सत्यमेव जयते
GOVERNMENT OF GUJARAT

Establishment of **Neem/ Tobacco oil Based Pesticide Unit**

Agro and Food Processing

Government of Gujarat

Vibrant GUJARAT™ 10-13 Jan 2017
Connecting India to the World | 8th Global Summit

Contents

Project Concept

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The concept

The project envisages setting up of bio-pesticides unit based on Neem and Tobacco natural raw materials which are easily available in Gujarat. The proposed unit shall have the facilities right from extraction of respective oils to the formulation of the bio-pesticide based on these oils.

Neem/ Tobacco oil based bio-pesticides

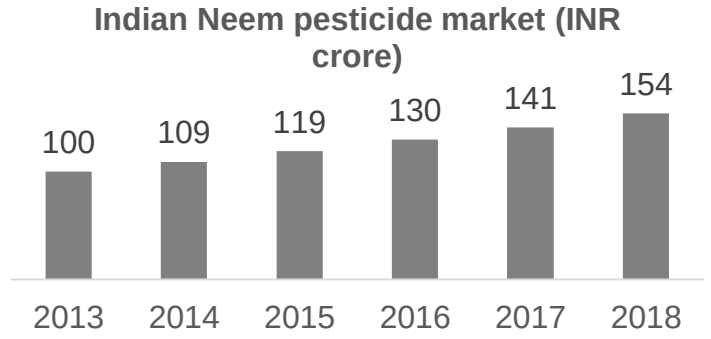
- Biopesticides are derived from natural materials including animals, plants, bacteria, and certain minerals that can be used to kill pests and weeds. Bio-pesticides fall into three major classes:
- Biochemical pesticides
- Microbial pesticides
- Plant-Incorporated-Protectants (PIPs)

- Neem oil pesticides find application in protecting several crops such as rice, red gram, coconut, cotton and grams from insect pest diseases.
- Neem based bio-pesticides are economical and effective for crops like cotton, potatoes and other horticulture crops, grown in Gujarat.
- TARGET PEST: Bollworms, Aphids, Jassids, Thrips, Whitefly, Leaf folder, Pod borer, Fruit borer, Leaf hopper, Diamond backmoth.
- TARGET CROPS: Cotton, Rice, Pigeonpea, Chickpea, Safflower, Okra, Cauliflower, Cabbage, Tomato.

- Tobacco oil is extracted from Tobacco seeds, which contains approximately 37% oil, and can be extracted using the same facilities used for Neem oil extraction.
- It is a semi drying oil without toxic substances like Tobacco leaves, but has strong tobacco odor.
- Refined tobacco oil is colorless, odorless and edible. Unrefined oil can be used for Bio-pesticide manufacturing.

Market potential

Growing demand for neem-based pesticides

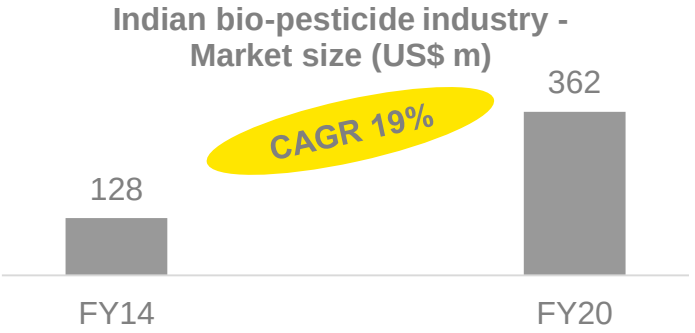


Source: Economics times

Indian neem-based pesticide market to grow at a

CAGR of 9%

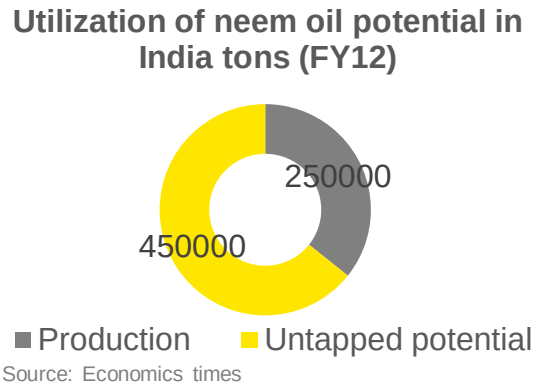
Growing Indian market for bio-pesticides



