



MARKET STUDY OF  
THE EXISTENT AND POTENTIAL  
**Indian Pongamia pinnata  
seeds market**

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Project Partners

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# ACRONYMS AND ABBREVIATIONS

<b>ABS</b>	Access and Benefit Sharing
<b>APEDA</b>	Agricultural and Processed Food Products Export Development Authority
<b>ASSOCHAM</b>	The Associated Chambers of Commerce of India
<b>BDA</b>	Biological Diversity Act, 2002
<b>CAC</b>	Codex Alimentarius Commission
<b>CBOs</b>	Community Based Organizations
<b>CFCs</b>	Chlorofluorocarbons
<b>CFR</b>	Community Forest Resource
<b>CFRR</b>	Community Forest Resource Rights
<b>CH<sub>4</sub></b>	Methane
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CO<sub>2</sub>e</b>	Carbon Dioxide Equivalent
<b>DFO</b>	Divisional Forest Officer
<b>DGFT</b>	Foreign Trade (Development and Regulation) Act, 1992
<b>ECOTA</b>	Economic Cooperation Organization Trade Agreement
<b>ET</b>	Evapotranspiration
<b>EXIM</b>	Export and Import
<b>FAO</b>	Food and Agriculture Organization
<b>FAQ</b>	Fair Average Quality
<b>FGD</b>	Focus Group Discussion
<b>FLO</b>	Fair-trade International
<b>FRA</b>	Forest Rights Act, 2006
<b>FSSAI</b>	Food Safety and Standards Authority of India
<b>GCCL</b>	Girijan Co-operative Corporation
<b>GDP</b>	Gross Domestic Product
<b>GGC</b>	Grower Group Certification
<b>GHG</b>	Green House Gas
<b>GoI</b>	Government of India
<b>GOs</b>	Government Orders
<b>GPs</b>	Gram Panchayats
<b>ICFRE</b>	Indian Council of Forestry Research and Education
<b>IFA</b>	Indian Forest Act, 1927
<b>IFAT</b>	The International Fair Trade Association
<b>IFOAM</b>	International Federation of Organic Agriculture
<b>INR</b>	Indian Rupee
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IUCN</b>	International Union for Conservation of Nature

<b>JFMC</b>	Joint Forest Management Committees
<b>LGs</b>	Local Groups
<b>MFP</b>	Minor Forest Produce
<b>MMTCDE</b>	Million Metric Tonnes of Carbon Dioxide Equivalents
<b>MoTA</b>	Ministry of Tribal Affairs
<b>MSP</b>	Minimum Support Price
<b>MTs</b>	Million Tonnes
<b>N</b>	Nitrogen
<b>N<sub>2</sub></b>	Di-nitrogen
<b>N<sub>2</sub>O</b>	Nitrous Oxide
<b>NAC</b>	National Advisory committee
<b>NAPCC</b>	National Action Plan on Climate Change, 2008
<b>NBA</b>	National Biodiversity Authority
<b>NCCF</b>	Network for Certification and Conservation of Forests
<b>NCOF</b>	National Centre for Organic Farming
<b>NMSA</b>	National Mission for Sustainable Agriculture, 2014-15
<b>NPOF</b>	National Project on Organic Farming
<b>NPOP</b>	National Programme on Organic Production
<b>NTCs</b>	Nationally Traded Commodities
<b>NTFP</b>	Non Timber Forest Product
<b>O<sub>3</sub></b>	Ozone
<b>PESA</b>	Panchayats (Extension to Scheduled Areas) Act, 1996
<b>PGS</b>	Participatory Guarantee System
<b>PRIs</b>	Panchayati Raj Institutions
<b>QMS</b>	Quality Management System
<b>RCOF</b>	Regional Council for Organic Farming
<b>RCs</b>	Regional Councils
<b>SAP</b>	Surplus Agriculture Produce
<b>SC</b>	Schedule Caste
<b>SDGs</b>	Sustainable Development Goals
<b>SHG</b>	Self Help Group
<b>ST</b>	Scheduled Tribes
<b>TBOs</b>	Tree Borne Oilseed
<b>TDCCOL</b>	Tribal Development Co-operative Corporation of Odisha Ltd
<b>TERI</b>	The Energy and Resources Institute
<b>TPC</b>	Third Party Certification
<b>TRIFED</b>	The Tribal Cooperative Marketing Development Federation of India
<b>UNDP</b>	United Nations Development Programme
<b>USD</b>	US Dollar
<b>VSS</b>	<i>Vana Samrakshana Samithis</i>
<b>WFTO</b>	World Fair Trade Organization
<b>ZC</b>	Zonal Councils

# EXECUTIVE SUMMARY

**There is significant demand for new end products generated from *Pongamia*.** *Pongamia* oil is currently the main product derived from *Pongamia*. Due to the many substitutes available and high costs linked to procurement and transportation, demand for the oil has however steadily decreased.

**Recommendation:** Target Tribal Cooperative Marketing agencies and other aggregators procuring *Pongamia* as potential clients for purification technology.

**There is significant potential for value creation in the *Pongamia* supply chain in Odisha/ Andhra Pradesh.** Currently, collection and processing of *Pongamia* is primarily carried out tribal villagers as a secondary source of income. Villagers currently lack incentive to collect the entirety of available *Pongamia* (only 20% of seeds are collected). Issues are i) costs related to processing ii) fluctuating demand, iii) marketing agencies' quality standards. Trading and transportation of produce is carried out by traders and the tribal and other marketing agencies. However, processing involves significant transactions costs due to lack of infrastructure and distance from collection locations to markets/ processing.

**Recommendation:** Directly engage with Tribal Cooperative Marketing agencies (e.g. Tribal Cooperative Marketing Development Federation of India (TRIFED)) and other aggregators, to design purchasing and collection schemes.

**Engagement with several levels of government is necessary to enter the *Pongamia* market:** *Pongamia* produce originating from Indian forests are owned by the local governing entity ("gram panchayat"). In areas where local entities can lay a "traditional" claim to the collection of the produce, their right to own, collect, and dispose of said produce is guaranteed by Indian law. The purchase and trade of *Pongamia* is governed by State level procurement agencies, (e.g. the Girijan Cooperative Corporation in Andhra Pradesh). They set minimum support prices, issue transport permits, and act in supervisory roles, depending on the state. In some states (e.g. Odisha) the registration with the Forest Department is also necessary.

**Recommendation:** Work with local organization in the field of Minor Forest Produce (e.g. Kovel Foundation in Andhra Pradesh) to facilitate engagement with local and state entities. Transit permits are a particular challenge and should be dealt with early when setting up commercial activity crossing state boundaries. Any entity who is not a citizen of India or a commercial set up having foreign share-holding will have to follow due procedures of the Access and Benefit Sharing (ABS) for accessing biological resources for commercial use.

**Fair Trade and Wild Harvest Organic certification schemes are available in both Andhra Pradesh and Odisha.** The National Programme for Organic Production (NPOP) offers a stable regulatory environment for both FairTrade and Wild Harvest approaches. Both third party certification (TPC), and Participatory Guarantee System (PGS) are relevant for *Pongamia* cultivation, but need to be selected with regards to the costs involved, and the export market targeted for the final product.

**Recommendation:** Consult the Annex to chapter 4 to identify the appropriate accredited certification agency under the NPOP, taking the difference between international and national standards into account. The Fair Trade Forum India is also a relevant resource.

**Ensuring adaptation and mitigation through *Pongamia* plantation** *Pongamia pinnata* can be useful in mitigating the impact of climate change by sequestering carbon. During the study it was calculated that the amount of carbon sequestered by one *Pongamia pinnata* tree was 0.84 tonnes/ha (approximately) and its carbon sequestration potential across the country is 2.53 million tonnes of carbon dioxide equivalent. *Pongamia* is a legume species which has the ability to fix nitrogen which enhances the soil nutrient content and also stimulates the productivity of the crops. Also the property of salt tolerance in *Pongamia* is used to produce oil-seeds on degraded, low productivity or salt-affected land.

**Recommendation:** Considering the co-benefits from *Pongamia pinnata*, its plantation in the agroforestry systems need to be promoted. Plantations of *Pongamia pinnata* can be undertaken in the tropical climatic conditions covering major parts of India. It is one of the preferred species for avenue plantations along side the national and state high ways all over India.

# Chapter 1.

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# INTRODUCTION

## Value links – a key perspective on development

Value chains can be defined as socio-economic systems that include all enterprises cooperating to serve a particular market (UNDP, 2008). Market-based development and the involvement of the private sector have been widely debated by international development actors since the UNDP report on making business work for the poor in 2004.

The study aims to conduct value chain analysis of Indian *Pongamia pinnata* seed (commonly called as *Karanj* in Hindi language) market with specific reference to Andhra Pradesh and Odisha. The study shall further provide practical guidance for commercialization related to *Pongamia pinnata* seeds. The study would also assess the potential of *Pongamia pinnata* trees with respect to adaptation to climate change.

An enterprise holds the core of a wider value chain community that consists of private associations, specialized service providers and industry specific public organizations providing support. An assessment of lessons learned in working with small holder's value chains governance models, traceability and direct payment models with respect to *Pongamia pinnata* during the study shall provide better insights in order to develop a sustainable value chain model. The activities of cost of collection, cleaning, primary processing & packaging and carriage play an important role in providing value to the product.

Due to value addition, at every stage there is enhancement in price of the commodity, which influences price of the final product. Fair price received by the primary collector for the commodity, premium on value addition by the aggregator by grading, enhancing role of industry in developing the end use products along with export of final product and raw materials will add value to the goods and an increasing the socio-economic status of the collectors. Developing a wider value chain community that consists of private associations, specialized service providers and industry specific public organizations will provide support to the *Pongamia pinnata* seeds market in India.

The value chain concept also plays a role in addressing environmental degradation and biodiversity loss. In context of *Pongamia pinnata*, it has potential climate change adaptation and development impacts including mitigation co-benefits of envisaged investment. Because of its versatility and systemic nature, the value chain concept helps addressing the interactions between economic development and social inclusion, as well as the interactions between economic growth and the environment.

Widely quoted variants of value chain development include:

- ▼ Value chain (or subsector) development
- ▼ Linking farmers to markets

- ▼ Making markets work for the poor
- ▼ Public-private development partnerships
- ▼ Inclusive business
- ▼ Standard initiatives for global commodities

Thus, the study concerns the outreach of value chain development and the possibility to get beyond islands of sustainability in an economy that otherwise continues inflicting ecological damage and exacerbating social in-equality.

## Objective

Market study of the existent and potential Indian *Pongamia pinnata* pods market and its adaptation and development benefits comprising an analysis of:

- ▼ Existing and potential supply and demand of Pongamia products (value chains);
- ▼ An assessment of lessons learned in working with smallholder associations and in tribal areas in Indian context, including value chain governance models, traceability and direct payment methods; an overview of the regulatory environment for agricultural productivities in India;
- ▼ An assessment of options to obtain fair trade certification and compliance with wild harvest organic standards;
- ▼ Potential climate change adaptation and development impacts including mitigation co-benefits of envisaged investments related to Pongamia according to local context factors linked to relevant SDGs.

## Methodology

The methodology adopted to achieve the objectives is discussed below.

### ASSESSMENT OF THE PRESENT STATUS OF PONGAMIA PINNATA SEEDS

*Karanj* is natural to India and found across several parts of India. It commonly grows along river banks, canal banks, roadsides, open farmlands and in backyards of dwellings of tribals and other forest dwellers in various states in India such as Andhra Pradesh, Odisha etc. In Jharkhand, *Karanj* tree is found nurtured in most of the rural households of Chhota Nagpur plateau. Plantation of *Karanj* has also taken place over the years in several states in the country. Due to such variety of habitats and ecosystems including open forests and private agricultural lands, where it is found as well as planted, it is difficult to estimate the exact number of *Karanj* trees present in the country. We have followed a mixed method approach (qualitative as well as quantitative) for estimating the current stock of *Karanj* in the study states.

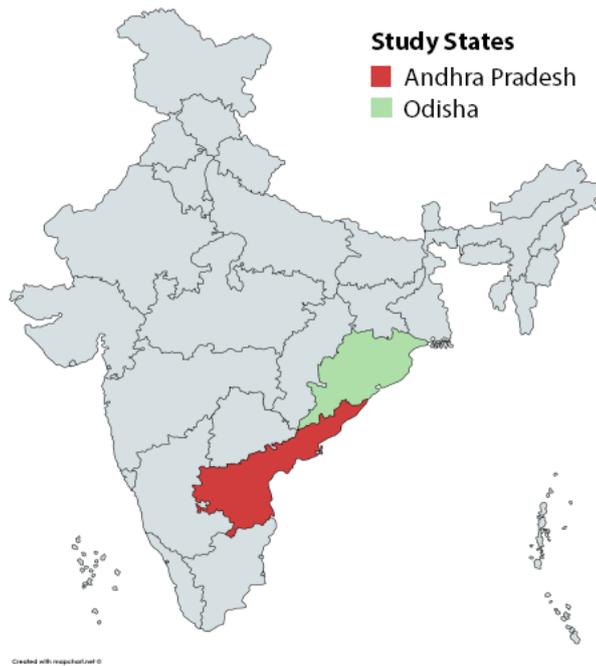
### SELECTION OF STUDY AREA

**Araku cluster** of **Andhra Pradesh** and **Baripada cluster** of **Odisha** were identified as the potential regions for conducting the value chain study with respect to *Pongamia pinnata*.

Key decision factors driving cluster prioritization:

- ▼ Very high potential for wild Pongamia pinnata bean sourcing
- ▼ Untapped Pongamia pinnata bean procurement area ranges from 35%-50%
- ▼ Pongamia pinnata Bean trader's involvement is low
- ▼ Industrial and vehicular pollution level is very low

Figure 1.  
Selected states  
for the study of  
Indian Pongamia  
Market



## ASSESSMENT OF EXISTING AND POTENTIAL INDIAN PONGAMIA MARKET:

In order to understand the Pongamia market in the selected cluster of Andhra Pradesh and Odisha, both, a primary and study of secondary literature were carried out. In total **5 Multiple Focus Group Discussions (FGDs)** (3 in Andhra Pradesh and 2 in Odisha) were conducted where the participants both men and women of the village are including *Pongamia pinnata* seeds cultivators, collectors, procurers, aggregators and traders. The survey questionnaire (open ended questionnaire) for the work study was prepared in specific for a group of collectors and traders in order to gather primary data. The same is attached as Annexure 1.

Secondary literature from various sources was referred in order to obtain data regarding the import and export of *Pongamia pinnata* pods, acts and laws regulating the production and trade and other institutional mechanism.

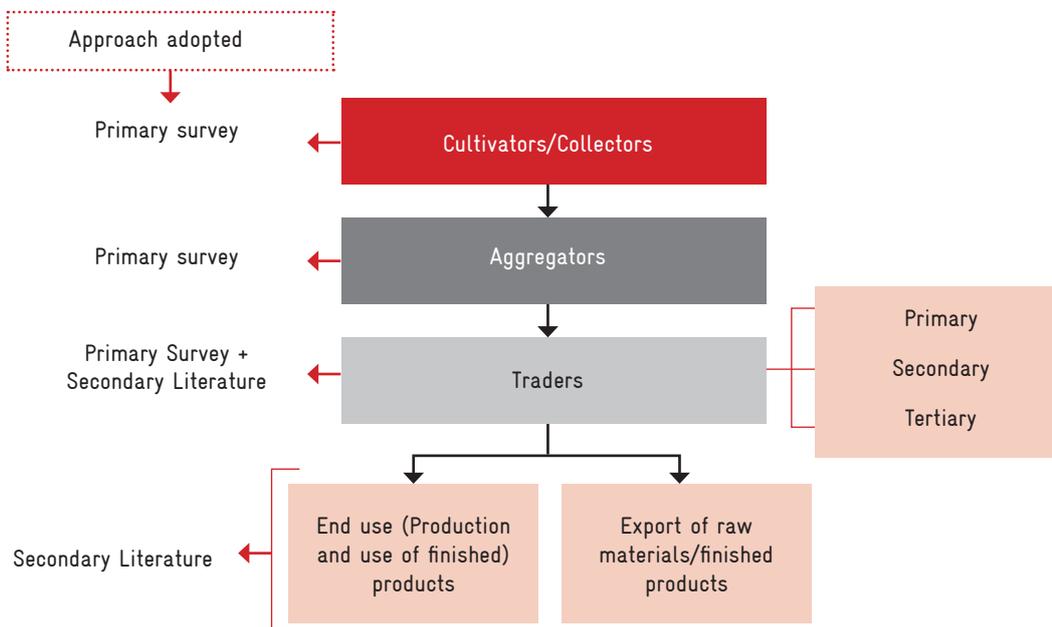


Figure 2.  
Methodology  
adopted for  
analysing  
*Pongamia pinnata*  
seeds market

## Status of *Pongamia pinnata* in India

*Pongamia pinnata* (L) Pierre [family: Fabaceae - Papilionoideae] is a medium-sized glabrous tree popularly known as *Karanja* in Hindi, Indian beech in English and *Pongam* in Tamil. *Pongamia pinnata* tree is drought-tolerant, semi-deciduous tree with short bole and spreading crown. It is widely grown from tropical dry to subtropical dry forest zones. It is a good shade bearer, suitable for planting in pastures, for afforestation in watershed areas and drier parts of the country.

