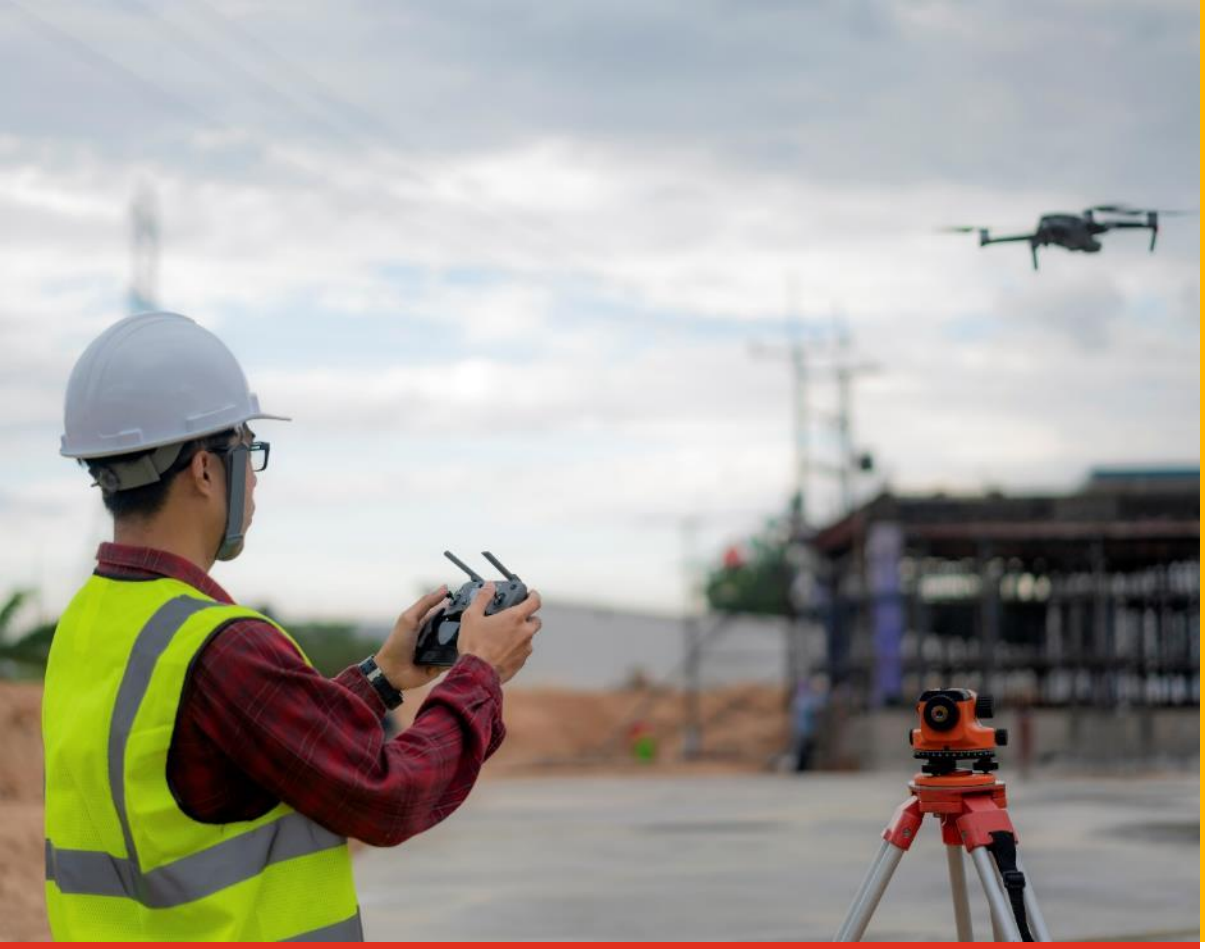

Infrastructure Development of Industrial Estates in Tripura

Infrastructural Assessment Report

September 2022

Final Report

Strictly private and confidential

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1. Context of the assignment

1. Context of the assignment

1.1. Background

Government of Tripura (GoT) applied for financing under Project Readiness Financing (PRF) facility from Asian Development Bank (ADB). The PRF loan is sought for project readiness activities, for preparing a sector development program and preparation of the project and design activities for investment-ready ensuing project(s) for the "Infrastructure Development of Industrial Estates in Tripura" in/ around 15 industrial estates of 6 districts in the state. The Department of Industries & Commerce (DoI&C) GoT is the executing agency (EA) with Secretary, DoI&C as the Project Director (PD). The PD will be assisted by a project management unit (PMU) established under implementing agency (IA)–Tripura Industrial Development Corporation Limited (TIDCL) with suitable resources.

In this regard, Tripura Industrial Development Corporation Limited (TIDCL or "Client") intends to develop an industrial strategy and investment plan for the state. As part of TIDCL's mandate of industrial development in the state, it has appointed individual consultants from PricewaterhouseCoopers Pvt. Ltd. ("PwC" or "Consultant") for formulating strategy and action plan for development of industry strategy. The consultants have built on the outputs of North East Economic Corridor (NEEC) Report developed by the Asian Development Bank as a guiding document. The NEEC report provides a view on the priority sectors for the region supported by value chain and OD analysis for the sectors. Further NEEC reports concludes on the infrastructure status in the region and identifies projects which will enable the development of overall North East Region. As part of this engagement the consultants have been mandated to conduct analysis and derive outputs to support the PRF loan. The scope of work of the consultants comprises the following:

a. Outline the economic profile of various districts/ areas in the immediate vicinity of each industrial node/ large industrial area or cluster/ border growth centre or urban growth centre;

b. Prepare an overview of the industrial scenario of the districts of the industrial nodes/ areas, which shall include: (1) taking inventory of the types of industries available in the districts, (2) mapping of competition at the state and district levels, and (3) mapping of existing industrial clusters/ hubs along with available transport network and ancillary facilities;

c. Prepare suitable product/ activity mix for the delineated zones within the industrial nodes/ areas or growth centres;

d. Determine the product mix for the processing and non-processing areas of the industrial node/ area taking into account the land requirement, while ensuring compatibility with land-use planning proposals delineated in master planer surrounding existing land-uses, any provisions in the NER regional plan/ city development plan, etc., and whether any adaptation and/or mitigation measures are to be incorporated in project planning and design/ implementation;

e. Assess and plan for export-oriented industries which can be located in the industrial node/ area or growth centres; and

f. Align industrial planning with quality infrastructure to foster industrial development, including development of SMEs, meeting national standards/ benchmarks/ rules and regulations, and/or international standards and best practices;

1.2. Objective

The objective of the report is to provide strategic support to TIDCL to enable the agency to carry out the development of industrial estates in Tripura. Therefore, report covers the following topics

- The mapping/ planning/ strategizing for developing regional value chains of the North East region (NER). This study will be in coordination with the North East Economic Corridor (NEEC) study report separately undertaken by ADB.
- Strategy to promote Tripura as a regional hub by developing a logistics hub which will help in evacuation through Chattogram Port (Bangladesh) and regional distribution.
- An infrastructure gap assessment, infrastructure costing, phasing plan, action plan, and investment plan.

2. Introduction

2. Introduction

2.1. Overview of the North Eastern Region

To achieve India's commitment of becoming a USD 5 trillion economy by 2025, it is important to propel industrial development in the whole nation, especially the North-Eastern Region (NER). The North East Region (NER) of India is fast gaining attention for its rich economic resources and strategic location. It has large deposits of oil, natural gas, coal, and limestones, and a sizable proportion of land under cultivation for agro-horticulture products, tea, bamboo, and rubber.

Tripura is home to a wide variety of flora and fauna. About half of the state's land area is under forest cover. The sal, a valuable tropical hardwood, is widely found. Various varieties of bamboo can also be found across Tripura. The region's geography and prevailing climatic conditions make it ideal for high-value horticulture. Tea, rubber, cash crops, and many kinds of fruits are cultivated in Tripura.

The NER is strategically located. Its geographic proximity to South East Asia makes its location even more favorable in relation to India's Act East policy, serving as the country's gateway to South East Asia. The region shares its land border with Myanmar which may act as a gateway for India to foster trade relations with other ASEAN countries. With increased ASEAN engagement becoming a critical part of India's foreign policy, the NER states have become strategically significant as important cultural and physical bridges. The NER also shares its border with the BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) nations (a group of seven countries i.e., Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand). The region has enormous potential to serve these neighboring nations and treat them as target markets. It connects the product market of the rest of the country and the robust South and Southeast Asian markets.

Apart from this, the fact that the Government of India set up a separate Ministry of Development of North Eastern Region in September 2001 speaks to the region's position as a crucial driver of India's Act East Policy (called the Look East Policy in its earlier form) and overall development as well.

However, despite its rich natural capital, strategic position, and government intervention, the fact remains that the NER contributes 2.8% to the nation's GDP[1], low in comparison with other states (the group of southern Indian states, for instance, contributes ~30% to economy[2]). The region has great economic potential across many sectors including agriculture, oil and gas, and tourism. But inadequate infrastructure limits its growth and production, and ability to attract investors and reap the benefits of its natural proximity with South Asian nations. Challenging terrains, limited connectivity, and an inadequate business ecosystem are among the primary causes for low private investments and the generally dilapidated condition of industry in the region.

The NER has an abundant natural resource base as well immense potential for horticulture and agriculture. The economic opportunities can be translated into high growth industries if developed, owing to the existence of potent input market catalysts like social (diversity, cultural richness), physical (potential energy supply hubs), human (inexpensive, skilled labour) and natural (minerals, forests, biodiversity) capitals.

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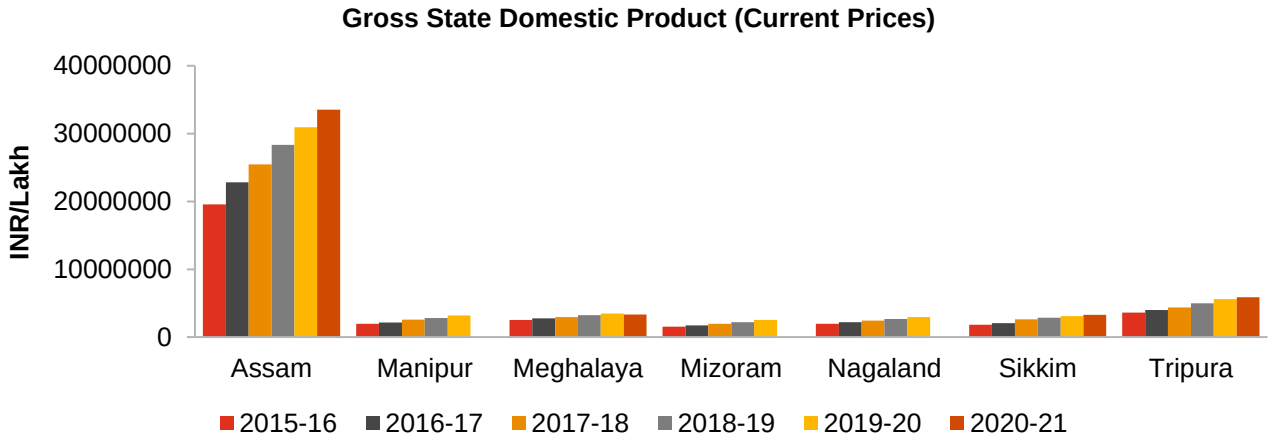
1 Gross State Domestic Product (Current Prices), : National Statistical Office, Ministry of Statistics and Programme Implementation, (2021)

2 Gross State Domestic Product (Current Prices), : National Statistical Office, Ministry of Statistics and Programme Implementation, (2021)

Figure 1: Economic structure of NER



Source: Reserve Bank of India (RBI)

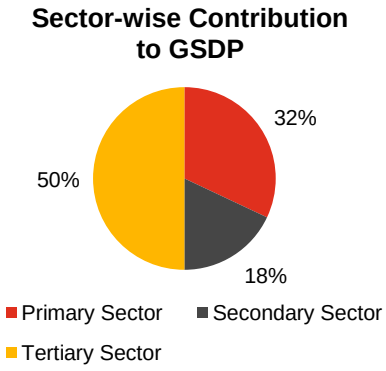
Examining macroeconomic trends reveals that the GSDPs of the states in the NER have shown a rising trend (except for Meghalaya which registered a slight fall between 2019-20 and 2020-21). Between 2015-16 and 2020-21, each of the states has registered an increase in its GSDP, indicating that their economies have been expanding steadily. The economy of the NER is largely characterized by the presence of agro-, mineral-, or forest-based industries.

The **primary sector** accounts for 31.4% of the states' income[3], revealing the importance of the agriculture sector in the region. Traditionally, two primary types of farming practices are seen in the region. They are settled agriculture and slash and burn cultivation. Settled agriculture is prominent in the plains, valleys, and gentler slopes, and slash and burn cultivation (known locally as *jhum*), is especially popular in the hilly regions of Meghalaya, Mizoram, and Nagaland. Over 70% of the population in the NER states is involved in agriculture.[4] Rice, cereals, pulses, and oilseeds are among the major crops grown in the region. Besides this, growing of cash crops like cotton and developing commercial plantations for rubber and tea cultivation is underway. Further, state governments in the NER are now focusing on gaining from the immense scope of the bamboo and high-value floriculture sectors to usher in accelerated growth.

The **secondary sector** in the NER contributes to just about 18%[5] of the states' incomes. The contribution of industries is a small share of their NSDP at below 20%. The NER's industrial development level remains lower than that of the rest of India even though there is potential for growth across a diverse set of sectors, for instance, tea, petroleum, petroleum refineries and petroleum products, chemicals and fertilizer, plywood, pulp and paper, cement, and thermal power-generating units.

The presence of a strong cottage industries is another characteristic of the NER. Silk yarn, cloth, and other forest-based industries like bamboo products, furniture, and a variety of domestic utility goods are produced by the industry. Further, industries producing cement, bricks, plywood, tea, and special varieties of rice and ginger can also be found in the NER.

Figure 2: Sector-wise Contribution to GSDP



Source: NITI Aayog

[3] North Eastern Region District SDG Index Report and Dashboard 2021-22, NITI Aayog (2021).
[4] North Eastern Region District SDG Index Report and Dashboard 2021-22, NITI Aayog (2021).
[5] North Eastern Region District SDG Index Report and Dashboard 2021-22, NITI Aayog (2021).

Sectors like oil and gas, tea, and timber are predominantly based in Assam, while activities around mining, sawmills, and plywood are present in other parts of the region. Among the NER states, Assam is the most industrialized with a diverse manufacturing base. The primary concern in developing the sector further is the inadequate domestic market presence. Besides this, a major barrier to the growth of industry in the region is the distinctly sparse presence of the private sector- less than 1%[6] of the corporates in India are present there. Also, the lack of transport connectivity with other parts of India poses a significant challenge to the growth of the secondary sector. Though the region has a huge potential for exports. However, this has not translated into reality. In 2019-20 and 2020-21, the NER accounted for only 0.16% of India's exports.

The **tertiary sector** accounts for almost 50% of the income of the NER states. Also, the sector's share in state domestic product values has been showing an upward trend. A majority of the contribution in the services sector is led by public administration indicating a huge dependence of the state on government jobs. The other major sub-sector is trade, hotels, and restaurants. These two sectors account for more than 50% of contribution in the services sector.

To promote economic development in the region, the GoI has initiated multiple schemes aimed at promoting industrialization in the region. A few of the latest initiatives are as follows:

- **North East Special Infrastructure Development Scheme**: was approved by the GoI in 2017. Under the scheme, 100% centrally funding is provided to the State Governments of North Eastern Region for projects of physical infrastructure relating to the::
  - Development of physical infrastructure for water supply, power, and connectivity.
  - Development of social infrastructure, education, and health
  - Tourism projects

  In Tripura, there are currently 4 education sector, 3 health sector, 1 power sector, and 3 roads and bridges related ongoing projects under the scheme.[7]
- **North East Industrial Development Scheme**: This scheme aims to push industrialization into the NER by providing financial assistance of up to INR 200 Crore/unit with few caveats. The scheme covers the manufacturing and service sectors, and aims to stimulate the growth of MSMEs in the two sectors. It came into effect in 2017 for a period of five years. In FY 2021-22, INR 30 Crore was released to the NER states. The benefits provided under the scheme, similar to those provided under the NESIDS, are as follows:

  a. Central Capital Investment Incentive for access to credit

  b. Central Interest Incentive

  c. Central Comprehensive Insurance Incentive

  d. Income Tax Reimbursement

  e. Goods and Services Tax Reimbursement

  f. Employment Incentive

  g. Transport Incentive

- **North-Eastern Development Finance Corporation (**NEDFi): To ignite the entrepreneurial spirit in the region, the NEDFi Opportunity Scheme for Small Enterprises (NoSSE) was launched to aid first generation entrepreneurs who are setting up industrial units and are short of equity. It is the designated nodal agency responsible for the disbursal of Central incentives to industries in the NER.
- **North East Venture Fund**: Similar to the NEDVFC's NoSSE, the NEDFi has set up a fund of INR 100 Crore to provide financial assistance to start ups in the region. It is a wholly owned subsidiary of the NEDFi that aims to promote entrepreneurship while maximizing returns on investments. For this, it provides capital as well as other forms of support.
- **UDAN 3.0:** This is a regional connectivity scheme, aimed at enhancing aerial connectivity and increasing the routes covered in the region. The scheme, introduced in 2016, will run for 10 years.

[6] North Eastern Region District SDG Index Report and Dashboard 2021-22, NITI Aayog (2021).
[7] Sector Wise Sanctioned, Completed, and Ongoing NESIDS Projects (2022-23), http://nesids.mdoner.gov.in/.

- **Special Accelerated Road Development Programme- SARDP-NE:** This initiative has been taken up by the Ministry of Road Transport and Highways. This programme envisages providing road connectivity to all the district headquarters in the NER by constructing highways with a minimum of two lanes. The SARDP-NE Phase 'A' is expected to be completed by 2023-24.
- **National Highways and Infrastructure Development Corporation:** this is a company owned fully by the GoI's Ministry of Road Transport and Highways which works to establish, design, build, operate, maintain, and upgrade National Highways and Strategic Roads including interconnecting roads in parts of the country which share international boundaries with neighboring countries. It aims to enhance regional connectivity to promote cross-border trade and commerce, and to help safeguard India's international borders. It is also focused on improving road connectivity and efficiency of the international trade corridor through the expansion of 500 km of roads in the North Bengal and the NER to enable efficient and safe transport regionally with other South Asia Sub-regional Economic Cooperation (SASEC) member countries. Some of the projects are being funded by the ADB.

2.2. Tripura: Overview

Tripura became a full-fledged state on 21 January 1972. It is the third smallest state in the country. On its northern, southern, and western sides, it is flanked by Bangladesh and the length of its international border with Bangladesh is about 856 km, or about 84% of its total border. It shares the rest of the border with Assam and Mizoram. The border with Assam is 53-km-long while with Mizoram is 109-km-long. The state has eight districts, namely Dhalai, Gomati, Khowai, North Tripura, Sephaijala, South Tripura, Unakoti, and West Tripura. The state is spread across 10,491 sq km. of which 60% is forest area. Only 27% of its total area is under cultivation. Further, Tripura has 87.22% literacy rate which is more than the national average.

The following table provides some key insights into the socio-economic scenario of the State:

Table 1: Key Insights: Tripura

Key Insights: Tripura	
GSDP at current price (Lakh/INR) – 2020-21	58879.53
Estimated Population (2019-20)	40,12,000
Population density	350 persons per sq. km
Literacy Rate	87.2%
Value of Exports (Crore/INR)- 2020-21	16.39
Value of Imports (Crore/INR)- 2020-21	716.87
Tourist inflow (2018-19)	5,29,879[8]
Overall SDG Index Score	58

Source: Economic Review of Tripura (2020-21), Directorate of Economics and Statistics, Government of Tripura (2021).

Profile of the districts in Tripura

Tripura has eight districts, namely Dhalai, Gomati, Khowai, North Tripura, Sephaijala, South Tripura, Unakoti, and West Tripura. This section provides a glimpse into each one.

[8] Department of Tourism, Government of Tripura (https://tripuratourism.gov.in/sites/default/files/TRIPURA_TOURISM_POLICY__3rd_Feb_2020_1230.pdf)

1. **Dhalai:** Socio-economically, this is the most backward district in Tripura.[9] In 2006, the Ministry of Panchayati Raj named Dhalai one of the country's 250 most backward districts (out of a total of 640). It is the only district of Tripura which receives grants from the Union Government under the Backward Regions Grant Fund (BRGF).

   Demographically, it has large tribal population, constituting more than half of the total population, and 25% of the households in the district are classified as Below Poverty Line (BPL).[10] The district has a literacy rate of 96.79%, higher than Tripura's 96.82% and India's 74.04%.

   The districts economy is majorly dependent on primary sector. An overwhelming 76% of the total workers are involved in agriculture.[11] Out of this, 37% are cultivators, 26% are marginal farmers, 10% work as agricultural labour, and 3% work in agri-allied sectors.[12] The gross cropped area in the district is 35,753.0 Ha, and it produces 1,01,632 MT of vegetables and 1,82,953 MT of fruits.[13] Agriculture, however, remains largely subsistence level– the practice of Jhum cultivation continues in many parts of the district. With increasing plantation activities like horticulture and sericulture, jhum cultivation has decreased to an extent in the last few years. Further livestock rearing for meat and dairy purposes is also an important livelihood in the region. The yearly meat production is about 3585.79 MT while egg and milk production are 1.99 crore and 13924.29 MT, respectively.[14]

   13,272 Ha of land is used for non- agricultural purposes. 6% of the total working population are cottage industry workers and 18% are engaged in other livelihoods.