Source: Morning Star, Grand view research, EY analysis

With less 10% contribution to of Indian agrochemicals market, bio-pesticides have a huge growth potential in India

High untapped potential for neem products in India



Source: Economics times

70%

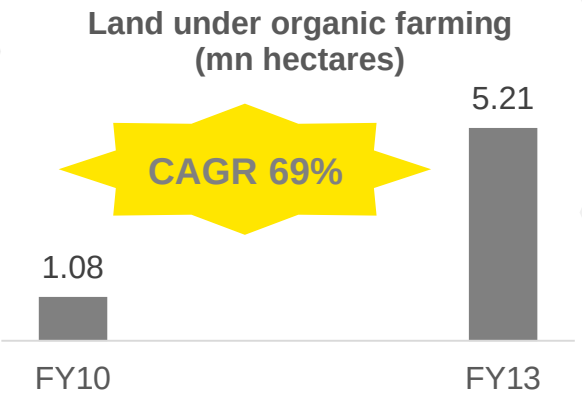
of the total neem oil potential still untapped

Market potential

Growing global and Indian demand for organic food

Increased per capita income driving awareness towards chemical free food, organic and natural products

Growing number of certified farmlands



Source: TechSci Research

Diverse climatic conditions and soil types across the country

Government promoting organic farming under National Project on Organic Farming, National Horticulture Mission and Rashtriya Krishi Vikas Yojana

Increasing investments by corporate giants

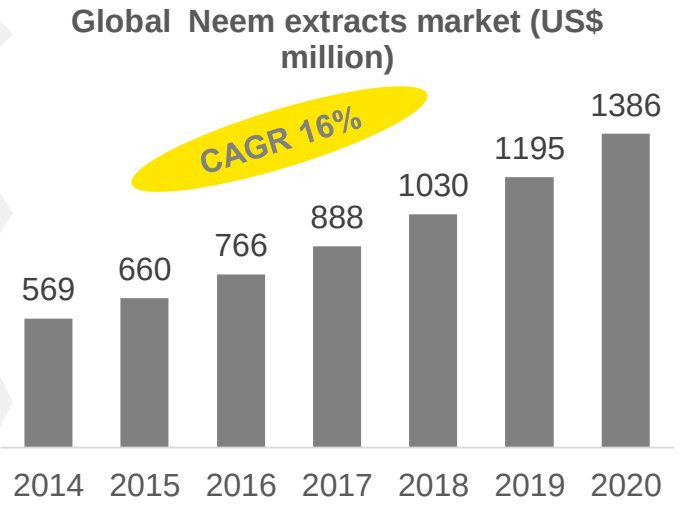
Export demand owing to increasing consumption of organic food in developed countries

Growing demand for neem extracts globally

Increasing consumption of bio-based fertilizers and pesticides

Growing concerns towards harmful effects of chemical-based fertilizers and pesticides on human health

Global organic food & beverage market is expected to reach USD 211.44 billion by 2020 growing at a CAGR of 15.7%



Source: PR Newswire

Market potential

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Government incentives for bio-pesticides production and consumption

Production

- Central Government provides grant-in-aid of INR4.5 million for building and INR2 million for procuring equipment for Bio-control Laboratories for production of bio-control agents including bio-pesticides to State Governments. Central Government also provides INR2 million as grants-in-aid to State Governments for procuring equipment for Bio-pesticides Testing Laboratories.
- The requirement for registration of bio-pesticides has been simplified to facilitate introduction of bio-pesticides.
- The Ministry of Agriculture and the Department of Biotechnology are responsible for promoting bio-pesticides, the former via the Central IPM Centre (Faridabad), the National Centre for IPM (NIPM) under the Indian Council For Agricultural Research (ICAR) and the Directorate of Biological Control.
- Under National Project on Organic Farming (NPOF) scheme, assistance upto 25% and 33% of financial outlay upto a ceiling of INR4 million and INR6 million respectively is provided as back ended subsidy through NABARD for establishment of bio- pesticides/bio-fertilizers production units and agro waste compost production units respectively.

Consumption

- Package of practices for control of pests and diseases in 66 crops have been revised to include techniques to reduce dependence on chemical pesticides and encourage use of bio-pesticides.