*Pongamia pinnata* tree grows under a wide range of climate as well as soil conditions and can grow even in dry areas with poor, marginal, sandy and rocky soils. In addition to drought, it can tolerate saline conditions. *Pongamia pinnata* is a preferred species for controlling soil erosion and binding sand dunes because of its dense network of lateral roots. Root, bark, leaves, flower and seeds of this plant also have medicinal properties and traditionally used as medicinal plants.

### GEOGRAPHICAL DISTRIBUTION AND ECOLOGY:

*Pongamia pinnata* is native to Bangladesh, India, Myanmar, Nepal and Thailand, exotic to Australia, China, Egypt, Fiji, Indonesia, Japan, Malaysia, Mauritius, New Zealand, Pakistan, Philippines, Seychelles, Solomon islands, Sri Lanka, both South and North Sudan and United States of America (Orwa et al., 2009).

*Pongamia pinnata* thrives in areas having an annual rainfall ranging from 500 to 2500 mm. In its natural habitat, the maximum temperature ranges from 27 to 38 degree Celsius and the minimum 1 to 16 degree Celsius. Mature trees can withstand water logging and slight frost. This species grows to elevations of 1200m, but in the Himalayan foothills, it is not found above 600m (GOI, 1983).

### BOTANICAL DETAILS

Family: Fabaceae - Papilionoideae

Synonym(s): *Derris indica* (Lam.) Bennett

*Pongamia glabra* vent

*Pongamia pinnata* merr

Common names: Telgu: *Lamiga, Kanuga*

Oriya: *Koranjo*

(Arabic): *um al shuur*

(Bengali): *Karanj, Karanja,*

(English): Indian beech, Karum tree, oil tree, Pongam oil tree, Poonga-oil-tree, seashore mempari

(Hindi): *Kanji, Karanj, Karanja, Pappar*

*Pongamia pinnata* is a fast growing tree, which reaches about 40 feet in height and spread, forming a broad, spreading canopy casting moderate shade. *Pongamia pinnata* is a medium sized, evergreen, perennial and deciduous tree. It is a fast growing and drought-tolerant tree.

The tap root of *Pongamia pinnata* is thick and long, lateral roots are numerous and well developed. Leaves are alternate, odd pinnately compound and hairless. It bears flowers of pink and white colour with short stalked, pea-shaped seeds attaining a height of about 15-18mm long.

Generally, pods are about 3-6 cm long and 2-3 cm wide. Seeds of *Pongamia pinnata* contain oil contents in a good quantity and are elliptical in shape.



Photo 1. *Pongamia pinnata*<sup>1</sup>

**Flowering and Fruiting:** Grafted tree starts bearing fruits at the age of 4 years and seedling raised trees at the age of 5 to 6 years. In different parts of the country, the harvest period varies from November/December and May/June months. The kernel yield varies between 8 to 24 kilogrammes (kg) per plant per year.

**Ethno-pharmacology:** Various plant parts of *Pongamia pinnata* tree are used for a number of pharmacological applications. Majority of these practices are followed in tribal areas of India which are a part of their traditional practices.

#### Root

- ▼ Juice of roots with coconut milk and lime water used for treatment of gonorrhoea: a sexually transmitted infection (Joshi, 2006 and Manandhar, 2002)
- ▼ Used for cleaning gums, teeth and ulcers (Bhattacharjee, 2001)
- ▼ Roots are bitter anti-helminthic and used for vaginal and skin diseases (Gills et al., 1998)
- ▼ Juice of the root is used for cleansing foul ulcers and closing fistulous sores (Gon, 2007)

#### Stem

- ▼ Aqueous extracts of stem bark exhibit significant Central Nervous System (CNS) sedative and antipyretic activity (Philip and Sharma, 1997)

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<sup>1</sup> Sources: <http://www.brahmayurved.com/herbs/indian-beech-or-karanj.php>, <https://www.indiamart.com/raghawji-virjee/natural-seeds.html>, <http://www.svlele.com/karanj.htm>, [http://www.hcms.org.in/product\\_detail.php?product=54](http://www.hcms.org.in/product_detail.php?product=54) [12/2019].

## Leaf

- ▼ Juice of leaves is used for cold, cough, diarrhea, dyspepsia, flatulence, gonorrhoea, leprosy (Ambsta et al., 1992; Bhattacharjee, 2001 )
- ▼ Leaves are digestive and laxative used for inflammations, piles and wounds.

## Fruit

- ▼ Fruits are used for abdominal tumors (Hartwell, 1967-1971).

## USES

**Wood:** Pongamia tree wood is commonly used as fuel wood. Its wood is medium to coarse textured. *Pongamia pinnata* wood is not considered as durable and it is susceptible to insect attack and tends to split when sown. Thus, the wood is not considered a quality timber. The wood is used for cabinet making, cart wheels, posts, agricultural implements, tool handles and combs.

**Oil:** A thick yellow-orange to brown oil is extracted from seeds. Yields of 20-25% of volume are possible using a mechanical expeller.

- ▼ The oil has a bitter taste and a disagreeable aroma, thus it is not considered edible.
- ▼ In India, the oil is used as a fuel for cooking and lamps. Furthermore, the oil is also used as a substitute for diesel. The oil is also used as a lubricant, water-paint binder, pesticide and in soap making and tanning industries.
- ▼ The oil is known to have value in herbal medicine for the treatment of rheumatism, as well as human and animal skin diseases. It is effective in enhancing the pigmentation of skin affected by leucoderma.

**Fodder and feed:** Grazing and foraging animals find the plant material unpalatable. Karanj cake is not commonly used as a feed for livestock and poultry due to the harmful effects of anti-nutritional/toxic factors present in the seed cake. However detoxified Karanj cake has been incorporated with animal feed successfully.

Photo 2. Pongamia  
Oil cake (left)

Photo 3. Pongamia  
Oil (right)

Source: (Indiamart.  
com, 2019)



**Medicinal properties:** Although all parts of the plant are unpalatable for animal consumption, if consumed will induce nausea and vomiting. The fruits and sprouts, along with the seeds, are used in many traditional herbal remedies. Juices from the plant, as well as the oil, are antiseptic and resistant to pests.

**Proteins for Human Diet:** *Pongamia pinnata* seed meal, which is a by-product of oil recovery plants, containing a higher percentage of protein, can be free from alkaloids and could be a source of supplementary protein for human diet. *Pongamia pinnata* seed cake (the material that is left after pressing the oil) is an excellent high protein fodder for livestock.

Amino acid composition is very important in determining the protein quality of any cake. Values for 18 amino acids, including essential amino acids, have been reported in *Pongamia pinnata*

seed cake. It was observed that the amino acid composition of *Karanj* cake was almost similar to that of sesame, groundnut cake and soybean meal. Further, *Karanj* cake was found to be rich in cysteine; it also has higher calcium, phosphorus and sodium; however, the concentrations of copper and iron are very low. The crude protein content of rotary-pressed *Karanj* cake ranges from 6 to 24%, while it varies from 22 to 29% in expeller-pressed *Karanj* cake and 30 to 34% in solvent-extracted *Karanj* cake (Rehman et al., 2011)

#### Other uses

- ▼ Dried leaves are used as an insect repellent in stored grains.
- ▼ The oil cake, when applied to the soil, has pesticidal value, especially against nematodes and improves soil fertility.
- ▼ It is a preferred species for avenue plantation, controlling soil erosion and binding of soil because of its dense network of lateral roots.

## CULTIVATION AND HARVESTING OF PONGAMIA PINNATA (KARANJ)

*Karanj* starts flowering from the 4<sup>th</sup> to 5<sup>th</sup> year of planting, with the yields increasing each year until it stabilizes around the tenth year. Flowers appear from April to June while pods ripen from March to May the following year (Troup, 1983). The fruits are harvested at different times across the country; mostly during the months of May-June. Seeds are usually harvested in the spring, each seed weighing from about 1.1 to 1.8 grams. The yield per tree can range from about 10 kilograms (kgs) (22 lb) to more than 50 kilograms (110 lb) depending on conditions, with an average of 1500 to 1700 seeds per kg. Historically the pods are removed from the trees by beating the branches with sticks and decorticated using mallets or stones. The pods are dried in sun for 2 to 3 days and the seeds are extracted by thrashing the fruits. Each fruit contains 1 to 2 red kernels and the reported yield of kernels per tree could range from 8 to 24 kg (Panigrahi et al., 2014). The basic nutritional components of *Pongamia pinnata* seeds may change depending on the season and maturity of the tree but in general, it contains oil (27-39%), protein (17-37%), starch (6-7%), crude fiber (5-7%), moisture (15-20%) and ash content (2-3%).

Panigrahi et al. (2014) managed to extract 27% Karanja oil using mechanical expeller and 35% karanja oil by using a Soxhlet apparatus<sup>2</sup>. They state that oil content usually ranges from 30-40%. Leaves from the tree are lopped for fodder and used as green manure. Branches of the tree are used to clean teeth in rural areas. The wood of the tree is also good as a fuel with calorific value of 4836 kcal per kg and used widely across India as fuel-wood. Wood is susceptible to insect attack though, thus it is only used in making tool handles and agricultural implements (Saksule and Kude, 2012).

The *Pongamia pinnata* trees are extremely drought-tolerant, owing to their deep root system, waxy leaf and favourable stress physiology. They are also salt-tolerant, so they could be grown on margin lands and in soils unsuited for food production (Wilkinson et al., 2012). *Pongamia pinnata* can be useful in mitigating climate change. This particular species of *Pongamia pinnata* significantly contributes to the carbon sequestration mechanism. According to a productivity<sup>3</sup> assessment study done by Competent Authority of Uttar Pradesh in India, the productivity of *Pongamia pinnata* is found to be 2.5 (Cubic meter/Hectare/Year), which significantly contributes to the carbon sequestration potential of *Pongamia* species. Therefore, the total carbon sequestered by Karanj across India is 2.53 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>e)<sup>4</sup>.

<sup>2</sup> A Soxhlet extractor (apparatus) is designed for the extraction of a lipid from a solid material

<sup>3</sup> Productivity refers to the rate of generation of biomass in an ecosystem

<sup>4</sup> A carbon dioxide equivalent (CO<sub>2</sub>-eq), is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP). It is commonly expressed as million metric tonnes of carbon dioxide equivalents (MMTCDE)

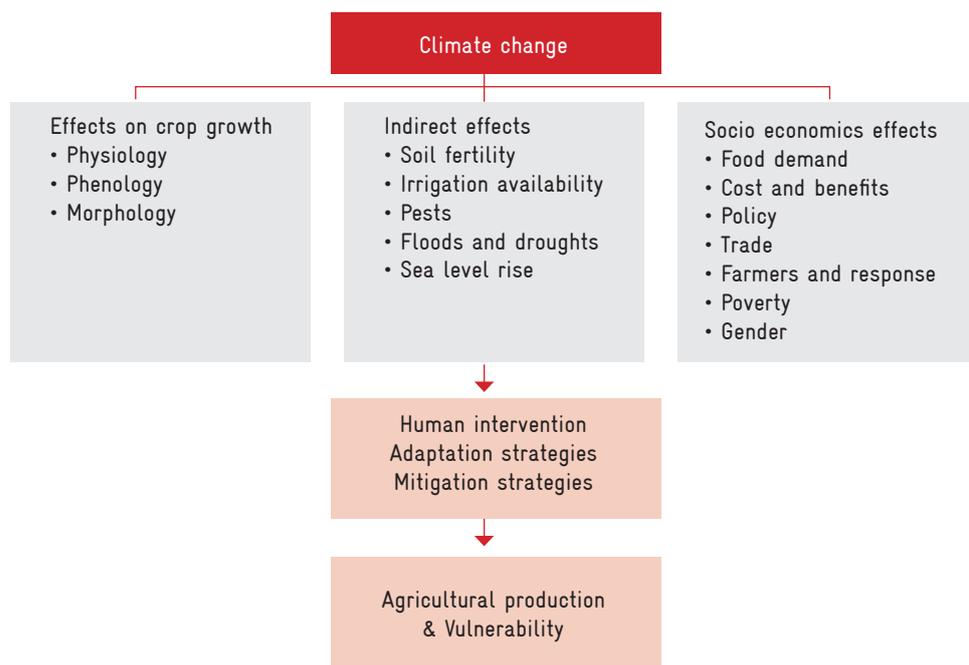
Extraction of biodiesel from the seeds of *Pongamia* is found to be an input for the climate change mitigation activities taking place in India and in the world at large scale. Existing *Pongamia* plantations are preferably done on non-agricultural lands and hence, the globally recognized threat of monocultures with food security has lesser relevance in the context of the study states of Odisha and Andhra Pradesh. Compared to petroleum-based diesel, biodiesel has a more favourable combustion emission profile, such as low emissions of carbon monoxide, particulate matter and unburned hydrocarbons. Carbon dioxide produced by combustion of biodiesel can be recycled by photosynthesis, thereby minimizing the impact of biodiesel combustion on the greenhouse effect. Biodiesel has a relatively high flash point (150<sup>o</sup> Celsius), which makes it less volatile and safer to transport or handle than petroleum diesel.

## Climate change impacts in India with a focus on the agriculture sector

Agriculture and the associated cultivation of species like *Pongamia pinnata* is directly dependent on various climatic parameters such as temperature, sunlight and water, which are the main drivers of crop growth. 70% of rural households in India still depend primarily on agriculture for their livelihood, with 82% of farmers being small and marginal (Panagariya, 2008). Thus, agriculture represents a core part of the Indian economy and provides food and livelihood activities to a large part of the Indian population. Climate change has emerged as an extreme challenge that agriculture in India and across the world have to face for the coming years. The magnitude of the problem varies from region to region inter alia influencing the agricultural productivity. Since almost two decades, there is a scientific consensus that the impact of climate change on agriculture could result in problems with food security and may threaten the livelihood activities upon which much of the population depends (IPCC, 2001). Increasing weather variability and worsening extremes will impact the agriculture sector more and more adversely. Many critical concerns related to climate change in coastal region of Andhra Pradesh and Odisha are identified, such as increase in the number of cyclonic storms and tidal waves cause damage to forests, increasing acidity of sea water (due to more dissolution of CO<sub>2</sub>), huge requirement of water for aquaculture and lack of irrigation facilities have caused dependence on groundwater, reportedly resulting in seawater intrusion (State Action Plan on Climate Change Andhra Pradesh, 2011 and State Action Plan on Climate Change Odisha 2018).

**Figure 3.**  
Assessment of  
Vulnerability of  
Agriculture to  
Climate Change

Source: Indian  
Agriculture Research  
Institute (IARI), 2017



Agriculture and horticulture are directly dependent on various climatic parameters such as temperature, sunlight and water, which are the main drivers of crop growth. While some aspects of climate change such as longer growing season and warmer temperatures may bring benefits in crop growth and yield, there will also be a range of adverse impacts due to reduced water availability and more frequent extreme weather conditions. According to the Intergovernmental Panel on Climate Change (IPCC, 2001), wheat yields are predicted to fall by 5 to 10% with every increase of 1 degree Celsius and overall crop yields could decrease up to 30% in South Asia by the mid-21st century. India could experience a 40% decline in agricultural productivity by the 2080s (IPCC, 2007). Rainfall in India has a direct relationship with the monsoons, which originate from the Indian and Arabian Seas.

A warmer climate will accelerate the hydrologic cycle, altering rainfall, magnitude and timing of run-off. Climate change also has a direct impact on crop evapotranspiration (ET). Even a marginal increase in ET demand due to global warming would have a larger impact on the fragile water resources of arid zone ecosystem such as in Rajasthan. Therefore, change in climate will affect the soil moisture, groundwater recharge, frequency of flood or drought, and finally groundwater level in different areas.

Hence, agriculture will need better management of natural resources like land, water and genetic resources to make it more resilient. India has made a National Action Plan on Climate Change (NAPCC), which was unveiled in 2008. There are 8 national missions that would form the core of the national plan. These include national missions for solar energy, enhanced energy efficiency, sustainable habitat, conserving water, sustaining the Himalayan ecosystem, a “Green India”, sustainable agriculture and strategic knowledge platform for climate change. The Sustainable agricultural practices have to balance environmental health and economic profitability in order to promote social and economic equity. The overall impact of climate change on India’s food production systems and economy is expected to be high since the agriculture and allied sector still accounts for a large share of Gross Domestic Product (GDP) and employment (NMSA, 2010). Thus, in order to promote sustainable agriculture, the Government of India has recently introduced the National Mission for Sustainable Agriculture (NMSA, 2010), which include a host of measures for adaptation, while also exploring strategies for mitigation in the sector.