   A water quality assessment carried out by the TIDC at the district's headquarter, Ambassa, reveals that the groundwater in the region has an acceptable pH limit of 7.1 and is free of toxic contaminants, making it suitable for a wide variety of uses. It does however have a high amount of dissolved iron (0.57 mg/l) which, if not controlled, may hinder crop growth and damage irrigation equipment. The water also has a high volume of dissolved solids (286 mg/l).

   Dhalai has 16 reported registered factories.[15] These include manufacturing units that produce wood/wooden based furniture, paper and paper products, and electrical machinery and equipment.

   Dhalai is home to one Industrial Area, namely the Integrated Infrastructure Development Centre (IIDC) at Lalchari covering 54 acres, and two tea estates in Kamalpur and Halahali. Besides this, sericulture is an upcoming sector and the current area under sericulture is 169.6 Ha.[16] There are 5 handloom units and 1650 handloom weavers in the district, and it also has 4 registered handicraft units and 204 trained handicraft artisans.[17]

   The region has some key strengths- a huge natural resources base, fertile land, climate conducive to a wide variety of crops, adequate and well spread rainfall, a high literacy rate, and its strategic location and connectivity via National Highway (NH) 44.

2. **Gomati:** this district was created in 2012. With 72% of the rural population living below the poverty line,[18] socio-economically it is among the relatively underdeveloped regions of Tripura. Out of a population of 4,41,538, 42.70% of the population is tribal.[19]

   In the district the primary sector is the most dominant with agriculture being the primary occupation in the region. 12.6% of the working population are cultivators, 8-9% are agricultural laborer's and 1.61% are

[9] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[10] https://dhalai.nic.in/about-district/
[11] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[12] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[13] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[14] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[15] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[16] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[17] District Profile: Dhalai, Tripura, Government of Tripura (2016).
[18] https://gomati.nic.in/
[19] District Profile Gomati District, Tripura, Government of Tripura (2018).

dependent on trade and commerce.[20] Paddy is the main food crop grown. Potato, sugarcane, mesta, jute, and mustard are some other crops grown in the district. Tea, coffee, rubber, jackfruit, banana, mango, and pineapple are the major plantation crops. However, only 31.61% of the land in the district is cultivable and land holdings are small.[21]

A water quality assessment carried out by the TIDC at the district's headquarter, Udaipur, reveals that the groundwater in the region has an acceptable pH limit of 7.2, and does not contain toxic contaminants, making it suitable for a wide variety of uses. However, like in Ambassa, here too, the groundwater is rich in iron (0.5 mg/l). Further, the water has been found to have high turbidity (14 NTU).

The district has 204 reported registered factories that employ 2208 people[22]. Sericulture and handicrafts are among the important secondary sector activities pursued in Gomati. 139.6 Ha are currently being used for sericulture and there are 688 weavers.[23] There are 6 handloom units and 16,370 workers engaged in handloom weaving while the handicrafts industry has 2,380 artisans.[24] Besides this, an industrial estate has been set up at Dhajanagar in an effort to catalyze industrial growth in the region. One of the major strengths of the district is its 100% literacy rate. Further, it is marked by lush green and fertile valleys along the river Gomati, making it suitable for the development of agriculture-allied industries.

3. **Khowai:** lies between West Tripura and Dhalai. It also shares a border with Bangladesh. The estimated total population of the district is 3,27,564 while the estimated literacy rate is 87.78%.[25]

   Primary sector activities are most common in the district. There are 32,079 farmer families in the area.[26] The irrigation system upon which agricultural activities depend is entirely controlled by the local drainage system i.e., streams, rivers, canals, springs, and dug out wells. The net sown area is 24824 Ha, the gross cropped area is 44192 Ha, and the area under food grain cultivation is 21949 Ha.[27] There is little fallow cultivable land left as more than 70% of the district is hilly and forest covered, and the terrain is mostly undulating.[28]

   Paddy is the main crop grown across the region. Beans, cowpea, and brinjal are cultivated during the monsoon. Among fruit crops, banana, papaya, citrus fruits, mango, areca nut, and litchi are cultivated. Mining is another important primary sector activity. Extraction of brick earth is carried out to provide raw material to brick kilns in the district.

   The major secondary sector activity in Khowai is brick manufacturing. It has 15 brick kilns.[29] The availability of brick earth makes the district suitable for further expansion of the sector. As part of its efforts to improve industrial prospects in the district, the Tripura government has set up a Government Industrial Training Institute in the district, to create a skilled labor pool.

4. **North Tripura:** The North Tripura District has a geographical area of 1422.19 sq km and a population of 4,44,579.[30] It is mostly hilly and shares a boundary of 53 km with Assam, of 109 km with Mizoram, and a 96-km-long international boundary with Bangladesh.[31]

   The economy of North Tripura is primarily based on primary sector activities like agriculture, animal resource development and fisheries. The main crops grown in the district include paddy, orange, pineapple, jackfruit, banana, lemon, Areca nut, and mango. Fisheries are also an important source of income, and

[20] District Profile Gomati District, Tripura, Government of Tripura (2018).
[21] District Profile Gomati District, Tripura, Government of Tripura (2018).
[22] District Profile Gomati District, Tripura, Government of Tripura (2018).
[23] District Profile Gomati District, Tripura, Government of Tripura (2018).
[24] District Profile Gomati District, Tripura, Government of Tripura (2018).
[25] https://khowai.nic.in/.
[26] District Profile Gomati District, Tripura, Government of Tripura (2018).
[27] District Survey Report: Khowai District, Tripura, Government of Tripura (2018).
[28] District Survey Report: Khowai District, Tripura, Government of Tripura (2018).
[29] District Survey Report: Khowai District, Tripura, Government of Tripura (2018).
[30] https://northtripura.nic.in/.
[31] https://northtripura.nic.in/.

many small- and medium-scale fisheries are in the region. Further, North Tripura also houses tea gardens, and rubber and bamboo plantations. The Jampui Hills region has been a major orange producing area. However, due to diversion of land for non-agricultural activities, there was a fall in orange production. The government is currently trying to revive citrus farming in the region.

The secondary sector is still growing in the district. It houses one industrial estate in Dharmanagar and an IIDC at Dewanpasa. Its closeness with Bangladesh and abundant horticultural output both make it a potential hub for food processing. The presence of the IIDC and the industrial estate will act to catalyze industrial growth in the region. There are 248 reported registered factories in North Tripura that employ 4482 people.[32] There are also many micro and small enterprises as well as artisan units in the district. There are 26 ready-made garments and embroidery units employing 182 persons; 12 wood/wood-based furniture units with 100 employees; 7 leather-based units employing 135 persons; 1 chemical-based unit with 16 employees; 7 rubber, plastic and petro-based units employing 170 persons; 2 mineral-based units employing 115 persons; 21 steel-based units employing 480 persons; 34 engineering units employing 110 persons; 42 repairing and servicing units employing 480 persons; and 96 other units employing 2694 persons.[33]

The existing manufacturing units in North Tripura will support the state government's current efforts to expand the secondary sector in the district.

5. **Sepahijala:** covers 1043.04 sq. km and has a population of 5,42,731[34]. Only about 12% of the district is occupied by small hilly ranges while the remaining 88% is almost plain land, bordering Bangladesh on the west and the south. The literacy rate of the district is 97.76%.[35]

   The main sources of livelihood are mostly primary sector based. A large number of people are involved in horticultural farming (vegetables and fruits) and rubber cultivation. The main crop cultivated in the district is paddy. Seasonal crops like potato, cabbage, radish, pulses, oilseeds, pineapples, and maize are also cultivated. Cash crops like rubber and tea are grown in many areas as well. The gross cropped area 93,399 Ha while 313 Ha of fallow land are yet to be developed.[36] Much of the agriculture is rain-fed or and by the local drainage system of streams, rivers, canals, and dug out wells. A few important rivers flowing through the district are Burima/Bijoy, Kachigung and Gomati. Mining is another important primary sector activity. Extraction of brick earth is carried out to provide raw material to brick kilns in the district.

   The major secondary sector activity in Sepahijala is brick manufacturing. It has 25 brick kilns.[37] The availability of brick earth makes the district suitable for further expansion of the sector. The district also has a commercial power plant, the Monarchak Solar Power Station, that is run by the North Eastern Electric Power Cooperation.

6. **South Tripura:** covers 1514.322 sq km and as per the Census (2011), the total population of the region is 4,30,499.[38] It shares a 204.487 km border with Bangladesh. The district is connected to Agartala by NH – 08.

   Anticlinal hill ranges forms the watersheds from which various drainage channels emerge. The district is drained by many perennial rivers, and the major rivers are Gomti, Muhuri, and Feni. A water quality assessment carried out by the TIDC at various locations in the district, namely Belonia, Sabroom, and Wards 2,4, 5, and 13 of Santirbazar, reveals that the groundwater in the region has a permissible pH limit. It does not contain toxic contaminant. However, the water in Belonia contains the highest volume of chlorides (35 mg/l) of all the locations included in the study. It also contains a high amount of calcium carbonate, increasing alkalinity. Additionally, it is relatively more turbid (5.4 NTU), falling above the permissible limit. The water in Sabroom and the four wards of Santirbazar, on the other hand, are less turbid, and have been found to have an acceptable taste and odour.

   The economy of South Tripura district is mainly primary sector based. Paddy, pineapple, jackfruit, banana,

[32] Brief Industrial Profile of North Tripura District, GoI.

[33] Brief Industrial Profile of North Tripura District, GoI.

[34] https://sepahijala.nic.in/

[35] District Survey Report: Sepahijala District, Tripura, Government of Tripura (2019).

[36] District Survey Report: Sepahijala District, Tripura, Government of Tripura (2019).

[37] District Survey Report: Sepahijala District, Tripura, Government of Tripura (2019).

[38] Brief Industrial Profile of Tripura (South) District, GoI.

nuts, and mango are cultivated here. Fisheries are one of the main sources of income. There are several rubber and bamboo plantations in the region as well. 70% of the workers are dependent on agriculture for their livelihood.[39] The tribal population continues to practice Jhum cultivation (shifting cultivation).

The district also has a vibrant secondary sector with 167 MSMEs.[40] These include, among others, 61 fabricated metal producers; 32 bricks/ cement producers; 23 food based units; 11 motor vehicle/cycle/automobile repair and service centres; 9 candle/decorative article/furniture and wooden fixtures/stamp manufacture units; 1 automobile battery servicing 1 ; 3 rubber sheets/ tyre retreading units; 3 screen printing, still photography/ computer servicing units; 4 bamboo and cane article/ wooden product manufacturing units; 1 jute article producer; 5 filtering and purifying machinery/ iron removal plant/ pumps and compressors repair units; 2 textile garments/tailoring units; and 5 agarbatti/bio-fertilizer making units. 3321 persons are employed in these units.[41]

Further, the state has four industrial areas – the Dhajanagar Industrial Estate, the Jalefa IIDC, the Sarasima IIDC, the Gokulpur IIDC, and a sawmill at Belonia.

7. **Unakoti**: covers 686.97 sq km and has a population of 2,98,194.[42] It shares a total international boundary of about 50 km with Bangladesh and is connected to the rest of Tripura by NH-44. The literacy rate of the district is 86.91%.[43]

   Primary sector activities provide livelihoods to a large section of the district's population. Paddy is the main crop grown here. Beans, cowpea, brinjal, banana, papaya, citrus fruits, mango, Areca nut, and litchi are also cultivated. The total cropped area in Unakoti is 22,442 Ha. Livestock and poultry farming are major sources of livelihood for the people of the region.

   There is some level of manufacturing activity in the district as well. There are 46 registered factories employing a total of 3994 persons.[44] These include wood and tea-based units and brick kilns.

8. **West Tripura:** is the most industrialized district in Tripura, covering 3544 sq kms.[45] It has all the essential infrastructure such as a well-developed airport, railway station, urban transportation, and rural transportation facilities. It has a population of 17,24,619.[46]

   Rural West Tripura is mainly dependent on primary sector livelihoods such as agriculture and allied activities. Paddy cultivation is the main agricultural activity. There are nineteen tea estates which makes the district the largest producer of tea.

   There are 1,863 registered industrial units and a total of 2,000 industrial units in West Tripura,[47] indicative of the flourishing secondary sector in the district. It also houses five industrial parks estates— the Arundhutinagar (AD Nagar) Industrial Estate, the Badharghat Industrial Estate, the Dukli Industrial Estate, Bodhjungnagar Growth Centre, and the Bodhjungnagar Export Promotion Industrial Park. Industries like steel plants, plastic- and rubber-based industries function out of these industrial estates. Dry fish, raw hides and skin, coir mattress, and fresh ginger are the major exportable products made in the region.

   The government has identified the following tertiary sector industries that can be set up in the region— automobile battery servicing; clinical laboratories; dyeing and printing units; fast food centres/ restaurants; pest control services; printing presses; watches and clocks repairing, sales and services; cycle and cycle rickshaw repairing; repairing of household electrical appliances; and web designing.[48]

[39] https://southtripura.nic.in/economy/
[40] Brief Industrial Profile of Tripura (South) District, GoI.
[41] Brief Industrial Profile of Tripura (South) District, GoI.
[42] https://unakoti.nic.in/demography/
[43] https://unakoti.nic.in/demography/
[44] https://unakoti.nic.in/factories-boilers/
[45] Brief Industrial Profile of Tripura (West) District, GoI.
[46] Brief Industrial Profile of Tripura (West) District, GoI.
[47] Brief Industrial Profile of Tripura (West) District, GoI.
[48] Brief Industrial Profile of Tripura (West) District, GoI.

Natural Resources: Tripura is well-endowed with natural resources, such as agro-horticultural and forest resources including a wide variety of medicinal plants, oil and natural gas, and mineral deposits.

The state, with climatic and geographical conditions that make it suitable for the cultivation for many kinds of horticultural and floricultural cultivation, is known for its vibrant food processing, bamboo, and sericulture industries. Local flora and fauna bear a very close affinity and resemblance with floral and faunal components of Indo-Malayan and Indo-Chinese sub-regions.

This section provides a brief exploration of the natural resource base of the region.

a. **Bamboo:** The state is a home to 21 species of bamboo, and an area of 7,195 hectares is used for bamboo cultivation.[49] Tripura's total bamboo yield is 1,88,512 MT/year out of which 82.7% is Muli Bamboo, 8.5% is the B. Tulda (Mrittinga) variety, while other varieties constitute the remaining 8.8%.[50] Further, it houses the largest bamboo flooring unit in India with a turnover of INR 25 Crore.[51]

b. **Rubber:** Tripura produces 83,701 mt of rubber[52] making it the second largest producer of rubber in India after Kerala. The area under rubber cultivation is 85,000 hectares. The state has more than 1 lakh rubber growers. Rural economy of INR 1,200 Crore is rubber-based and its cultivation has helped settle tribal *jhumias* (shifting cultivators).[53]

c. **Tea:** It is the fifth largest tea producing state of India. The state has 58 tea gardens as of February 2020 that cover an area of >6,885 hectares.[54] There are a total of 23 tea processing factories, of which 4 are cooperatives, 2 are public sector ones while 17 are privately owned.

d. **Tropical harvest:** Tripura has the optimal climatic conditions for the cultivation of various tropical fruits and horticulture crops like pineapple, jackfruit, and oranges. Plantation crops like Areca nut, Coconut, Cashew, various winter and summer vegetables, spices, and flowers can also be cultivated here. As per the third advance estimate of 2019-20, the total fruit production in the state is 562.46 thousand MT, while vegetables and spice yields are 811.67 thousand MT and 33.15 thousand MT respectively. The total area under horticulture in the state is 121160 ha. An additional 1370 ha area for fruit cultivation, 1142.6 ha for Areca nut cultivation, 5050 Ha for vegetables and 200 Ha for open field flower have been brought under cultivation during 2019-20 which has benefitted nearly 30,000 farmers in the state.[55]

e. **Natural gas:** Tripura is endowed with natural gas (~97 methane) with estimated availability of 400 BCM, this is commercially exploitable but due to lack of physical infrastructure to transport it to main nodes, it is still untapped. For the upstream segment, Assam and Tripura are the primary hydrocarbon producers.

f. **Medicinal Plants:** Tripura's tropical climate supports the growth of various plants with medicinal value. It is home to 266 medicinal plants, 581 herbs and 379 species of trees. Out of the 266 medicinal plants identified by the Tripura Forest Department, 12 are suitable for cultivation and income generation.[56] Between 2008 and 2011, 1,513 kg Gamar seeds were marketed by the Medicinal Plant Board of Tripura to Oushadhi Pharmaceuticals. Further, from 2011 to 2014, Kalmegh amounting to 984 kg was marketed by the board, generating sales proceeds of INR 33,209.[57]

g. **Sericulture:** In Tripura, mulberry sericulture was introduced at a small level during the 5th five-year plan on the recommendation of the North Eastern Council. Initially it was confined only to government farms but was slowly expanded into villages. At present, there are 20 sericulture clusters functioning

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49 ENVIS Centre

50 Government of Tripura (https://www.indianchamber.org/wp-content/uploads/2019/03/DESTINATION-TRIPURA-INVESTMENT-SUMMIT.pdf)

51 Government of Tripura (https://www.indianchamber.org/wp-content/uploads/2019/03/DESTINATION-TRIPURA-INVESTMENT-SUMMIT.pdf)

52 Government of Tripura (https://www.indianchamber.org/wp-content/uploads/2019/03/DESTINATION-TRIPURA-INVESTMENT-SUMMIT.pdf)

53 Government of Tripura (https://www.indianchamber.org/wp-content/uploads/2019/03/DESTINATION-TRIPURA-INVESTMENT-SUMMIT.pdf)

54 ENVIS Centre

55 Government of Tripura (https://www.indianchamber.org/wp-content/uploads/2019/03/DESTINATION-TRIPURA-INVESTMENT-SUMMIT.pdf)

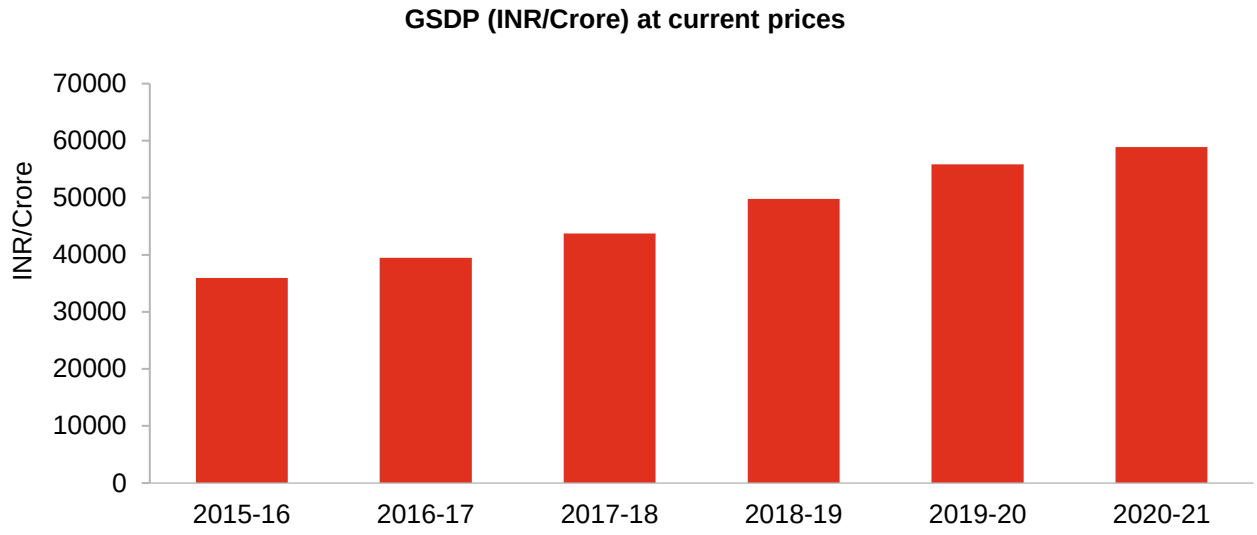
56 Government of Tripura (https://farmersportal.tripura.gov.in/PDF/profile/forest/Medicinal_New.pdf)

57 Government of Tripura (https://farmersportal.tripura.gov.in/PDF/profile/forest/Medicinal_New.pdf)

across the state's 8 districts.[58] In 2020-21, 3.6 MT silk was produced in the state while 40.3 MT of mulberry cocoons were harvested.

Economic Profile of Tripura:

Figure 3: Tripura's GSDP at current price



Source: Directorate of Economics & Statistics, Government of Tripura

Tripura has been registering an upward trend in its Gross State Domestic Product (GSDP), revealing a steady growth of the state's economy. The annual growth rate of Gross Domestic Product (GDP) (at constant prices) per capita is 8.84%[59]. The Net State Domestic Product (NSDP) of the state has grown at a CAGR (in INR) of 10.15% between 2015-16 and 2020-21.[60]

While there has been a clear increase in Tripura's GSDP, Tripura remains industrially backward, the primary reason for this being its geographical isolation. The low availability of infrastructure has made economic development and decentralization challenging, which has kept the state from realizing the full potential of its diverse resource base.

