliminary

Mango cost curve for US imports

USD/ kg of mango fruit



Key insights

- Global demand for mangoes have increased year over year, making it the fastest growing segment of fruit sales
- Mexico dominates the US mango market, with 66% of US imports; Brazilian represents 7% of US imports; India and Thailand represent less than 2% of US imports of mangoes
- Indian mangoes are substantially more costly to US buyers than mangoes from Mexico or Brazil, largely due to costs of transportation which could be reduced with higher trade volumes
- India and Thailand are also required to irradiate mangoes prior to export to control the spread of pests; the costs of irradiation is relatively small compared to transportation costs
- The mango varieties from India and Thailand are considered superior to the Tommy Atkin and Kent varieties from Mexico and Brazil, but are relatively new to the US market (imports began after 2006)

Source: Expert interviews, 1UN Comtrade (US reported imports for HS Code 080450); 2National Mango Board (https://www.mango.org/) US Dept of Agriculture Economic Research Service (https://www.ers.usda.gov/); Food and Fertilizer Technology Center for the Asian and Pacific Region (http://www.fftc.agnet.org/); International Society for Horticultural Science (https://www.ishs.org/)

Shrimp value chain analysis

Sample analysis: determine primary levers to increase exports for each cluster and quantify the value at stake

Lever	Opportunity	Pain points addressed	Value, $M[1]
Increase global demand	Seafood exporters group and orgs like MPEDA need to craft focused strategies aimed at increasing shrimp demand and opening up new markets (e.g., Germany, Spain, UK)	N/A	~200-350
Increase shrimp farmer productivity	Improve shrimp farm productivity through improving stocking density, increasing number of harvests, and improving shrimp survival rates	Low shrimp production outside of Andhra Pradesh and Gujarat Low shrimp production in winter months	~50-400
Improve shrimp quality	Increase shrimp survival rates through improved hatchery operations, yielding better quality inputs for farmers.	Lack of quality seed High prevalence of disease SPS non-compliance	~600
	Improve SPS compliance to open up the EU for increased exports	SPS non-compliance	~850
Increase export value through processing	Increase value-add of shrimp exports by capturing processing opportunities beyond freezing such as ready-to-cook and ready-to-eat shrimp	Lack of branding to pursue processed segments (e.g., ready to cook, ready to eat, breaded)	~400

1. Values may not be additive as there are tradeoff to consider between density, productivity, quality, and processing

Sample analysis: lay out the portfolio of action plans across value chains to illustrate overall opportunity in terms of increased export

Cluster	Lever	Opportunity	Value, $M[1]
Shrimp	Increase global demand	Seafood exporters group and orgs like MPEDA need to craft focused strategies aimed at increasing shrimp demand and opening up new markets (e.g., Germany, Spain, UK)	~200-350
	Increase shrimp farmer productivity	Improve shrimp farm productivity through improving stocking density, increasing number of harvests, and improving shrimp survival rates	~50-400
	Improve shrimp quality	Increase shrimp survival rates through improved hatchery operations, yielding better quality inputs for farmers.	~600
		Improve SPS compliance to open up the EU for increased exports	~850
Spices	Increase export value through processing	Increase value-add of shrimp exports by capturing processing opportunities beyond freezing such as ready-to-cook and ready-to-eat shrimp	~400
	Improve trade promotion	Promote export by re-designing **engagement with countries and buyers** along with **strong end-customer promotion**	130-220
	Increase output through higher productivity	Increase production and reduce costs by **increasing yield through enhanced productivity, increased cultivated land** and **reduced wastage**	600-900
	Improve spice quality & variety	Improve quality through **higher control over farming, incentivizing best agriculture practices,** more **investment in quality focused R&D**, and renewed emphasis on **traceability**	300-400
	Increase export value through processing	Increase value-add of spice exports by improving incentive structure and **producing further-processed products such as marinates, coatings etc.**	~300
Mango	Improve trade promotion	Promote export by re-designing **engagement with countries and buyers** along with **strong end-customer promotion**	8-13
	Increase productivity	Increase production by **improving productivity** through **promotion of best practices**	30-40
	Reduce wastage	**Reduce post-harvest losses** by **investment in key infrastructure** and **extension services** to farmers	30-50
	Improve mango quality & variety	Improve quality through **higher control over farming, incentivizing best agriculture practices**, more **investment in R&D and treatment facility**	85-100
	Increase export value through processing	Increase value-add of mango exports by improving quality of pulp and **exporting further-processed products such as pickle, jams, juices etc.**	15-20
		Total	~4300

Chapter 2: States could create a detailed action plan for each project, and identify which actions generate a hard, measurable ROI

Chapter 2:

List action items

Key questions answered in this chapter

- What are the list of actions being undertaken in each project?
- How do these initiatives come together as a project plan?
- Which of these initiatives will generate a hard measurable ROI? Which will generate a soft ROI?

Sample template: States should create a detailed list of actions against each project, with identified owners and KPIs to track performance

		Intervention	To be completed by	Owner	KPIs	Key stakeholders
Project #1	1	...	...	...	…	…
	2	...	...	...	…	…
	3	...	...	...	...	...
Project #2	1	...	...	...	...	...
	2	...	...	...	...	...
	3	...	...	...	...	...
Project #3	1	...	...	...	...	...
	2	...	...	...	...	...
	3	...	...	...	...	...
			Detail the timeline for completing the action	Detail who will be driving the intervention and will be accountable for the timeline and outcomes	Each project should have a reasonable mix of hard, soft and policy interventions to ensure accountability and holistic solutioning	Each intervention should identify impacted stakeholders, this can serve as starting point for stakeholder mapping

All actions can be classified into three categories based on the kind of type of outcomes expected

Intervention	Description	Sample interventions and outcomes
Hard ROI	Effectiveness of actions can be directly measured through a quantifiable metric	Increasing area under production by converting degraded forest area
Soft ROI	Effectiveness of action can be indirectly assessed by tracking movement in a particular metric	Marketing campaign leading to improved market penetration
Regulatory, policy or procedural	Action results in a policy or regulatory change that may or may not have directly measurable outcomes	Simplifying application process for export licenses by reducing documentation requirements

Sample analysis: Illustrative list of KPIs for different types of interventions (1/2)

	Intervention categories	Illustrative examples	Potential KPIs	Key stakeholders
Hard ROI	1 **Improving input management**	• **Wood: develop high yielding tree varieties**, utilize high quality sap material	• Yield productivity per HA • % of farmers using certified seeds • % of area with nutrient deficiency	• Farmers • Agri chem producers • Agri universities
	2 **Investing in value-add processing**	• **Shrimp:** expand production of **ready-to-eat and ready-to-cook products**	• Processed products as % of total export value	• FMCGs • State Governments
	3 **Expanding production area**	• **Palm oil: increase area under production** by converting land from lower-value crops	• Annual production area (in Acres) • Unproductive land (e.g., wasteland, degraded forests) converted to productive	• State governments
	4 **Developing supply-chain infra**	• **Buffalo: expand storage facilities** in largest producing states, which are cold chain deficit	• % of post-harvest wastage • Utilization % of storage facilities	• Trade associations • State Governments
Soft ROI	5 **Building farmer capacity**	• **Mango: improve access to information** on HYV seeds, pesticide and equipment	• # of trainings conducted • # of farmers trained/connected	• Farmers • State governments, • Trade associations
	6 **Strengthening quality procedures**	• **Shrimp: Tagging farm produce** to track antibiotic use and identify SPS violation source	• # of SPS violations • % of produce GI tagged	• Trade associations • Central governments

Sample analysis: Illustrative list of KPIs for different types of interventions (2/2)

	Intervention categories	Illustrative examples	Potential KPIs	Key stakeholders
Soft ROI *contd.*	7 **Investing in branding and marketing**	• **Spices: position origin-based branding** of spice varieties to command price premium	• $ value per unit exported (constant/real $) • % of export value from 'premium' brands	• Trade associations • Central Government
Regulatory policies and procedures	8 **Establishing commodity boards**	• **Woods, Palm Oil: establish dedicated boards** to promote production and import substitution	• Balance of Payments/Trade deficit	• Trade associations • Central Government
	9 **Expanding trade agreements**	• **Rice: pursue agreements with East Asian countries** to expand rice exports	• Market penetration % • Balance of Payments/Trade deficit	• Central Governments
	10 **Improving ease of doing business**	• **Shrimp: single window clearance** to ease farm registration/export approval	• # of days for registration/approval	• Central Governments • State governments

Chapter 3: States should identify regulatory, policy and procedural initiatives to support the execution of each project plan

Chapter 3:

Policies and procedures

Key questions answered in this chapter

- What the regulatory, policy and procedural initiatives required to support the project plan?
- Who needs to be consulted to understand the impact of these changes?
- Who can drive these changes and what is the strategy for engaging them?

Sample template: States should detail the policy changes, target outcome and key stakeholders for each policy intervention

		Current policy/procedure	Change required	Target outcome	Key stakeholder(s) to engage	Additional groups to consult
Value chain #1	1	...	...	...	...	...
	2	...	...	...	...	...
	3	...	...	...	...	...
Value chain #2	1	...	...	...	...	...
	2	...	...	...	...	...
	3	...	...	...	...	...
Cross-cutting	1	...	...	...	...	...
	2	...	...	...	...	...
	3	...	...	...	...	...
			Specify the change required in existing policy/procedure	Detail what outcome this change will unlock (i.e., answer what success looks like)	Identify the key stakeholder(s) who can help implement/institutionalize this change	Identify additional stakeholder groups who should be consulted to refine the policy change (e.g., FPOs, exporters etc.)

Chapter 4: Mapping stakeholders across value is a critical input for detailing each project's engagement strategy

Chapter 4:

Plan for stakeholder management

Key questions to answer in a successful transformation plan

- Who are the likely stakeholders across value chain?
- Who are the owners for each initiative? Who are the other impacted stakeholders?
- What is the engagement strategy for each of the stakeholders?

Sample template: Project team should detail their engagement strategy for all identified stakeholders for a specific value chain

		Key stakeholder	Engagement channels	Frequency	Owner
Government	1	...	...	...	...
	2	...	...	...	...
Private sector	1	...	...	...	...
	2	...	...	...	...
Farming communities	1	...	...	...	...
	2	...	...	...	...

Detail the different formal/informal channels to reach out to the concerned stakeholder (e.g., organized meetings, public consultations etc.)

Detail the expected frequency of interactions be required to influence or inform the required change (e.g., monthly reviews, daily stand ups etc.)

Identify which state team member should own and implement the engagement strategy to bring about the required change

Sample analysis: map required stakeholders to understand champions and enablers – Smart Cities Pune example

Illustrative

PMPML
- Run bus ITMS systems and share incremental revenue
- Operate busses on ABB BRT route

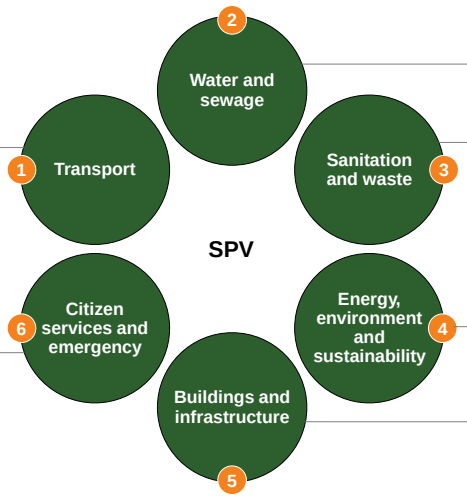
PMC (transport and road department
- O&M of roads in ABB area
- Integrated planning

Traffic Police
- Operate adaptive traffic management with central command control centre
- Enforce parking rules in city

PMC (IT dept.)
- Back-end support to citizen services

Police department
- Provide additional policemen to SPV (through PMC)
- O&M of infrastructure and equipment provided by SPV

Hospitals/Fire
- O&M of infrastructure and equipment provided



PMC (Water department)
- Operate and manage Pan-city solutions in water and sewage
- Provide water in bulk to ABB
- Major O&M in ABB

PMC (Water and sanitation dept.)
- Provide employees to undertake door-to-door collection of waste

MSEDCL
- Execute smart grid project
- O&M of smart meters and T&D infra.

MPCB/Irrigation dept/NGT/CWRRS
- Provide necessary approvals and monitor environment impact

PMC (Garden dept.)
- Support SPV in developing parks and open spaces

SRA
- Overall governance including consent and eligibility

Source: Reimagining Pune, Mission Smart Cities

Chapter 5: States will need to identify target outcomes and detail processes for tracking progress

Chapter 5:

Expected outcomes

Key questions to answer

- What are the outcome metrics for each project?
- What is the current baseline for these metrics and what is the target value?
- What is the process for tracking each metric and how regularly will they be refreshed/reviewed?

Each project action should be associated with an outcome metric that should be calculated and tracked in a transparent manner

Detailed examples follow

		Intervention	KPI	Baseline	Target	Data source	Refresh frequency
Value chain #1	1	...	...	...	...	...	...
	2	...	...	...	...	...	...
	3	...	...	...	...	...	...
Value chain #2	1	...	...	...	...	...	...
	2	...	...	...	...	...	...
	3	...	...	...	...	...	...
Value chain #3	1	...	...	...	...	...	...
	2	...	...	...	...	...	...
	3	...	...	...	...	...	...

A baseline value for each identified outcome metric should be established

Once the baseline is established, an aspirational target should be set based on the identified intervention

A reliable data source should be identified for tracking progress

A data refresh frequency should be identified based on update process for the identified data source

Sample template: Opportunity estimation, action lists, stakeholders map and outcome metrics can be collated to create a summary view of a value-chain action plan

Action plan #					
Value chain	XXX	**2019 exports**	$XX M	**2020 export target**	$XX M
Priority actions	▪ ▪ ▪				
Key milestones	▪ ▪ ▪				
Outcome metrics	▪ ▪ ▪				
Key stakeholders	▪ ▪ ▪				

Chapter 6: States will need to make funding requests to implement their action plans, including both upfront funds required and further disbursement based on implementation success

Chapter 6:

Funding request

Key questions to answer in a successful transformation plan

- How much funding is required to implement the action plans successfully?
- What are the likely sources of funding? What is the strategy for securing funding?
- What are the right metrics and milestones for further funding disbursement?

Sample template: States should detail the funding required for each project plan, based on initial requirements as well as any additional needs upon hitting milestones

Project requirements | Total plan requirement

	Funding requirements of key initiatives	Initial funding required	Key milestones	Additional funding	Potential sources of funding
Project #1	1 ...	Xx INR Cr	...	Xx INR Cr	...
	2 ...		...		...
	3 ...		...		...
Project #2	1 ...	Xx INR Cr	...	Xx INR Cr	...
	2 ...		...		...
	3 ...		...		...
Project #3	1 ...	Xx INR Cr	...	Xx INR Cr	...
	2 ...		...		...
	3 ...		...		...
		Xx INR Cr		Xx INR Cr	

Describe the funding needs of major initiatives, in terms of quantum and purpose of the required funds (e.g., xx Cr required to train yy farmers on seed replacement)

Describe project milestones and additional funding requirements (e.g., additional infrastructure requirements after achieving year 1 targets)

Identify public and private sector pool of funds that can be tapped to support project objectives

Sample template: Once project-wise funding requirements are clear, states should aggregate all identified funding sources and detail an engagement strategy

	Total funding target	Key stakeholder(s)	Engagement strategy	Owner
Funding source #1	Xx INR Cr	...	...	...
Funding source #2	Xx INR Cr	...	...	...
Funding source #3	Xx INR Cr	...	...	...
		Identify key stakeholders to engage to access required funding (e.g., Central Ministry departments/officials, Private Sector CSR heads etc.	Detail an engagement strategy for each stakeholder (e.g., formal application, project presentation etc.)	Identify an individual or team responsible for pursuing stakeholders and unlocking the funding required for the plan

Chapter 7: States must outline how they will implement their action plans and the associated governance structure

Chapter 7:

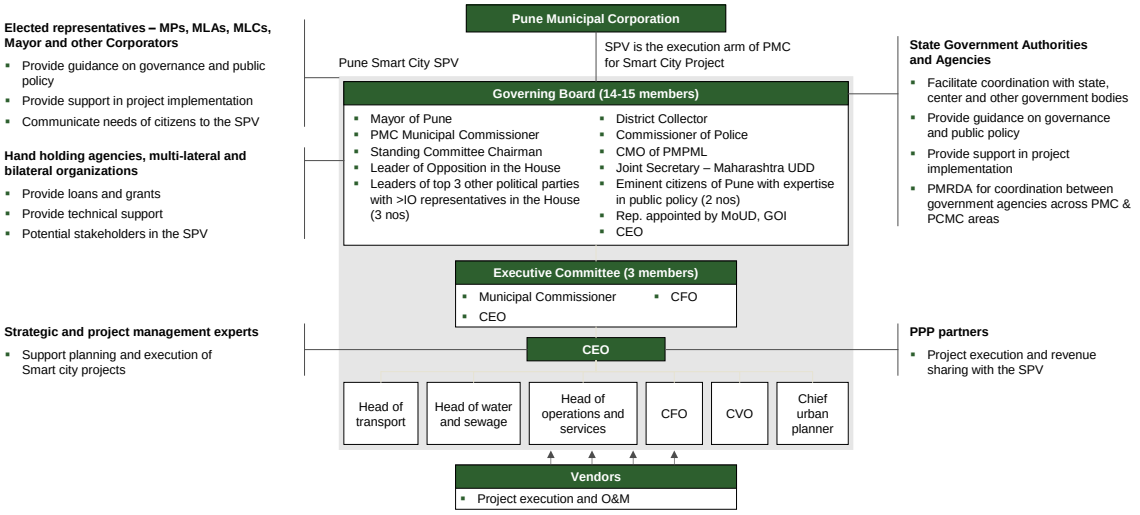
Governance cadence

Key questions to answer in a successful transformation plan

- What will be the members of the state body and how will it be structured?
- Who will be staffed on the dedicated project cell?
- What are the mechanisms to ensure progress and implementation course correction?

Illustrative example: governance framework for action plan implementation – Smart Cities Pune

Illustrative



Source: Reimagining Pune, Mission Smart Cities

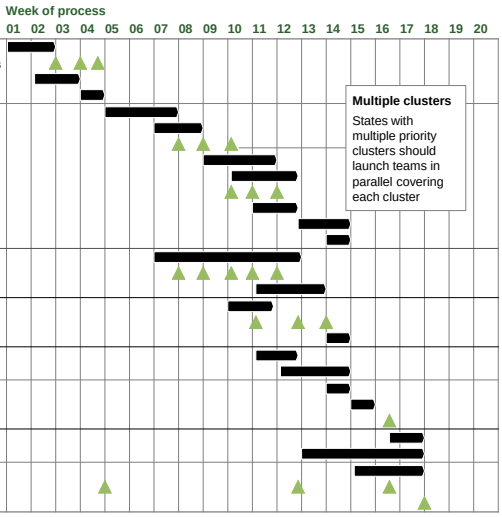
Contents

What should a state-led plan consist of?

How should a state-led plan be developed?

Suggested activities for creating state-led export plan

Chapter	Activity
1. Identify target projects	Align on current state of value chain and benchmark state performance against other exportters
	Hold expert consultations (farmer, private sector, academic) to solicit feedback on prioritized clusters
	Identify current pain points, potential projects and target markets
	Evaluate export potential and value at stake
2. Detail action plan	Perform deep-dives on prioritized clusters to identify pain points inhibiting exports
	Analyze current state of enablers to identify which enablers are more relevant for improvement
	Hold expert consultations on cluster solutions and enablers
	Design action plans per cluster aligned to specific enablers
	Understand which stakeholders are most crucial to ensuring success of the action plans
	Expert private sector consultations on investment opportunities and incentives
	Evaluate impact on smallholder farmers to ensure they participate in the value capture
	Synthesize action plans across clusters into one state plan
	Determine sequencing for action plans
3. Policies and procedures	Identify regulations, policies and procedures required to support project plan
	Hold stakeholder consultations to refine proposed changes (can be done in conjuction with 2)
	Identify key stakeholders to institute required changes and detail engagement strategy
4. Map stakeholders	Map all impacted stakeholders against each initiative
	Perform stakeholder consultations and detail engagement strategy
	Detail engagement strategy
5. Detail expected outcomes	Detail project KPIs for tracking progress
	Baseline KPI values and detail process for regular refresh
6. Outline investment requirement	Evaluate funding requirements for portfolio of action plans, including required capital investments
	Create metrics and milestones for further disbursement
	Finalize entire funding request (e.g., upfront requirements, implementation milestones)
7. Setup governance	Create governance model to oversee implementation of state-led plans
	Create detailed implementation plans across portfolio of action plans
Check-ins with central guidance bodies	Identify key stakeholders and required committees to oversee any initiatives
	Receive feedback and coaching from central guidance body
	Submit plan



Sample evaluation template: Funding could depend on plan quality, evaluated based on the robustness of each chapter (1/2)

Preliminary
Illustrative

	Robust		Less robust	Total points
	25	15	5	
1 Identify target projects	▪ Prioritized crop value chains after assessments on nationally prioritized value chains ▪ Identified target markets for crop value chains with clear analysis of opportunities and challenges ▪ Detailed project plans with sequence and details of action items after accounting for impact, feasibility and synergies — Include 3 detailed elements (a) initiatives with hard, measurable RoI such as farm-related inputs (b) support initiatives with soft ROI (Return On Interest) such as farmer capacity building, branding etc. and (c) regulatory, policy and procedural initiatives needed	▪ Prioritized crop value chains after assessments on nationally prioritized value chains ▪ Identified target markets for crop value chains ▪ Project plans with sequence and details of action items — Include 3 detailed elements (a) initiatives with hard, measurable RoI such as farm-related inputs (b) support initiatives with soft ROI (Return On Interest) such as farmer capacity building, branding etc. and (c) regulatory, policy and procedural initiatives needed	▪ Prioritized crop value chains ▪ Project plans with sequence and details of action items	x
2 Comprehensive list of projectised action items	▪ Comprehensive list of action points and projects to be undertaken both on the demand side and supply side ▪ Project plans with details of action timelines, owners, KPIs and key impacted stakeholders	▪ List of action points and projects to be undertaken with detailed project ▪ Project plans with action timelines	▪ List of action points and projects to be undertaken	x
3 Stakeholders map	▪ Map all stakeholders who will execute these action points and codify their roles and responsibilities ▪ Identify several private sectors players that could anchor the projects and address specific constraints in the value chains ▪ Identify mechanisms to attract and partner with private sector players and build a strategy accordingly with clear owners for execution	▪ Map important stakeholders who will execute these action points and codify their roles and responsibilities ▪ Identify private sectors players that could anchor the projects and address specific constraints in the value chains ▪ Identify owners for stakeholder engagement strategy	▪ Map some stakeholders who will execute these action points and codify their roles and responsibilities ▪ Identify 1-2 private sectors players that could anchor the projects and address specific constraints in the value chains	x

Sample evaluation template: Funding could depend on plan quality, evaluated based on the robustness of each chapter (2/2)

Preliminary
Illustrative

	Robust		Less robust	Total points
	25	15	5	
4 Policies and procedures	▪ Detail required policy and procedural changes with targeted outcomes, and a detailed engagement strategy for all key impacted stakeholders	▪ Detail required policy and procedural changes with targeted outcomes, and all key stakeholders	▪ Detail required policy and procedural changes with targeted outcomes	x
5 Expected outcomes	▪ Detail target outcomes against portfolio of projects for prioritized value chains ▪ Baseline targeted outcomes and identify clear opportunity for improvement through interventions ▪ Detail processes for regularly tracking metrics against each outcome	▪ Detail target outcomes against portfolio of projects for prioritized value chains ▪ Baseline targeted outcomes and set targets	▪ Detail target outcomes against portfolio of projects for prioritized value chains ▪ Set targets against each outcome	x
6 Investment requirements	▪ Determine the funding requirements with a detailed break up for action plans and create fund request to the Finance Commission ▪ Develop upfront capital expenditures and suggest metrics and milestones for further fund disbursement ▪ Identify all potential sources of funding including convergence with existing schemes	▪ Determine the funding requirements for action plans and create fund request to the Finance Commission ▪ Develop upfront capital expenditures and suggest metrics for further fund disbursement	▪ Determine the high level funding requirements for action plans	x
7 Governance	▪ Create governance structure that enables decision-making and collaboration across public and private sectors, and creates accountability for progress including implementation, tracking, and monitoring	▪ Develop a proposed governance model including structure and decision rights	▪ Develop a proposed governance model	x
			Total	x

IV. CROP VALUE CHAIN DEEP DIVES

High Level Expert Group Value Chain Analyses

Annexure

Agenda

- **Shrimp**
- Buffalo
- Mango
- Vegetable oil
- Wood
- Chilli
- Rice

Executive Summary – Shrimp Value Chain

Global and Domestic Landscape

Global Shrimp Demand is **16 Bn. USD**

India is **world's largest shrimp exporter** (6 Lakh MT)

India's **2nd largest agri exports** (10% of India's agri exports)

(Frozen Shrimp exports have **grown at 15% CAGR)**

Shrimp accounts for **70% of India's Marine Exports**

Candidate Species: Black Tiger, Vannamei & Scampi

>90% of Shrimp production comes from Aquaculture Farms

Andhra Pradesh - **Hub for Shrimp farming** (>60%)

India's Competitiveness in the Shrimp Value Chain

Lowest cost producer of Shrimp

Suitable **Agro-climatic conditions** for Aquaculture

Vast Production Base: **extensive coastline (7517 km)**

Significant Surplus: **>50%** produce is exported

Meeting **24% of Global Demand** & **36% of USA's** shrimp imports (Largest exporter to USA)

Strategic location advantage with respect to markets

C**ompetitors -** Ecuador, Indonesia, Thailand

Potential Opportunities for Growth

Key Destination Markets: USA (35%), Vietnam (25%), China (20%), EU (10%) & Japan (5%).

Potential to expand the limited exports to China due to Higher Duties & EU due to SPS Rejections

Tremendous scope for Value Addition for better price realization - **93% exports are semi-processed**

Value addition stands at 72% (Thailand) & 21% (Indonesia) – Ready to cook & Ready to eat segments.

Key Pain Points	Enablers	Stakeholder (s)	Measurable Metrics
Low productivity	Technology – stocking density;	MPEDA, Private Sector	Increase in stocking density
Lack of focus on Value Addition & Processing	Investments in Processing & Skilling	Centre & State Governments; Private Players	% Value Added Exports from State No. of People Skilled
Quality - SPS Violations & rejections	Testing facilities, Input Management, Digitalization & Traceability	Export Inspection Agency (EIA), State Government	Reduction in SPS Rejections Input Compliance No. of Farms Certified
High Tariff Barrier	Trade Relations	Ministry of Commerce	No. of Agreements Signed
Low presence in US, EU and Japan	Promotion & Branding	MPEDA	Increase in Market Share

Potential for Indian imports to reduce from USD 9.5 Bn to USD 6.5 Bn and increase in forest cover by 1.5% by 2025

Shrimp value chain analysis

India’s success in the global shrimp market illustrates export potential, however challenges remain

Executive Summary

Key insights

Shrimps are **India’s second largest agriculture export outside of rice**, representing ~10% of ag exports

India is the **world’s largest shrimp exporter**, meeting 24% of global demand and is the largest exporter to the US, making up 36% of its shrimp imports

India **exports more than half** of the shrimp it produces, which is mostly produced through **aquaculture** (94%). Shrimp accounts for 70% of India’s seafood exports.

93% of exports are unprocessed (frozen), however processed exports (e.g. ready-to-cook and ready-to-eat) have grown by 54% CAGR from $24M to $320M from 2014-2018

Black tiger, Vannamei and scampi are the candidate species in Indian aquaculture. **Aquaculture industry has exploded** in India and Vannamei shrimp production alone grew 107% year over year since 2009 (**high survival rate, high yields** and **low monitoring** compared to black tiger)

Shrimp is produced mostly in Andhra Pradesh, which produces >60% of shrimp in India

There is an estimated ~$2.6 bn opportunity in incremental exports to build on India’s success with shrimp and further increase shrimp exports globally

Key issues and challenges

The shrimp industry faces a range of challenges, predominantly facing smallholder farmers

Challenges include:

- Expensive feed production
- Poor quality larvae from unauthorized hatcheries. Lack of access to hatcheries
- High prevalence of diseases decreasing shrimp survival rate (recently White Spot Syndrome)
- Low farming productivity outside of Andhra Pradesh and Gujarat
- More use of antibiotics and chemicals and intensifying farming technique putting stress on organisms and environment.
- Several challenges, including lack of brand marketing and SPS issues, are inhibiting value addition opportunities in ready-to-cook and ready-to-eat segments

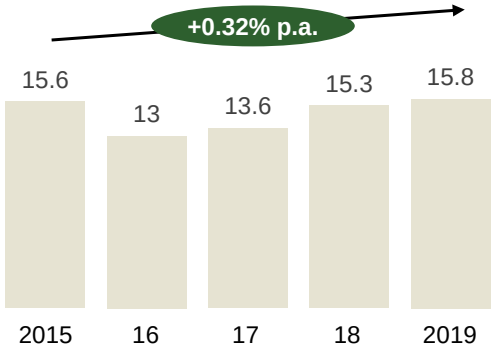
In order to further increase exports, India could incentivize smallholder farmers to utilize best aquaculture practices, purchase higher quality seed, while exploring value addition opportunities in foreign markets

Production landscape of India, all shrimp varieties

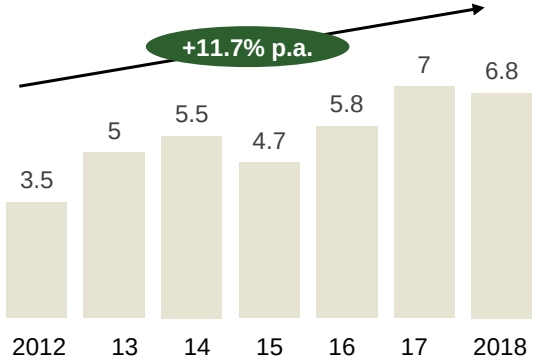
Source: MPEDA; COMTRADE

Overview – Shrimps Trade and Production

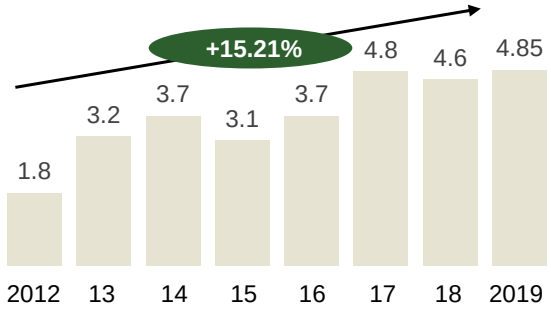
Global Shrimps Trade, $bn



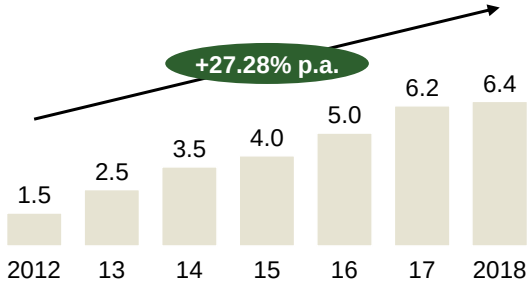
Indian Marine Exports, $bn



Indian Frozen Shrimp exports, $bn



Indian Vannamei production, L MT



Key Insights

- Global demand for shrimps increased by CAGR 5% (last 5 years)
- Increase in shrimp exports is aided by exploding vannamei production in India aquaculture
- Increasing demand for Indian shrimps across US – Salad shrimps, Cooked & EZPL(Easy Peel)
- Decline in Indian shrimp imports by EU due to SPS (Sanitary & Phyto-Sanitary) mandates and port rejections
- Farms follow semi-intensive culture method and hence yields are comparatively lesser than Indonesia/Thailand
- Early Mortality syndrome, White spot syndrome virus & seed quality constraints impacted production adversely
- Reinstating/Renewal/Issue of export licenses for markets like Russia & EU are temporarily on hold due to border rejections

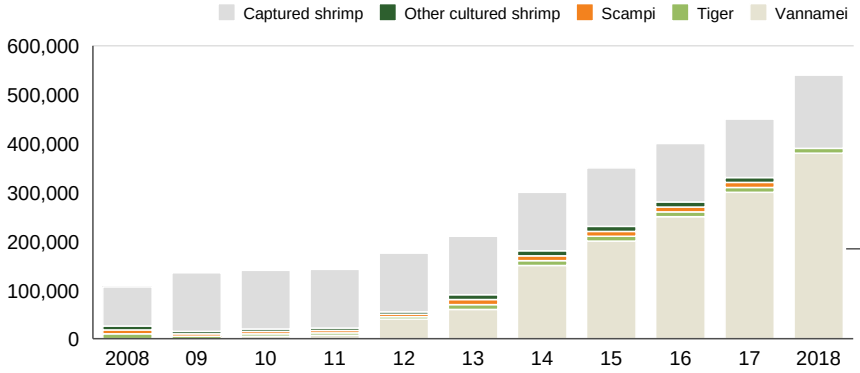
Source: UN COMTRADE (Import and Exports); FAOSTAT (Global Trade), MPEDA & OEC World

Shrimp value chain analysis

Growth in Indian shrimp exports are fueled by the rise in vannamei shrimps, which are primarily produced out of Andhra Pradesh

Vannamei shrimps exports are increasing in share…

Progress in export of shrimp during the last 10 years, MT



Vannamei, an exotic species known for its taste and low cost, is most sought after in the export market and we are doing extremely well in culturing it

- Y.G.K. Murti , President, Association of Indian Fishery Industries

…Heavily driven by production in Andhra Pradesh

State	Vannamei shrimp production, MT
Andhra Pradesh	456,300
Gujarat	55,161
West Bengal	43,622
Tamil Nadu	37,229
Maharashtra	22,191
Odisha	6,073
Kerala	1,465
Karnataka	208
Goa	78

Success of Andhra Pradesh

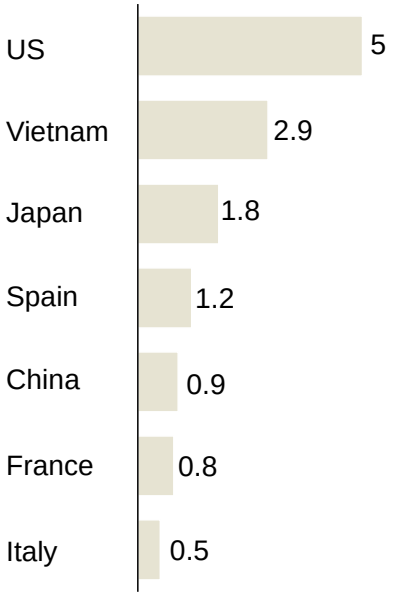
Andhra Pradesh is uniquely suited for shrimp farming due to high temperatures and excellent water quality and accounts for >60% of India's shrimp production

Much of India's success in global shrimp trade caused by decision to invest heavily in **vannamei** production**, a new variety of shrimp in India**. **Andhra Pradesh** has seen particular success due to this decision

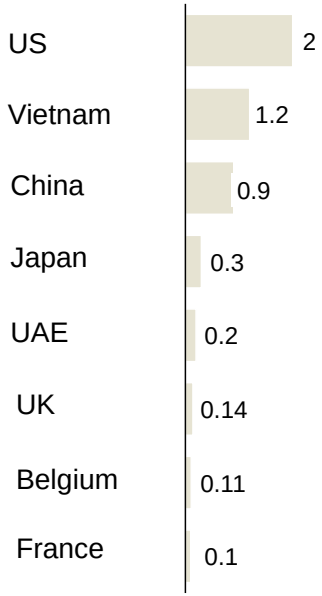
Source: Expert interviews; MPEDA

Destination markets – USA is the largest global importer of Vannamei while India predominantly exports to USA, Vietnam & China markets

Top countries importing Shrimps, $bn (2017)



Top 10 countries importing Shrimps from India, $bn (2017)



Details and discussion

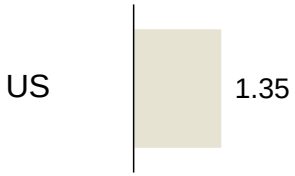
- Anti dumping duty at 1.35% by USA
- Non tariff barriers like SIMP (Seafood Import Monitoring Procedure) & SPS measures are existing
- India should focus on primary production to deal with the concern.
- Strict farm registration methods and traceability protocols must be implemented to avoid border rejections

Source: OEC World, UN COMTRADE (Global);

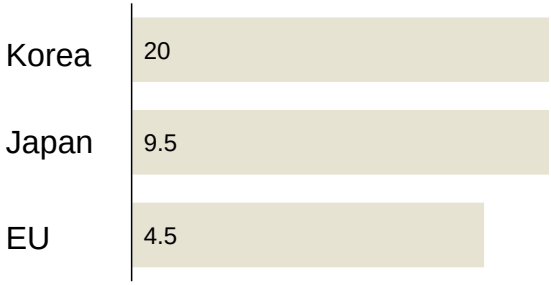
Steps for shrimp farm registration	Stakeholders
Obtaining application from Fisheries Department	Fisheries Dept.
Submission of application with land documents and ID proofs to Village Revenue Officer	Village Revenue Officer (VRO)
Obtain NOC from Village Revenue Officer, Mandal Revenue Officer (MRO) and Regional Revenue Officer (RO)	VRO, Regional Revenue Officer (RO) and Mandal Revenue Officer
Submit NOC, application and land documents to Fisheries Department Officer (FDO)	Fisheries Department Officer (FDO)
Application Assessment Mandal Level Committee, FDO, Pollution Dept. and Agriculture Officer	Mandal Level Committee, FDO, Pollution Dept., Agriculture Officer
Physical verification and Inspection of site Recommendation to District Level Committee (DLC) if it meets the standard check list	District Level Committee (DLC)
Authorization and Check by DLC DLC: Collector, JD of Fisheries, JD of Agriculture, JD of Irrigation (fresh water), Pollution Dept.	DLC involves Collector, JD-Fisheries, Agriculture, Irrigation, Pollution Dept.
Authorization and Check (after DLC it will go to CAA, Chennai)	DLC, Coastal Aquaculture Authority (CAA)
CAA issues the license to farmers, dispatch over courier	CAA
The process is quite tedious and takes at lest over an year. Experts mentioned that in few cases, the requests for approvals have been pending since 3-4 years	**…need for a single window clearance**

Trade overview – Trade relationships, duties, and Non-Tariff barriers

Import duties for Shrimp for top import markets, USA – 1.35%



Normal import duties are prevailing in all markets, but prices are factored in the contract and importer has to bear following duties.



Known issues for non-tariff barriers with Indian exports for Shrimps.

EU : SPS mandates & 50% sampling in PODs (Port of Destination)

USA :

- SIMP – Seafood Import Monitoring Procedure (SIMP)
- TEDs (Turtle Exclusion Device) on trawling nets for wild caught shrimps.

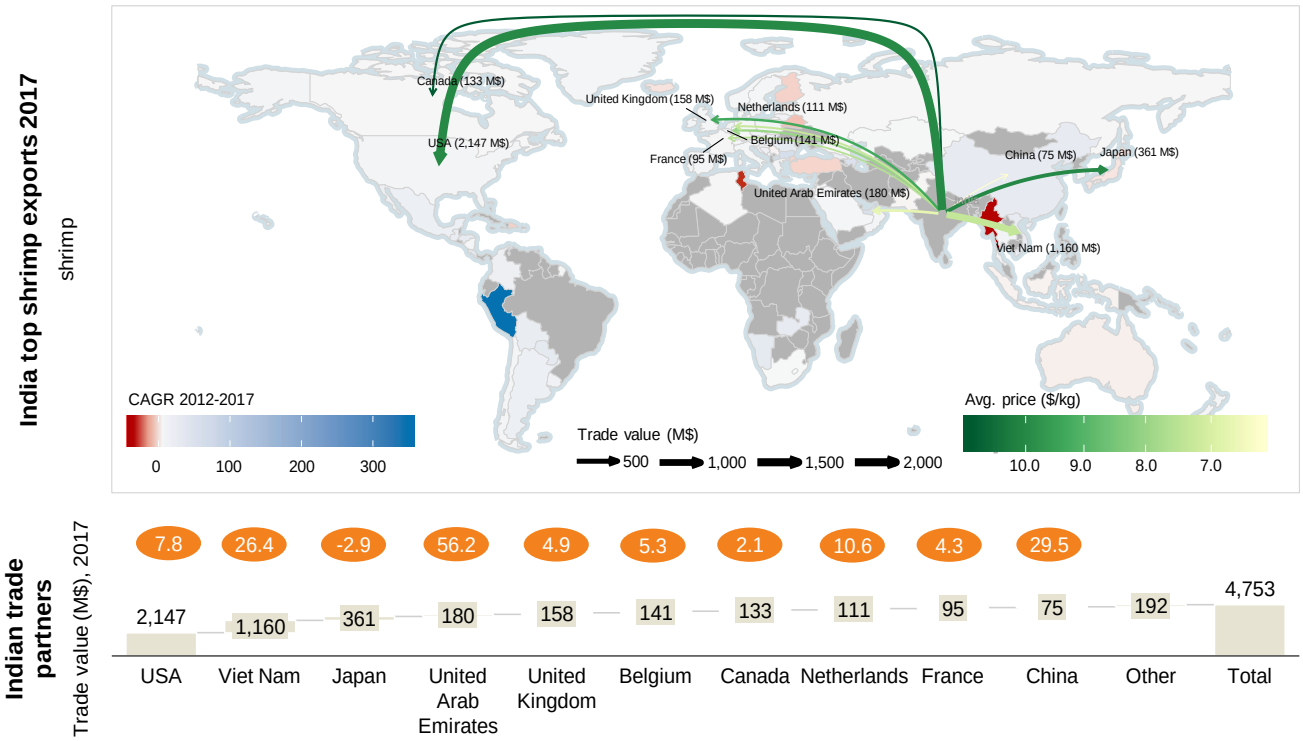
Russia & Japan : Chemical and Dye tests

EU & Russia : Delays/rejections of plant approvals for manufacturing & exports

Source: Secondary Research

Shrimp value chain analysis

India is the largest exporter of shrimp to the US, but is limited in its exports to the EU and to China



Total value of exports is $4,752,532,012

HS Codes: 030616, 030617, 030635, 030636, 030695, 160521, 160529

Source: FAO

% 5 year demand CAGR

Key insights

India is the largest exporter of shrimp to the USA, exporting $2.1B, and has saturated 80% of the exports potential

Exports to Europe are relatively limited due to SPS standards, at about $500M total to UK, Belgium, Netherlands, and France combined

Exports to China are low ($75M) because duties are so high that it is more cost effective to export shrimp to Vietnam and Vietnam then re-exports to China. Only 22% of the potential has been realized

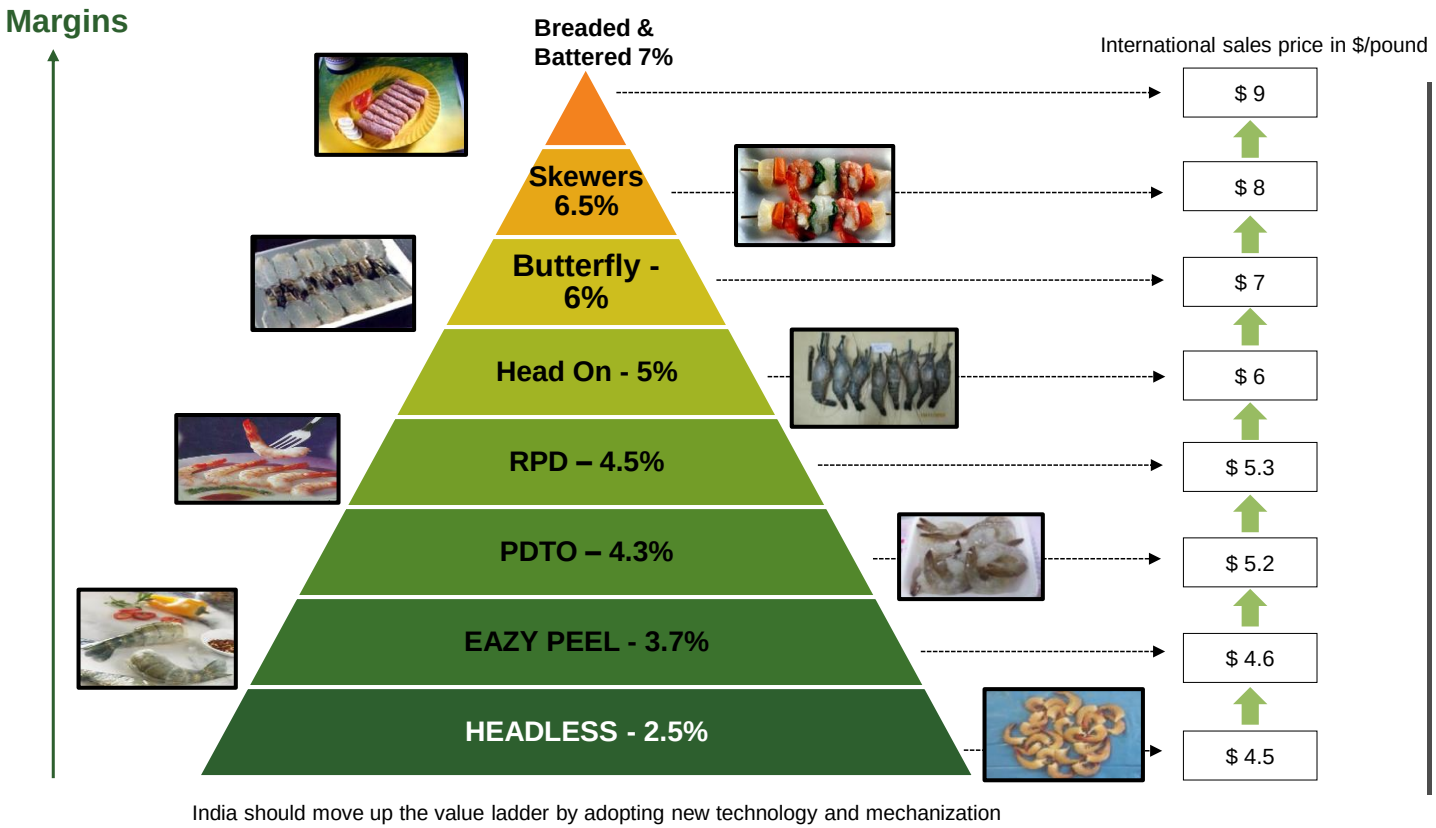
Value addition – India primarily exports non-value added product of the shrimp value chain

India predominantly exports non-value added or primary value added shrimps (1&2) and should focus on further value addition as cost of production is comparatively lesser in India. Ready to cook, ready to eat & other processed items command a premium price over basic product.

Shrimps	1.HON/Headless	2.PD/PDTO	Cooked/Blanched	Skewers/Butterfly/Breaded
Indian exports 6.2 LMT	**Indian exports** 3.3 LMT	**Indian exports** 2.5 LMT	**Indian exports** 0.3 LMT	**Indian exports** 0.1 LMT
Top 3 exporters	**Top 3 exporters**	**Top 3 exporters**	**Top 3 exporters**	**Top 3 exporters**
Devi Sea Foods	Devi Sea Foods	Nekkanti Seafoods	Falcon Marine	Sagar Grandhi
Falcon Marine	Falcon Marine	Devi Fisheries	Forstar Frozen	BMR industries
Nekkanti	Nekkanti	Sagar Grandhi	Febin Marine	Forstar Frozen
Top 3 importers	**Top 3 importers**	**Top 3 importers**	**Top importers**	**Top importers**
Minh Phu Seafood (Vietnam)	Minh Phu Seafood (Vietnam)	Chicken of the Sea(US)	ZB Industries(US)	Marubeni(Japan)
Chicken of the Sea(US)	Hoang Cau Trading (Vietnam)	AZ Gems (US)	AZ Gems (US)	Aquastar (US)
AZ Gems (US)	Zhanjiang Guolian (China)	Arista Industries(US)	Tandels (US)	

Source: Port Data & Secondary research

Value ladder – shrimps



India should move up the value ladder by adopting new technology and mechanization

India is maintaining the lead position in exports due to extensive production volumes in basic exports.

Shift towards value addition will consume 3x time and huge reduction in volumes.

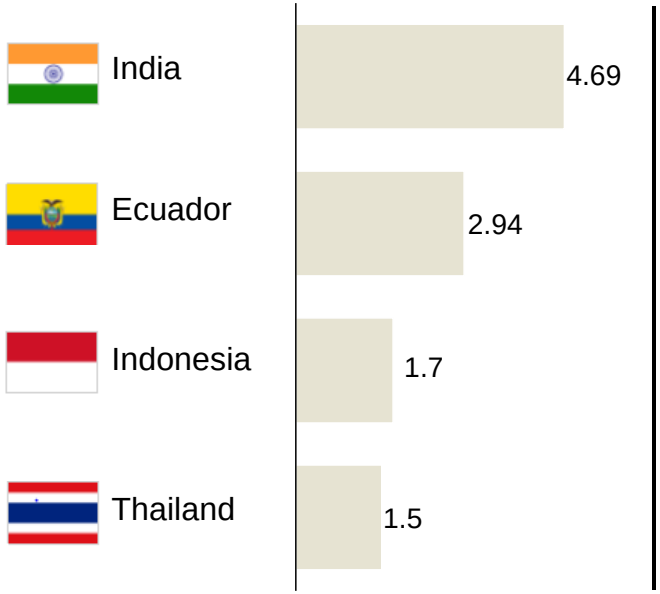
Efficiency of skilled workers is a major constraint for India.