Cultivation strategies for *Pongamia pinnata* need to take into consideration the local climatic aspects as well as the impacts of climate change. The selection of sites for plantation and the models of plantation in combination with other agriculture and horticulture crops will have to be decided considering the impacts of the climate change on the survival and productivity of *Pongamia* pods. *Pongamia pinnata* as a tree contributes to the carbon sequestration mechanism. Building soil carbon is considered a worthwhile activity regardless of whether sequestered carbon can be sold. On the mitigation side, additional incentives for farmers to build soil carbon would contribute to the global challenge of reining in GHG emissions.

## Chapter 2.

# ANALYSIS OF PONGAMIA – RELATED VALUE CHAINS IN INDIA

### Market characteristics

*Pongamia pinnata* is not solely a wild species, it is also commonly found in backyards of rural dwellings of tribal households. It is widely found as avenue plantation, homestead gardens, village commons, farmlands as well as inside forests. This makes its counting on ground a difficult task. Data regarding the total trees present on ground is neither available nor easy to estimate. Most of the districts in study states (Andhra Pradesh and Odisha) are mainly tribal dominated districts where other Minor Forest Produce (MFPs) such as *pongamia pinnata* seeds, tamarind, mahua, gum karaya, lac kusumi, neem seeds, honey, myrobalan etc. are found in abundance.

The Tribal Cooperative Marketing Development Federation of India (TRIFED) came into existence as a national-level apex organization functioning under the administrative control of the Ministry of Tribal Affairs. The ultimate objective of TRIFED is socio-economic development of tribal people in the country by way of marketing development of the tribal products on which the lives of tribals depends heavily as they spend most of their time and derive major portion of their income. According to the data made available by TRIFED, in Indian scenario the estimated production potential of *Pongamia pinnata* seeds (*Karanj* seeds) was 0.40 Lakh Million Tonnes (MTs) in the year 2018, which is worth Rs. 40 crores (USD 56264). This estimate is attributed to TRIFED and hence can be characterised as the amount available within tribal communities as MFPs. This most likely excludes agro-forestry plantations, street trees and other village trees. 2017 TERI estimates cite a figure of 0.56 million tonnes of available karanj harvest nationally. Whereas, the estimated collection potential of this commodity is Rs. 0.25 Lakh MTs accounting

Photo 4. Storage Centres of Pongamia (Odisha)

Source: (Panda, 2019)



for Rs. 25 crores. Major producing states in India are Andhra Pradesh, Odisha, Madhya Pradesh, Jharkhand, Rajasthan and Chhattisgarh. But considering various factors such as the highest number of tribal population and high abundance of Pongamia trees, this study will solely focus on Andhra Pradesh and Odisha.

The Focus Group Discussions (FGDs) done in Andhra Pradesh and Odisha represent the existing value chain process, which is observed across India.

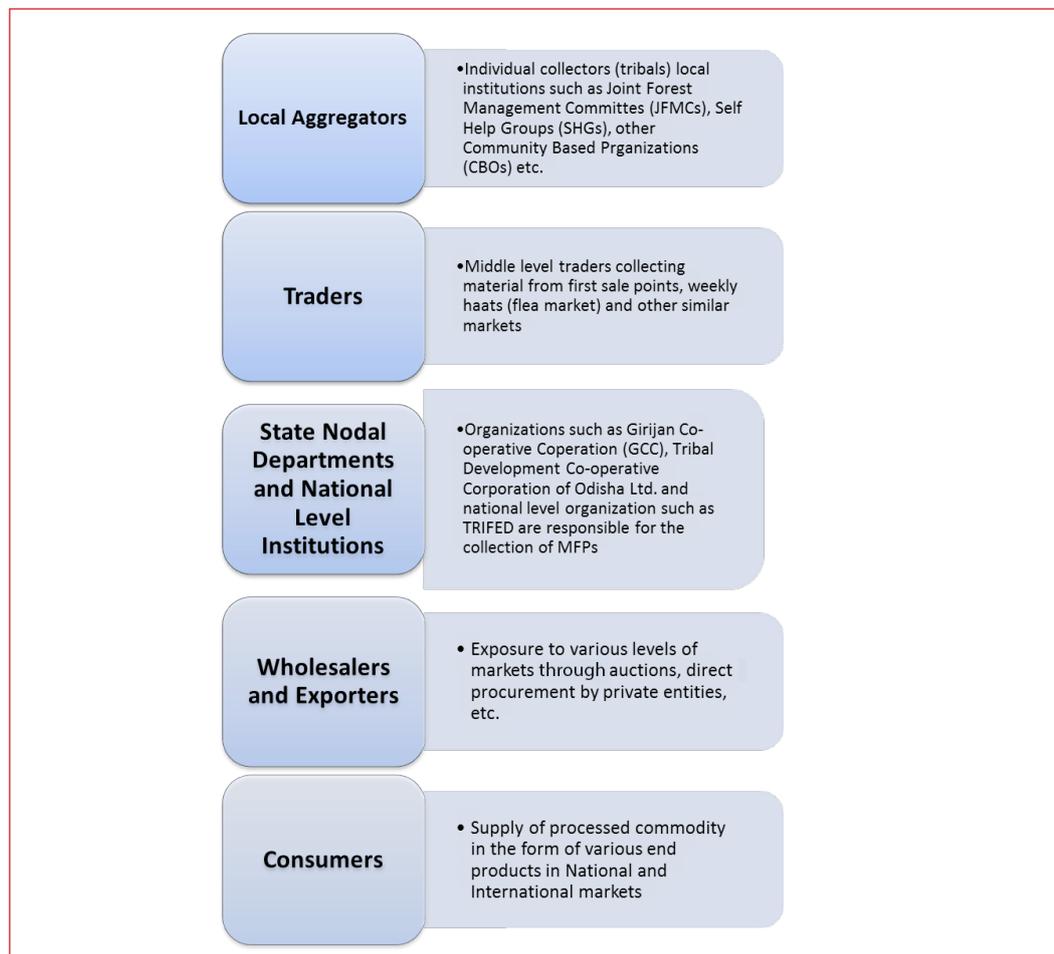


Figure 4. Existing value chain mechanism

## Characteristics of Primary collectors harvesting Pongamia pods and seeds

### ARAKU VALLEY, ANDHRA PRADESH

Araku valley is located in the south-eastern Indian state of Andhra Pradesh surrounded by the thick forests of the Eastern Ghats mountain range. According to the 2011 Census, a caste-wise population break up shows that 91.5 per cent of the population in Araku Valley belonged to the ST communities and 0.9 per cent belong to the Scheduled Castes (SC). As per the primary study conducted by TerViva on the geographical distribution of *Pongamia pinnata* across India, Araku valley was recognized as a potential region for the presence of Pongamia trees. There are 156 villages in Araku Valley block, with around 60 to 100 households per village (Census, 2011). In the state of Andhra Pradesh, the major occupation followed by people residing in the villages is agriculture i.e. around 70%, whereas 20% of people are engaged in domestic work and the remaining are not trained. The size of land owned per family ranges between 1 to 8 acres and there are large open spaces available around the households in the villages. In general, around 1 to 2 household members, majorly males, are involved in the

collection of Pongamia pods where each person collects around 500 kg of Pongamia pods on an annual basis. During one Focus Group Discussion, it was told by the villagers that the distance of their households from collection point is 1 to 4 km.

Photo 5. Tribal Communities during Focus Group Discussion in Araku Valley

Source: (Sharma, 2019)



*Pongamia pinnata* has an informal pattern of distribution in this region where a minimum of 5 to 6 Pongamia trees occur in each homestead garden and an equal number of trees are identified in village commons and inside forests for the collection of seeds. In the entire Andhra Pradesh region, the best quality Pongamia pods are said to be found in Araku region. The bigger size of seeds and the golden colour of the oil are important indicators. Only the pods that fall on the ground are collected and on an average 50 to 60% of the Pongamia pods are left behind on the tree. The wet pods are later dried in the sun for two weeks and then can be sold in the market. The villagers collect around 30 kg of Pongamia pods per week which are then sold to the local traders or state government agency such as Girijan Co-operative Cooperation Limited (GCCL) in the local flea (*shanti*) markets. As per the Ministry of Tribal Affairs, for *Karanj (Pongamia pinnata)* seeds the Minimum Support Price (MSP) rate as on 21.11.2017 is Rs. 18 per kg. Further, the MSP recommended for the financial year 2018/19 is Rs. 19 per kg, which has been accepted nationwide. During the consultation process, it was found that in open markets of Andhra Pradesh the price available for *Pongamia pinnata* pods range between Rs. 25 to 27 per kg, which is then procured by local traders and sold in the open market with a raise of 10% at a final rate of Rs. 32 to 35 per kg (including transportation charges). A typical smallholder farmer earns Rs. 50,000 annually among which 10% (i.e. around Rs. 5000) is contributed by selling Pongamia pods.

Photo 6. Mr. N. Prasad, Kovel foundation, in conversation during discussion session in Kantipuram (Araku Valley)

Source: (Sharma, 2019)





Photo 7.  
Interaction session  
with Pongamia  
traders in Aaraku  
Valley

Source: (Sharma,  
2019)

## BARIPADA, ODISHA

In Odisha, Mayurbanj district has been identified for having high abundance of *Pongamia pinnata* (*Karanj*) trees. Here, around 60 to 65% of Pongamia trees are present in the areas under the Forest Department and the remaining 35 to 40% are in revenue/private land, which belongs either to farmers or to local village committees. In total, 122 potential villages were identified covered with good numbers of Pongamia trees in and around this district. All these 122 villages come under 12 revenue blocks of Mayurbhanj district. High potential regions (block/villages) in Mayurbanj district include Udala, Bangiriposi, *Karanj* ia, Jashipur, Thakurmunda, Sarat, Kaptipada etc. Additionally, *Karanj* trees are also found in Bisra block of Sundargarh district which is famous for apiculture where *Karanj* honey with high medicinal value is obtained.

During the primary survey conducted by TERI for the Pongamia market study in Jashipur region of Baripada district (Odisha), it was found that an individual trader procures around 5 tonnes of Pongamia pods directly from the tribal villages. On an average there are around 25 traders in Jashipur region, hence the total potential for the procurement of Pongamia pods in this region ranges from 122-125 tonnes on a yearly basis.



Photo 8. Focus  
Group Discussions  
in Baripada city of  
Mayurbanj district in  
Odisha

Source: (Sharma, 2019)

Photo 9. Tribal village women involved in Pongamia pods collection in Simlipal tiger reserve (Baripada, Odisha)

Source: (Sharma, 2019)



The collectors in Mayurbanj region are mainly the tribal villagers. According to them on an average 8 days are spent by them in collection of the Pongamia pods and almost the same number of days in decortication and de-hulling of the pods to obtain the seeds. In addition, the storage and transportation of Pongamia pods/seeds to bigger markets far from the collection points in the village is a hindrance for villagers. Thus, introduction of proper storage facilities, installation of de-hulling machines and shell separators could help the villagers saving time, which they could use more productively collecting Pongamia pods. There is also a lack of proper selling points near the villages, long transport ways, bad infrastructure causes inconvenience for the Pongamia pods collectors to sell their product in the markets.

Photo 10. Collection and transportation of MFPs in Baripada (Odisha)

Source: (Sharma, 2019)



## Price decision

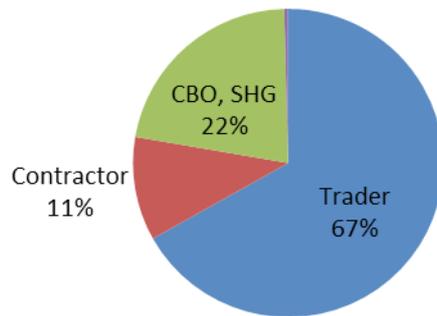


Figure 5. Players who decide the prices of Karanj collected

Source: TERI (2017)

## Distribution channels and Market Price

### SCHEME OF MINIMUM SUPPORT PRICE (MSP) FOR MINOR FOREST PRODUCE (MFP) – TRIFED:

The Government of India has decided to introduce the scheme of “Mechanism for Marketing of Minor Forest Produce (MFP) through Minimum Support Price (MSP) and development of value chain”. The scheme is designed as a social safety<sup>5</sup> net to improve the livelihoods of MFP gatherers by providing them a fair price for the collected MFPs. The MSP scheme seeks to establish a framework to ensure fair returns for the produce collected by tribals, assurance of buying at a particular price, primary processing, storage, transportation etc. while ensuring sustainability of the resource base. The price of *Pongamia pinnata* seeds is fixed Rs. 19 per kg (2019) under the MSP scheme of Ministry of Tribal Affairs (MoTA).

According to a study conducted by TERI, traders, CBOs and contractors form the major players, who have the large say in determination of price of *Karanj*. They are the most accessible links for collectors for selling the produce.

The state exercises its control over trading of MFPs through the agencies under its control. Within the states, control over the trade of MFPs does not vest with a single agency, but with several types of agencies:

In **Andhra Pradesh**, the Girijan Co-operative Cooperation Limited (GCCL), a public sector undertaking by the Government of Andhra Pradesh was established in the year 1965 with a mission of socio-economic uplifting of tribal groups in Andhra Pradesh, to protect them from the exploitative intermediaries and establish a mutually beneficial relationship between the tribals and the rest of the world. Hence, the GCCL has the monopoly over purchase and trade of *Karanj* seeds in Andhra Pradesh. According to the GCCL Stock Report (2019), the quantity of *Pongamia* seeds obtained in the current season is around 3.13 tonnes, which values for Rs. 0.6 Lakhs in Andhra Pradesh.

The Andhra Pradesh Non Timber Forest Produce (NTFP) (Regulation of Trade) Act, 1971 stated that government would fix the price of the produces in consultation with the advisory committee constituted. Hence, the responsibility for fixing the price of other produces lies with the GCCL.

5 There is no specific definition of Safety Net defined by Government of India. But it is considered with respect to this particular scheme – Minimum Support Price for Minor Forest Produce that the efforts of harvesting, primary processing and paid out costs for any Minor Forest Produce should be compensated with a benchmark price for the primary collector. So that there is effective compensation for the time spent by the primary collector.

If there is a scope for commercial exploitation of NTFP in any particular division, the Divisional Forest Officer (DFO) calls for advance tenders and hands over the rights of buying to the highest bidder.

It can be determined by the response of the *Karanj* pod traders that in Andhra Pradesh, on an average 50 lorries of Pongamia pods, each lorry with a capacity of 18 tonnes, hence in total 1000 tonnes of Pongamia pods are transported from Araku Valley to different parts of the state and other states as well for processing in one season. The potential of the region shall double, i.e. it can be around 2000 tonnes if the remaining 50% of the Pongamia pods on the trees could be collected. Hence, Pongamia pods produced in Araku valley hold a major share in the overall production of the state and special focus on these regions can contribute significantly in meeting the demand of the Pongamia market.

From the past 10 years, due to less production and demand of Pongamia oil in the local market, traders from Andhra Pradesh have started selling the commodity in external markets (i.e. other regions of India). In total around 140 to 150 quintal Pongamia pods are transported to other cities like Chittoor, Chennai etc. Pongamia oil is used there for various purposes such as in tanneries and soap industries etc. Transit permit is a big concern among the traders for expanding their market. After interaction with the traders in this region it was found that the demand for the Pongamia oil is reduced as there are a lot of substitutes available in the market for this commodity. During the primary survey it was also found that the industries using Pongamia oil as a raw material are unwilling to pay high rates for its procurement and transportation.

In **Odisha**, The Tribal Development Co-operative Corporation of Odisha Ltd (TDCCOL) holds the monopoly to procure MFPs and Surplus Agricultural Produce (SAP) collected by the tribals at fair and remunerative price and arrange their marketing. According to TDCCOL officials, the production of Pongamia pods has been decreasing subsequently in Baripada region of Odisha over the years. Around 80% of the seeds are not attended, hence the potential of this region is not utilised to its fullest. The agency is also facing an issue in mass procurement of the pods. TDCCOL purchases Pongamia pods under the MSP scheme on Fair Average Quality (FAQ) basis. Therefore, because of these high quality standards for procurement of pods, many villagers are now uninterested in selling them to TDCCOL. A large number of traders in the open market are providing high prices to the villagers.

#### **Relevant financial incentives for harvesting Pongamia:**

Welfare schemes for vulnerable sections of the population by the Centre and States have been implemented by the Government of India and the State Government as well for providing relevant financial incentives for harvesting *Pongamia pinnata* seeds.