It is a primarily agrarian state, with more than 40% of the population depending on agriculture and allied activities[61]. However, only about 26% of the land in the state is cultivable, as the rest of the terrain is hilly and forested, which constrains the amount of land available for farming. Rice is the most widely grown crop in the state. Its climate is suitable for a variety of horticultural/ plantation crops as well, including pineapple, jackfruit, tea, rubber, and bamboo. The undulating topography of the land favors fruit production.

The contribution of the primary sector to the state's GSDP was 43.02% in 2020-21, marginally lower than that of the tertiary sector. As stated above, geographical conditions in Tripura are suited to the cultivation of horticultural crops such as banana and pineapple, and several horticultural schemes have been initiated, including programmes for the development of fruit trees, and of kitchen gardens.

Cropping accounted for 45.42% of the sector's GSDP while livestock rearing and mining and quarrying contributed 11.69% and 21.21%, respectively. Other major primary sector activities in the state include forestry and logging. Small and marginal farmers constitute about 96% of the total farmers in Tripura against 78% that of country. Agriculture and allied activities are main backbone of the state's rural economy. In 2020-21, INR 1091.30 Crore was spent by the state government on agriculture and allied services.

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58 North Eastern Development Finance Corporation Ltd (http://databank.nedfi.com/)
59 Economic Review of Tripura 2020-21
60 Ministry of Statistics and Programme Implementation
61 Economic Review of Tripura 2019-20

The secondary sector contributed 10.86% to the state's GSDP between 2020-21. Within the sector, the share of construction in the GSDP was 48.86%, making it the most profitable secondary sector activity in the state while water supply had the lowest contribution at 3.1%. The manufacturing sector accounted for 21.48% of the secondary sector's GSDP, indicative of the need to strengthen manufacturing activities in the state.

The tertiary sector's share in Tripura's GSDP in 2020-21 was the highest of the three sectors at 46.13%. The largest contributor in the tertiary sector in Tripura is public administration. Public administration had the largest share out of all tertiary sector activities at 28.11%. Trade, hotels, and restaurants were a close second, with a 24.01% share in the GSDP. The smallest share was that of financial services at 6.01%, followed by transport, storage- and communication-related services, which accounted for 8.45%.

There has been a gradual shift in economic base from primary to tertiary sector activities. Manufacturing activities have not seen similar growth owing to low industrialization and infrastructure related challenges. To remedy this, the government has taken various steps to increase industrialization and attract investments. The state currently has one SEZ, five industrial estates, six industrial areas, and four PSUs.[62]

The table provided here shows the sector-wise contribution to the GSDP and is indicative of the weak secondary sector of the state, which consistently contributes the least to the GSDP.

Table 2: Sector-wise Percentage Contribution to GSDP at current prices

Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (2nd RE)	2019-20 (1st RE)	2020-21 (ADV)
Primary	33.48	32.67	33.29	41.22	43.18	43.05	40.15	41.43	43.03	43.02
Secondary	14.11	15.27	14.19	15.01	12.95	13.65	13.49	13.43	11.69	10.86
Tertiary	52.41	52.06	52.52	43.77	43.87	43.3	46.36	45.14	45.28	46.13

Source: Economic Review of Tripura 2020-21

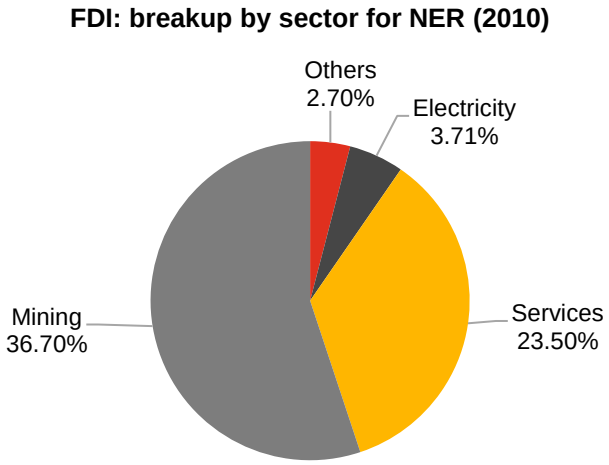
Investment Trends: Tripura has recorded impressive growth rate during the last decade; the state's economy achieved a growth rate of 9.2% in real terms during 2014-15.[63]

a. **Foreign Direct Investment (FDI):** Owing to the relative lack of industrialization in the state, the FDI inflow into Tripura is lower than that of many other Indian states. FDI inflow into Tripura stood at USD 122 million between April 2000 and September 2019. Between October 2019 and March 2021, inflows stood at USD 0.43 million.[64] Out of the total FDI sums India draws, the share of the NER states in this is less than 1%.[65]

According to the GoI's Department for Promotion of Industry and Internal Trade, the top ten sectors that attract FDI inflows are the services sector, computer software and hardware, telecommunications, trading, construction development (townships, housing, built-up infrastructure, and construction development projects), automobile industry, construction (infrastructure) activities, chemicals (other than fertilizers), drugs and pharmaceuticals, and hotels and tourism.

62 Niti Aayog
63 TIDC (https://tidc.tripura.gov.in/about-tripura)
64 Department for Promotion of Industry and Internal Trade (DPIIT)
65 North East Economic Corridor – Bringing people and markets together, ADB, March 2022

Figure 4: FDI Breakup of NER region



Source: Centre for Monitoring Indian Economy (CMIE) database

the FDI breakup by sector for the NER states shows that mining attracted the largest share of investments followed by the service sector. Considering the overall share of Tripura's foreign investments alongside that of other states in India, despite its huge manufacturing potential and high literacy rate, the region attracts low FDI inflows.

b. **Exports and Imports:** Tripura's foreign trade is focused on Bangladesh. The total volume of trade has increased manifold- from a meagre INR 4.12 Crores during 1995-96 to about INR 537.08 Crores during 2018-19[66].

The following table shows the trade volume during last few years as well as the rising level of exports:

Table 3: Trade Volume of Tripura

Year	Imports (Crore/INR)	Exports (Crore/INR)	Total (Crore/INR)
2014-15	357.65	1.02	358.67
2015-16	381.76	1.96	383.72
2016-17	300.23	4.6	304.83
2017-18	384.22	6.46	390.68
2018-19	522.42	14.66	537.08

Source: Department of Industries & Commerce, Government of Tripura

Given below are tables showing the composition of imports and exports between 2020-21:

Table 4: Composition of Exports

S. No.	Commodity	Total Value (INR Cr)
1.	Fresh Ginger	4.51

[66] Department of Industries & Commerce, Government of Tripura

S. No.	Commodity	Total Value (INR Cr)
2.	Seeds of Cumin	4.34
3.	Grapes	2.31
4.	Pomegranate	1.73
5.	Citrus	1.51
6.	Dry Fish	0.88
7.	Wood Apple	0.36
8.	Onion	0.08
9.	Fresh Orange	0.07
10.	Tamarind	0.07
11.	Other commodities	0.53
Total		**16.39**

Source: DGCIS, AIS

Table 5: Composition of Imports (2020-21)

S. No	Commodity	Total Value (INR Cr)
1.	Variety of fish- Small fish	248.61
2.	Food Items	157.67
3.	Cement	130.13
4.	Dry Fish	47.31
5.	Steam Coal	42.37
6.	Plastic Items	19.72
7.	Steel Sheets	14.47
8.	PVC Pipes/ Tube	12.05
9.	Flavor Drinks	9.84
10.	MS Rod	6.94
11.	Other commodities	27.76
Total		**716.87**

Source: DGCIS, AIS

Primary sector exports dominate the total exports of the state, emphasizing the need to strengthen the secondary sector. With the state government focusing on bamboo and rubber products, and food processing, secondary sector exports in nearby markets can be increased.

Apart from the export commodities mentioned in the table above, other major exports from Tripura include limes, jackfruit, and pineapples. Its primary foreign trade partner, Bangladesh, has also been importing spare parts of CNG-run vehicles, broomsticks, and rubber latex from the state since 2018.

Existing Infrastructure: To fully understand the investment trends in Tripura, it is important to look at the current physical infrastructure of the state.

Though it can be said to be strategically located in terms of its potential to help build India's trade relations with South East Asia, the Partition of India in 1947 left Tripura greatly disadvantaged in terms of connectivity. Prior to partition, the distance by road from Agartala to Kolkata for instance was about 500 km. After partition, the route to Kolkata via the Siliguri land corridor became 1,700 km long. Connectivity through various waterways too was severed.

1. **Roadways:** Tripura currently has 6 National Highways spread over 854 km, and 4 in-principle declared National Highways covering 229.25 km.[67] The National Highway, linking Agartala to Guwahati, has been upgraded and extended up to Sabroom (the southern-most point in the State), which is about 75 km. away from Bangladesh's Chattogram port. The state is currently developing the Kailashahar – Kumarghat section of NH-208, the Khayerpur – Amtali section (Agartala bypass) of NH-08, the Agartala – Khowai section of NH-108B, the Kailashahar – Kurti bridge of NH-208A, the Manu – Simlung section of NH-44A, and the Churaibari – Agartala section of NH-08 (strengthening with paved shoulder). Besides this, two RCC Bridges over river Muhuri and over river Gomati are being developed and geometric improvement on the 21.789 km long Churaibari – Agartala section of NH-44 has also been undertaken.

   Apart from this, a new bridge, the Maitri Setu has been constructed as an important roadway in the state. The bridge is a 150-metre (490 ft) bridge on the Feni River. It links Tripura with Bangladesh's Chattogram port, and thus provides a shorter and more economical route between the state and Bangladesh as well as between India's eastern and western states. The bridge was opened to the public in March 2021.

2. **Railways**: Currently, the rail route in Tripura covers 264 km. This network is entirely broad gauge. In 2019, it completed the 38 km Belonia–Sabroom rail line, connecting Sabroom, Tripura's southernmost town, to the rail network. This was the last section of a new 114 km broad gauge Agartala–Sabroom rail line.

   Currently, the major outgoing commodity by rail are bricks and stones which are shipped by rail to Assam, West Bengal, and Odisha. Meanwhile, food grains (mainly from Punjab and Haryana) arrive in Tripura by rail. The main origin stations for goods in Tripura are Jirinia, Belonia, and Kumarghat, while the main destination stations are Agartala and Belonia.

   The Agartala–Akhaura broad-gauge rail line connecting Tripura and Bangladesh, a major 12-km-long rail project, is under construction in the state. The length of the section in India is expected to be 5.5 km and the remaining 6.5 km is expected to be in Bangladesh. The entire cost of the project, including the rail line in Bangladesh, will be borne by the GoI. The Ministry of Development of North Eastern Region is financing the work on the Indian side, while the GoI's Ministry of External Affairs is financing the work on the Bangladeshi side.

3. **Airports**: Owing to the hilly terrain, landslides, and other socioeconomic factors, air travel is the most efficient way of commuting to and from Tripura. This means that while industries like tourism and information technology depend squarely on flying, others (whose cargo is not transported by air) are also dependent on air-based transport for personnel to run and expand their businesses. Agartala Airport is the second busiest airport in North East and efforts are currently underway to make it an international one. People in Tripura are dependent especially on the flights operating between Agartala-Kolkata and Agartala-Guwahati. Besides, recent improvements have been made to air connectivity with other sectors of the country- from Agartala to Delhi, Mumbai, Bangalore, Hyderabad and Chennai. The runway at the airport has been extended to 7,500 feet and an Instrument Landing System has been successfully installed making night operations possible.

[67] PWD (R&B), Tripura

4. **Inland Waterways**: Two inland waterway routes that can connect the rest of India to Tripura are Kolkata–Ashuganj–Agartala and Kolkata–Daudkandi–Sonamura. They shorten the distance between Agartala and Kolkata significantly (the current road distance via the Chicken Neck Corridor is ~1,650 km).

   As India and Bangladesh signed a Protocol on Inland Water Transit and Trade (PIWT&T) in 1972, which allows inland vessels of one country to transit through the routes of the other country specified in the protocol, the development of these waterways have the potential to benefit both nations.

5. **Electricity**: The state is presently a power-surplus one. In 2019-20, 712,16 MU of power was generated in the state.[68] The Tripura State Electricity Corporation Ltd has a total capacity of 110 MW from 3 generating stations, namely the Gomuti Hydro-electric Project, the Baramura Gas Thermal Power Station and the Rokhia Gas Thermal Power Station. In addition to this, it has diesel based generating units of 5.85MW, which have been in operation since pre-1947.[69] Further, there is also an ONGC-run power plant in Udaipur district's Palatana village.
6. **Industrial Infrastructure**: In order to improve industrial infrastructure, the Tripura Industrial Development Corporation Ltd. Is to set up a Special Economic Zone (SEZ) at Paschim Jalefa, Sabroom, South Tripura District. This will be a multi-sector SEZ.

   Other infrastructure for trade includes **Land Custom Stations** (LCSs) and **Border Haats**. Tripura currently has 8 notified LCSs at Agartala, Srimantpur, Muhurighat, Khowaighat, Dhalaighat, Manughat, Old Raghnabazar and Sabroom. However, out of these, the Dhalaighat LCS is operational for immigration purposes only and the Sabroom LCS is yet to become operational.

   Further, two Border Haats, located at the Srinagar-Chhagalnaiya and Kamalasagar-Tarapur border points have been set up on the Tripura- Bangladesh border. Both the haats are functional and have contributed not only to boosting the local economy but to strengthening the ties between the people of the two countries.[70] New haats have been proposed for development at Raghna (North Tripura) and Kamalpur (Dhalai). In addition, a site has already been selected for a similar haat at Kathalia (Nirbhaypur) in Sipahijala and the site selection process is underway for a haat at Khowai. The goods sold by people from Tripura include local handicrafts, horticultural produce like banana and jackfruit, cosmetics, steel utensils, saree, and unstitched cloth. Sellers from Bangladesh trade in dry fish, bakery items, sarees, plastic goods, fruits like green apple and watermelon, and some local vegetables.

Industrial policy: To promote economic development, Tripura offers various incentives to its investors under the Tripura Industrial Investment Promotion Incentive Scheme (TIIPIS), 2022[71].

A brief of the same are provided in the table below.

Incentive	Benefits	Special Provisions for Thrust Sectors[72]
Capital Investment Subsidy	30% on fixed capital investment subject to a ceiling of INR 100 Lakh per enterprise.	For thrust sector industries subsidy rate is 40% and the ceiling is INR 125 Lakh per enterprise

[68] Tripura State Electricity Corporation Ltd. Agartala

[69] TSECL

[70] Department Of Industries & Commerce, Government Of Tripura

[71] Tripura Industrial Investment Promotion Incentive Scheme (TIIPIS), 2022, Government of Tripura (https://industries.tripura.gov.in/sites/default/files/TIIPS-2022.pdf).

[72] The state has identified the following as its thrust sectors: **(I) Manufacturing Sector**: Industrial units which are using bamboo, rubber, agriculture and horticultural produce and natural gas as their major raw materials during production; Tea manufacturing; agar oil extraction industry; rubber wood processing industry; industrial units using plastic waste/e-waste as major raw material during production; Municipal Waste Processing; packaging material manufacturing activity; agricultural waste processing industry; industries manufacturing/using bio-degradable plastics; industries making cutlery items using areca nut leaves or bamboo, and **(II) Service Sector**: tourism promoting activities (water sports, ropeways, adventure and leisure sports, and floating restaurants) with a minimum

Incentive	Benefits	Special Provisions for Thrust Sectors[72]
Procurement Preference	15% on all purchases through tenders by State Government Agencies on products manufactured by eligible enterprises	-
Industrial Promotion Subsidy	Subsidy equal to the net amount of the "Goods and Services Tax" actually paid by an enterprise. Subject to an overall ceiling of INR 80 Lakh per annum. The aggregating limit of entitlement of an enterprise for 5 years cannot exceed 150% value of investment made in plant and machinery.	The annual upper ceiling of the subsidy is INR 125 Lakh per enterprise.
Export Promotion Subsidy	Paid to industrial enterprises on exporting goods through the Land Custom Stations in the state at a rate of 10% on value of export. Subject to an upper ceiling of INR 50 Lakh per annum. Only for the items manufactured in Tripura, provided an enterprise achieves at least 20% value addition within the state.	-
Power charges	Provided to all eligible industrial units with connected load of above 20 HP at a rate of INR 5.00 per unit without any upper ceiling. Industrial units with connected load up to 20 HP will be provided partial reimbursement of power charges at 25% of power charges actually paid by the enterprise, subject to a maximum amount of INR 15.00 Lakh per enterprise per annum.	Annual upper ceiling is INR 25 Lakh per enterprise per annum.
Partial Reimbursement of Interest on Term Loans	4% of the interest on term loan availed by the enterprise. Subject to an upper ceiling of INR 5.00 Lakh per enterprise per annum.	Rate of 5% with an upper ceiling to INR 12 Lakh per enterprise per annum.
100% Reimbursement of Standard Certification charges/ fees/ expenses	One-time payment for standard certifications in 12 selected areas issued by national and international bodies. Also applicable for reimbursement of fees/ charges on account of yearly renewal of standard certifications. One-time full reimbursement of fees payable for acquiring Technical Know-how/ Technology Transfer from any recognized national/ international research	-

investment of INR 3 Crore (excluding cost of land); hospitals/nursing homes with minimum investment of INR 3 Crore (excluding cost of land) with a minimum capacity of 25 beds.

Incentive	Benefits	Special Provisions for Thrust Sectors[72]
	laboratories/ technical institutes/ universities.	
100% Exemption from the payment of Earnest Money and Bid Security Deposits	For all eligible local enterprises on tenders floated by State Government Agencies.	-
Employment Cost Subsidy	-	Full reimbursed to eligible Micro, Small and Medium Enterprise belonging to the thrust sector on contribution made towards EPF and ESI Scheme. Subject to employment of 20 or more skilled and semi-skilled workers who are domicile of Tripura.
Subsidy on fees paid for Credit Guarantee of loans	Paid to micro and small enterprises on loans granted by Banks/ NBFCs.	-
Subsidy for participation in fares and exhibitions	-	To be reimbursed at a rate of 50% of the expenditure incurred for travelling expenses of one person and transportation of goods. Subject to an upper ceiling of INR 1.00 Lakh for each participation. This is further subject to two maximum participations a year per unit.
State Transport Subsidy	50% of transportation cost incurred for transportation of secondary raw materials by rail from the railway station nearest to the location of the seller to the Railway Station nearest to the location of the buyer as per Railway Standard Parcel Rate	-
Operational Subsidy to industrial units	New eligible industrial units availing fixed capital investment subsidy from any subsidy scheme of the State/ Central Government to be provided all operational subsidies	-
Special Incentives to Industrial Enterprises that continue to operate for five (5) years a. Industrial Promotion Subsidy	a. Industrial Promotion Subsidy: provided to enterprises at 25% of Goods and Services Tax actually paid after 5 years of operation with the condition that the aggregating subsidy amount paid since commissioning of the project shall not	a. - b. the annual upper ceiling is INR 25 Lakh per enterprise. c. -

Incentive	Benefits	Special Provisions for Thrust Sectors[72]
b. Power Charge Subsidy c. Employment Cost Subsidy	exceed the 150% of investment in plant and machinery b. Power charges will be provided to all eligible industrial units with connected load of above 20HP at a rate of INR 5.00 per unit without any upper ceiling. The industrial units with connected load up to 20 HP will be provided partial reimbursement of power charges at 25% of the power charges actually paid by the enterprise, subject to a maximum amount of INR 15.00 Lakh per enterprise per annum. c. Employment cost subsidy for MSMEs employing 20 or more persons domiciled in Tripura at a rate of 50% of employer contribution paid towards EPF and ESI after 5 years of operation.	

Similarly, central schemes also provide various incentives to industries in the state. Under the GoI's North East Industrial Development Scheme, the following incentives are provided to eligible industrial units on a reimbursement basis:

Central Capital Investment Incentive for Access to Credit: 30% of investment in plant and machinery with an upper limit of INR 5 Crore per unit.

Central Interest Incentive: 3% on working capital credit advanced by eligible banks/financial institutions for the first 5 years from the date of commencement of commercial production of a unit.

Central Comprehensive Insurance Incentive (CCII): Reimbursement of 100% insurance premium on insurance of building and plant and machinery for 5 years from the date of commencement of commercial production of a unit.

Goods and Service Tax (GST) Reimbursement: Reimbursement up to the extent of the Central Government's share of CGST and IGST for 5 years from the date of commencement of commercial production of a unit.

Income Tax Reimbursement: Reimbursement of the Centre's share of income tax for the first 5 years, including the year of commencement of commercial production of a unit.

Transport Incentive (TI): The following are the subsidies provided under this-
a) 20% of the cost of transportation including the subsidy currently provided by the Railways/ Railway PSU for movement of finished goods by rail.

b) 20% of the cost of transportation for finished goods, for movement through inland waterways.

c) 33% of the cost of transportation of air freight on perishable goods (as defined by the International Air Transport Association) from the airport nearest to the place of production to any airport within the country.

Employment Incentive (EI): The Centre pays 3.67% of the employer's contribution to the Employees Provident Fund (EPF) in addition to Government bearing 8.33% Employee Pension Scheme (EPS) contribution of the employer in the Pradhan Mantri Rojgar Protsahan Yojana (PMRPY).