Technological advancement and machinery is required to venture more into high value added segment.

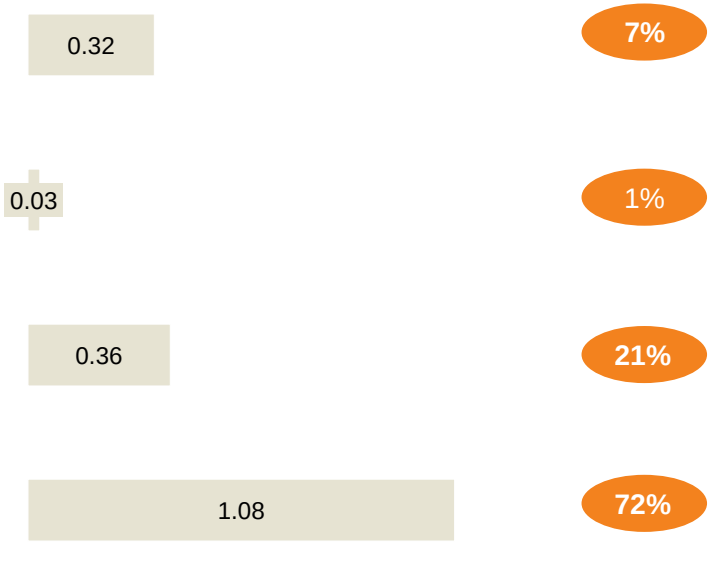
Even lead exporters are into the exports of basic products and are not interested to disrupt the existing process flow.

India lagging behind Competitors like Thailand and Indonesia

Exports – 2018 $bn. : India – Global leader



India lags in terms of higher value addition of shrimps



Indian Shrimp processing not developed due to :

Lack of mechanization and technology | Lack of efficiency and availability of skilled workers.

Comparatively easy operations to export basic product in volumes.

Thailand Shrimp processing Industry is highly developed due to

- High technology
- High vertical integration
- Focused market operations
- Branding of Shrimps

x%

% of value addition of total exports

Shrimp industry – Vietnamese interventions

Project SuSV: Towards a **Su**stainable and equitable **S**hrimp production and **V**alue chain development in Vietnam

March 2016 – February 2020
20,000 farmers in 3 provinces

Budget – 2.4 million euro

Till date 600 farmers (in 30 collaborative groups) became BAP (Best Aquaculture Practices) & ASC (Aquaculture Stewardship Council) compliant

Resolution I20 – Sustainable development of sector - By 2050

Project Mangroves and Markets(MAM) – started in 2013 by IUCN(International Union for Conservation of Nature) to increase mangroves & allied crop of shrimps.

- Shrimps reared in mangrove forested waterways (zero input usage)
- The produce is certified organic by Naturland (German standard) :
  (Fetch higher prices in destination markets)
- Shift of farmers towards integrated farming and environment friendly practices to minimize wastage

Source: https://news.mongabay.com/2018/07/pushing-vietnams-shrimp-industry-toward-sustainability/

Shrimp value chain analysis

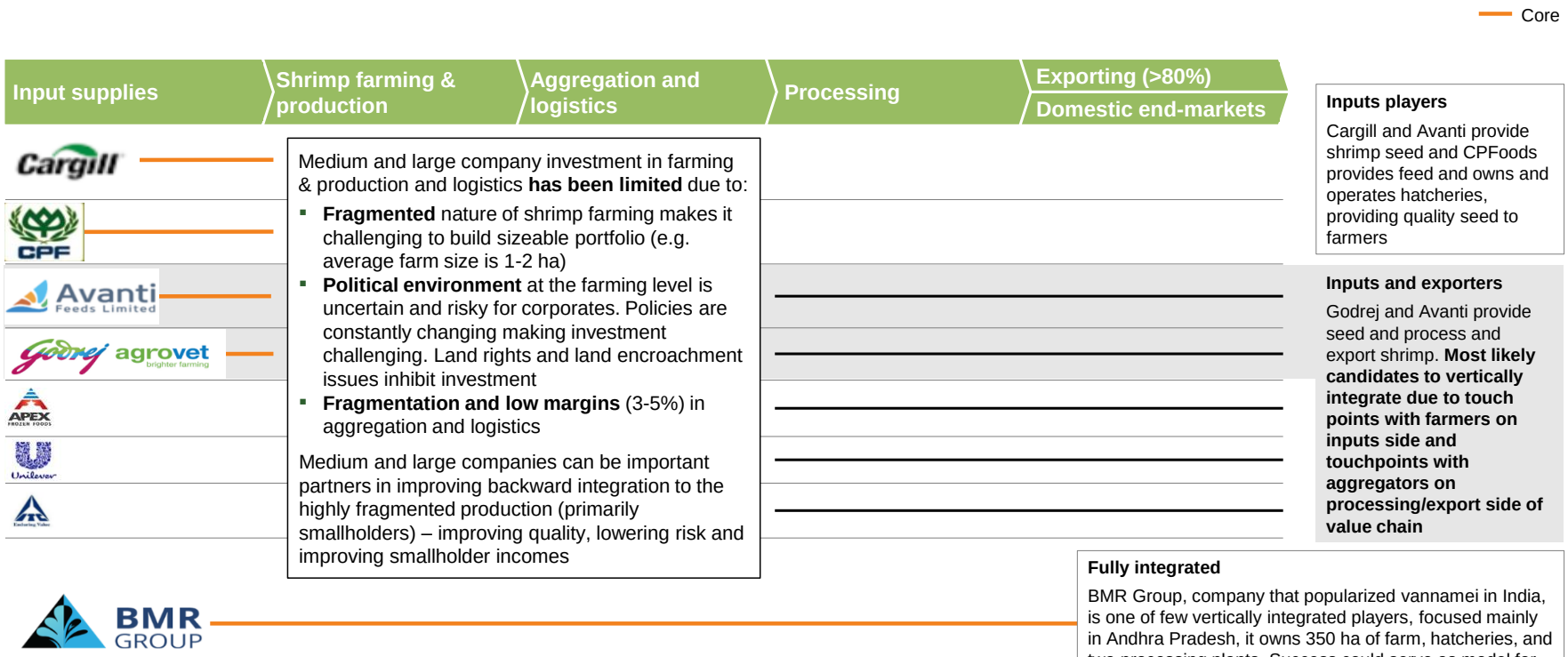
A small number of companies control inputs and exports, while thousands of smallholder farmers produce and farm shrimp

Simplified shrimp value chain		Input supplies	Shrimp farming & production	Aggregation and logistics	Processing	Exporting (>80%) Domestic end-markets
Activities		Shrimp feed manufacturing Hatchery Antibiotic/probiotic development	Both aquaculture and wild capture Hatchery production Harvesting	Cold storage Shipping to processor	Freezing Packaging	Processor often exports through relationships with foreign importers
Products		Shrimp fry, feed, medicine, etc.	Raw shrimp meat	N/A	Frozen & packaged shrimp	N/A
Key pain points throughout the value chain		Inefficient hatcheries produce low quality seed Hatcheries reliant on imports from US, Mexico, and Indonesia for broodstock)	High cost of feed inputs Low production outside of AP and Gujarat Prevalence of disease due to low quality seed and other practices Price fluctuations	Cold storage challenges Price fluctuations	Low shrimp availability during winter season drives up processing costs Lack of branding to pursue processed segments (e.g., ready to cook, ready to eat, breaded)	SPS non-compliance (e.g., port rejections from US and EU) Lack of backward integration for exporters to influence farmer decisions during farming & production
Financial indicator	**Profit margin,**%	20-30%	15-25%	5%	20-30%	N/A – Most processors export directly
Consolidation level	**Number of players**	10's	1000's	100's	10's	
Key players in the industry		Great Salt Lake in USA (covers about 50% of global supply), Hawaiian producers	Small players Smallholder farmers account for 90% of the land used for shrimp culture	Small players	AVANTI FEEDS LIMITED CASTLEROCK COASTAL CORPORATION LIMITED	

Source: Expert interviews; MPEDA; Seafood trade intelligence portal

Shrimp value chain analysis

Medium and large companies are focused on input supplies and processing/exports



Source: Press search; Company websites; MPEDA Annual Report 2017-2018

Corporate investments - Global players export Shrimps and Indian participation is on a Limited Scale

Company	Country	2019 revenue, $B	Description of operations
CP Foods (Thailand)	Global	16 Billion USD	Integrated agro industrial and food business. Livestock and aquaculture. The business is mainly categorized into 3 : Feed, Farm & Food. Also operates retail and food outlets
Thai Union Frozen (Thailand)	Global	4 Billion USD	Highly established and engaged in trade of seafood. Frozen and chilled seafood and related business. 42% business. Acquired brands across countries for different value added products
BMR Group (India)	Indian	7 Million USD	Fully and Vertically integrated and have well defined traceability network, 600 hectares of farming, 250 hectares of hatchery, on site labs and feed mills
Avanti (India)	Indian	0.9 Billion USD	Avanti is majorly focused in supply of inputs. They provide Shrimp seeds and process and export shrimps

A small number of companies control inputs and exports while thousands of farmers produce and farm shrimps where **investment is lacking**

Medium and large companies are focused on investment in input supplies and processing

Farming and Branding are not driven by major investments due to lack of benefits

Source: Secondary Research

Pain points in shrimp value chain

High Medium Low

Value chain	Pain points	Description and details	Level of impact
Input supplies	Hatcheries – Low quality seeds.	Many hatcheries are unauthorized – low Survival rates from seeds supplied. Total washout of crop due to early mortality (white spot syndrome virus is prevalent.)	High
	High reliance on brood stock imports	Only 11 CAA authorized broodstock suppliers are exporting to India and quarantine facilities in Indian airports are nascent.	Medium
	High Feed cost	Feed cost can go up to 60% of the total production cost	Medium
Farming & production	Increased stocking density is a threat	Higher stocking density is critical to shrimp health without proper management.	High
	Long & Complex Farm Registration	Complex farm registration formalities coupled with processing delays to the order of a few years, stringent controls on norms and barriers on land/infra development	Medium
Aggregation and logistics	Lack of awareness on Cold Chain management. Weak infrastructure base	Shrimp is a highly perishable product, ill management of cold chain results loss in freshness. No access to Farmers/agents for facility to store incase of market fluctuations.	High
	Lack of Traceability & Sustainability systems within Value Chain	Lack of Traceability : Aggregation effectiveness varies, making it challenging for exporters to identify shrimp farms utilizing poor practices	High
Processing	Seasonal availability of shrimps	Shrimp farming is majorly divided into 2 seasons, and hence raw material availability is lean during off season	Medium
	Low focus on value addition and lack of branding.	Exporters' focus have never shifted into branding of produce like ready to cook and ready to eat and not having a proper customer base.	Medium
	Availability of Skilled Manpower	Unavailability of skilled workers is a major barrier to value addition since processing majorly involves skilled manual activity,	High
Exporting / Domestic end-markets	High border rejections due to SPS variations.	Port rejections of Indian shrimps across borders due to SPS violations and presence of antibiotics and salmonella.	High
	Lack of branding and consumer perception.	Unlike other agri produce, exporters are not backwardly integrated with farmers or feed manufacturers to influence their production methods and inputs.	Medium
	High Tariffs	Anti Dumping Duty (ADD) by US at 1.35% on imports while Ecuador is exempted of ADD. High Tariffs for Korea(20%), EU (4-5%) & Japan (9.5%).	

Source: Secondary Research

Shrimp value chain analysis

Andhra Pradesh and West Bengal state governments have led in incentivizing shrimping industry

	Inputs	Shrimp farming & production	Transport and logistics	Processing	Exporting
Andhra Pradesh	**Quarantine facility:** Allotted 30 acres and provided Rs 68 crore to create state-of-the-art facility for broodstock multiplication	**Aqua zones:** AP government pledged to expand an additional 16,000 hectares in 2018. Due to delays in the required zoning exercise, area for aquaculture only expanded by ~2,500 hectares	**Vision 2029:** Capital subsidies for cold chain, processing units, reefer vans, and port facilities. Promote export through quality management, packaging, labeling, marketing, and brand development		
West Bengal	**Infrastructure**: In 2017 the state supported cage aquaculture, starting with an initial 80 cages installed in brackish water bodies owned by the State Fisheries Development Corporation (SFDC), fishery cooperatives, and private owners.	**Incentives:** The West Bengal Fisheries Investment Policy of 2015 extends fiscal incentives to encourage entrepreneurs for micro, small, medium & large enterprises in aquaculture		**Processing for export**: West Bengal deemed fisheries a sunrise sector in 2017, granting the State Fisheries Department Rs 900 crore to export fish products. Investment will go towards new processing and packing facilities	
Tamil Nadu	Extension of assistance for cage infrastructure, fish seed production	Announced in 2019 it would be creating a brackish water aquaculture policy and develop ~50,000 ha for aquaculture production. Formation of District Fish Farmers Development Agency (DFDA) in all districts for popularizing fish culture in rural areas and extend training to fish farmers;			
Central government	**Development of Inland Fisheries & Aquaculture**: Macro policy to spend RS 135 crores (~$19M) to develop aquaculture, including freshwater, brackish, and inland soils. Implementation will be mostly managed by state governments. Funding will be available to farmers who undergo certain capital investments such as renovation/construction, training, reclamation, aerator or pump installations, and establishment of hatcheries.				

Source: Government of India; New India Express; The Hindu; Government of Andhra Pradesh; Kolkata Gazette, United News of India; Seafood source; Press search

Benfish – The Initiative

Benfish
West Bengal State Fishermen's Co-operative Federation Ltd.
(An organization under Department of Fisheries, Govt. of West Bengal)

VISION

To establish West Bengal as a leading producer of fish and fish products for both domestic and international markets through cooperative movement.

ABOUT

Launched in 1978, Dept. of Fisheries and Dept. of Co-operative jointly took financial assistance from NCDC for all round social and financial development of community.

Serving as the apex body of Fishermen's co-operatives in the state.

Turnover of about Rs.500 Crs., they serve 19 central and 203 primary co-operatives.

It has regular employees & contract workers (part time/full time).

Establishments and Infrastructure:

5 Ice plants, 1 Cold Storage, 2 Cold rooms, 1 processing unit,

3 fishing harbors, 1 International sea food processing centre

5 fish markets, 4 booking centers, 2 project offices

2 zonal office, 1 residential flat

Main Activities

- Providing financial assistance to fishery cooperative Societies
  Construction of fish market Complex under NFDB,NCDC & RIDF(NABARD)
- Construction of Cold storage and ice Plant under RKVY,NFDB & NCDC Projects
- Sale of fried fish products and participation in the Fair and Mela and sale of raw fish in dressed and packed conditions.
- Setting up fuel(Diesel) Pump for supply of fuel to mechanized fishing boats.
- Managing affairs relating to ISFPC (International Sea Food Processing)
- Facilitating Death and accidental Insurance claims for fishermen.

Benfish Complex - International Sea Food Processing Centre

- Started operation in 2001
- 10 factories – Exporting black tiger, vannamei, seacaught, etc.
- Govt. leased out these factories to different exporters with various facilities.
- Common Ice plant, water tank, ETP, Factory wise peeling sheds in same compound outside factory
- Common labor quarters building and factory wise hostels.
- Trainings are conducted by EIA,MPEDA for value addition, hygiene practices and acts as a skilling centre.
- Benfish Management Committee to supervise and manage daily operations of the complex.

Supply-side enablers assessment for shrimp value chain

High Medium Low

Enabler	Description of enablers relative to shrimp value chain		Suggestions/Recommendations	Who to Solve
Govt. Procedures	Complex farm registration formalities coupled with processing delays to the order of a few years, stringent controls on norms and barriers on land and infra development & Pollution control. Export approval licenses are on hold with Govt. and huge interface dispute between the Centre & State over power.		A separate agency/governing body reporting to MPEDA (state /central), subsuming power of existing offices for the sector or formation of a marine board with cluster officers and representation from EIA, CAA, State Fisheries Dept. to synergize activities across all shrimp exporting states. Single registration body/single window clearance to ease farm registration/export approval. Digitized database related to farm, feed, hatchery, factory for 100% traceability	**New body (State/Centre with EIA,CAA, State Fisheries dept.**
R&D for Best Technologies	Technology improvements can help improve shrimp stress from extensive farming, improving density and yield. Govt. labs benefit from monopolization of testing for China and EU. Limited number of Auditors cause bottlenecks for private labs and slow & cumbersome processes.		There exists a bottleneck in terms of number and efficiency of Govt. labs (EIA) for exports to China and EU while private labs are commoditized for other destination markets. Similar to APEDA, EIA should allow private certified labs for standardized testing for exports to all destinations. Capacity development for increased strength of EIC Auditors	**State Fisheries Dept./MPEDA,CAA**
Access to finance	Farmers have limited access to finance and rely on intermediaries that have low capital		State Govt. should facilitate the access to finance for small farmers via Schemes promoting/subsidizing crop insurance	**State Fisheries Dept.**
Availability of Skilled Manpower	Unavailability of skilled workers is a major barrier to value addition since processing majorly involves skilled manual activity, Monetary support to workforce		Schemes that directly subsidize the training or creation of **value chain cluster** like Benfish model(W Bengal) in states, a skilling centre for workforce with infra and accommodation facilities, can be linked to NRLM – Centralized shrimp park. Reinstation of FMI- **Focus Market Incentive** aimed at promoting value addition, provides extra wages for labors.	**State Govt. & Fisheries Dept.** **Centre**

Supply-side enablers assessment for shrimp value chain

High Medium Low

Enabler	Description of enablers relative to shrimp value chain		Suggestions/Recommendations	Who to Solve
Inputs management	Indian relies on Mother Prawn imports from Hawaii Domestic unregistered hatcheries produce low quality seed. Feed formulation and constitution		Centre to push for R&D on indigenous brood stock development and improvement of quarantine infrastructure (Only 1 in Chennai presently). To propose, Vizag, Mumbai/Gujarat, Kolkata. Regulate sale of broodstock imported to authorized hatcheries only. Penalize hatcheries operating without license & strict monitoring. Mandatory streamlined feed regulation at production/imports with minimum 20% Feed Testing before administration.	**Centre** **CAA/MPEDA** **CAA/ State Fisheries Dept.** **State Dept./EIA**
Water management	Daily water exchange is necessary to ensure hygiene and reduce incidence of diseases. Better water quality also enables higher amounts of production		Subsidies for water discharge treatment, bio fencing, reservoir, lime treatments of dykes, best aquaculture practices by State Govt.	**State Dept., CAA**
Aggregation for export	Lack of Traceability : Aggregation effectiveness varies, making it challenging for exporters to identify shrimp farms utilizing poor practices		Efforts from State Govt. for mandatory registration of farms and consolidation of database by Centre for a nationwide database of farmers and 100% traceability of material. GPS based farm registration should be implemented	**State Dept./ CAA**
Infra & logistics	Lack of formal cold chain infrastructure leads to excessive wastages, (except for Andhra Pradesh, which has close access to ports)		Investments by Centre & state on shrimp parks with focus on cold chain infra & Incentives for shrimp processors – collateral free loans for value addition projects, duty free import of equipment (EPCG Schemes) for value addition for all exporters. Currently its available only for 100% EOU.	**State & Centre**

Demand-side enablers assessment for shrimp value chain

High Medium Low

Enabler	Description of enablers relative to shrimp value chain		Suggestions/Recommendations	Who to Solve
Tariff barriers	Anti Dumping Duty (ADD) by US at 1.35% on imports while Ecuador is exempted of ADD. High Tariffs for Korea(20%), EU (4-5%) & Japan (9.5%) which the importers have to pay while exporting from India. Vietnam has no such tariffs and thus Indian exports are routed via Vietnam/		Focused efforts are needed for building trade relations around Shrimp. MPEDA should either increase focus or appoint exclusive resources for the same. India must strengthen trade relationships through bilateral agreements/FTAs/PTAs, to make India competitive w.r.t Vietnam. Eg. Zeroing duty followed by Devi Sea Foods	**Centre/ MPEDA**
Non tariff barriers	**Branding and Global perception of Indian shrimps,** Tarnished image of Indian shrimps due to SPS rejections (20 from EU & 83 from US in 2018) fetching low value contracts and leading to differential testing of consignments on borders of EU, Korea, Japan (50% containers).		**Improved Regulation of Antibiotics & Hatcheries** Control of Antibiotics & ban on unauthorized hatcheries to improve the perception of importers. State wise body for marketing & branding of exports with niche quality specifications.	**State/ CAA**
	Sustainability of Shrimp Ecosystem. Highly Capital intensive sector with lower proportion backward integration (<20%). Global demand is having a frame shift towards sustainability and farms with certifications with global benchmarks and standards have become imperative. Farm registration, effluent management are ill-developed. Monterey Bay Aquarium, a USA based compliance agency rates India RED on its eco-certification on a scale of (Green|Orange|Red).		India needs to align to a globally acceptable standard (Aquaculture Stewardship Council/Marine Stewardship Council) for Sustainability and Farm Traceability. Certification Subsidies exist but not enforced well. Farm effluent management should be incorporated in Indian Shrimp ecosystem with due data collection.	**Centre/ MPEDA/ EIA/CAA**
	EU has utilized exclusionary tactics (e.g. delayed Indian plant approvals in Europe) for Indian shrimp, limiting export potential.		Govt. Delegations to EU & Russia for matters of re-instation/fresh issue of export licenses	**Centre/ EIA**

Shrimp value chain analysis

In order to maintain an advantage in the global shrimp export market, India may need to reckon with a set of risks

Risks	Implication for India	Proposed options	Expert perspective
Higher bar on sustainability and traceability	Higher traceability and sustainability standards from EU and US (e.g., requirement for no antibiotic residue and/or turtle exclusion device) could **close key end-markets** for Indian shrimp	Enhance traceability programs and increase backward integration links so exporters can influence farmer and hatchery processes and methods based on international standards	The antibiotic residue issue is the single largest issues facing the shrimp market. There is currently a traceability solution being implemented to detect which farms are using antibiotics. Right now, it's not very well organized, but it will improve. **– Shrimp SPS expert**
Trade barriers to large markets	EU and China have both utilized exclusionary tactics (e.g., high import duties in China and delayed Indian plant approvals in Europe) for Indian shrimp, limiting export potential	Strengthen trade relationships with China to collaboratively negotiating to lower Chinese duty Swiftly correct any non-compliances and demonstrate to EU that improvement has been incorporated	China has prohibitive barriers to Indian exports in terms of tariffs. When they sell to India, they'll sell at any price. China has the ability to dump commodities at any prices. It can be very discriminatory. **– Commodity exporter**
Environmental risks	Shrimp farming can be particularly environmentally detrimental due to shrimp farmers clearing mangroves, which are effective in carbon sequestration. Environmental risks associated with shrimp may adversely impact global demand	Seafood exporters groups could launch global marketing campaigns touting the benefits of shrimp. Exporters can work with farmers to ensure practices are sustainable and then brand Indian shrimp as sustainably farmed	India should think about moving its product up the value chain and developing a branding for sustainable shrimp, instead of only exporting a mid-tier quality commodity. **– Aquaculture scientist**

Value chain levers for Shrimp : India could realize an additional value of 2.5 Bn. USD by pursuing a portfolio of initiatives

Point Of Departure: (2019)

Shrimps (6 L MT)

- HeadOn (3-3.5 LMT)
- PD/PDTO (2--2.5 LMT)

Revenue of 4.8 Bn. USD

Major Focus Markets

- USA
- EU
- Vietnam

Lever		Opportunity	Value[1]
Increasing demand	A	Seafood export association and nodal agencies must devise a strategy aimed at increasing shrimp demand and opening up new markets	.2 - .3 Bn. USD
Improve Compliance	B	Improve shrimp quality through GMP in hatcheries, better quarantine facilities for brood stock and regulates hatchery practices.	.8 – .85 Bn. USD
Improving Productivity	C	Improve shrimp farm productivity through improving stocking density increasing number of harvests and shrimp survival rates.	.05-.4 Bn. USD
Improve Quality	D	Improve shrimp quality through GMP in hatcheries, better quarantine facilities for brood stock and regulates hatchery practices.	.6-.64 Bn. USD
Increasing Value Addition	E	Capturing processing opportunities beyond basic processing such as ready to cook and ready to eat fetching better market value and boost exports	.4 Bn. USD

Demand Side Enablers **Supply Side Enablers**

Point Of Arrival: (2024)

Shrimps (8-9 LMT)

- Basic(4 - 4.5 LMT)
- Value Added (3.5 – 4 LMT)

Revenue of 7 – 7.5 Bn. USD

Markets (Across Continents)

A set of identified enablers can help create additional global demand and meet supply requirements

Measurable Milestones for Central & State Govt.

Central Govt

Collation of a Central Shrimp Database Creation of common IT Infrastructure for States. Digital Database to be made accessible publically	**Time taken** (Phase wise targets)
Broodstock Quarantine Facilities Expand from only existing Chennai Facility to A.P. (Vizag|Vijaywada); Gujarat (Bhuvneshwar| Ahemdabad); West Bengal (Kolkata)	**Number of Facilities** (Operational)
Workforce Skilling Program to be rolled out In co-ordination with National Rural Livelihood Mission – Operational Guidelines for States to be developed with earmarked incentives	**Time Taken** (To be Operational)
Standardized Effluent Treatment Scheme for shrimp processing facilities should be developed and mandated by the government for streamlining expansion for privates	**Time Taken** (To be Operational)

State Govt

Farm Registration: All shrimp farms to be digitally registered and geo-tagged.	**Time taken** (Phase wise targets)
To create **Cluster wise Shrimp Authorities** with COs which subsume powers of all bodies – Central, MPEDA, EIA CAA and State	**Time taken** (Single Window Clearance)
Workforce Skilling Program to be implemented- States to contribute land, identify private anchor exporter and allocate funds accordingly. A shrimp park like Benfish should be developed for Value Addition	**Time taken** (Land Contribution, Fund contribution to Private)
Lab Infrastructure for testing Govt. (EIC) Labs needed (Bhuvaneshwar, Surat.) in major states (AP, WB & Gujarat) for exports to China & EU.	**Number of Labs** (Operational)

Shrimp value chain analysis through Covid lens

High Medium Low

Supply / Demand Enablers / Constraints	Impact	Reaction
Demand of Indian Exports		Demand for shrimp products got drastically affected across the globe. Buyers insisted on delay/re-negotiation of contracts. FSR and HoReCa channels are completely shut world wide which is a major market for shrimps.
Export restrictions		Destination markets reluctant to accept orders and continued lockdown in EU & Russian markets till June 1st week.
Impact on relative competitiveness due to foreign exchange or freight rate changes, etc.		Though the strengthening of dollar earning better foreign exchange, there is an increase in variable costs of business w.r.t. RM cost, labour cost, higher transportation cost etc.
Impact on production in competing origins		Current production cycle in other origins are not affected completely but hatchery operations are disrupted and breeding cycles are stopped. This will result in short supply of seeds and resultant reduction in crop.
Exporters		Exporters were initially taking position to exploit reduced raw material prices. Currently they are working with limited capacity and manpower.
Govt. Policies & Infrastructure		Minimum support price was introduced on purchase of prawns to support farmers in the initial lock down phase, currently prices are market driven. Warehousing capacities are saturated due to halt in exports. Port operations are disrupted.

Agenda

- Shrimp
- **Buffalo**
- Mango
- Vegetable oil
- Wood
- Chilli
- Rice

Executive Summary – Bovine Value Chain

Global and Domestic Landscape

Global Bovine Demand: **50 Bn. USD**

India is **world's 4th largest bovine exporter** (1.7 Million MT) and contributes to 6% of world demand

India primarily exports chilled and frozen meat followed by bovine edible offals

Majority of the bovine production is concentrated in 3 states – Uttar Pradesh, Maharashtra and Andhra Pradesh. Buffalo industry is restricted in many other states, leading to a lack of abbatoirs

India's Competitiveness in the Bovine Value Chain

Largest cattle/buffalo population in the world

Significant Surplus: **>90%** produce is exported

India's production has cost advantages but typically supplies commodity market

However, buffalo are not bred for meat export. Usually used for milk and then slaughtered after milk production ends

Competitors – Australia, U.S.A, Brazil

Potential Opportunities for Growth

Key Destination Markets: Vietnam (49%), Malaysia (10%), Indonesia (8%), Iraq (5%) & Philippines (3%)
Top markets can be accessed, with trade negotiations and certain zones of India certified by the OIE[1] as FMD[2] free
Tremendous scope for Value Addition for better price realization - **99% exports are semi-processed**

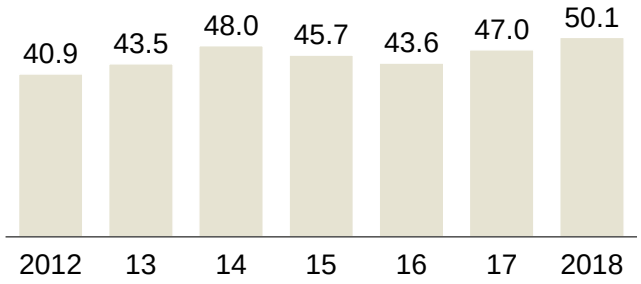
Key Pain Points	Enablers	Stakeholder (s)	Measurable Metrics
All abbatoirs concentrated in U.P in North India	Market linkages	State Govt., Central Govt., Private Sector	Increase in number of abbatoirs
~10 million male calves are slaughtered each year	Aggregation for export	State Government, Dairy Co-Ops, AIMLEA	% of meat output
67% high export duty on hides	Export duties on hides	Central Government	Increase in forex in bovine value added products
High Tariff Barrier	Trade Relations	Ministry of Commerce	No. of Agreements Signed
No presence in China, EU and US	Propagate zone wise FMD status	Central Government, APEDA	Increase in Market Share

Potential for Indian Bovine Exports to grow from 12.36 L to 18 L MT and 3.6 to 7 USD Bn.

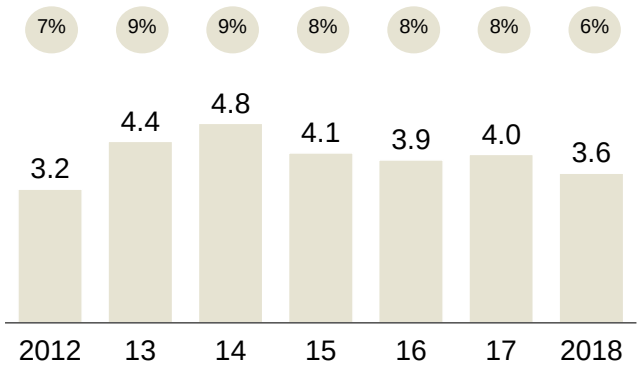
Bovine meat value chain trade and production overview

… India as % of Global

Global trade of the bovine meat value chain, $bn

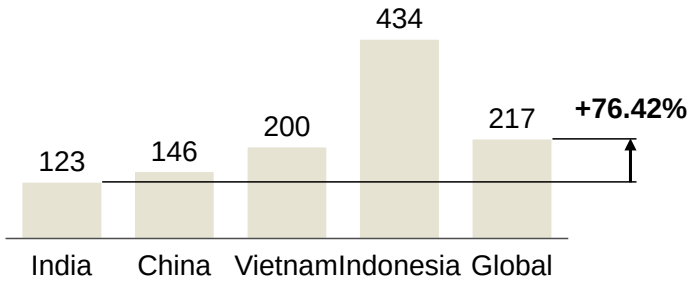


Indian bovine meat exports, $bn

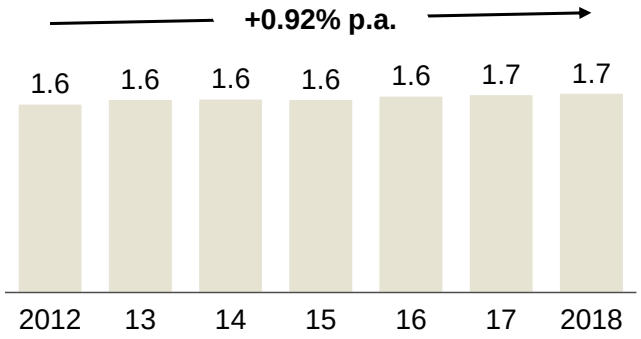


Global bovine meat productivity, kg/animal

India is 76% less productive than global average



Indian bovine meat production, Mn tons

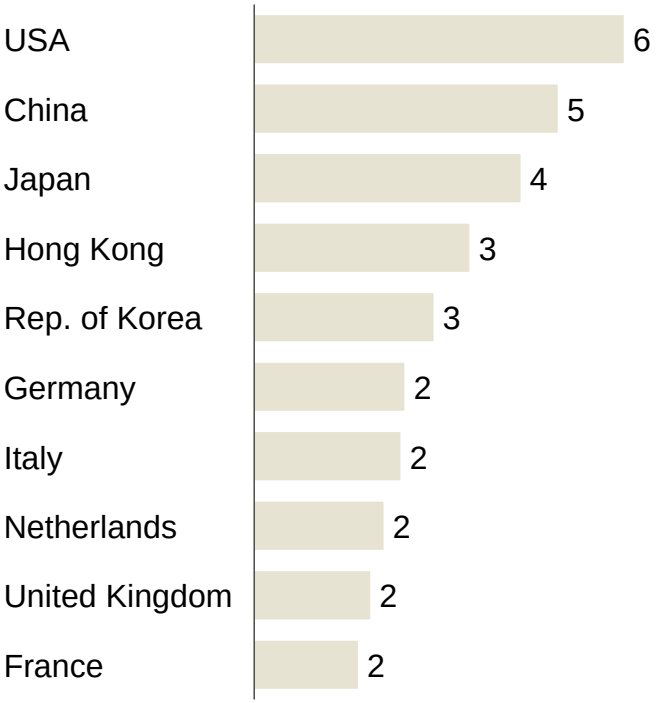


Source: DGCIS, UN COMTRADE , FAOSTAT, Expert consultations

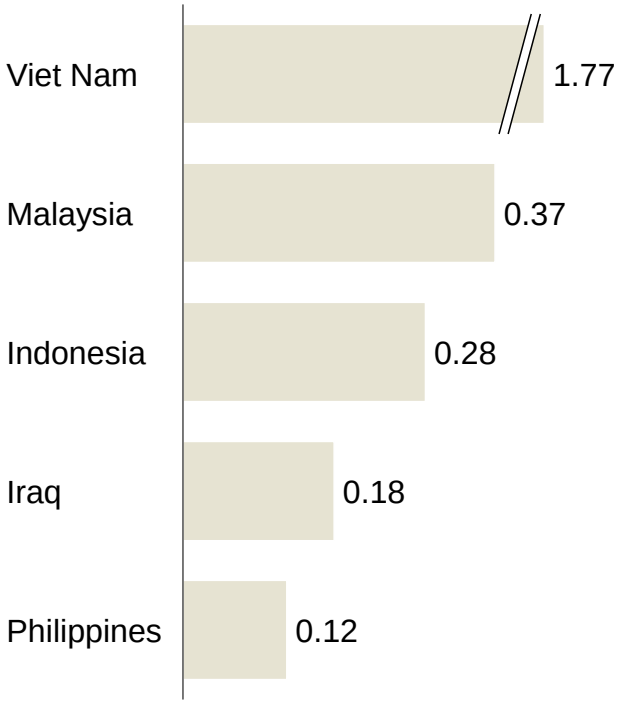
- Global trade peaked in 2018 and is expected to retain its growth in the near future.
- However, India recorded the lowest beef exports as China cracked down illegal meat supplies of Indian exports through Vietnam
- India is 76% less productive than the global average, as buffaloes are mainly used for dairy and are only slaughtered for meat after their milk productivity has peaked
- Buffalos in India are not administered growth promoters, antibiotics and hormones and is naturally reared
- India does not have access for buffalo meat exports to large meat importing countries like Europe, China and USA

USA and China, are the largest global importers of Bovine Meat, While India predominantly exports to Vietnam, Malaysia and Indonesia

Top 10 countries importing Bovine meat, $bn



Top 5 countries importing Bovine Meat from India, $bn



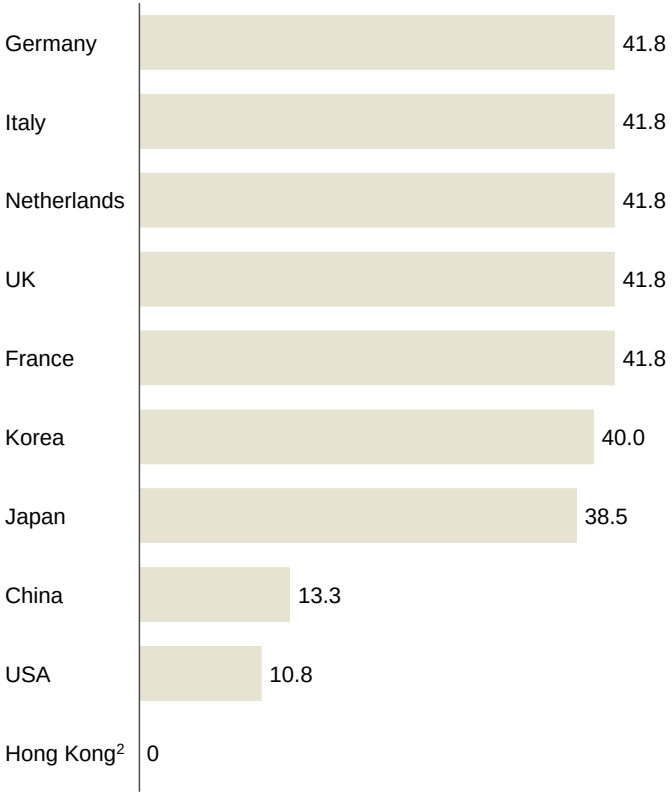
- The top 10 countries account for ~64% of global beef imports, with limited to no exports from India
- Top markets can be accessed, if there is a concerted effort by the governments and certain zones of India are certified by the OIE[1] as FMD[2] free
- There have been several interventions by the Central government (e.g. allocated INR 13,343 Crore in May 2019) to fully control FMD in livestock and support exports, however, a unified district level program will require to tackle the problem from ground level
- On the other hand, due to its low cost advantage India typically supplies commodity markets

1. International Organization for Animal Health 2 Foot and mouth

Source: Press search, UN Comtrade, Expert consultations

Bovine trade relationships, duties, and non-tariff barriers

Import duties on India for Bovine meat for top markets, %



1. World Organization for Animal Health 2 Hong Kong is a free port, hence no tariffs

Source: ITC, Press search, Expert consultations

Known issues for non-tariff barriers with Indian exports for Bovine (Buffalo) meat

- Although relatively low cost producer, due to international certification of animal health status and challenged by lack of bilateral trade agreements & sanitary protocols, India is unable to increase exports and compete with other major meat exporting countries.
- EU, USA and China do not allow import of Indian Buffalo meat only because no serious efforts have been made to gain market access.

Global trade pacts inhibiting Indian exports

- EU-Vietnam Free Trade Agreement (EVFTA), expected to take effect in 2020, the EU to remove tariff's on meat including, Buffalo meat
- Australia's agreement with US (AUSFTA) and Japan (JAEPA), help export meat at competitive prices. Due to lack of a FMD free status from the OIE1, some countries apply restrictions on imports of Indian Buffalo meat.
- In 2019, the European Union and Mercosur, the free-trade zone of Brazil, Uruguay, Paraguay and Argentina, reached a political agreement to remove trade barrier, this will help South American countries to export beef and other ag products at a low tariff rate.
- Thailand & Bangladesh impose high duty on import of buffalo meat from India to restrict imports
- China - Australia FTA : 95% of Australian exports to China will be tariff free. This will include many agricultural products, including beef and dairy
- Australia - Vietnam : are parties to the agreement establishing the ASEAN-Australia-New Zealand Free Trade Area
- Indonesia - Australia FTA : Tariffs are reduced to 2.5% in beef and are mostly eliminated by 01.01.2020 and fully in 2023
- Indonesia-Australia Comprehensive Economic Partnership Agreement: a free trade agreement removing tariffs from nearly all products traded between both countries including beef

India primarily exports chilled and frozen meat of the bovine value chain and could focus on further value added preparations

2018, Bovine Meat		2018, Meat preparations[1]		2018, Fats of bovine animals[2]		2018, Edible offals of bovine animals		2018, Raw hides and skins of bovine[3]	
Global imports, $bn	$50.1	**Global imports,** $bn	$2.5	**Global imports,** $bn	$2.5	**Global imports,** $bn	$4.1	**Global imports,** $bn	$3.8
Indian exports, $bn	$3.6	**Indian exports,** $bn	$0.0004	**Indian exports,** $bn	$0.04	**Indian exports,** $bn	$0.21	**Indian exports,** $bn	$0.0003
Top 3 exporters	• USA • Australia • Brazil	**Top 3 exporters**	• Brazil • Ireland • Germany	**Top 3 exporters**	• USA • Australia • Canada	**Top 3 exporters**	• USA • Australia • Brazil	**Top 3 exporters**	• USA • France • Australia
Top 3 importers	• U.S.A • China • Japan	**Top 3 importers**	• U.S.A • U.K • Canada	**Top 3 importers**	• Singapore • USA • Belgium	**Top 3 importers**	• China • Japan • Egypt	**Top 3 importers**	• China • Italy • Republic of • Korea

1. It excludes livers and homogenized preparations
2. The data also includes sheep and goat, Tallow, Fats and Lard stearin, lard oil, oleostearin, oleo-oil and tallow oil
3. The data also includes Equine

Source: UN COMTRADE, Expert consultations

Pain points with highest impact to bovine meat production (1/2)

High Medium Low

Value chain	Pain points	Description and details	Level of impact on export
Input supplies	▪ Shortage of feed and fodder due to reduced availability of fodder and crop residues	▪ The annual fodder production is 907.85 million tons, where as the requirement is about 1759 million tons leading to a deficit of 53 percent green and 41 percent of dry fodder	Medium
Buffalo farming & production	▪ Highly fragmented, ranging from 2 – 10 buffaloes per farm	▪ Animals are used for dairying, secondary occupation for about 69 percent of India's farming community	High
	▪ Prevalence of diseases due to lack of vaccination.	▪ There is a need to increase the number of veterinary hospitals and dispensaries commensurate to bovine population.	Medium
	▪ Annually upto 10 million male buffalo calves not being salvaged & reared for their meat potential.	Male calves are not reared for meat and are neglected. Female buffaloes are not effectively culled for meat due to slaughter restrictions.	High
Aggregation and logistics	▪ Unfavourable restrictions on buffalo slaughter	▪ Most states do not have pragmatic slaughter regulations and adversely affect realizing productivity potential	Low
	▪ Insufficient livestock markets	▪ Unorganized trade due to inadequate facilities at the livestock markets. Also, there is a need to increase the number of livestock markets for trade	High
	▪ Disparity of slaughtering fees in various states	▪ Fees charged by municipal corporations or other local bodies for slaughtering of animals are paid by traders (aggregators) and less effort is made to make rules consistent	Low

Contd….