The '**Van Dhan Scheme**' is an initiative by the Ministry of Tribal Affairs to promote MFPs-centric livelihood development of tribal gatherers and artisans. It mainstreams the tribal community by promoting primary level value addition to MFP at a grassroots level. It is proposed to set up around 6000 Van Dhan Vikas Kendras in the country comprising 300 tribal gatherers each, thus, providing employment to almost 45 lakh tribals. Through this initiative, the share of tribals in the value chain of Non-Timber Forest Produce is expected to rise. New value addition and processing centres will be established by TRIFED in about 300 districts across India. So there is opportunity for tribal communities to unite and form SHGs and take advantage of the scheme. Through the establishment of Van Dhan MFP processing centres, primary collectors would get opportunity to value add to the MFPs so that collectors can sale the same instead of only raw material. Thus receives higher price and can also explore better markets.

## Available and potential processing methods of the raw product in India

After collection of *Karanj*, processing is the next task. It usually involves removing the shells. On a small-scale level of extraction, open spaces in and around homes are the preferred places for processing with 60% households choosing that option. Community land, forests and private land are also other places for processing by villagers. *Karanj* does not require significant resources for preliminary processing. Extraction of oil may require the use of machines.

The processing industry in case of *Karanj* is to deseed the pods. Seeds are mainly exploited for non-edible oil. Mature seeds consist of 95% kernel and can contain 27% oil (ICFRE, 1995). This activity enhances the cost of the processed commodity at local level and also helps generate employment for the collectors. The nearness of a processing industry encourages collectors to go for value addition of the MFP as well.

However, the surveyed respondents stated that in most cases processing industries are not available nearby collection locations. Collectors thus find it difficult to add much value to the collected produce.

## End products sold and exported in other countries:

### EXPORT INFORMATION

India has been exporting *Karanj* oil to various countries including the United States, Italy, Spain and Malaysia among others, from a number of points. Chennai Sea, Hyderabad, Cochin Sea, Tuticorin Sea, Tughlakabad are some of the major loading ports in terms of export value earned as well as quantity of export. In the absence of EXIM (Export-Import) data on export of *Karanj* oil, estimates of export from Zaub Technologies and Data Services Pvt. Ltd. are used for 2014 - 2016. The table below shows export of *Karanj* from India to various countries from 2004-2016. The export amount helps in understanding at least the part of production for export purpose. From the table we can easily conclude that the maximum quantity exported was during 2014-2015. The quantity exported shows 691.97 kg in the 2015-2016 for April to September interval. Since the data is not complete for the entire year, the figure looks lesser than the previous years where the quantity of export ranges between about 768 kg to 1685 kg annually.

Table 1. Export information related to *Pongamia pinnata* seeds from India

Sr.No.	Year	Quantity in kg	Values in Rs. Lacs
1	2004-2005	768.88	449.28
2	2005-2006	1,253.56	764.19
3	2006-2007	1,085.05	757.09
4	2007-2008	973.15	799.81
5	2008-2009	825.13	791.16
6	2009-2010	870.59	948.7
7	2010-2011	1,618.71	1,888.61
8	2011-2012	1,178.36	1,453.66
9	2012-2013	1,010.71	1,660.81
10	2013-2014	1,032.81	2,017.66
11	2014-2015	1,685.69	2,662.04
12	2015-2016 (Apr-Sep)	691.97	1,210.36

Source: (Zaub Technologies, 2016)

This table clearly shows the changing trends in the quantity and values obtained from export quantity. From 2004 to 2010 value received by exporting is quite less as compared with the quantity exported. This shows that at that time cost received was quite low.

## IMPORT INFORMATION

The table below shows the import quantity of *Karanj* from various countries from 2004 to 2016. It clearly shows that import is done only during 2004/05, 2007/08, 2011/12, 2012/13 and 2015/16. Due to lack of access to the EXIM databases the country specific information could be available for *Pongamia* seeds.

Table 2. Import information related to *Pongamia pinnata* seeds from India

S. No.	Year	Quantity in kg	Values in Rs. Lacs
1	2004-2005	83	5.25
2	2005-2006	-	-
3	2006-2007	-	-
4	2007-2008	0.02	0.06
5	2008-2009	-	-
6	2009-2010	-	-
7	2010-2011	-	-
8	2011-2012	0.2	0.2
9	2012-2013	1	12.29
10	2013-2014	-	-
11	2014-2015	-	-
12	2015-2016 (Apr-Sep)	0.45	1.62

Source: (Zauba Technologies, 2016)

The table above shows quantity of *Karanj* oil imported from Iran, UK, United States, Netherland and France. In 2004 to 2005 large quantity had been imported. But after 2005 quantity imported is almost negligible. There are no assessments done for export and import quantities of *Pongamia* seeds and hence, the reasons of changes in quantities need to be studied.

## Chapter 3.

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# REGULATORY REGIME FOR PONGAMIA (HARVESTED FROM WILD AND HOMESTEAD) AND EXPERIENCES WORKING WITH PRIMARY COLLECTORS IN INDIA

### Introduction to national regime for regulating Pongamia market

Forests and the resources derived from them are life sustaining elements for people living in and around Forest areas. With such a large population dependent on forest resources, MFP is India's largest unorganized sector. *Pongamia pinnata* is largely collected from wild and is rarely cultivated on large scale for the purpose of seed collection. Most of the plantations of *Pongamia pinnata* are done as avenue trees and the species is reared domestically for its various uses including oil, twigs and leaves for manuring. During the scoping phase of the study it was found that most of the districts in study states are mainly tribal dominated where other MFP such as Mahua seeds, *Buchanania* pods, Arjun bark, *Pongamia pinnata* Myrobalans, etc. are also traded. Collection of MFP is an important livelihood activity for over 100 million tribal and other forest dwelling communities in India. Thus, knowledge of *Pongamia pinnata* seed as a commodity is an established MFP for livelihood all over India. The forest dwelling population in India source about 20% to 40% of their household income from sale of MFPs. *Pongamia pinnata* seed collection is also regulated as per the regulations defined at national and state levels for MFP. The regulatory regime for MFP at national level is defined by the Indian Forest Act (IFA, 1927), Panchayats (Extension to Scheduled Areas) Act (PESA, 1996), Biological Diversity Act (BDA, 2002) and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act (FRA, 2006)<sup>6</sup>. The following table provides an overview in regard to the various aspects of MFP collections, protection, transport and trade being dealt by various legislations.

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6 Popularly known as the Forests Rights Act (FRA, 2006).

Table 3. Minor forest Produce (MFP) with various Acts and Rules in India

Subject related to MFPs	Indian Forest Act (IFA) and Rules 1927	Panchayats (Extension to The Scheduled Areas) (PESA) Act and Rules 1996	National Biodiversity Act (BDA) and Rules 2002	Forest Right Act and (FRA) Rules 2006
Definition				☐
Protection, and Sustainable use	☐		☐	☐
Ownership	☐	☐		
Harvesting	☐	☐	☐	☐
Transit	☐			☐
Trade			☐	
Access and Benefit Sharing ABS			☐	

## DEFINITION OF MFP

FRA, 2006 Section 2(i) defines “minor forest produce” as all non-timber forest produce of plant origin including bamboo, brush wood, stumps, cane, tussar, cocoons, honey, wax, lac, tendu or kendu leaves, medicinal plants and herbs, roots, tubers and the like. Prior to this, all the MFP have been treated under IFA, 1927 through provision of ‘forest produce’ which is defined in section 2(4) as “anything, which is usually found in forests or those, which become forest produce only if they are found in or brought from a forest.”

## PROTECTION AND SUSTAINABLE USE OF MINOR FOREST PRODUCE

Major regulatory regime for the protection and management of forest proceed from IFA, 1927. This act under the sections 4 to 27 provides for the creation of Reserve Forests and under sections 29 to 34, for the creation of Protected Forests. Even in these legally defined forest areas, the extraction of forest products for domestic consumption is traditionally permitted as a measure to cater to local dependence. Thus, anything that is ‘forest produce’ as per IFA, 1927 needs permission for its collection and transit under IFA, 1927.

According to the Biological Diversity Act (BDA) “**sustainable use**” means the use of components of biological diversity in such manner and at such rate that does not lead to the long-term decline of the biological diversity thereby maintaining its potential to meet the needs and aspirations of present and future generations. FRA, 2006 in section 2 (n)<sup>7</sup> explains the sustainable use of biological resources in the same way as assigned in clause (o) of section 2<sup>8</sup> in the Biological Diversity Act.

Under section 38 of BDA, 2002 it is listed that without prejudice to the provisions of any other law for the time being in force, the Central Government, in consultation with the concerned State Government, may from time to time notify any species, which is on the verge of extinction or likely to become extinct in the near future as a threatened species and prohibit or regulate collection thereof for any purpose and take appropriate steps to rehabilitate and preserve those

7 **FRA (2006), Section 2 (n):** “sustainable use” shall have the same meaning as assigned to it in clause (o) of section 2 of the Biological Diversity Act, 2002 (18 of 2002);

8 **BDA (2002), section 2 Clause (o):** “sustainable use” means the use of components of biological diversity in such manner and at such rate that does not lead to the long-term decline of the biological diversity thereby maintaining its potential to meet the needs and aspirations of present and future generations.

species. In this context, *Pongamia pinnata* is not mentioned by the Central and the State government in the list of nearly extinct species.

## OWNERSHIP

In national context, FRA from 2006, enacted in 2007, grants community forest rights to manage, protect and regenerate the forest under section 3(1) (i), and to own and dispose minor forest products from forests where they had traditional access. Section 3(1) (c) of the Forest Rights Act 2006 defines forest rights as inclusive of 'right of ownership, access to collect, use and dispose of minor forest produce which have traditionally been collected within or outside village boundaries'. In addition to the PESA, 1996 which had authorised states to assign the responsibility to the panchayats and grama (village council) - sabhas<sup>9</sup> as the owners of MFPs, the FRA, 2006 provide ownership rights for MFPs to gram sabhas as well as to individuals and communities. Once, rights are recognised under FRA, 2006 then there is no requirement to take permission from the DFO as mentioned in the Indian Forest Act, 1927.

## TRADE, ACCESS AND BENEFIT SHARING AND NATIONALLY TRADED COMMODITIES (NTCS)

Access and Benefit Sharing (ABS) of biological resources is regulated under section 3 of BDA where any commercial use of biological resource would need permission from National Biodiversity Authority. Any entity who is not a citizen of India or a commercial set up having foreign share-holding will have to follow due procedures for accessing biological resources for commercial use, research, etc. In case of commercialization benefit sharing needs to be done based on the profit accrued as per the National Guidelines of Access and Benefit sharing under BDA, 2002.

### **Biological resources normally traded as commodities issued under BDA:**

The Act inter alia provides that the users of bio-resources seek approval of National Biodiversity Authority (NBA) for obtaining biological resources for research or commercial use. In the notification number S. O. 2726(E) from 2009, the Central Government, in consultation with the National Biodiversity Authority (NBA), declared that the provisions of the BDA shall not apply to certain biological resources. The list includes the seeds of *Pongamia pinnata*, found wild and domestically which are included under the biological resources as normally traded as commodities. The notification further provides that products derived from seeds of *Pongamia pinnata* are to be treated as NTCs. This notification shall not apply to the wild relatives of cultivated species (biological resources). A self-declaration form appended to the notification provides for the exporter to declare the source of procurement to keep the implementation of the notification under careful watch and scrutiny.

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9 Definition of **Gram Sabha** - A body consisting of persons registered in the electoral rolls relating to a village comprised within the area of Panchayat at the village level;

**Gram Panchayat** - Panchayat means an institution (by whatever name called) of self-government constituted under article 243B of Constitution of India.

## Relevant acts and policies for regulation of NTFPs in Andhra Pradesh and Odisha

In the selected clusters of Andhra Pradesh and Odisha, several acts and rules have been formulated from time to time governing the NTFPs.

### ANDHRA PRADESH (AP)

Since the study area in AP is also governed by these, it is necessary to understand the significance of the important acts and rules<sup>10</sup>, that govern the management of NTFPs in the state. The brief content of some of the important Government Orders (GOs) issued regarding the NTFP usage in AP is mentioned below:

- ▶ G.O. Ms. No. 43, 2000: Enhancement of incentive to 'Vana Samrakshana Samithies' (VSSs<sup>11</sup>) for apprehending smuggling of forest produce – 50% of the compounding fees collected or 50% of the value of the produce would be sanctioned as incentive to the VSS.
- ▶ To reduce the burden of VSS chairperson in approaching the forest department officials for NTFP permits, the DFO may sanction sufficient member of permits for NTFP in advance and keep with the concerned Forest Section Officer.
- ▶ The Andhra Pradesh Minor Forest Produce (Regulation and Trade) Act 1971, imports certain restrictions on the purchase or transport of MFP. This act makes provision for regulating in the public interest the trade of certain minor forest produce by creation of the state monopoly.

#### ***Andhra Pradesh Forest Produce Transit Rules, 1970***

- ▶ “Forest produce in transit” includes forest produce found stored in any place or in the margin of any public road or cart track or food-path whether or not loaded in carts or other vehicles and forest produce found in any river, canal or water course whether in rafts or not.
- ▶ No forest produce shall be moved into or from or within the state by land or water, unless such produce is accompanied by a permit therefor issued under rule 5 and produced for check immediately on demand.
- ▶ The DFO or an officer or person duly authorised by him in this behalf shall, subject to the provisions of the rules, [issue a permit in Form-I in respect of forest produce to be removed from the forest areas or Government Timber Depots, and in Form-II in all other cases].
- ▶ The DFO may refuse to issue such permits, if he has any doubt either of ownership or the existence of forest produce itself and, may withhold the issue of transit permits until it is proved to his satisfaction that the forest produce that exists lawfully belongs to the applicant.

The transit permits are issued duly following the rules and regulation in force such as the Andhra Pradesh Forest Produce (Storage and Depot) Rules 1989, Gram Sabhas and Control of Tribal Land Alienation in V<sup>th</sup> Scheduled Areas etc.

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10 A list of acts and rules relevant to production and trade of *Pongamia pinnata* are - AP Abnus Leaves Act (1956), The AP Forest Act (1967), The AP Forest Produce Transit Rules (1970), The AP NTFP (Regulation of Trade) Act (1971), The AP NTFP (Regulation of Trade in Abnus Leaves) Rules (1970), The AP Forest Contract (Disposal of Forest Produce) Rules (1977), The AP Scheduled Areas NTFP (Regulation of Trade) Act (1979), The AP Forest Produce (Storage and Depot) Rules (1989), The AP Scheduled areas NTFP (Regulation of Trade) Rules (1990).

11 **Vana Samrakshana Samithies (VSS):** The forests of the State to be covered under this Resolution shall be grouped into the following two categories: (a) Reserved Forests, Protected forests, Village forests, Revenue forests etc. not covered under Protected Areas. (b) Protected Areas (National Park and Sanctuaries) excluding Core Areas, and Mangrove Wetlands. The Committee constituted for the first category of forests will be known as Vana Surakshya Samiti (VSS).

## ***Pongamia pinnata* as a state monopoly in Andhra Pradesh**

In AP, two regulations, the AP Minor Forest Produce (Regulation of Trade) Act 1971 and the AP Scheduled Areas NTFP (Regulation of Trade) Act declare that trade in NTFPs is a state monopoly, irrespective of ownership status of land where they occur. The government has appointed GCCL as their agent for the purpose of purchase and trade of NTFP.

As per this agreement collection, storage, removal and disposal of the produces is subject to the conditions and restrictions put from time to time. The corporation is exempted from the payment of the security deposit for the NTFP.

- ▼ The tribal groups living in the sanctuary areas are permitted to collect the NTFP only if they carry identity cards issued by the GCCL and duty attested by the wild life wardens of the concerned area.
- ▼ The corporation shall be entitled to appoint agents to supervise the work of collection and removal of the produce.
- ▼ The corporation shall maintain monthly accounts pertaining to the yield obtained cost of collection, quantity disposed of and the amount realized in the prescribed form.
- ▼ Rentals will be paid at 15% of the procurement price of total quantity of NTFP procured subject to payment of minimum rentals equal to the average of the previous three years. Such rentals shall be paid by book adjustment.
- ▼ The corporation shall at all times comply with the provisions of AP Forest Act, 1976 and any statutory modifications thereof.
- ▼ The GCCL officers are authorized to search and seize the NTFP in the areas it operates. GCCL is also authorized to have manned check gates at strategic points to carry out its responsibilities.
- ▼ The lease agreement with GCCL however is not particular that the agency has monopoly only in the scheduled areas. This implies that the agency has monopoly rights over the listed NTFP all over the state.