Growth Drivers

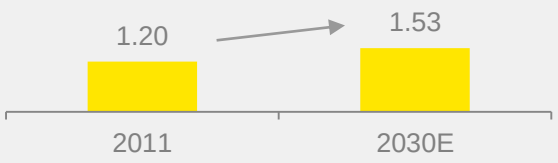
Widening demand – supply gap of food crops, increasing demand of organic food and the government focus on conserving the environment is expected to drive the growth of biofertilizers and bio-pesticides industry in India

Demand-side

Growing population

India's population is projected to increase by ~17%, from 1.31 billion in 2015 to reach 1.53 billion by 2030 and surpass China's population. There will be an increase usage crop growth and protection nutrients to feed such a large population.

Population of India (in billion)



Impetus by GoI to improve the soil health and conserve environment

Under the National Food Security Bill, GoI will ensure a monthly quota of 7 kg per person for a family below the poverty line. To meet this target in a ecologically sustainable way and without degrading the environment, GoI is giving a strong push to the organic farming by providing subsidies for new biofertilizer/ biopesticide units.

Increasing affordability

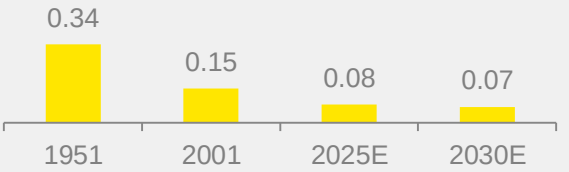
Per capita net national income has increased by 10.1% to INR88,538 per annum in FY15, over FY14. This has led to a shift in consumption pattern, which is expected to lead to increase in sale of high-nutrition and high-priced organic food products.

Supply-side

Arable land is declining

Increasing land for commercial and urban usage has led to the decline of arable land from 0.34 ha in 1950 to 0.15 ha in 2000. It is further expected to reduce to 0.07 ha by 2030.

Per capita arable land in India (ha)



Low food grain yield

Per hectare yield in India is 3 tons/ha, lower than the global average of 4 tons/ha. For China and Indonesia, it is 6.5 tons/ha and 5 tons/ha respectively. Major reasons are low usage of pesticides (only 35% area is covered, (25%), excessive use of conventional fertilizers (N, P, K) (120 kg/ha in India vs. global average of 33 Kg/ha) leading to soil degradation.

Source: FICCI agrochemical report - November 2015; Ministry of Agriculture, GoI

Gujarat - Competitive Advantage

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Abundance of neem trees and tobacco in Gujarat

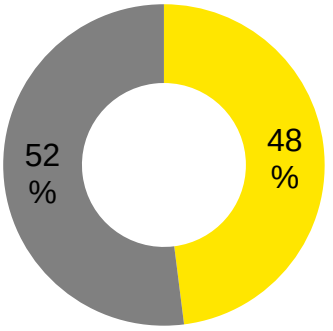
111,261 neem trees
53.575 tons of seeds

Neem trees constituted 13.1% of the total trees across eight municipalities in Gujarat in 2012

The Central government plans to plant 20 million neem trees in smart cities

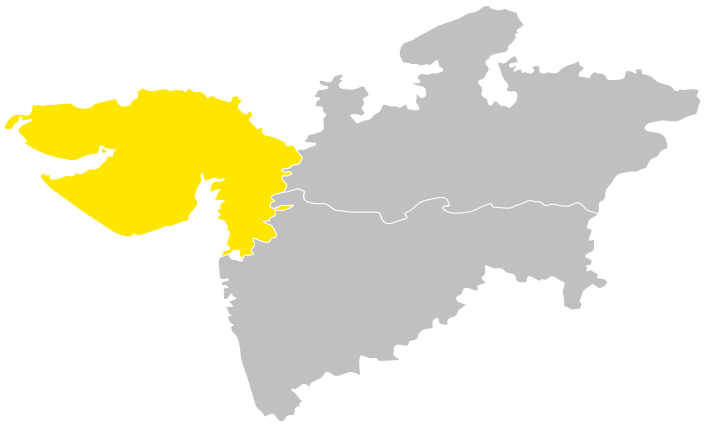
Suitable climatic and topographical conditions for cultivation of Neem

Neem, being a drought resistant tree can grow in regions with an annual rainfall below 400 mm
It thrives best in well drained deep and sandy soils.