1. World Organization for Animal Health

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, Expert consultations

Pain points with highest impact to bovine meat production (2/2)

High Medium Low

Value chain	Pain points	Description and details	Level of impact on export
Processing	▪ Disconnect between dairy cooperatives and meat industry	▪ Buffaloes slaughtered in India are a by-product of the dairy cooperatives and is beneficial to all stake holders, to work together and eliminate middlemen for better profit realization	●
	▪ Abattoirs are mostly concentrated in the State of Uttar Pradesh.	▪ Due to state regulations, most surplus buffalo livestock states are unable to establish export abbotairs. Therefore, processing is mostly concentrated in U.P, thereby, making movement of animal a challenge from different states leading to increased costs	●
Export-ing (90%)	▪ High cost of inland transportation costs increase the overall cost	▪ Significant expenditure is incurred in transporting packaged buffalo meat from the factory gate to the shipping port	◐
Domes-tic end-markets	▪ Lack of branding and value added meat products to pursue processed segments (e.g., ready to cook meals)	▪ Exporters need to diversify their product offering and further meat processing units should be encouraged. They have not focused on branding convenient meals and is yet to explore various target markets	●
	▪ Lack of OIE[1] FMD free certification has led to several countries banning Indian buffalo meat	▪ As a member country of OIE[1], it is mandated to report a list of animal diseases at regular intervals, while it is free from all the other diseases except for foot and mouth (FMD)	●

1. World Organization for Animal Health

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, Expert consultations

Supply-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Market linkages	Buffalo meat farmers do not work with exporters but traders leading to a fragmented supply chain (e.g., >90% of Indian buffalo meat is exported) Most abbotairs are concentrated in U.P. There is a need to establish new abbatoirs in surplus buffalo population states - M.P, Karnataka, Rajasthan and Gujarat to minimize movement of animal and improve margins across the value chain Absence of additional integrated abattoirs in the States of India has prevented the ability to produce required quantities of Buffalo meat	Majority of the meat is exported, for an un-interrupted supply of meat exports there is a need to connect the farmers with the end markets by establishing tie ups with state dairy co operatives and eliminating middlemen Strengthening state governance and allowing to facilitate approvals/permissions of new facilities will improve farmer income and further stop vigilantes from disrupting livestock transportation and supply chain	▪ All India Meat & Livestock Exporters Association ▪ State government ▪ Central government ▪ Dairy Co-Ops
Infra & logistics	India's 3 largest bovine meat producing states – U.P, Maharashtra & A.P are cold chain deficit, with U.P not having close access to port, leads to high wastage	Investments by Centre & state on mega food parks with focus on cold chain infra and proximity to ports can reduce the wastage and boost exports	▪ All India Meat & Livestock Exporters Association ▪ State government ▪ Central Government
Access to finance	Farmers have limited access to finance because animal farming is their secondary occupation, hence they mostly rely, on intermediaries that have low capital	Improving access to finance through banks like NABARD and other rural development institutions would help farmers improve farm conditions of cattle and prevent diseases	▪ Central Government ▪ State government

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, IFCN Expert Interview and consultations

Supply-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Inputs management	Genetic potential of species need to be substantially increased and upgraded with appropriate scientific breeding, feed management practices	Corporate investments and professional management need to be permitted to operate on existing government farms, perhaps as JVs for supply of elite germplasm of livestock with demonstrated higher productivity Establishment of rural feed processing units for producing silage, based on utilizing agricultural crop residue, feed quality grains and molasses to manufacture low cost feeds.	▪ All India Meat & Livestock Exporters Association ▪ State government ▪ IVRI ▪ Feed Companies
Aggregation for export	The livestock industry is extremely fragmented, 2-10 animals being the average farm size for 85% farms in India, making it difficult for exporters to identify farms with poor practices. Approximate 10 million male calves can be salvaged by facilitating milk co operatives to rear and sell buffalo livestock directly to export abbotairs. ~20% of animals reared for buffalo meat can generate an additional USD 800 million worth of exports per annum	Exporters are recommended to incorporate traceability technologies such as ERP systems to track individual livestock up to each carton of the final products to maximize exports and improve quality control including disease management Establish tie ups with state dairy co operatives and set up institutional financing through NABARD/rural banks that would help farmers in their feed and disease management programs Implementation of the Scheme of male buffalo calf rearing for meat production under DAHD (Department of Animal Husbandry & Dairying) - farmers to benefit from this scheme. Experimentally initiate an active role for the district magistrate and district veterinary officers in the value chain of rearing male buffalo calves	▪ All India Meat & Livestock Exporters Association ▪ State government ▪ DAHD

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, IFCN Expert Interview and consultations

Supply-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Govt. Regulations and approvals	States should facilitate quick approvals, with support of district administration, understanding the importance of the meat sector and its potential of incremental income to farmers	Committees formed by governments for grant of approval for establishment of green field projects and capacity enhancement should include industry stakeholders in their decision criteria of approvals and denials	▪ All India Meat & Livestock Exporters Association ▪ State government ▪ Central government
	Standardize laws and regulations for export abbotoirs across states for enhancing production	GoI should facilitate a dialogue between states to standardize rules and regulation that cause less hindrance in practice of export abattoirs. E.g regulations on treated water, environment protection, wastewater outlet, etc	
Water management	Clean water intake and cleaning practices are necessary to ensure hygiene and reduce livestock infections, poor water quality could also lead to high intake of heavy metals effecting cattle health	State Governments to tie up with ICAR, IVRI & animal science division of Livestock Universities to facilitate farmer training programs on watershed management and impact on livestock health, productivity and production of quality meat.	▪ IVRI ▪ ICAR ▪ State Government

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, IFCN Expert Interview and consultations

Demand-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Trade & treaties	Top exporting countries like Australia and Brazil, have various trade agreements with the top importing regions – EU, China and USA, restricting trade with India Trade imbalance should be leveraged by the government as few countries are deficit in their domestically available bovine meat (Nigeria, Angola, Algeria, Turkey, Iran, Thailand, Indonesia) Performance of Free trade agreements with different countries need to be evaluated as they impose high import duties and restrict Indian bovine exports (Thailand levies 50% duty and Bangladesh levies 45% duty)	India must strengthen trade relationships with countries through agreements, especially around disease management, SPS agreements and Veterinary protocols. GoI need to aggressively evaluate with the active support and involvement of Indian Diplomatic Missions and the Ministry of Commerce & Industry to open target markets through FTAs and PTAs	▪ APEDA ▪ Central Government
Institutions and consortiums	Institutions like APEDA and AIMLEA, working to advance integration of abattoir operations, processing technologies and promote safe export standards, will need to work together across stakeholders, to expand and increase demand abroad Multiple entities (APEDA, EIC, FSSAI, CAPEXIL) govern the export requirements for meat production and this often results in confusion in operations and delay in dispatch of consignments.	Abattoirs in India are authorized and registered by APEDA to supply buffalo meat for export, hence there is a strong need to tighten quality standards and facilitate dialogue between countries to resolve conflict and widen export markets Single-window governance model could boost meat sector exports	▪ APEDA ▪ Central Government ▪ EIC ▪ DAHD

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, Expert Interview and consultations

Demand-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Propagate zone wise FMD status	India has promulgated “National Animal Disease Control programme” (NADCP) in June, 2019, with a 5 year time bound programme for reaching FMD free status Progress reporting in public domain will facilitate monitor the progress zone/state wise by the OIE.	Identify a state with negligible infection of FMD, with the support of state government, AIMLEA and OIE classify it by zones to achieve the required FMD free status FMD free status, along with traceability will help facilitate smooth entry into higher value markets like USA, EU, U.K and Japan	▪ APEDA ▪ Central Government
Adherence to export market requirements	Top importing countries have banned or restricted meat exports from India due to inadequate quality and lack of disease free certifications	There is need to strengthened the certification procedures, each export consignment is subject to compulsory microbiological and other tests and a comprehensive pre-shipment inspection certificate is issued by a Government laboratory. Going forward, once the veterinary protocols are agreed with the authorities in new markets, specific requirements should be accepted and adhered to without delays	▪ APEDA ▪ FSSAI ▪ EIC ▪ DGFT
Refund of Duty & Levies	Presently only 0.15% Duty Drawback is granted for meat exports. Quantum of non-refunded duty causes a cost disadvantage of approx. 8%.	Grant of this refund under RoDTEP (Remission of Duties and Taxes on Exported Products) Scheme will make Indian prices competitive and boost exports	▪ Central Government

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, Expert Interview and consultations

Demand-side enablers assessment for Bovine Meat

High Medium Low

Enabler	Description of enablers relative to Bovine Meat	Recommendation/Suggestion for Bovine Meat	Stakeholder Responsible
Export Duties on hides	There is a need to abolish the 67% (effective) export duty on raw hides, particularly buffalo hides from export abbotairs.	The center should correct the export duties for raw hides as the top 10 bovine meat exporting countries do not levy any export duty. The duty, is a disadvantage of approximately 3% - 4% in meat price Vs competition with other countries	▪ Central Government
Branding and variety	Indian exporters have not focused on value added ready-to-cook and ready-to-eat meat products. Lack of branding on buffalo meat, leads to being considered a “mid-tier” commodity, with reduced price premiums	While, small quantities of value added cooked products are already being exported to few countries, exporters need to bring in expats for transfer of knowledge, expertise and technology to set up processing units across states that target specialized markets.	▪ Exporters ▪ EIC
	Buffalo meat in India can be classified as natural or organic as there are no hormomes or antibiotics administered to the animal in any particular stage making it a premium quality meat	AIMLEA will need to seek guidance and discussion with the EIC for classifying and labelling of Indian meat that is exported	

Source: FICCI - The Indian buffalo meat value chain,2015, FAOSTAT, Secondary Research, Expert Interview and consultations

Roadmap 2024: Value chain levers for Buffalo Meat
India can achieve an additional 3-3.5 Bn. USD of exports

Demand Side Enablers

Supply Side Enablers

Point of Departure (2019)	Lever	Opportunity	Value	Point of Arrival (2024)
Buffalo meat (present volumes) - 12.36 lakh MTs	A Increasing demand	APEDA, DAHD & AIMLEA to devise strategies to aim at increasing demand and gaining access to new markets. 6 lakh MTs.	**2.10 Bn. USD**	**Buffalo meat (volume) 18 lakh MTs**
	B Improve compliance	DAHD to implement effectively FMD-CP & establish OIE recognised FMD Disease Free Zones (DFZ) in 11 States with animal identification and movement control by establishment of check posts.		
	C Improving productivity	Salvaging even 20% of the 10 million male Buffalo calves in the FMD DFZ's in the proposed 11 States by including farmers in the DAHD implementing Scheme with modification of guidelines. Some States to amend Buffalo slaughter regulations similar to as existing in U.P, Rajasthan, Punjab, Haryana etc. Encourage farmers to utilise silage in feeding of Buffaloes to increase live weight & corresponding carcass weight.		**Revenue of 6.5- 7.0 Bn. USD**
Revenue of 3.60 Bn. USD	D Improve quality	APEDA meat plant inspection to be more effective and exercise strict control on unauthorized meat export		
Major focus markets : Vietnam Malaysia Indonesia Egypt	E Increasing value addition	APEDA & EIC to facilitate Cooked Meat, canned meat & By-products exports to EU and other countries to fetch better unit value realisation and increase exports.	**0.25 Bn USD**	
		Promotion of Pet Foods & value added pet food items.	**0.15 Bn USD**	
		Permit duty free export of raw salted Buffalo hides	**0.75 Bn USD**	

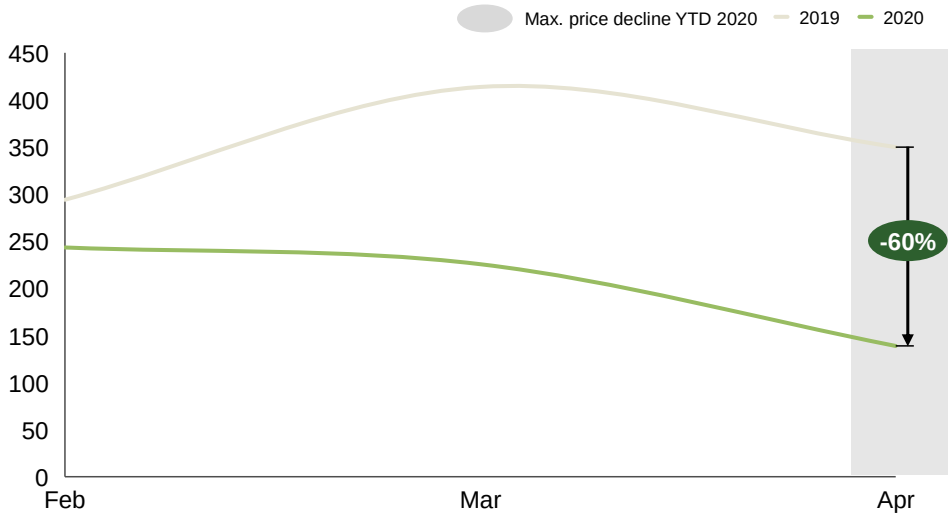
1. Will contribute 2.0 lakh MTs of additional raw material.

Expert Interview and consultations

Exports in meat, dairy and poultry collapsed by upto ~60% due to disruptions across the value chain

Risk from COVID-19: Limited Moderate High

Estimated Monthly exports for Meat, dairy & poultry products[1], Million USD



Significant decline in March and April – Due to very stringent lockdown conditions within India, livestock markets remained shut and movement of material and men were curtailed. This prevented production of Buffalo meat to be undertaken at the abattoirs. Stocks produced pre-lockdown were no doubt exported with increase in unit price realisation of approx. 10%. Fresh orders from Asian and Middle-Eastern countries were slightly less, however, requirement from Indonesia remained robust, which unfortunately could not be supplied.

Themes	Disruptions	Impact due to Covid - 19
Demand Shifts	**Diminished consumer demand** in most import markets due to their lockdown Shift in consumer **demand towards less expensive alternatives**	Moderate
Supply Chain Impact	Abattoirs ran out of existing stocks due to **strict restrictions of animal movement** Processors are keen to restart their operations but enduring social-distancing measures mean it will **not be easy to source animals in the near term**	High
Logistics and labour impact	Significant disruption, **witnessed in India and import markets - SEA and China ports**, when port clearances came to a **halt due to mass labour shortages.**	Moderate
Trade Restrictions	Potential disruption in imported bovine meat **trade in case of border closure.**	High

1. 90% of the total trade is Buffalo meat exports

Source: DGCIS, Team analysis

Agenda

- Shrimp
- Buffalo
- **Mango**
- Vegetable oil
- Wood
- Chilli
- Rice

Executive Summary – Mango Value Chain

Global and Domestic Landscape

India is the largest producer of Mango (**>40% of global production)** – but **productivity is 1.5-2x lower** than other major global exporting countries

Trends (2014-2018)

- Global Mango demand has **grown at a 5% CAGR**
- Indian exports have **declined at 3% CAGR**
- India has **slipped from 4th to 6th position globally**
- Indian exports were **6%** of global demand **in 2018** as compared to **9% in 2014.**

India's Competitiveness in the Mango Value Chain

Alphonso Variety is unique to India : superior to other varieties in terms of flavor, taste and sweetness

Strong presence in the Middle East Market due to competitiveness - demand for Totapuri Pulp and market proximity.

Indian Mangoes are **4 times the landed cost in US** as compared to LATAM mangoes

Major Competitors: Mexico, Brazil and Thailand.

Potential Opportunities for Growth

Following a **cluster approach with customized practices and single window clearances**

Thrust on Value Added Mango exports: Primary processed (55-60% currently) and secondary processed exports (5-10% currently) to fetch higher premiums.

Significant opportunity to **increase exports to China, South Korea & Vietnam (South East Asia) and Germany, Netherland, France & Spain (EU and USA).**

India has **2% Market Share in the US** – not cost competitive and higher preference for LATAM Mango supplies

Key Pain Points	Enablers	Stakeholder (s)	Measurable Metrics
Limited processing infrastructure	Investment in processing & quality	APEDA, Private Sector, State Govt.	% Value added exports from state
Cost competitiveness EU/USA	Logistic Subsidies & Export incentives	Central Govt., APEDA	Subsidy schemes % Incentive increased
Low productivity & High varietal diversity	Adoption of high yielding varieties	NHB, R&D Bodies State Government	Increase in the productivities from state
Quality - SPS Violations & rejections	Testing facilities, Digitalization & Traceability	Export Inspection Agency (EIA), State Government	Reduction in Rejections Input Compliance No. of Farms registered
Wastage - 40% (fresh) 35% (processed)	Post Harvest Infra & Practices	State Govt., Private Sector	Reduction in wastages Increase in exports

Potential for Indian Exports to grow from 1.5 to 2.5 LMT and 158 to 350 USD Mn.

India could increase Mango exports by addressing certain challenges

Executive Summary

Key insights

- **India is the largest producer of Mango** representing >40% of global production, however, India **exports <5% its production. (**Mangos represent **<1% of India's agri exports)** India supplies **6% of global export demand**
- India is the **world's 6th largest Mango exporter** trailing behind Mexico, Netherlands, Thailand Peru and Brazil**.** Having major trade partners being UAE, Saudi Arabia, UK, USA and Yemen.
- **Current exports are a small proportion of imports by major markets** – USA (2%), China (1%), Netherlands (4%), Germany (2%) (exporting to US was banned until 2006; landed cost today is 4 times that of Mexico)
- **Indian exports have declined by 3% CAGR** between 2014 and 2019 mainly because of production constraints and quality issues largely pertaining to the Middle East
- **India primarily exports minimally processed Mango** (pulp, puree, dried, extracts) accounting for **~**60% of exports. S**econdary processed exports** (juices, jams etc.) **are quite low** at 5-10%

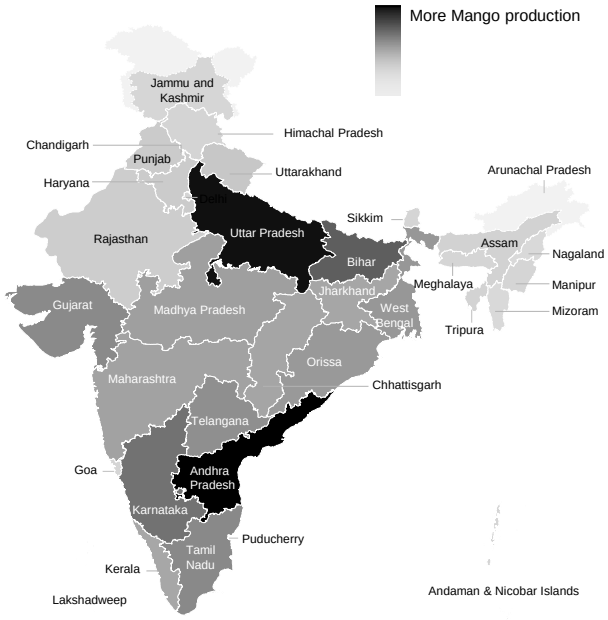
Production is concentrated in in **UP, Andhra Pradesh, Bihar and Karnataka (60%)**

Key issues and challenges

- **Small and marginal farmers(<2.5Ha) Account for ~76% Mango production,** they who stand to benefit financially should exports increase. However, the industry faces a range of challenges to overcome:
  - **Low yields, rain fed farms and high wastage** leading to higher production costs and limited buffer for exports
  - **Stricter and varied quality control standards** implemented by major importers like EU and US while **SPS, pest and disease controls and traceability** remain a challenge
  - **Strong competition** from other Mango producing countries like Brazil, Mexico, Peru and Thailand which exports superior quality at competitive prices
  - **Limited secondary value-added exports** combined with **little promotional support in end markets**

There is an **opportunity to increase Mango exports by $200Mn** by improving quality and yield through backward integration, driving investment in infrastructure and better promotion in terms of branding and positioning of Indian Mango.

Production landscape of India

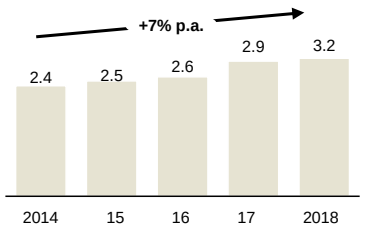


Source: Ministry of Commerce & Industry | https://pib.gov.in/Pressreleaseshare.aspx?PRID=1562530, Press Search

India's Mango exports have declined due to production and quality issues as global demand continues to grow

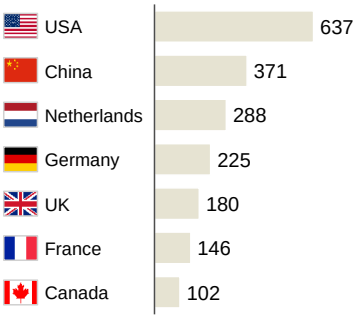
Global Mango market

Global Mango trade
USD Bn

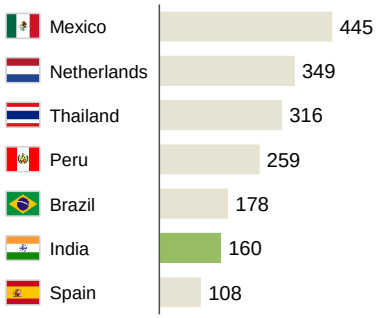


6% global demand met by India

Top Mango Importing countries,
USD Mn



Top Mango Exporting countries,
USD Mn



Key insights

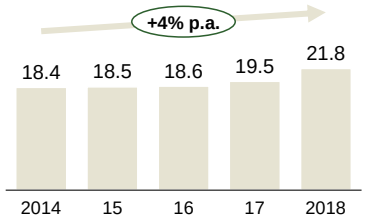
Global Mango demand has increased by 5% in value and 2.5% in terms of volume. between 2014-18 suggesting a steady rise in prices

India has slipped from 4th to 6th position between 2014-18 serving 6% of global demand as compared to 9% in 2014

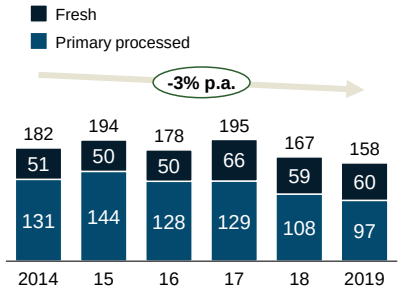
All major importing countries are seeing significant growth with China leading the pack with 20% growth between 2014-18

Indian Mango market

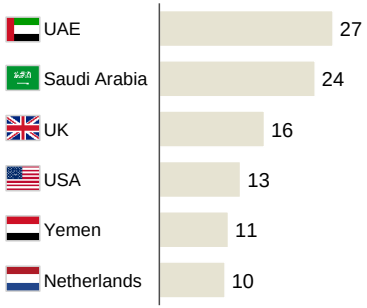
India - Mango Production
Mn MT



India - Mango Exports
USD Mn



Top destination markets for Indian Mango, USD Mn



Indian exports saw significant decline between 2014-19 because of fall in demand from Middle East trade partners like UAE, Saudi Arabia, and Yemen

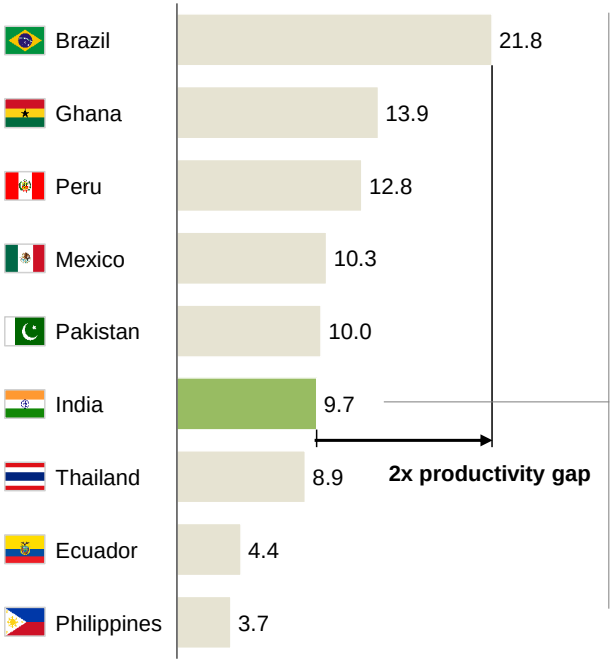
Export of pulps declined by 6% while fresh Mangos saw a growth of 4% in 2018 – Lower share for value added exports

Source: Comtrade; FAOStat, https://commerce-app.gov.in/eidb/ecomq.asp

India lags in Mango productivity relative to several large exporters with significant variance between states

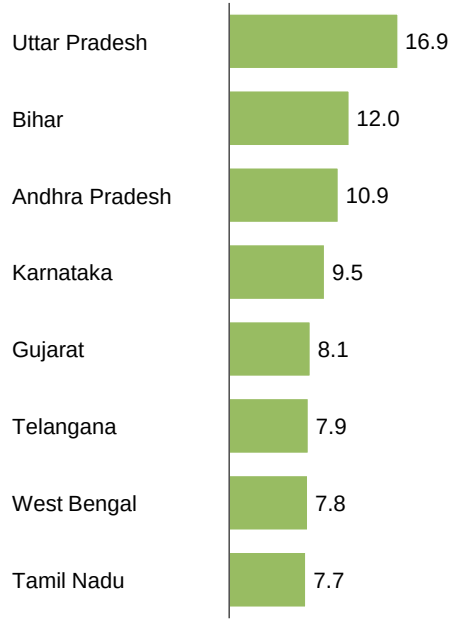
Mango yields - By country

Avg. MT/ha 2018



Mango yields - By states

Avg. MT/ha 2015-18



Key insights

India's Mango **productivity is 1.5-2x lower than other global exporters**

Significant yield difference between the states suggests that there exists an **opportunity to improve yield through deployment of best farming best practices and productivity improvement levers**

Major reasons identified for low productivity include:

- **Senility of Mango trees-** Marked decline in productivity of orchards in the age group of 30+ because of large unpruned canopy leading to low exposure to sunlight
- **Poorly managed high density orchards-** Difficulty in pruning, non-standardized nutrient management and low light penetration
- **Large degree of rainfed farms-** Erratic rains on account of climate change leading to staggered flowering and delayed maturity causing more instances of pest and diseases
- **Production from low yielding seedlings-** ~70% usage of low yield seedlings due to unwillingness of farmers to switch to high yielding grafting material because of 2-3 years of lag in production

1. States included in the chart cover ~80-85% of national production for Mango

Source: FAO crop yield data, 2018, Indistat, Enhancing Mango ICAR Research report

Global Best Cultivation Practices w.r.t South American countries, reference: Mexico

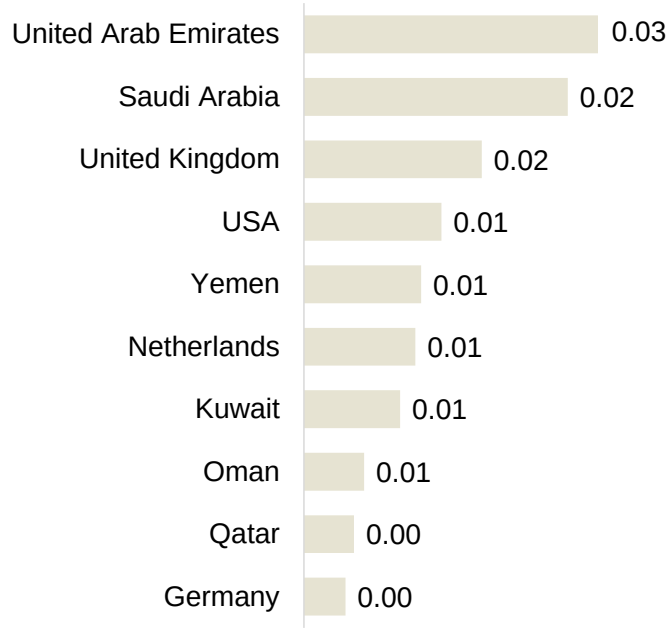
Particulars	INDIA 	MEXICO 
Plant Density	100 trees / Ha	HDP 1000 trees / Ha
Flower Inducement	Normal flowering	Induced flowering with Calcium Nitrate
Irrigation	Majority Manual irrigation	Drip irrigation
Harvesting	Manually harvesting with poles	Mechanized Harvesting
Soil Testing	Not regularly undertaken	Regularly undertaken
Fertigation	Minimally practiced	Widely through Drip irrigation

Source: Secondary Research

Destination markets – USA is the largest global importer of Mango while India predominantly exports to UAE, Saudi and UK markets

Top 10 countries importing Mango, $ 3.2 bn

Top 10 countries importing Mango from India, $ 0.158 bn



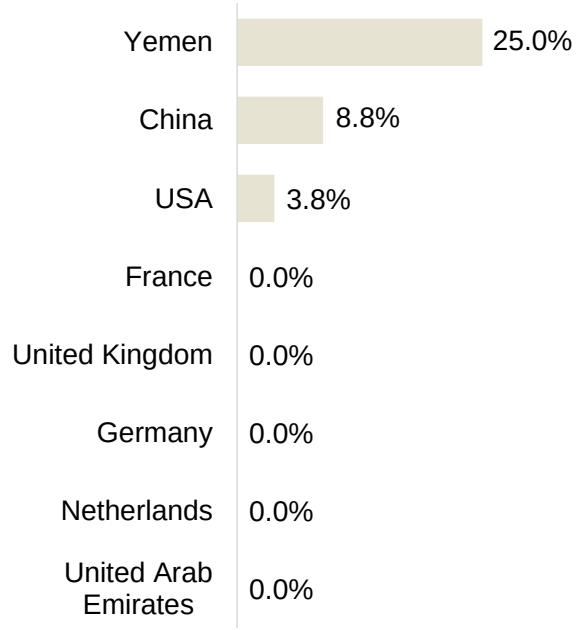
Comments

- India has 2% share in total imports of USA (largest exporter of Mango) due to price competitiveness from Mexico and Brazil
- India should focus on branding of Indian Alphonso Mango which is better in quality compared to other Mango varieties from other countries
- India should focus on cost competitiveness by increasing farm productivity and quantum of trade volumes

Source: UN COMTRADE (Global); DGCIS (India)

Trade overview - Trade relationships, duties, and non-tariff barriers

Import duties for Indian Mango for top import markets, %



Known issues for non-tariff barriers with respect to Indian Mango Exports

- Poorly established infrastructure for processing and storage
- Damages during transit (Heat injury – 10%-20%)
- SPS regulations and lack of compliance

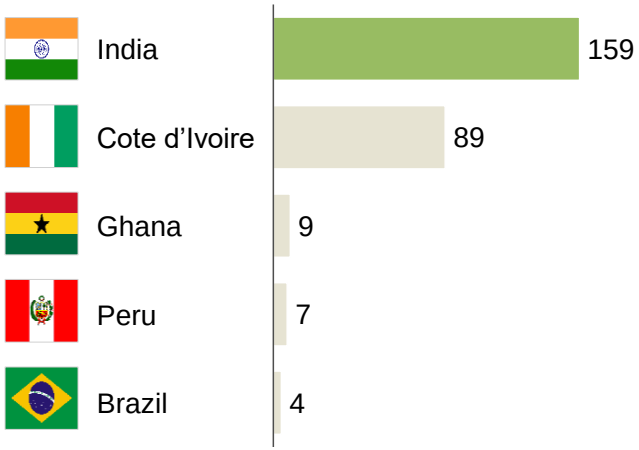
Global trade pacts inhibiting Indian exports

- Price competitiveness w.r.t Mexico and Brazil
- Different processing requirements for different countries (Vapor treatment – Japan, Irradiation – USA, Hot water treatment – EU)
- Lack of branding of Indian Mangoes in the international markets

Source: International Trade Centre, UN Comtrade, Secondary Research

Quality issues continue to be major concern in EU and US markets compared to peers

EU interceptions per $100M of Mango import
Avg. interceptions 2014-18



USA Refusals per $100M of Mango import
Avg. refusals 2014-18

~87% decline of Indian Mango exports to EU because of ban of import of Indian Alphonso Mangos between 2014-15 on account of pest infestation

Source: Europhyt, FDA portal,

Key insights

- **India has the highest proportion of interceptions and border rejections** amongst the major exporting countries to US and EU for Mangoes

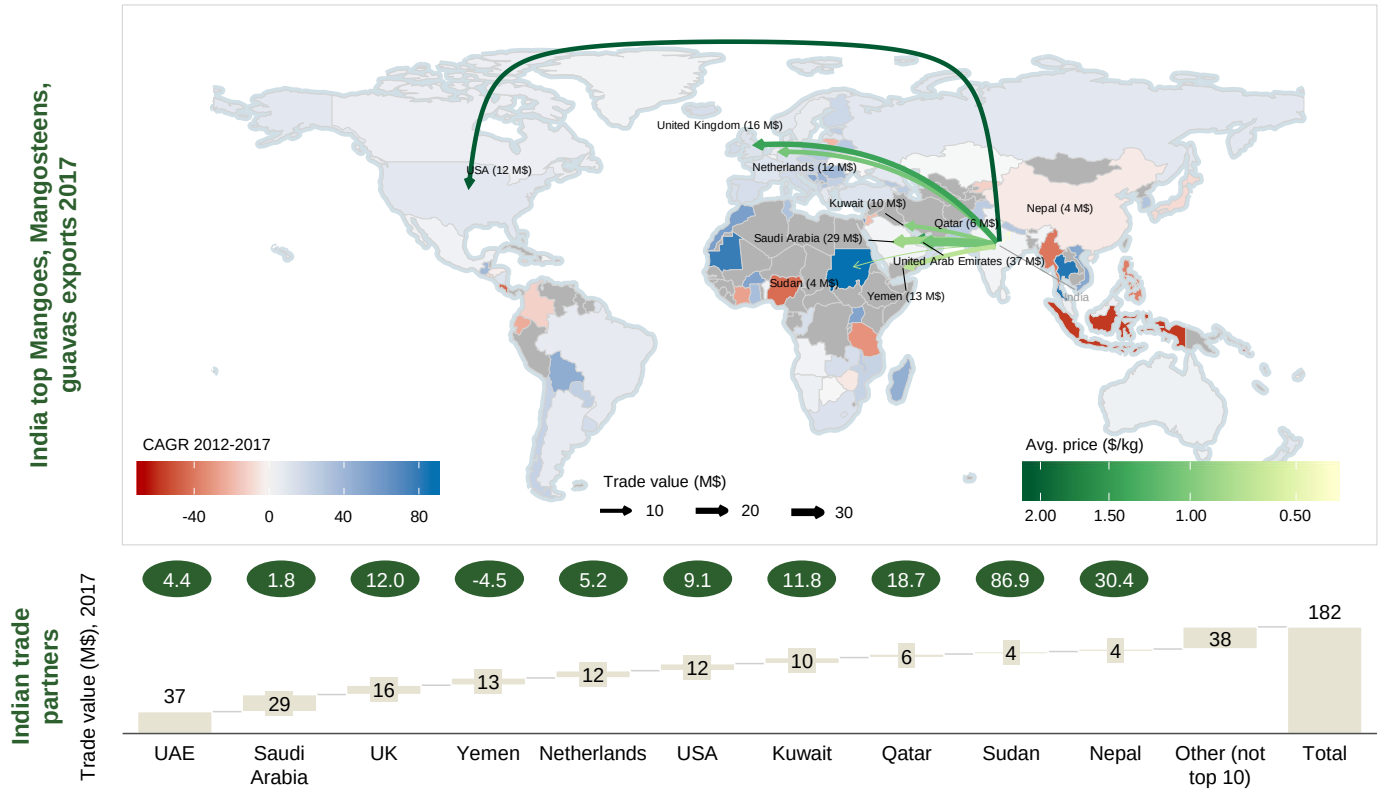
In EU, primary reasons for interceptions are :

- Improper Phyto. certificates – 79%
- Harmful organisms (Pests etc) – 21%

Presence of insects and pests in wooden packaging material is also a major reason for rejections

Cases of pests have declined over time but cases of improper certificates have remained constant

India's Mango exports are largely limited to Middle eastern countries with significant opportunity in other nations



Total value of exports is $182,165,550
HS Codes: 080450

Source: UN Comtrade data; Displayed trade flows represent 79.2% of total trade flow value of India

Key insights

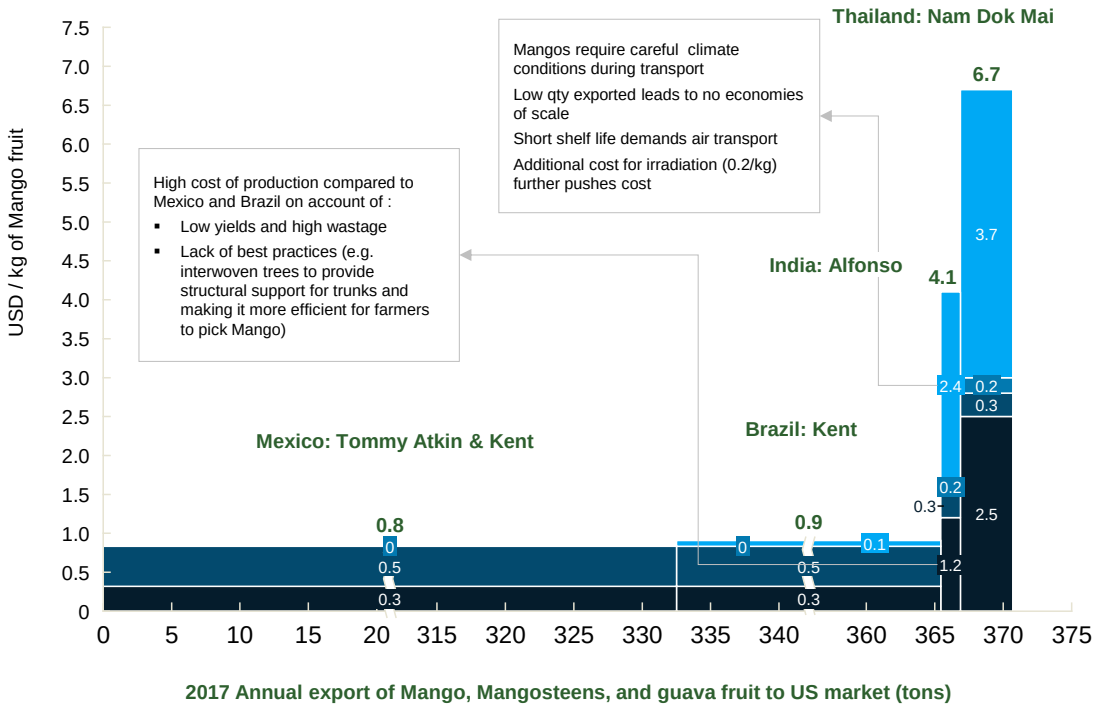
- Major markets are Middle East, US and UK.
- Exports to US are at an extremely high price due to irradiation and high logistics cost. (Indian Alphonso $ 4.1/kg compared to Kent from Brazil and Mexico at $ 0.9/Kg)
- Exports to fast growing markets regions like Sudan, Morocco, Bolivia, Thailand, Russia etc. are relatively negligible

US landed cost for Indian Mango is 4x the cost of Mangos from Mexico

PRELIMINARY

Mango cost curve for US imports

USD/ kg of Mango fruit



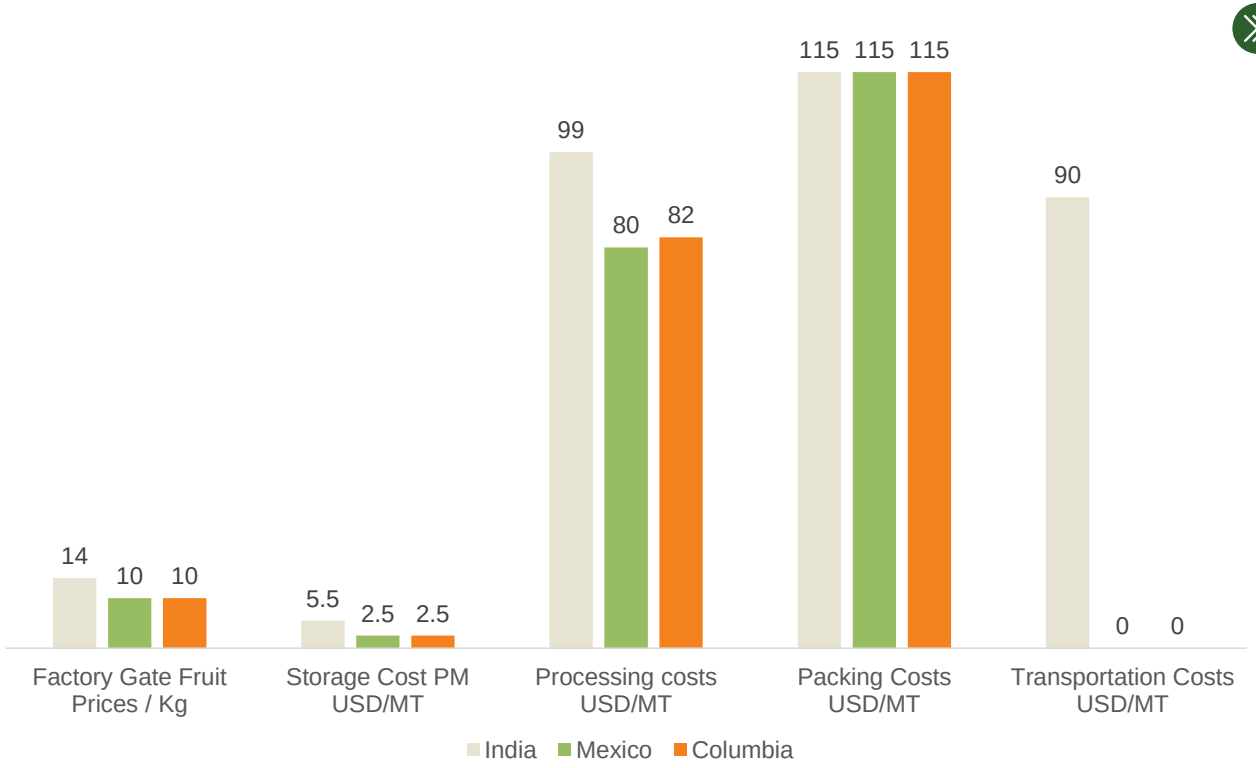
2017 Annual export of Mango, Mangosteens, and guava fruit to US market (tons)

Key insights

- Global demand for Mangoes have increased year over year, making it the fastest growing segment of fruit sales
- Mexico dominates the US Mango market, with 66% of US imports; Brazilian represents 7% of US imports; India and Thailand represent less than 2% of US imports of Mangoes
- Indian Mangoes are substantially more costly to US buyers than Mangoes from Mexico or Brazil, largely due to costs of transportation which could be reduced with higher trade volumes
- India and Thailand are also required to irradiate Mangoes prior to export to control the spread of pests; the costs of irradiation is relatively small compared to transportation costs
- The Mango varieties from India and Thailand are considered superior to the Tommy Atkin and Kent varieties from Mexico and Brazil, but are relatively new to the US market (imports began after 2006)

Source: Expert interviews, [1]UN Comtrade (US reported imports for HS Code 080450); [2]National Mango Board (https://www.Mango.org/) US Dept of Agriculture Economic Research Service (https://www.ers.usda.gov/); Food and Fertilizer Technology Center for the Asian and Pacific Region (http://www.fftc.agnet.org/); International Society for Horticultural Science (https://www.ishs.org/)

Competitive Benchmarking - Supply Chain to USA



Key insights

Processing cost is lower in competing countries due to larger volumes, shorter harvest window leads to Indian processing plants operating at 20% capacity

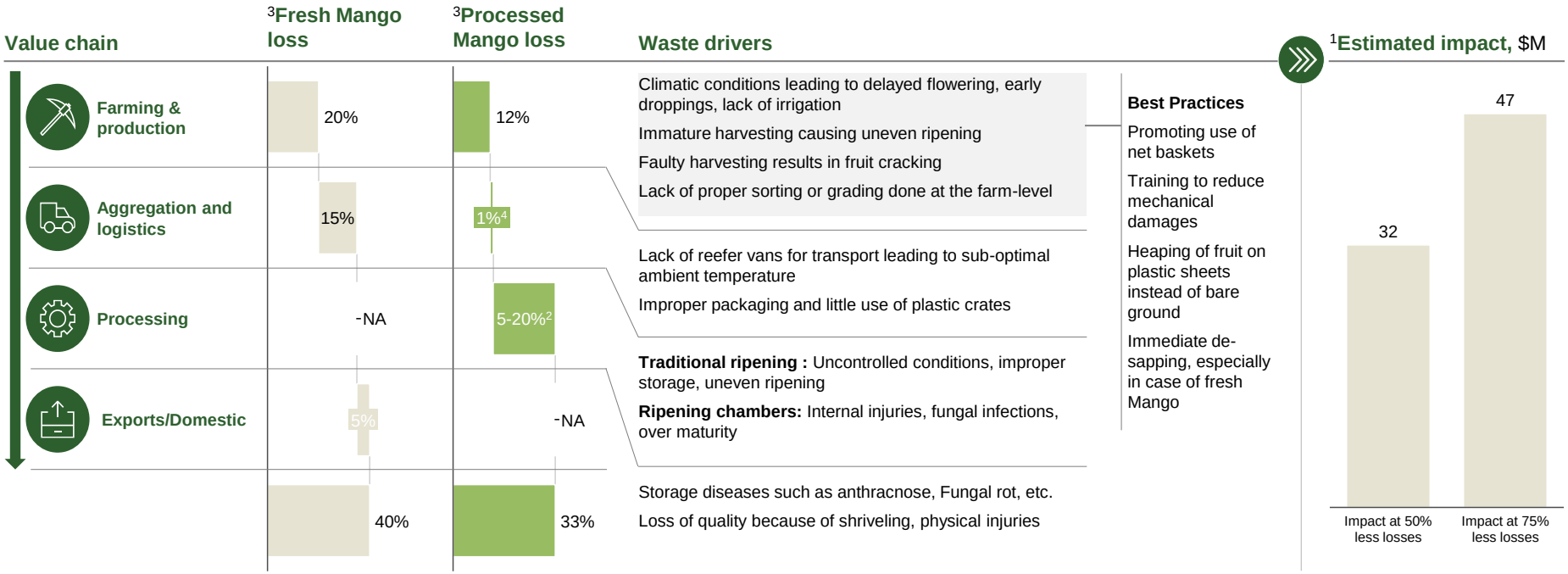
Packaging cost is at par, since all 3 mostly countries import material from Italy (Aseptic Bags).

Transport cost for India is higher due to distance of the destination markets. LA countries have negligible transport cost for USA

Storage costs are higher in India due to higher power tariff.

Controlling post-harvest food loss could potentially help increase exports by additional ~$30-50 Mn

Current **wastage levels are as high as 40% in case of fresh Mangos and 35% in case of processed Mango pulp**. Bringing down the wastage level will allow increased exports, reduced costs, and higher income for farmers

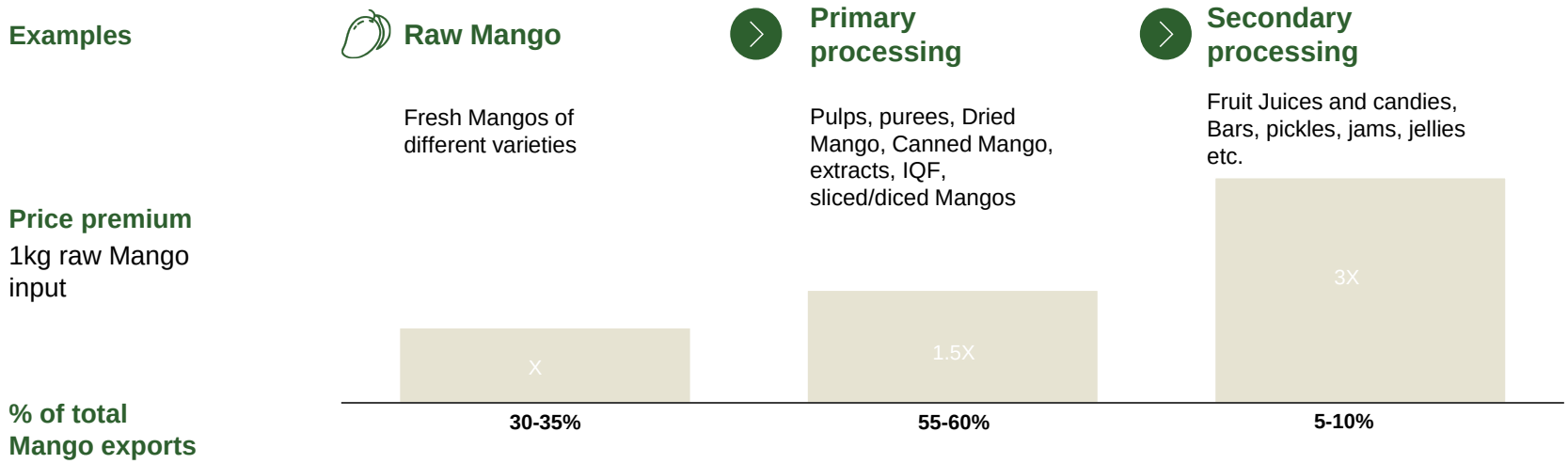


1. Assuming demand for additional production without any change in global export prices
2. Traditional ripening has higher losses (~20%) as compared to ripening chamber (~5%)
3. Price loss arising out qualitative factors have not been covered
4. Negligible losses during transport and aggregation for processed Mango value chain is on account of proximity of processing plants to farms and use of damaged Mangoes in processing

Source: FAO report, Expert calls

Value added export portfolio could provide opportunity to increase exports

There is an opportunity to **expand export of primary processed Mango** (E.g.- dried, diced, pulp, extracts) which command a premium and to **start exporting secondary processed Mangos** (pickles, juices, jams)



Key areas to be addressed to increase processed Mango exports:

Primary processing- Stop adulteration of pulps with low quality/variety, better packaging (bag and box vs tetra), Focus organic and certified segments

Secondary processing- R&D in value added mango products, improved branding and retail linkages, end use led variety selection & product development

1. Based on expert interviews and best estimates
2. Assumed increase in secondary exports from 5% to 20%

Source: Comtrade, Press search, Expert calls

A few players have vertically integrated along the Mango chain, but large corporate presence is limited

Inputs players

Cos. like Syngenta and IFFCO provide crop protection and nutrients. While sourcing of most planting material is through local nurseries, certain private players like Jain Irrigation and very few private players provide high yield varieties

Vertically integrated players

There are several models of integration currently in the industry.

Jain Irrigation owns nurseries, contracts farmers for production & procurement, provides extension services, Sources and processes Mango and exports to international majors like Coke and Pepsi

Kay Bee Exports (largest exporter of fresh fruits from India to Europe) owns farms, undertakes integrated contract farming and has a distribution company in UK. This company is also into freight forwarding and customs clearance

Big industrial companies in past 5-6 years like Reliance, Essar and Sanghi group have also started producing Mango on large scale through scientific plantation techniques.

Processors and exporters

Most large processors procure Mangos largely through agents and large farmers and lesser proportion through *Mandis* (30-40%). Smaller processors sell their output to large exporters and certain domestic players

While there has been private interest in F&V exports, **investment in production and logistics is still limited** due to fragmented nature of farming making it challenging to build sizeable portfolio (e.g. average farm size is 1-2 ha), production and farming outside of core competency, lack of cold chain infrastructure and long pending reforms in APMC Act.