As marketing of NTFP is confined to a limited number of items being collected by tribal groups, in-case of marketing of other NTFP commodities in the tribal areas and in non-Tribal Forest Department take the responsibility by conducting auction from time to time.

## **ODISHA**

In Odisha, 80 items have been identified as NTFP, out of which 68 items have been termed as MFPs.

### **NTFP policy - 2000 for Odisha:**

- ▼ The NTFP policy 2002 is not only present in scheduled areas but also in the entire state. The policy had become over due after promulgation of PESA and subsequent state confirmatory act, Orissa Gram Panchayat Act in 1997.
- ▼ According to this policy, Gram Panchayats (GPs) have been authorized to regulate the purchase, procurement and trade of NTFPs including 68 items of MFPs so that the primary gatherers get fair price for the NTFP gathered by them.
- ▼ The policy resolution contains a list of 60 items of NTFP in the Annexure - A and items including the seeds of various NTFP species in its Annexure - B and 9 restricted items of NTFP in Paragraph 4 (B) of the resolution.

- ▼ Forest produces like tamarind, honey, hill brooms, Siali leaves, Myrobolans and tree borne oilseed (TBOs) like Neem, **Karanj**, Babul, Kusum etc., which come under these items are termed as MFP and have been kept under control of GPs.
- ▼ The collection and trading of 9 restricted items of the resolution require permission from the Government of Odisha.
- ▼ The transport and trade of these NTFPs are under the control of the Panchayati Raj Institutions (PRIs).
- ▼ No Transit permit will be required for transport of any NTFP items within the state.

#### **Gram panchayat MFP Administration rule 2002:**

- ▼ The power to regulate procurement and trading of MFP whether produced in Government lands and forest areas within the limits of the Grama or collected from reserve forests and brought in the Grama.
- ▼ In case of the forest areas where *Vana Sanrakshyana Samiti* has been formed the GPs shall give priority to such Samitis and its members in the matter of collection and trading of MFP.
- ▼ Any person intending to be registered as a trader in MFP shall apply to the GP. The fees for registration for every item of MFP shall be as such be notified by Government from time to time.
- ▼ If the person is engaged in the trading of MFPs without registering himself with the GP, the Sarpanch<sup>12</sup> (council head) of the GP can lodge the necessary complaint before the DFO for taking appropriate action against the person concerned for such illegal trade.
- ▼ The Panchayat Samiti the authority to fix up the minimum price of procurement of different MFP payable to the primary gatherers during the next trading year.

#### **Manufacturing:**

- ▼ A manufacturer or an industrial consumers user, who is establishing a plant in Odisha for the purpose of any specified forest produce as raw material, has to register himself with the forest department. If the requirement of consumption exceeds the prescribed quantity, one has to declare its stock and register separately for each specified forest produce (The Orissa Forest Produce (Control of Trade) Act from 1983). Trade is free for 69 items under the panchayats through a license fee which is applicable for the trader. Trader is required to report to the GP regarding the quantity procured, etc. which the GP is to report to the Forest Department.

#### **Issues related with Transportation of NTFPs:**

No transit pass is required if a person is using forest produce for his own bonafied consumption. The person may transport individually the specified forest produce up to a limited quantity.

If MFPs transported within the district, there is no transit pass required. For transporting items outside the state district transit permit is required. For 68 MFPs Gram Panchayat can issue transit passes (Orissa Gram Panchayat MFP Administration Rules 2002).

Forest Right Act and Rules, 2006 gives ownership to individual, community and Gram Sabha for the access, collection, processing and trade of MFPs. Under this act the Gram Sabha is empowered to give transit permission only till first sale point. Section 41 & 42 of the Indian Forest Act 1927 empowers the State forest department to issue transit permits for the forest produce when transported within the district, state, country and also outside the country. The same is applicable for the study area in Andhra Pradesh and Odisha for the regulation of *Pongamia pinnata* seeds. A transit permit which is not valid throughout the country leads to constraints in the transportation of the commodity. Laws restricting free movement of MFPs can bring uncertainty in market operations, and inhibit gatherers from maximising returns

12 A sarpanch is a decision-maker, elected by the village-level constitutional body of local self-government called the Gram Sabha (village government) in India.

to production. It is also recommended that the Gram Sabha may be authorised by the State Government for issuing single point transit permit for the forest produce that they obtain from their respective community forest resource. FRA 2006 gives ownership rights of MFPs to the individual, community and Gram Sabha and also effects certain functions of the agencies such as GCCL, which have state monopoly for the procurement of MFPs. Also the regulations promoting the monopolistic conditions in the state for procurement of MFPs implies greater hold of existing players on the market rendering it difficult for new players to enter the market. A limited number of buyers thus operate under monopolistic conditions.

## Traceability of individual harvests

The concept of traceability came to the fore for the management of tropical forests with a growing worldwide awareness of environmental issues. When forest traceability is correctly used and well integrated into a company's practices, it helps to optimize the management of harvesting plans.

The problem of non-traceability is a major concern in the context of Minor Forest Product (MFPs) such as *Pongamia pinnata*. One of the major issues relate to the tracing of the raw material (MFP) used by several industries in the sector. There is lack of awareness among many of the end users, as to the extent to which wild harvested materials are used. Lack of information on the status of MFPs is a major impediment. Currently, there are no provisions in India whatsoever to make the industries provide information on the source of the raw material. Most often more than 80-90 % of the raw material comes from forest areas, at an unspecified price. Hence, the establishment of a monitoring system on the forest management unit level would provide an opportunity to trace a product from the source to the consumer (Chain of Custody). Forest certification can be described as another independent instrument guaranteeing the contribution of forest harvesting to sustainable development. Each type of certification requires a reliable traceability system that covers the entire processing chain and is verified annually by the certifying body. Therefore, traceability systems may be seen as a response to meet a regulatory constraint, which can subsequently turn out to be a major advantage in terms of the management of logging operations, stock movements, logistics and invoicing and development of market.

## Possible role of digital services – experience in tribal areas

Going digital might lead to an expansion of tribal commerce and the availability of tribal products over larger areas, reaping greater benefits for tribals especially in terms of Minor Forest Produce (MFPs). An e-commerce website – 'www.tribesindia.com' has hence been made available for sale of all its products<sup>13</sup>. The users can buy authentic items online through digital payment methods as well. One of its major aspects focuses on promoting the role of digital services through *Jan Dhan* bank accounts for payment of MSP to the collected MFPs particularly in the tribal areas. Here payments to the MFP primary collectors is done in cash if the amount is up to INR 500 and payments above that are done digitally through the Jan Dhan bank accounts.

Barring states which have functioning Minor Forest Produce Federations, the system of registering and helping collectors in case of exigencies rarely exist. In such conditions, providing them protection against risks or accidents becomes difficult. In a study conducted by TERI for deciding the minimum support price for *Pongamia pinnata*, it was found that in states like

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13 The categories of tribal products sold by Tribes of India include: Metal Craft, Tribal Textiles, Tribal Jewellery, Tribal painting, Cane & Bamboo, Terracotta & Stone Pottery, Gift and Novelties, Organic and Natural Food Products

Andhra Pradesh, Odisha, Chattisgarh, Telangana, Jharkhand and Chattisgarh around 96% of village dwellers/tribals have a bank account (figure) under the ***Van Dhan Scheme*** of Government of India. This fact is encouraging and should be taken advantage of to transfer benefits in case of issues during collection, processing and/ or marketing of *Karanj*. There is a potential that the remaining 4% should also be brought under the ambit of financial inclusion as early as possible.

Linking collectors through their Bank Accounts to existing government insurance systems will be useful in providing security to the collector against the physical risks (production risk, price or market risk, financial risk, institutional risk, and human or personal risk) during the collection to selling of *Karanj*. Existing schemes such as the '*Pradhan Mantri Suraksha Bima Yojana*', where the person is insured for INR 200,000 against accidental damage at a premium of INR 12 per year, should be promoted.

The fact that such large number of tribals in the states of Andhra Pradesh and Odisha have a bank account is encouraging and should be taken advantage of to transfer benefits in case of issues during collection, processing and/ or marketing of *Karanj*. The use of digital services can be made in order to bring the remaining proportion under the ambit of financial inclusion as early as possible.

## Scope of foreign investments in Indian Pongamia market

The Indian Pongamia market is regulated by many acts and rules for maintaining the sustainable collection and use of the commodity. For example, Community forest Resource (CFR) rights, of the Forests Rights Act, 2006, gives communities ownership over their forests. It has also stopped private companies from gaining access to tribal land. The market for both primary and secondary products acquired from *Pongamia pinnata* is very much open for foreign investments and there are no restrictions. In order to enter the Pongamia market the interested company has to follow the specified rules and regulations listed in the previous sections. Various aspects such as registration of the interested agency with the Gram Panchayat, regulations related to transit rules *i.e. transportation of commodity at inter-state* and intra-state, issuance of transit passes and fair-trade standards should be considered carefully by the interested parties while entering the Pongamia seeds market in India.

## Chapter 4.

# FAIR-TRADE AND (WILD HARVEST) ORGANIC CERTIFICATION AND STANDARDS

### Relevant and fair-trade standards in India for certification of organic products that result from wild harvest

Over 300 million people who live in and nearby forest area depends on the forest in India (FAO, 2014). Recently, the high consumer demand and steady growth of the MFPs is gradually increasing in the world market due to use of forest products in food and medicinal industry. Thus, the subject of certification is emerging very fast and promotion. The certification of MFPs including medicinal and aromatic plants has many direct and indirect benefits. The development of a mechanism for MFP product certification, which, unlike timber certification, has been a difficult and complex matter until date.

India currently holds the ninth position among 178 countries that actively practice organic agriculture (ASSOCHAM, 2018). With only 0.4% of the total agricultural land area designated for organic cultivation, the industry still has great scope to grow. The price of the raw MFP gets enhanced when value addition takes place. Van Dhan Yojana of The Ministry of Tribal Affairs (MoTA) is planning to support community level MFP processing centres. But to realise the

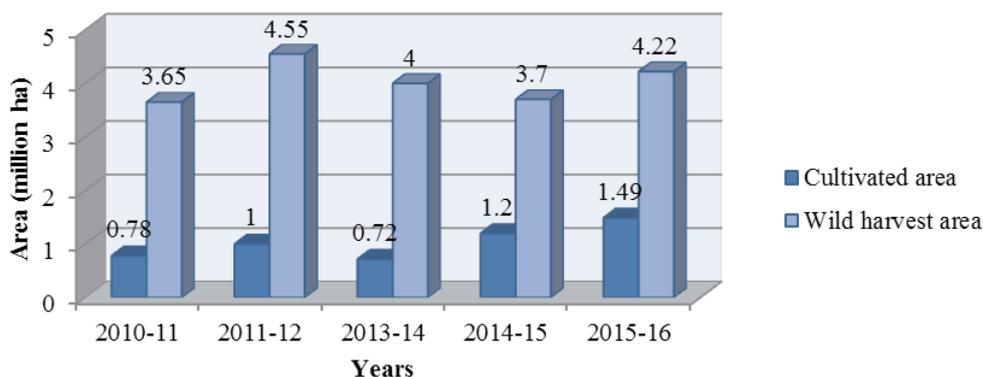


Figure 6. India's cultivated and wild harvested area (in million ha)

Source: (APEDA, 2019)

benefit from value addition, there is also a need to provide cost-effective certification system for value added MFPs and an interactive marketing platform.

## REGULATORY FRAMEWORK FOR THE CERTIFICATION PROCESS OF ORGANIC PRODUCTS

Several steps have been taken by the Government of India (GoI) from regulatory point of view to match the global standards of organic products in India. This attempt has incentivized the production of farmers and prompted companies to create consumer awareness.

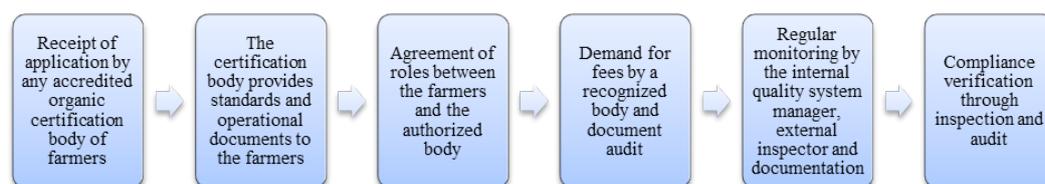
To provide a focused and well directed development of organic agriculture and quality products in India, the following bodies were formed:

1. Agricultural and Processed Food Products Export Development Authority (APEDA) for implementing the National Programme on Organic Production (NPOP)
2. National Centre for Organic Farming (NCOF) for implementing the Participatory Guarantee System (PGS) in India
3. Food Safety and Standards Authority of India (FSSAI) for regulation of food safety standards of organic packaged food and beverages products

The Ministry of Commerce and Industry, (Government of India) has launched the National Programme on Organic Production (NPOP) in the year 2000, which was formally notified in October 2001 under the Foreign Trade (Development and Regulation) Act (DGFT). NPOP provides information on standards for organic production, systems criteria and procedures for accreditation of inspection and certification bodies. The standards and procedures have been drawn up in harmony with international standards such as those of Codex<sup>14</sup> and The International Federation of Organic Agriculture (IFOAM)<sup>15</sup>. In 2006, India's organic certification process under NPOP had been granted equivalence with the European Union. Farmers and processors can get a certificate from agencies accredited by NPOP, which has been in place since 2001. In this process farmers growing perennial crops need to wait for three years to get a new certificate. For annual crops, the waiting time is two year. The farmers which are already practising organic can get a certificate after a year. The cost of the certification process may vary from INR 15,000 to INR 50,000, depending on the size of the holding and the fee of the inspecting third-party.

Figure 7. Certification process in India

Source: <http://organicterrace.in/blog/how-to-get-organic-certification-in-india/>



14 The Codex Alimentarius Commission (CAC) is an international food standards body established jointly by the Food and Agriculture organization (FAO) and the World Health Organization (WHO) in May 1963 with the objective of protecting consumer's health and ensuring fair practices in food trade.

15 The International Federation of Organic Agriculture Movements (IFOAM - Organics International) is the worldwide umbrella organization for the organic agriculture movement, which represents close to 800 affiliates in 117 countries.

## CERTIFICATION AGENCY

The organic certification process is carried out by accredited bodies under NPOP. In order to verify farms, storages and processing units, 28 agencies have been accredited by APEDA. A list of these agencies is attached in the Annexure 3. These private agencies are responsible for verification of the organic farmers, processors, manufacturers and traders, and issuing them certificates. Since these agencies are recognized by APEDA, compliance with the standards is monitored.

## Wild Harvest Organic Certification

Wild harvests can also be certified as organic. According to NPOP, for the organic certification process, conversion of land for organic farming must be done. But in the case of wild lands, no conversion period is required. Furthermore, the conditions apply only to the natural forests and only the products are certified, and not the forests.

Must wild harvest collection should not exceed the sustainable yield of any species and it must not threaten the local ecosystem. Around 40% produce should be left in the forest itself. The produce must derive from a stable and sustainable growing environment and also contribute to the maintenance of natural heritage.

Following are the requirements for the Organic Certification of the Wild Harvest:

1. Wild Harvest products shall only be certified 'Organic' if derived from a stable and sustainable growing environment and contribute to the maintenance of natural heritage.
2. Harvesting or gathering the product shall not exceed the sustainable yield of the ecosystem or threaten the existence of plant or animal species. Around 40% produce should be left in the forest itself.
3. Products can be certified 'Organic' only if derived from a clearly defined collecting area, which is not exposed to prohibited substances and subjected to inspection.
4. The collection area shall be at an appropriate distance from conventional farming areas, pollution and contamination sources.
5. The operator managing the harvesting or gathering of the products shall be clearly identified and be quite familiar with the collecting area in question.
6. While harvesting or gathering the products, attention should be paid towards maintenance and sustainability of the ecosystem.
7. The operator must instruct the collectors, that:
  - a. Defines the area of collection
  - b. Informs them about the standards and other requirements for certification
8. The collectors must sign the written statements that they have followed the instructions.
9. The operator must maintain the entire records of the collectors, also the quantities bought from them.
10. The area of production must properly be marked on maps, which should be large and distinct enough to minimize the risk of mixing up with non-certified production.

Other than the third party certification (TPC), there are other approaches in the country such as the Participatory Guarantee System (PGS) where farmers living in similar geographical area (in the same of close-by villages) inspect and verify each other's process and confirm the adoption

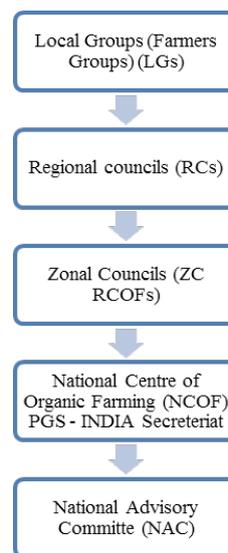
of standards. PGS-India was officially recognised in India in 2015. Currently, PGS-India is implemented by the National Centre of Organic Farming (NCOF) under the National Project on Organic Farming (NPOF), Department of Agriculture, Cooperation and Farmers' Welfare, GoI.