Gujarat produced **48%** of India's total tobacco production in 2015

Proximity to organic farming states



Proximity to two states with maximum land under organic farming - Madhya Pradesh (440,000 hectares), Maharashtra (150,000 hectare)

Strong local demand for pesticides

- Gujarat is one of the leading states in the consumption of pesticides with 7% share in 2014.The total crop area in Gujarat is more than half of the total land area.
- Gujarat being India's major producer of tobacco, cotton, groundnuts and other crops which are relatively more prone to the attack of pests leading to greater consumption of pesticides in the state.

Gujarat - Competitive Advantage

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Higher prices for tobacco boost sowing area in Gujarat

125,000 tons of tobacco
(Production in 2014)

Tobacco price – 2,700 per kg, up by ~100% y-o-y

Area under cultivation up from 103,400 hectares (3-year average) to 152,000 hectares in 2016

Other advantages

Ease of doing business

- Only state which comply 100% with the environmental procedures. Gujarat fares highly when it comes to setting up a business, allotment of land and obtaining a construction permit.

Flourishing economy

- Gujarat contributes 7.2% of the Nation's GDP and shows leadership in many areas of manufacturing and infrastructure sectors. Gujarat's SDP (State Domestic Product) at current price registered a growth of 11% during the year 2014-15.

Strategic location and excellent infrastructure

- Located on the west coast of India, Gujarat is well connected to the major cities of the world by air and sea routes. The state has 45 ports, 12 domestic airports and 1 international airport in addition to an extensive rail and road network.

Subsidies for 'Horticulture' – extensive user of biofertilizers and biopesticides

- GoG though National Horticulture Board (NHB) provides back-end subsidies for the development of commercial horticulture which involve bio-technology tissue culture, organic foods and bio-pesticides. The subsidy varies from 20% of the project cost with a maximum of INR2.5 million.

Promoting the use of biofertilizers and bio-pesticides

- GoG and Navsari Agricultural University (NAU) has completed soil testing in 18,618 villages of Gujarat and issued soil health cards to over one million farmers. Based on soil testing report, cropping system, quantity and type of agricultural chemicals will be decided to optimize productivity in future in South Gujarat.

Favourable labour policy

- The Gujarat government has recently passed the Labour Laws Bill (December 2015), to give an impetus to industrialization. The key reform includes a provision for out-of-court settlement to speed up the process labour related dispute resolutions.

Better social infrastructure

- Gujarat has one of the lowest cost of living amongst the Indian states and is relatively less congested and less polluted, offering better standards of living to the inhabitants and providing a better environment to work.

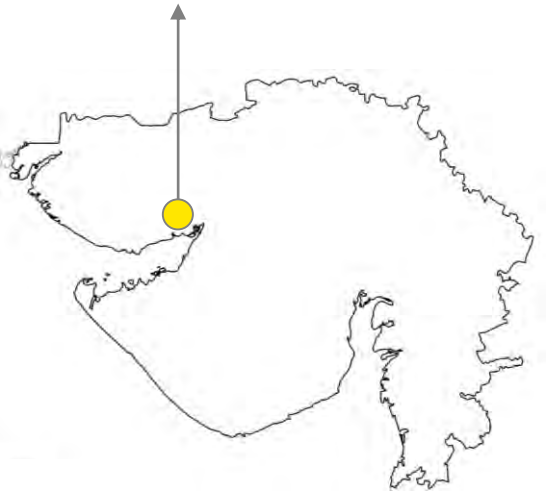
Project Information

Project location

- Mithi rohar industrial estate in Kutch district will be an ideal location to establish a neem oil pesticide manufacturing plant.
- The estate will enjoy proximity to a wide cover of neem plantation in the Kutch district along with low and cost and close proximity to the ports for export of neem oil.