Source: Press search; Company websites, Expert interviews

Mango value chain faces challenges largely in production and logistics, which inhibits export growth

~10% sourced directly from farmers

Simplified Mango value chain	Input supplies	Mango farming & production	Aggregation and logistics	Processing	Exports (<5%) / Domestic (>95%)
Activities	▪ Seedlings – normal & grafted ▪ Nutrients and crop protection	▪ Fertilization, pesticide application ▪ Orchard planting ▪ Orchard care ▪ Orchard management and harvesting (yearly)	▪ Sorting & grading ▪ Packaging & transportation	▪ Ripening (ripening chamber) ▪ Pulping, pasteurization & aseptic packing ▪ Pickle making, drying ▪ Juicing	▪ Marketing and export
Products	▪ Saplings, grafting material, fertilizers (straight and mixed), fungicides, equipment such as sprayers	▪ Ripe and unripe Mango fruit	▪ Sorted & graded Mangos	▪ Fresh fruits, Mango pulp, concentrates, juice , jelly, Mango bar, dried Mango, pickles	▪ Fresh Mangos and processed products (e.g., pulp, puree, slices & dried)
Key pain points throughout the value chain	▪ Low use of quality planting material ▪ Lack of organic Inputs ▪ Lack of proper irrigation facilities	▪ Low yields ▪ Challenges managing pest and diseases ▪ High harvest losses ▪ Lack of pre-cooling infrastructure ▪ Market price fluctuations	▪ Limited cold storage, refrigerated transport and improper package material leading to high wastage	▪ Dependency on 3rd party processing units ▪ Low capacity utilizations increasing planting costs ▪ Adulteration in varieties supplied to pulp processors	▪ Pesticide residues ▪ Different requirements for pest treatment ▪ Limited branding and secondary processing ▪ High logistic cost to reach EU & NA making India uncompetitive
Financial indicator — **[2]Profit margin, %**	15%	20-30%	5%	20%	25%
Consolidation level — **Number of players**	1000's	1000000's	1000's	100's	10'S
Key players in the industry	Large number of small suppliers of grafts & crop management inputs	[1]Medium to large farmers	Producers, Pre Harvest contractors, Wholesalers, Processors, Retailers Startups – bigbasket, ninjacart, WAYCOOL, crofarm	Unilever, Jain Irrigation Systems Ltd., Mother Dairy, Nestlé, PepsiCo, Capricorn, Parle Agro, Coca-Cola	Jain Irrigation Systems Ltd., Capricorn, kaybee, Rainbow International Exports

1. ~76% of production is undertaken by small and marginal farmers
2. Requires further validation

Source: APEDA, AgriExchange, FAO report on Mango loss, 2016, Expert interviews, Press Search

Addressing key pain points can enable farmers to increase Mango quality and production

High Medium Low

Value chain	Pain points	Description and details	Level of impact on export
Input supplies	Low use of quality planting material	60-70% of current production comprises of low yielding varieties. Farmers are wary of using high yield grafting materials in older trees as they lose production for 2-3 years (Gestation Period)	Medium
	Limited availability of organic inputs	Shortage of organic inputs, technology, knowledge and funding along with limited to no subsidies for organic inputs for exports	Low
	Lack of proper irrigation	Most orchards use rain fed and with changing climate and erratic rains, lack of proper irrigation often leads to crop failure	High
Farming & production	Low yields	India faces low productivity relative to other Mango-producing countries - 9.7 Tons/Ha vs 21 Tons/Ha in Brazil and 13 Tons/Ha in Peru making Indian exports expensive, harvesting practices also renders produce unmarketable (~15%)	High
	Challenges in managing pests & disease	Limited knowledge for farmers on managing pests and diseases, leading to potential incidents of total yield loss events	High
	Lack of pre-cooling infrastructure	Lack of pre-cooling immediately after harvest limits the shelf life of produce and thereby constrains long distance exports	High
Aggregation and logistics	Limited cold storage, refrigerated transport and packaging material during transport	High wastage (15-20%) on account of limited supply of cold storage and reefer trucks especially during peak seasons. Most produce is transported in open trucks, farmers do not always have access to quality packaging material and they tend to use locally available material like bamboo baskets, which leads to compression damage during transportation and storage.	High
Processing	Dependency on 3rd Party Units	Most of the processors depend on third party units for processing and proper certification is an area of concern	Medium
	Lower capacity utilizations	Mango is highly seasonal and harvest is only expected at certain times of the year depending on the local conditions leading to lower utilization of processing capacity	Low
	Adulteration of variety in pulps	Processors report that agents and traders often mix cheaper varieties with desired varieties leading to rejections and complaints from importers; Multiplicity of varieties and lack of uniformity in harvesting leads to variation in quality	Low
	Pesticide residues	Improper farm practices and unavailability of higher quality pest control methods lead to improper pesticide residues	Medium
Exporting	Varying requirements for pest treatment	Vapor heat treatment (mandatory for EU) and gamma radiation treatment (mandatory for US) are in limited supply and are often far from farms, increasing costs	High
	Limited branding for exports and secondary processing	Lack of branding for Indian Mangos, lack of GI (currently only Alphonso has GI), limited end customer promotion and low export secondary processed exports	High
Domestic end-markets	High logistic cost to reach EU – making India uncompetitive	Lower shelf life as compared to Thai and Brazilian varieties, requires Indian Mangos to be exported via air freight leading to significantly higher logistics cost	High

Source: Expert interviews; Press Search, ICRIER Working paper 345

Supply-side enablers assessment for Mango value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Increase productivity	Low yields because of limited use of high yielding grafted material and lack of irrigation Limited knowledge amongst farmers for managing pests and disease	Increase production through productivity improvement by encouraging use of high yielding grafted material, propagation of zone specific best practices and proper training with timely information to farmers on pest and disease management	National Horticulture Board
Reduce wastage	Limited cold storage, refrigerated transport, packaging material and pre-cooling infrastructure	Reduce post-harvest losses by investment in key infrastructure like Pack houses, Cold Storages, refrigerated transport and precooling infrastructure in Sync. With availability of adequate refrigerated transportation during peak season leading to an added export potential of 30-50 $M	Ministry of Agriculture and Farmers Welfare
Improve Mango quality & variety	Port rejections at destinations due to detection of pesticide residue/microbial load and poor traceability & low shelf life	Improve quality through investments in R & D, Incentivize improved agriculture practices, build adequate infrastructure and have better monitoring and control over the value chain operations (85-100 $M Added Potential)	Indian Council of Agriculture Research with State Government
Increase export value through processing	Limited branding of exports, Limited value added exports	Increase value-add of Mango exports by incentivizing processing, improving quality standards and encouraging export of private label/Branded products such as Juices, Jams, Pickle etc.	MOFPI (Ministry of Food Processing Industries)

Source: Secondary Research

Demand-side enablers assessment for Mango value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Improve trade promotion	Limited branding for exports Varying requirements by different countries	Promote exports by re-designing offers basis engagement with specific markets/Buyers backed by strong branding and promotion (Added potential 8 – 13 $M)	APEDA
Trade & treaties	Non-coverage of export standards by FSSAI, delayed reaction to food safety issues raised by importing nations and insufficient G2G engagements	FSSAI standards in Sync. with exports: harmonize domestic standards with international requirements G2G engagement: Equivalence Mutual Recognition Agreements (MRA) and thrust on value addition	FSSAI & APEDA
Adherence to export market requirements	India has the highest proportion of interceptions and border rejections amongst the major exporting countries to US and EU for Mangoes	Whilst pest related rejections have declined over time, cases pertaining to residues and microbial load as well as faulty/fake phyto certificates have increased. Educating all stake holders across value chain regarding SPS standards of importing markets is required	APEDA
Cost compe-titiveness EU & USA	Indian Mangoes are substantially more costly to US buyers than Mangoes from Mexico or Brazil, largely due to costs of transportation	In key mango producing areas, during peak mango producing season, adequate transportation should be available to connect fruit to the pack houses, processing centers and ports/ Air ports. For fresh fruit, hub and spoke model of connectivity to ports needs to be in place. Frequency of cargo flights/enhanced allocation of space for mango needs to be planned along with flights to major markets from nearest airports (Ex: Lucknow for UP Mango)	Export Promotion Council

Source: Secondary Research

Mango value chain analysis

India could increase Mango exports by pursuing a portfolio of initiatives adding a potential ~$168-220Mn to exports

Point Of Departure:

(2019)

Mango (1.5-1.7 LMT)

- Fresh (0.5-0.6 LMT)
- Processed (1-1.1 LMT)

Revenue of 158 Mn. USD

Major Focus Markets

- Middle East

Lever	Opportunity	Value[1]
Improve Mango Quality & Variety	A Improve quality through higher control over farming, incentivizing best agriculture practices, more investment in R&D and treatment facility	**85 - 100 Mn. USD**
Increase Productivity	B Increase production by **improving productivity** through **promotion of best practices** 1. Farmer Training 2. Availability of Inputs 3. Irrigation 4. Farm Aggregation	**30 – 40 Mn. USD**
Reduce Wastage	C Reduce post-harvest losses by investment in key infrastructure and extension services to farmers	**30-50 Mn. USD**
Improve Trade Promotion	D Promote export by re-designing engagement with countries and buyers along with strong end-customer promotion	**8 - 13 Mn. USD**
Adherence to export market requirements	E Govt. interventions to reduce Risk 1. Mutual Recognition Agreements 2. MEIS 3. Other policies	

Point Of Arrival:

(2024)

Mango (2.3-2.5 LMT)

- Fresh (0.8-0.9 LMT)
- Processed (1.3-1.5 LMT)

Revenue of 300-350 Mn. USD

Markets

- EU and USA
- Middle East

A set of identified enablers can help create additional global demand and meet supply requirements

Supply Side Enablers

Demand Side Enablers

Measurable Milestones for Central & State Govt.

Central Govt	
Collation of a Central Mango Database Creation of common IT Infrastructure for States Digital Database accessible publically	**Six Months** (To get the data ready)
Funds for Infrastructure development To Increase the number of pack houses & Processing units in different states for the export of fresh and processed Mangoes.	**Funds released**
Subsidies in adoption of high yielding varieties In co-ordination with the states, incentive for adoption of new and high yielding varieties should be adopted	**Specific schemes and varieties** (To be Operational)
Incentivizing Mango exports other than MEIS The logistics subsidies for Indian Mangoes like Alphonso to reach US & EU will help India to garner good market share in the markets	**Scheme announcement** (To be Operational)

State Govt	
Farm Registration: All Mango farms to be digitally registered and geo-tagged.	**Time taken** (Phase wise targets)
To create **Mango Value chain Cluster** CEO which subsume powers of all bodies: Central, APEDA and State; Single window system – End to End activities of mango from Farm to market	**3 months before next Mango Season**
Workforce Skilling Program to be rolled out - States to identify private anchor exporter and allocate funds accordingly. A Mango exporting hub to be developed in each state based on cluster identification	**Release of Funds Identification of Parties**
Pack houses & Processing Infrastructure for Mango processing should be developed and incentivized by the government for streamlining expansion for privates	**Number of Units**

Mango value chain analysis through Covid lens

High Medium Low

Supply / Demand Enablers / Constraints	Impact	Reaction
Demand of Indian Exports		Demand for Indian exports of fresh Mango is decreased from both US and Japan as the inspectors were not able to reach the locations from importing countries
Impact on production in competing origins		The health emergency in Central Mexico has caused most of the Mango warehouses to shut down and also ~60% of workers in the sectors have lost their jobs
Export regulations imposed by importing countries		The European Union has eased rules for import of Mangoes The physical certificate assuring food safety, is no longer required. Instead an online certification issued by relevant authorities of exporting country will be enough.
Impact on relative competitiveness due freight rate changes etc.		Due to restriction and lack of air freight, there is more load on ocean freight and the Logistics industry is facing container shortages

Source: Secondary Research

Agenda

- Shrimp
- Buffalo
- Mango
- **Vegetable oil**
- Wood
- Chilli
- Rice

Executive Summary – Vegetable Oils Value Chain

India's Oil Imports

Largest Agri Import (10Bn$)

Consumption: 25.9 MMT (2018-19), **60% Imports**

Oils imports increasing at **7.5% CAGR since 2008**

Palm Oil accounts for **50% of total oil imports** and India is the largest palm oil importer **(~10 MMT)**

Major oils produced: Soyabean, Groundnut, Mustard, Rice Bran, Cotton Seed, Coconut

Major oils imported: Palm oil, Sunflower, Soyabean

Key road blocks to Oil production in India

Limited potential area for Oil crops

>60% of Oilseed crops are rain-fed crop

Climate(drought/floods) **affecting crop & oil yields**

Lack of awareness among farmers on best practices

Higher cost of cultivation compared to major producing countries – **Market Prices governed by Oil Imports**

Low Crop Attractiveness and Remuneration – no assured procurement support (MSP)

Potential Opportunities for Growth

Untapped Potential of Palm Oil Plantations (highest oil yields) - grown only on ~17% of potential area. Privatization in palm oil plantations can bring in economies of scale & rapid increase in area under cultivation

Secondary Oils: India is only leveraging 54% of total Cottonseed and 60% of its total rice bran potential.

Yield gap of 65% exists in oilseed crops due to lack of awareness of best management practices. Huge area potential available for oilseeds (Soybean : ~5 Mn Ha, Mustard: ~15 Mn Ha) from rice fallows, expansion to non traditional areas, inter cropping techniques etc.

Key Pain Points	Enablers	Stakeholder (s)	Measurable Metrics
Low yield of existing seed varieties	R&D, IP Policy & Technology Imports	ICAR – IIOPR/ IIOR, Central Government,	New Varieties introduced, Per Hectare Yields
Lack of adoption of good PoPs	Extension & PPP Models	State Governments/ KVKs	Increase in Avg. Yield Average SRR
Low oil crop attractiveness	Pricing Schemes & Policies, Governance	DAC&FW/ CACP/ Central Government	Area increase Oil Production
Low Oil Extraction Efficiencies	Processing Efficiency & Infrastructure	Central Government, Private Players	Oil Extraction Ratios (OER) - % Increase
Limited Oil Palm Plantations	Policy (Oil Palm as a plantation crop)	DAC&FW/ Central Government	Increase in Crop Area Palm Oil Production

Potential for Indian Oil Imports to reduce from "23.8" to "17" MMT and "15.3" to "10.9" USD Bn. in 2024-25

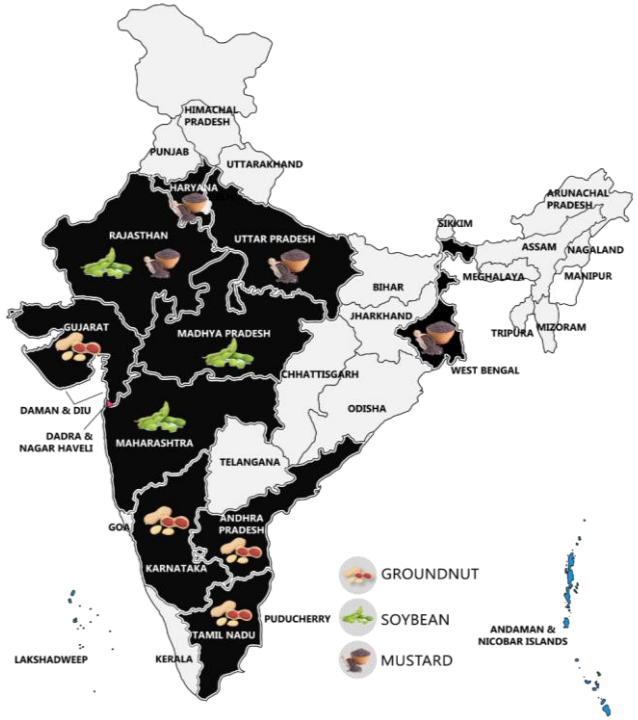
Executive Summary

Key points

- India's per annum vegetable oil consumption in 2018-19 is 25.9 Mn MT. Domestic production is 10.5 Mn MT and imports are 15.4 Mn MT
- ~80% of Indian oil production is from primary sources (oilseeds (70%), and Tree Borne Oils - TBOs (10%)) and ~20% from secondary sources (Cottonseed and Rice Bran)
- In India, oilseeds are cultivated over 26.67 million Ha producing 30.06 million tonnes of oilseeds translating to 7 Mn MT of oil annually. 95% of Indian oilseeds production is from 3 crops – Soyabean, Mustard & Groundnut and 10 states only
- India is among the top 5 largest oilseed crop producing countries in the world, and is also one of the largest importers of vegetable oils today.
- Bulk of India's imports in 2018-19 included- palm oil (~10 Mn MT) Soybean Oil (~2.9 Mn MT) and Sunflower oil(~2.4 Mn MT)
- Due to lower production, India imports almost 60 per cent of its requirement (2016-17: imports costed Rs. 73,048 crore but also earned about Rs. 29,000 crores foreign exchange through export of oilseed and allied products like De-Oiled cakes, oil meals, etc).

Key issues and challenges

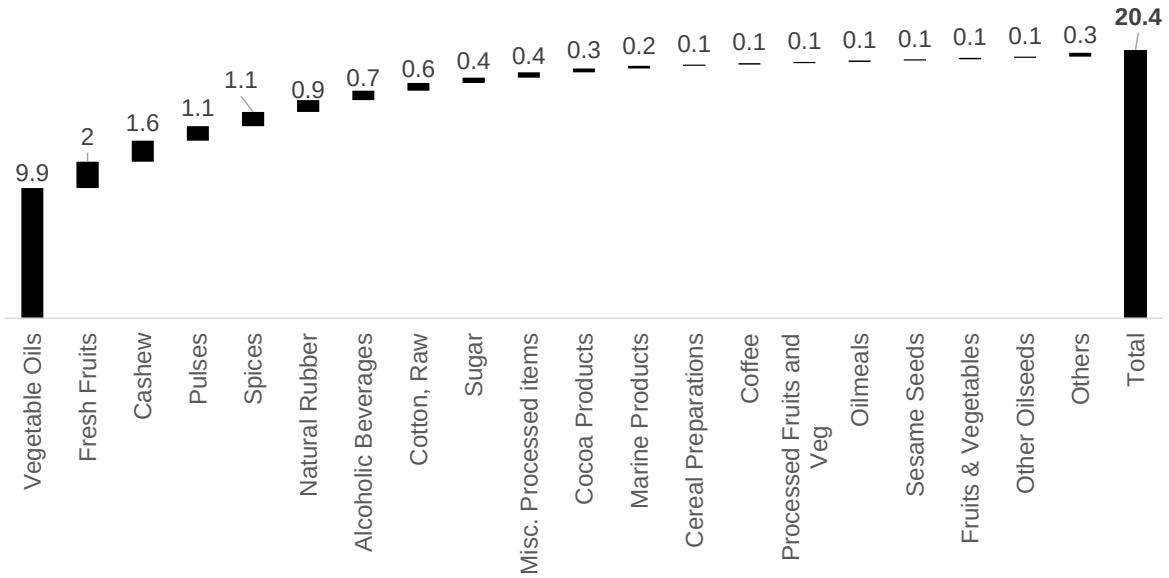
- Low productivity of Indian crops compared to global productivity standards
- Lack of adoption of good Package of Practices by the Indian Farmers
- Lack of development for short, high yielding, biotic and abiotic stress resistant varieties, compared to cereals there has been failure of hybridization and seed multiplication programs
- More than 85% of the area under oilseed cultivation falls under rain-fed, leaving farmers to gamble with the monsoon for higher yields
- Low attractiveness in growing oilseeds crops for the farmers, as the MSP or income generation from oilseeds is lower to that of Wheat or paddy
- Oil Extraction in Indian mills is less compared to that of the Global extraction standards



95% of Indian Oilseed production (Soybean, Mustard, & Groundnut) happens in the above 10 states

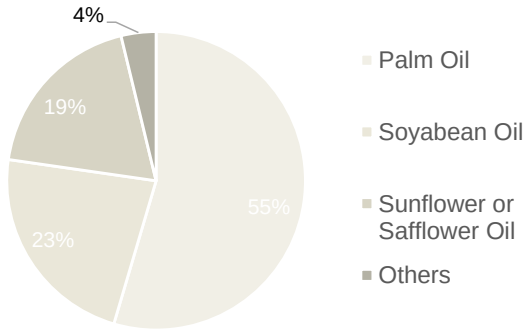
Almost 50% of Indian agri-imports are in vegetable oils, this translates to over 70,000 Cr. INR in foreign exchange

India imports significant amounts of vegetable oils, fresh fruit, cashews, pulses and spices
2018 agriculture imports, Bn $



Source: ComTrade, DGCIS
https://www.downtoearth.org.in/coverage/agriculture/palm-oil-consumption-increased-230-in-almost-2-decades-yet-india-imports-most-of-it-61040

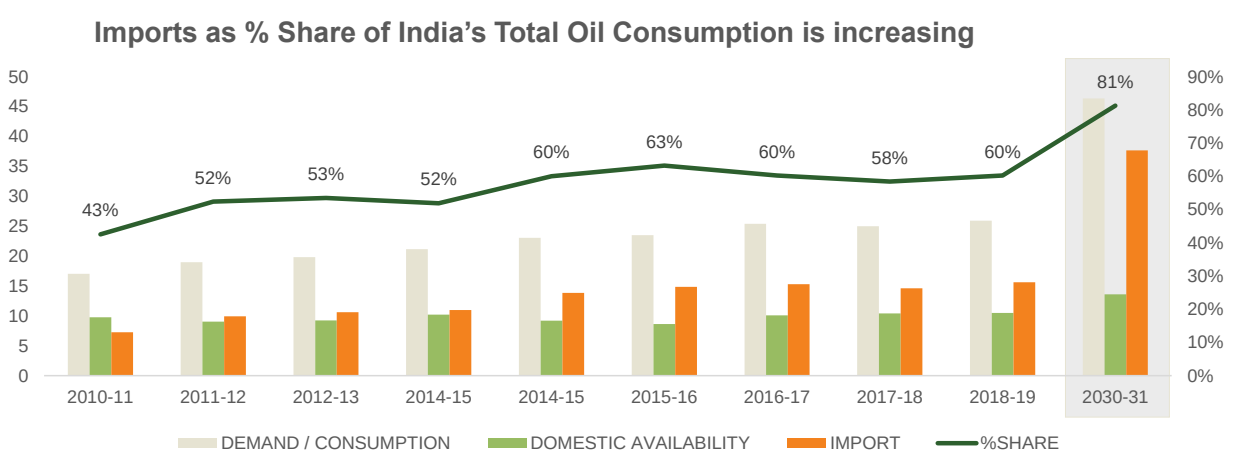
Vegetable Oils' 2018 Imports in India (~10 Billion USD)



India is one of the major growers of oilseeds. Its vegetable oil economy is the fourth-largest after the US, China and Brazil. Yet, India relies on imports to meet over 70 per cent of its vegetable oil requirements; almost 60 per cent of the requirement is met through palm oil.

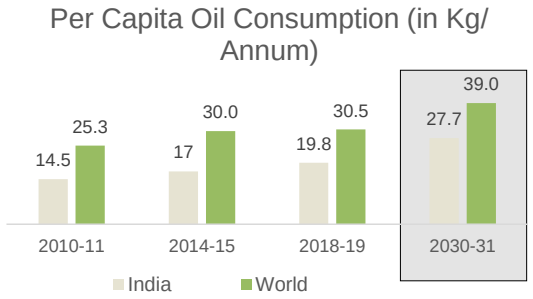
India imports 5.5 $B of the total 29.1 $B Oil Palm exported globally. The Oil Palm scenario thus presents an opportunity to boost trade surplus for India.

The Indian Vegetable Oil imports are increasing at a CAGR of 7.6% since 2008-09 and may cost ~1.68 lakh crore in Forex by 2030



- Domestic Availability/Production of Edible Oils has remained almost stagnant (~2% CAGR) - from 2008-09 (8.46 Mn MT) to 2018-19 (10.5 Mn MT)
- During the same time, the consumption increased by 5% CAGR from 16 Mn MT in 2008-09 to 26 Mn. MT in 2018-19
- To meet the increasing consumption, the imports (or the domestic deficit) for edible oils increased at 7.6% CAGR from 7.5 Mn MT in 2008-09 to 15.6 Mn MT in 2018-19
- As of 2018-19, over 60% of the total edible oil demand in India was met by imports

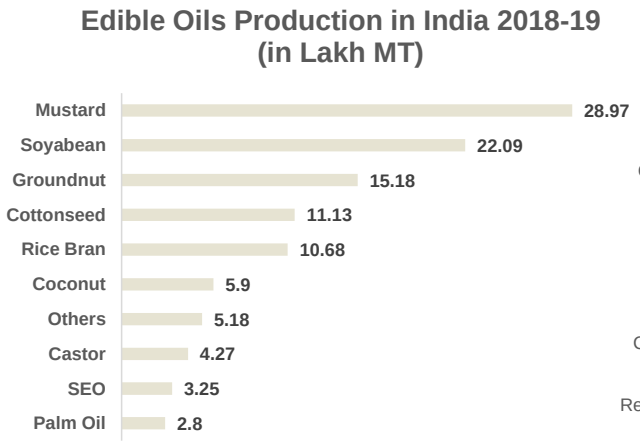
Projections are current numbers extrapolated to 2030-31 using linear regression at the current CAGR

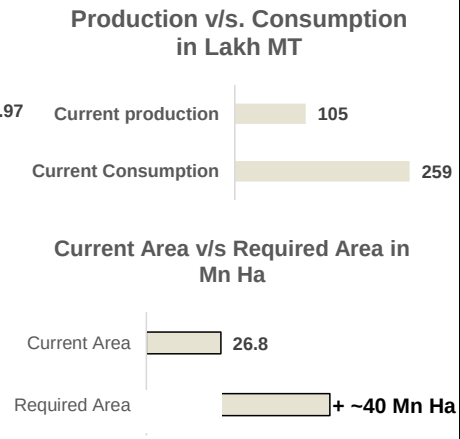


Projections call for prompt actions

- With increasing population and per capita oil consumption over the years, the trade deficit in edible oils is only going to widen further. Growth rate of production needs to match with demand to maintain imports at current level.
- Edible Oil imports have cost India approx. INR 75000 Cr. of foreign exchange in 2018-19 and at the current rate of increase in oil imports, India will be spending ~1,68,000 Cr. INR by 2030 only on Vegetable Oils..

Almost 40 Mn. Ha more cultivable land would have been required in 2018-19 (at current mix of oil cultivation) for India to be self sufficient in vegetable oils

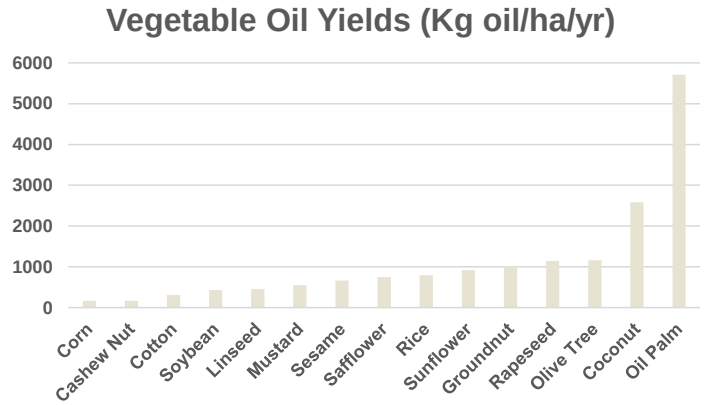




India's Vegetable Oil Portfolio

- Mustard oil is the largest produced in India followed by Soybean, & Groundnut among primary oils
- The above 3 oils accounted for 60% of total oil production on over 80% of the cultivated land for vegetable oils
- India also produces oil from secondary sources like rice bran and cottonseed – which account for another 20% of total oil production in the country

https://dfpd.gov.in/ ; www.attar.nact.org



Changing the Oil Basket

- For India to be self sufficient in edible oils, at the current mix, India should produce oils in an additional 40 Mn Ha of land.
- India needs to add to its oil production basket, crops with higher Oil yield per hectare per year
- Oil Palm looks like a promising option offering higher production in a unit area among other edible oils. The same amount of oil can be produced in roughly 4.5 Mn Ha of Oil Palm Plantations

A multipronged approach leveraging India's resource pool and strength needs to be followed towards Oil self sufficiency

Source (Crop)	Area under Cultivation (in Mn Ha)	Consumption (in Mn T)	Production (in Mn T)	Imports (in Mn T)
(1)	(2)	(3)	(4)	(5)
Primary - Annual (Rapeseed & Mustard (42%), Soybean (32%), Groundnut (22%), Sesame (3.4%), Sunflower (1.1%), Niger (0.3%), Safflower (0.1%)	24.45	12.6	7.00	5.60
Primary- Perennial (Coconut (56%), Oil palm (27%), Olive, Mahua, Edible TBOs (17%))	2.36	10.84	1.04	9.8
Secondary Sources (Rice Bran (48%), Cottonseed (41%), SEO (11%))	-	2.46	2.46	0
TOTAL (2018-19)	26.81	25.90	10.50	15.40

Indian production basket is pre-dominantly oilseeds (Annual Crops) with an average oil yield of less than 0.3 ton/ha/year, followed by perennials (coconut, oil palm etc.) with an average oil yield of 0.44 ton/ha/year. Oil Palm, if grown with Best Management Practices (BMP) can give a yield of 3-4 ton/ha/year of oil and India should focus on exhausting that potential.

Towards Self-sufficiency

Long Term Plan - Oil Palm

- Oil Palm can achieve significantly higher production in significantly lower resources due to higher yield (40 Mn Ha v/s 4.5 Mn Ha).
- This approach is long term due to high gestation window for oil palm
- But India has limited potential for Oil Palm (<2 Mn Ha) due to lack of right agro climatic zones

Diversification - Oilseeds

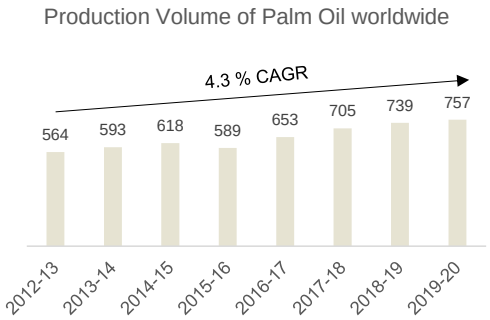
- Expansion of oilseeds – relatively low investment crops that have high potential area.
- Focus on yield improvement

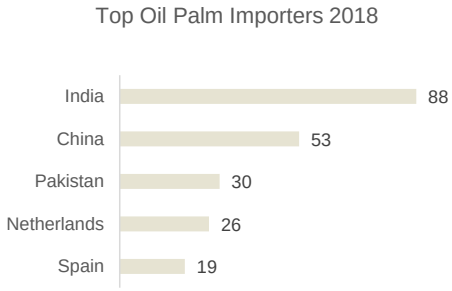
Exploring other Oils

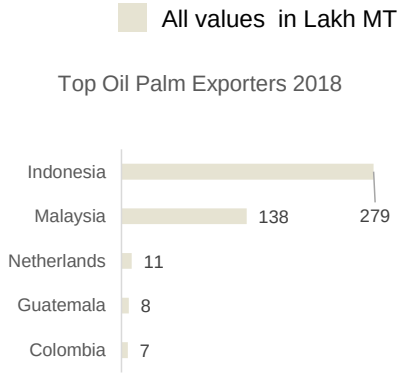
- Secondary sources of oil that align with existing competencies in Indian production – Rice Bran Oil and Cotton Seed Oil
- Production for these oils exceeds consumption

India is the largest importer and consumer of the Oil Palm importing almost 18% of the trade surplus.

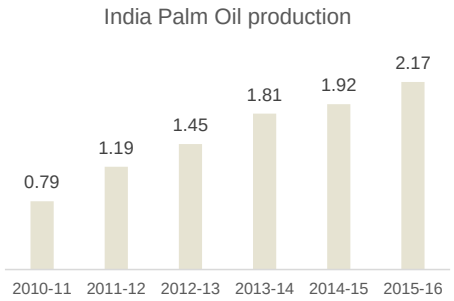
Global Scenario

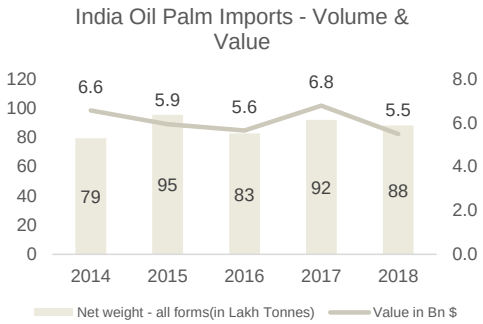






India Scenario





*SRC: UN COMTRADE

Global Oil Palm production volumes are increasing at CAGR ~5%

India is the highest importer of Oil Palm, accounting for almost 17.5% of the total global trade

Indonesia, & Malaysia together account for around 85% of the total trade volumes

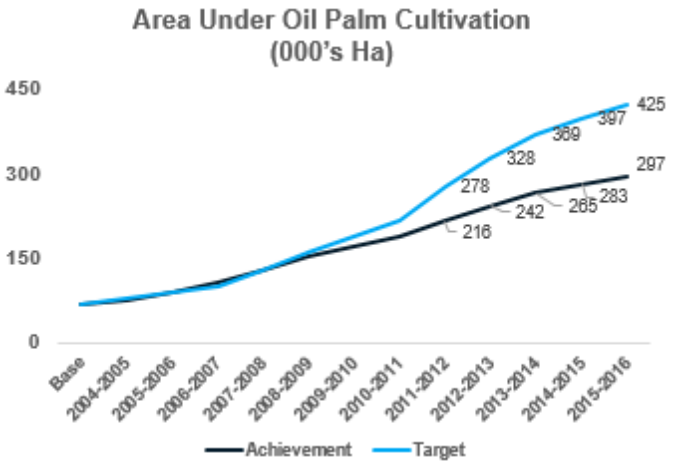
European Union (Netherlands, Italy, Germany, & Spain, and others) are the highest importers after India & China

Import volumes of EU decreased in the past 5 years

Indian production levels are still very low meeting only 5% of the total consumption requirement

India meets majority of its palm oil requirements from Indonesia and Malaysia and spends around 5.5 Bn $ on these imports yearly

Implementation of Centrally Sponsored Oil Palm Development Schemes has resulted in area expansion from 8585 ha (1991-92) to 3,16,600 ha (2016-17)



ISOPOM | **OPAE** | **NMOOP**

In view of the importance and significance of oil palm cultivation, Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW) had taken up many oil palm development and promotion programmes

1991-92	Technology Mission on Oil Seeds & Oil Palm (TMOP) is setup by Department of Agriculture, Cooperation and Farmer Welfare
VIII & IX plans (1992-2003)	Centrally Sponsored Scheme Oil Palm Development Programme (OPDP) was taken up under TMOP
X & XI plans (2004-2013)	Centrally Sponsored Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM) for promoting Oil palm cultivation
2011-2015	A Special Programme on Oil Palm Area Expansion (OPAE) under RKVY from the year 2011-12 to 2014-15
XII plan (2014-2017)	A National Mission on Oilseeds & Oil Palm (NMOOP) launched under which Mini Mission - II (MM - II) was dedicated to oil palm

The Dr. Rethinam Committee constituted by Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW) have identified 19.33 lakh ha area suitable for oil palm cultivation in 19 states of the country including 2.18 lakh ha area in North Eastern States during the year 2012.

Of the 19.33 lakh Ha, total coverage under Oil Palm Cultivation up-to 2016-2017 is 3.17 lakh Ha. Targets have been missed constantly for almost a decade now due to multiple pain points across the value chain

*SRC: NMOOP.GOV.IN

The cost of producing 1 tonne FFB* is 5633 INR assuming that the productivity is 18.7 Tonnes/ Ha over the full life span

S.No	Input	Cost (Rs. / Ha)
1	Irrigation	20290
2	Fertilizer Management	26440
3	Pest Control	2630
4	Harvesting & Transportation	9800
5	Land Rent	30445
6	Interest on capital	5600
7	Amortized value of EC	10155
8	**Total CoC per year**	**105360**

S.No	Age of Plant	Expected productivity (MT/ Ha)
1	4	12
2	5	14
3	6	16
4	7	18
5	8 to 22	20
6	23 to 25	19
7	26 to 28	18
8	29 to 30	17
Weighted Average Productivity during the full life span		**18.7**

Palm oil plantation requires huge establishment costs in the initial 3 years (gestation period), and regular maintenance costs every year afterwards totalling to 1.05 lakhs per year (for 30 years). The weighted avg. yield of FFBs over the full life span is 18.7 T/ Ha

From the above Tables, it is understood that the cost of production (averaged out across 27 years fruiting period) of 1 MT FFB is (**105360** (Rs./ yr) **/ 18.7** (MT/ Ha)) =**5633 Rs. / MT**

India's cost of production is at least 29% higher than that of Indonesia/ Malaysia, owing to rain-fed irrigation in those countries

SRC: Oil Palm: Pricing for Growth, Efficiency & Equity report by CACP *FFB: Fresh Fruit Bunches

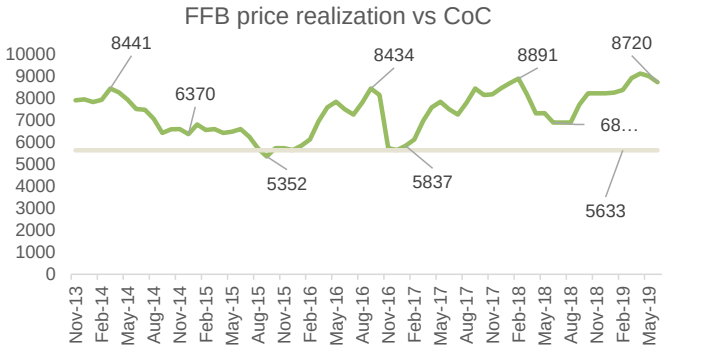
FFB(Fresh Fruit Bunches) PRICING FORMULA

$$P_{FFB} = k * ((PCPO * OER) + (P_{PKO} * OERK))^{*}$$

P_{FFB} = Price of FFBs at the mill gate OER = Oil Extraction Rate for CPO = 18%

K = % returns to growers (75.25%) P_{PKO} = PKO Price (Import price)

P_{CPO} = CPO Price (Import price) OER_K = Oil Extraction Rate for CPKO = 9%



Although the cost of cultivation is constant, the price realization for farmer varies heavily due to its direct dependence on the import prices from other countries

Oil Palm value chain is characterized by lower production, and high inter-dependence between milling and production





Simplified Oil Palm Value Chain		Input supplies	Oil Palm Plantation	Milling	Refining	B2B / B2C
Activities		Seeds, Fertilizers and Pesticides production & distribution	Farming, Harvesting, Connecting to Mills, Pricing	Collection Centres, OER, processing	Further processing, fractionation and derivatives	Direct consumer sales or connection to other industries
Products		Seedlings, fertilizers, pesticides	FFBs,	CPO, & CPKO, EFBs, Fibre, broken shells	RBD Palm Oil & RBD Palm Kernel Oil, PFAD	Palm oil derivatives and fractions
Key pain points throughout the value chain		Low focus on R&D for producing seedlings. Inability to produce HYVs, dwarf varieties, and higher OER varieties Insufficient Oil Palm seed gardens in India	Higher water requirement & gestation period Difficulty in harvesting/uprooting Low OER and FFB yields outside of AP & Telangana; No Remunerative prices and higher price fluctuations; Lower Area Under Cultivation	Higher Cost of operations No grade based pricing Lower Shelf life	Under utilization of capacities	Indian Palm Oil not competitive compared to Imports
Consolidation level	**Number of players**	10's	1,00,000's	24	10's	1000's
Key players in the industry			~90-95% small and marginal farmers	Public and private players – Gogrej Agrovet, 3F private limited, AP OilFed, Oil Palm India pvt ltd, Ruchi	Adani, Ruchi, etc.	HUL, Britannia, ITC, Asian Paints, Adani

Source: Expert interviews, Press Search

Pain Points with highest impact to Oil Palm Industry

High Medium Low

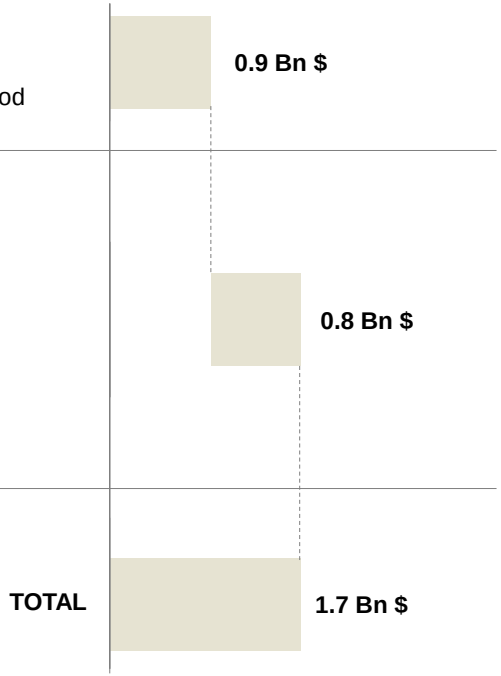
Value chain	Pain points	Description and details	Level of impact on import
Input supplies	Inability to produce HYVs, dwarf varieties, and higher OER varieties	IIOPR produces 1st generation varieties & circulates to private companies. R&D for 2nd & 3rd gen varieties focused on dwarf, high and quick (within 18 months) yielding varieties is minimal	High
	Insufficient Oil Palm seed gardens in India	Domestic seedling production potentiality is 60.00 lakh from public & private sector (10 seed gardens) located in AP, Kerala and Karnataka. Seedling requirement is 71.50 lakh @ 143 plants per ha to cover 50000 ha. Imports are crucial to meeting targets.	High
Plantation	Higher Water Requirement	Lack of water for irrigation is a major problem. Oil palms guzzle up to 300 litres per tree, per day.	Medium
	Higher Gestation Period	1st 3 years of plantation will be highly cost intensive with no income generation for farmers	Medium
	Difficulty in harvesting & uprooting	Local varieties grow 40-50 ft tall and skilled labor availability is difficult to harvest such tall trees	Medium
	Low OER and FFB yields outside of AP & Telangana	OER of FFBs in AP & Telangana are ~18% while that of other states is far less. For example, OER in Tamil Nadu is 15%. FFB Yield in TN is 10 T/ Ha, while in AP is 18 T/ Ha	High
	No remunerative prices and higher price fluctuations leading to lower area under adoption	Palm oil prices are influenced by import prices, which are highly competitive – making the prices fluctuating and less remunerative for Indian farmers	High
Milling	No grade based pricing	Farmer pricing is based on quantity of FFB supplied, but not quality. Due to lack of labor availability, farmers end up harvesting unripe fruit also contributing to lower OER during milling	High
	Higher Cost of Operations	Seasonality of oil palm leads to under-utilization of mills leading to higher running costs	High
	Low Shelf Life	Palm Oil has a shelf life of 24hrs. Late processing leads to increase in the FFA % (Free Fatty Acids) compromises on oil quality	Low
Refiners	Lower utilization of refining capacities	Importing refined palm oil is cheaper compared to importing crude palm oil and processing locally due to competitiveness of palm oil and lower import duty differential. Hence refineries remain underutilized	Medium
B2B B2C	Indian Palm Oil not competitive compared to Imports	Indonesia/ Malaysia offer cheaper oils than the ones produced in India since cost of cultivation in India is at least 25-30% higher and plantations are lower in scale leading to expensive operations	Low

Source: Press search; Company websites, Expert interviews

Value Chain Levers: India could realize additional value by pursuing a portfolio of initiatives by promoting oil palm industry

Lever	Opportunity	Pain points addressed
Increase Area Under Cultivation	A Government needs to craft focused strategies to increase area under oil palm cultivation by converting wastelands/ and lands from other crops and increasing farmer profitability	Lower production volumes available from India No remunerative prices Harvesting difficulties and higher gestation period
Increase Oil Palm Yield & Efficiency in Extraction	B Increasing oil palm production by developing high FFB yielding, and high oil yielding varieties Increasing Oil extraction by incentivizing farmers to go for seed replacement to higher OER varieties, harvest only ripe fruit, and incentivizing the private sector establishments to upgrade the processing equipment	Inability to produce HYVs, dwarf varieties, and higher OER varieties Low FFB yields outside of AP & Telangana Low OER yields outside of AP & Telangana No grade based pricing
Improve Governance	C Improving Government involvement by setting up a dedicated board for oil palm which will regulate the import tariffs regularly helping the Indian Oil palm industry, and which will take up the implementation of various measures as highlighted by this presentation	Lower utilization of refining capacities Fluctuating Import Prices

Value, $M (accrual from year 2030)

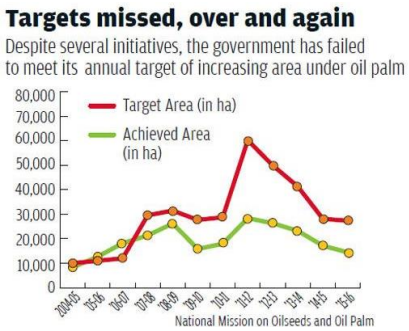


A1 Government needs to craft focused strategies to increase area under oil palm cultivation by increasing farmer profitability

Background

Farmer Buy-in is missing!

Despite Government efforts in the last 30 years to increase the area under cultivation of oil palm, the set targets were hardly achieved. Farmers are not accepting it as a potential replacement to their regular crops, as oil palm is not giving enough profit, and brings along many complications



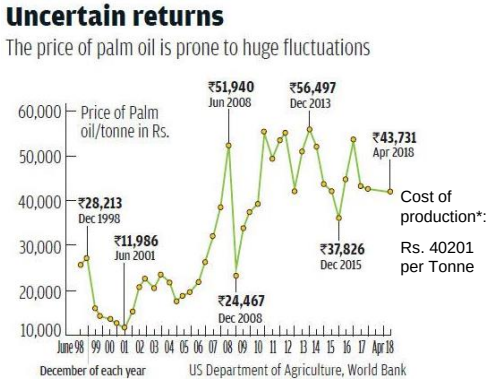
Key Challenges

- The crop starts fruiting only after a gestation period of 3-4 years. and needs so much of money and effort during this time, but pays nothing limiting the entry for an Indian small holder farmers
- The money paid to the farmer from the sale of FFBs is currently linked to Import landed prices – and the imports have always been lower because of the stiffer competition from Malaysia/ Indonesia, making the crop very less profitable for the farmers
- The crop is not very attractive either for the farmer in terms of operations. As the crop grows 50-60 ft taller, finding skilled labour for harvest is a problem

Suggestions

- Financially supporting the farmers in the 1st 3 years by giving him additional subsidies (25% more than the current subsidies) for inter-cropping and maintenance
- Making the pricing based on normative costs of cultivation instead of linking with import prices. Developing an Edible Oil Development Fund by charging a 0.5% Cess on imports and supporting farmers whenever the FFB price falls below 10,035 INR/ Tonne from the fund.
- Developing Dwarf varieties through R&D or spending on R&D to build mechanical harvesters

Import Price Fluctuations



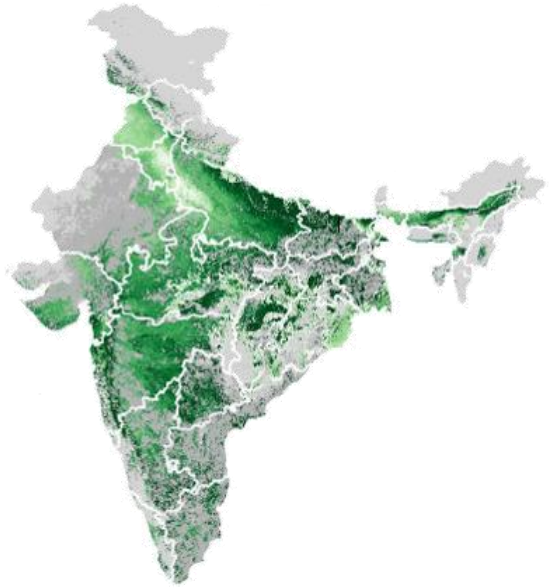
Oil Pricing Formula: -linked with import prices

$$P_{FFB} = k * \left((PCPO * OER) + (P_{PKO} * OERK) \right)^{*}$$

- Market trends show oil prices have risen and fallen by up to 50 per cent over the past 15 years, and sometimes lower than the cost of cultivation for farmers prompting them to uproot their plantations during distress years

*Cost of production during 2012, as per CACP report on Oil Palm

Government needs to craft focused strategies to increase area under oil palm cultivation by converting wastelands and land from other crops and encourage privately owned and managed plantations



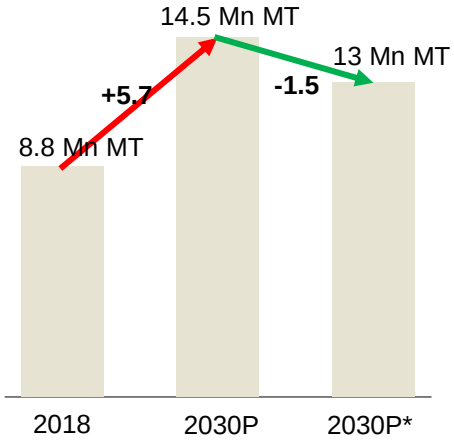
The above map highlights area under paddy cultivation. Some part of the above area from suitable agro climatic zones can be potentially converted into oil palm cultivation

A2 Revising the Maximum Potential Area

The current potential of 1.93 Mn Ha may not help India in doing away with palm oil imports completely. Potential. Experts believe that the target area for growing oil palm can be increased by considering current area under cultivation for Rice/Sugarcane crops in the oil palm favourable agro-climatic regions. Further, wastelands and islands like Sagarmala, Bodoland, etc should also be considered by GOI for area expansion

A3 Encouraging privately owned and managed plantations

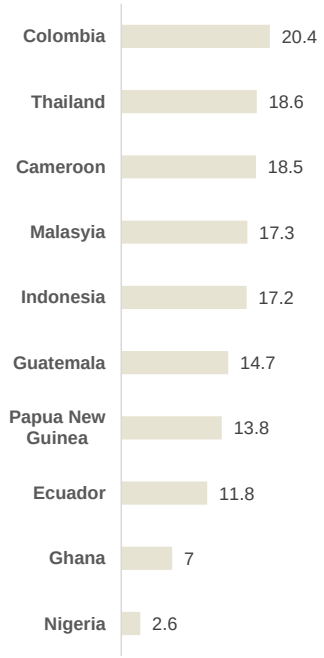
Oil Palm is a 25 year crop with no or low yields during the initial 6 years with no return. Farmers cannot afford this. It should be declared a plantation crop so private players can invest. Private players need to be hand-holded for the 1st 6 years, until they are settled and the operations stabilized. Land lease norms should also be relaxed allowing lease for 30 years, so that the private players can buy land from the farmers.India should encourage major private players in the Industry to own and manage plantations. This would bring economies of scale and make the CoC competitive with the likes of Malaysia and Indonesia



By following A1, A2, & A3 levers, and by increasing the area under palm oil cultivation across states to 50% of total potential over the next 5 years by 2025-26, India can expect to reduce the vegetable oil imports by 1.5 Mn MT saving the country 0.9 Bn $ by 2030

B1 Increasing oil palm production by developing high FFB & oil yielding varieties, and increasing oil extraction rate by incentivizing farmers and millers

FFB Yield – World (MT/Ha)



There is significant potential to improve average yields of FFBs as there are large inter-state differences in oil palm yields.

Yield during Stabilized Production (8 years)

Andhra Pradesh & Telangana	18-20 Tonnes
Tamil Nadu	7-9 Tonnes
Goa & Gujarat	10 Tonnes

Therefore, to increase palm oil production in the country, it is necessary that the oil palm yield in other states be improved at least to the level of Telangana & Andhra Pradesh

Not all the states in India are in par with that. Telangana state OER is comparable with that of the likes of Colombia and Malaysia, while the OER for the rest of the country is very low

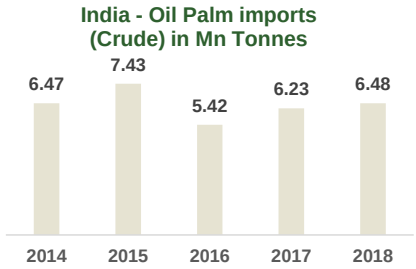
Challenges	Suggestions
Development of new seed varieties	Improving R&D infrastructure to meet the emerging needs of the Indian farmers – like developing high FFB and oil yielding, low gestation and dwarf varieties
Unavailability of imported seed varieties with higher yields & OER.	In the short run until the HYV are available from local production, it is suggested to import such seedlings from Malaysia and Indonesia
Lack of Best Management Practices	Adoption of recommended irrigation management practices. ▪ Use of fertigation. ▪ Regular plant health management. ▪ Adoption of best management practices as envisaged by ICAR-IIOPR

C Setting up a dedicated Oil palm board which will regulate the import tariffs and will hold accountability for Oil palm growth in India

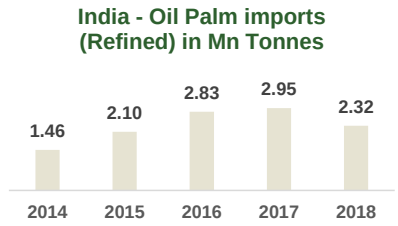
An oil palm board is suggested to regulate policy related issues, maintain transparency of operations between the farmers and millers and be the nodal agency with separate branches in individual state Agriculture departments.