PGS - India being participatory does not require any third party and is low cost, while third party certification is cost intensive and is generally unaffordable by small and marginal farmers. PGS guarantee system are locally focused and are ideal for local and domestic markets, while TPC systems are meant for taking the produce in international markets. PGS-India standards are the same as that of NSOP under NPOP. Any amendment or modification in NSOP is deemed to have been incorporated in PGS-India standards. For interpretation of any part or section of PGS-India standards NSOP must be referred.

Key stakeholders (producers, consumers, retailers, traders and others such as NGOs, societies/ Gram panchayats/ State/Central Govt. organization/agencies /farmer etc.,) are engaged in the initial design, and then in the operation of the PGS. Here, the local farmers conduct their own appraisal and maintain the rules and standards of the group. The process becomes much simpler and cheaper when it is controlled by the farming community itself. PGS-India controls the quality system through internal quality management system (QMS) through Farmer Grower Group Certification (GGC) instead of a certifying agency.

Figure 8.  
Organizational  
structure PGS India

Source: PGS-India



## Fair-Trade standards

Fair-trade is defined as a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers - especially in the South (World Fair Trade Organization (WFTO) and fair-trade Labelling Organizations International, 2009). Fair trade also advocates the payment of higher prices to exporters, as well as improved social and environmental standard.

There are various key initiatives which support the development of fair-trade for MFP in India:

- ▼ FLO is the International Fair Trade Labelling Organization, which since 1997 has been coordinating the various national initiatives by gradually drawing up international standards for each commodity and promoting a single fair-trade label.

- ▼ IFAT is the International Fair Trade Association for fair-trade organizations with 220 members in 59 countries, 65% of them in the Global South. IFAT has three goals: market development, advocacy and building trust. It allows accredited members to use its FTO Mark, which it emphasizes is distinct from the FLO product label.
- ▼ Southern fair-trade networks are increasingly being set up in Bangladesh (ECOTA Fair Trade Forum), India (Fair Trade Forum India), Nepal (Fair Trade Group Nepal), Kenya (Kenyan Federation of Alternative Trade) etc.

The Government of India has a mission to buy from ethnic-minority-led businesses for decades. In addition, it has a high potential in developing a fair-trade marketing secure consumer loyalty in the face of price competition. There have been an increasing number of national initiatives that are trying to target fair and green trade products to these consumers. Various fair trade-organization's partnerships and government and non-government organizations technical assistance programmes are coming up in India.

India's organic food exports have found a new strength: online traceability. Web-based **TraceNet** can trace an organic product right from its origin.

- ▼ It assembles, stores and reports information on each organic food produced for export.
- ▼ It is a web-based traceability system, which integrates various stakeholders in the organic supply chain, such as farmers, processors, traders, certifying agencies, accreditation body and the Agricultural and Processed food products Export Development Authority (APEDA).
- ▼ It maintains all the information about each organic product, right from the time a crop is sown till it reaches the importer. All authorised stakeholders register under a certifying agency for organic certification as per the National Programme for Organic Production (NPOP).
- ▼ This platform also provides certification for the organic products made from minor forest produces (MFPs). For this, the places from where MFPs can be collected are marked on state maps by the forest department. Those who collect MFPs are called certified wild collectors. The rest of the certification procedure is the same as that for agricultural products.

In India, there is a need to develop national standards of certification for forest products such as non-timber forest products, including Pongamia seeds. Currently, the Network for Certification and Conservation of Forests (NCCF) is trying to develop standards in this regard. NCCF is trying to develop a separate Certification scheme for non-timber products of forest origin and to promote sustainable NTFP resource management. Such kind of system shall ensure resource sustainability, a product based certification to address the limits and thresholds values for different plant and animal origin products, it also ensures socio-economic benefits and benefit sharing with the forest dwellers, local communities and others involved in collection of NTFPs. Development of such certification system can help in the value addition of commodity especially for the minor forest produce such as Pongamia pods etc.

## CHALLENGES FOR FAIR-TRADE PROCESSES IN INDIA:

On a global scale fair-trade has historically been seen as a small niche operation (1 to 3% of the relevant market), but its recent growth, improved quality and marketing put it in a position to be able to gain further mainstream sales and broaden its impact. In India, much of this has to do with its advocacy role in trying to influence more the mainstream market. The local markets in India has many other challenges in response to competition from major brands setting up their own "Fair-Trade lite" and cause-related marketing schemes that offer similar sounding products for lower prices. For a country like India where there is a long tradition of trade of MFPs, traditional knowledge available regarding harvesting, collection, processing, and storage of MFPs, and a large number of MFPs are unique due to tropical climate, there is a need to develop country specific standards and protocol.

## Chapter 5.

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# POTENTIAL ADAPTATION AND DEVELOPMENTAL IMPACTS OF PONGAMIA PINNATA

The objective of the present study focuses on conducting a market study of the Indian *Pongamia pinnata* seed market including its investment context in order to provide practical guidance for foreign companies aiming to enter the Indian *Pongamia* market with products, services and technologies. Exploring a range of alternative scenarios in this context shall allow the companies to identify potential risks and plan how they will counteract or mitigate their impact of various externalities affecting the market. Potential adaptation and development impacts including mitigation co-benefits of envisaged investments related to *Pongamia* according to local context factors can be assessed based on the following scenarios presented below:

### Potential adaptation and development impacts of the following four scenarios

**a) Incentivizing smallholders to harvest wild growing *Pongamia* in forests; fair-trade and organic certification ensure higher prices, which are transferred to smallholders and make harvesting in less accessible regions economically attractive.**

The government has introduced various schemes in order to provide fair rates to the primary collectors of MFP in the country. The MSF scheme for MFP launched by Ministry of Tribal Affairs (MoTA) aims to build a system that is decentralised with collectors made responsible for the scheme implementation. Self-Help Groups (SHGs) would be formed, which would sell the MFPs at village haats (local markets). Value addition centres (*Aadi Ajeevika Value Addition Centers*) would be established to improve the rates tribals get for the produce collected by them. This scheme has enormous potential with respect to *Pongamia pinnata* seeds collection to enhance livelihoods of forest-dependent communities and would result in their economic empowerment.

Fair-trade mechanism is a new concept in India. Such marketing mechanism can raise attention to the inequalities faced by people involved in MFP collection belonging to tribal areas. In the long run, fair-trade and certification process of MFP through involvement of national agencies can result in more structural changes to support smallholders and local economies.

**b) Introducing a new processing technology to India, making it possible to reduce the bitterness of *Pongamia* seeds and open up possibilities for the production of products such as high-quality vegetable oil.**

*Pongamia* oil has been used traditionally for medicinal and other non-edible purposes. The main reasons for non-edible use are bitter taste and possible toxic elements in the oil. In India not much research has taken place so far to remove the bitterness and also to clearly define the non-toxic properties of the oil so as to use it as high quality edible oil. Decortication is the main process in the post-harvest processing of *Pongamia*. As per the primary research conducted by TERI during the present study, decortication and de-hulling of the pods to obtain the seeds is a tedious task for the collectors and seller. This process when done manually required a large amount of man-power and time. Minimum Support Price for one kilogram of manually decorticated *Pongamia* seeds is INR 18, out of which the value for efforts for decortication is about INR 0.11. The mechanical de-corticator will be helpful in reducing the manual processing efforts and the collectors can collect pods upto 10 kg per day. Thus, introduction and installation of de-hulling machines and shell separators in order to address an important operation of separating kernels from the pods could help the villagers in saving time which they could use more productively collecting *Pongamia* pods from the trees.

**c) Introducing a new variety of *Pongamia* to India, which is more resistant to drought and produces higher yield; creation of *Pongamia* plantations on formerly degraded land.**

In India, a very limited research is underway to develop high-seeding varieties with an emphasis on selecting varieties that will yield maximum quantities of biofuel (oil extracted from the seeds) (Sahoo et al., 2009; Mukta Sreevalli, 2010; Sunil et al., 2010). The 'Seeds of Hope' project in southern India found that wild types are unpredictable in cropping (number of pods per tree) and trees can take up to 10 years to mature. The practice of grafting helped reduce time to maturity to three years in some cases (Tigunait, 2006). The leguminous tree of *Pongamia pinnata* could be utilized to procure pods as a MFP or to produce biofuel while restoring degraded land and improve soil properties. Restoring the degraded lands using suitable species like *Pongamia* can provide an opportunity to enhance ecosystem services and support local economies.

**d) Substitution of less sustainable/resilient crops (e.g. wheat) and secondary products (e.g. animal protein) by the new variety of *Pongamia* mentioned (see c).**

At present, there is a very limited practice of planting *Pongamia pinnata* trees in agro-forestry systems. Unless and until the new properties from future new variety of *Pongamia* are proved in terms of resilience and its importance as animal protein, its incorporation in farming system will not be possible. There is a need to have established evidence to convince farmers to adapt such variety if developed.

## Potential mitigation co-benefits of *Pongamia pinnata*

*Pongamia* is a preferred species for plantations along road side in all parts of India due to its ability to grow on varied climatic and soil conditions. The plantations also generate several co-benefits as described below.

### Carbon sequestration potential of *Pongamia pinnata*

*Pongamia pinnata* can be useful in mitigating the impact of climate change by sequestering carbon. A study conducted by Edrisi in 2016 showed that a 5- year-old pongamia plantation has a carbon sequestration potential of around 49.28 t ha<sup>-1</sup> (Edrisi et al., 2016). According

to a productivity assessment study done by the Competent Authority of Uttar Pradesh the productivity of *Pongamia pinnata* is found to be 2.5 (m<sup>3</sup>/ha/Year). Using the wood density value of 0.67 tonnes/ m<sup>3</sup> (Wood densities of tree species for tropical Asia, FAO) and productivity as 2.5 m<sup>3</sup>/ha/year, the amount of carbon sequestered by one *Pongamia* tree was calculated as 0.84 tonnes/ ha (approximately).

From a study conducted by TERI in 2018 (submitted to Tribal Cooperative Marketing Development Federation of India Ltd. (TRIFED), the total number of *Pongamia* trees found across different states in India is estimated to be 91, 15, 508 and the total potential *Karanj* area is 8, 14, 975 hectares. Using productivity as 2.5 m<sup>3</sup>/ha/year and wood density as 0.67 tonnes/m<sup>3</sup> (FAO, 1997) we calculated the total biomass which is equivalent to 1.37 million tonnes and total carbon stock is 0.69 million tonnes. Therefore the total carbon sequestered by *Karanj* across the country is 2.53 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>e)<sup>16</sup>.

- ▼ In case of **Andhra Pradesh**, total numbers of *Karanj* trees is estimated to be 74, 34, 375 and total *Karanj* area is 99,125 hectares (TERI, 2018). Total biomass is 0.17 million tonnes and total carbon stock is 0.09 million tonnes. Therefore total amount of carbon sequestered is 0.33 million tonnes of CO<sub>2</sub>e.
- ▼ In case of **Odisha**, total number of *Karanj* trees is estimated to be 85,41,200 and total *Karanj* area is 99,650 hectares (TERI, 2018). The total biomass of the trees has been estimated to be 0.17 million tonnes and the total amount of carbon sequestered is 0.33 million tonnes. Therefore total amount of carbon sequestered is 0.33 million tonnes of CO<sub>2</sub>e.

Significant amount of carbon is sequestered in the area. Extraction of biodiesel from the seeds of *Pongamia* is found to be an input for the climate change mitigation activities taking place in India at large scale. The projections made in the study conducted for Powerguda in Andhra Pradesh showed that approximately 36.07 tonnes of CO<sub>2</sub>e is being sequestered from about 12,600 kg of oil yield (Silva E, 2004). Cultivation strategies for *Pongamia* need to take into consideration the local climatic aspects as well as the impacts of climate change. It is a potential tree that provides substantial role in cleaning the atmosphere from CO<sub>2</sub>.

### ***Pongamia pinnata* in agro-ecosystems**

*Pongamia pinnata* is a legume species. Legumes provide many different functions and ecosystems services that are of great value for agriculture and society (De Faria et al., 2011). Including legume food, forage and tree crops in farming systems is one approach that can contribute to mitigating climate change. They provide important sources of oil, fibre, and protein-rich food and feed while supplying nitrogen (N) to agro-ecosystems via their unique ability to fix atmospheric N<sub>2</sub> in symbiosis with the soil bacteria rhizobia, increasing soil carbon content, and stimulating the productivity of the crops. Following are some of the advantages of *Pongamia pinnata* if it is incorporated in the agriculture:

- ▼ The ability of the legumes to fix their own N via symbiosis with rhizobia bacteria reduces emissions of fossil energy-derived CO<sub>2</sub>. The CO<sub>2</sub> that is respired from the nodulated roots of *Pongamia* originate from the atmosphere via photosynthesis, so any of the CO<sub>2</sub>, which is not recaptured by the plant and eventually escape from the legume canopy to the atmosphere will essentially be CO<sub>2</sub> neutral. Thus, all the CO<sub>2</sub> released during the synthesis of fertilizer N is derived from fossil energy and represents a net contribution to atmospheric concentrations of CO<sub>2</sub>.

<sup>16</sup> A carbon dioxide equivalent (CO<sub>2</sub>-eq), is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP). It is commonly expressed as million metric tonnes of carbon dioxide equivalents (MMTCDE).

- ▼ Biomass can potentially be used to replace fossil hydrocarbons for heat, power, solid and liquid fuels, materials or chemicals (Bessou et al., 2010). *Pongamia* offers an interesting possibility for future biodiesel production with potential applications for legume-based bio-refineries. These species also play a key role in soil carbon sequestration.
- ▼ *Pongamia pinnata* shows various adaptation properties as well. Property of salt tolerance in *Pongamia* is used to produce oil-seeds on degraded, low productivity or salt-affected land (Kesari and Rangan, 2010; Odeh et al., 2011). *Pongamia* is capable of withstanding drought stress, can grow on saline soils and needs little topsoil as it has a dense network of lateral roots and thick long taproots. *Pongamia* plantations can help alleviate compaction and crusting.

## Potential risks in terms of maladaptation or unintended impacts related to *Pongamia pinnata*

The risk of *Pongamia pinnata* invading bush-lands and grazing lands outside its native land can lead to severe issues. *Pongamia pinnata* is tolerant to a wide range of soils, including saline soils. In addition, its seeds are dispersed in larger number by the means of water. According to experts certain attributes of *Pongamia pinnata* have led some people to recommend its restriction outside its native range, particularly if cultivation is proposed close to national parks or the preferred habitats include coastal and riverine habitats, primarily in humid tropical and subtropical areas (500–2500 mm rainfall per annum). The Guidelines on biofuels and invasive species' by the International Union for Conservation of Nature (IUCN) 'recommends that 'environmental management plans' are drawn up for biofuel plantations so that adequate planning and funding is in place to ensure, among other things, that seedlings are eradicated outside of designated plots. Finally, there is a risk that import of *Pongamia* varieties from overseas might introduce new genetic material into the Indian *Pongamia* population and the impacts of the same need to be studied carefully before introduction of the variety.

## Chapter 6.

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# GENERAL FINDINGS AND RECOMMENDATIONS

## FOR ACTION ON THE INDIAN PONGAMIA MARKET

The broad objective of the study conducted by TERI on the *Pongamia pinnata* seed market in India focused on assessment of potential for investment by understanding various factors such as socio-economic, local market actors, regulatory regimes with special reference to states of Andhra Pradesh and Odisha. In order to estimate the potential and current status of the Pongamia seed market, field visits were made to Araku valley and Baripada cluster of Andhra Pradesh and Odisha respectively. The analysis conducted during the study presents a clear picture of the existing and potential supply and demand for *Pongamia pinnata* seed value chains.

Based on the rapid surveys and review of secondary literature, the following recommendations are suggested:

### Challenges and potential for entering Indian Pongamia market

#### TRANSIT PERMIT ISSUES

Transit permit is an important provision under IFA, 1927 which is a national level legislation. Hence, it is implemented in the states by not diluting its context as defined in IFA, 1927. Currently, the potential of *Pongamia pinnata* pods procured from the regions in Andhra Pradesh and Odisha is not explored to its fullest. Hence, because of the less quantity of pods procured, currently no hindrance is faced by small traders for the transportation of the commodity within the state. But the problem in the trade prevails when large amount of *Pongamia pinnata* seeds are to be transported between two states. Hence, the transit permit which is not valid throughout the country leads to many constraints in the transportation of *Pongamia pinnata* pods. Laws restricting free movement of MFPs can bring uncertainty in market operations, and inhibit gatherers from maximising returns to production. In the areas where Forest Rights Act, 2006 is applicable, Gram Sabha is authorised for issuing transit permit till the first point of sale for the forest produce which gets recognized mainly within the state. But there is a need to have a mechanism where after first point of sale, the permit given by government would be recognized at national level. So that there will be ease of transporting the MFPs across India.