The overall cap for benefits under all the components is INR 200 Crore per unit.

Challenges Faced by Tripura: Limited private investments and rudimentary physical infrastructure restrain the state's growth potential.

Though it now has essential infrastructure, this is hardly sufficient to stimulate industrialization. Reasons for the current state of insubstantial development are mentioned below:

Geographical:

- Due to restrictions, the only way possible to traverse is through its own boundaries by passing Chicken's Neck (via Siliguri corridor), which increases travel time manifolds.
- Geographical isolation from rest of India escalates the logistics cost and time for the products to reach target markets, reducing its competitiveness.

Climate:

- Coupled with the geographical isolation of the state, the climate of Tripura, with its long rainy season of 6 months, limits the working season to 4-6 months. Thus, projects completion time and costs both increase substantially.

Funding and financing:

- Tripura is special category state and dependent on its funding from the central government. But the "management of its long international border imposes huge administrative and financial costs"[73] on Tripura.
- Also, as a result of the relatively slow pace of industrialization and high unemployment, the state has a limited tax base.[74]

Absence of skilled labor:

- Although, Tripura has a high literacy rate of 87.22%, that does not assure high skilled labor or relevant talent for carrying out any activity to run the industry.

Inadequate infrastructure:

- Irregular topography makes it difficult and creates transportation choke points.
- Absence of cold storages and proper warehousing facility lead to agri-wastage and lowers the income of farmers.
- The development of agriculture and allied activities, especially for integration into global value chains, is crucial.

Environmental challenges:

While Tripura's forest cover provides huge ecological as well as economic benefits to the state, there is an 'opportunity cost in terms of the area that becomes unavailable for other economic activities and this results in development and fiscal disability'[75].

Market scenario:

- The shallowness of the region's market is one of the major hindrances to the growth of the manufacturing sector of the state.

This report aims to examine the infrastructure gaps in Tripura's existing industrial parks and provide a phased action plan to address the same. Considering Tripura's strengths and weaknesses as discussed above, the following sections of the report will focus on identification of priority sectors that have the potential to fast-track industrial growth in the state. Further, a brief about the initial review of the infrastructure available at industrial estates will be provided. Priority

[73] Economic Review Of Tripura (2019-20), Directorate of Economics and Statistics, Government of Tripura (2020).
[74] Economic Review Of Tripura (2019-20), Directorate of Economics and Statistics, Government of Tripura (2020).
[75] Economic Review Of Tripura (2019-20), Directorate of Economics and Statistics, Government of Tripura (2020).

sectors shall be mapped to each industrial estate it is best suited to support. Based on the infrastructure assessment and the mapping of priority sectors to specific parks, the report will suggest the necessary infrastructure in each industrial park, a phasing plan and an action plan needed to develop Tripura's industrial parks.

3. Identification of Priority Sectors

3. Identification of Priority Sectors

In the traditional debate on whether industrial development is a path-dependent process or one where leapfrogging preliminary stage is possible, most developing countries today are aiming for the latter. They are planning rapid structural changes by moving from traditional primary products to nontraditional industrial products and finding niches in industrial products, consumer products with high-income elasticities of demand, and modern services.

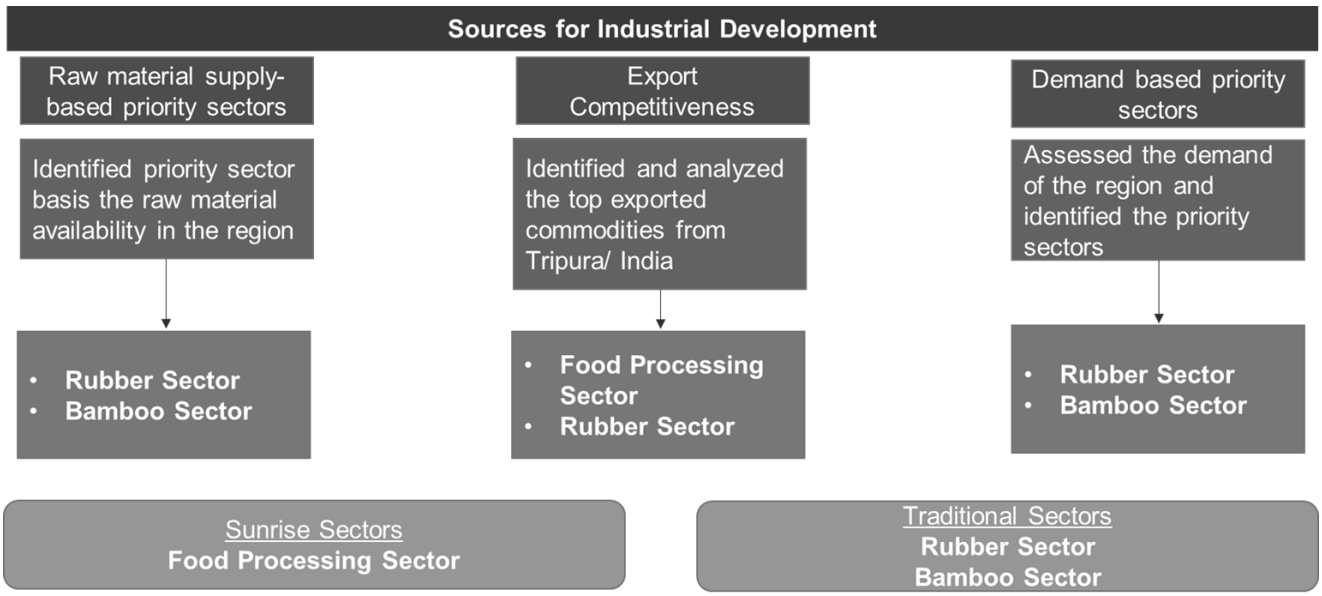
Evidence, however, indicates that it is easier for a country to develop a comparative advantage in some product if it already has a such advantage in similar products. Consequently, leapfrogging—or the development of a such advantage in sophisticated and complex products (e.g., advanced machinery, chemicals, and pharmaceuticals) without having previously developed a comparative advantage in similar products—is rejected by the empirical evidence[76].

In case of Tripura priority product choices may be based on a combination of both the approaches (i.e., path-dependent and leapfrogging). Hence, Tripura could focus on improving competitiveness in its focus industries serving both current and emerging needs of the target markets. The below framework is building on ADB's earlier engagement of Feasibility study to develop an economic corridor in NER. The NEEC report has identified priority sectors for the region which included agriculture, bamboo, oil and gas, rubber processing, cement and medical tourism.

Identifying a set of priority sectors helps to streamline industrial policy making and to ensure that government spending is optimally focused. Such sectors may be sunrise industries, or new industries arising due to technological, regulatory, economic, or social change. Or they may be existing industries which are resurging after a period of low growth due to changing conditions within the industry or the overall market environment. The identification of high growth potential, thus, allows governments to focus on supporting the sectors that have the potential to fast-track industrial growth. Since Tripura is currently aiming to catalyse industrial development, a similar exercise was carried out to earmark the sectors with high growth potential.

The following sector identification framework for Tripura explains the step-by-step process of identifying the priority sectors (both traditionally strong and sunrise sectors) and focusses on both current performance and future potential of industries/ sectors in Tripura.

Figure 5: Framework adopted to identify priority sectors for Tripura



[76] J. Felipe. 2015. *Development and Modern Industrial Policy in Practice: Issues and Country Experiences*. Manila: ADB. https://www.adb.org/sites/default/files/publication/158170/development-modern-industrial-policy-practice.pdf.

The team has identified and used three criteria to undertake the identification of priority sectors.

1. **Raw material-based priority sectors:** As a part of this criterion, priority sectors will be identified by assessing the raw material availability in the state and its production capacity.
2. **Export competitiveness:** In this criterion the consultant has undertaken assessment of potential exports from Tripura. Further value-added products which can be competitive have been identified based on origin destination analysis. This assessment will help in arriving at a list of products with high export potential.
3. **Demand based priority sectors:** As a part of this criterion consultant has analysed India's top imported commodities over the recent years. Further based on the raw materials available in Tripura, consultant shall shortlist imported products in India which can be manufactured in Tripura. Finally, the consultant will explore whether the Import Substitution Industrialization (ISI) is feasible considering the domestic manufacturing cost and cost of current imports.

A prioritized list of sectors has been compiled based on the outcomes of these three criteria.

3.1. Raw material-based priority sectors

Tripura is endowed with a vast natural resource base. It is rich in natural resources such as bamboo plantation, natural gas, rubber, tea, and medicinal plants.

1. Plantations: Tripura has an area of 2005.75 sq.km of bamboo plantation with a total yield of 1,88,512 MT/yr[77], 58 tea gardens covering an area of >6,885 hectares, as of February 2020[78] and 85453.63 hectares of rubber plantation[79]. As per the study of the National Bureau of Soil Survey and Land Use Planning, an ICAR organization located in Nagpur under the Ministry of Agriculture, the maximum area that can be brought under rubber cultivation in Tripura is 1 lakh Ha.[80] The production of rubber in 2019-20 was 83,701 MT in the state.
2. Horticulture: Tripura's geography and climatic condition, as well as the soil types means that horticulture in the state has great scope for development. The climate is conducive to the growing of a number of tropical and sub-tropical fruits and vegetables. Fruits like Pineapple, Jackfruit, Orange, Banana, Litchi, Lemon / limes as well as plantation crops like Areca nut, Coconut, Cashew, various winter and summer vegetables, spices, and flowers can be cultivated here. Further, the topography of the state is such that it is suitable for horticultural crops.

Further based on industrial output as per the ASI data of Tripura, a long list of sectors has been identified. The list of sectors are as follows –

Table 6: List of sectors and products along with their output

Sectors	NIC code Product)	Products	Tripura output (2017-18) (INR Lakhs)
Manufacture of food products	103	Processing and preserving of fruits & vegetables	786
Manufacture of food products	105	Manufacture of dairy products	2650
Manufacture of food products	106	Manufacture of grain mill products, starches & starch products	12440

[77] https://www.destinationtripura.com/bamboo.html
[78] ENVIS Centre
[79] https://tidc.tripura.gov.in/rubber/
[80] Department of Industries and Commerce, Government of Tripura (https://industries.tripura.gov.in/rubber-overview#:~:text=As%20per%20the%20study%20of,point%20in%20terms%20of%20area.).

Sectors	NIC code Product)	Products	Tripura output (2017-18) (INR Lakhs)
Manufacture of food products	107	Manufacture of other food products (coffee, tea, mate, spices, bakery)	24747
Manufacture of food products	108	Manufacture of prepared animal feeds	1704
Manufacture of beverages	110	Manufacture of beverages	6344
Manufacture of tobacco products	120	Manufacture of tobacco products	565
Manufacture of textiles	131	Spinning, weaving & finishing of textiles	82
Manufacture of products of bamboo, cork, straw and plaiting materials	162	Manufacture of products of bamboo, cork, straw & plaiting materials	1431
Printing and reproduction of recorded media	181	Printing and service activities related to printing	1258
Manufacture of coke & refined petroleum products	192	Manufacture of refined petroleum products	10822
Manufacture of chemicals & chemical products	201	Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms	119
Manufacture of rubber & plastic products	221	Manufacture of rubber products	18929
Manufacture of rubber & plastic products	222	Manufacture of plastic products	2444
Manufacture of other non-metallic minerals (cement, ceramic)	239	Manufacture of non-metallic mineral products (cement, ceramic)	42482
Manufacture of basic metals	241	Manufacture of basic iron & steel	6308
Manufacture of basic metals	243	Manufacture of basic precious & other non-ferrous metals & casting of metals	89
Manufacture of fabricated metal products, except machinery and equipment	259	Manufacture of other fabricated metal products; metalworking service activities	1024
Manufacture of electrical equipment	273	Manufacture of wiring and wiring devices	200
Manufacture of furniture	310	Manufacture of furniture	1390

Source: DGCIS, AIS

Further the above long list has been refined by analyzing regional concentration of upstream and downstream industries (location quotient [LQ]).

The LQ quantifies how concentrated an industry is in a region compared with a larger geographic area such as the state or country. It reveals what makes a particular region unique when compared with the national average[81]. Industries with a high LQ are typically (but not always) export-oriented industries, which are important because they bring money into the region rather than simply circulating money that is already in the region. Industry LQs are calculated by comparing the industry's share of regional output with its share of national output. LQ is always positive. LQ > 1 can be interpreted as indicating that the industry under study is more concentrated in the region than the national average. The basic uses of industry LQs include:

- determine which industries make the regional economy unique,
- identify the export orientation of an industry and identify the most export-oriented industries in the region,
- identify emerging export industries beginning to bring money into the region, and
- identify endangered export industries that could erode the region's economic base.

For a given industry, i, and for any given region, j, the LQ is defined as follows:

$$LQij = \left(\frac{\frac{xij}{xik}}{\frac{xkj}{xkk}}\right)$$

where xij represents output of industry i in region j, xik is the total output of industry i in all regions, xkj is the total output of all industries in region j, and xkk is the total output of the overall region.

The values of LQ for the selected long list sectors are shown below.

Table 7: List of sectors and products along with their LQ

Sectors	Product	LQ
Manufacture of rubber & plastic products	Manufacture of rubber products	11.1
Manufacture of other non-metallic minerals (cement, ceramic)	Manufacture of non-metallic mineral products (cement, ceramic)	8.56
Manufacture of food products	Manufacture of other food products (coffee, tea, mate, spices, bakery)	4.33
Manufacture of beverages	Manufacture of beverages	4.16
Manufacture of furniture	Manufacture of furniture	3.47
Manufacture of products of bamboo, cork, straw and plaiting materials	Manufacture of products of bamboo, cork, straw & plaiting materials	3.19
Manufacture of food products	Manufacture of grain mill products, starches & starch products	2.19
Manufacture of food products	Processing and preserving of fruits & vegetables	1.68

[81] F. Strotebeck. 2016. *The Location Quotient – Assembly and Application of Methodological Enhancements*. https://www.researchgate.net/publication/299536337_The_Location_Quotient_-_Assembly_and_Application_of_methodological_enhancements (accessed 29 May 2020).

Sectors	Product	LQ
Manufacture of food products	Manufacture of prepared animal feeds	1.6
Printing and reproduction of recorded media	Printing and service activities related to printing	1.5
Manufacture of food products	Manufacture of dairy products	0.81
Manufacture of rubber & plastic products	Manufacture of plastic products	0.62
Manufacture of tobacco products	Manufacture of tobacco products	0.6
Manufacture of coke & refined petroleum products	Manufacture of refined petroleum products	0.59
Manufacture of basic metals	Manufacture of basic iron & steel	0.52
Manufacture of fabricated metal products, except machinery and equipment	Manufacture of other fabricated metal products; metalworking service activities	0.42
Manufacture of electrical equipment	Manufacture of wiring and wiring devices	0.12
Manufacture of basic metals	Manufacture of basic precious & other non-ferrous metals & casting of metals	0.05
Manufacture of chemicals & chemical products	Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms	0.02
Manufacture of textiles	Spinning, weaving & finishing of textiles	0.01

Based on the above assessment, the sectors where the LQ>1 have been identified which indicates that the industry under study is more concentrated in the region than the national average. Hence the following sectors can be shortlisted as priority sectors due to availability of raw materials and locational advantages in the region.

Table 8: Manufacturing sectors identified based on above parameters

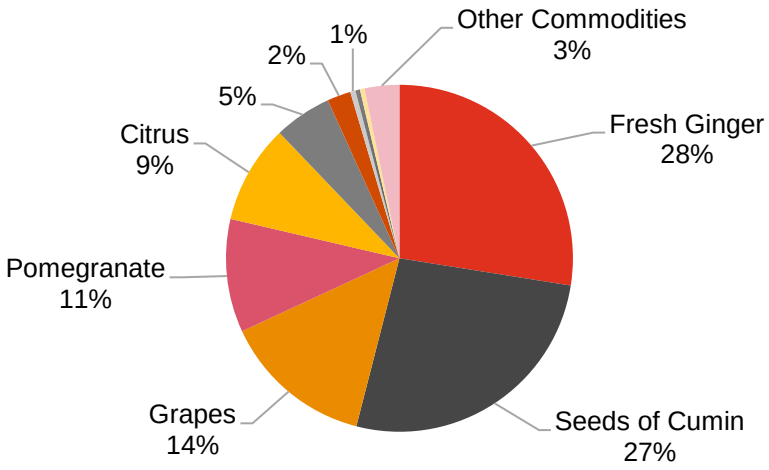
Sectors	Products
Manufacture of food products	• Processing and preserving of fruits & vegetables
	• Manufacture of grain mill products, starches & starch products
	• Manufacture of other food products (coffee, tea, mate, spices, bakery)
	• Manufacture of prepared animal feeds
Manufacture of products of bamboo, cork, straw and plaiting materials	• Manufacture of products of bamboo, cork, straw & plaiting materials
Manufacture of rubber products	• Manufacture of rubber products

3.2. Export competitiveness

In this subsection, products from Tripura which can be exported have been identified. Currently, few commodities mostly in their natural form are being exported without much processing to various countries. These include vegetables and fruits.

Given below is the composition of export commodities in FY 2020-21. We could observe that all the products which are being exported are in their natural form and no major processing of the goods is happening resulting in low value exports.

Figure 6: Composition of exports commodities



Source: https://ecostat.tripura.gov.in/eco-review-2020-21.pdf

There are a wide variety of crops that are being produced in Tripura. The table below highlights the various crops and the production quantity in FY2020-21

Table 9: Crops and their production in FY 2020-21

S. No.	Crops	Area (Ha)	Production (Lakh MT)	Productivity (MT/ Ha)
1.	Mango	10288	52366	5.09
2.	Pineapple	9859	143744	14.58
3.	Orange	4707	21087	4.48
4.	Jackfruit	5491	133251	24.27
5.	Banana	10677	110400	10.34
6.	Litchi	933	3219	3.45
7.	Lime/ Lemon	5014	24167	4.82
8.	Papaya	3146	31775	10.10
9.	Sapota	91	569	6.25

S. No.	Crops	Area (Ha)	Production (Lakh MT)	Productivity (MT/ Ha)
10.	Musambi	1190	2404	2.02
11.	Guava	673	3156	4.69
12.	Others	2208	19210	8.70
Total		**54277**	**545348**	**10.05**

Source: Horticulture and Soil Conservation, Tripura

Currently, most of the fruits are not processed and are being sold in their natural form. The food processing industry in the state is still at a nascent stage. The top 5 crops produced in terms of area coverage are mango, banana, pineapple, jackfruit, and orange However in terms of output the top 5 crops are pineapple, jackfruit, banana, mango, and papaya. Further it could also be noted that fruits such as pineapple and jackfruit are extremely popular crops from the region. In 2018, the President of India also named Queen variety of pineapple as the state fruit of Tripura. In terms of productivity jackfruit, pineapple, papaya, and banana have the highest yield per hectare. These crops are all suitable for food processing, both at the primary and secondary levels, as due to the high price of horticultural produce, regional consumption is low.

Only about 5-10% of the total produce is currently processed in India in contrast to developed countries like USA where 95% of the produce undergoes food processing. As per the Agricultural and Processed Food Products Export Development Authority, there is huge potential for food processing industry in the NER.[82] The table below highlights the food processing potential for major crops in north east. Considering the availability of crops produced in Tripura as highlighted in Table 9, pineapple, jackfruit, orange, banana are among the top 5 crops produced. Further based on discussion with TIDC and horticulture departments it was highlighted that Tripura is famous for Pineapple and Jackfruit. These commodities are highly perishable and currently most of the consumption is happening in unprocessed state in regional markets only. Hence market surplus can be considered as output of these crops which can be processed for export markets. Further It should also be noted that Tripura will be able to process crops which are being produced in neighboring states. Pineapple is one of the top 5 crops produced in Manipur in 2014-15. Hence food processing units in Tripura could consider processing of pineapple which produced in neighboring states like Manipur and Assam. Mizoram too is a viable source of raw materials as it focuses on the production of commercial fruit crops like mandarin orange, banana, mango, pineapple, and the recently introduced dragon fruit.

Table 10: Marketable surplus in some of the key crops grown in NER

Product Name	Production in NER (MT)	Consumption in NER (MT)	Market Surplus (MT)	Market Surplus as % of production
Ginger	355454	49241	306213	86.1
Lemon	215287	38605	176682	82.1
Orange	589736	86606	503130	85.3
Pineapple	777144	38891	738253	95
Jackfruit	492898	82295	410603	83.3
Rice	6754700	6387320	367380	5.4
Maize	350000	10246	339754	97.1

[82] Comprehensive Master Plan for Tapping The Export Potential of North Eastern States, Agricultural and Processed Food Products Export Development Authority (https://drive.google.com/file/d/1UghLOHot6zDnXNESf7M_Kdsu-GN6vU73/view).

Product Name	Production in NER (MT)	Consumption in NER (MT)	Market Surplus (MT)	Market Surplus as % of production
Banana	1208197	243846	964351	79.8
Chili	122444	89760	32684	26.7
Litchi	78847	3666	75181	95.4
Papaya	216462	80259	136203	62.9
Grapes	23980	4054	19926	83.1

Source: Agricultural and Processed Food Products Export Development Authority

Considering the region's food processing potential and the availability of produced fruit in the region, this report envisages food processing as one of Tripura's priority sectors.