Roles & Responsibilities of the Board

- The board shall be responsible for reviewing the normative cost of cultivation and revise support prices for FFBs
- The board shall ensure transparency regarding the OER percentages claimed by the millers for the FFB pricing formula.
- The board shall create a standard grading mechanism, facilitate grade based pricing and ensure timely harvests of FFBs
- The board shall be responsible to meet area expansion targets and implementation of Best Management Practices for yield. (currently monitored by NFSM)
- The board shall support farmers by facilitating the formation of a Harvesters' group and other such plantation management groups



The share of refined oil in India's overall oil import has surged to 18 per cent for 2018-19 from the level of 12 per cent in 2014-15 despite the overall oil import increasing marginally (14.42 to 14.9 mil. Tonnes).

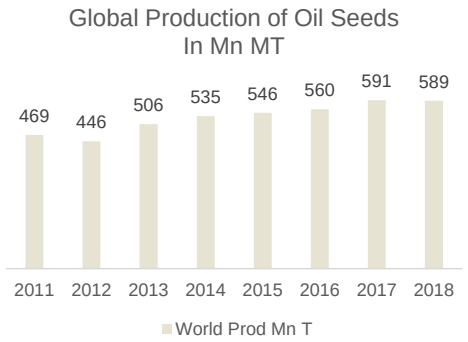


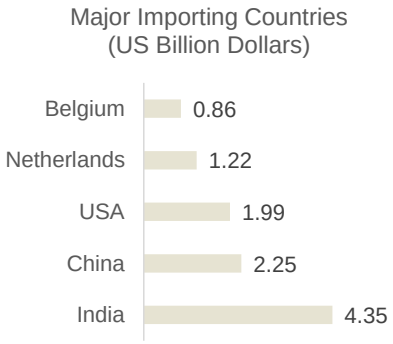
The average capacity utilization of Indian edible oil refineries at 46 per cent, which is a sharp decline from 65 per cent about five years ago

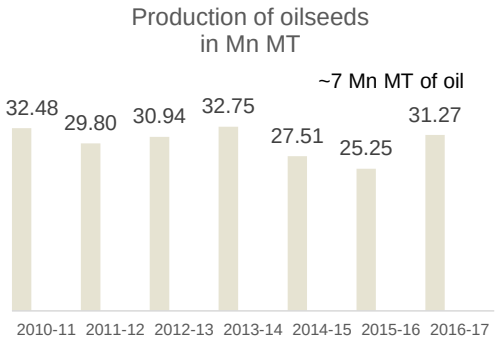
It is very important for the Government to safeguard the interests of Indian refiners and regulate the tariff differential of crude v/s refined palm oil to ensure maximum value addition within domestic borders.

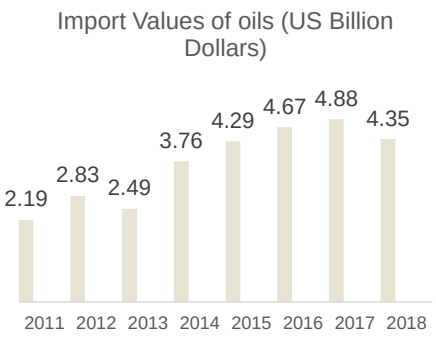
- The board shall be made responsible for implementing various suggestions discussed in this report in coordination with the states. The Horticulture Departments of respective states shall nominate resources for coordinating the operations with said Board.
- The Board shall take up a revised potential area estimation activity for Oil Palm expansion. The same shall be done in a cluster approach considering the pragmatics of plantation development in identified areas.
- A 5-year expansion plan should subsequently be formed and implemented. Incentivization of the same should be based on area, yield and OER milestones and not just area to promote both quantity & quality.

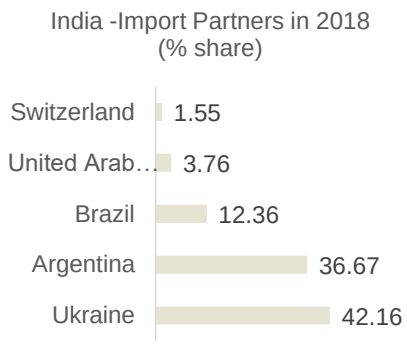
India is one of the largest producers of oilseeds worldwide, but still it is the largest importer and the imports increased at 10% CAGR since 2011







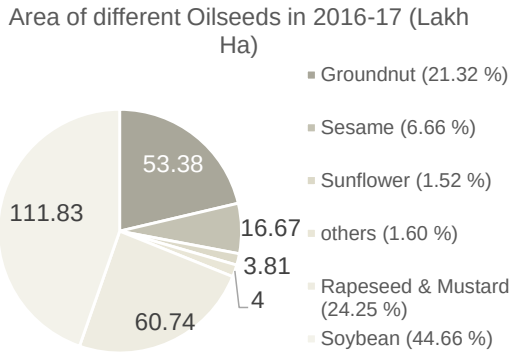


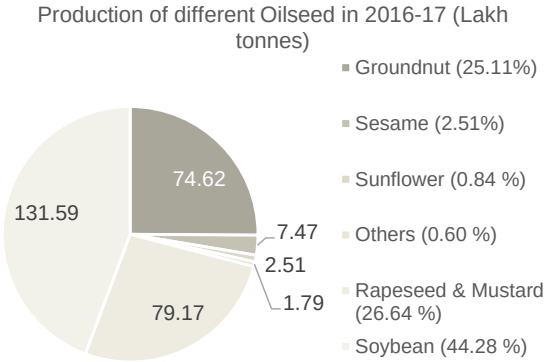


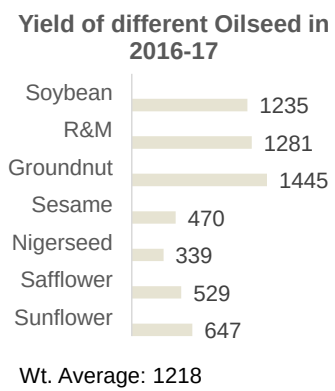
UN COMTRADE, FAOSTAT, NFSM, NMOOP

- Global production of oilseeds is increasing at a CAGR of 3.3%
- India's production has been decreasing (except for the jump from 2015-16 to 2016-17) over the past few years
- India is one of the largest oilseeds producing countries worldwide after USA, Brazil, Argentina, and China
- India is also currently the largest importer for Vegetable oils from oilseeds, followed by China and US
- Majority of Indian imports are from Ukraine (Sunflower oil), and Argentina (Soybean)
- Indian vegetable oil imports from oilseeds increased at a CAGR 10% since 2011
- Almost 25 Mn Tonnes of oil from oilseeds is exported worldwide, and India imports ~5.4 Mn T

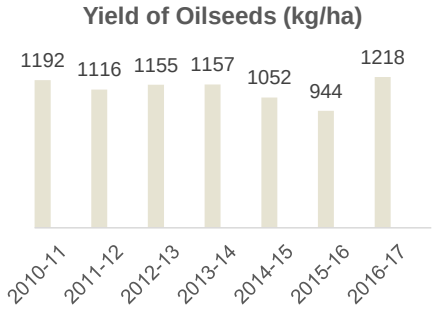
Indian Oilseeds basket:
Area, production, yield, imports and exports share

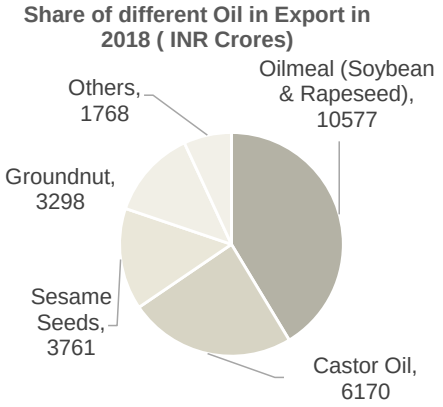


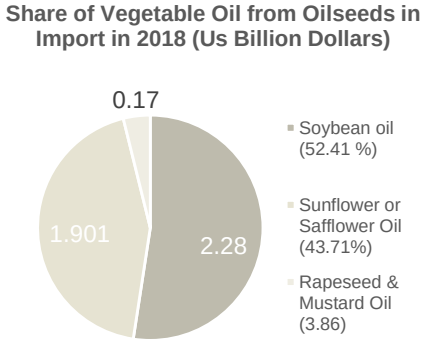




Wt. Average: 1218







UN COMTRADE, FAOSTAT, NFSM, NMOOP

Among all oils, soybean is the largest sown (111.83 Lakh Ha) and with largest production (131.39 Lakh MT), followed by Mustard and Ground Nut

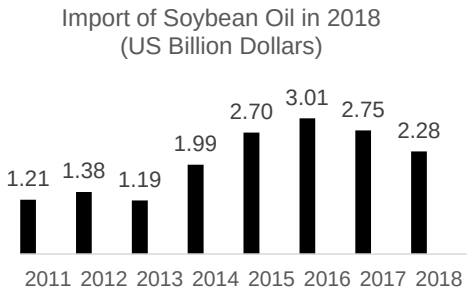
The yield is highest for Groundnut followed by mustard and soybean

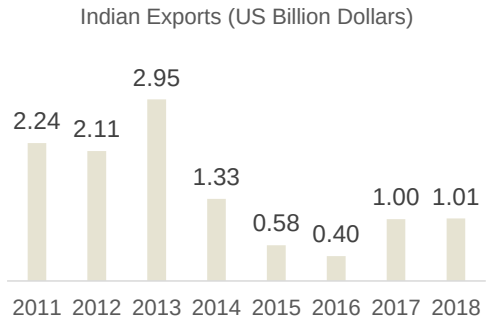
Over the years, the yield of oilseeds is inconsistent and fluctuating.

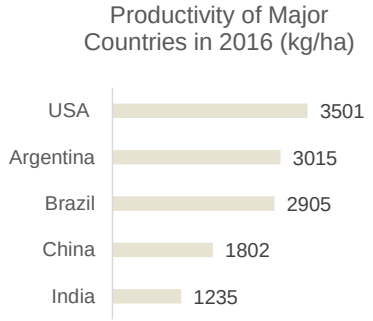
Despite high production, Soybean is the largest import in oilseeds for India accounting for 52% followed by Sunflower

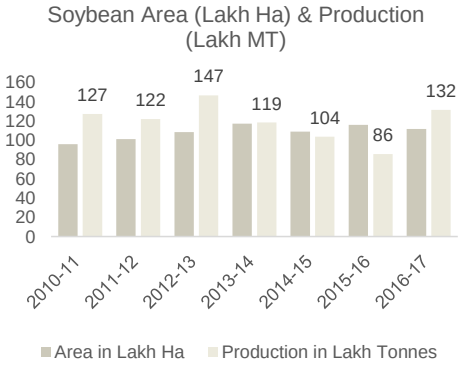
In 2017-18, India imported 4.5 Bn$ worth of oil from various oilseeds (majorly Soybean, & Sunflower) and exported ~3.5 Bn$ worth oilseed products (Soybean DOC, castor oil, ground nut oil and sesame oil)

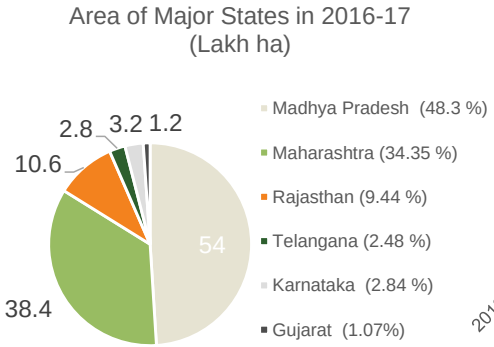
Soybean is the largest oilseed in India by Area under cultivation and production, and 5th most in the world.

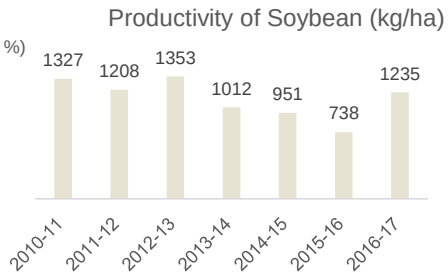












http://agricoop.gov.in/ https://comtrade.un.org/data/ https://www.sopa.org//

India's soybean cultivation is concentrated in 3 states – namely MP, MH & RJ covering ~92% of the total soy bean area

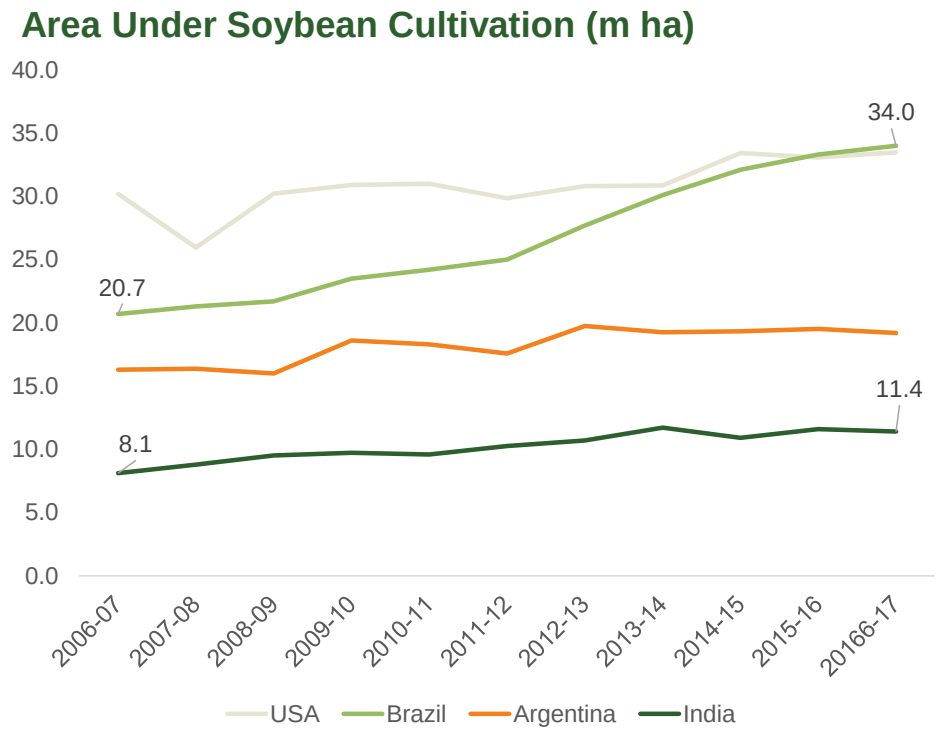
The area under soybean cultivation is on a decreasing trend (from 147 lakh MT to 86 lakh MT) between 2012-16 – owing to erratic rainfall, higher biotic stresses, lower price realization and shift to competing crops

Indian Soy bean productivity is decreasing over the years and comparatively lower wrt world average.

India is the largest importer for Soybean oil and the imports increased during 2013-16 to compensate for lower production

Indian De-oiled Soy cake has very high demand abroad, and fetches better value realization.

Case Study: Brazil's area under Soybean cultivation increased from ~20 Mn Ha to ~34 Mn Ha since 2006



Reasons for increase in area in Brazil:

Initially

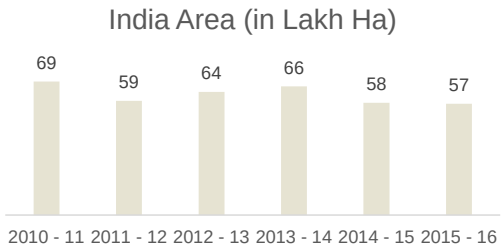
- support by wheat crop.
- Development in transportation and storage infrastructure.
- Development of agriculture machinery and its adoption
- Tax incentives
- Increase in Processing industries

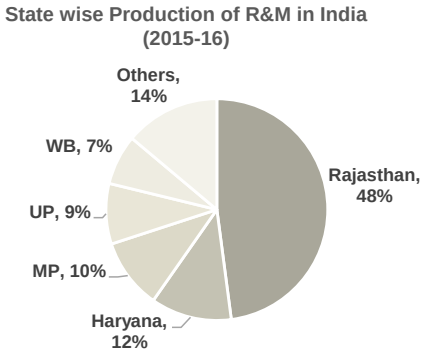
Later

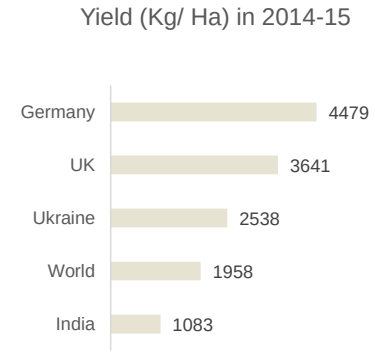
- Major Expansion in Northern and Central Part of the country.
- Conversion of pasture land and natural vegetation into crop lands.
- Development of cultivars adapted to low latitudes.
- Soil Reclamation measures.
- Use of Rhizobium inoculum.
- Increased Profitability

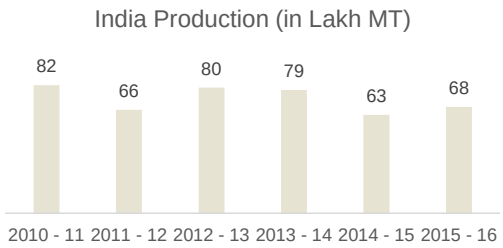
https://www.intechopen.com/books/a-comprehensive-survey-of-international-soybean-research-genetics-physiology-agronomy-and-nitrogen-relationships/explanations-for-the-rise-of-soybean-in-brazil
https://www.ocl-journal.org/articles/ocl/full_html/2018/01/ocl170039/ocl170039.html#S8

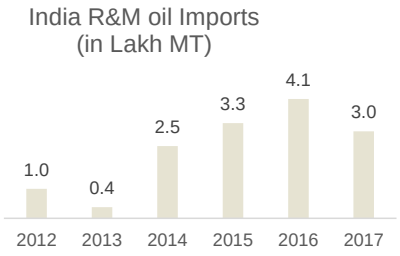
Rapeseed & Mustard is the largest oilseed in India by the amount of oil produced (~2 Mn T)

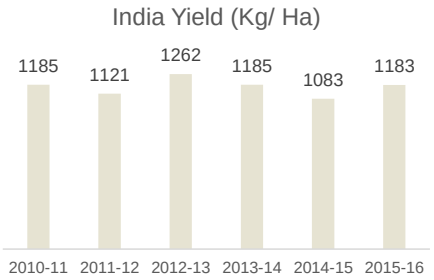












Total production of Rapeseed and Mustard was about 67.9 Lakh tonnes in 2015-16

About 3 Lakh tonnes of oil is being imported in 2017

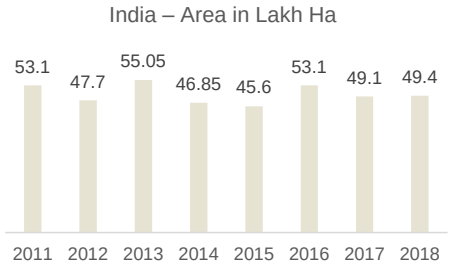
From 2009, Production of R&M increased with a CAGR of 0.3% but the import increased at 27 %

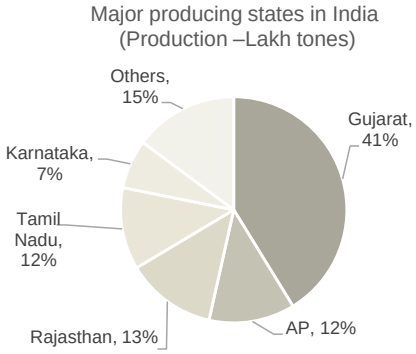
From 2000 to 2016, CAGR for production is 3%, Area is 2% and Yield is 1%.

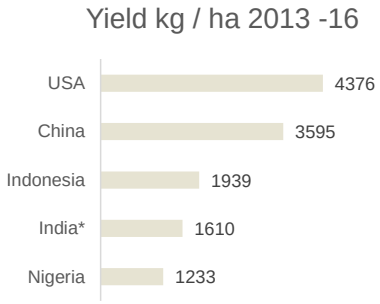
Longer crop duration and high carbon content in the soil are the major factors attributing to high productivity of rapeseed in Western part of the World.

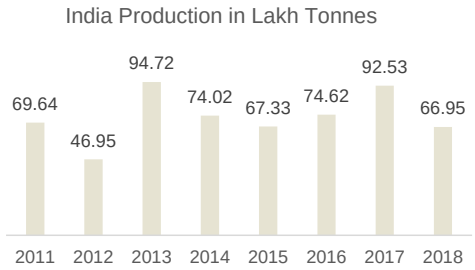
FAO stat http://nmoop.gov.in/ http://agricoop.gov.in

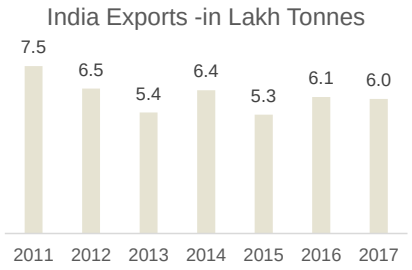
Groundnut is the highest oil yielding among all the oilseeds, and also provides export potential for the country

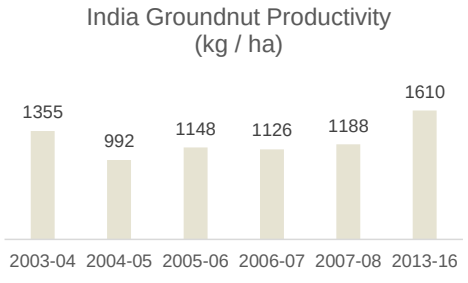












http://www.fao.org/faostat/en/

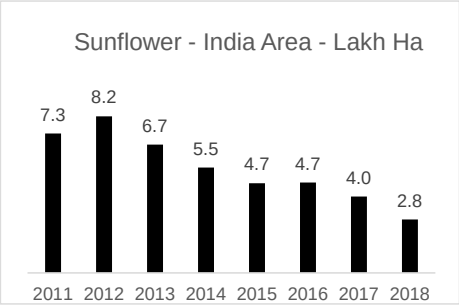
In three out of ten years under study the production of groundnut varied. The reason for this may be due to good monsoons during these two years under study

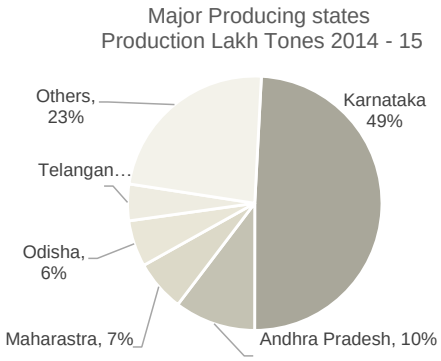
2015 -16, India export has been reduced 32 % due to high demand in local market and ban by Vietnam highest importer.

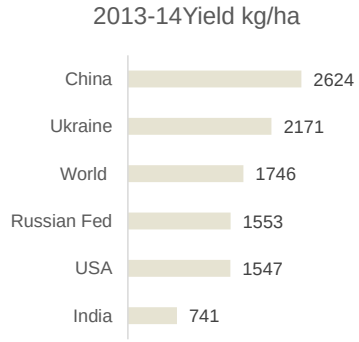
Indian Groundnut productivities are very low compared to Global average, as the crop is majorly rain-fed.

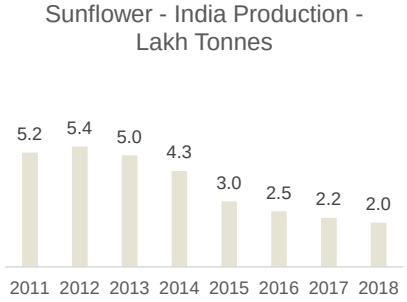
Groundnut crop is not very attractive to Indian farmers – as the MSP is low, and Govt does not provide assured buying, and the markets are far from their home locations, and poor storage options

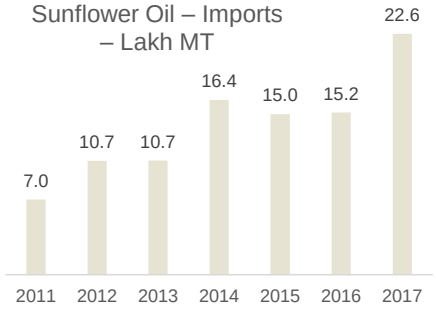
India's Sunflower seed production decreased over the years, and Imports started increasing

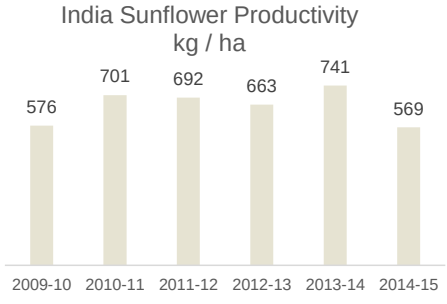












Sunflower production in India is decreasing gradually. Punjab/ Haryana used to be largest producers in 90's, and production from these states is completely reduced since.

After Soybean, sunflower is the largest imported oil accounting for 2.2 Mn MT and 1.9 Bn $ of forex.

Indian Sunflower productivities are very low compared to Global average, as the crop is majorly rain-fed.

Sunflower crop is not very attractive to Indian farmers – as the MSP is low, and Govt does not provide assured buying.

http://www.fao.org/ http://www.isec.ac.in/Sunflower-Production.pdf

Summary of Top Potential Oilseed Crops for India

Soybean

- Soybean crop is less remunerative to farmer compared to Paddy
- Government doesn't provide assured procurement in Soybean unlike it does in Paddy/ Wheat
- Low productivity compared to top producing countries
- Heavy dependence on rainfall. Erratic rainfall in recent years led to fluctuations in production levels
- Poor adoption of technology – broad bed furrows, Soil health check-up, seed treatment, micro irrigation etc. are not practiced
- Unavailability of quality inputs- particularly seeds and low Seed Replacement Rate
- Poor extension services
- Majority of the farmers do not have primary processing facility for cleaning, grading etc.

Mustard

- Inadequate availability of hybrid seed and higher costs for seeds levied by private firms
- Lack of short duration varieties of Mustard for Rice Fallow areas.
- Requirement for High yielding and High oil content hybrids.
- Broom Rape is major factor for lower yields. Technology to control broom rape should be developed.
- Majority of the farmers do not have primary processing facility for cleaning, grading etc.
- No proper facility for fair testing of Oil content in mustard seed
- No information on Market prices leading to distress sale with some farmers at Village level traders.
- Also distance from field to APMC markets lead to sale at village level at lower prices

Groundnut

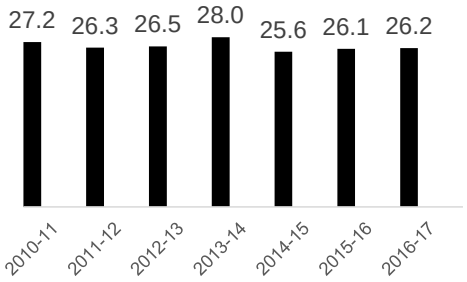
- Groundnut is a highly water consuming crop & generally rain-fed. The productivity varies with rainfall
- Infestation by white grubs is a major problem in groundnut cultivation.
- Lack of development of new varieties / technologies for controlling Peanut Bud / Stem Necrosis /Clamp virus diseases.
- Lack of high yielding and high performing varieties that can stand adverse weather conditions.
- Aflatoxin contamination is a major concern for ground nut processors - mainly because of poor post harvest handling
- Lack of proper primary processing and marketing infrastructure
- Poor adoption of good package of practices by farmers – for eg. Improper pest and nutrient management

Sunflower

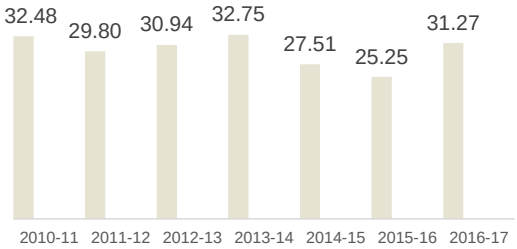
- Sunflower is highly susceptible to biotic stresses like –Alternaria leaf spots, downy mildew, root rot, collar rot and head borer etc.
- Productivity of the crop (569 kg/Ha) is almost 1/3rd the global average.
- Growth is limited to only traditionally cultivated areas
- Low inputs responsive hybrids / varieties with IPM module may be evolved by ICAR/SAUs.
- Lack of awareness in farmers about MSP, and government procurement

NMOOP implemented since 2014-15 played a vital role in driving the production & productivity enhancement of oilseeds in the recent years

Area of Oilseeds
(Mn ha)



Production of oilseeds
in Mn MT



UN COMTRADE, NMOOP

PLAN PERIOD	SCHEME	Avg. Area (Mn Ha)	Avg.Prodn (Mn MT)	YIELD (Kg/ha)
V & VI (1974-85)	IODP		11.42	621
VII-IX (1985-02)	TMOP		19.48	825
X (2004-07)	ISOPOM		23.33	918
XI (2007-12) Avg	ISOPOM	26.75	28.93	1082
XII (2012-17) Avg	ISOPOM/ NMOOP	26.57	30.01	1129
XII (2012-13)	ISOPOM	26.48	30.94	1168
XII (2013-14)	ISOPOM	28.05	32.75	1168
XII (2014-15)	NMOOP	25.60	27.51	1075
XII (2015-16)	NMOOP	26.13	25.25	968
XII 2016-2017	NMOOP	26.63	33.60*	1261

National Mission on Oilseeds and Oil Palm (NMOOP) launched in 2014-15 has played a catalystic role in enhancing the production and productivity of oilseeds and area expansion of oil palm in the country. Concerted efforts made under this mission to bring additional area under oilseeds cultivation through utilization of rice fallow areas, intercropping with pulses and other suitable crops have paid dividends. The involvement of Krishi Vigyan Kendras (KVKs) under ICAR in demonstration of frontline technologies to the farmers has also contributed significantly to achieve the desired targets. Recently Govt. has also planned to create seed hubs of oilseeds though ICAR/KVKs/SAUs

Oil seeds value chain is characterized by lower production, and higher inter-dependence between processing and production

Simplified Oil Palm Value Chain		Input supplies	Crop Development	Aggregation & Logistics	Processing	B2B / B2C
Activities		Seeds, Fertilizers and Pesticides production & distribution	Farming, Harvesting, Connecting to Mandis, Pricing	Mandis, regulations	Processing, and distribution	Direct consumer sales or connection to other industries
Products		Seeds, fertilizers, pesticides	Oilseeds	Oilseeds	Crude & Refined Oil	Refined oil derivatives and cooking oil
Key pain points throughout the value chain		Unavailability of good quality seeds Low innovation in seeds –in developing high yielding, drought, and stress resistant seeds	Low Seed Replacement Rate Heavy dependence on rainfall Lack of access to modern crop technology No remunerative prices and no assured procurement from Govt Higher attractiveness in other crops	Due to low land holding the aggregation is difficult. Many levels of handling.	Processing is less lucrative.	Out priced in World markets for bi-products like DOC.
Consolidation level	**Number of players**	100's	1,000,000's	10,000's	10's	1000's
Key players in the industry			~90-95% small and marginal farmers	Small and medium traders	Adani, Ruchi, etc.	HUL, Britannia, ITC, Asian Paints, Adani

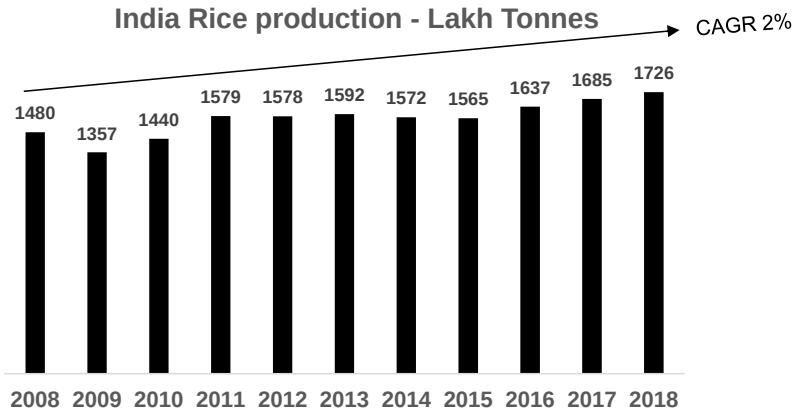
Source: Expert interviews, Press Search

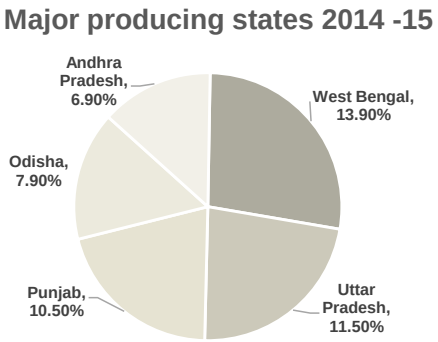
Pain Points with highest impact to Oilseeds Industry

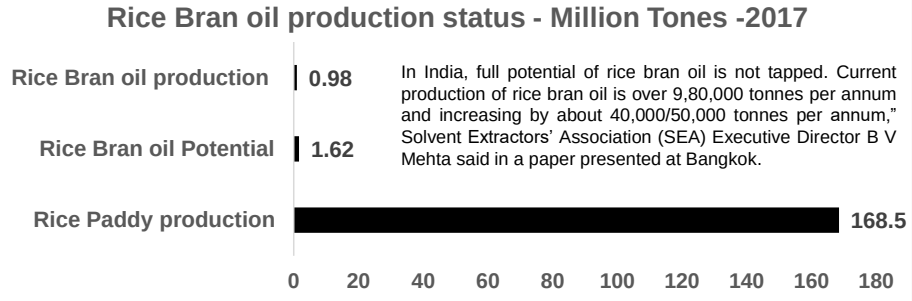
Value chain	Pain points	Description and details	Level of impact on import
Input supplies	Unavailability of good quality seeds	Poor availability of good quality seed is the biggest challenge of Indian Agriculture, particularly in crops like soybean where the seed requirement is high	High
	Low innovation in seeds –in developing high yielding, drought, and stress resistant seeds	There is scarcity of short, high yielding, biotic and abiotic stress resistant varieties. As compared to cereals there has been failure of hybridization and seed multiplication programs	
Crop Development	Low Seed Replacement Rate	Farmers mostly uses farm saved seeds particularly groundnut & Soya bean and other in oilseeds resulting lesser production & income ultimately	High
	Heavy Dependence on rainfall	More than 85% of the area under oilseed cultivation falls under rain-fed. As these crops are mostly grown under rain-fed, farmers have to gamble with the monsoon to get the expected yield	
	Lack of access to modern crop technology	Extension services to the farmers are very poor. And farmers still practice age old methods to cultivate oilseeds	
	No remunerative prices and no assured procurement from Govt under MSP	Income generation from oilseeds is comparatively lower to that of Wheat or paddy. Hence farmers generally prefer growing paddy/ Wheat instead of Soybean/ Mustard. MSP procurement by government is also not assured.	
Aggregation & Logistics	Due to low land holding the aggregation is difficult. Many levels of handling.	Lot of middlemen add up the cost to the produce, Unlike in USA only elevators are operating.	Low
Processing	Processing is less lucrative.	Installed milling capacity is double than the crop availability – leading to under utilization and crush disparity	High
		Limited Value Addition scope in India. Dependency on basic bi-product DOC & Oil.	
B2B / B2C	Indian de-oiled cake is not cost competitive in the global market	MSP Support from government is distorting markets leading to uncompetitive prices in export market.	High

Source: Press search; Company websites, Expert interviews

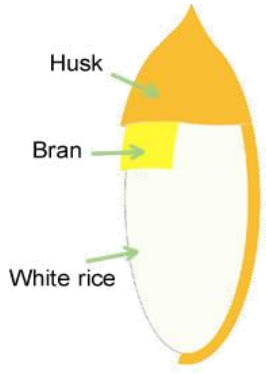
India produces only about 60% of its total Rice Bran Oil potential







In India, full potential of rice bran oil is not tapped. Current production of rice bran oil is over 9,80,000 tonnes per annum and increasing by about 40,000/50,000 tonnes per annum," Solvent Extractors' Association (SEA) Executive Director B V Mehta said in a paper presented at Bangkok.



http://www.fao.org/faostat/en/#data/
https://www.thehindu.com/business/agri-business/india-to-ship-10000-tonnes-of-rice-bran-oil/article7572160.ece
https://www.thehindubusinessline.com/economy/agri-business/scope-to-boost-rice-bran-oil-output-demand-sea/article9830157.ece

India ranks 2nd in production and 1st in exports of rice.

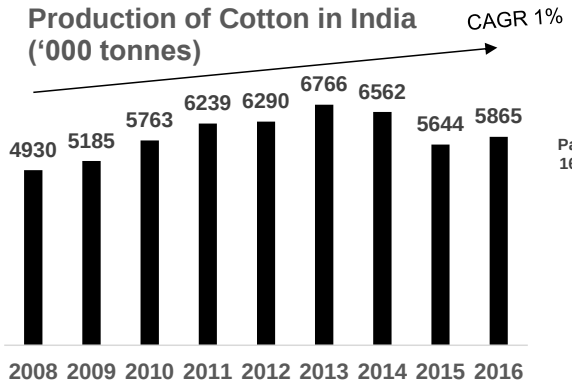
Paddy production was about 1726 lakh tonnes (2018) growing at a CAGR of 2% since 2008.

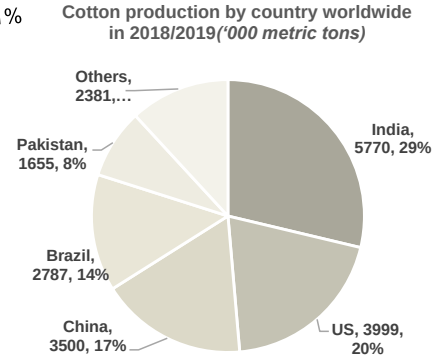
Within India, top paddy producing stated are West Bengal, Uttar Pradesh and Punjab and should be focus states for Rice Bran Oil.

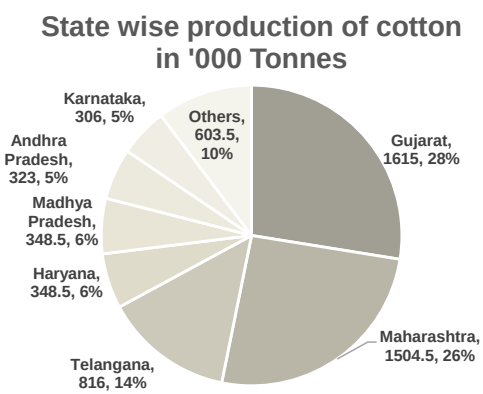
Extraction Ratios for Rice Bran
Rice Bran recovery – 8%
Rice Bran oil recovery – 16.5 %

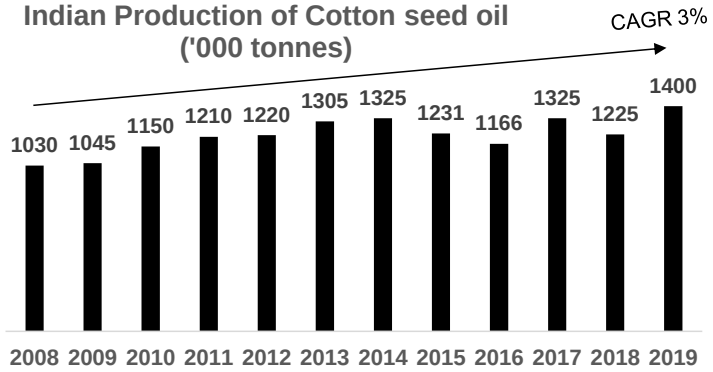
In 2017, Rice Bran oil production is 0.98 million tonnes. With the paddy production of 168.5 million tonnes, potential estimated is about 1.62 million tonnes which is 0.64 million times lesser than present production.

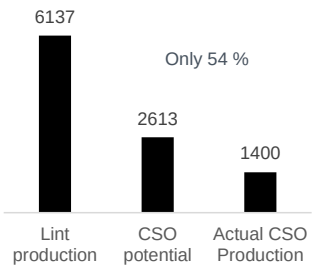
India produces only about 54% of its total Cotton Seed Oil potential



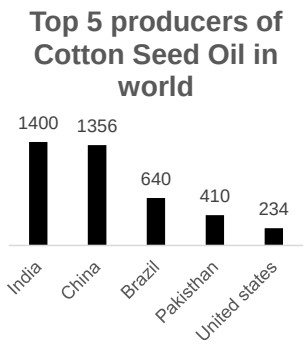








2019 data in '000 tonnes



Within India (top cotton producing country), top three producing states are Gujarat, Maharashtra and Telangana and should be focus states for Cotton Seed Oil production

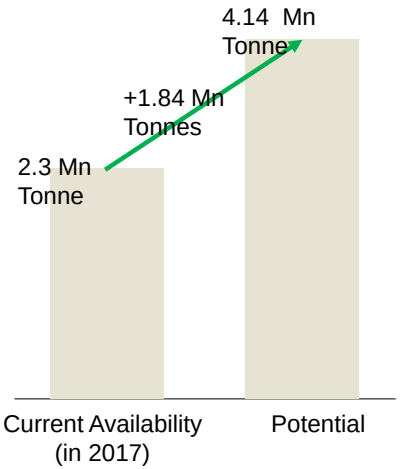
Extraction Ratios
Seed cotton to seed is 66%
Seed to oil is 20% i.e.
i.e.13.2 % from seed cotton.

In 2019, Cotton Seed Oil production is 1.40 million tonnes. With the lint production of 6.1 million tonnes, potential estimated is about 2.6 million tonnes (54%) which is 1.2 million times lesser than present production.

India could realize additional value in oils by leveraging its production base of rice and cotton

Lever	Opportunity
Rice Bran Oil	India is processing only 5 million tone of total 9.8 million tonnes of rice bran output and the rest is consumed directly as cattle feed. Based on rice bran potential, rice bran oil production potential is over 1.62 million tonnes per annum in India, adding that the untapped potential is nearly 6,50,000 tonnes. India has over 200 rice bran oil making units (total installed capacity is 1 million tonne), with Punjab and Haryana having over 100 mills and over 30% of total capacity. India exported 9,500 tonnes of rice bran oil in 2017-18 fiscal (Punjab's share was 6500 tonne) For producing the full potential of rice bran oil, manufacturing units need to be set up across the country, especially in West Bengal, Uttar Pradesh and Andhra Pradesh.
Cotton Seed Oil	India produces about 1.2 million tonne cottonseed oil every year and nearly 60-65% production of it is done in Gujarat. The state has over 1,000 cottonseed oil mills. Similar infrastructure should be developed across other states such as Maharashtra and Telangana The customs duty for crude and refined vegetable oils was changed recently but the duty on crude and refined cottonseed oil remains unchanged at 12.5% and 20% respectively. India imported cottonseed for the first time as the international prices are cheaper than domestic market on account of lower import duty. According to cottonseed oil millers, in domestic market, prices of the oil is at about `65,000-66,000 per tonne while the imported cottonseed oil prices is lower by `3,000 a tone. According to the industry observers, if the government doesn't take corrective action, it will hurt the domestic cottonseed oil industry and farmers will also affected as it will pressurize the cotton prices in India.

Increase in Oil Availability
(in Mn T)



By leveraging the untapped potential in oil production from secondary sources, India can produce 1.84 Mn Tonnes more oil resulting in savings of 1.1 Bn USD (~8000 Cr. INR)

https://www.financialexpress.com/industry/india-does-a-first-on-cottonseed-oil-set-to-import-as-international-prices-turn-cheaper-than-domestic-ones/965413/
https://www.tribuneindia.com/news/archive/business/rice-bran-oil-extractors-make-a-killing-farmers-left-in-lurch-634302

Vegetable Oils value chain analysis

Value chain levers for Vegetable Oils: India could realize an additional savings in Forex of worth 4.4 Bn. USD by 2024 by pursuing a portfolio of initiatives

Oil Palm
Oilseeds
Secondary Sources

Point Of Departure:(2019/20)

IMPORTS (15.4 MMT)

TOTAL PRODUCTION (10.5 MMT)

- Palm Oil (0.28 MMT)
- Oilseeds oils (7 MMT)
- Secondary oils (2.46 MMT)

FOREX OF 10 BN. USD

A set of identified enablers can help create additional capacities in house to meet domestic consumption requirements

Lever		Opportunity	Value[1]
Increasing Area under cultivation	A1	Increase area under oil palm cultivation by converting wastelands/ and lands from other crops	**0.9** Bn. USD**
Increasing FFB yield & OER	A2	Increasing oil palm production by developing high FFB yielding, and high oil yielding varieties	**0.8** Bn. USD**
Improving Governance* **	A3	Set up a board for oil palm to regulate tariffs and to implement measures highlighted in this report	
Increasing Area under cultivation	B1	Traditional Area Expansion, Crop diversification, Entering Non Traditional Area, inter-cropping, etc.	**1 Bn. USD**
Increase Oil Seeds Yield & Oil Extraction	B2	Focused R&D measures to develop high yielding, and stress resilient seeds, and ensuring adoption	**2.2 Bn. USD**
Improving Governance* **	B3	Reforms improving crop attractiveness among farmers -like assured procurement, income support	
Utilizing full potential from other Oils	C1	Extracting full potential from Rice Bran and Cotton Seed	**1.1 Bn. USD**
Creating Awareness for other oils	C2	Creating awareness among consumers for using secondary source of oils over the traditional ones	

Point Of Arrival: (2024)

PROJECTED IMPORTS* (23.8 MMT) - A

EXPECTED PRODUCTION (~17.3 MMT)

- Oilseeds oils (12 MMT)
- Secondary oils (4.3 MMT)
- Others (1.04 MMT)

NET INCREMENT IN PRODUCTION (6.8 MMT) - B

NET IMPORTS (17 MMT) (A-B)

FOREX OF ~10.9 BN$ with interventions, as against 15.3 Bn$ w/o interventions. Savings of ~4.4 Bn $.

*Imports are expected to increase at 7.49% CAGR
**Savings from Palm Oil will accrue from 2030, so not included in the savings of 2024-25
***Value only considered from increasing area and increasing yield levers, governance lever is required to ensure the opportunity is captured

Agenda

- Shrimp
- Buffalo
- Mango
- Vegetable oil
- **Wood**
- Chilli
- Rice

Executive Summary – Wood Value Chain

India's Wood & Wood Product Imports

Global exports of USD 270 Bn. in 2018
Global forest area of 4.06 Bn. Ha - 30% in Russia and Brazil alone. Top producing nations being Russia, Brazil, Canada, Sweden and USA
Indian Imports at 7.3 Bn. USD in 2018
India has **70 million hectares of forest cover** (only 22% of geographical area) with industrial **wood production of 3 Mn. m3 annually.** (1.1 Mn ha leased to State Forest Development Corp.)

Key road blocks to Wood production in India

Consumption of wood - 65 Mn m3 in 2017,
- 15 Mn m3 out of this, met by imports due to the **felling restrictions in Indian forests** (forest conservation is essential for India)
- 3 Mn m3 from forests
- 47 Mn m3 from plantations
- India has **only 10 Mn ha** under plantations, not treated as an **agriculture crop**

Productivity in plantations - 4.6 m3/ha vs. global benchmark of 19 m3/ha
Productivity in forests – 0.4 m3/ha vs. a global average of 2.1 m3/ha

Opportunities

- **Land is available for increasing plantations - use underutilized land resources**, like cultivable wastelands, fallow lands and much of the agricultural land available with the farmers for agro forestry
- **Productivity increase in both forest lands and plantations** – Provide PoPs, species and subsidies to farmers; private sector involvement
- **Industry linked wood sourcing with cluster based wood catchments** to be implemented for making the domestic wood cost competitive

Key Pain Points	Enablers	Stakeholder Responsible	Measurable Milestones
Limited area under plantations	Promoting agro forestry plantations	Central & State Govt. Private industries	Increase in area under plantations
Low productivity of forests & plantations	Private sector involvement, Best PoPs, farmer subsidies	Central & State Govt. Private industries	Increase in productivity(m^3/ha)
Felling and transit regulations for species in plantations	Change in regulations	Central Government (MoEF & CC)	Removal of species from felling regulations
Investment in agro forestry - unattractive	Funding norms for plantations to be framed for private sector investment	Central Government	New investment norms for funding
Higher transportation costs	Catchment area close to industries	Central & State Govt.	Transportation cost

Potential for Indian imports to reduce from USD 9.5 Bn to USD 6.5 Bn and increase in forest cover by 1.5% by 2025

Wood based value chains

Definitions

Canopy: The cover of branches and foliage formed by crowns of trees.

Canopy Cover: The percentage of ground covered by a vertical projection of outermost perimeter of natural spread of foliage of plants/trees.