## MARKET DEMAND

The demand of *Pongamia pinnata* seed oil is influenced by other competing natural oils, availability of industry using *Pongamia pinnata* seed oil and ease of transportation of *Pongamia pinnata* seed oil. Both the cases from Odisha and Andhra Pradesh mentioned in the report highlight these issues. Traditionally *Pongamia pinnata* seeds have been used for various purposes including for medicinal purposes, in tanneries, etc. Over the period, there have been changes in the traditional uses of *Pongamia pinnata* seeds due to alternatives available. At the same time, there have been new uses identified such as bio-diesel from *Pongamia pinnata* seeds and an avenue of new market has begun. But considering the extant demand of the *Pongamia pinnata* seeds all through out in various types of markets within and outside India, for which very limited information is available. Hence, there is a need to map various types of markets and the purposes to which these markets cater to with respect to *Pongamia pinnata* seeds. This would lead to do scoping of markets as well as the potential of the available resource of *Pongamia pinnata* seeds.

## SCOPE IN REMOVING TOXIC ELEMENTS FROM PONGAMIA OIL TO MAKE IT EDIBLE

India is facing shortage of edible and industrial inedible oils. So, there is a need to import oils from abroad to meet up the demand in many foreign countries. *Pongamia pinnata* seed oil can play a vital role in minimizing the shortage of inedible oil in the country to some extent. But the non-alkaloids contained in the seed meals and oil could have been possible to remove efficiently. Therefore, promoting research in finding ways to remove the toxic elements from the *Pongamia pinnata* oil can lead to development of Indian Pongamia market. Such findings will open up a possibility to obtain an edible oil and meal from Karanja seed by refining, which will lead to a complete removal of the alkaloids.

Adding value to Pongamia oil cake - to be used as fertilizers in agriculture, for extraction of Karanj cake is not commonly used as a feed for livestock and poultry due to the harmful effects of anti-nutritional/toxic factors present in the seed cake. Hence, there is a risk of potential hesitancy among the people to use this product. To overcome this undesirable characteristic, the toxic components may be reduced by undergoing physical/chemical treatments.

## NATIONWIDE AVAILABILITY AND AN ESTABLISHED MFP ITEM

*Pongamia pinnata* is found naturally or can be cultivated throughout India. The nation wide availability and optimum growth of Pongamia trees present a high scope of various agencies to enter Indian Pongamia market. Pongamia seeds have been traded almost all over India as one of the MFP items. It is also locally used mainly for medicinal purposes. Hence, it is an established trade item known to collectors and traders.

## Potential partners and relevant stakeholders in Andhra Pradesh and Odisha

- ▼ **State level procurement agencies** (Girijan Co-operative Corporation – Andhra Pradesh, Tribal Development Co-operative Corporation of Odisha Ltd.) – State level Aggregator, compliant to government systems of procurement
- ▼ **Village level bodies** such as Gram Sabha – in order to regulate the collection and transportation of Pongamia pods from their areas. – Sustainable management of resources, employment opportunity provider through harvesting of Pongamia seeds

- ▼ **Local level organization** working in the field of Minor Forest Produce (MFP) in selected states – Kovel Foundation (Araku Valley, Andhra Pradesh) – Facilitator in capacity building, training, and handholding

## Approaches and routes to cooperate with smallholder farmers especially in tribal areas

### BUY BACK

Promoting buy back guarantee for Pongamia pods / seeds can prove as a successful approach to cooperate with smallholder farmers. The buy-back mechanism can directly cut off the middlemen. Since the produce is picked up from farm-gate that means, the collection point is established near the village, this will also save on transportation cost.

### COLLABORATION WITH STATE NODAL AGENCIES

Girijan Co-operative Corporation (GCC) in Andhra Pradesh and Tribal Development Cooperative Corporation (TDCC) in Odisha are the State level nodal agencies for trade of Pongamia seeds. Involvement of other local level organizations such as the Kovel Foundation which has a significant presence in Andhra Pradesh in the field of Minor Forest Produce (MFP) can also provide efficient access to the resources.

### TECHNICAL ASSISTANCE IN DE-CORTICATION

Introduction of proper technical assistance in-terms of installation of de-hulling machines and shell separators can help in saving time of the villagers and they can give more of their time in the collection of the Pongamia pods manually. It is observed that only 50% of the pods get collected and rest are left since the efforts of collection, decortication and sale do not match the financial returns. Hence, technical assistance in processes like de-cortication would be of help if large quantity of seeds needs to be collected.

### CO-BENEFITS OF PONGAMIA PINNATA PLANTATION

*Pongamia pinnata* is a preferred species in the agroforestry models. This species is well known for controlling soil erosion with extensive network of lateral roots, it tolerates moderate levels of salinity, incorporation of leaves and the press-cake into soils improves fertility. It is also used in reforestation of marginal land. Additionally Pongamia flowers are considered a good source of pollen for honeybees in India and they yield adequate nectar. *Pongamia pinnata* is a shade giving tree. Its leaves are traditionally used to package and conserve the freshness of hot season fruits like Mango etc. *Pongamia pinnata* can also be useful in mitigating the impact of climate change by sequestering carbon. Considering large number of uses of the species, different types of agroforestry models already exist across different parts of India. But proper marketing mechanism would promote the interest of the local tribal groups.

## The standards and processes to achieve a Fair-Trade certification

At present there are no specific Fair Trade Standards available in India. But there are a number of other systems which indicate fair price, procurement and equitable trade by following existing legal mechanisms in the country. Based on such legal mechanisms government recognized certification system could be developed for procurement of Pongamia seeds.

In a nutshell, Pongamia seed is a traditional MFP collected and used across India. Almost 50% of the produce does not get collected due to limited market as well as limited procurement infrastructure. Ministry of Tribal Affairs (MOTA) has provided Minimum Support Price for the procurement of the produce to sustain the livelihood of the forest dwellers collecting Pongamia pods and selling decorticated seeds. There is a potential to introduce the decorticator to enhance the manual collection for large scale commercial use. The present system of transit of Pongamia seeds needs to be reformed with simpler system which could be easily followed and accepted at national level.

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## Annexure 1.

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# QUESTIONNAIRE FOR TRADER

NAME OF TRADER / COMPANY

ADDRESS – VILLAGE, DISTRICT, STATE

EMAIL, PHONE –

1. Which are the commodities you are selling?
2. For how many years you are selling the particular commodity?
3. How many different grades are available for a commodity?
4. How do you recognize / differentiate the grades? Physical and other attributes
5. What are the prices for various grades of commodity?
6. How much is the demand of a commodity in a year?
7. What is the value chain of a commodity? (i.e. which are the major trading centres from local level to national and international levels, what kind of value addition happens for the given grade and at what scale?)
8. How do the value addition and scale / level of market impacts the price of the commodity?
9. What is the supply trend of the commodity throughout the year?
10. What is the shelf life period for the commodity?
11. Will you observe any changes in the physical attributes (color, shape, size) of the commodity from past years?
12. What are the changing trends (Pricing, Demand) of the commodity?
13. What are the different marketing competitions you are facing?
14. Is there any competition (alternate product) of the particular commodity available in the market? How it is affecting the demand of the commodity?
15. Who is currently buying the commodity (Industries, Pharmaceutical Industries, and Household Purposes etc)? ,
16. What are the reasons behind the demand of the commodities?
17. What are the major factors influencing the buying behaviour?
18. How long a particular commodity is in storage facility? What type of storage facilities are used to prevent deterioration of the commodity?
19. On what basis the expiry date of the product is decided?
20. What are the main market days? (Is there any particular season in which sales are high?)

21. Problems faced by the retailers during selling, exporting, importing of the commodity?
22. What were the different approaches used in marketing earlier and now for the commodity and how it is beneficial for you?
23. What are the risks involved in collection, processing and trading of the commodities?
24. How much time is generally needed for collection, processing and trading of the commodities (per unit)?

## PONGAMIA SPECIFIC QUESTIONS

1. How much Pongamia (primary products, i.e. seeds in pods and shelled Pongamia beans) is currently being harvested in AP and Odisha?
2. Current price of Pongamia in those market and impact of prices set by Ministry of Tribal Affairs?
3. How has the market evolved and developed during the last years?
4. Is Pongamia directly sold by small/harvesters/intermediaries?
5. What is the role of smallholder associations/producers organizations?
6. How much is the profit is left with smallholders/harvesters as compared to the intermediaries?
7. What is the end price of the product?
8. Which are the most relevant and already competing /established products with similar project characteristics?
9. What are the comparative disadvantages/advantages of the product/value chain in national and export markets?
10. Which are the existing products for competition on the Pongamia market?

## Annexure 2.

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# KEY INFORMATION/ CONTACTS

## GATHERED DURING ARAKU CLUSTER AND BARIPADA VISIT

### Ware-house contacts:

1. Dr. S. Ashok Kumar, General Manager (Retail Marketing & Industrial Divins), Girijan Co-operative Corporation Limited, Lawsons Bay Colony, Opp. VUDA park, Visakhapatnam-17. Mobile-9490166280, 9440632411; [Email- gmrmdgcc@gmail.com](mailto:gmrmdgcc@gmail.com)
2. Odisha State Civil Supplies Department, Hikimput Depot, Nandapur, Koraput, Odisha.
3. Mr. Vinay Kumar Jain, RSV Exim Private Limited, Plot No. G- 4 & 5, Phase 2, Visakhapatnam Special Economic Zone, Duvvada, Visakhapatnam, AP. Phone- 9425204523, 7382089318, Emai- vinay\_19792001@yahoo.com

### Oil Mill contacts:

1. Sri Satya Oil Mills, Ankapalli, Andhra Pradesh. Phone- 9849925244
2. Mani Oil Mills, Akkayyapalem, Main Road, Visakhapatnam, Andhra Pradesh. Phone- 8912765648
3. Bhuvanewari Matha Oil Mills, Seetampeta, Visakhapatnam, Andhra Pradesh. Phone- 7702125695
4. Trinath Thakura Oil Mill, Main Road, Hatapada, Pujariput, Padwa, Odisha. Phone- 9437312697, 9438833795
5. K. Ramu, Oil Mill Owner, Dharmavaram, Anantapur district, Andhra Pradesh. Ph. No. 9885553451
6. Shri Shaker, Large scale Oil Mill Owner, Dharmavarm, Andhra Pradesh, Ph. No. 9490623651

### Seed Processing unit contact:

1. Mr. Vinay Kumar Jain, RSV Exim Private Limited, Plot No. G- 4 & 5, Phase 2, Visakhapatnam Special Economic Zone, Duvvada, Visakhapatnam, AP. Phone- 9425204523, 7382089318, Emai- vinay\_19792001@yahoo.com

### Tribal Welfare department contact:

1. Mr. D. K. Balaji, IAS, Project Officer, Integrated Tribal Development Agency, Paderu, Andhra Pradesh. Phone- 08935 250833, Email- [poitda.pdr@gmail.com](mailto:poitda.pdr@gmail.com)

**Truck Owner's Association contact:**

1. Mr. Y. Raju, Gajuwaka Steel City Lorry Owner's Association, Rajiv Nagar, Near Toll Gate, Kurmannapalem, Visakhapatnam. Phone- 9248419616, 7386826776

**NGO and Co-operative society contacts:**

1. Tribal Educational Rural Development Society, Dumbriguda, Visakhapatnam, AP. Phone- 08936 249135
2. The People Service Organisation, Door No. 21A, Sarada Nilayam, Murali Nagar, Visakhapatnam, AP. Phone- 9152769215
3. Good Earth Society, 7-143, Bosu Beda, Visakhapatnam, AP. Phone- 9441140687
4. Green & Health Tribal Development Society, Araku Colony, Visakhapatnam, AP. Phone- 0891 249441, 9492823138
5. V. Krishna Rao, CEO of Kovel Foundation, Sagar Nagar, Visakhapatnam, Mob : +91 9440976848, E-mail: [kovel@rediffmail.com](mailto:kovel@rediffmail.com)
6. Shri Devullu, Director, SANJEEVINI Rural Development Society, Vishakapatnam, Andhra Pradesh, Mob no. – 9440119789, E- mail: devullupachari@gmail.com
7. Society for Promoting Rural Education and Development, Janiguda, Koraput, Odisha. Phone- 06852 250326
8. Tribal People and Women Welfare Organisation, Lingaraj Nagar, Jeypore, Koraput, Odisha. Phone- 9777576989
9. Prantiya Utkal Seva Samiti, Nandapur, Koraput, Odisha. Phone- 9861511405