Mithi rohar industrial estate: key highlights	
Area	41.7 hectares
Land price	INR720 per sq mt (FY17)
Focus sectors (Kutch)	► Pharma and chemicals ► Mining and metals ► Ship building ► Building products ► Agricultural equipment and machinery ► Smart cities ► Advanced manufacturing ► Financial services ► Professional services ► Transportation equipment ► Printing and publishing ► Food processing and dairy ► Skill development ► Information and technology ► Film and cultural industries ► Apparel and handicraft ► Solar and Wind ► Salt processing
Existing major chemical players (around Mithi rohar)	► Aromatics (India) Pvt. Ltd ► Nahta Salt and Chemical Pvt Ltd. ► Royal Petrochem ► Kutch Brine Chem Industries ► Kandla Agro Chemicals Pvt ltd

Mithi rohar industrial estate



Sourcing of raw material

- Neem Kernels are the key raw materials used in the production of neem oil pesticides.
  - Kutch houses a large number of neem trees in Gujarat (22.5 lakh trees in 2009) with neem constituting almost 14% of the total number of trees in the district.
- Further, the plant can source the equipment and machinery from the well-established industry clusters.
- Distance from major tobacco producing areas
  - Banaskantha – 266 km (abundant neem plantation also)
  - Mehsana – 291 km (abundant neem plantation also)
  - Gandhinagar – 305 km
  - Kheda – 317 km
  - Sabarkantha – 347 km
  - Anand – 357 km

Project Information

Infrastructure availability

Logistics and connectivity

Rail

- The nearest railway station is at Gandhidham at a distance of 13 km from the Mithi Rohar

Road

- National Highways: NH–41, which connects Gandhidham and Nandgam passes throughMithi Rohar
- NH141Connects the estate to the port

Air

- Ahmedabad International Airport is the nearest airport located at a distance of 308 Km from Mithi Rohar .
- There are domestic airports located in Kandla and Bhuj.

Port

- Sanand is connected to the following ports in Gujarat:
  - Kandla – 16Km
  - Jodia – 172 Km
  - Salaya – 285 Km
  - Veraval – 399 Km

Utilities

Water

- Gujarat Industrial Development Corporation (GIDC) will provide water to the proposed facility.

Power

- OPG Power Gujarat pvt Ltd will provide power to the Mithi rohar plant
- It has two 150MW stations with 70% coal linkage
- The unit would need 150 KVA connected power, 50 KL water per day and 18 MTPD coal or equivalent FO as fuel.

Project Information

Manufacturing process

Neem oil pesticides

Cleaning of neem / tobacco seeds

Removal of stone and other foreign matter from the fruits/seeds. The kernels are then isolated from the shells with the aid of air classifier.

Crushing in expellers

Cold process of crushing the seed kernels of neem between shaft and blades.

Filtration of neem oil

Further, neem oil passes through filters and sent for packing.

Neem oil is further processed for obtaining Azadirachtin, using Methyl Alcohol as solvent which is recovered after final separation using distillation.

Azadirachtin extraction

Pressing

Grinding neem seeds according to the amount of oil content in the seeds and sizes. Then woven dried seeds are fed into the pressing machine where neem oil is pressed out under high pressure and strong forces.

Steam distillation

The dried neem seeds are put into the steam boiler where they get swollen thus making neem oil squeezing easier. This is accompanied by increasing pressure in the boiler which drives the neem oil.

Storage and packing

Neem oil needs to be stored in a cool dark place if not to be shipped directly as pesticides

Neem Oil is usually sold in bulk in 10 MT road tankers. It is also dispatched in 200 Kg MS barrels, specifically for bulk buyers and export purpose. 200 Liter (Kg) HDPE drums are also used.

Manufacturing process

Tobacco oil pesticides

Cleaning of tobacco seeds

Neem seed needs cleaning before processing which involves removal of stone and other foreign matter from the fruits/seeds.
Furthermore, the seedsare isolated from the shells with the aid of air classifier.

Crushing in expellers

In this process the seeds pass through rotating stones OR impact Blades designed specially, which break the shell.

Processing of tobacco oil

Pyrolysis involves heating tobacco leaves to about 900 degrees Fahrenheit in a vacuum, to produce an unrefined substance called bio-oil.

Filtration of tobacco oil

Further, neem oil passes through filters and sent for packing.