Currently, Tripura has competitive advantage in the production of pineapple, jackfruit, rice, food grains, etc. Upon further analysis it is found that rice and food grains produced in the region are locally consumed with a surplus of less than ~10-20%, but in the case of fruits like pineapple, jackfruit, and orange the market surplus after consumption can be as high as ~85-90%. This indicates a huge potential for setting up of fruit processing industries. Further, organic farming is gaining a lot of prominence and the state government has certified 2,000 hectares of land for organic farming. This will further boost the growth of organic farming and organic food processing.

3.3. Demand based priority sectors

In this subsection, products whose current demand is being met through imports, but which can be manufactured competitively in Tripura, owing to locational advantages like the abundant availability of raw materials, have been identified. This is a strategy focusing on promoting domestic production to foster industrialisation. Its aim is to achieve self-sufficiency by protecting and incubating local industries so that the goods produced by them can compete with similar products that are currently being imported.

From within from the commodities imported by India, those that can be viably manufactured in Tripura have been shortlisted based on the state's locational advantages and natural capital base. The table below shows some goods that can be domestically produced in the state.

Table 11: Marketable surplus in some of the key crops grown in NER

S. No.	Products Imported in 2021	Value of Imports (thousand USD)
1	Edible fruit and nuts; peel of citrus fruit or melons	36,57,870
2	Paper and paperboard; articles of paper pulp, of paper or of paperboard	35,85,509
3	Edible vegetables and certain roots and tubers	32,97,325
4	Wood and articles of wood; wood charcoal	21,50,984
5	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	12,73,205
6	Coffee, tea, mate, and spices	12,39,422
7	Beverages, spirits, and vinegar	9,00,606

8	Rubber and rubber-based articles	2,152,581.67

Source: DGCIS, AIS

Considering the availability of natural resources and the logistical challenges of procuring additives and other components, it has been found that it is viable for the state to focus on products which have high levels of natural rubber content. In order to shortlist the products that can be competitively manufactured in the state, imported products using rubber as a primary raw material have been identified and listed in the table below.

Table 12: Imports: Rubber Products

HS Code	Commodity	2020-21 Value of Imports (Lakh/INR)	2021-22 Value of Imports (Lakh/INR)
40	Rubber and Articles Thereof	2,152,582	3,082,130
4014	Hygienic or Pharmaceutical Articles (Including Teats), Of Vulcanized Rubber Other Than Hard Rubber, With or Without Fittings of Hard Rubber	14,428	14,277
40151100	Surgical Gloves, Mittens and Mitts	27,466	34,045
40141020	Rubber Contraceptives, Female (Diaphragms; Cervical Caps)	9	4
40149030	Feeding Bottle Nipple	522	492
40141010	Rubber Contraceptives Male (Condoms)	554	781
4009	Tubes, Pipes and Hoses, Of Vulcanized Rubber Other Than Hard Rubber, With or Without Their Fittings	101,601	109,504
4013	Inner Tubes, Of Rubber	1,355	3,581
40129010	Solid Rubber Tyres for Motor Vehicles	68	6
4012	Retreaded or Used Pneumatic Tyres of Rubber, Solid or Cushion	6,174	9,114

	Tyres, Tyre Treads and Tyre Flaps, Of Rubber		
4010	Conveyor or Transmission Belts or Belting, Of Vulcanized Rubber	61,930	78,732
40082930	Latex Foam Sponge of Other Non-Cellular Rubber	645	1,256
4016	Other Articles of Vulcanized Rubber Other Than Hard Rubber	405,271	495,354
Source: Export Import Data Bank, **Department of Commerce, GoI (July 2022)**			

In 2021, rubber and rubber-based artefacts worth USD 41,00,755 were imported by India. The current gap between domestic demand and supply creates a unique opportunity for Tripura as its natural resource base makes it well-positioned to fill this gap.

The state is the second largest producer of rubber in the country, after Kerala. Annually, its total rubber production is ~83,000 MT, with a yield of 1350 kg/hectare/year[83], slightly lower than the national average. The total area under rubber plantations in the state is ~85453.63 hectares[84]. It contributes ~9% to India's total production.

While the products listed in Figure 8 are all rubber-based manufactures, considering the current industrial ecosystem and the lack of downstream and ancillary industries in Tripura, the manufacture of **rubber contraceptives, surgical gloves,** and **feeding bottle nipples** may be most viable for the state. Such products are relatively simpler to manufacture, requiring minimal technological and infrastructural intervention, enabling them to fully capitalize on the benefit of raw material availability. This strategy will also allow the state to catalyze overall industrial growth as the domestic demand for these products makes them a viable choice. Further, MSMEs involved in such import substitution efforts will find support through various governmental schemes, for instance the central government's Atmanirbhar Bharat scheme.

Once the industrial ecosystem in the state improves, more complex and capital-intensive rubber-based manufactures such as vehicle tyres and vulcanized conveyor or transmission belts can be undertaken. This will be enabled also by the fact that the existing rubber sector ecosystem will attract bigger investors and businesses, such as large tyre manufacturers.

Products
1. Tyres
2. Tubes
3. Flaps
4. Contraceptives
5. Other Hygienic & Pharmaceutical Products

[83] https://tidc.tripura.gov.in/rubber/
[84] https://tidc.tripura.gov.in/rubber/

6. Conveyor Belting
7. Latex Foam Sponge
8. Other Rubber Articles

A detailed value chain analysis on the above products in the next section will help in shortlisting products which can be manufactured in Tripura.

Based on the assessment of above criteria and considering all the stakeholder's consultation during site visits resulted in identifying the following priority sectors:

The shortlisted priority sectors are:

1. Food processing
2. Rubber
3. Bamboo

Food processing has the potential for exports specifically in pineapple and jackfruit segment. While considering the import of fish in the state, processing of fish could be considered as one of the priority segments. Rubber and bamboo industry has huge availability of raw material in the region further supported by domestic and regional demand.

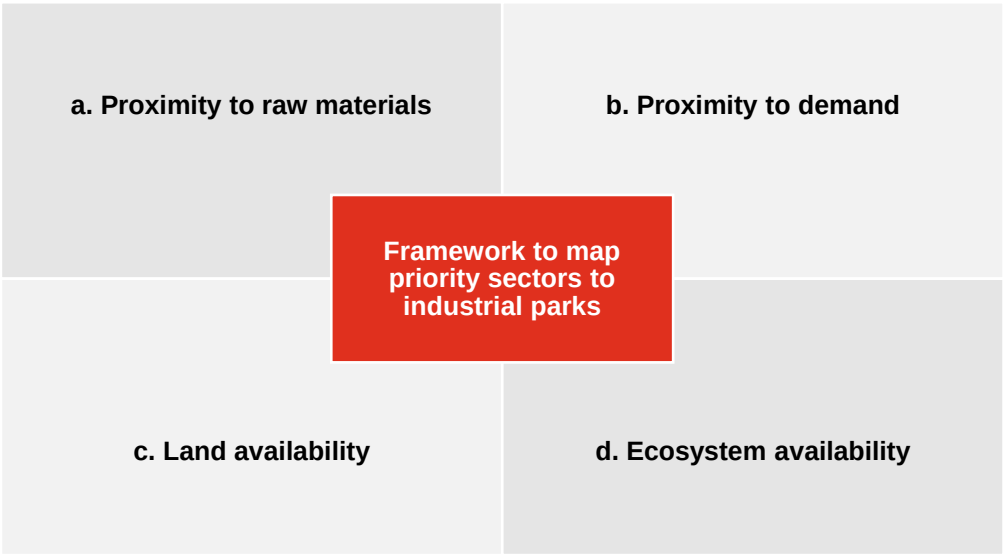
The next section will examine the suitability of each industrial estate for the three priority sectors identified in the discussion above. The mapping of the priority sectors to individual parks will be done based on infrastructure availability and an assessment of potential locational advantages.

4. Land Suitability for Priority Sectors

4. Land Suitability for Priority Sectors

4.1. Approach

Based on the priority sectors identified in the previous section, the industrial infrastructure of the state may be mapped to the sectors. The mapping will ensure the availability of sector specific infrastructure in each industrial park making them competitive and attractive to investors. To map the priority sectors to each individual park, the following framework has been used.



4.2. Profile of industrial land in Tripura

Tripura is in its budding stage of industrial development. Tripura Industrial Development Corporation is the nodal agency for development of industrial parks in the region. It aims to act as a catalyst in the process of promotion and development of industries and create industrial infrastructure to support economic development of the state. Currently there are 17 Industrial Parks in Tripura of which 6 are present in West Tripura, 5 are present in South Tripura, 2 each are present in North Tripura and Unakoti and 1 each are present in Gomati and Dhalai

Of the total 580 acres of vacant land majority (~82.9%) of the land is available in 7 industrial parks namely Bijoypur (~90 acres), Bodhjungnagar (~74 acres), R.K.Nagar (~77 acres), Kathalia (40.3) Dewanpasa (~34 acres), Sonamukhi (~130 acres) and Jalefa (~39 acres).

Figure 7: Land Availability in industrial parks of various districts

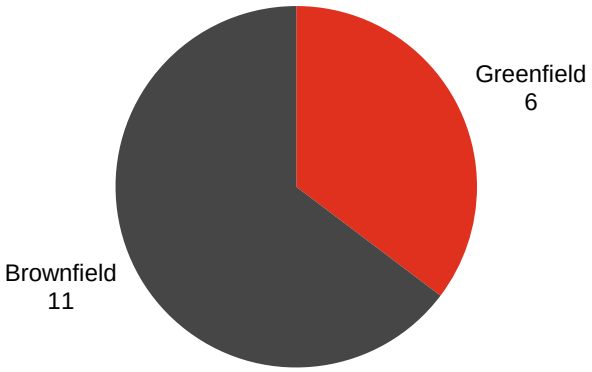
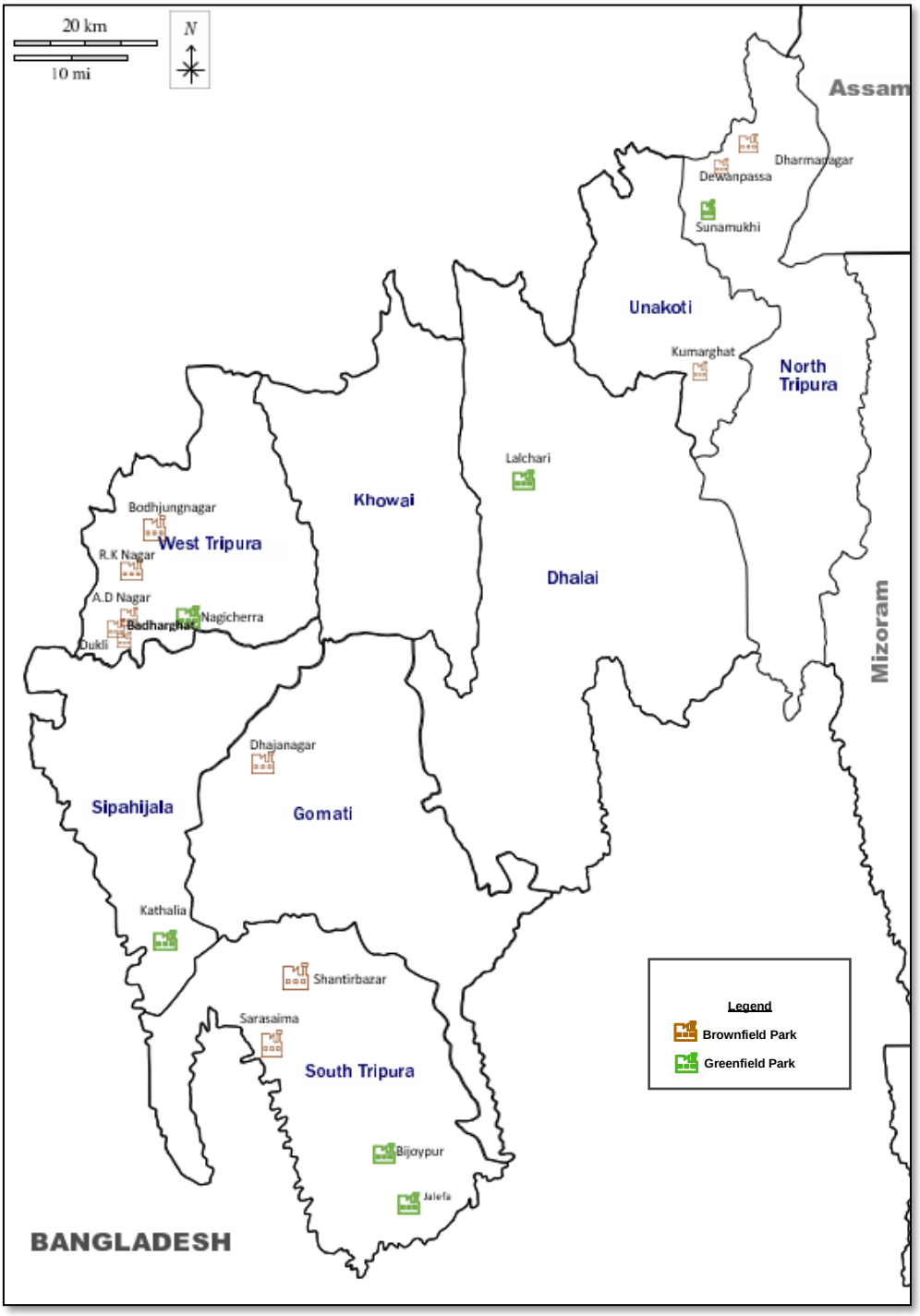


Figure 8: Location of Industrial Parks (Indicative)

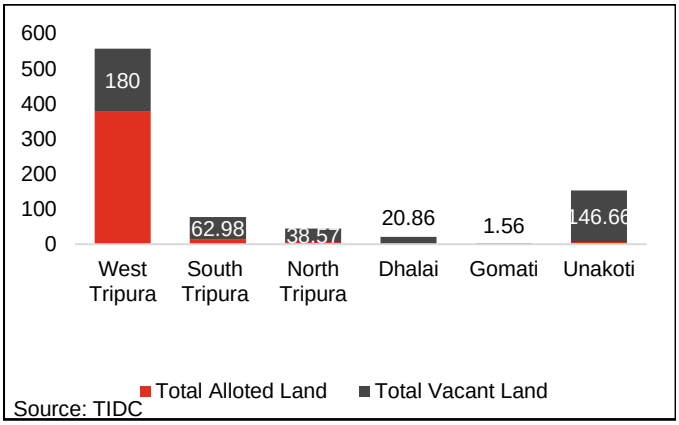


Source: d-maps.com, Study Team

The land for industries is allotted by TIDC on lease basis. The lease period is around 30 years.

The North East Economic Corridor study by ADB has highlighted that the development of a **Multi-Modal Logistics Park** in Sabroom will improve competitiveness and reduce cost of logistics in the NER region as a whole. Hence in addition to these industrial parks a logistic park is envisioned at Sabroom. The logistic parks will support the priority industries to ship their goods to various demand centres through the Chattogram Port.

Figure 9: Industrial Land Profile



Source: TIDC

Districts in North Tripura are targeting sectors based on natural resource availability and sectors that cater to regional markets.

Out of the 17 industrial parks listed above, four (4) are located in North Tripura. These are Kumarghat, Dharmanagar (Mission Tilla), Dewanpasa Lalchari, Ambassa, and Sonamukhi. Considering the access to raw material, demand centres and existing ecosystem, Kumarghat and Dharmanagar parks could focus on prioritizing bamboo-based industries. Dharmanagar's borders with Bangladesh and Assam will prove to be an advantage as the neighboring regions will serve as local markets for the park's bamboo products. Kumarghat already has a round bamboo stick unit at, equipped with 50 round stick making machines that has a monthly production capacity of 60 MT, and Dharmanagar has an incense production cluster. Both regions also have furniture/handicraft clusters that use bamboo as a raw material. These indicate the existence of the required ecosystem for bamboo processing which may be further strengthened through targeted investments towards sector development.

On the other hand, Kumarghat, Dewanpasa, Lalchari Ambassa, and Sonamukhi parks could prioritize the food production sector due to access raw materials like jackfruit. Kumarghat is in the Unakoti district, making it a potential hub for citrus fruit processing. Similarly, since Lalchari is in the Dhalai district, it has the advantage of sourcing agricultural produce easily – the district produces 1,01,632 MT of vegetables and 1,82,953 MT of fruits, of which there is ample surplus. The Dewanpasa, Dharmanagar, and Sonamukhi industrial estates are also suited for citrus-based food processing industries, especially as the Tripura government is currently making efforts to revive citrus cultivation in the Jampui Hills, which was traditionally a major citrus growing pocket.

Apart from jackfruit, orange, pineapple, banana, lemon, Areca-nut, and mango are also grown in the region which the parks can source for processing. Moreover, the district is home to a wide variety of wild edible fruits[85] that present an interesting opportunity for the food processing sector. The abundance of bael, for instance, is an advantage as it is used to make a summer beverage. Also, a particular variety of wild mango, the Mangifera sylvatica Roxb., can be found easily through the summer months in North Tripura. It is highly valued by local people and can be used to produce jams and preserves.

Districts in West Tripura are targeting sectors catering to the rest of India and regional markets.

West Tripura is the most industrialized region in Tripura. A few of the industrial parks in the region are the Bodhjungnagar, RK Nagar, and Nagicherra parks. Considering the access to rest of India and existing ecosystem the rubber sector is the most promising for this region.

One of the key reasons for this is that Tripura's rubber park is situated in the Bodhjungnagar Industrial Area where infrastructure and facilities, including a common effluent treatment plant, access to a warehouse, a laboratory, stable water supply, and sewerage facilities, are being provided. Besides this, the park's closeness to Agartala, the state capital, means that it has easy access to markets across the country as well as to

[85] http://nopr.niscair.res.in/bitstream/123456789/7967/1/NPR%205%284%29%20302-305.pdf

Bangladesh's latex market. The RK Nagar park will also be able to exploit this locational advantage. All three parks will benefit from the presence of the Regional Rubber Training Centre located in Agartala.

Another advantage is easy access to raw materials— in terms of area under natural rubber cultivation in the state, West Tripura accounts for 40%. The parks, therefore, enjoy proximity to raw materials as well. Nagicherra houses a Tripura Forest Development and Plantation Corporation-owned rubber wood processing centre. Promotion of the rubber sector here will allow for forward integration where aged rubber trees that cannot be tapped can be processed to make furniture. The presence of a Horticultural Research Centre in Nagicherra further makes the site viable for rubber production as it will be able to benefit from the centre's expertise with plantation crops.

Apart from rubber, the park at RK Nagar will also benefit from prioritizing its bamboo sector. It houses the Tripura Bamboo Park, located around 20 km west of Agartala city. The park is already attracting investors interested in setting up units in the park. In this regard, the presence of bamboo plantation clusters at Hezamara, Mohanpur, Belbari, and Mandwi are also a boon for the RK Nagar park's bamboo processing sector.

Dukli industrial park, spread over 45.77 acres shall prioritize food processing due to its ability to access jackfruit and pineapple which are grown extensively across the district. Dukli town is connected to the rest of Tripura through rail and road networks ensuring transportation of raw materials and processed food products to potential markets easy. The park can find R&D support from the Horticultural Research Complex and the Horticultural Society of Tripura. Processed food products from the park also have access to the Central Warehousing Corporation's 19,250 MT warehouse located in Agartala. West Tripura is also home to various edible wild plants. The Borassus flabellifer, used for jaggery production, elephant apple, which has medicinal value, and tamarind, used as a condiment, are found exclusively in this region of the state. Access to these throws up new opportunities for the food processing sector in the district, especially for small-scale enterprises.

Districts in South Tripura have the advantage of access to a port and hence export oriented sectors shall be targeted.

South Tripura district's industrial areas at Sarasima, Sabroom and Santirbazar. Priority sectors mapped to these parks are rubber processing and food processing.

Being in South Tripura, they have easy access to Bangladesh where they will find a market for various rubber products including latex. Within India, the two towns are linked to Agartala by NH 8 and rail, giving them access to domestic markets as well. There are currently three MSMEs already based out of the district, indicating the existence of rubber processing capacity in the region. There is also a Latex Centrifuging Factory and a natural rubber processing plant in the district's Takmacharra area. Additionally, the Sarasima and Santirbazar also enjoy proximity to raw materials as the second largest district in terms of area under rubber plantations is South Tripura.

Paddy, pineapple, jackfruit, banana, nuts, and mango are widely cultivated in the district, enabling unhindered access to the raw materials necessary for food processing. As the economy of South Tripura is mainly primary sector based, there is already extensive primary processing capacity in the region. Further, there are 23 registered food processing-based industrial units located there, making sourcing of skilled labour easier.

The biggest industrial park in South Tripura is the Sabroom Special Economic Zone, a multi-sector SEZ at Jalefa. It would be beneficial for the SEZ to focus on food processing as the sector is an export-oriented one. The SEZ's location, in Sabroom, will give it access to the Chattogram port in Bangladesh via the Maitri Setu not only to markets in Bangladesh but in the larger South Asian region as well. South Tripura too has some edible wild plants whose growth is largely restricted to this region, namely passionfruit, which is used to make squash and preserves, and the Harabari plant whose fruit is used in pickles. Access to these fruits too may be beneficial to the expansion of food processing at the SEZ.