## Annexure 3.

# LIST OF ACCREDITED CERTIFICATION BODIES UNDER NPOP

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
1	Bureau Veritas (India) Pvt. Limited	Contact Person: Mr. Jagdheesh N Manian Head – Certification Address: 72 Business Park, Ground Floor Marol Industrial Area, MIDC Cross Road 'C', Andheri ( East) Mumbai – 400 093, Maharashtra Email : <a href="mailto:kaushik.sengupta@in.bureauveritas.com">kaushik.sengupta@in.bureauveritas.com</a> Contact Number : Office : +91 22 62742905; Mobile :+91 22 8691874332; Direct : +91 22 62742932 Website : <a href="http://www.bureauveritas.co.in">http://www.bureauveritas.co.in</a>	NPOP/ NAB/001	Renewal of accreditation is under process since 31.05.2019	NPOP USDA NOP	 (w.e.f: 17-01-2018)
2	ECOCERT India Pvt. Ltd.	Contact Person: Mr. Anil Jadhav Chief Executive Officer Address: Unit number 801, 8th Floor, The Palm Square, Sector 66, Golf Course Extension Road, Gurgaon 122102 Haryana India Telephone: +91-124-6999959 Fax: +91 124 4313171 Email: <a href="mailto:anil.jadhav@ecocert.com">anil.jadhav@ecocert.com</a> Website : <a href="http://www.ecocert.in">www.ecocert.in</a>	NPOP/ NAB/002	22.08.2020	NPOP USDA NOP Livestock w.e.f 01.06.2018	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
3	IMO Control Pvt. Ltd.	Contact Person: Mr. Umesh Chandrasekhar Director Address: No. 3627, 1 <sup>st</sup> Floor, 7 <sup>th</sup> Cross, 13 <sup>th</sup> ' G ' Main, H.A.L. 2 <sup>nd</sup> Stage, Bangalore-560 008. Tel. No: +91-80-25285883, 25201546, 25215780 Fax: 0091-80-25272185 Email: <a href="mailto:imo@imocontrol.in">imo@imocontrol.in</a> Web: <a href="http://www.imocontrol.in">www.imocontrol.in</a>	NPOP/ NAB/003	28.09.2019	NPOP  USDA NOP	
4	Indian Organic Certification Agency (INDOCERT)	Contact Person: Mr. Mathew Sebastian Executive Director Address: Kuttamassery, Thottumugham P.O Aluva – 5, Ernakulam District Kerala Telefax: 0484 2922400, 2630908 Email: <a href="mailto:info@indocert.org">info@indocert.org</a> Web: <a href="http://www.indocert.org">www.indocert.org</a>	NPOP/ NAB/004	24.10.2020	NPOP  USDA NOP  Mushroom w.e.f 15.04.2019	
5	Lacon Quality Certification Pvt. Ltd.	Contact Person: Mr. Bobby Issac Director Address: Chenathra, Theepany, Thiruvalla - 689 101 (Kerala) Tel. No: 0469 2606447 Fax: 0469 2631902 Email: <a href="mailto:info@laconindia.com">info@laconindia.com</a> Web: <a href="http://www.laconindia.com">www.laconindia.com</a>	NPOP/ NAB/006	31.10.2020	NPOP  USDA NOP  livestock w.e.f 15.04.2019	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
6	OneCert International Private Limited.	Contact Person: Mr. Sandeep Bhargava Director Address: H-08, Mansarovar Industrial Area, Mansarovar Jaipur-302020, Rajasthan Phone & Fax- 0141-2395481,6541882, 6541883(Direct) Email:- <a href="mailto:info@onecertinternational.com">info@onecertinternational.com</a> , <a href="mailto:sandeep@onecertinternational.com">sandeep@onecertinternational.com</a> Website:- <a href="http://www.onecertinternational.com">www.onecertinternational.com</a>	NPOP/ NAB/008	26-10-2021	NPOP  USDA NOP  Livestock w.e.f 08.04.2016  Animal Feed Processing & Handling w.e.f 20.06.2017  Aquaculture w.e.f 01.06.2018  Mushroom w.e.f 15.04.2019  Seaweed, Aquatic Plants & GreenHouse Crop Production w.e.f 15.04.2019	 (w.e.f: 23-01-2015)
7	SGS India Pvt. Ltd.	Contact Person: Mr. Soumik Mondal National Certification Manager Address: SGS India Pvt Ltd 226,Udyog Vihar, Phase-I Gurgaon-122016 Haryana Tel: +91 124 6776300 Ext 6379 91 124 6776379 (Direct) Fax: +911246776403/04 Mobile: +91 8860117818 Email: <a href="mailto:Soumik.Mondal@sgs.com">Soumik.Mondal@sgs.com</a> Website <a href="http://www.sgs.com">www.sgs.com</a>	NPOP/ NAB/009	01.05.2020	NPOP  USDA NOP	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
8	CU Inspections India Pvt Ltd. (w.e.f. 19/12/2018)	Contact Person: Dr. Binay Kumar Choudhury Chairman Address: 22 <sup>nd</sup> & 23 <sup>rd</sup> Floor, B Wing Arihant Aura, Plot No. 13/1, TTC, Opp, Turbhe Railway Station, Thane Belapur Road, MIDC Side, Navi Mumbai - 400705, Maharashtra  Tel: +91-22-61294300 Fax:+91-22-61294217 Mobile: 9969002860 Email: <a href="mailto:cuorganic@controlunion.com">cuorganic@controlunion.com</a> <a href="mailto:bkchoudhury@controlunion.com">bkchoudhury@controlunion.com</a> Website: <a href="http://www.controlunion.com">www.controlunion.com</a>	NPOP/ NAB/0010	28.05.2020	NPOP  USDA NOP  Livestock w.e.f 21.04.2016  Seaweed, Aquatic Plants & GreenHouse Crop Production w.e.f 15.04.2019  Aquaculture w.e.f 15.04.2019	  (w.e.f. 01-07-2013)
9	Uttarakhand State Organic Certification Agency (USOCA)	Contact Person: Sh. Gauri Shankar Director Address: Third Floor, Krishak Bhavan Mussoorie By Pass Ring Road Nehru Gram, Dehradun, Uttarakhand Tel: 0135 2671734 Email: <a href="mailto:info@usoca.org">info@usoca.org</a> Website: <a href="http://www.usoca.org">www.usoca.org</a>	NPOP/ NAB/0011	13-11-2021	NPOP  USDA NOP  Livestock w.e.f 08.06.2016  Seaweed, Aquatic plants and Greenhouse Crop Production w.e.f 01.06.2018	
10	APOF Organic Certification Agency (AOCA)	Contact Person : Mr. Himanand Semwal Director Address: Row House No A, Shroff Suhana, Veerbhadra Nagar, Baner, Pune, Maharashtra (Pincode -411045) Landmark- Opp. to Maruti Nexa & Skoda Showroom, (Pashan Highway Side Road) Phone: 7720073202, 8806230301 Email: <a href="mailto:info@aoca.in">info@aoca.in</a> Website: <a href="http://www.aoca.in">www.aoca.in</a>	NPOP/ NAB/0012	09-01-2022	NPOP	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
11	Rajasthan State Organic Certification Agency (RSOCA)  (w.e.f: 24-01-2019)	Contact Person: Mr. Madhu Sudan Sharma Director Address: 3rd Floor, Pant Krishi Bhawan, Janpath, Jaipur 302 005 Rajasthan Tel. No.: 0141-2227104, Tele Fax: 0141-2227456 Email: <a href="mailto:rocajpr.cb@gmail.com">rocajpr.cb@gmail.com</a> Website: <a href="http://www.mpsoca.org">www.mpsoca.org</a>	NPOP/ NAB/0013	09.10.2019	NPOP USDA NOP (w.e.f 01-07-2015)  Livestock w.e.f 26.07.2018	  (w.e.f: 24-01-2019)
12	Vedic Organic Certification Agency	Contact Person: Dr. (Mrs.) M. Usha Managing Director Address: Plot no-54, Ushodaya Enclave Mythrinagar, Miyapur Hyderabad-500050 Telangana Phone: 040-65276784 Fax: 040-23045338 Email : <a href="mailto:voca_org@yahoo.com">voca_org@yahoo.com</a> Website: <a href="http://www.vediccertification.com">www.vediccertification.com</a>	NPOP/ NAB/0014	Renewal of accreditation is under process since 30.09.2017	NPOP USDA NOP (w.e.f 01-10- 2011)	
13	ISCOP (Indian Society for Certification of Organic Products)	Contact Person: Prof. Dr. S.R. Sree Rangasamy President Address: 135, Ponnurangam Road West, R.S. Puram, Coimbatore - 641002 Tel: 0422-2546160; Mobile: +91 94432 95403 Email: <a href="mailto:iscopcbe@gmail.com">iscopcbe@gmail.com</a> Website: <a href="http://www.iscoporgcertindia.com">www.iscoporgcertindia.com</a>	NPOP/ NAB/0015	Renewal of accreditation is under process since 30.09.2017	NPOP	
14	TQ Cert Services Private Limited (formerly FoodCert India Private Limited)	Contact person: Mr. Tenny Koshy Cherian Director Address: A Wholly Owned Subsidiary of Tata Projects Limited 4th floor, Mithona Towers-I 1-7- 80 to 87 Prenderghast Road, Secunderabad Telangana - 500003 Mob : +91 9848335693; 9654803362 Email: <a href="mailto:tq@tqcert.in">tq@tqcert.in</a> ; <a href="mailto:tennycherian@tataprojects.com">tennycherian@tataprojects.com</a> Website:- <a href="http://www.tqcert.in">www.tqcert.in</a>	NPOP/ NAB/0016	Renewal of accreditation is under process since 30.09.2017	NPOP USDA NOP (w.e.f 1-6- 2011)	  (w.e.f: 07-12-2017)

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
15	Aditi Organic Certifications Pvt. Ltd	Contact person: Mr. Narayana Upadhyaya Director Address: Aditi Organic Certifications Pvt. Ltd. No. 38, 1st Floor, 20th Main Road, First Block, Rajajinagar, Bengaluru-560010 Tel.: +91-080 23328134/35/36 Fax: +91-80-23373083 Mobile: +91-9845064286 Email: <a href="mailto:aditiorganic@gmail.com">aditiorganic@gmail.com</a> Website: <a href="http://www.aditicert.net">www.aditicert.net</a>	NPOP/ NAB/0017	30.09.2020	NPOP  USDA NOP (w.e.f 1-6-2010)  Livestock w.e.f 15.04.2019	 <b>ADITI</b>  (w.e.f: 22-10-2014)
16	Chhattisgarh Certification Society, India (CGCERT)	Contact person: Mr. S.C. Agrawal (IFS) Chief Executive Officer Contact address: Campus SFRTI Near Vidhan Sabha Zero point, Baloda Bazar Road, Raipur, Chhattisgarh 493 111 Tel: +91-771-2283249 Fax : +91-771-2283249 Email: <a href="mailto:cgcert@gmail.com">cgcert@gmail.com</a> Website: <a href="http://www.cgcert.com">www.cgcert.com</a>	NPOP/ NAB/0018	15-09-2021	NPOP	
17	Tamil Nadu Organic Certification Department (TNOCD)	Contact person: Mr. A. Mathialagan Director Contact address: 1424 A, Thadagam Road G.C.T Post, Coimbatore – 641013 Tamil Nadu Tel.: 0422 2435080 Fax: 0422 2457554 Email: <a href="mailto:tnocdcbe@gmail.com">tnocdcbe@gmail.com</a> Website: <a href="http://www.tnocd.net">www.tnocd.net</a>	NPOP/ NAB/0019	30-09-2021	NPOP	
18	Intertek India Pvt. Ltd.	Contact Person: Mr. Neeraj Gupta (Head – Certification, Food Services) Address: E-20, Block B-1 Mohan Cooperative Industrial Estate Mathura Road New Delhi – 110 044 Phone: +91-11-4159 5430/ +91 9971656236 Fax : +91-11-4159 5475 E-mail : <a href="mailto:neeraj.gupta@intertek.com">neeraj.gupta@intertek.com</a> Website : <a href="http://www.intertek.com">www.intertek.com</a>	NPOP/ NAB/0020	Accreditation has been suspended for 6 months w.e.f 24.10.2019	NPOP  USDA NOP (w.e.f 01-10-2011)	 <b>intertek</b> Total Quality. Assured.  (w.e.f: 02-01-2019)

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
19	Madhya Pradesh State Organic Certification Agency	Contact Person : Mr. K.S. Tekam Managing Director Address: Vasundhara, B-II Office Complex Gautam Nagar Bhopal 462 023 Madhya Pradesh Tel: 0755 2600609 E-mail: <a href="mailto:md.mpsoca@gmail.com">md.mpsoca@gmail.com</a> Website: <a href="http://www.mpsoca.org">www.mpsoca.org</a>	NPOP/ NAB/0022	30-09-2020	NPOP (w.e.f 01-10-2011)	
20	Odisha State Organic Certification Agency (OSOCA)	Contact Person: Mr. Pradosh Kumar Samal CEO Address: Plot No.-326, Baramunda, Bhubaneswar, Dist. Khordha, Orissa-751003 Phone: (0674)2563639/2561783 Fax: (0674)2562078 Mobile No.: 9437211001 Email: <a href="mailto:ceosoca@gmail.com">ceosoca@gmail.com</a> <a href="mailto:directorossca@rediffmail.com">directorossca@rediffmail.com</a> Website: <a href="http://www.ossopca.org">www.ossopca.org</a>	NPOP/ NAB/0025	31-5-2021	NPOP	
21	Natural Organic Certification Agro Pvt. Ltd.	Contact Person: Mr. Sanjay Deshmukh Managing Director Address: Flat No. A-6, 3rd Floor, Pol Heights, Above Lodha Hospital, Mumbai-Bangalore Highway, Warhe, Pune-411058 Tel- 91-20-65218063 Cell no. 09822006586, 8888810492 Email: <a href="mailto:mail-nocaindia@gmail.com">mail-nocaindia@gmail.com</a> , <a href="mailto:nocaagro@gmail.com">nocaagro@gmail.com</a> Website: <a href="http://www.nocaagro.com">www.nocaagro.com</a>	NPOP/ NAB/0026	14.02.2020	NPOP  (w.e.f:1-12-2011)	
19	Madhya Pradesh State Organic Certification Agency	Contact Person : Mr. K.S. Tekam Managing Director Address: Vasundhara, B-II Office Complex Gautam Nagar Bhopal 462 023 Madhya Pradesh Tel: 0755 2600609 E-mail: <a href="mailto:md.mpsoca@gmail.com">md.mpsoca@gmail.com</a> Website: <a href="http://www.mpsoca.org">www.mpsoca.org</a>	NPOP/ NAB/0022	30-09-2020	NPOP (w.e.f 01-10-2011)	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
20	Odisha State Organic Certification Agency (OSOCA)	Contact Person: Mr. Pradosh Kumar Samal CEO Address: Plot No.-326, Baramunda, Bhubaneswar, Dist. Khordha, Orissa-751003 Phone: (0674)2563639/2561783 Fax: (0674)2562078 Mobile No.: 9437211001 Email: <a href="mailto:ceoosoca@gmail.com">ceoosoca@gmail.com</a> <a href="mailto:directorossca@rediffmail.com">directorossca@rediffmail.com</a> Website: <a href="http://www.ossopca.org">www.ossopca.org</a>	NPOP/ NAB/0025	31-5-2021	NPOP	
21	Natural Organic Certification Agro Pvt. Ltd.	Contact Person: Mr. Sanjay Deshmukh Managing Director Address: Flat No. A-6, 3rd Floor, Pol Heights, Above Lodha Hospital, Mumbai-Bangalore Highway, Warhe, Pune-411058 Tel- 91-20-65218063 Cell no. 09822006586, 8888810492 Email: <a href="mailto:mail-nocaindia@gmail.com">mail-nocaindia@gmail.com</a> , <a href="mailto:nocaagro@gmail.com">nocaagro@gmail.com</a> Website: <a href="http://www.nocaagro.com">www.nocaagro.com</a>	NPOP/ NAB/0026	14.02.2020	NPOP	 (w.e.f:1-12-2011)
22	Fair Cert Certification Services Pvt. Ltd.	Contact Person: Dr. Pushkar Kulshrestha CEO Address: C-122, Gauridham Colony Khargone Madhya Pradesh 451001 Tel : +91-7282-231271/203017 Fax : +91-7282-231271 E-mail: <a href="mailto:cert.fair@gmail.com">cert.fair@gmail.com</a> Website: <a href="http://www.faircert.com">www.faircert.com</a>	NPOP/ NAB/0027	14.02.2020	NPOP	
23	Gujarat Organic Products Certification Agency (GOPCA)	Contact Person: Mr. S J Solanki Director Address: Beej Pramanan Bhavan Opp. Gokul Row House, Nr. Shyamal Cross Satellite, Ahmedabad 380 015 Gujarat Tel: +079-26740031 Fax: +079-26740031 E-mail: <a href="mailto:dirgopca@gmail.com">dirgopca@gmail.com</a> Website: <a href="http://www.gopca.in">www.gopca.in</a>	NPOP/ NAB/0028	Renewal of accreditation is under process since 19.06.2017	NPOP (w.e.f 20.06.2014)	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
24	Uttar Pradesh State Organic Certification Agency	Contact Person: Mr. P.C Singh Director Address: Government Garden Campus Kariyappa Road, Alambagh Lucknow 226 005 Uttar Pradesh Tel : +91 – 0522 – 2451639 Mobile : +917317001283 E-mail: <a href="mailto:upsoca.org@gmail.com">upsoca.org@gmail.com</a> Website: <a href="http://www.upsoca.org">www.upsoca.org</a>	NPOP/ NAB/0029	Renewal of accreditation is under process since 19.06.2017	NPOP  (w.e.f 20.06.2014)	
25	Karnataka State Organic Certification Agency	Contact Person: Mrs. M.H. Banthanal Director Address: K.A.I.C Premises, Opp. Baptist Hospital Bellary Road, Hebbal Bangalore, Karnataka-560024 Tel : +91 – 80-23418302, +91 – 80-23415505 Mobile: 9448990350 E-mail: <a href="mailto:dscbng@gmail.com">dscbng@gmail.com</a> Website: <a href="http://www.kssoca.org">www.kssoca.org</a>	NPOP/NAB/003016-08-2021		NPOP  (w.e.f 17.08.2015)	
26	Sikkim State Organic Certification Agency (SSOCA)	Contact Person: Mrs. Sherab L. Dorjee CEO Address: Ground Floor, Soil Testing Lab Building, ICAR Complex, Tadong, Gangtok, Sikkim 737102 Tel : +91 – 03592-232494 Fax: +91 – 03592-232495 E-mail: <a href="mailto:ssoca2016@gmail.com">ssoca2016@gmail.com</a> Website: <a href="http://www.ssoca.in">www.ssoca.in</a>	NPOP/NAB/003102-10-2019		NPOP  (w.e.f 03.10.2016)	
27	Global Certification Society	Contact Person: Dr. Subhash Chaudhary Chairman Address: Kesar Bagh Colony, Mohal Nihang (Tika Nihang), near Dr. Chaudhary Hospital, Palampur, Himachal 176 061 Tel : 01894-234230 Fax: 01894-230131 E-mail: <a href="mailto:chairman@glocert.org">chairman@glocert.org</a> Website: <a href="http://www.glocert.org">www.glocert.org</a>	NPOP/NAB/003202.10.2019		NPOP  (w.e.f 03.10.2016)	

Sr. No	Name of the Certification Agency	Contact Person & Address	Accreditation No.	Validity of Current Accreditation	Scope of Accreditation	Certification Mark
28	GreenCert Biosolutions Pvt. Ltd	Contact Person: Mr. Sujit Raghunath Kaisare CEO Address: B13, Anandmayi Apt, Karve Road Erandwane, Pune- 411004 Tel: +91 - 9850914230 E-mail: <a href="mailto:ceo@greencertindia.in">ceo@greencertindia.in</a> , <a href="mailto:contactus@greencertindia.in">contactus@greencertindia.in</a> Website: <a href="http://www.greencertindia.in">www.greencertindia.in</a>	NPOP/NAB/003302.10.2019		NPOP  (w.e.f 03.10.2016)	
29	Telangana State Organic Certification Authority	Contact Person: Dr. K Keshavulu Director Address: HACA Bhawan, 1st Floor. 5-10-193, Opp. Public Garden Hyderabad 500 004 Tel : 040-23237016, 040-23235939 E-mail: <a href="mailto:tsscadir@gmail.com">tsscadir@gmail.com</a> Website: <a href="http://www.tsoca.telangana.gov.in">www.tsoca.telangana.gov.in</a>	NPOP/NAB/003431.05.2021		NPOP  (w.e.f 01.06.2018)	

Last Updated on: 06-11-2019