Biotic Pressure: Normally used for forests, and it indicates adverse impact of human and cattle demand on the forests for their timber fuelwood and fodder requirements, and when these requirements exceed sustainable production of same in the forests, leading to degradation in quality and productivity of forests

Degraded Forest: Forest degradation is a process in which the biological wealth of a forest area is permanently diminished by some factor or by a combination of factors. "This does not involve a reduction of the forest area, but rather a quality and productivity decrease in its condition. "The forest is still there, but with fewer trees, or less species of trees, plants or animals

Very Dense Forest: All lands with a forest cover having a canopy density of 70 percent and above.

Moderately Dense Forest: All lands with forest cover having a canopy density between 40 to 70 percent.

Open Forest: Lands with forest cover having a canopy density between 10 to 40 percent.

Farm Forestry: The practice of cultivating and managing trees in compact blocks on agricultural or farm lands.

Agro forestry: The practice of cultivating and managing trees on agricultural lands, along with agriculture, animal husbandry and other related economic activities

Source: Global forest resources assessment, 2020 - http://www.fao.org/3/I8661EN/i8661en.pdf

Wood based value chains

Introduction to Forests

Forest

Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

Natural forest

Forest predominantly composed of trees, herbs and shrubs established through natural regeneration.

It includes forests for which it is not possible to distinguish whether planted or naturally regenerated, forests with a mix of naturally regenerated native tree species and planted/seeded trees, and where the naturally regenerated trees are expected to constitute the major part of the growing stock at stand maturity

Plantation Forest

Planted Forest that is intensively managed, having one or two species, even age class, and regular spacing.

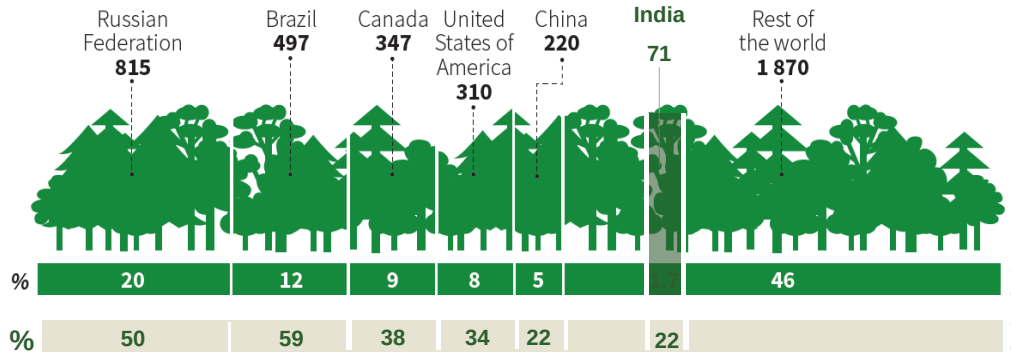
It also includes short rotation plantation for wood, fibre and energy. It excludes forest planted for protection or ecosystem restoration and forest established through planting or seeding which at stand maturity resembles or will resemble naturally regenerating forest.

Source: Global forest resources assessment, 2020 - http://www.fao.org/3/I8661EN/i8661en.pdf

Wood based value chains

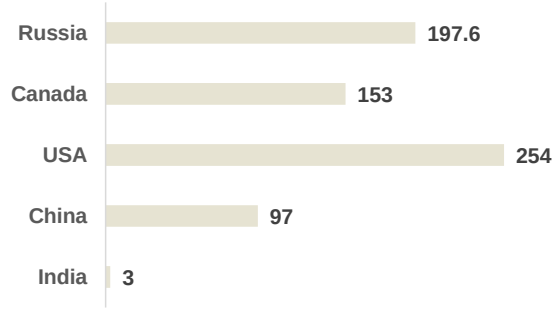
Forests and productivity

forest area, 2020 (million ha)

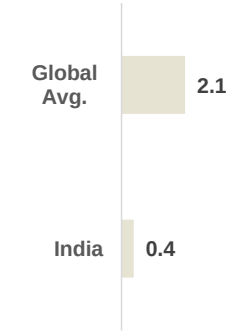


- Forest area of 4.06 billion hectares (ha) in the world
- India has ~ 70 million ha under forest cover, which is ~22% of its geographical area
- India has only 0.06 ha per capita forest area vs. world average of 0.6 ha

Industrial Wood Production (Mn m3/annum)



Productivity (m3/ha/annum)



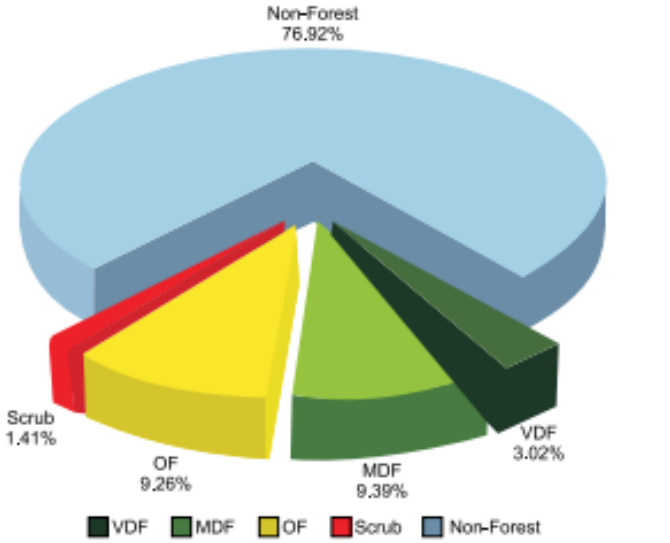
- Low productivity of forests on account of (i)-increased biotic pressure, leading to degradation of forests, ~ 30 million ha of degraded forests (canopy cover of 10-40%) and (ii)-increased focus on conservation forestry in last three decades
- ~1.1 million ha of forests is with forest development corporations (FDCs), which were assigned these forest lands for growing commercial plantations through intensive management; but these produce only ~ 2 million MT of wood- extremely low productivity
- Lack of investment in forestry sector across the country, as perceivably this sector does not give much tangible return on potential investment

Source: Global forest resources assessment, 2020

Wood based value chains

Forests and productivity

India has ~ 70 million ha under forest cover, which is ~22% of its geographical area

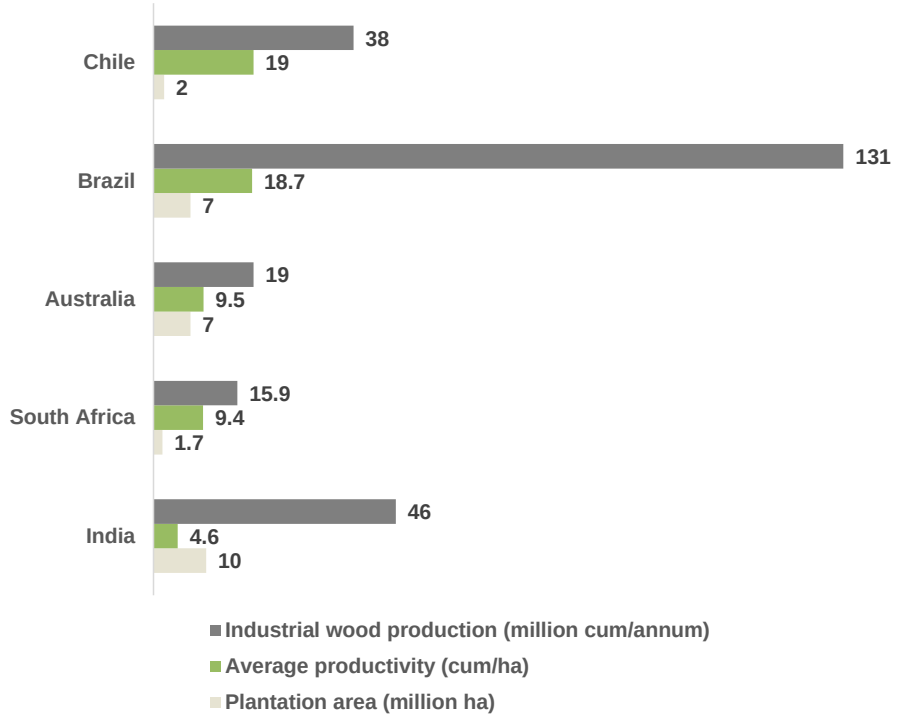


VDF: Very Dense Forests; MDF: Medium Dense Forests; OF: Open Forests

Source: Global forest resources assessment, 2020

Wood based value chains

Plantation and productivity



Key insights

- India has ~ 10 million ha under plantations (also termed as Trees outside Forests-ToF) compared to 70 mn ha of forest area, producing almost 90% of wood requirement
- In comparison with other countries India's plantation productivity is also distinctly lower

Key issues and challenges

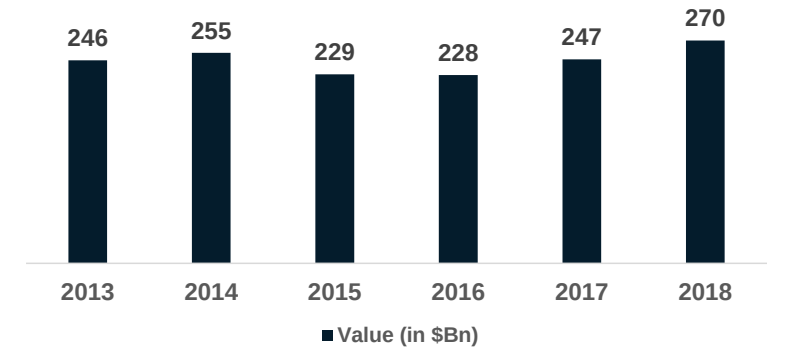
- **Low productivity of plantations** due to non – implementation of best package of practices, lack of quality plant material and paucity of funds
- **Small size of plantations** (agro forestry), making mechanisation extremely difficult thereby increasing cost of wood production and reducing farmer level realisation
- **Restrictive regulatory regime**, especially for felling and transit of long rotation tree species, leading to harassment of farmers, increased transaction cost, reduced marketability as well as profitability
- **Lack of institutional funding** for tree plantations
- **Lack of alignment and linkages** of agro forestry, farm forestry and FDC (Forest Development Corporations) plantations with end use industrial applications

Indian Imports

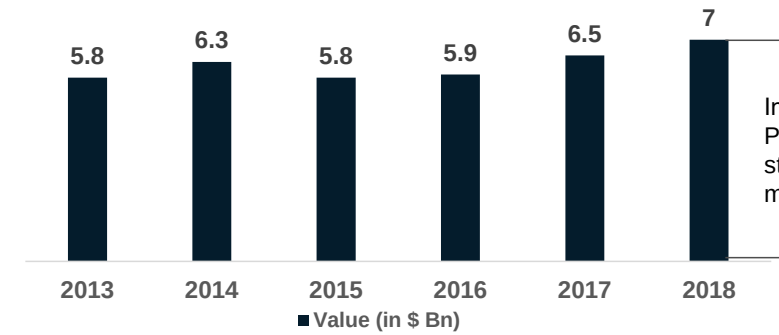
Indian imports have been increasing gradually

Global Scenario

Global Exports of Forest Products

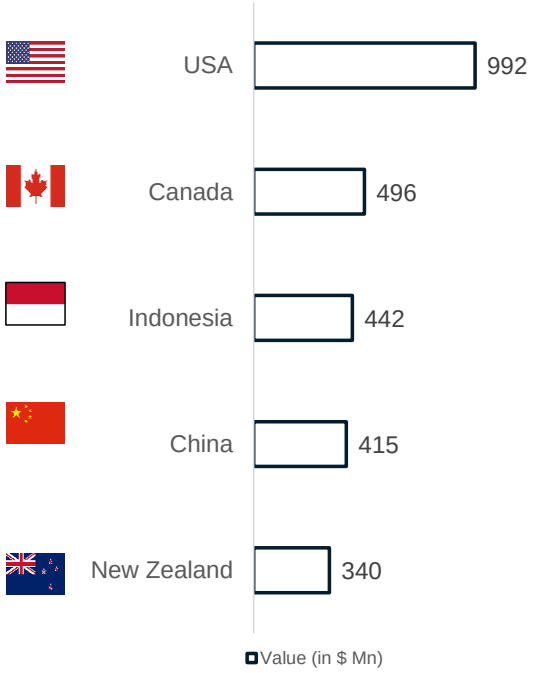


Indian Imports of Forest Products



India's Import of Forest Products have been steady at around $ 6.5 Bn mark over 2013-2018

Top 5 Exporters of Forest Products to India in 2018



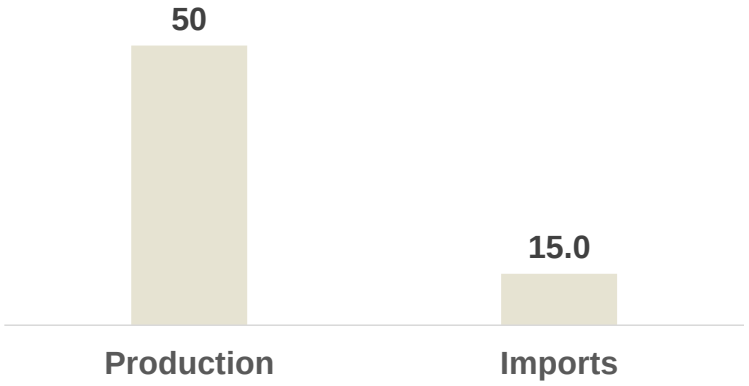
Source: FAO Yearbook – Global Wood Production, export, Import - 2017, FAO Stat

India’s production vs. import

Key Inferences

- Wood and wood products imports are growing at a CAGR of 3.8% whilst the production/removals of wood from forests and plantations on an annual basis, is decreasing
- With increasing population and per capita consumption increase in wood products, the deficit in removals and imports is only going to widen further
- Currently, ~23% of the consumption of wood and wood products is met by imports

Production Vs. Import in 2017 (in Mn m3)



Source: FAO Yearbook – Global Wood Production, export, Import - 2017,

Wood based value chains

Major challenges faced by the wood industry

Production based

- Low productivity of forests and plantations
- Lack of availability of quality planting material and extension of package of practices
- Lack of scale and mechanization, leading to higher cost of wood production
- Lack of institutional funding for tree plantation
- Non availability of potential cultivable land to supply the current consumption for wood and wood products

Industry based

- Mis - match between quality and species of wood required for product manufacturing and the same being produced under forests/FDC and agro forestry systems
- Longer lead distance of wood procurement, leading to increased transport cost from farm gate to industry location
- Increased mill – landed cost of wood, leading to reduced competitiveness of domestic manufacturing

Gaps in current policies

- Lower import duty on wood products, thereby increasing push for imports
- Felling and transit restrictions for specific species of trees used for manufacturing of wood products
- Implementation of credible forest certification of forests and plantations

Action Plan

Additional land available to cater to the trade deficit is a major limitation

To cater to the current import volume and become self sufficient,

- India would have to dedicate additional 37.3 Mn ha of forest area for wood production, with the current productivity of 0.4 m3/ha/annum- not possible as current production forests are only ~7 Mn ha producing 3 Mn m3/ha
- For producing required wood volume through plantations, India would have to dedicate additional 3.2 Mn ha at a productivity of 4.6 m3/ha

Key Inferences

- Land availability for production forestry will be a roadblock
- Felling in forest is restricted
- **A possibility for increasing the wood availability through plantations**
- **Mechanisms and appropriate policies to be put in place**
- **Involvement of state and private sector are a must**

Action Plan

India could substitute imports and gain self sufficiency in long term for Wood & Wood Products

A. Improving productivity of FDC land and degraded forests (3.5 million ha) under industry linked concessions and high productive wood plantation model

B. Bringing unused institutional land (0.5 million ha) under high productive and market linked tree plantations

C. Promoting globally competitive wood based industries for import substitution

D. Cluster based industry linked wood catchment development under agro forestry models (1 million ha)-at economical lead distance from wood based industries

Action Plan

42.3% of existing forest cover is degraded forests and under FDC-huge potential to improve wood availability

A. Improving productivity of degraded forests and FDC lands (3.5 million ha) under industry linked concessions and wood production model

Bringing 500k ha of State Forest Development Corporations (SFDCs) under high productive industry linked tree plantation- through collaborative industry lease models (with in 100 km of existing or new industry locations)

Bringing 10% degraded forests (or 3 million ha) under collaborative industry lease models- on the lines of S-E Asian countries such as Malaysia (Sabah)

Malaysia Case Study:

- Acacia / euca plantation of 7 year rotation, each year 12.5k ha plantation:
- 99 years lease from Forest Department (FD) to Sabah Forest Industries
- Industry bearing all plantation and conservation costs
- Wood owned by industry with royalty to FD
- 10 years basis sustainable management plan
- Regulatory functions with FD
- Annual generation of 5 million man days and 2.5 million cum wood
- Monitored annually by third party/certification agency

State	FDC (Mn ha)	Degraded Forests (Mn Ha)	% of overall degraded forests
Madhya Pradesh	0.40	3.6	12%
Odisha	0.03	2.3	7%
Maharashtra	0.36	2.1	7%
Chhattisgarh	0.20	1.6	5%
Assam	-	1.5	5%
Andhra Pradesh	0.08	1.3	4%
Karnataka	0.04	1.3	4%
Rajasthan	-	1.2	4%
Tamilnadu	0.08	1.1	4%
Telangana	0.03	1.0	4%

Source: Indian State of Forest Report – 2019, The Puzzle of forest productivity report (CSE 2017)

Action Plan

42.3% of existing forest cover is degraded forests and under FDC-huge potential to improve wood availability

A. Improving productivity of degraded forests (3.5 million ha) under industry linked concessions and wood production model

Action Points

- Identification of 0.5 million ha of FDC land (in potential 8 states) and 3 million ha degraded forest land (in potential 10 states) which are with in 100 km of existing wood based industries of potential industries
- Entering in to 40 year industry lease arrangement with willing industries for industry linked high productive plantations, based on bidding or based on quantity linked royalty basis by state forest department (SFD) or by state forest development corporation (SFDC), under guidelines of MoEF & CC
- Industry lease arrangement to be modelled based on S-E Asia/ Malaysia working arrangements, with a provision of 10 years management and plantation certification programme, to be monitored by an independent agency

Potential Funding Agencies

- Institutional funding, FDC investments, Private Industry Investments, NABARD

Partner and Anchor Agencies

- State Forest Development Corporations(SFDC), Industries, Forest Departments (FDs)

Required Policy Interventions

- MoEF to issue required guidelines and go ahead for private sector involvement under Forest Conservation Act
- Plantation funding as per agri funding norms from Compensatory Afforestation Funds, Green India Mission etc. should be used
- No felling and transit restriction for the species planted (list annexed) by Central Government on the lines done for bamboo
- Viability gap assistance to be provided by state government for wood raw material, till wood from leased plantations are available to related industry

Activity Performance Measures

- Finalisation of approvals and collaborative framework by 2022
- Plantation of 500k ha by 2024
- Industry concession based management and plantation of entire 3.5 million ha by 2026

Source: Indian State of Forest Report – 2019, The Puzzle of forest productivity report (CSE 2017)

Wood categories

B. Bringing unused institutional land under market linked tree plantation

Action points

- Total wasteland existing in the country is ~ 55.7 Mn ha which is 17 % of the India's total geographical area
- Bringing 500k ha unused institutional land (Temple Trusts, SEZs, Corporate/PSU owned land, NHAI, State Highways, railway side) under industry linked tree plantations (short and long rotation species)
- Establishing formal revenue sharing arrangements between institutions and local farmers, in consultation with linked industry providing assured buy back of the wood produced

Critical components

- Additional income to farmer and the institution, including quality wood availability at assured price to the industry

Activity locations

- All states having institutional land under Temple Trusts, SEZs, Corporate/PSU owned land, NHAI, State Highways, railway side

Required Policy Interventions

- Collaborative framework with farmers and linked industry for each type of institution
- No felling and transit restriction for the species of plantation used by existing industry (list annexed) on the lines done for bamboo by central government
- Norms for agro forestry plantation funding to be similar as agri -funding norms
- Related linked industries to be provided viability gap assistance by state government for wood, till the time wood is available from plantations

Partner and Anchor Agencies

- Institutions, leading farmers/ aggregators, industry, State Industry Departments
- Anchored by State Industry Departments

Potential Funding Agencies

- Institutions, NABARD, Institutional finance, Private investment by Industry etc

Targets

- Plantation over 500k ha under proposed high productive and market linked tree plantations of short and long rotation tree species

Outcomes

- Production of more than 10 MnT industrial wood per annum, at 20% reduced mill landed cost (vs existing) for panel, pulping and timber industry
- Creation of more than 22 million mandays per annum in rural areas in plantation raising and management
- Creation of additional income and carbon sequestration benefits to industries

Activity Performance Measures

- Finalisation of institutional land, leading farmers/aggregators and industries including required collaborative framework, by 2022
- Plantation of 200k ha by 2024
- Plantation of 500k ha by 2026

Wood categories

C. Promoting globally competitive wood based industries for import substitution

Action points

- On the strength of improved availability of cost competitive wood and raw material inputs as well as required policy changes, setting up of demand driven wood/bamboo based industries across application segments of **pulping, paper/board, MDF/PB/Plywood, Veneer and furniture manufacturing,** to substitute:
- USD 4 Bn import in next 5-7 years and
- USD 7 Bn import in next 10-17 years

Activity locations

- Based on available/ to be developed wood/bamboo catchments of leased forests/ FDC and agro forestry clusters across all states

Potential Funding Agencies

- Institutional finance, Private investment by Industry, Government funding through industry department / industry corporations

Partner and Anchor Agencies

- Private industry and State Governments
- Anchored by Industry Department of State Governments

Required Policy Interventions

- Wood/bamboo industries to be established in identified clusters by state government, which are linked to wood catchments existing or to be developed
- Viability gap assistance by state governments for wood / pulp input till domestic wood catchments from lease forests/ wood catchments or related pulping capacities, are available (incentive to be provided to paper mills procuring wood from farmers engaged in agro / farm forestry so that they are further incentivized to promote the same and source even more from domestic farmers
- Incentives to wood/bamboo based industries as per priority sector industry norms, to be provided by state government,-
  - 20% of project cost, disbursed over 5 years
  - Electricity duty exemption on captive power
  - Reimbursement of power cost @Rs.3/unit for 5 years
  - Secure coal supply (Rs.1000/MT concession over bid price) for 15 years
  - 100% Gross SGST reimbursement for 15 years
  - Assured water supply
  - One time assistance on construction of effluent treatment plant
  - 100% exemption on stamp duty
- Relaxing regulatory and licensing regime for setting up wood pulp/ wood/bamboo based industries and bringing in single window and time bound (3 months) approval, licensing and consent system to avoid existing multiple and cumbersome approval processes
- Any wood purchased by a Pulp & Paper Mill should attract GST rate of 5% with a suitable ‘Actual User’ condition so that it is not diverted for any other use where GST rate is higher

Targets

- New industries turnover of USD 4 Bn by 2025
- New industries turnover of USD7 Bn by 2035

Outcomes

- Saving of foreign exchange of USD 4Bn/ annum in 5 years and USD 7Bn/annum in 10 years
- Direct employment of more than 50 million mandays per annum in wood based manufacturing activities
- Indirect benefits of:
  - -Creating more than 291 Mn mandays per annum in plantation and forestry related activities
  - -Support to doubling income of more than half a Mn farmers
  - -Increased forest and tree cover by ~5 Mn ha in next 15 years
  - -Additional carbon sequestration benefits of ~70 MnT equivalent CO2 per annum in next 15 years

Wood categories

D. Cluster based agro forestry wood catchment development

Action points

- Wood/bamboo based industries/ clusters to be linked to existing/to be developed wood resource catchments through agro forestry with in 100 km, leading to reduced transportation cost (State wise species list annexed)
- Aggregation of short rotation agro forestry plantations from existing ~2 ha/unit to ~100 ha / unit through industry linkage and contract forming model
- Reduced wood production cost through mechanization and improved productivity on the strength of certified planting material and best silvicultural practices

Critical components

- Increased profit realization/ha/annum for the farmer on the strength of improved productivity and reduced lead distance for the industry
- Industry passing on part of transport cost saving to farmers/aggregators,

Activity locations

- All states with wood panel and wood pulp manufacturing units, either existing or proposed

Required Policy Interventions

- Implementation of model contract forming Act for industry linked agro forestry plantations
- No felling and transit restriction for the species of plantation used by existing industry (list annexed),- to be done by Central Government, on the lines done for bamboo
- Norms for agro forestry plantation funding to be similar as agri -funding norms
- Setting up of National Wood & Bamboo Board, to promote industry linked wood production (in all type of lands) including related policy and value chain issues

Partner and Anchor Agencies

- Farmers, identified aggregators, industry, Mission on Agroforestry
- Anchored by identified wood/bamboo based industry/ industries

Potential Funding Agencies

- Investment by industry, institutional finance, NABARD, Krishi Kalyan Cess/ and Mission on agroforestry

Targets

- Plantation over 1 million ha under proposed industry linked cluster based agro forestry, involving more that 500k farmers

Outcomes

- Production of more than 30 MnT industrial wood per annum, at 30% reduced mill landed cost (vs existing) for panel, pulping and furniture industry
- Doubling the farm income of more than half million farmers
- Creation of more than 112 million mandays per annum in rural areas in plantation raising and management

Activity Performance Measures

- Finalisation of industries and catchments including contract farming arrangements, by 2022
- Plantation of 500k ha by 2024
- Plantation of 1 million ha by 2026

Action Plan

India could substitute imports and gain self sufficiency for Wood & Wood Products

Action Points

	Pain Points Addressed	Outcomes	Employment generation (Mn mandays/annum)
A Improving productivity of FDC plantations and degraded forests (3.5 million ha) under industry linked concessions and wood production model	▪ Limited wood availability in terms of species (short and long rotation) and quality ▪ Cost competitive of wood and timber ▪ Sustainable management of degraded forests	▪ Production of more than 30 MnT industrial wood per annum ▪ ~25% reduced mill landed cost (vs existing)	157
B Bringing unused institutional land (0.5 million ha) under high productive and market linked tree plantation	▪ Low productivity of plantations ▪ Cost competitiveness of industrial wood ▪ Low investment in forestry	▪ Production of more than 10 MnT industrial wood per annum ▪ 20% reduced mill landed cost (vs existing	22
C Promoting globally competitive wood based industries for import substitution	▪ Non-competitive wood cost ▪ Restrictive regulatory regime- inhibiting growth of trees, plantations and processing industries	▪ Saving of foreign exchange of USD 4Bn/ annum in 5 years	50
D Cluster based wood catchment development under agro forestry models (1 million ha)	▪ Limited wood availability in terms of species (short and long rotation) and quality ▪ Scaling up and mechanisation ▪ Improved cost competitiveness of wood produced in agro forestry	▪ Production of more than 30 MnT industrial wood per annum ▪ 30% reduced mill landed cost (vs existing)	112

Increase in forest cover by 1.5% | 17.5 MnT of Carbon sequestration per annum

Action Plan

Becoming a net wood exporter and saving on imports can be possible for India

Recommendations to the GoI for improving wood production and developing wood markets

Setting up of a dedicated National Wood & Bamboo Board within Ministry of Agriculture for promoting and comprehensively addressing all related issues

- Promoting dedicated and industry linked plantations (Farmers Producers Organizations, institutional land, FDC/degraded forest land)
- Input subsidy, post – harvest management facilities, interest moratorium to be applicable to plantation forestry as well, similar to agri – crops
- Considering agro forestry as an agri – crop and taking into account for priority sector lending for farmers
- Setting up special purpose vehicles enabling financial/banking institutions to address financial needs of agro forestry

Enhancing wood production by adopting best package of practices with improved yield

- Providing saplings of high quality
- Developing high yielding tree varieties through tree improvement and improving nursery/plantation techniques
- Utilizing Krishi Kalyan Cess (KKC) funds to boost agro forestry
- Establishing and promoting credible forest certification process, encouraging farmers and plantation agencies to adapt sustainable management practices

Making changes in the policies and making Indian wood cost competitive compared to the imports, thereby encouraging industries to substitute their imports

- Rationalizing the transaction cost involved in inter state – wood transfers
- Creating organized wood markets where farmers/agencies can bring their produce for selling
- Promoting cluster based wood catchment development to reduce cost of production and transportation of wood to industries through PPP models
- Incentivizing and facilitating setting up of wood based industries in related wood catchments

Source: Paper on “Promoting sustainable trade of wood and wood based products in India” by NCCF

Action Plan

Action Plan

Import substitution potential

Category	Recommendation	Import Substitution Opportunity (in $ Mn) Medium Term (5-7 Years)
Paper & Paperboard	▪ Incentivise setting up of wood based industries, which would contribute for import substitution	1278
Recovered Paper	▪ Enhance paper recovery process for recycling ▪ Impose duty on import of waste paper	730
Wood Pulp	▪ Reducing mill landing cost ▪ Policy changes for felling and transit	454
Industrial Roundwood	▪ Bringing additional areas under cultivation: institutional land, state forest land, degraded forest land ▪ Improving the productivity of the plantations ▪ Easing of felling and transit regulations across the states	207
Sawn Wood		118
Wood Based Panels	▪ Aiding the industries by subsidizing the plant and machinery cost ▪ Change in the import duty for panels and furniture ▪ Supporting the unorganized sector	117
Furniture		147
		3051

Wood value chain analysis

Value chain levers for wood and wood products: Saving on imports

Point Of Departure: (2019)
- **Forex of 7 Bn. USD**

Focus towards agro forestry promotion and increase in productivity

Category	Recommendation	Import Substitution
Paper & Paperboard	Incentivise setting up of wood based industries, which would contribute for import substitution	**USD 1.27 Bn.**
Recovered Paper	Enhance paper recovery process for recycling Impose duty on import of waste paper	**USD 0.73 Bn**
Wood pulp	Reducing mill landing cost Policy changes for felling and transit	**USD 0.45 Bn**
Industrial Roundwood	Bringing additional areas under cultivation: institutional land, state forest land, degraded forest land .	**USD 0.20 Bn**
Sawnwood	Improving the productivity of the plantations Easing of felling and transit regulations across states	**USD 0.11 Bn**
Wood based panels	Aiding the industries by subsidizing the plant and machinery cost	**USD 0.11 Bn**
Furniture	Change in the import duty for panels and furniture Supporting the unorganized sector	**USD 0.14 Bn**

Point Of Arrival: (2024)
- **Forex of ~USD 6.5 Bn with interventions as compared to a Forex of ~USD 9.5 Bn* without interventions**

**Imports are expected to grow at a CAGR of 3.8% and the forecast is estimated on a basis of USD 7 Bn imports in 2018*

Annexure I:
Species to be exempted from felling and transit

Wood based value chains

Annexure I -List of tree species to be exempted from felling and transit restrictions

Tree Species	Tree Species	Tree Species	Tree Species
Poplar species	*Acacia species*	*Anthocephalus cadamba*	*Gmelina arborea*
Eucalyptus species	*Dalbergia sissoo*	*Leucaena leucocephala*	*Gliricidia sepium*
Alnus nepalensis	*Salix tetrasperma*	*Grevellia robusta*	*Casuarina species*
Melia species	*Bombax ceiba*	*Tectona grandis*	*Ceiba pentendra*
Ailanthus excelsa	*Artocarpus*	*Millettia pinnata*	*Albizia species*
Terminalia species	*Depterocarpus turbinatus*		

Annexure II:
Species to be exempted from felling and transit

Wood based value chains

Annexure – II: Species to be promoted in Agro forestry – Zone wise

Southern zone

(Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana States)

1. Melia dubia and Melia composita
2. Albizzia procera
3. Ailanthus excelsa
4. Gmelina arborea
5. Grevillea robusta
6. Swietenia macrophylla
7. Swietenia mahagoni
8. Eucalyptus, Leucaena, Casuarina
9. Artocarpus hirsutus
10. Albizzia falcataria

Central zone

(Maharashtra, Chhattisgarh, Madhya Pradesh States)

1. Khaya senegelensis and Khaya anthotheca
2. Eucalyptus
3. Ailanthus excelsa
4. Swietenia macrophylla
5. Swietenia mahagoni
6. Melia azedarach
7. Melia composita
8. Melia dubia
9. Parkia biglandulosa

Northern Zone

(Uttar Pradesh, Uttara Khand, Himachal Pradesh States)

1. Poplar and Eucalyptus
2. Cedrala tuna
3. Swietenia macrophylla and Swietenia mahagoni
4. Salix spp.
5. Anthocephalus cadamba
6. Melia dubia
7. Melia composita
8. Lannea grandis
9. Morus alba
10. Kydia calycna

Source: Paper on “Promoting sustainable trade of wood and wood based products in India” by NCCF

Wood based value chains

Annexure – II: Species to be promoted in Agro forestry – Zone wise

Eastern Zone

(Assam, Bihar, Jharkhand, West Bengal, Odisha States)

1. Gmelina arborea
2. Cedrala tuna
3. Grevillea robusta
4. Swietenia macrophylla
5. Swietenia mahagoni
6. Anthocephalus cadamba
7. Melia dubia and Melia composita
8. Duabanga sonneratioides
9. Artocarpus hirsutus
10. Poplar and Eucalyptus

Western Zone

Gujarat, Rajasthan, Punjab, Haryana States)

1. Melia dubia and Melia composita
2. Ailanhus excelsa
3. Poplar
4. Eucalyptus / (Leucaena and Casuarina for Gujarat)
5. Albizzia procera
6. Prosopis cineraria
7. Cedrala tuna
8. Swietenia mahagoni
9. Melia azedarach
10. Dalbergia sissoo

Source: Paper on “Promoting sustainable trade of wood and wood based products in India” by NCCF

Annexure III:
Wood – Category wise insights

Wood categories

Category wise usage of a tree (Indicative)

For example, 7 year old eucalyptus plantation

Fuel wood (branches leaves)-15% of tree

Pulpwood (Wood pulp, Paper & Paperboard) - 25% of tree

Industrial logs - wood panel products such as plywood, MDF, Particle Board - 40% of tree

Timber logs - Solid or Sawn wood - 20% of tree

* All product segments of wood would need different species and maturity of trees

Wood categories

Major categories of wood products

Paper & Paperboard

Used for commodities like Newsprint, printing and writing paper, other paper and paper- board

Wood Pulp

Used as a raw material for paper & paperboard

Sawn Wood

Applications in Window & door frames, structural timber etc

Veneer Sheets

Use in plywood, laminated construction, furniture, veneer containers, etc.

Recovered Paper

Waste and scrap collected for re-use as a raw material for the manufacture of paper and related products.

Industrial Roundwood

Used for manufacturing wood based panels, saw logs veneer logs, pulpwood

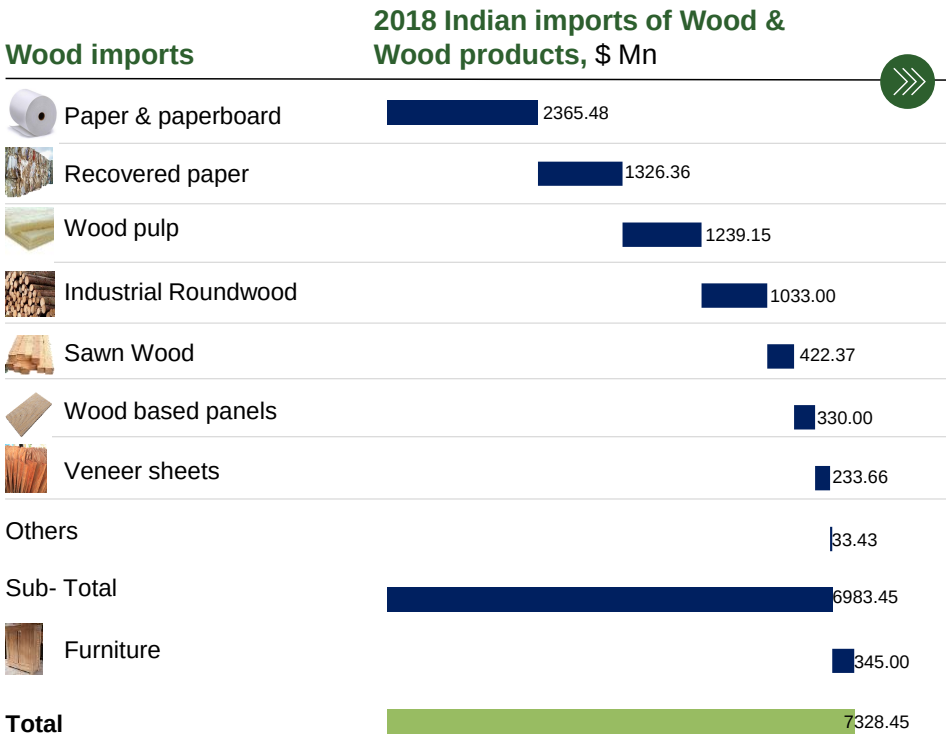
Wood based panels

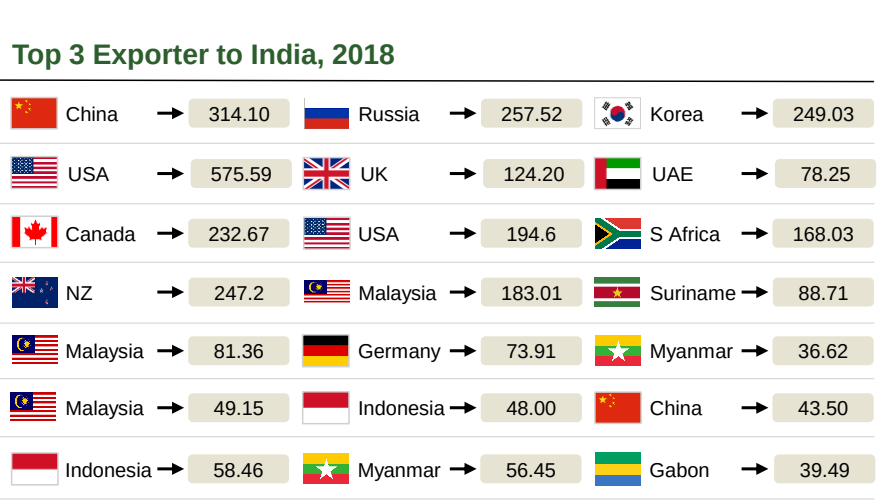
Used for commodities like, Furniture, Panels, Carving products, Flooring Tiles, Shuttering Ply

Furniture

Used in Kitchen, office, home, interior furnishing, etc.

India's total imports of different Wood and Wood based products in 2018





In 2018, top four categories – Paper and paperboard, Wood Pulp, Recovered paper and Industrial Round wood constituted 82% of total forest and forest products imports.

The other prominent categories of imports were Sawn wood, wood based panels, veneer sheets and furniture.

Others include - Wood chips and particles , Wood Charcoal , Pulp from fiber other than wood , Wood pellets and other agglomerates, Wood Residues , Round wood (fuel)

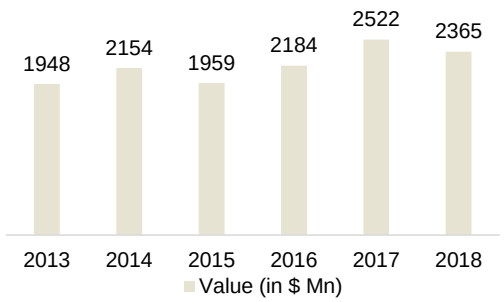
Source: Comtrade

Indian Imports

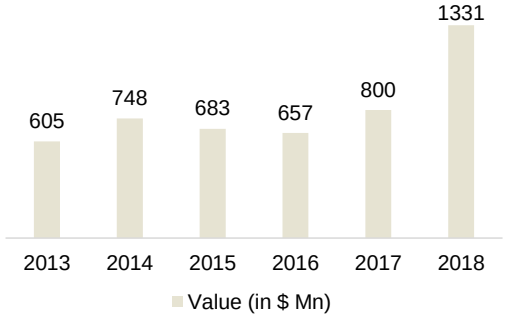
Indian imports – Wood & Wood Products

Top categories for Imports (1/2)

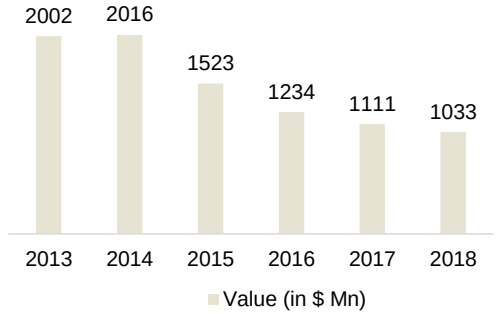
Indian Imports – Paper & Paperboard



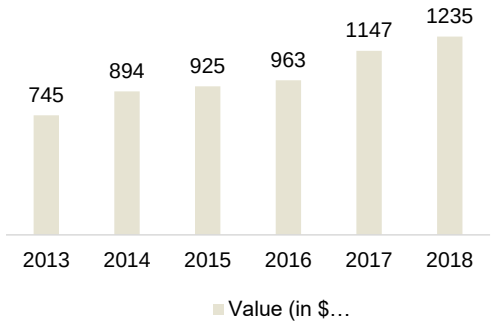
Indian Imports – Recovered Paper



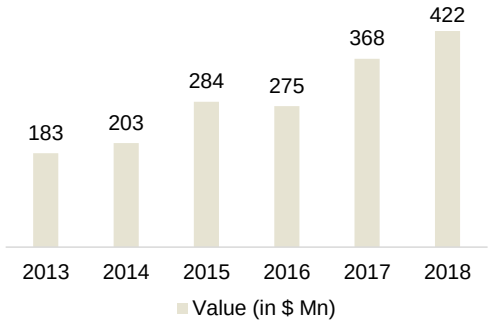
Indian Imports – Industrial Roundwood



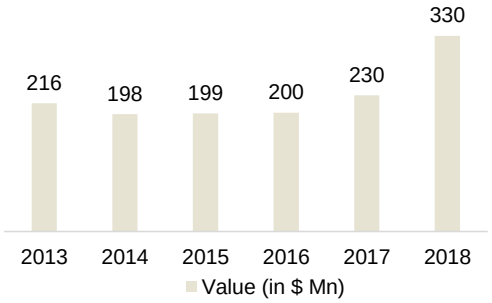
Indian Imports – Wood Pulp



Indian Imports – Sawn Wood



Indian Imports – Wood Panels



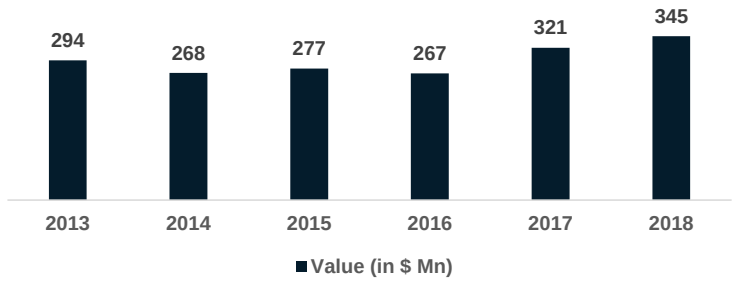
Source: Paper & Paper board, wood pulp, wood panels - UN Comtrade; Recovered paper, Industrial Roundwood, Sawn wood – FAO Stat

Indian Imports

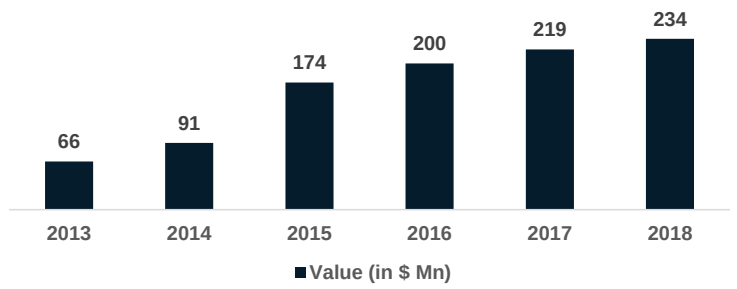
Indian imports – Wood & Wood Products

Top categories for Imports (2/2)

Indian Imports – Furniture



Indian Imports – Veneer Sheets



Category of Import	2018 Imports (in $ Mn)	Growth over 2017-2018	5 Yr CAGR 2013-18
1. Paper & Paperboard	2365	-6 %	4.0 %
2. Recovered Paper	1326	66 %	17.0 %
3. Wood Pulp	1235	8 %	11 %
4. Industrial Logs	1110	-7%	-12 %
5. Sawn Wood	422	15%	18.2 %
6. Furniture	345	7.5%	3.3 %
7. Wood Panels	281	44 %	9 %
8. Veneer Sheets	234	7 %	28.8 %

- Veneer sheets, Sawn wood and recovered paper are having the highly increasing CAGR because of increased demand in furniture sector and cheaper import cost comparing to the production cost.
- Industrial logs has a decreasing CAGR rate but the value of the import is still too high. It is expected to grow by 5% in the coming years
- Recovered paper import can be reduced by recycling the total paper consumed in our country. India recycles only 20-25% of the total paper consumed comparing to the 80-85% of world.

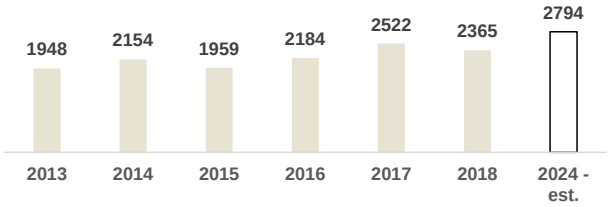
Source: UN Comtrade, FAO Stat, HS Codes for Furniture – 940330, 940340, 940350, 940360, 940381, 940382

Wood categories

Paper & Paperboard

Indian paper industry accounts for 4% of the world's production of paper

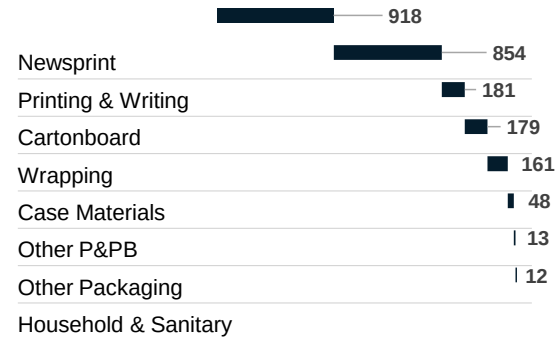
Indian Imports (in $ Mn)



Per capita paper consumption in India at a little over 13 kg, is way behind the global average of 57 kg, likely to grow to 17 Kg by 2024-25.

Major paper grades being imported are writing paper, newsprint, coated paper and Kraft paper

P&PB Imports – 2018 (in $ Mn)



Source: FAO STAT, www.thehindubusinessline.com http://www.iarpma.org/

Key insights

- Import of paper and paperboard has been rising in last 5 years at a CAGR of ~6%, and concerted pulp linked manufacturing effort would be required to arrest this trend
- Existing domestic consumption is ~18.8 million TPA (writing & printing-5.5, paperboard-9.6, speciality papers-1.1 and newsprint-2.6), likely to grow to ~23.5 million TPA by 2024-25

Key Challenges

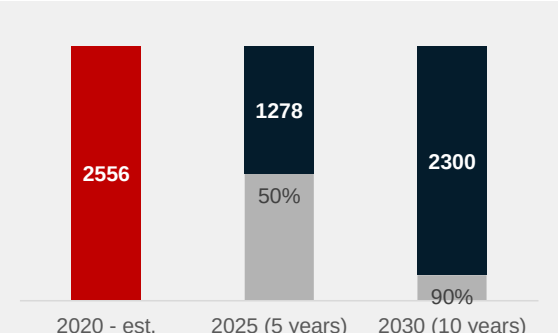
India's paper industry, operating at 80% of the capacity, which is low for a high capital intensive and continuous process industry (Rs. 1500 – Rs. 2000 Cr.)