The table below maps the priority sectors to each industrial park based on the framework mentioned above.

Table 13: Mapping of Industrial parks to priority sectors

Priority sectors	Bamboo	Rubber	Food processing
Kumarghat	✓	-	✓
Dharmanagar (Mission Tilla)	✓	-	-
Dewanpasa	-	-	✓
Lalchari, Ambassa	-	-	✓
Sonamukhi	-	-	✓
Bodhjungnagar	-	✓	✓
RK Nagar	✓	✓	-
AD Nagar	-	-	-
Dukli	-	-	-
Badharghat	-	-	-
Nagicherra	-	✓	-
Dhajanagar (Udaipur)	-	-	-
Sarasima	-	✓	-
Jalefa, Sabroom	-	-	✓
Santirbazar	-	✓	-
Kathalia Industrial Area	✓	-	-
Bijoypur Industrial Area	-	-	✓

In the next sections of the report detailed assessment of infrastructure requirements for priority sectors followed by a detailed infrastructure Assessment will be carried out for each of the individual industrial parks.

5. Infrastructure requirements of the priority sectors

5. Infrastructure requirements of the priority sectors

To identify the sector specific infrastructure needs which will help attract investments into the region, a benchmarking analysis has been done. This analysis has focused on identifying the common infrastructure provided to investors as part of the park. The following framework was used to identify the benchmarks:

1. Type of investors the parks attracted
2. Location of industrial parks
3. Similarity in terrain
4. Access to raw materials and markets

Based on the above framework, the following benchmarks have been chosen for the identified priority sectors

1. Food processing - North East Mega Food Park situated in Assam – This mega food park is one of the successful food parks in India. Further this park is in similar terrain and region like Tripura. Also, the manufacturers in this park are focused on raw materials available in the state.
2. Rubber - Rubber Park situated in Ernakulum – Since Kerala is the largest natural rubber producing state, the identified benchmark has been successful in attracting major investments by rubber manufacturers.
3. Bamboo - Bamboo Technology Park in Assam – Although the park is only five years old, considering the similarity in terrain of Assam and Tripura, location, and access to raw material from the state, this park has been chosen for benchmarking for the purpose of identifying the key infrastructural needs of the bamboo sector.

Food Processing

The North East Mega Food Park is situated in Assam. The food park can support 30 -35 large food processing units and has a cumulative investment of ~250 crores. It is expected to generate an annual turnover of INR 400-500 crore and employment for ~30000 people (including direct and indirect jobs).

A brief of the project details is shown in table below.

Name of the Project	**Mega Food Park, Nathkuchi MOFPI Scheme**[86] Under Ministry of Food Processing Industry
District	Nalbari
Accessibility	**Air:** 100.3 km Lokpriya Gopinath Bordoloi International Airport **Rail:** Tihu Railway Station, Tihu Main Road, Tihu, **Road:** 90 KM from Guwahati. Excellent road link with entire North Eastern states and rest of the country.
Total Project Cost	INR 7598.00 Lakh
Total Allocable Area	27 acres (Approx)
Infrastructure Facilities available/to be available	Internal Road with Drainage, Water Supply, fire security system, Internal Electrical Distribution Network with 33/11 KV Sub-station, Common Facilities building, warehouse, Standard Design

[86] The scheme has been started in 2012

	factory (SDF), Cold storage, Food Testing Laboratory etc.

Source: https://aidcltd.assam.gov.in/portlet-sub-innerpage/mega-food-park

The park was designed with separate Central Processing Unit and individual networks of primary processing units and collection centres.

The Central Processing Unit is in a well-connected region which offers the following advantages-

a. Well connected to all the primary processing and collection centres
b. Proximity to Guwahati for ease of distribution
c. Proximity to urban centre for skill procurement and labour
d. Ease of availability of water, power, and other facilities

The current process of procurement is described below

Figure 10: Procurement process in CPUs in Northeast Mega Food park

With this framework in place, the Assam Food processing park provides related infrastructure to support the industrial units. Given below is a description of infrastructure assets provided by Assam Mega Food Park in the common processing unit –

Table 14: Infrastructural needs of food processing sector

Infrastructure	Description
Warehousing	• The food processing industry depends on seasonality and timing of harvest and cannot rely on just in time approach for its manufacturing. Hence it heavily depends on the warehousing facilities within the park for both raw materials and finished goods. As part of this facility a 10,000 MT of dry storage has been built.
Cold Chains	• An efficient cold chain is required which provides end to end solutions such as pre- cooling, Reefer vans etc. precooling centres can be set up major districts and production centre to protect the food from degradation. As part of the facility 3,000 MT of cold storage has been built.
Quality and FPO Labs	• Quality labs help in standardization of food making process by standardizing raw materials, finished goods etc. The FPO labs would aid in getting food certifications providing a one stop solution for all testing compliances
Truck Terminals	• Truck terminal needs to be constructed based on the expected capacity of the food park to allow for proper unloading and loading of vehicles
Gender Inclusive Food Processing Training Centre	• Having a gender inclusive food processing training centre within the park helps to find relevant work force in a more efficient manner. It would also provide hand

Infrastructure	Description
	on experience and skilling on post-harvest handling, preservation, and processing activities
Common Facility Buildings	• Common facilities required for business facilitation include canteen, meeting hall, business centre, first-aid facilities, bank/bank extension counter, couriers, freight forwarders, packing material supplier
Water Supply System	• A capacity of 2 lakh litres ensures smooth operation of food processing units. The water supply must include provision of potable and treated water.
Power Substation	• A power substation of 5MVA is installed in the vicinity of the Food Park
Other Infrastructure	• Waste disposal (water and solid), fire-fighting systems, road, drainage, power, and telecommunication systems are some of the other infrastructures which are among the basic critical infrastructure present in every industrial park.

Currently in Tripura, the industrial parks are focused on providing basic infrastructure such as power, water, internal roads etc. However, considering the need to attract investments in food processing industry further strengthening of infrastructure like value added services could be considered in line with the North East Mega Food processing park in Assam. The food processing parks in the state, may consider investing in cold chains for end-to-end solutions such as pre- cooling. This will help increase the shelf life of food products. Further, truck terminals could also be built to cater to the transportation needs of the units in the park. To ensure availability of skilled labour, the establishment of a dedicated and gender inclusive food processing training centre may be considered.

Expanding the existing common facilities provided to business units at the park to include canteens, meeting halls, business centres, first-aid facilities, bank/bank extension counters, couriers, freight forwarders, and packing material suppliers will help business facilitation at the Tripura park while also attracting investments.

Based on the infrastructure facilities provided in the North East Mega Food park, the following benchmarks could be considered for development in Tripura

Infrastructure	Description
Warehousing	• Considering a facility of 10,000 MT of dry storage has been built for an industrial park with 28 acres allottable land, a benchmark of 400 MT per acre could be considered for development in Tripura.
Cold Chains	• Considering a facility of 3,000 MT of cold storage has been built for an industrial park with 28 acres allottable land, a benchmark of 110 MT per acre of cold storage could be considered for development in Tripura
Truck Terminals	• A truck terminal in an area of 1.69 acres could be considered for development which will have capacity to cater to approximately 67 trucks at a time.
Common Facility Buildings	• A common facility building of about 4200 sq. metres. The CFB will house common business facilities which act as enablers for the Processing Units in the park viz, food products order (fpo) cum quality control laboratory, a gender inclusive food processing training centre, canteen, meeting hall, business centre, first-aid facilities, bank/bank extension counter, couriers, freight forwarders, packing material supplier etc.
Water Supply System	• Considering a capacity of 2 lakh litres for 28 acres of allottable area, 7kld of water supply could be considered for each industrial unit in Tripura.

Infrastructure	Description
Power Substation	• A power substation of 5MVA and 33/11 KV electric substation could be considered for development in a mega food park in Tripura.

Rubber Sector

The Rubber Park situated in Ernakulam is one of the most successful rubber parks in India. It is a joint venture by KINFRA (Govt of Kerala) and Rubber Board (Govt of India). The park is the first of its kind and is spread across 110 acres. There are a total of 55 units within the park.

The park has some major advantages due to which it has been operating successfully, which are –

a. Availability of rubber testing and certification centre within the premise
b. Abundance of raw materials
c. Distance to sea and air terminals (<30km)
d. Adequate infrastructure.
e. Robust single window clearance

The Rubber Park ensures the provision of the required infrastructure as mentioned below to support the functional units within the park –

Table 15: Infrastructural needs of rubber sector

Infrastructure	Description
Power	• 110/11kV Substation at the Park has a capacity of 25 MVA. This is connected to an ultra-modern distribution network using 11kV underground cables.
Water	• An artificially constructed pond inside the Park has a capacity of 25 million litres. Storm water of 65 acres of the Park's land is collected here. There is 1.5 MLD water supply system with 0.45 MLD overhead storage. Augmentation of the capacity by another 1.5 MLD is about to be completed.
Waste Management System	• The capacity of the present plant is 250 Cu. M. Augmentation of the treatment capacity to 500 Cu. M by adding another unit of 250 Cu. M is about to be completed.
Testing Facilities	• Testing of all Rubber /Polymer products and their certification to any international standards can be done at the NABL accredited J J Murphy Research Centre in the Park.

Currently, Tripura has successfully provided the basic infrastructure support needed by the rubber sector. However, additional focus is required to attract sector specific investments into the region. To help the growth of the sector, the state government can work to enhance its existent skilling and up-skilling in harvesting, processing, estate management, marketing, and value addition. Making value added products more competitive may also have positive outcomes for the sector while also helping attract investors. Setting up of testing facilities individually for each investor is very expensive. Hence, setting up of testing facilities will help in attracting investors as it will reduce the overall investment requirement for the investor.

Based on the infrastructure facilities provided in the Rubber park, the following benchmarks could be considered for development in Tripura –

Infrastructure	Description
Water Supply System	• Considering a capacity of 3 MLD for 66 acres of allottable area, 5 KLD of water supply could be considered for each industrial unit in Tripura.
Power Substation	• A power substation of 33/11 KV electric substation could be considered for development in Tripura. Underground cabling could help in developing an ultra-modern distribution system.
Testing facilities	• Development of testing centre which is NABL accredited.
Waste management system	• Development of Effluent Treatment Plant with a treatment capacity of 4.5 Cu. M per acre

Bamboo Sector

The concept of Bamboo Park is in its nascent stage. One of the successful bamboo parks established in India is Bamboo Technology Park in Assam. It is located in Chaygaon Growth Centre, Kamrup. The bamboo technology park was established with collaboration with private players. The park has been established in a total area of 20 acres and ~6.61 acres (allottable land) focussing on value-add bamboo products. The park is located at 39 km from the airport and 5km form Chaygaon and has excellent connectivity to NH 37(3 km away). The park provides excellent infrastructure facilities like those mentioned below –

Table 16: Infrastructural needs of bamboo sector

Infrastructure	Description
Common Infrastructure	• Bamboo stick-making facility, Bamboo Plastic Composite (BPC) facility, Strand woven bamboo block unit, Vacuum pressure treatment plant, Resin/Glue Plant, Bamboo charcoal plant
Value added Facilities	• Administrative and marketing centre, product design centre
Trunk Infrastructure	• Internal Roads and drainage, Overhead tank with water supply network, Street lighting system,

The Assam Bamboo Technology Park provides to investors a holistic range of infrastructure necessary for bamboo processing. Similarly, the bamboo parks in the State need to provide value-added facilities, such as an administrative and marketing centre, and a product design centre. It is imperative to develop drainage and water supply facilities as well.

Further, provision of bamboo plastic composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plants are the other sector-specific infrastructure whose provision will help attract investors.

Meanwhile, the Tripura Bamboo Mission is already creating enhanced bamboo processing facilities which will be run using the PPP model. The state government has also established bamboo depots at the Kumarghat Industrial Estate and Chakmaghat to ensure hassle free raw material availability.

Based on the assessment above, the infrastructure requirements of the three sectors have been summarised by categorising them into “Critical infrastructure” and “good to have infrastructure”.

Critical infrastructure refers to the most basic facilities which are essential for the operation of industries within the park. These facilities include roads, and water and power supply. Good to have infrastructure, on the other hand, are the facilities that help reduce costs, improve convenience, and provide support for sector growth. This refers to infrastructure such as testing labs and gender inclusive training centres.

Critical Infrastructure Needs – Infrastructure such as roads, water connection and land development etc. which need to be finished on priority to attract industrial players to set up units within the industrial region.

Table 17: Summary of immediate logistic and infrastructural needs of priority sectors

Priority Sector	Road	Railways	Ports	Effluent Treatment	Water	Power	Urban Connectivity
Rubber	✓	✓	✓	✓		✓	✓
Bamboo	✓					✓	✓
Food processing	✓		✓	✓	✓	✓	✓

Based on the benchmarking exercise, it can be observed that all industrial parks provide access to critical infrastructure to ensure attractiveness from investors. The table below summarises the infrastructure and capacity of the critical infrastructure which needs to be built.

Infrastructure	Description
Water Supply System	• A 5 KLD of water supply for each industrial unit in Tripura focusing on rubber and bamboo sector while a 7 KLD water supply for each industrial unit focusing on food processing.
Power Substation	• A dedicated power substation of 33/11 KV electric substation for each industrial park. Underground cabling for high end parks could help in developing an ultra-modern distribution system.
Road network	• Internal roads to be built to ensure ease of moment of goods
Waste management system	• Development of Effluent Treatment Plant with a treatment capacity of 4.5 Cu. M per acre
Connectivity to gateways	• External roads to be built to ensure connectivity to gateways and urban centres.

Good to have Industrial Infrastructure- This includes infrastructure which is not essential for industrial processes but adds value to the ecosystem such as display centres, and gender inclusive skill development and industrial training centres. Apart from the critical infrastructure provided, as mentioned above, each sector has certain other infrastructure requirements. Such facilities will help in enhancing the value proposition of the sites from the perspective of an industrial investor. Further, other facilities including testing and certification labs help in providing a conducive environment for development of the targeted sectors.

For the bamboo sector, it is important to have large dry warehousing facilities as unprocessed bamboo is space consuming. Further, in order to manufacture bamboo-based products, it is necessary to have facilities such as bamboo stick-making facilities and Bamboo Plastic Composite. This will ensure less capital investment requirement from investors making the park more attractive for investments compared to other industrial parks.

The food processing sector requires specialised cold storage and warehousing facilities. Large volumes of raw material collected from PPCs need to be stored carefully in order to increase their shelf life. After processing, products need to be stored in carefully monitored conditions. Thus, warehousing, and cold storage are the backbones of food processing industrial units. Apart from these, such parks also require Quality and FPO Labs to ensure manufacturing of standardized high-quality food products and beverages. Lastly Food Processing Training Centres help in ensuring availability of the skilled labour necessary for processing activities. However, it should be ensured that such centres are equally accessible to both men and women by taking steps towards

creating gender inclusive spaces. Hence food processing sector investors look for availability of such infrastructure while making investment decisions.

Among the various infrastructure needed by rubber-based industries, an important requirement is testing centres which have the facilities for both chemical and physical tests. Further, it is important to provide facilities for certification of products.

Thus, in order to support thrust sectors, it is necessary to undertake various good to have infrastructure development projects. The table below provides a summary of sector-specific infrastructure requirements.

Table 18: Summary of good to have infrastructural needs of priority sectors

Priority Sector	Sector Specific Infrastructure required
Bamboo	• Bamboo stick-making facility, Bamboo Plastic Composite (BPC) facility, Strand woven bamboo block unit, Vacuum pressure treatment plant, Resin/Glue Plant, Bamboo charcoal plant
Food processing	• Warehousing, cold storage, Quality and FPO Labs and Food Processing Training Centre
Rubber	• NABL accredited testing centre for Rubber/Polymer products

The above infrastructure can be developed either by the government directly or can be considered for development by private player. Since other industrial parks in India have been successful in attracting private sector participation in warehousing, cold storage, testing centres and gender inclusive skill development centres, these sector specific infrastructure for food processing and rubber can be considered for development by private sector. However, to ensure successful development of projects by private sector there is a need to ensure financial feasibility of the project. Since the feasibility of such developments is not financially feasible till the parks are fully developed and have attracted investments, development of above projects under public private partnership could be explored. As part of such development model, government may provide land for development of such infrastructure while private sector could focus on modular development of such facilities.

Based on the benchmarking exercise, it can be observed that all industrial parks provide access to critical infrastructure to ensure attractiveness from investors. The table below summarises the infrastructure and capacity of the good to have infrastructure which needs to be built.

Infrastructure	Description
Bamboo stick-making facility, Bamboo Plastic Composite (BPC) facility, Strand woven bamboo block unit, Vacuum pressure treatment plant, Resin/Glue Plant, Bamboo charcoal plant	• Based on the type of products being manufactured using bamboo in the region, specific infrastructure such as stick making facility for agarbattis, BPC facility for increasing the shelf life of bamboo etc could be planned for development
Warehousing	• 400 MT per acre of cold storage per acre of allottable industrial land
Cold storage	• 110 MT per acre of cold storage per acre of allottable industrial land
Testing centres	• Testing centre will help in ensuring ease of exports and hence such facilities shall play a key role in attracting investments in rubber and food processing sectors

6. Infrastructure Gap Assessment

6. Infrastructure Gap Assessment

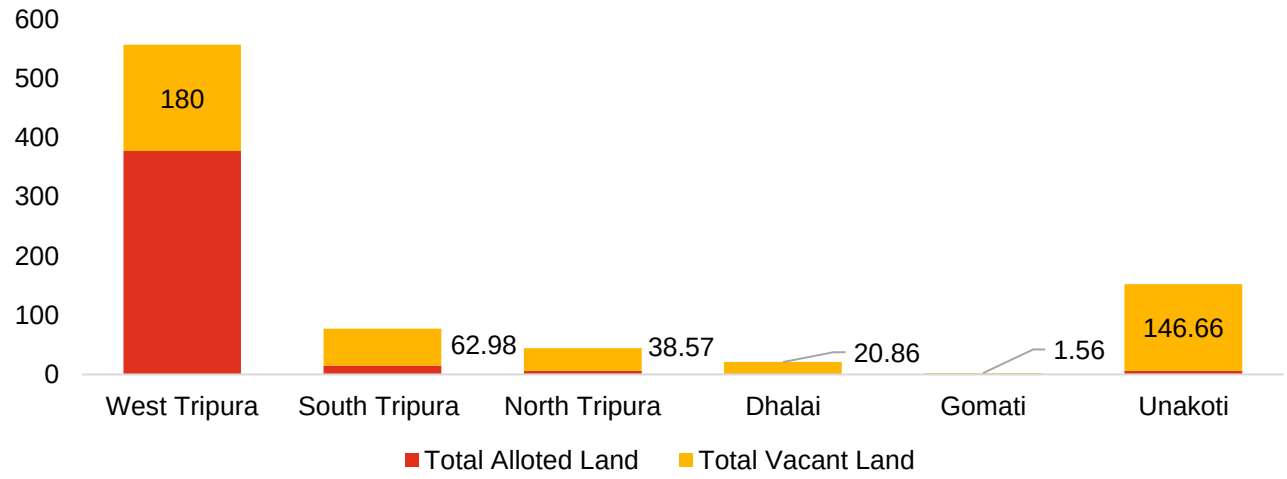
To address the infrastructure challenges in the NER, the NEEC report adopted an economic corridor approach. Through this approach, The NEEC study provided an array of investment measures in the NER across transport, urban, and trade infrastructure, and in agriculture and other focus industries, that will help revive the region economically. The report recommended investments in transportation infrastructure across all the states while recommending sector specific initiatives based on priority sectors for each state. As part of the study, investments in Tripura have been identified in roads (core and branch), waterways, food processing, bamboo, rubber, water supply, urban roads, sewage treatment, power, and trade facilitation.

Taking forward the findings presented in the NEEC report, further assessments of individual industrial park-level data has been carried out to identify the infrastructural gaps in Tripura specifically. In this section we evaluate the existing infrastructure present in the state's industrial parks and evaluate the infrastructural gaps and approximate cost for their development based on the given benchmarks.

Tripura Industrial Development Corporation is the nodal agency for development of industrial parks in the region. Currently there are 17 Industrial Parks in Tripura of which 6 are present in West Tripura, 5 are present in South Tripura, 2 each are present in North Tripura and Unakoti and 1 each are present in Gomati and Dhalai.

Of the total 580 acres of vacant land, a majority (~82.9%) of the land is available in 7 industrial parks, namely Bijoypur (~90 acres), Bodhjungnagar (~74 acres), R.K.Nagar (~77 acres), Kathalia (40.3) Dewanpasa (~34 acres), Sonamukhi (~130 acres), and Jalefa (~39 acres)

Figure 11: Land Availability in industrial parks of various districts



Source: TIDC

The land for industries is allotted by TIDC on lease basis. The lease period is around 30 years. Out of the 17 industrial parks in Tripura, 11 are brownfield, namely the Bodhjungnagar Park, the RK Nagar Park, the Sarasima IIDC, the Dharmanagar IIDC, the AD Nagar Park, the Santirbazar IIDC, the Kumarghat Park, the Dewanpasa IIDC, the Dukli Park, and the Badharghat Park.