Blending of neem and tobacco oil

Since tobacco is not directly soluble in water, it is mixed with neem oil to enhance usability

Packing of bio-pesticide liquid

Project Information

Key equipment required

Manufacturing equipment	Qty	Suppliers
Vibratory Screen	2	Goldin (India) Engineering company, Goldin India Equipment Pvt. Ltd., Vadodara
Conveyors	4	Ahmedabad, Darshini Engineers, Ahmedabad, Future Indsutries Private Ltd., Ahmedabad
MS Sheet hopper	2	R B Panchal Fabricators, Ahmedabad, Ambey Industries, Vadodra
Silo-bin with blower	4	Solids And Automation Technologies, Vadodra, Goldin (India) Equipment Pvt Ltd, Vadodara
Seed crushing expellers	4	Tiny Teck Udyog, Rajkot, Meswania Brothers, Rajkot
Horizontal kettle	4	Gem Pharma Machineries, Mumbai, Rehan Engineering Mumbai
Electrical insulation	4	Laxmi Rubber Industries, Mumbai Tiny Teck, Rajkot
Neem & Tobacco oil - Plat & Frame filter press	4	Goyum Screw Press, Punjab Goldin (India) Equipment Pvt Ltd, Vadodara
Neem cake pulverizer	1	Rajlaxmi Engineering Corporation, Nagpur, Goldin (India) Equipment Pvt Ltd, Vadodara,
Azadirachtin extraction plant	1	Shri balaji Engineering works, Jaipur, Desmet Chemfoods Pvt. Ltd, Mumbai
MS Extractor Vessels	2	H. H. Enterprises, Punjab, Servotevh Engineers Pvt. Ltd, Mumbai Desmet Chemfoods Pvt. Ltd, Mumbai
Steam boiler	1	Thermax Ltd, Chinchwad, Pune Walia Engineering Pvt. Ltd, Ahmedabad.
Biopesticide blending unit	1	Servotevh Engineers Pvt. Ltd, Mumbai Desmet Chemfoods Pvt. Ltd, Mumbai
Bio pesticide liquid filling & packing line	1	Servotevh Engineers Pvt. Ltd, Mumbai Desmet Chemfoods Pvt. Ltd, Mumbai
HT/LT Electricfication with 120 KVA DG set for standby power	1	Kirloskar Electricals limited, Ahmedabad

Project Information

Estimated manpower requirement

Manpower requirement at the site

Managers	Super visors	Plant operators	Accountant
3 Persons	4 Persons	8 Persons	1 Persons

Office assistants	Unskilled labour	Security and other support personnel
2 Persons	13 Persons	4 Persons

Leading players

E.I.D-Parry (India) Limited	Neeming Australia Pty Ltd,	PJ Margo Pvt. Ltd,
The Indian Neem Tree Company	Parker Biotech Private Limited	Gramin India Agri Businest
Agro Extracts Limited	Ozone Biotech	Fortune Biotech Ltd.,
	Greeneem Agri (P) Ltd	

Other collaboration opportunities

Besides the leading producers mentioned above several neem oil and neem oil pesticide producers in Southern and Western India offer collaboration opportunities for investors.

Pradeep Agrotech	Maharashtra
Nature neem	Tamil Nadu
Nikita Agro Industries	Tamil Nadu
Uno Naturals & Greens Pvt Ltd.	Tamil Nadu
GreeNeem Agri Private Limited	Tamil Nadu
Manidharma Biotech Pvt Ltd.	Tamil Nadu
Agro Extracts Limited	Tamil Nadu
Agri Life SOM Phytopharma (India) Ltd.	Hyderabad

Key considerations

- To maintain an efficient supply chain and logistics facilities as the solution is highly susceptible to temperature, humidity, exposure to UV spectrum
- Quality control measures

Project Financials

Estimated project cost

Sample cost* of setting-up a neemoil/tobacco oil bio-pesticides facility in Mithi Rohar
The estimated financials are for a medium scale production unit, producing 30 MTPD (Metric Tons per Day) or 9000 MTPA fibre. This capacity is suggested based on possible availability of raw-material and optimum size of project investment.