- Lower import duty on Paper and Paperboard (P&PB), and FTA with ASEAN countries, which have lower manufacturing cost due to leased forest based wood sourcing - hurting local industries
- High cost of production caused by inadequate availability, high cost of raw materials, power cost and concentration of mills in one particular area, non availability of good quality fiber, uneconomical plant size, technological obsolescence

Suggested Action Points

- Incentivise setting up of paper and paperboard manufacturing industries, linked to domestic pulp manufacturing, to improve cost competitiveness / import substitution
- Customs duty for import of Paper and Paperboards be increased by 25% subject to availability of wood domestically
- Category be kept in the Negative List (i.e., no preferential treatment) in bi-lateral and multi-lateral trade treaties and agreements

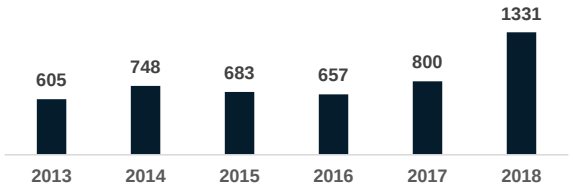
Estimated opportunity for import substitution (in $ Mn) Considering 10% special grade requirement imports



Recovered Paper

Waste paper has become a major raw material for paper making

Indian Imports (in $ Mn)

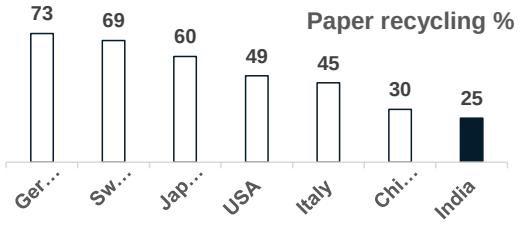


Key insights

- Out of 10.1 MnT recovered paper consumed in the country (2018), only 3.7 MnT is through domestic recovery/collection, imports ~6.4 MnT
- An eight - fold jump in mixed waste paper import into India in the first half of 2018-19 from about 0.19 Lakh MT per month to about 1.5 lakh MT per month
- India also overtook China as the main export destination for mixed paper from USA
- India consumes around 17 MnT of paper annually - huge potential for recovery of waste paper

Key Challenges

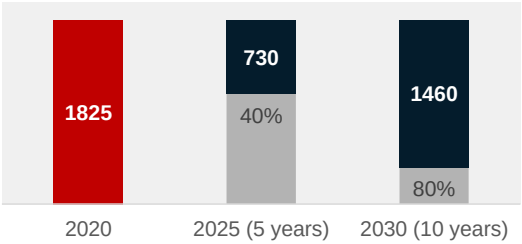
- Contaminated portion of the foreign waste (including plastic) imported into India finding its place to dumpsites with adverse environmental & public health impact.
- Cheaper imports make indigenously sourced waste paper less competitive which in turn dis-incentivizes waste segregation and recycling efforts in India and eventually such non-segregated local waste end up as a landfill.
- Reduction in earnings of poor and vulnerable rag-pickers and small entrepreneurs such as scrap vendors, impacting the circular economy
- India recycles only 20-25% of the total paper consumed and a large chunk is not collected as compared to 80-85% in the developed world



Suggested Action Points

- Impose ban on import of mixed// unsorted waste paper into India.
- Increase the effective rate of duty (or) impose a cess on import of waste paper @ 10% by removing the nil duty exemption on such imports under specific preferential tariff agreements (PTA) or end use condition vide Customs Notification 50/2017.
- Utilise duty/cess collections to provide necessary financial and infrastructure support to Municipalities/ NGOs / private sector that are working on scientific waste collection, segregation and solid Waste Management programmes
- Improve recovery process for the waste paper by facilitating and incentivising municipalities for waste segregation at source, collection, aggregation and recycling in collaboration with related industries

Estimated opportunity for import substitution (in $ Mn)
Considering 10% special grade requirement imports



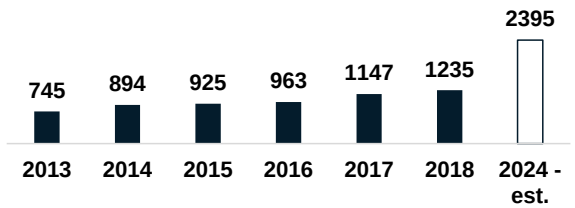
*Calculated on a base of 2018 paper consumption

Source: FAO STAT, IPMA, https://www.business-standard.com/article/economy-policy/imports-of-paper-paperboard-up-29-5-in-q1-capacity-utilisation-drops-119092600254_1.html

Wood Pulp

Pulp imports growing at CAGR of ~11%

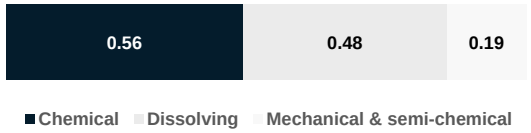
Indian Imports (in $ Mn)



Top exporters to India are South Africa, Canada, USA, Indonesia and Sweden

For 1 Mn Tonnes of wood pulp, the pulp wood requirement would be 13 Mn cum to 18 Mn cum

Wood Pulp Imports – 2018 (in $ Bn)



Key insights

- Import of pulp has a rising trend in last 5 years (~ 30% being softwood pulp),

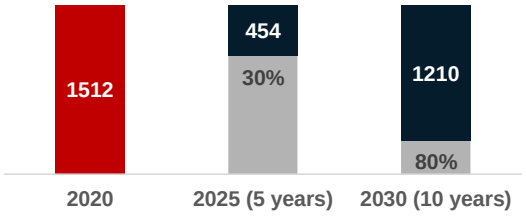
Key Challenges

- All pulp mills in the country are integrated, and there is no excess pulp available for paper/paperboard units which do not have pulp mills or are located in non-wood growing areas- pushing the need for pulp import
- High mill delivered wood cost (hardwood), leading to reduced competitiveness of domestic manufacturing, thereby increasing import of pulp and paper

Suggested Action Points

- Setting up new pulping capacities and expanding existing capacities by developing cost efficient wood catchments-through industry linked, scaled up, aggregated and mechanised agro forestry systems
- Need for policy change regarding felling and transit of hardwood as well as softwood species, to help substitute import of both hardwood and softwood pulp, (softwood species are grown in temperate and hilly areas of the country)- a list of such species attached
- Relaxing regulatory and licensing regime for setting up wood pulp/ wood based industries and bringing in single window and time bound (3 months) approval system to avoid existing multiple and cumbersome approval processes

Estimated opportunity for import substitution (in $ Mn) Considering 20% special grade requirement imports

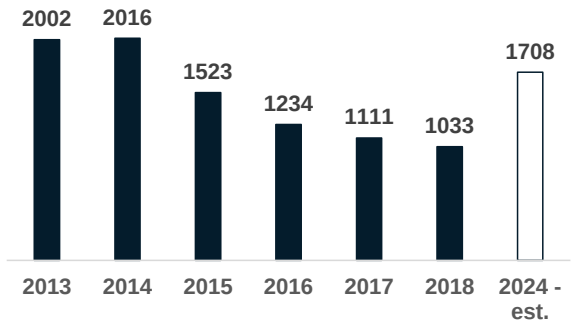


Source: FAO STAT

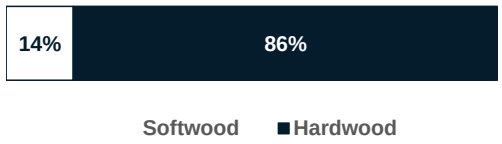
Industrial Roundwood

Indian imports likely to grow by 5%

Indian Imports* (in $ Mn)



Softwood & Hardwood composition by Value for Indian imports for past 5 years



Key insights

- Out of total consumption of ~54 million cum of industrial logs, domestic production is ~49 million cum and balance 5 million cum is being imported (~30% softwood), due to low availability of certain species, mainly of longer rotation tree crops
- Total import value (2017) has been ~USD 1.03 billion.

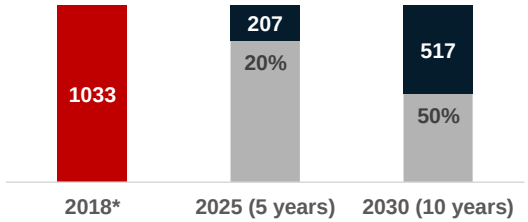
Key Challenges

- There is a mismatch between quality and species of wood required for product manufacturing and the same being produced under forests/FDC and agro forestry systems
- Non – availability of Quality Planting Material for growers
- Cost of growing of wood is higher (vs. S-E Asia), adversely impacting farmer profitability as well as industrial viability
- Low productivity of forests and plantations

Suggested Action Points

- State Forest Corporation land (~1.1 million ha) to be used for high productive and industry linked short and long rotation tree crops under a collaborative lease arrangement to ensure required quality and cost of wood
- ~20% of degraded forest land (total 30 million ha) to be brought under appropriate conservation and production forestry to be managed by the industry (which would be responsible for conservation as well as production forestry)- a model already implemented in South East Asian countries (separate slide attached)
- Productivity improvement of plantations through certified quality plant material and silvicultural means

Estimated opportunity for import substitution
(in $ Mn)

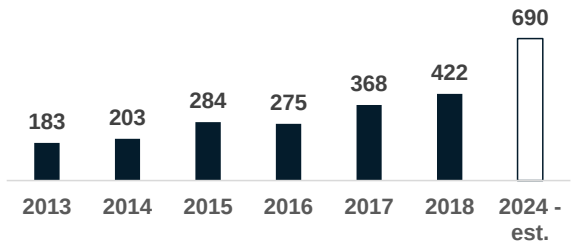


Source: *FAO STAT, #FAO Yearbook – Global Wood Production, export, Import - 2017

Sawn Wood

Growth potential due to demand in construction and furniture sector

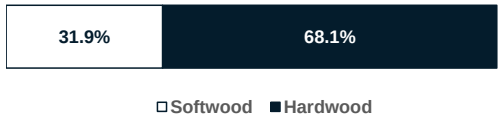
Indian Imports* (in $ Mn)



Major exporters to India for softwood are Germany, United States and Ghana

Major exporters to India for hardwood are Malaysia, Myanmar, Brazil and Tanzania

Softwood & Hardwood composition by Value for Indian imports for past 5 years



Key insights

- Major volume of the segment is produced from long rotation tree species (sal, teak, acacia, albizia, Gmelina, Dipterocarpus, species) under forests/FDC and ToF (farm forestry)
- Annual consumption is ~7.8 million cum (2017); import ~11%
- Sawn wood including solid wood sections used in buildings, construction, structural applications and furniture

Key Challenges

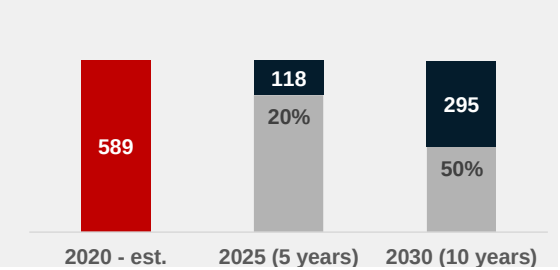
- Gradually production of long rotation tree species under farm forestry is reducing due to its long gestation period, leading to delayed realisation of income
- Exporting countries offering sawn wood at competitive prices.
- With growth of conservation forestry in country, its production from forests/FDC areas are likely to reduce in future, putting increased push for imports

Suggested Action Points

- Need to substitute wood in timber applications with engineered wood to reduce cost and improved efficiency of manufacturing, especially for non-load bearing furniture and panel applications
- Growing the demand linked species on institutional land (~1million ha - temple trust, SEZs, PSUs, Corporates, Highway/railway line sides, community waste etc.) by implementing a Public Private Partnership model where quick returns are not anticipated
- Species mismatch vs. application requirement- need to link/streamline plantation species and management systems in Forests and Forest Development Corporations (FDCs) with industry and market demand requirement

Estimated opportunity for import substitution

(in $ Mn)

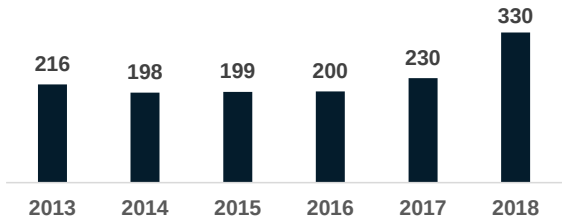


Source: FAO STAT

Wood Based Panels

India accounts for 0.79% of the world's production of wood based panels

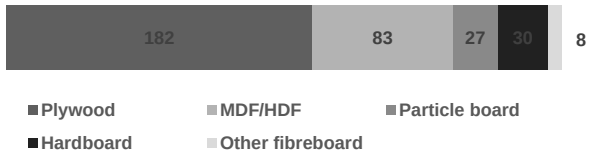
Indian Imports* (in $ Mn)



Plywood, Particle Board and MDF (Medium Density Fiber Board) constitute wood panel /engineered wood segment, majorly used in construction, paneling and furniture.

Import of wood based panels has been rising with a 5-year CAGR of ~7% from 2013-18.

WBP Imports – 2018 (in $ Mn)



Key insights

- Total consumption of MDF is ~ 0.5 million cum , with 50% requirement getting imported. It has a CAGR of ~20%.
- Total consumption of Particle Board (PB) is ~0.2 million cum, with almost 70% being imported. It has a CAGR of ~ 12%, mainly driven by furniture industry.
- Total consumption of plywood is ~ 2.6 million cum with almost no import, growing at CAGR of ~10%, which has got subdued slightly due to real estate issues

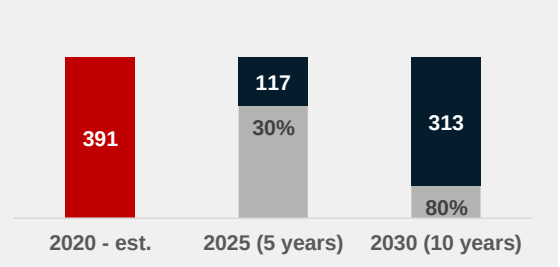
Key Challenges

- Challenging market conditions due to regulatory changes (such as capping of plywood manufacturing, pollution regulations due to use of low quality resins).
- Plant and Machinery form majority component of plant set up costs which are very costly, followed by Building and Civil work.
- MDF requires mature wood (7-8 years rotation) and existing agro forestry models need to be changed to ensure required maturity, by incentivizing the farmers for its adoption.

Suggested Action Points

- Regulatory changes need to be made relating to the licensing of panel manufacturing industries.
- Subsidising the plant & machinery cost in setting up industries would increase the production within country, which would contribute for import substitution.
- Involvement of industries in captive plantations / contract farming based agro forestry plantations in 50 km catchment of mills, to reduce cost of wood and its transportation to mills, which is extremely important for import substitution.
- Anti-dumping duty should be increased and it should be country or company independent.

Estimated opportunity for import substitution (in $ Mn) Considering 20% special grade requirement imports

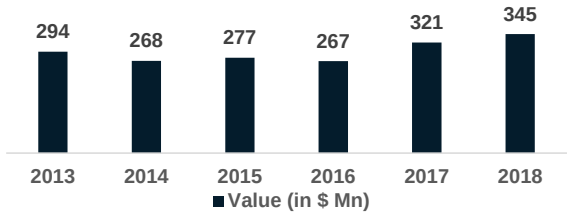


Source: FAO STAT,INDIAN WOOD SECTOR MARKET STUDY 2016, https://www.researchgate.net/publication/301684417_Trends_and_perspectives_of_Indian_wood_based_panels

Furniture

Indian furniture industry is growing at a rate of 3.5% CAGR

Indian Imports* (in $ Mn)

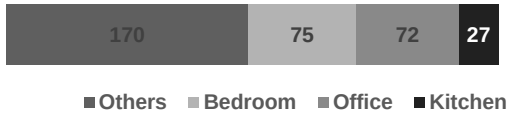


Wood based furniture constitutes around ~65% of the total sector. 20% using Plywood, PB (Particle Board) and MDF (Medium Density Fiberboard), balance using solid wood.

Furniture market in India is dominated by the un-organized sector constituting around ~85% of the market.

Preference is tilting towards high-end, low maintenance, quickly installable (knock down) furniture with customization options.

Furniture Imports – 2018 (in $ Mn)



Source: FAO STAT, NSDC Furniture and Furnishing sector Report, CEDAR Report

Key insights

- Home furniture is the largest segment in the Indian furniture market, accounting ~65 percent of sales.
- Top 5 countries for Indian wood furniture imports- China, Malaysia, Italy, Germany and Sri Lanka.
- Raw material is available only in few states and it needs to be transported to long distance to industries, resulting in the higher product cost than imported furniture.

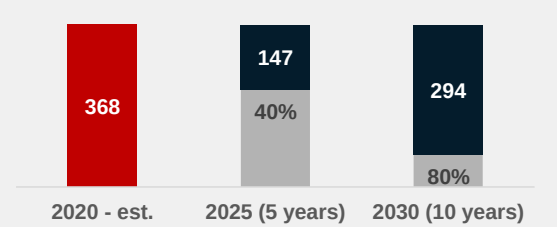
Key Challenges

- Market is moving towards technology advancement but majority production coming from unorganized players, they can`t afford latest technology and machinery.
- Imported furniture are mainly manufactured using PB and MDF. Firstly the MDF and PB Manufacturing need to be increased in the country to improve competitiveness of domestic manufacturing.
- The Government of India presently allows duty free import of furniture for all the SEZs and STPIs. A sales tax of 14.5% is being imposed for transactions with local players. This incentivizes import rather than local buying, which is adversely affecting sectoral growth. Revisiting this tax policy will help local business

Suggested Action Points

- Subsidising light mechanisation of unorganised sector along with design, branding and marketing linkage to reduce wastage and improve cost effectiveness, functionality, and quality furniture manufacturing in the country. This would also increase demand for wood based panels (MDF and PB)
- Promote MDF and PB manufacturing industries in the country as they provide critical raw material for mechanised furniture production in organised sector.
- Improved availability pf solid wood/timber in the country through organized and aggregated plantations, to reduce high end solid wood furniture imports
- Furniture should be considered as a necessity good and GST should be reduced for this sector.

Estimated opportunity for import substitution
(in $ Mn)



Agenda

- Shrimp
- Buffalo
- Mango
- Vegetable oil
- Wood
- **Chilli**
- Rice

Executive Summary – Chilli Value Chain

Global and Domestic Landscape

Global Chili Demand **($ 0.84 Bn - 2019)** - **growing at 6%** CAGR (2014-2018) – 57% Whole, 43% Value Added.

India is world's largest chilli producer and exporter:

- Meets **59% of global** demand (Avg. 2014-18)
- Exports **20-25%** of the produce.
- Chilli is the most exported Spice from India **(~42% of total)**
- ~70% production from AP, Telangana, MP, and Karnataka. **(Andhra Pradesh: ~40%)**

India's Competitiveness in the Value Chain

Unique Attributes: Global demand for Aroma & Pungency (High Pungent Chilli)

Strong Production Base & Surplus : Largest Chilli producer: ~1.5 – 2 Mn MT / year

Competitors: China, Peru, Mexico and Spain

China per Ha Yields are 2.5x higher than India.

Indian Exports: 81% Whole form & 19% in Value Added

India caters 27% of the Value Added and 66% of the Whole Chilli Global demand.

Opportunities

Value Added Exports Share (by Vol.): China - 65%, Spain – 90%, India – 19% (Avg. of last 5 years)
Need to incentivize processing and value added exports.
Potential to increase share in USA and EU markets by improving SPS standards.
Scope to export directly to China (Currently Vietnam imports major quantity of Chilli from India, processes at cheaper costs due to automation and re-exports to China at zero % duty under China - ASEAN pact).
Destinations like Mexico can be redeveloped – Indian Chilli Imports are banned currently

Key Pain Points	Enablers	Stakeholder(s)	Measurable Metrics
Indian Exporters get a shorter time (3 months) to fulfil export obligations	**Policies for Ease of Trade** (can be increased to 12 months like Vietnam)	Ministry of Commerce / Directorate General of Foreign Trade	Volume/Value of Exports
Port rejections at due to SPS violations. Usage of banned pesticides	Testing facilities, Input Management & PPP Models; Traceability initiatives	Ministry of Agriculture, Spices Board, State Govt.	Increase in Exports Reduction in rejections at EU and USA. No. of registered farms
Lower incentives for processing & value added exports.	Incentive Schemes "RoDTEP" & Central investment scheme.	Ministry of Commerce & Industry	% Value Added Exports Processing Capacity Number of Jobs created
Tariff Barriers	Trade Relations	Ministry of Commerce	New Trade Agreements

Potential to double the export volumes and increase revenues from "0.8" to "1.8Bn" USD Bn.

India's success in global chilli market illustrates export potential, however challenges remain

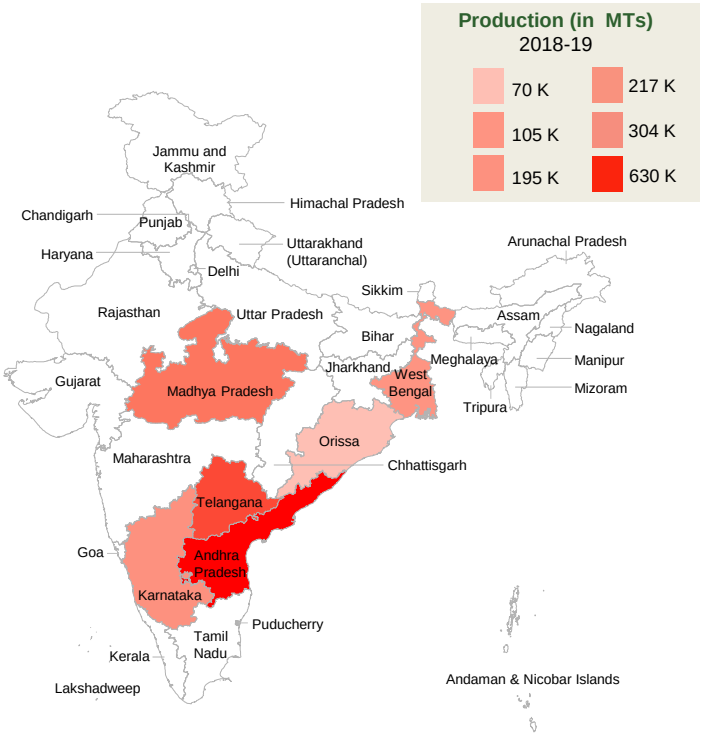
Key insights

- Chilli is major in Indian Spices Export, covering **~42% of total spices exports**, followed by Cumin ~14% and Turmeric ~11% (Avg of 2014-19)
- India is the world's largest chilli exporter, **exporting 20-25% of its produce** to meet **over 40% of global demand** consistently, **80% of which goes to Vietnam, China, Thailand, Srilanka, Indonesia & USA**
- Majority of the chilli exports are unprocessed (~83% - dried and whole, 17% in value added form in 2018-19)
- **~70%** of India's production is concentrated in **AP, Telangana, MP, and Karnataka.**
- Between 2014-18, India's Chilli Exports grew at **8.4% CAGR against 17% for China**. China is expected to overtake India in 2025 as the biggest chilli exporter on account to cheaper value addition, lower costs of cultivation and high yields **(chilli yields are 2.5x higher in China)**
- China is also engaging in high scale contract farming Africa to produce high heat chillies.

Key issues and challenges

- **~90% of spice production is undertaken by small and marginal farmers** who stand to benefit financially as exports increase. However, the industry faces a range of challenges to overcome:
  - **Stricter and varied SPS standards** implemented by major importers like EU, US, Canada
  - **Quality production** at scale
  - **Low yields** leave limited buffer for exports
  - Lack of Climate Resilience – significant impact of changes in weather.
  - **Increasing competition from** countries like China, Spain and Peru.
  - **Limited value-added exports** combined with **little promotion to end buyers** (business and retail)
  - There is an **opportunity to increase chilli exports by $0.6-1Bn** by working on processing, **quality and yield issues** in India while engaging with governments around **SPS standards and trade duties**.

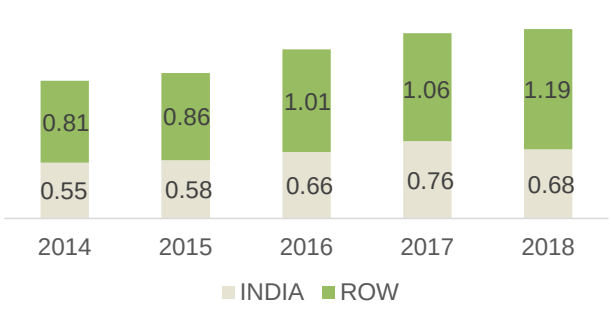
Production landscape of India



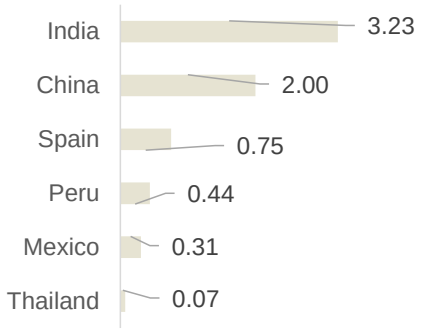
Source: Comtrade, Spice Board of India, Press search

Overview - Chilli value chain trade and production

Global Chilli Exports, US$ Bn (2014-18)



Global Exporters of Chilli, US$ Bn (Cumulative of 2014-18)



Key Insights

Global Exports CAGR: (2014-18)

- Volume - 6.1%, Value - 6.6%

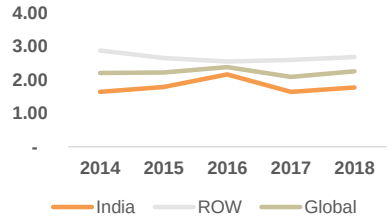
Value/Volume Propositions: ($/Kg)

- Global - $ 2.2, India - $ 1.8, ROW - $ 2.7

Indian Facts:

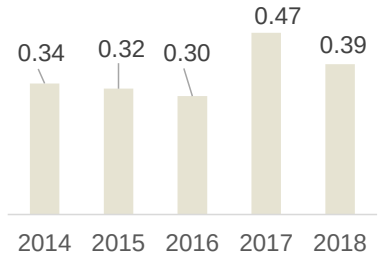
- Indian Share of Global Trade – 59% (Avg. Vol.) & 47% (Avg. Val.)

Global Chilli Price Trend, US$ Bn

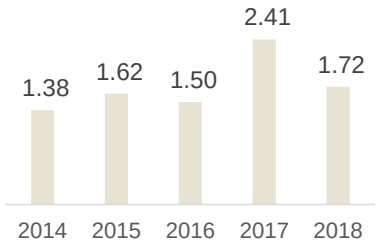


- **China stands as largest importer of Indian Chilli during 2019.**

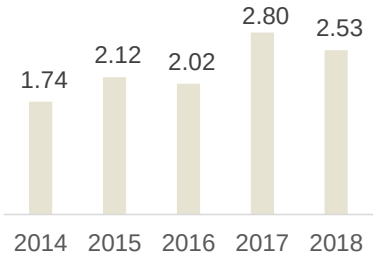
Indian Chilli Exports, Mn MT



Indian Chilli Production, Mn MT



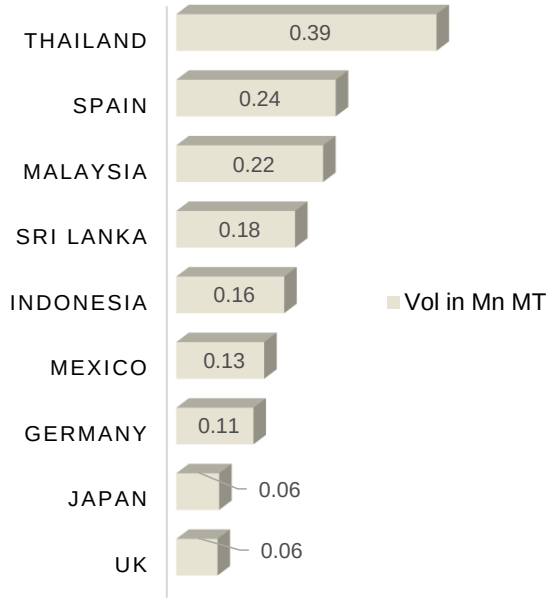
Indian Chilli Yields, MT/Ha



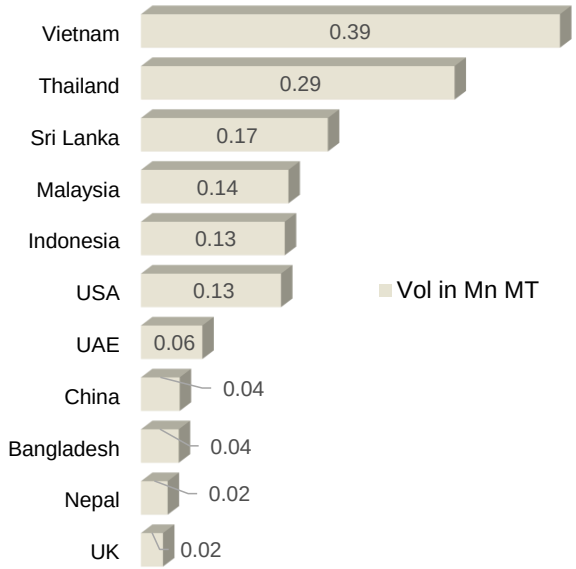
Source: UN COMTRADE (Import and Exports); SpiceBoard (Production/Yield)

Destination markets - USA is the largest global importer of Chilli value chain and India predominantly exports to SEA and USA

Top 10 Global Importers of Chilli,
(Cumulative of 2014-18)



Top 10 countries importing Chilli from India,
(Cumulative of 2014-18)



Key Insights

- USA is the major market for Mexico owing to NAFTA (North American Free Trade Agreement)
- S.E.Asian markets prefer China's Value-added Chilli over India due to price competitiveness/FTA's.

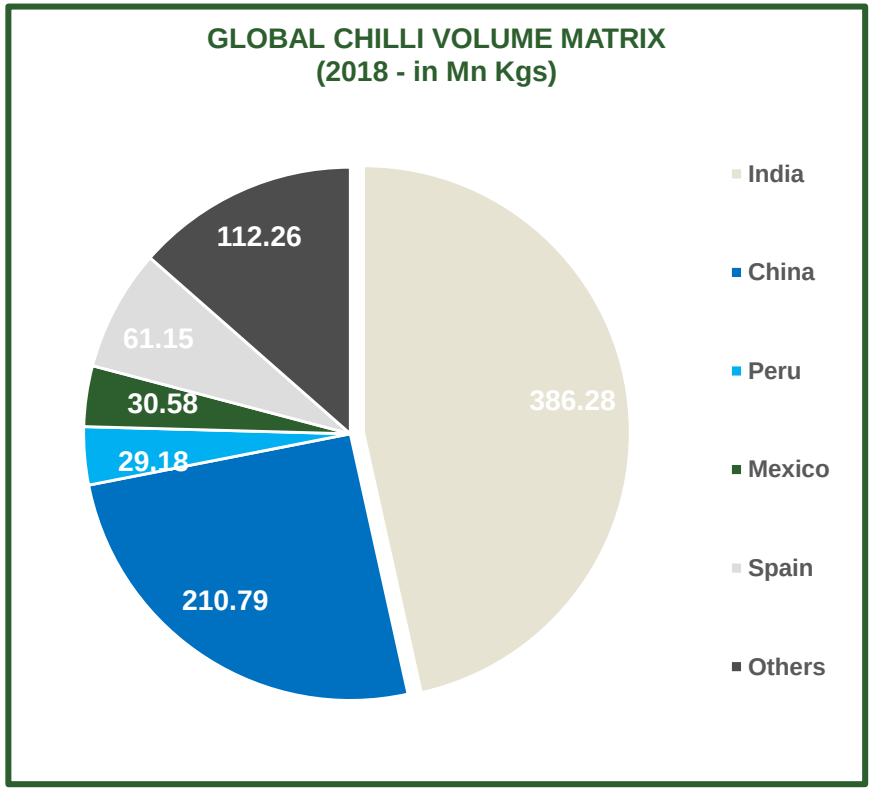
Value added exports:

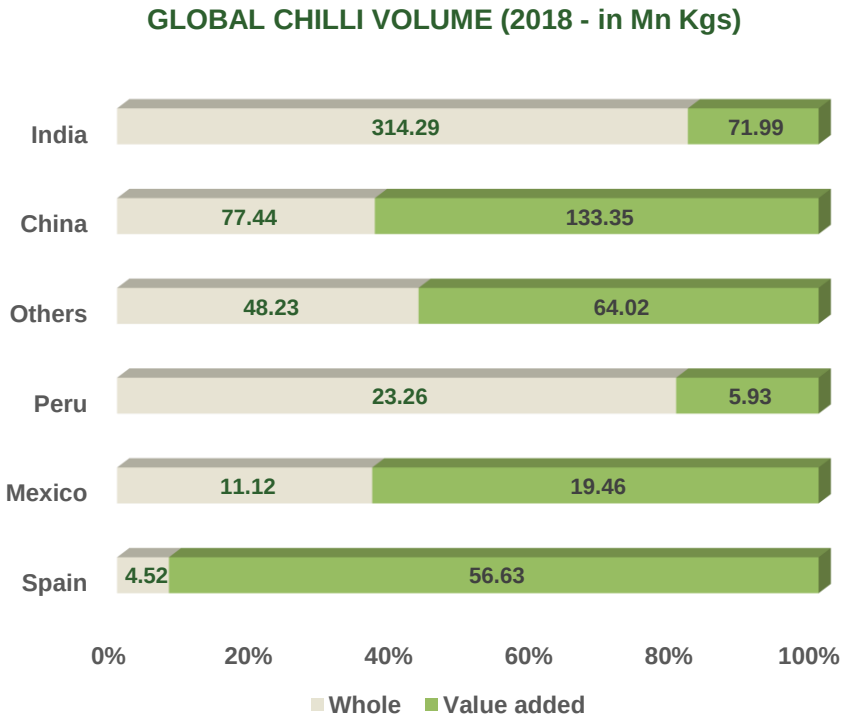
- China - 65%, Spain – 90% while India – 19%
- China's & India's exports to USA are growing at a CAGR 16% & 3.6%
- ~90% of Spain's imports (38.6 Mn Kgs out of 43.9Mn kgs in 2018) are in value added form from China.
- Mexico imports approx. 80% (22.8 Mn Kgs out of 27.9Mn Kgs in 2018) of its whole chilli from China

Source: UN COMTRADE (Global); DGCIS (India)

Indian Chilli has greater demand globally because of uniqueness in Aroma and Pungency as rest of the world deals with Paprika.

India is the source for High heat varieties; Peru and China supply low heat chilli.





Source: UN COMTRADE (Import and Exports);

Value addition – India primarily exports Chilli in Whole form

	Chilli	Chilli – Value Added	Chilli - Whole
Global imports, $bn	$ 6.89	$ 2.93	$ 3.95
Indian exports, $bn	$ 3.23	$ 0.85	$ 2.38
Top 3 exporters	India China Peru	China India Spain	India China Peru
Top 3 importers	USA Thailand Spain	USA Germany UK	Thailand USA Malaysia

(Cumulative of 2014-18)

Source: UN COMTRADE

Key Insights

- Value added share in exports(Vol.)
  - China - 65%,
  - Spain – 90%
  - India – 19%
- India's contribution to world demand
  - 27% in VA
  - 67% in Whole
  - over last 5 years to world imports.
- China's contribution to world demand
  - 29% in VA and
  - 15% in Whole
  - over last 5 years to world imports
- India lags China in low heat chilli segment.
- India's Value Added exports are predominantly to USA & UK.

Chilli - Trade relationships, duties, Tariff and non-tariff barriers

Key Insights

Import duties for Chilli in major markets

Country	Duty
US	5cents/kg
EU	Zero %
China	10%
Indonesia	3.1% for whole & 5 % for powder

Global trade pacts inhibiting Indian exports

- NAFTA creates a competitive advantage for Mexico inhibiting Indian Value Added exports
- Vietnam is one of the top 3 importers of Indian Chilli. It exports the same to China at zero duty under China-ASEAN CEPT scheme.
- Removal of Generalised System of preferences (GSP) benefits by USA in 2019.
- Indian exports without ASEAN Free Trade Agreement certificate to SEA nations is dutiable.

Key Insights

Known issues for non-tariff barriers with Indian exports

Port rejections (count) - due to food safety compliance regulations,

- 2015 : EU-47, USA-209
- 2019 : EU-52, USA-109

Stringent quality parameters & molecular restrictions (count),

- 2015 : EU-457, USA-130, Japan-272, India-9
- 2019 : EU-482, USA-130, Japan-278, India-58

Allergen Specification (Count):

- USA:8, EU:14

Noxious weed Specification

- USA - 112 weeds

Lack of standardization in food safety & testing standards across the globe.

Source: Secondary Research

Chilli value chain is characterized by consolidation for processors and exporters and millions of small Chilli farmers across India

~50-55% of total exports are whole Chillis

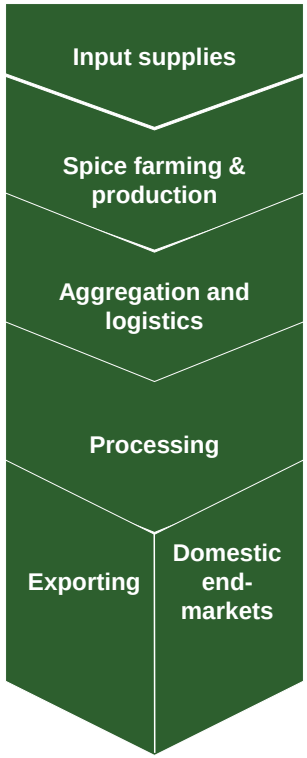
Simplified Chilli value chain		Input supplies	Chilli farming & production	Aggregation and logistics	Processing	Exporting (~5-10%) / Domestic end-markets
Activities		Licensing, Production & Distribution	Farming, drying, trade packaging of Chilli	Transport from farm to *Mandi*, storage, sorting, grading and supply to processors.	Crushing, grinding, cleaning, other value add processing	Marketing and exports foreign importers (in most cases processors are exporters)
Products		Seeds, fertilizers, pesticides	Dried and other cold stored	Sorted and graded Chilli	Crushed, grounded	Export packaged, processed and unprocessed
Key pain points throughout the value chain		Distribution of banned pesticides	Quality and variety not in line with global demand. Limited productivity and non-standard practices.	Contamination during handling Low traceability to farm	Limited demand for Value added segment due to price competitiveness Lack of Incentives for private sector investment in processing	Lower incentives for value added exports (2%) compared to basic (3%). (China gives 10% incentive) Increasing competition from other Chilli producing countries Rejections because of SPS non-compliance
Consolidation level	**Number of players**	10's	1,000,000's	1000's	10's	100's
Key players in the industry		UPL, IFFCO, Nuziveedu Seeds, Bayer, Syngenta, Aries Agro Limited, Madras Fertilizers Limited	~90-95% small and marginal farmers	Small traders, wholesalers, commission agents	AVT Natural, Synthite, Olam Spices, NEDSPICE, JABS, Plant Lipids, ITC Enduring Value, Laxmi enterprises etc.	

1. ~3-5% margin in case of whole Chilli exports
2. < 5% of Chilli procurement is currently done through contract farming

Source: Expert interviews, Press Search

Pain points with the highest impact relate to production and export marketing – Chilli Value Chain

High Medium Low



Pain points	Description and details	Level of impact
Distribution & use of banned pesticides	Distribution and use of pesticides / insecticides banned in importing countries. Use of red and yellow label pesticides (deviations from recommended dosages)	
Limited productivity higher cost of cultivation & limited area under cultivation	Limited productivity of Organic and IPM varieties coupled with high labor costs (due to minimal mechanization) relative to other exporting countries inhibits increase in cultivated area.	
Contamination during handling	Poor post-harvest handling practices lead to contamination. Lack of segregation of crops during aggregation (mandi auctions) and processing activities increases the risk of allergens	
Low traceability to farm	Presence of multiple intermediaries and aggregators limits traceability to farms beyond *mandi* and critically impacts value realization to farmer.	
Limited Demand of Processed goods	Cost effective processing operations in competing countries such as China and Vietnam limit processed exports from India	
Incentives prohibit private sector investment in processing.	No specific government subsides and/or incentives for processed spices; limited incentive for processing spices domestically.	
Limited contact with end customers	Over 50% exports are made through intermediaries in EU and US	
Export Incentives (MEIS & Duty Drawback Scheme)	Whole chilli exports receive higher government subsidy compared to value added chilli. (3% + 0.15% incentive for whole vs. 2% + 0.15% for value added chilli)	
SPS non-compliance	High number of rejections and notifications by EU and US due to SPS violations and quality issues. Port rejections have been due to high number of food safety compliance regulations: **2015** **2019** **EU** 47 52 **USA** 209 109	

Supply-side enablers assessment for Chilli value chain (1/4)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Infrastructure	Lack of Investment in processing infrastructure to meet the value added market demand.	**Proposed amendments Central investment subsidy scheme** a) 25% of Project Cost up to Rs. 5 Cr currently. Should be extended up-to Rs. 30 Cr. depending on total project cost. Projects above 100 Cr to be considered as “Mega” Projects b) Mandatory **Term Loan** (amounting to 10%) condition should be made flexible/waived against submission of certain documentation as needed by the Project Management Agency to perform due diligence of the application. c) Power subsidies @1.5 – 2 Rs. / Unit, should be given d) Wheeling of Electrical Wind Energy should be allowed to for 3rd party plants if the business owns the WTG (Wind Turbine Generator) capacity to optimize power costs.	**Spice Board** **Ministry of Commerce & Industry**
Ease of Trade	Schemes relating to trade should make the environment conducive for business operations	Chilli (HSN Codes – 0904) should be included under the **Interest Equalization Scheme** for subsidized financing of eligible exporters EOU (Export Oriented Units) and Bonded Warehouses (under Sec. 65 of the Customs Act, 1962) importing for re-exports must be exempted from PQ (Plant Quarantine) clearance and allowed to import freely.	**Ministry of Commerce & Industry / Directorate General of Foreign Trade**

Supply-side enablers assessment for Chilli value chain (2/4)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Market Linkages	Lack of market linkages leads to poor price discovery and lesser realization to farmers.	States should identify chilli clusters and create FPOs allowing easier dissemination of best practices, bulk procurement of quality inputs and market linkages	**Spices Board along with State Governments**
Agri-Extension	Farmers use banned pesticides due to lack of awareness	PPP models similar to ITC-GoAP IAEP programme need to be scaled across all chilli clusters of Indian	**State Govts. With relevant depts. (Horti/Agri)**
Insurance to Crops	Uncertain rains year on year climate put farmer at risk	Governments to provide affordable and accessible Crop Insurance	**State Governments/NABARD/ MFIs (Micro-Finance Institutions)**
R&D	Lack of focus on R&D of High yielding varieties	Each state's chilli cluster should be linked to Research body which is to be provided funds for R&D activities contextual to local production base.	**Spices Board along with State / Local Research Bodies**
Inputs Management	Non compliance to MRL export requirements	Restricting use of banned pesticides. Regulating distribution through designated cluster authorities	**Spices Board along with State Governments**
Farm level investments	Lack of Govt. encouragement at farm level investments	Incentivizing corporates to be anchor investors for farm infrastructure in line with new land ordinance	**State Governments**
Water management	Rainfed areas are most affected during poor erratic rainfalls	Govt. to identify and support rain-fed regions with subsidies for water sources to increases area under chilli cultivation.	**State Governments**

Supply-side enablers assessment for Chilli value chain (3/4)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Export Incentives	Competing countries provide marginally higher incentives affecting India's competitiveness. Exporter Incentive Scheme is being removed from 2021-22. Already downsized from 3% (Value Added) & 5% (whole) to 2% & 3% respectively	**Merchandise Exports from India Scheme:** Need to match export incentives inline with competition. • India: 3% on Whole and 2% on Value added exports, • China: 10% for both Incentives need to be restructured to incentivize Value Addition and Investments in processing. "Rodtep" scheme to consider incentive on chilli exports inline with China.	**Ministry of Commerce & Industry / Directorate General of Foreign Trade**
Harvesting techniques	Poor post harvesting techniques lead to contamination & infestation	Govt. to promote and subsidize farm infra/machinery such as tarpaulin, poly-houses etc. for post harvesting practices. Union Ministry of Agriculture to set funds aside under Mission for Integrated Development of Horticulture (MIDH) for implementing mechanization.	**National Horticulture Board (NHB)**
Promoting other Varieties	**Indigenous & Organic varieties** Low focus on indigenous & Organic varieties which fetch higher premiums **Alternative Varieties** Promote varieties which can contribute import substitution.	Corporates and govt. to jointly promote clusters of specific indigenous products. Identification of such areas to be done by Spices Board across India R&D Focus needed to develop a production base of high colour, low heat, high yielding chilli seed varieties can minimize import from Peru and China.	**Ministry of Agriculture along with Spice Board**

Supply-side enablers assessment for Chilli value chain (4/4)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Advance License	Indian Exporters get lesser time (3 months) to fulfil export obligations	**On the lines of Vietnamese practices:** Timeline for export against advance licenses can be increased to 12 months to leverage, - seasonal procurement - Import of chillies for value addition. Allow free & liberalized imports of equipment's of packing material for re-export of value added chilli.	**Ministry of Commerce, Industry and Trade/ DGFT**
Governance Structure	Agriculture is a state subject and enabling structure for states to work on national level policies is needed	Separate lead for each value chain who can coordinate with each state to drive exports in specific value chain. Spices Board to promote back end activities of farming.	**Ministry of Agriculture / Spices Board**
Adoption of GAP (Good Agricultural Practices) Certification	Non-Standard Agri practices leading to heterogeneity in qualities produced	GAP enhances the productivity and quality, reduce the levels of physical, chemical and microbial contaminants in the produce, hence fetching premiums to farmers. Subsidies for certification cost and hand holding in implementation of GAP Practices by farmers. Promote acceptance of IndGAP Certification globally that facilitates traceability of spices for export purposes.	**Spice Board, Local Governments along with Corporates**

Demand-side enablers assessment for Chilli value chain (1/2)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Trade & treaties	ASEAN countries have zero duty for China unlike India, making Indian export uncompetitive. Indian exports to Latin American countries have imposed tariffs. Importers can re-export within Latin America at zero duty. NAFTA creates a competitive advantage for Mexico inhibiting Indian Value Added exports.	FTA's / PTA's to be developed with major spice importing nations. Vietnam is one of the top 3 importers of Indian Chilli. It exports the same to China at zero duty under China-ASEAN CEPT scheme. India should engage in discussion for level playing field for Indian Exporters. Discussions on rationalizing import quality specifications with EU and USA. India to Re-negotiate with USA to keep GSP benefits in place.	**Ministry of Commerce, Industry and Trade, DGFT**
Branding and variety	Lack of focus on branding based on origin / variety by the exporters resulting in losing premiums.	Special focus on key export varieties - High pungency, High colour, low heat. Govt. should encourage branding its attributes with geographical importance by subsidizing the branded exports over bulk.	**Spice Board and Ministry of Agriculture**
Institutions and consortiums	Institutions working to advance farming best practices and improving quality but there is scope to create awareness of health benefits of spices across the globe	Institutions can help in growing consumption of Indian spices across the world by creating awareness of related health benefits.	**Spice Board and Ministry of Agriculture**

Demand-side enablers assessment for Chilli value chain (2/2)

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations	Who will solve?
Adherence to export market requirements	Interventions to form clusters of production to comply with specific export market requirements can improve SPS compliance	Formation of clusters and policies to focus on production for complying to EU/US market requirements could help in export growth.	**Spice Board, Local and State Governments**
Destination market investment support	Investment in warehousing / distribution centers in destination markets lack encouragement.	Govt. should support the investments in terms of branding and distribution centers in destination markets to improve the reach of Indian Spices companies and reduce time to market.	**Central Government**
Market Access	Lost opportunities in Export markets	Push for raising the ban of Indian whole chilli export to Mexico. Incentivize export of Nutraceutical and Oleoresin products to compete in Value Added segments	**Ministry of Commerce, Industry and Trade, DGFT**
Laboratory Infrastructure	Lab technologies not up to date for stringent compliance standards of EU & USA	Allow Duty free import of lab testing consumables and equipment needed for maintaining updated technology. Spices Board to scale up lab technology to test all parameters listed by Food Safe markets	**State / Central Governments**

Chilli Roadmap to 2024

Demand Side Enablers
Supply Side Enablers

India could double the volumes in Chilli exports and realize additional value of 0.6 - 1 Bn. USD

Point Of Departure: (2019)

Chilli (458 Mn Kgs)

- Whole (379 Mn Kgs)
- Value added (79 Mn Kgs)

Revenue of 0.84 Bn. USD

Major Focus Markets

- South East Asia
- USA

A set of identified enablers can help create additional global demand and meet supply requirements

Lever		Opportunity	Value
Trade & Treaties	A	FTA's / PTA's can increase the market share from existing markets while entering new markets and segments. • Destinations like Mexico can be redeveloped • Increasing share in ASEAN, LATAM and EU markets.	**0.3 to 0.4 Bn. USD**
Adherence to export market requirements	B	Formation of clusters and policies to focus on production compliant to EU/US market norms will contribute to exports GAP Certification can help in fetching premiums.	**0.1 – 0.2 Bn. USD**
Branding & Variety	C	Subsidies in branded segment to boost value added exports. Branding and ensuring sustainable production of key export varieties with special focus on Organic, High pungent, High colour, low heat could lead to better premiums in long term.	**0.05 – 0.1 Bn. USD**
Govt. Support through policies & reforms	D	Govt. policies to boost trade through policies: ▪ Increase of incentive for Value added chilli exports at par with competition (China -10%, India – 2%). Restructure incentive so as to favour value added exports ▪ Central investment subsidy schemes (Limits to Rs. 5Cr now) ▪ Subsidize powder charges (No subsidy now) ▪ Agri Extension system and Insurance to Crops	**0.1 – 0.2 Bn. USD**
Farm level management	E	R&D on high yielding and pest resistant varieties Capital investments at farm level increase yield & product compliance and automation. Port rejection at destination markets can be reduced by restricting the use of banned pesticides.	**0.05 – 0.1 Bn. USD**

Point Of Arrival: (2024)

Chilli (900 Mn Kgs)

- Whole (650 Mn. Kgs) – 1x
- Value added (250 Mn. Kgs) – 3x

Revenue of 1.4-1.8 Bn. USD

Major Focus Markets

- LATAM
- ASEAN
- EU

Measurable Milestones for Central & State Govt.