Brownfield industrial parks located in West Tripura are highly developed and have attracted majority of the investments in the state. There are five parks in West Tripura (the Bodhjungnagar, RK Nagar, AD Nagar, Dukli, and Badharghat parks), four in South Tripura (the Santirbazar and Sarasima IIDCs, and the Kumarghat and Dhajanagar parks) and two in North Tripura (the Dharmanagar and Dewanpasa IIDCs).

The total vacant allottable area across these parks is about 200 acres. Much of this available land, ~65%, is concentrated in West Tripura. Among the parks in the district, the Bodhjungnagar Park accounts for the largest share of 48%.

Infrastructure status

Nine out of these 11 brownfield parks provide basic infrastructural support to industrial units, though the Bodhjungnagar park is the only one that has an effluent treatment plant. The Santirbazar and Dewanpasa IIDCs are in very nascent stage of development where investments are needed to set up the basic infrastructure as depicted in pictures below.

Most of the parks are well connected to the rest of the state, especially the Bodhjungnagar, RK Nagar, AD Nagar parks. The closeness of these three parks to the state capital is advantageous for them. Five parks, however, including the Santirbazar, Sarasima, Dharmanagar, Dewanpasa, and Kumarghat IIDCs, are connected to Agartala by NH-8. The Dhajanagar park, which is 50 km away from the state capital, has poor external connectivity.

Each park is suited to support industrial activities across various sectors. Industrial parks in West Tripura have units focused on rubber and bamboo-based industries while industrial parks in South Tripura house sawmills and stone-crushing units. The Bodhjungnagar park has the highest number of functional units, at approximately 120, the Santirbazar IIDC has the lowest, at ~1-2.

Considering the need for development of various infrastructure projects across industrial parks, the table below highlights the costing benchmarks based on national benchmarking, primary consultations, and consultations with TIDC officials.

Table 19: Industrial infrastructure costing benchmarks

Infrastructure	Cost	Unit / Description
Boundary Wall construction	13,50,000	INR/km
Road Construction	1,75,00,000	INR/km
Drainage	16,00,000	INR/km
Water Supply Network OHR, IPR, etc.	1,00,00,000	INR
Water Pipeline	14,00,000	INR/km
Gas supply line	5,00,00,000	INR/km
Overhead water tank with a capacity of 1 Lakh litres	45,00,000	INR/unit
Underground water tank with a capacity of 1 Lakh litres	90,00,000	INR/unit
Effluent Treatment Plant (ETP)	1,00,000	INR/KLD
Sewage Treatment Plant (STP)	20,000	INR/KLD
Iron Removal Plant with 1000 LPH capacity	50,000	INR/unit[87]
Solar streetlights	18,000	INR/unit[88]

[87] Innovative Techniques and Technology Solutions to Water contamination in Odisha State, Odisha Health and Nutrition Support Project, Bhubaneswar (2013).

[88] https://4.imimg.com/data4/HM/XR/MY-148259/solar-street-light.pdf

Infrastructure	Cost	Unit / Description
Electric Substation for each unit	23,00,000	INR/ unit (for 11kV/0.433 distribution up to 500 kVA)
33 KV/ 11KV electric substation for industrial park	5,00,00,000	INR/substation
Electric Line	7,20,000	INR/km
CCTV	1,250	INR/unit
Fire safety system (including reserve tank, hydrants, and pumps)	50,000	INR/acre
Land Development and filling costs	40,00,000	INR/acre
Cold Storage	10,000	INR/MT
Warehousing	2,000	INR/MT
Construction of external 2 lane road with divider	4,00,00,000	INR/km
Weigh Bridge	18,933	INR/ton
Signage	500	INR/unit
Rubber testing facilities	60,00,000	INR
Bamboo common facilitation center	1,50,00,000	INR
Food processing training center	35,00,000	INR
Food testing labs	4,00,00,000	INR
Truck terminal	25,00,000	INR
ICT infrastructure	5,00,000	INR/Km
Climate resilient utility corridors	2,50,00,000	INR/Km
Common facilitation centre for smart industrial park	20,00,000	INR
Bus terminal for public transport	4,00,000	INR
SCADA system for smart industrial parks	10,00,00,000	INR

Sources and Assumptions

a. The cost of construction of boundary walls, road construction, water connection, electric connection, drainage, streetlights electric substation, STP, ETP, overhead and underground water tanks, and land development have been taken as average of costs based on consultation with TIDC officials and previous regional projects undertaken by experts and TIDC.

b. The cost of cold storage and weigh bridges have been taken from national benchmarks[89], while the cost for warehousing has been estimated based on discussions with TIDC officials.

c. Based on benchmarking exercise in Chapter 5, it has been estimated that in industrial parks where food processing has been identified as a priority sector, the daily demand for water is typically 7 KLD per acre. In other parks with different industries, water demand has been estimated to be 5 KLD per acre.

d. Based on benchmarking exercise in chapter 5, the effluent discharge has been estimated to be 4.5 KLD per acre.

e. Through stakeholder consultations, it was also understood that 25% of total daily water consumption is typically used to fulfill non-industrial uses, including industry workers' potable and non-potable needs and fire safety needs. The demand for water for industry workers' needs can be taken to be 4.5 liters per employee and the daily sewage discharge can be taken to be 80% of the daily total water consumption.

f. Based on consultations with the TIDC officials, it has been estimated that for every 1 km stretch, 33 streetlights are required.

g. The length of required feeder lines is estimated based on discussions with TIDC and the Tripura electricity department.

h. It has been assumed that for parks up to 50 acres, tanks with a capacity of 2.5 lakh will be needed, for parks between 50 and 100 acres tanks with a capacity of 4 lakh will be needed, and for parks larger than 100 acres tanks with a capacity of 5 lakh will be required.

i. Based on discussions with TIDC, the internal road width has been estimated to be intermediate carriage way of 5.5 meters. Further, the external road width is a dual carriage way estimated at 7.5-meter width.

j. The fire safety system uses the water line which is being built as part of the industrial infrastructure network. In this regard, stakeholder consultations have identified additional systems such as water pump to maintain pressure in the pipeline, a reserve tank which is exclusive for fire disaster, and water hydrants, the cost of developing such facilities has been estimated to be INR 50,000 per acre.

k. Based on discussions with stakeholders, the number of signages required in an industrial park can be estimated at 1 sign per acre.

l. Cost estimation for sector-specific infrastructure was done based on the following assumptions:

   i. Testing Facilities for Rubber Products: In Kerala rubber park, the testing center consists of facilities for physical and chemical testing. As part of this center, the infrastructure components developed are rubber process analyser, rubber universal tensile testing machine, BIN aberration testers, Visco meter, Chemical apparatus, flex tester, melting point apparatus, PH meter and Soxhlet extractor. The cost of developing such an infrastructure is estimated at INR 60 lakhs based on national benchmarks and secondary research.
   ii. Common Infrastructure for Bamboo Processing: The facilities proposed under the common facilitation center such as Bamboo stick-making facility, Bamboo Plastic Composite (BPC) facility, Strand woven bamboo block unit, Vacuum pressure treatment plant, Resin/Glue Plant and Bamboo charcoal plant. The cost estimates for such infrastructure have been calculated based on benchmarking and secondary research.
   iii. Gender Inclusive Food Processing Training Centre: The cost estimation for the FPTC was done based on national benchmarks and the equipment availability guidelines[90] issued by the Ministry of Food Processing, GoI.
   iv. Food Testing Lab: The cost of developing a food testing lab was estimated using national benchmarks released by the Food Safety and Standards Authority of India[91] and the MoFPI[92].
   v. Truck Terminal: the cost of developing a truck terminal with a truckers' amenity centre was estimated based on primary consultations.

m. Cost estimation of for smart industrial park infrastructure was done based on the following assumptions:

[89] NSSPL.

[90] Cost norms of equipment required to be available at training center for various job roles/QPs for Skill Development, Ministry of Food Processing, GoI (2021).

[91] Standard Specifications For Setting Up Of A Basic Functional Food Analysis Laboratory, Food Safety and Standards Authority of India (2021).

[92] Cost norms of Plant & Machinery and equipment for Food Testing Laboratory Ministry of Food Processing, GoI (2020).

i. ICT infrastructure: The cost of laying optical fibre networks was estimated based on secondary research and primary consultation.
ii. Climate resilient utility corridors: The cost of developing utility corridors was based on the guidelines released of the Ministry of Road Transport and Highways.[93]
iii. Common facilitation centre: This was estimated based on the guidelines released by the GoI under the 'Micro & Small Enterprises Cluster Development Programme (MSE-CDP)' programme.[94]
iv. Public Transport: The costing for the development of transportation services was based on secondary research.
v. SCADA: This was estimated on the basis of primary consultations.

6.1. Infrastructural requirements of brownfield projects

6.1.1. Rubber Sector-focused Industrial Parks

a) **Bodhjungnagar Industrial Area**: is situated 12km from Agartala and is the largest industrial park in the state, spread across 535.73 acres of land. The park was established in 2000. Currently, ~120 industrial units are situated within the park alongside 23 industrial sheds. The park itself is divided into 4 categories— a Growth Centre, an Export Promotion Industrial Park, a Rubber Park, and a Food Park. Though the industrial area caters to all of Tripura's identified priority sectors, its strengths make it an optimal location for rubber-based industries. An overview of Bodhjungnagar Park is tabulated below.

Description	Details
Distance from Agartala	12 km connected by 3.5 – 5.5m black top intermediate carriageway. The road condition needs to be improved
Distance from Railway connectivity	20 km from Agartala Railway Station
Total number of industrial units	~120
Current Industrial ecosystem	Rubber, Food Processing and Bamboo
Total Industrial Land	535.73 acres
Total Allottable Land	295.65 acres
Total Vacant Allottable Land	72.67 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The infrastructure facilities currently provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	Partially built boundary wall encompassing existing industrial units

[93] Ministry of Road Transport and Highways, GoI (https://www.unescap.org/sites/default/files/Presentation%20by%20Ministry%20of%20Road%20Transport%20%26%20Highways%2C%20India.pdf).
[94] New Guidelines of Micro & Small Enterprises Cluster Development Programme (MSE-CDP), GoI (2022).

Infrastructure Assessment	
Internal Roads	Internal roads of intermediate carriageway of 5.5 metre width are built to cater to the existing industrial units
Water Supply Network	25000 gallons per hour water connection to individual units
Access to Power	Individual industrial units have access to power with a line capacity of 11KV and a substation with a 132KV capacity present within the premises
Effluent Treatment Plant	500 KLD capacity
Natural Gas Connection	Industrial units with this requirement have been provided with natural gas connections
Food Testing Centre	Testing lab to address the needs of the food park within the industrial area has been established
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Administrative office and Guest House • Drainage

Currently, the infrastructure available in the park provides a basic level of support to many industries. It has a partially built boundary wall that covers the existing ~120 industrial units. The internal roads have been built cater to the existing units, and every unit has access to power. The park has a substation with a capacity of 132 KV to meet industrial power needs on its premises. It has an effluent treatment plant with a 500 KLD capacity to treat the waste generated through the processing of rubber and horticultural produce. However, it does not have an STP yet. Further, it provides 25,000 gallons of water per hour to individual units which is integral to the smooth operation of food processing as well as rubber and bamboo-based units. It provides natural gas to the industrial units that require this, too. Among other basic infrastructure, the park already has a developed drainage system. In terms of sector-specific infrastructure, it has a Food Testing Centre to support food processing units. Apart from this, the park has streetlights, industrial sheds, an administrative office, and a guest house. However, with this current infrastructure, the industrial needs of the park are only partially fulfilled.

The gap analysis has led to the following findings pertaining to infrastructural needs of the park -

Bodhjungnagar Industrial Area: Critical Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Construction of a 2 km long compound wall	2 km	27,00,000
Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	7,00,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of 4 km electric lines	4 km	28,80,000
Installation of 10 additional 11 kV electric stations	10	2,30,00,000

Installation of 3 km additional gas supply lines	3 km	15,00,00,000
Development of a 22 KLD sewage treatment plant	22 KLD	4,40,000
Installation of 20 CCTVs	20	25,000
Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	42,00,000
Construction a 4.5 km drainage system	4.5 km	72,00,000
Fire safety system	1	1,45,00,000
Signage	73	36,500
Total cost		**28,49,81,500**

To improve the overall security and reduce trespassers, completion of the boundary wall along with the installation of 20 CCTV cameras has been proposed. The park has developed internal roads, a power system, a gas supply system, and a water supply system. However, based on inputs from the TIDC and site visits, expansion/upgradation of these systems has been identified. Hence, as part of internal infrastructure development, 4 km internal roads, 3 km of water supply pipeline, 4 km of electric line, 10 additional 11 kV electric sub-stations, and 3 km of gas pipeline projects have been suggested. Considering the usage of water for non-industrial purposes at each of the parks and a sewage generation of 0.1 KLD per acre, it is estimated that for 222.48 acres of allotted land, a 22 KLD STP system will be required at the park.

Besides these, two other crucial infrastructural projects that should be undertaken at the park are the development of a fire safety system and the installation of signboards. Considering the size of the park, it has been estimated that 73 boards will be needed at the park.

The external infrastructure of the park is well developed. As highlighted above, a 132 KV substation is already built. Further, the park is well connected to the nearest highway. However, the requirement of a feeder line segregation of 10 km was highlighted during discussions with the TIDC. Hence, the development of a 10 km feeder line has been proposed as part of the necessary external infrastructure for the park.

Bodhjungnagar Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 10 km feeder line to connect the existing substation to the main grid	10 km	1,50,00,000
Total		**1,50,00,000**

The Bodhjungnagar Industrial Area houses rubber and food processing industrial units. It is suited for these sectors as it is close to the state capital, making it well-connected to target markets, both regional and international. The location of the park gives it the advantage of having easy access to raw materials as well— in terms of area under natural rubber cultivation in the state, West Tripura accounts for 40%. This locational advantage could be exploited, and the park could focus on supporting the rubber sector. Apart from access to rubber, the park has the advantage of the presence of bamboo plantation clusters nearby as well. Further, all

three horticultural crops identified for food processing — jackfruit, orange, and pineapple, are widely cultivated in West Tripura.

As the rubber and food processing sectors have been identified as priority sectors for the park, based on the benchmarking in Chapter 5, additional sector specific 'good to have infrastructure' such as cold storage, dry warehousing, testing facilities and gender inclusive training centres are being proposed for development in the park. Considering the available allotment area of ~73 acres, as identified in Chapter 5, a cold storage of 110 MT per acre leading to an overall cold storage requirement of 8,000MT is being proposed. Similar benchmarking suggests development of 400 MT of dry warehousing for each acre of allottable land, hence 29,000 MT of dry warehousing has been proposed. Further, a rubber testing facility is being proposed as well. Based on national benchmarking and secondary research, the cost of developing such a facility has been estimated to be INR 60,00,000.

Discussions with the TIDC and the tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that most do not generate highly non-polluting inorganic wastes. In the current scenario, the waste generated by the food processing and the rubber industries is largely organic and does not require treatment. The profile of the industries is expected to be similar in the short to medium term. Hence, capital expenditure towards solid waste management has not been assumed.

A summary of additional infrastructure required to support the development of priority sectors in the park are listed below.

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a cold storage facility with a capacity of 8,000 MT	8,000 MT	8,00,00,000
Development of a dry warehousing facility with a capacity of 29,000 MT	29,000 MT	5,80,00,000
Testing Facilities for Rubber Products	Testing facilities (for both chemical and physical testing) for all rubber /polymer products and facilities for their certification for applicable international standards are needed.	60,00,000
Total Cost:		**14,40,00,000**

Considering its locational advantages and its current stage of development, it is recommended that the Bodhjungnagar park be further developed as a 'smart industrial park. This is discussed in greater detail in Section 6.2.4. The estimated costs for the infrastructural requirements for the same are tabulated below—

Smart Infrastructure Required	Cost in INR
ICT network	An optical fibre network has already been developed by BSNL.
Climate resilient utility corridors	25,00,00,000

Common facilitation centre	20,00,00,000
Public transport	4,00,000
SCADA	10,00,00,000
Total Cost	**55,04,00,000**

b) **R.K. Nagar Industrial Area**: spread across 226.16 acres and situated 12 km away from Agartala, this park is the second largest industrial park in Tripura. Currently, ~ 22 industrial units are situated within the park alongside 18 industrial sheds. It is home to the first bamboo park in the state. The details of the park are tabulated below.

Description	Details
Distance from Agartala	12 km connected by 3.5 – 5.5m black top road/ road condition needs to be improved
Distance from Railway connectivity	20 km from Agartala Railway Station
Total number of industrial units	~22
Current Industrial ecosystem	Rubber and Bamboo
Total Industrial Land	222.16 acres
Total Allottable Land	146.96 acres
Total Vacant Allottable Land	73.49 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The R.K Nagar Park provides basic support to the industries located within it. It has a partially built boundary wall and internal roads that cater to the existing industrial units, and currently provides 15,000 gallons of water per hour to individual units as well as natural gas supply to the industries requiring the same. Units also have access to power through a power line with a capacity of 11KV.

Though the park already has about 22 units, including some rubber-based ones, it does not yet have an ETP. Other than this, the park has streetlights, industrial sheds, and drainage facilities. With this current infrastructure, the industrial needs of the park remain partially fulfilled. The infrastructure facilities currently provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater to existing industrial units
Water Supply Network	• 15,000 gallons per hour water connection to individual units

Infrastructure Assessment	
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is a substation near the premises, but it needs upgradation
Effluent Treatment Plant	• No Effluent Treatment Plant present
Natural Gas Connection	• Gas connections have been given to industries requiring the same
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

The park's boundary wall and internal roads needs to be extended and the basic industrial infrastructure, such as water, power, and gas, too needs to be improved. Based on discussions with the TIDC, tenants and site visits, it has been found that development of 2 kms boundary wall, 4 kms internal road, 4 kms electric line, 5 11 KV electric sub stations, 3 kms gas pipeline, and the installation of 20 CCTV cameras is required. In order to comply with safety standards, the park requires a fire safety system as well.

Considering that bamboo is the priority sector identified for this park, it is estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. As the park has a total allottable area of 73.49 acres, considering effluent treatment capacity requirement per acre to be of 4.5 KLD, the park needs an ETP with a capacity of 330 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been identified as 7 KLD. Finally, assuming that one sign board needs to be installed on after every acre, as the vacant area in the park is ~74 acres, it is estimated that 74 signboards will need to be put up across the premises.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated by the bamboo and the rubber industries is largely organic and does not require treatment. The profile of the industries is expected to be similar in the short to medium term. Hence, capital expenditure towards solid waste management has not been assumed.

The critical infrastructure gap analysis has led to the following findings pertaining to infrastructural needs of the park has been summarized in table below–

R.K. Nagar Industrial Park: Critical Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Construction of a 2 km long compound wall	2 km	27,00,000
Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	7,00,00,000
Installation of a water supply network.	1	1,00,00,000

R.K. Nagar Industrial Park: Critical Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of 4 km electric lines	4 km	28,80,000
Installation of 5 additional 11 kV electric stations	5	1,15,00,000
Installation of 3 km additional gas supply lines	3 km	15,00,00,000
Development of a 7 KLD sewage treatment plant	7 KLD	1,40,000
Installation of 20 CCTVs	20	25,000
Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	42,00,000
Construction a 5 km drainage system	5 km	80,00,000
Development of a 330 KLD effluent treatment plant	330 KLD	3,30,00,000
Fire safety system	1	73,50,000
Signage	74	37,000
Total cost:		**29,98,32,000**

R.K Nagar Industrial Area is suited to rubber and bamboo sector units. Furthermore, it is close to the state capital, allowing it to access both regional and international target markets. Its location gives advantage of having easy access to raw materials— in terms of area under natural rubber cultivation in the state, West Tripura accounts for 40%. Additionally, bamboo-based units here can benefit from their proximity to the bamboo plantation clusters at Hezamara, Mohanpur, Belbari, and Mandwi.

The external infrastructure of the park needs further improvements. The park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. In addition, a feeder line segregation of 10 Kms has been proposed based on discussions with the electricity department. Hence, the following necessary external infrastructure is being proposed.