Project cost	
Project components & specifications	**Cost (INR lakhs)**
Land (Area: 1.48 acres – 6,000 square meters) Rate: (INR720 per sq m as of FY17 at Mithi Rohar)	47.08
Plant building cost	111.25
Machinery and equipment	469.7
Miscellaneous fixed assets (Furniture and fixtures, office equipment, etc.)	69.22
Provision for Contingencies	38.07
Preliminary and pre-operative expenses (Technology etc.)	74.17
Margin money for working capital	312.99
Total project cost	**11,22.51**

The total project cost of neem/ tobacco oil pesticide oil in Mithi Rohar, Gujarat, is approximately INR11.23 crore

Approvals & Incentives

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Clearances/ approval required

Approvals/clearance required	Department to be approached and consulted
Incorporation of company	Registrar of companies
Registration/Industrial license	▸ For Biopesticides (Covered under Central Insecticides Act., 1968) - Central Insecticides Board, Govt of India, Faridabad
Allotment of land	State industrial development corporation
Approval of construction and country planning	▸ Town and country planning ▸ Municipal and local authorities ▸ Chief inspector of factories ▸ Pollution control board ▸ Electricity board
Finance	▸ Eligible financing institutions under the NPOF scheme are i) Commercial Banks, Regional Rural Banks (RRBs), State Cooperative Banks (SCBs), State Co-operative Agricultural and Rural Development Bank (SCARDBs), Scheduled Primary Urban Cooperative Banks (PUCBs), Agricultural Development Finance Companies (ADFCs), North Eastern Development Finance Corporation (NEDFI), and such other institutions which will be eligible for refinance from NABARD. ii) Cooperatives where they seek loan from National Cooperative Development Cooperation (NCDC) ▸ Refinance assistance @ 90% of the term loan (95% in case of SCARDBs and in the North Eastern Region) would be provided to the financing banks.
Registration under state sales tax act and Central and State excise act	▸ Sales tax department ▸ Central and state excise department
Exiting business	Ministry of corporate affairs

Other approvals

- Industrial Entrepreneur's Memorandum (IEM).
- Approval from Secretariat of Industrial Approvals (SIA)
- Ministry of Industries, Govt. of India, New Delhi as the plant and machinery cost exceeds INR 10 million.
- Pesticides Control Board, Government of India prior to marketing their products for agriculture purpose.
- Registering with BIS for quality standards of bio-pesticides and related products.
- Unit will also require approval from State Level Authorities under Dept. of Agriculture, Government of Gujarat.
- Registration with RBI, DGFT and CHEMEXCIL, Mumbai as registered manufacturer and exporter of Bio-pesticides.

Approvals & Incentives

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Incentives from GoI

- In view of the increasing and indiscriminate use of synthetic pesticides, deteriorating soil health and productivity, the concept of organic farming is gaining importance globally as well as in India.
- GoI has introduced a Capital Investment Subsidy Scheme (CISS) under National Project on Organic Farming for commercial production units for organic/ biological inputs.
- The scheme is being implemented by the Department of Agriculture & Cooperation through National Centre of Organic Farming (NCOF) in collaboration with NABARD or NCDC.

Capital Investment Subsidy Scheme (CISS) for biofertilizer / biopesticide production units	
Subsidy	► 25% of total financial outlay subject to the maximum of INR40 lakh per unit, whichever is less ► Subsidy will be released in two instalments
Procedure for sanction and release of Subsidy	NABARD releases subsidy to the units financed by: ► Commercial Banks, ► Regional Rural Banks (RRBs) ► State Cooperative Banks (SCBs), ► State Cooperative Agricultural and Rural Development Banks (SCARDBs) ► Scheduled Primary Urban Cooperative Banks (PUCBs), and such other institutions which will be eligible for refinance from NABARD. ► NCDC may release subsidy to projects financed by it in the cooperative sector

Main objectives of the scheme

- To encourage the new investors / entrepreneurs / existing companies in the fertilizers and pesticides manufacturing to start manufacturing biofertilizers and biopesticides.
- To promote organic farming in the country by making available the organic inputs such as biofertilizers, biopesticides and fruit & vegetable market waste compost and thereby better return for the produce.
- To prevent pollution and environment degradation by proper conversion and utilization of organic waste.

National Bank for Agriculture and Rural Development (NABARD)

www.nabard.org/

Agriculture and Co-operation Department

www.agri.gujarat.gov.in/index.htm

Gujarat Industrial Development Corporation

www.gidc.gov.in/

Industries Commissionerate

www.ic.gujarat.gov.in

This project profile is based on preliminary study to facilitate prospective entrepreneurs to assess a prima facie scope. It is, however, advisable to get a detailed feasibility study prepared before taking a final investment decision.

For further details:

iNDEXTb
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(A GOVT. OF GUJARAT ORGANISATION)
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