Central Govt		State Govt	
Develop FTA's with major Chilli importing nations and create access to new markets. LATAM, ASEAN and EU are the markets to concentrate.	**Execute in 1 year** (reduction in duties)	**Sophisticated testing facility** Lab Infrastructure capable of testing for all listed norms of Food Safe markets to ensure product compliance. Govt. to allow Duty free import of lab testing consumables and equipment needed for maintaining updated technology.	**Duty Free Imports to be enforced in FY 2020-21**
Restructuring and scaling Export Incentives Focus towards value added exports inline with competing origins such as China. (India offers 2% on value added exports and 3% on whole to its exporters, some countries offer up to 13% for both)	**Restructure before the end of FY 2020-21**	**Adoption of GAP Certification** Popularizing Adoption of Good Agriculture Practices (GAP), Integrated Pest Management (IPM), Integrated Nutrient Management, Good Post harvest Practices (GPHP) by conducting awareness programs. Subsidies of certification cost (IndGAP) and do hand holding of farmers needed.	**Subsidy schemes for certification enforced in FY 2020-21**
Infrastructure Increase subsidy through Central Investment Subsidy Scheme for larger investments (from 5 Cr to 30 Cr). Offer Power subsidies. Mandatory Term Loan (amounting to 10%) condition should be made flexible/waived.	**Update Scheme by end of FY 2020-21**	**R&D** R&D on high yielding, pest resistant and required seed varieties in the market.	**MoU to be signed with Agri Universities within FY 2020-21**
Ease of Trade Chilli (HSN Codes – 0904) should be included under the **Interest Equalization Scheme** for subsidized financing of eligible exporters. EOU (Export Oriented Units) and Bonded Warehouses (under Sec. 65 of the Customs Act, 1962) importing for re-exports must be exempted from PQ (Plant Quarantine) clearance and allowed to import freely.	**With Immediate effect**	**Harvesting techniques** Govt. to promote and subsidize farm infra/machinery such as tarpaulin, poly-houses etc. for productive post harvesting practices.	**Subsidy schemes for certification enforced in FY 2020-21**

Agenda

- Shrimp
- Buffalo
- Mango
- Vegetable oil
- Wood
- chilli
- **Rice**

Executive Summary – Rice Value Chain

Global and Domestic Landscape

Global Rice Trade growth - **6.72% CAGR (last 6 years)**

India:

2nd largest producer at 115 MMT (6-7 MMT Basmati)

34% lower productivity (3.9 v/s global 5.9 MT/Ha)

L**argest exporter (11.5 MMT -** over 30% market share

of which **4-4.5 MMT is of Basmati)**

FCI is the **largest rice buyer (40 MMT)** for PDS with MSP prices increasing year-on-year.

India's Competitiveness in the Value Chain

Basmati Rice is **unique to India: 75% of Global production**. Scope of crop expansion in GI areas.

India's competitors : Thailand and Vietnam – cost competitive players with better consistency in terms of quality, and standardized payment terms.

Non Basmati Rice – large surplus pool, needs to be made available for exports by modifying FCI Procurement strategies

Potential Opportunities for growth

Middle East is a major market for Basmati while **Africa** is major market for Non Basmati Rice

Scope of expansion: Non Basmati into South East Asia (Indonesia, Philippines, Malaysia), North Africa (Egypt, Algeria, Tunisia). **Basmati into Europe, USA and South America**.

Promoting Basmati into new markets and **creating an Indian (Non Basmati) Brand** of higher value like **Sona Masuri** similar to the Thai Jasmine variety.

Organic and Food Safe Markets like US, EU and Australia which are highly organized and growing markets

Key Pain Points	Enablers	Stakeholder(s)	Measurable Metrics
Excess FCI Buying; Increasing MSPs	Government Policies (Bhavantar Scheme)	Central Government, FCI	Export Surplus (MT) MSP v/s Export Price
Low Productivity and High water usage	Input Management	State Governments, R&D Bodies	Productivity (Kg/Ha) Litres/Kg of Rice
SPS Violations in EU (Tricyclazole Issue)	Quality Standards of Destination Markets	APEDA & Private Players	Reduction in Rejections No. of PPP Clusters
Tariff Barriers	Trade Relations	Ministry of Commerce	No. of Trade Agreements
Counterparty Defaults	Risk Management	Futures Exchanges, Govt. Banks & ECGC	Number of Defaults & Recoveries
Logistics cost is 7-8% higher for India	Export Incentives	Central Government	Landed cost difference with competitors

Potential for Indian Exports to grow from 10-11 MMT to 16-18 MMT and US$ 7-8 Bn to US$ 12-14 Bn. by 2024

India is the world’s largest exporter of rice, but challenges remain

Key insights

- Indian Rice Industry is broadly classified under Basmati & Non Basmati.
- India produces 115 MMT of Rice, of which only 6-7 MMT is Basmati Rice. Of this 110-117 MMT, 40-50 MMT is procured by the govt. under PDS.
- Indian is the world's largest exporter of Rice (10-12 MMT of which 4-4.5 MMT is Basmati).
- However, last 2-3 years India have been loosing customers to competing origins (Thailand, Vietnam, China Myanmar, Cambodia, Pakistan) on account of geo-political issues, price competitiveness and inconsistent govt. policies.
- Indian exports to EU have come down due to pesticide residue issue in Indian production
- Issues on both categories are separate & have been addressed individually due to differences in their marketing mix and India's weightage on Global Supply and Demand.

Key issues and challenges

- India's exports are stagnant in last 3-4 years (10-12 MMT) in volume terms and dropping in value terms.
- India's position as top exporter is gradually slipping as competing origins scale up in terms of affordability, quality, production and consistent export policies.

Key Challenges are as follows :

- Low productivity and stagnant production
- Lacking export competitiveness
- Varietal limitations
- Quality and pricing inefficiencies
- Exportable surplus trapped with FCI
- Receding Water table & Global warming

Production landscape of India, all rice varieties

SOURCE: APEDA; UN COMTRADE; DOGR; NAFED, USDA

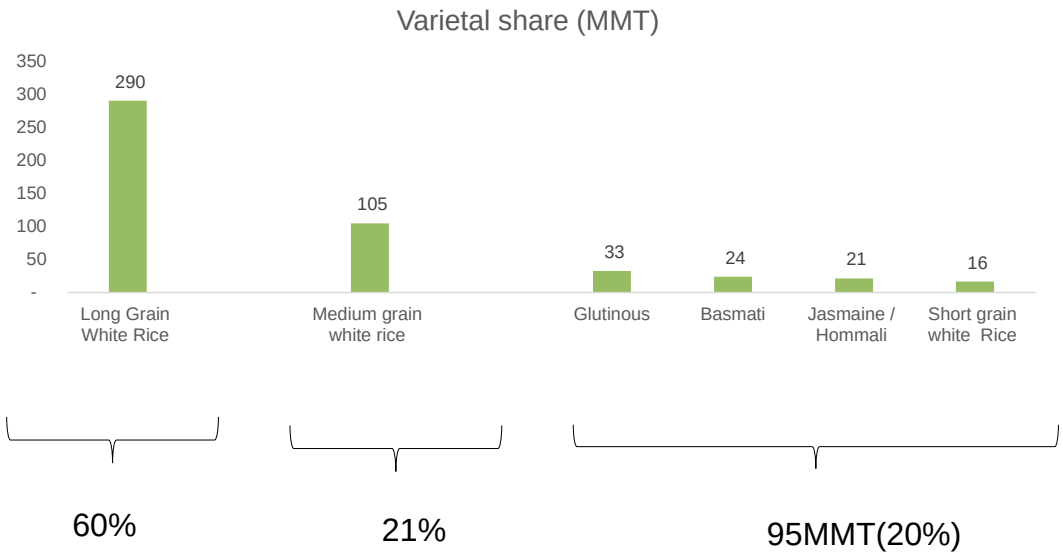
Water Management in Rice
India's Rice Exports seen through a lens of Sustainability

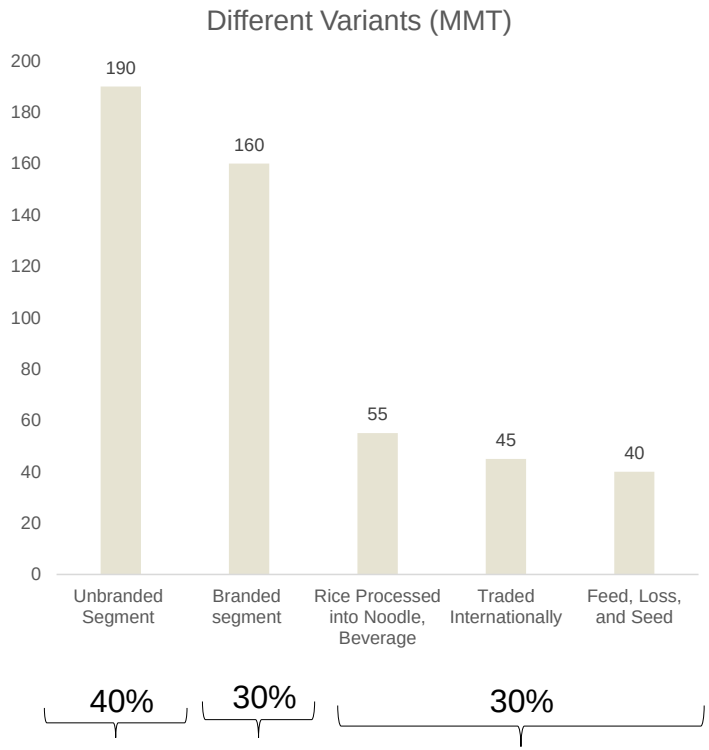
- Receding Water Table is a challenge and a huge threat to the sustainability of Indian Rice Production. Paddy being a water guzzling crop, consumes 2,600 to 5,400 litres of water for 1 kg of Rice production. Paddy cultivation because of its traditional way (flooded area transplantation) is one of the biggest contributor to Global warming.
- A Subsidy Structure needs to be introduced for controlling irrigation in rice via adoption of technologies including but not limited to:
  - **Laser Land Levelling :** reduces the duration of irrigation
  - **Drip Irrigation :** saves up to 30% water
  - **Alternate Wetting & Drying (AWD) Method :** saves up to 30% water
  - **Direct Seeding of Rice (DRS) Method :** can save up-to 32% water compared to transplanted rice.
  - **Land preparation practices** like Shallow tillage & shortened land preparation should also be promoted to improve water efficiency
- R&D on low irrigation varieties should be a key focus area to ensure sustainability of domestic water resources while enabling growth in Rice Exports.
- The Government also needs to consider diversification of its crop mix away from Rice in areas where the Water Table is critically threatened such as Punjab (Annually receding by .7-1 meter) and towards areas which are Agro-climatically suited for Rice production.

SOURCE: Secondary Research

Some Interesting Rice Facts

Major Varietals Basket {490 MMT}



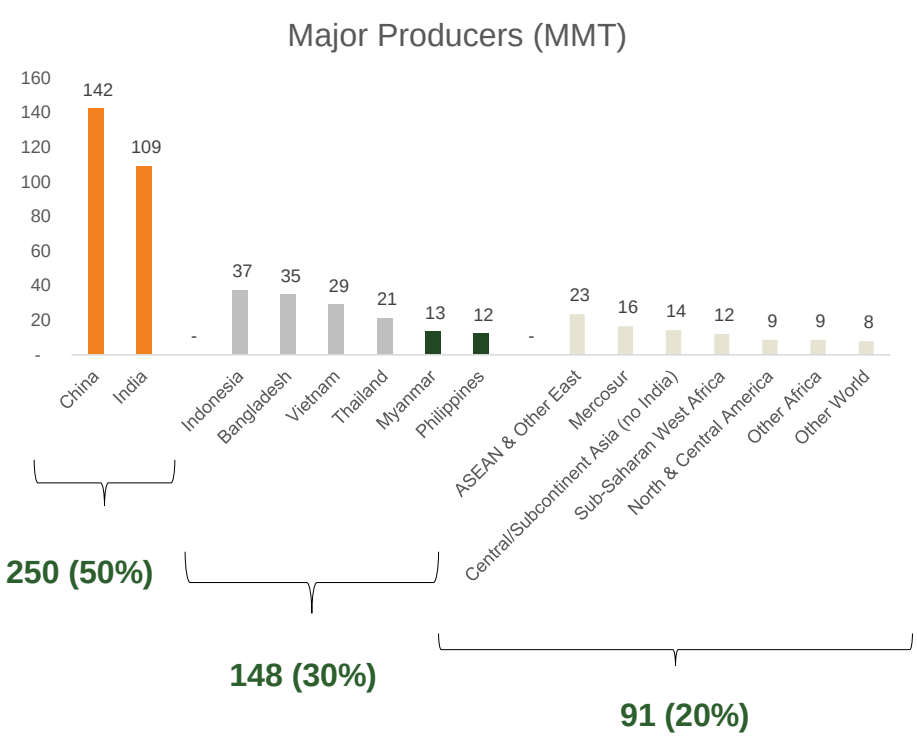


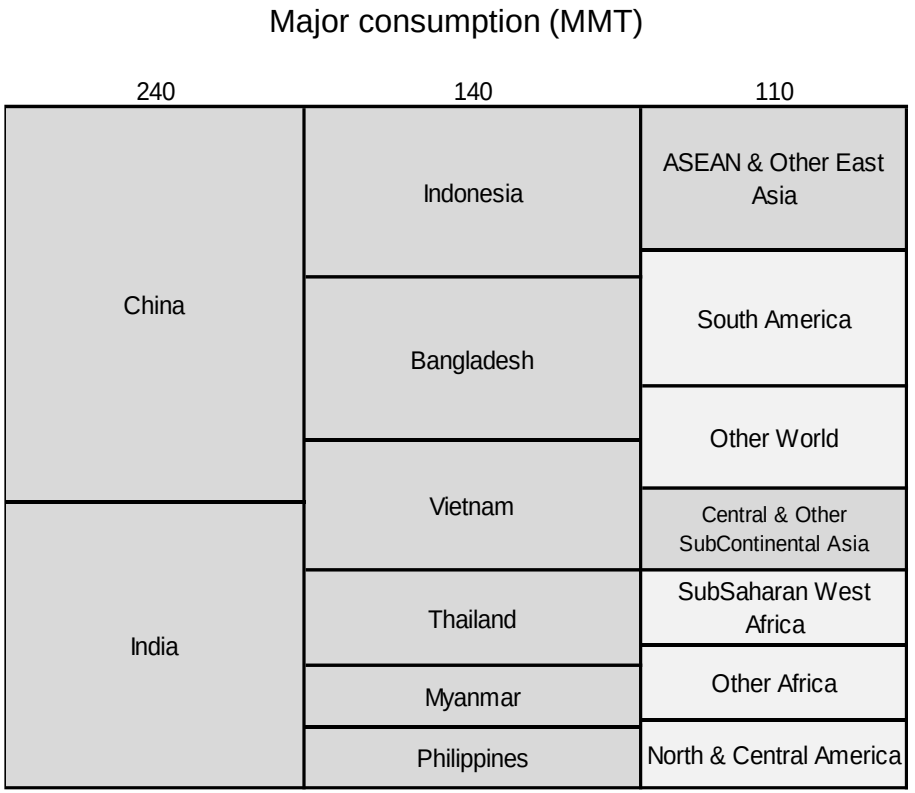
The branded rice segment forms about 30% of the world's rice basket while India largely exports in unbranded form capturing lower premiums. Data on branded rice exports specifically is not captured at exit points (at best 10% of India's total exports)

SOURCE: UN COMTRADE – (2012-2019 Averages), Bloomberg

Some Interesting Rice Facts

Major Production & Consumption Basket {490 MMT}

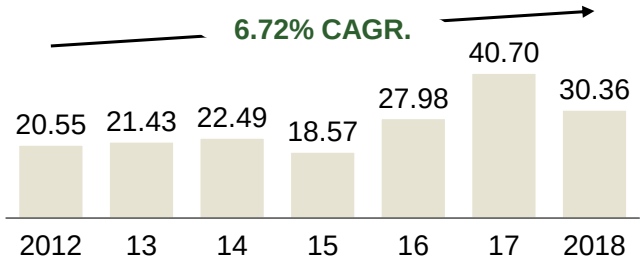




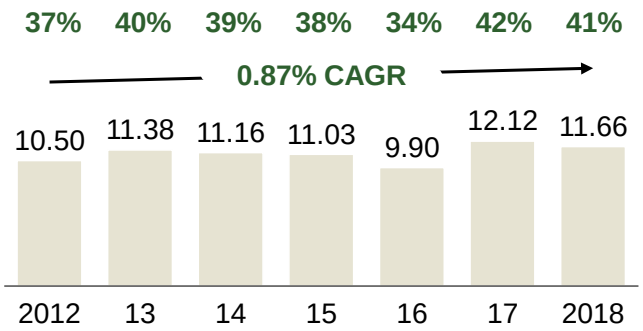
SOURCE: UN COMTRADE – (2012-2019 Averages), Bloomberg

India's Rice production and export volumes have been stagnant over the years

Global Rice Trade, $bn

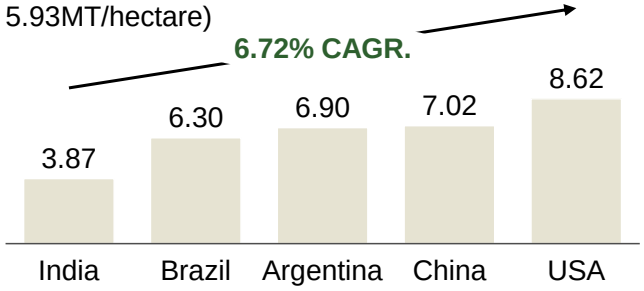


Indian value chain Rice exports, MMT

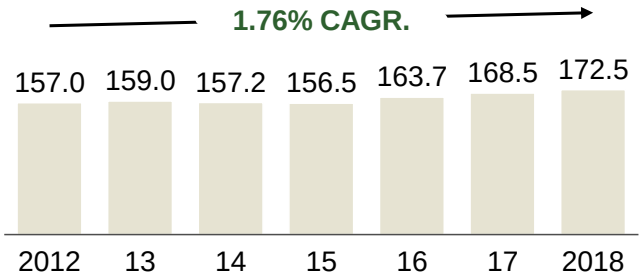


Paddy Global farm yields,
MT/hectare

India is 34% less productive than global benchmarks (Global Avg. (top 10 producers) is 5.93MT/hectare)



Indian value chain Paddy production, MMT

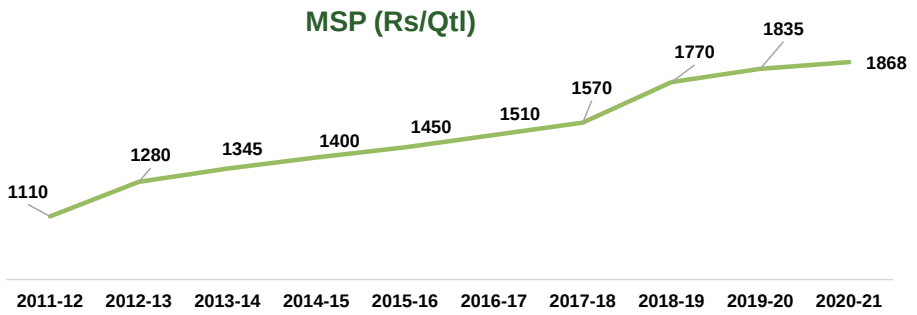


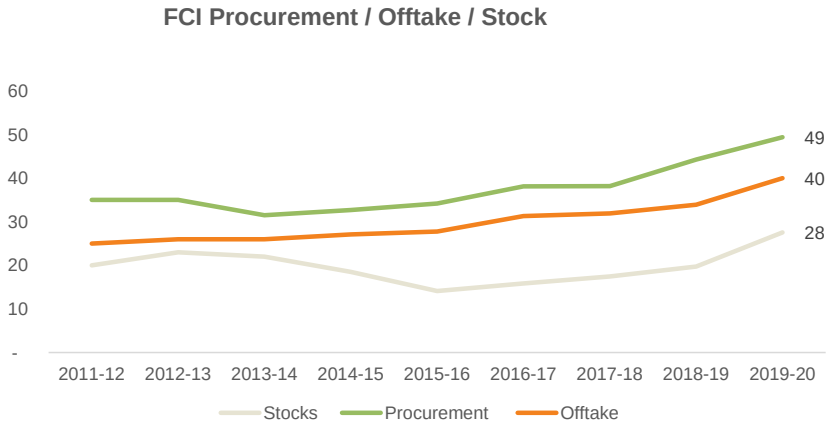
SOURCE: UN COMTRADE (Import and Exports); FAOSTAT (Production/Yield)

Comments:

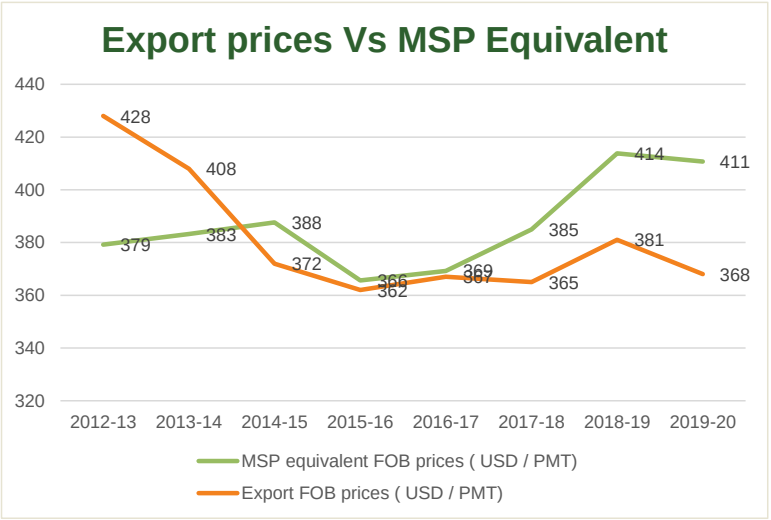
- Global Rice Trade has grown at a CAGR 6.72% in the last 6 years.
- Indian Rice production and exports have been fairly stagnant. Increasing FCI procurement year-on-year along with hikes in MSP is leading to smaller export surplus and uncompetitive pricing in international market.
- Indian productivity is lagging behind global averages, with U.S.A as global leader in paddy yield.
- The Value Chain needs to also be looked through from a sustainability lens given the water consumption.

Ever increasing MSPs backed by aggressive FCI Procurement leave little exportable surplus for exports, at uncompetitive prices





SOURCE: FCI, DFPD



Comments:

YoY increase in MSP and Increased procurement by FCI is leading to market distortion thereby making Indian prices uncompetitive for Rice exports

Despite higher offtakes, FCI stocks are piling up but not getting released for the Open market

Exportable surplus is getting trapped in FCI/govt. stocks

Indian Rice Balance sheet

all Fig in '000 MT

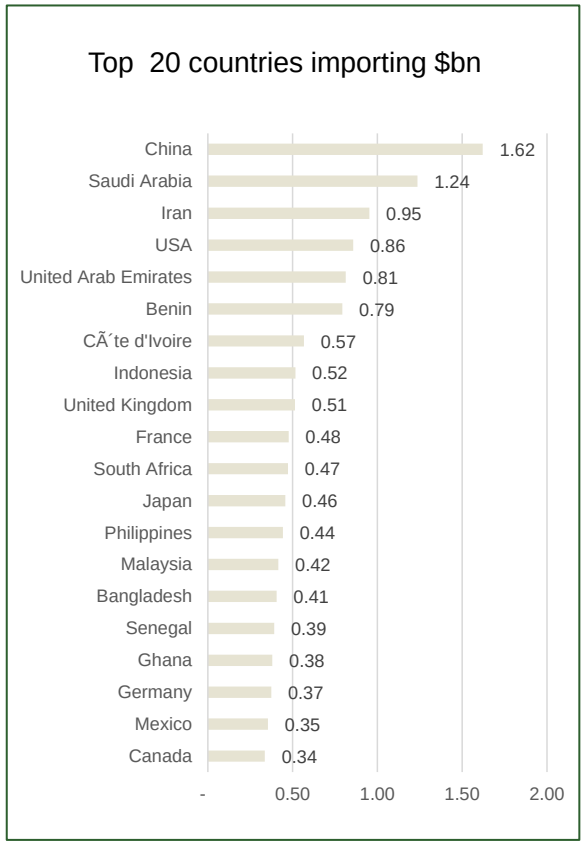
Attribute	Country	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Area Harvested '000 HA	India	44,006	42,754	44,136	44,110	43,499	43,993	43,774	44,160	43,600	44,000
Beginning Stocks	India	23,500	25,100	25,500	22,800	17,800	18,400	20,550	22,600	29,500	35,000
Production	India	1,05,301	1,05,241	1,06,646	1,05,482	1,04,408	1,09,698	1,12,760	1,16,480	1,17,939	1,18,000
Total Supply (F)	India	1,28,801	1,30,341	1,32,146	1,28,282	1,22,208	1,28,098	1,33,310	1,39,080	1,47,439	1,53,000
Exports (E)	India	10,376	10,869	10,619	12,238	10,357	11,710	12,041	10,420	10,100	11,000
Domestic Consumption (G)	India	93,325	93,972	98,727	98,244	93,451	95,838	98,669	99,160	1,02,339	1,04,000
Ending Stocks (A) = (F-E-G)	India	25,100	25,500	22,800	17,800	18,400	20,550	22,600	29,500	35,000	38,000
Government Stock (B)	India	20,000	23,000	18,629	14,157	15,872	17,470	19,744	27,633	33000 (E)	35000 (E)
Marketable Surplus (A-B)	India	5,100	2,500	4,171	3,643	2,528	3,080	2,856	1,867	2,000	3,000
Buffer stock norms ' (C)	India	7,200	7,200	7,200	11,100	11,100	11,100	10,200	10,200	10,200	10,200
Excess stock with Govt (B-C)	India	12,800	15,800	11,429	3,057	4,772	6,370	9,544	17,433	22800 (E)	24800 (E)

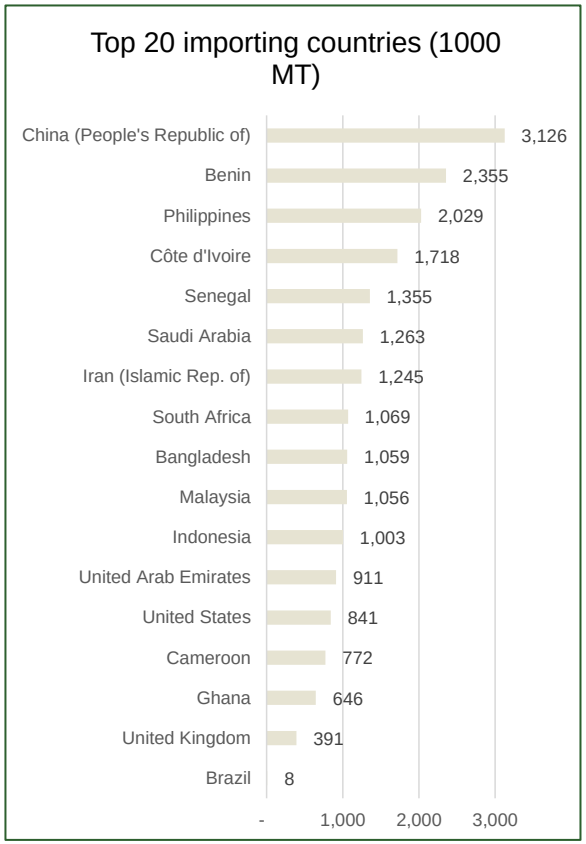
Stocks getting trapped at FCI level leaving lesser marketable surplus for exports

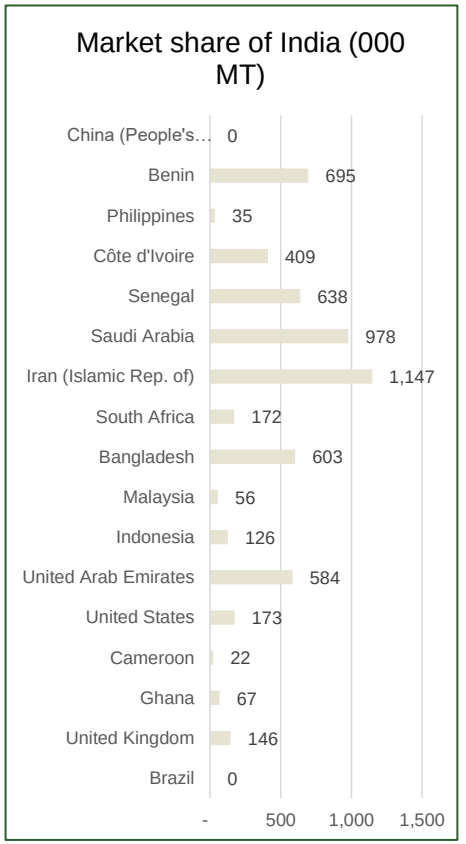
Marketable surplus is declining every year.

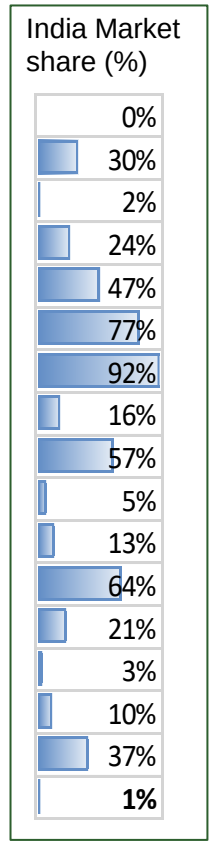
SOURCE: USDA, FCI, APEDA

India predominantly exports to Asia, Africa & EU with scope to increase market share in multiple other importing countries





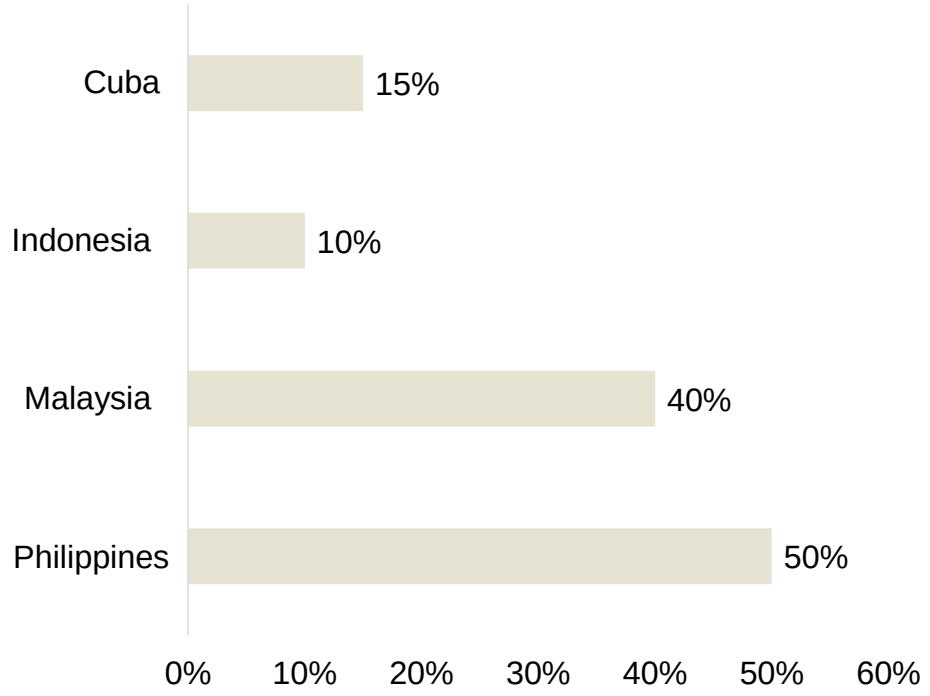




SOURCE: UN COMTRADE (Global); DGCIS (India)

Trade relationships, duties and non-tariff barriers

Import duties for Rice value chain for top import markets, %



SOURCE: Secondary Research

Known issues with Indian exports for Rice Value Chain

- **Indonesia** levies a 10% import duty **for Indian rice**, while Pakistan has an **import duty free** access.
- In **Philippines**, consignments from **India** incur a 50% duty, while it is 35% for rice exports from other ASEAN (Association of Southeast Asian Nations) countries.
- ASEAN countries are having lower import duties through a **Preferential Trade Agreements (PTAs)** with Malaysian govt for Rice exports. Given higher oil imports, India should leverage the same for favorable bilateral agreements.
- **China:** Despite India's significant import bill from China, Rice exports are negligible to China. A sectoral agreement for Indian rice exports is required to allow access to Chinese Market.

Value Addition in the Rice Value Chain

Comments : India predominantly exports base commodity and should focus on further value add

Fortified		Organic		Ready to Eat		Compliance Rice		Healthy segment (Brown , Black , Low GI)	
Global Market Size, $bn	$2.6	**Global Market size ,** $bn	$0.6	**Global Market size,** $bn	$1.0	**Global Market size,** $bn	$1.4	**Global Market size ,** $bn	$2
Global trade flow, $bn	$0.72	**Global trade flow,** $bn	$0.2	**Global trade flow,** $bn	$ 0.16	**Global trade flow,** $bn	$ 1.0	**Global trade flow,** $bn	$ 0.26
India's Export, $bn	$4	**India's Export,** $bn	$0.001	**India's Export,** $bn	$.06	**India's Export,** $bn	$.7	**India's Export,** $bn	$.083
Top 3 Countries	• USA • China • Japan	**Top 3 Countries**	• US • UK • Europe	**Top 3 Countries**	• US • France • UK:	**Top 3 Countries**	• Europe • US • UK	**Top 3 Countries**	• Japan • South Korea • USA

SOURCE: UN COMTRADE, BLOOMBERG

Rice Value Chain is characterized by fragmented Production Base with High counterparty risk and absence of Risk Management tools

Simplified Rice value chain		Input supplies	Farming & production	Milling	Logistics	Exporting (10%) Domestic end-markets
Activities		Seeds, Fertilizers and Pesticides production & distribution	Farming, drying, trade packaging and delivery to Mills	Storage, sorting, grading, milling, packing and selling to exporters or to government	Truck and Rake movement to ports, storage, barges an container stuffing, vessel loading	Exports through Brokers or trade houses or direct destination buyers
Products		Seeds, fertilizers, pesticides, Farm mechanization	Paddy and Hay	Rice, Husk, Brokens	Rice and Packing Material	Export processed Rice
Key pain points throughout the value chain		Distribution of pesticides, and low yielding seeds High input material rates	Low Productivity & Stagnant Production	Small milling capacity Fragmented production & processing zone	Logistics Cost CONCOR (Container Corporation of India) & Container Handling at Ports Port Infrastructure	Multiple external middle men/enterprises Increasing competition from other producing countries Low export competiveness
Financial indicator	**Value Share, %**	5%	60%	20%	10%	5%
Consolidation level	**Number of players**	10's	1,000,000's	1000's	10's	100's
Key players in the industry		UPL, IFFCO, Nuziveedu Seeds, Bayer, Aries Agro Limited, Madras Fertilizers Limited, Syngenta	~90-95% small and marginal farmers	Small Millers	Local Transports, Shipping Lines	India Gate Basmati Rice, Daawat The Finest Basmati

SOURCE: Expert interviews, Press Search

Pain points in value chain

High Medium Low

Key areas	Pain points	Description and details	Level of impact
Farming, Production, Logistics	Low Productivity & Stagnant Production Lack of Public Infrastructure	Due to seed heterogeneity and variance in farm practices, the final produce is uneven in appearance against global standards. India's productivity is 3 Tons/Ha compared to global average (6 Tons/Ha) resulting in higher prices. Indian production, especially that of Basmati (6-7 MMT) has been stagnant at 100-110 MMT in last 10 years. Silo infrastructure for storing rice unavailable to farmers.	Medium High
Quality	Quality Conditions	Port rejections of Indian Rice on Pesticide MRLs, Limited share in EU & USA Markets	High
	Varietal Limitation	Not able to access major rice consuming destination markets like Japan, China, and Korea due to customer preference for Glutinous Rice which is not in line with production	Medium
Govt. Role	Taxation & Cess	Different state APMC have different tax structure ranging from 1% in Delhi to 4% in Punjab, leading to distortion in market and malpractices	High
	Interest Subvention	Interest subvention of 5% to small and medium enterprise is leading to most small millers to turn to exports with very low priced offerings.	High
	Lack of focused approach for Rice exports	Ministry of Commerce & APEDA is handling a diverse and voluminous Basket of Products where Rice is just one of the many Products	Medium
Value addition	Marketing Support	Generic marketing of Rice in overseas markets doesn't serve India's interest to increase Revenues in major markets or entering new markets. Brand building activities are inadequate for higher value capture	Medium
	Branded Exports : Company Brands	TDS of 22% levied on brand protection	Medium
Markets	Tariff/Non-Tariff Barriers : Non Basmati Exports	Non-uniform duties **:** Higher import duties imposed by Philippines on India (50%) v/s Thailand (35%). Indonesia has preferential Trade Agreement with Pakistan for zero duty while Indian Rice attracts US$ 32/ MT duty	High
	New Markets	US led quality norms are catching up fast in countries such as Jordan, Qatar & Lebanon. Overall imports of Iraq & Yemen have increased from 1 lakh MT to 5 Lakh MT in last 5 years	Medium
	Logistics Cost	India's logistics cost is almost 7-8% more than competing origins like Thailand & Vietnam.	High

SOURCE: Secondary Research

Supply-side enablers assessment for rice value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations
Govt. policy	**Separate Export promotion Council for Rice Exports:** Ministry of Commerce & APEDA is handling a diverse and voluminous basket of Products where Rice is just one of the many Products	Establishing a **separate Export Promotion council for Rice** which can focus on issues and promotion in a comprehensive manner
	Taxes and Cess: Different state APMC have different tax structure ranging from 1% in Delhi to 4% in Punjab, leads to distortion in market and malpractices.	**Uniform cess and tax structure** across the country to encourage expansion of sourcing basket
	Interest Subvention : Interest subvention of 5% (for MSMEs) is leading to most small millers to turning to exports while large enterprises cannot avail any subvention.	Rice should be brought under Agri-processed commodity and should fall under Interest subvention scheme. Alternatively, large and medium sized enterprises should also come under subvention for rice exports.

SOURCE: Secondary Research

Supply-side enablers assessment for rice value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations
FCI procurement & MSP	**MSP :** FCI is buying almost 1/3 of the total crop at MSP thus, creating a market distortion making Indian Rice uncompetitive in export market (especially white rice). Year on year hike in MSPs is making India lose its market share in Non Basmati segment to newer origins such as Myanmar, Cambodia and Vietnam **Govt .Buying :** Govt Buying of 38-40 Mln Tons is almost half of available crop after Farmer retention, leaves very low surplus for exports	Beyond Buffer Stock procurement FCI should introduce a Price differential scheme **(Bhavantar scheme)** to be introduced where price difference between MSP and open market prices can be credited into farmers account as **DBT (Direct Benefit Transfer)** Govt. stocks built up over & above required levels, should be offered in the open market within the same season at appropriate market based pricing through **Open Market Sale Scheme (OMSS) so that the surplus stocks are released for export markets**
Farm Productivities, logistics and infrastructure	**Low Productivity & Stagnant Production:** India's productivity is low (3 Tons/Ha) v/s the average of Top global exporters at 6 Tons/Ha leaving lower surplus at higher prices Silo Infrastructure for farmers unavailable forcing farmers to liquidate stocks at unfavourable prices	Govt to focus on improving productivity in states like Bihar, Orissa, Jharkhand & UP where average yield is less than 2.5 MT/Ha as against a National Average of 3.9 MT/Ha). Crop rotation to be promoted to improve productivity Focus on Soil health by State Agri Departments through Crop residue management & Green manure usage. In case of Basmati: New varieties almost take 5-7 years to develop as brands, caution should be exercised whilst launching new varieties, lest established brands be diluted. Agri Universities should focus on developing high yielding, pest resistant varieties Silo Infrastructure needs to be created in accordance to production volumes
Water management	**Receding Water Table is a challenge & Climate change is** posing a big threat to the exports of Rice from India Paddy being a **water guzzling crop** – consumes on an average 3000-4000 litres for 1 kg production. At the same time, its one of the biggest contributor of Climate change as well	Reimagine / Rethinking of paddy cultivation – Following methods to improve water efficiency upto 15-20% (Subsidy Structure to be introduced for adoption of these technologies) 1. Laser land levelling 2. Drip Irrigation – 3. AWD Method 4. Direct sowing (Direct seeded varities)

SOURCE: Secondary Research

Demand side enablers assessment for value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations
Tariff / Non Tariff Barrier	**Philippines** - Higher Import duties imposed by **Philippines** on India **(50%) v/s 35%** to other ASEAN countries. **Indonesia** has preferential Trade Agreement with **Pakistan for zero duty**. **Indian Rice exports are charged US$ 32/ MT duty** **Malaysia: PTA with ASEAN countries** makes Indian exports uncompetitive. India's imports of palm oil should be leveraged for Rice exports **Korea** using exclusionary tactics by issuing origin specific tenders. India is unable to export due to such tenders. **China:** Though there has been approvals of few rice exporter, export volumes are negligible	**PTAs: Leverage Trade talks, doing bilateral agreements** and India's import of Palm Oil to remove inequity in Rice duties. Given huge oil imports, India should have **PTAs with** Indonesia and Malaysia to boost rice exports volumes A **Separate dialogue with Korean Government via Ministry of Commerce** through Ministry of External Affairs for Sectorial Agreements on Non origin/India specific tenders Given our huge imports from China, we should leverage that to have **sector specific Rice exports to China**
New Markets	Rice Imports of Iraq & Yemen over all imports have increased from 1.00 lakh MT to 5.00 Lakh MT over the last 5-6 years Latin America, Russia, Far East (Taiwan, Japan) are potential markets and need to be tapped.	**Ministry of Commerce to give a Marketing/Trade Promotion subsidy of 90%** for developing new markets **Focus Market Scheme (FMS): Volume based** for Basmati / premium grades can be provided for new markets**. APEDA should play a key role in this.** Government to facilitate mechanisms for trading with countries like Iraq

SOURCE: Secondary Research

Demand-side enablers assessment for rice value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations
MRL Limits / Quality adherence	**Limited share in EU & USA** markets due to port rejections of Indian Rice on Pesticide MRL issues is leading to Pakistan capturing India's Basmati market share US led quality norms are catching up fast in countries like **Jordon , Qatar, Lebanon**	PPP models to be encouraged to grow rice which meets the market standards of importing markets like US & EU where MRL limits are very stringent by developing Pesticide free Areas. Discounts to Exporters/Yield drop compensation to Farmers to be introduced. Under APEDA's Export Promotion Forum, creation of an International Standards Adherence Facilitation Body to negotiate on Bilateral trade treaties to harmonize on Indian pesticide norms. For e.g. **EU norms for Tricyclazole is 0.01 PPM whereas for US it is 3 PPM** This needs to be done on an urgent basis with MENA (Middle East and North African) countries as "US led" pesticide norms are catching up.
Varietal diversification & Value added premiumization	Major Rice eating and importing Markets like **Japan, China, and Korea are inaccessible** due to customer preferences for Glutinous Rice **Indian Brands and Varieties to be promoted as India's answer to Thai Jasmine Rice :** Basmati export is at $1000/MT price bracket and at $400 price for Non Basmati. There is a need to grow and promote a mid range standard variety on lines of Thai Jasmine Rice Consuming pattern is moving towards **healthy and value added segment** post COVID-19	Introduction of **new varieties such as glutinous rice** and longer cylindrical varieties - extension institutions, Agri Universities to support with better implementation of Lab to Land programs. Identification of Ideal growing areas is crucial. **APEDA** in consultation with Industry associates: ▪ To promote Specialty Rice like **Sona Masuri under low GI Brand** ▪ To promote **Ponni rice** ($ 600-650 price band) which can compete with Thai Jasmine as these varieties have consumer preference in certain markets ▪ To promote **short grain aromatic varieties** like **Kala Namak (UP), Black Rice (NE)** protected under GI as specific regions Ministry of Commerce to provide Incentives / subsidies to Industry for establishing value chains & markets for **Value Added products** such as **Fortified Rice, RTE/RTH, organic Rice & Black Rice. Subsidy for brand promotion expenses should be considered**

SOURCE: Secondary Research

Demand-side enablers assessment for rice value chain

High Medium Low

Enabler	Issues / Concerns	Suggestions/ Recommendations
Branding and Marketing	**Marketing Support**: Generic marketing of product categories in overseas markets reduces India's price realization in major markets - existing markets or opening new markets **Branded Exports**: Most Rice exports are done in Private labels with brands belonging to overseas customers. Maximum value in the chain is captured at the brand end in destination.	APEDA to give subsidy for **brand building** in **overseas markets** for higher value capture to **premier Trade Houses** Need for a comprehensive scheme for promoting Indian brands and provide support under the Foreign Trade Policy. **Registered Indian Brands (upto 5 kg individual packs** and 20 kg in a master carton) should be considered for MEIS benefits to increase branded export.
Risk Management	**Payment Mechanism :** In Iran, India has issues with payment terms and unreliable counter parties **3rd Country Remittance :** Many cash strapped 3rd world countries like Sudan, Syria and other countries route payment via 3rd country due to USD scarcity and US sanctions **Price Risk:** Large volume exports throughout the year are difficult due to prices and volume	Clear directives on payment terms with designated banks. Alternatives through UAE or other payment centres should be worked out India needs to relax 3rd country payment. India must work to facilitate payment from sanctioned countries like Sudan, Syria etc. Work with NCDEX/MCX for putting in place **derivatives contracts** on local commodity exchanges to provide price risk mitigant for rice exporters
Logistics & Infrastructure	**Logistics Cost:** India's logistics cost is almost 7-8% more than other competing origins like Thailand & Vietnam. **Port Infrastructure :** Poor Infrastructure at ports like Kakinada which handles more than 25% of the total export volumes	India's Rice exports should be considered for subsidy to make Indian rice prices at par with other competing origins **(MEIS @ 8-9%)** More focus to be given on improving infrastructure to increase efficiency & turn around time i.e. Berthing facilities, Warehousing & Roads to build capacity for loading volume of 4 MMT p.a.

SOURCE: Secondary Research

Rice value chain analysis

Value chain levers for Rice: India could realize an additional value of 5-6 Bn. USD by pursuing a portfolio of initiatives

Point Of Departure: (2019)

Rice (10-11 MMT)
- Basmati (4-4.5 MMT)
- Non-Basmati (6-6.5 MMT)

Revenue of 7-8 Bn. USD

Major Focus Markets
- Middle East (Basmati)
- Africa (Non-Basmati)

Lever	Opportunity	Value[1]
Increasing demand	Ⓐ Increasing market share in existing markets while entering new markets	**2.5 - 3.0 Bn. USD**
Branding Indian Exports	Ⓑ Niche varieties / Value Added Premiumization: 1. Organic rice 2. RTE/ RTH 3. Healthy segments 4. Compliance Rice 5. Sona Masuri / fine varieties	**1 – 1.5 Bn. USD**
Tariff & Non-Tariff Barriers	Ⓒ S.E. Asia Markets & China can be leveraged with PTA / Special agreements	**1.5-2 Bn. USD**
Increasing productivity	Ⓓ Increase rice production through higher productivity	
Govt. Support through policies	Ⓔ Govt. policies to boost trade: 1. Release of stocks 2. MEIS 3. Other policies	

Point Of Arrival: (2024)

Rice (16-18 MMT)
- Basmati (6-6.5 MMT)
- Non-Basmati (10-12 MMT)
- VAP (.5-1 MMT)

Revenue of 12-14 Bn. USD

Markets (Across Continents)

A set of identified enablers can help create additional global demand and meet supply requirements

Demand Side Enablers

Supply Side Enablers

1. Value only considered from Demand Side lever assuming supply side enablers would meet into new created demand

Measurable Milestones for Central & State Govt.

Central Govt		State Govt	
▪ **Interest Subvention for Rice Enterprises** Extending interest subvention to all rice enterprises by bringing Rice under Agri-processed commodities	**Time taken** (to be operational)	▪ **PPP Models with Private Anchors** for MRL Compliance and water conservation. Dissemination of central schemes/subsidies with the right extension support to be given in rice catchments. Private players to also build package of practices to align production to MRL compliant quality which enables exports to USA and EU	**Time taken** (Identifying private anchors; phase wise targets for farmers in cluster/ catchment area
▪ **National Scheme for Irrigation Technologies** for Rice to promote via subsidies & incentives to farmer clusters/FPOs. Funds to be earmarked for purpose of farmer welfare, sustainability of crop and water conservation.	**Time taken** (to be operational)	▪ **Building Silo Infrastructure** for storage of farmer produce	**Storage Capacity (**MT Rice)
▪ **Incentives for Branded exports over bulk** exports to be rolled out to allow capturing higher premiums domestically and enabling better returns for farmers	**Time taken** (to be operational)	▪ **Price Differential & Open Market Sale Schemes** to be introduced for minimization of market distortion due to MSP Procurement	**Export Surplus Created** (MT Rice)

Rice value chain analysis through Covid lens

High Medium Low

Constraints	Impact	Reaction
Supply Side Short term disruption in terms of logistics and operations in the rice value chain. Inland milling & logistics as well as port operations affected.		Higher logistics costs & drop in operational efficiency High counter-party default risk Labour Unavailability
Demand Side Long term disruption in customer preferences – more focus on quality, organic segments and traceability measures. Short term spike in demand & global prices due to food security by importing countries		Demand for Indian Basmati remains mostly unaffected, while quality competition among origins for other generic NBR segment will increase. Increased demand in countries like Africa, Philippines, Malaysia are