R.K Nagar Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 10 km feeder line to connect the existing substation to the main grid	10 Kms	1,50,00,000

Total cost:	**6,50,00,000**

Based on the sector specific infrastructure identified in Chapter 5, the additional infrastructure identified to attract investments in rubber and bamboo sector are - development of warehouses, testing facilities and common infrastructure for bamboo processing such as bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants etc. Considering available allottable area of 73.49 acres, a dry warehouse of 29,000MT has been proposed in line with the benchmarks identified in chapter 5. The table below lists some additional sector-specific infrastructural requirements for the park–

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a dry warehousing facility with a capacity of 29,000 MT	29,000 MT	5,80,00,000
Testing Facilities for Rubber Products	Testing facilities (for both chemical and physical testing) for all rubber /polymer products and facilities for their certification to any international standards are needed.	60,00,000
Common Infrastructure for Bamboo Processing	Infrastructure for bamboo processing, including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant, could be developed.	1,50,00,000
Total cost:		**7,90,00,000**

Considering its locational advantages and its current stage of development, it is recommended that the R.K Nagar park be further developed as a ‘smart industrial park. This is discussed in greater detail in Section 6.2.4. The estimated costs for the infrastructural requirements for the same are tabulated below—

Smart Infrastructure Required	Cost in INR
ICT network	50,00,000
Climate resilient utility corridors	25,00,00,000
Common facilitation centre	20,00,00,000
Public transport	4,00,000
SCADA	10,00,00,000
Total cost	**55,54,00,000**

c) **IIDC Sarasima Industrial Area**: is situated 125 km from Agartala and spread across 52.37 acres of land. Currently, ~ 5 industrial units are situated within the park alongside 4 industrial sheds. While the park currently

has the industrial ecosystem to support sawmills and stone crushing units, it could focus on supporting rubber processing and food processing as well. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via NH 8 but the access road is in bad condition
Distance from Railway connectivity	<1 km from Railway Station
Total number of industrial units	~5
Current Industrial ecosystem	Sawmills and Stone Crushing
Total Industrial Land	32.55 acres
Total Allottable Land	19.78 acres
Total Vacant Allottable Land	16.26 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Sarasima park has some of the critical internal industrial infrastructure required by industries. This includes water, power, and gas supply. However, it does not have a dedicated power substation on its premises. It also does not have an ETP. Further, both the boundary wall and the internal roads within the park have been partially developed so far. The trunk infrastructure it provides are streetlights, a drainage system, and industrial sheds. This present infrastructure is not yet adequate to meet the needs of the park fully and must be developed further. The infrastructure facilities currently provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater to the existing industrial units
Water Supply Network	• Water connection has been given and there is an existing overhead water storage tank of 1 lakh litres and an underground storage tank of 1.5 lakh litres within the premises
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premises, but one is present near the park
Effluent Treatment Plant	• No Effluent Treatment Plant present
Natural Gas Connection	• No gas connection available.
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

Apart from improving security by installing CCTVs and extending the boundary wall, the internal roads and

some other internal infrastructure need improvement. This includes water, power, and gas supply systems. Based on discussions with the TIDC, tenants and site visits, development of 2 kms boundary wall, 1 km internal road, an internal water supply network, 1 km electric line, 2 11 KV electric sub stations, a water pipeline, drainage system, a fire safety system, 4 acres of land development and 20 CCTV camera requirements have been identified. Further, considering the size of the park, it is estimated that 17 signboards will be required on the premises.

Considering that rubber is the priority sectors identified for this park, it is estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of 19.78 acres and considering effluent requirement of 4.5 KLD per acre, the required ETP capacity for the park is 90 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been identified as 2 KLD.

The critical infrastructure gap analysis has led to the following findings pertaining to infrastructural needs of the park has been summarized in table below.

Sarasima Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 2 km long compound wall	2 km	27,00,000
Construction of a 1 km intermediate carriageway of 5.5 m width	1 km	1,75,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of 1 km electric lines	1 km	7,20,000
Installation of 2 additional 11 kV electric stations	2	46,00,000
Development of a 2 KLD sewage treatment plant	2 KLD	40,000
Installation of 20 CCTVs	20	25,000
Installation of 1 km water pipeline where the diameter of the pipes is 6 inches or 150 mm.	1 km	14,00,000
Construction a 1 km drainage system	1 km	16,00,000
Development of a 90 KLD effluent treatment plant	90 KLD	90,00,000
Land development and filling of 4 acres	4 acres	1,60,00,000
Fire safety system	1	9,89,000
Signage	17	8,500

Sarasima Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Total cost:		**6,45,82,500**

The park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 1 Km has been assumed based on discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

Sarasima Industrial Park: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 1 km feeder line to connect the existing substation to the main grid	1 Km	15,00,000
Total cost:		**5,15,00,000**

While the current industrial ecosystem is limited to stone crushing and sawmills, it is recommended that the park focus on supporting rubber processing as well. Being in South Tripura, industries within the park will have easy access to Bangladesh where they will find a market for various rubber products including latex. Within India, the town is linked to Agartala by NH 8 and rail, giving the park access to domestic markets as well. There are currently three MSMEs already based out of the district, indicating the existence of rubber processing capacity in the region. There is also a Latex Centrifuging Factory and a natural rubber processing plant in the district's Takmacharra area. Additionally, the Sarasima park enjoys proximity to raw materials as South Tripura is district that has the second highest area under rubber plantations.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated by sawmills and stone crushing units is largely organic and does not require treatment. The profile of the industries is expected to expand to include rubber units in the future. However, the refuse generated by rubber will remain largely nonpolluting in the short to medium term. Hence, capital expenditure towards solid waste management has not been assumed.

Since rubber has been identified as a priority sector for the park, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as dry warehousing and testing facilities are proposed for development in the park. Considering allottable area of 19.78 acres, a dry warehouse of 7,900 MT has been proposed in line with the benchmarks identified in chapter 5.

Some of the additional infrastructure required to support the rubber sector are listed below.

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a dry warehousing facility with a capacity of 7,900 MT	7,900 MT	1,58,00,000

Testing Facilities for Rubber Products	Testing facilities for both chemical and physical testing) for all rubber /polymer products and facilities for their certification to any international standards are needed.	60,00,000
Total cost:		**2,18,00,000**

d) **IIDC Santirbazar Industrial Area**: is situated 84 km from Agartala and is spread across 52.37 acres. Currently, ~ 1-2 industrial units are situated within the park. In this park infrastructure may be developed to support rubber processing industries. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via NH 8 but the 4m black top road access road is in bad condition
Distance from Railway connectivity	1 km from Local Railway Station
Total number of industrial units	~1-2
Current Industrial ecosystem	NA
Total Industrial Land	24.88 acres
Total Allottable Land	19 acres
Total Vacant Allottable Land	8 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Santirbazar Industrial Area does not currently have any industrial infrastructure on its premises –

Infrastructure Assessment	
Boundary Wall	Boundary wall needs to be built.
Internal Roads	No internal roads have been built
Water Supply Network	No water connection given
Access to Power	No power connection
Effluent Treatment Plant	No Effluent Treatment Plant present
Natural Gas Connection	No gas connections.
Other Trunk Infrastructure	—

A 5 km boundary wall and internal roads covering 2 km need to be developed. To improve security within the premises, 20 CCTVs are required to be installed. Basic infrastructure necessary for any industry like water and power supply networks must be developed as well – stakeholder consultations have revealed that a 3 km electric line and 2 km water pipeline are needed. The premises also require a water supply network, 3 additional electric stations, and a fire safety system. Apart from this, the drainage system must be lengthened by 3 km, and ETP &

STP facilities need to be developed. As rubber is the identified priority sector, a suitable ETP system is required in the park. It is estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of 19 acres and considering effluent requirement of 4.5 KLD per acre, the required ETP capacity for the park is 85 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been identified as 1.5 KLD. Finally, keeping in mind the size of the park, it is estimated that 8 signboards need to be installed on its premises. The critical infrastructure gap analysis has led to the following findings pertaining to infrastructural needs of the park has been summarized in table below

Santirbazar Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 5 km long compound wall	5 km	67,50,000
Construction of a 2 km intermediate carriageway of 5.5 m width	2 km	3,50,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of a 1 Lakh litre overhead water tank and a 1.5 Lakh litre underground tank	2,50,000 Litres	1,80,00,000
Installation of 3 km electric lines	3 km	21,60,000
Installation of 3 additional 11 kV electric stations	3	69,00,000
Development of a 1.5 KLD sewage treatment plant	1.5 KLD	30,000
Installation of 20 CCTVs	20	25,000
Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm	2 km	28,00,000
Construction a 3 km drainage system	3 km	48,00,000
Development of 85 KLD effluent treatment plant	85 KLD	85,00,000
Fire safety system	1	9,50,000
Signage	8	4,000
Total cost:		**9,59,19,000**

The external infrastructure of the park needs some improvements. The park is well connected to the nearest state road. However the state road needs upgradation and the same has been proposed for development.

There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 4 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

Santirbazar Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Construction of a 4 km-long dual lane external road with a width of 7.5 metres between state road to national highway	4 kms	16,00,00,000
Construction of a 200 m dual lane external road with a width of 7.5 metres from the boundary wall to the state road	200 m	80,00,000
Installation of a 4 km feeder line to connect the existing substation to the main grid	4 Kms	60,00,000
Total		**22,40,00,000**

As rubber has been identified as a priority sector for the park, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as dry warehousing and testing facilities are proposed for development in the park. Considering allottable area of 19 acres, a dry warehouse of 7,600 MT has been proposed in line with the benchmarks identified in chapter 5.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated does not require treatment. The profile of the industries is expected to expand to include rubber-based units in the future. However, the refuse generated by rubber will remain largely nonpolluting in the short to medium term. Hence, capital expenditure towards solid waste management has not been assumed.

Some of the additional infrastructure required to support the rubber sector are listed below.

Identified Additional Infrastructure Projects		**Cost in INR**
Development of a dry warehousing facility with a capacity of 7,600 MT	7,600 MT	1,52,00,000
Testing Facilities for Rubber Products	Testing facilities for both chemical and physical testing) for all rubber /polymer products and facilities for their certification to any international standards are needed.	60,00,000.
Total cost:		**2,12,00,000**

6.1.2. Bamboo Sector-focused Parks

a. **Kumarghat Industrial Area**: is situated 125 km from Agartala and is spread across 52.37 acres. Currently, ~16 industrial units and 26 industrial sheds are situated within the park. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via NH 8 but the 4m black top access road is in bad condition
Distance from Railway connectivity	1 km from Local Railway Station
Total number of industrial units	~16
Current Industrial ecosystem	Sawmill and Agarbatti
Total Industrial Land	45.66 acres
Total Allottable Land	24.26 acres
Total Vacant Allottable Land	22 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Kumarghat Industrial Area provides some support to the industries located within it. It has a partially built boundary wall and internal roads that cater to the existing industrial units, and currently provides water from a tank with a capacity of 1 lakh litres to individual units as well as natural gas supply to the industries requiring the same. Units also have access to power through a power line with a capacity of 11KV. Other than this, the park has streetlights, industrial sheds, and drainage facilities. With this current infrastructure, the industrial needs of the park are only partially fulfilled. A summary of the current infrastructure facilities provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater to the existing industrial units
Water Supply Network	• 1 lakh litre water tank with water connections to units
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premises, but one is present near the industrial park
Effluent Treatment Plant	• No Effluent Treatment Plant present
Natural Gas Connection	• Gas connections have been given to industries requiring the same
Other Trunk Infrastructure	• Industrial Sheds • Drainage

The park has a boundary wall that is partially built, internal roads catering to existing units, and a water tank with a capacity of 1 lakh litres that supplies water to the existing 16 units. Units also have access to power although there is no power station, and to gas. The park already has streetlights and a drainage system. There is, however, no ETP as of now in the park. This present infrastructure is not yet adequate to meet the needs of the park fully and must be developed further. Both the boundary wall and internal roads need to be developed further in the Kumarghat Industrial Area. To improve power supply outcomes, the park also needs 2 11 KV electric sub stations. It also requires one STP and one ETP each to treat the waste generated by industrial units. Bamboo is the priority sector identified for this park.

It has been estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of ~24.26 acres and considering effluent requirement of 4.5 KLD per acre, the required ETP capacity for the park is 110 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been identified as 2 KLD. Besides this, the water pipeline needs to be lengthened by 2 km, the drainage system needs to be extended by 1 km. Based on the size of the park, it has been estimated that 22 signboards need to be put up. For security, 20 CCTVs are required on the premises while a fire safety system is required in order to ensure a safe working environment.

The gap analysis has led to the following findings pertaining to the infrastructural needs of the industrial park

Kumarghat Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 1 km long compound wall	1 km	13,50,000
Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	7,00,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of 4 km electric lines	4 km	28,80,000
Installation of 2 additional 11 kV electric stations	2	46,00,000
Development of a 2 KLD sewage treatment plant	2 KLD	40,000
Installation of 20 CCTVs	20	25,000
Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	4 km	56,00,000
Construction a 4 km drainage system	4 km	64,00,000
Development of a 110 KLD effluent treatment plant	110 KLD	1,10,00,000
Land development and filling of 15 acres	15 acres	6,00,00,000
Streetlights for 4 km internal roads	4 km	23,76,000
Fire safety system	1	12,13,000

Kumarghat Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Signage	22	11,000
Total cost:		**17,54,95,000**

In terms of external connectivity, the park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 30 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

Kumarghat Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Construction of a 700 m-long dual lane external road with a width of 7.5 metres from the boundary wall of the park to the nearest highway	700 m	2,80,00,000
Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	45,00,000
Total cost:		**8,25,00,000**

The park has an industrial ecosystem that supports agarbatti making industries. It is well-suited for this considering its access to raw material, the requisite existing ecosystem, and demand centres. Kumarghat already has a round bamboo stick unit, equipped with 50 round stick making machines that has a monthly production capacity of 60 MT. Apart from this, being located in North Tripura allows it to access to existing bamboo processing capacity – the region has several bamboo-based furniture/handicraft clusters indicating the existence of the required ecosystem for bamboo processing.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated by bamboo units is organic and does not require treatment. The profile of the industries is expected to remain similar in the short to medium term. Hence, capital expenditure towards solid waste management has not been assumed.

As the bamboo has been identified as a priority sector for the park, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as dry warehousing and other sector-specific infrastructure have been proposed for the park. Since benchmarking in Chapter 5 suggests development of 400 MT of dry warehousing for each acre of allottable land, developing 9,700 MT of dry warehousing for ~24.26 acres has been proposed. Proper warehousing is important as not all industrial units will be able to store raw materials especially since unprocessed bamboo is space consuming.

Some of the additional infrastructure required to support the bamboo and food processing sectors are listed below.

Identified Additional Infrastructure Projects		Cost in INR
Development of a dry warehousing facility with a capacity of 9,700MT	9,700 MT	1,94,00,000
Common Infrastructure for Bamboo Processing	Infrastructure for bamboo processing, including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant, could be developed.	1,50,00,000.
Total cost:		**3,44,00,000**

b. IIDC Dharmanagar Industrial Area: Currently, there are three industrial units are situated within the park. Though the park is suited to supporting sawmills and stone crushing units, its location makes it well suited to supporting bamboo-based units as well. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via NH 8 but the road access road is in bad condition
Distance from Railway connectivity	<6 km from Railway Station the road connectivity to railway is very bad.
Total number of industrial units	~3
Current Industrial ecosystem	Sawmills and Stone Crushing
Total Industrial Land	7.95 acres
Total Allottable Land	4.56 acres
Total Vacant Allottable Land	4.50 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Dharmanagar Industrial Park provides a basic level of infrastructural support to industrial units. It has a partially built boundary wall and internal roads that cater to existing units, not covering the entire park area. Units in the park have access to water though there are no tanks on the premises. Units have access to power with a line capacity of 11KV. There is no gas supply available yet. Other available trunk infrastructure includes street lighting, industrial sheds and drainage. Individual industrial units have access to power with a line capacity of 11KV. Natural gas supply infrastructure also exists. Currently, the park provides the following infrastructure –

Infrastructure Assessment	
Boundary Wall	Fully built boundary wall encompassing existing industrial units
Internal Roads	Internal roads are built to cater to the existing industrial units

Infrastructure Assessment	
Water Supply Network	Water connection is given and there is a water tank of 10,000 litre capacity.
Access to Power	Individual industrial units have access to power with a line capacity of 11KV. There is no substation within the premises, but one is present near the park
Effluent Treatment Plant	No Effluent Treatment Plant present
Natural Gas Connection	No Gas connection
Other trunk infrastructure	Streetlights CFC building

The Dharmanagar Industrial Area needs to install 20 CCTVs to ensure security. The park also requires a water supply network with a pipeline of 1 km and a 1 km power line to support industrial activity. It has been estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Since the total area in the park is less than 10 acres, it is estimated that no major industries will be set up in this area. Further, an overhead tank with a capacity of 1 Lakh litres has been proposed for the park.

Further since less than 5 acres is available for allotment, it is estimated that only micro scale industries in identified priority sectors may be attracted into the park. Hence this park could be developed as a green industrial park where only green category industries are allotted land. Hence, we are not assuming setting up of any ETP in this park. However, considering the sewage generated, the required STP capacity is estimated at 0.5 KLD. Besides the requirements identified above, it is important to install a fire safety system and signboards in the park. Based on its size, it is estimated that 5 signboards will also be required in the park.

The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park –

Dharmanagar Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 1 km intermediate carriageway of 5.5 m width	1 km	1,75,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of an overhead water tank with a capacity of 1 Lakh litres	1,00,000 litres	45,00,000
Installation of 1km electric lines	1 km	7,20,000
Installation of 2 additional 11 kV electric stations	2	46,00,000
Development of a 0.5 KLD sewage treatment plant	0.5 KLD	10,000

Dharmanagar Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Installation of 20 CCTVs	20	25,000
Installation of 1 km water pipeline where the diameter of the pipes is 6 inches or 150 mm.	1 km	14,00,000
Construction a 1 km drainage system	1 km	16,00,000
Fire safety system	1	2,28,000
Signage	5	2,500
Total cost:		**4,05,85,500**

The external infrastructure of the park needs some improvements. The park is well connected with road network. However, there is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further, the requirement of a feeder line segregation of 0.5 Km has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

Dharmanagar Industrial Park: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 500 m feeder line to connect the existing substation to the main grid	500 m	7,50,000
Total cost:		**5,07,50,000**

The Dharmanagar park could focus on prioritizing bamboo-based industries. It already houses an incense production cluster. Apart from this, the region also has furniture/handicraft clusters that use bamboo as a raw material, indicating the existence of the required ecosystem for bamboo processing.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated by sawmills and stone crushing units at the park is organic and does not require treatment. The profile of the industries is expected to expand to include bamboo-based industries in the short to medium term. These too will generate organic refuse. Hence, capital expenditure towards solid waste management has not been assumed.

Based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as dry warehousing and other sector-specific infrastructure have been proposed for the park. Considering the available allotment area of 4.5 acres, based on benchmarking in Chapter 5 which suggests development of 400 MT of dry warehousing for each acre of allottable land, for ~4.56 acres, 1,800 MT of dry warehousing has been proposed. The following table lists the infrastructure required by the sector –

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a dry warehousing facility with a capacity of 1,800 MT	1,800 MT	36,00,000
Common Infrastructure for Bamboo Processing	Infrastructure for bamboo processing, including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant, could be developed.	1,50,00,000
Total cost:		**1,86,00,000**

6.1.3. Food Processing Sector-focused Parks

a. **IIDC Dewanpasa Industrial Area**: is situated 163 km from Agartala and is spread across 52.37 acres. Currently, ~ 3 industrial units located within the park alongside 1 industrial shed. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via NH 8 but the road access road is in bad condition
Distance from Railway connectivity	<6 km from Railway Station the road connectivity to railway is very bad.
Total number of industrial units	~3
Current Industrial ecosystem	Sawmills and Stone Crushing
Total Industrial Land	46.22 acres
Total Allottable Land	40.07 acres
Total Vacant Allottable Land	34.07 acres
Landowner	TIDC
Land Use	Land use conversion has been done

At present, the Dewanpasa Industrial Area only has a partially built boundary wall that encompasses the existing industrial units and internal roads that do not cover the full park area.

Infrastructure Assessment	
Boundary Wall	Partially built boundary wall encompassing existing industrial units
Internal Roads	Internal roads are built to cater to the existing industrial units

Infrastructure Assessment	
Water Supply Network	Water connection has been given to industrial units. However, there is no water storage tank on the park premises.
Access to Power	No electricity and power connection
Effluent Treatment Plant	No Effluent Treatment Plant present
Natural Gas Connection	No Gas connection

The Dewanpasa park does not have any of the critical infrastructural facilities. A boundary wall of 1 km and internal roads of 4 kms need to be constructed. Further, a water supply network with a 4 km pipeline needs to be developed. To fulfil industrial power needs, 8 additional 11 kV electric substations are required. Food processing is the priority sector identified for this park and it has been estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of 40.07 acres and considering effluent requirement of 4.5 KLD per acre, the required ETP capacity for the park is 180 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been estimated at 4 KLD. Apart from the requirements listed above, the industrial park needs a fire safety system. Based on its size, it is estimated that the park needs 34 signboards as well.

The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park –

Dewanpasa Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 1 km long compound wall	1 km	13,50,000
Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	7,00,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of an overhead water tank with a capacity of 1 Lakh litres and an underground tank with a capacity of 1.5 Lakh litres.	2,50,000 litres	1,80,00,000
Installation of 4 km electric lines	4 km	28,80,000
Installation of 5 additional 11 kV electric stations	5	1,15,00,000
Development of a 4 KLD sewage treatment plant	4 KLD	80,000
Installation of 20 CCTVs	20	25,000
Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	4 km	56,00,000

Dewanpasa Industrial Park: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction a 4 km drainage system	4 km	64,00,000
Development of a 180 KLD effluent treatment plant	180 KLD	1,80,00,000
Streetlights for 4 km internal roads	4 km	23,76,000
Fire safety system	1	20,00,000
Signage	34	17,000
Total cost:		**14,82,28,000**

To meet industrial needs, a 1 km long boundary wall and internal roads of 4 km may be built. Further, a water supply network and a 4-km-long water pipeline as well as eight (8) additional electric stations and a 4 km-long power line to meet other basic industrial needs need to be developed. In order to process industrial waste, two (2) STPs and one ETP could be built. Besides this, the drainage system may be lengthened by 4 km. One cold storage facility and warehousing facilities with a capacity of 5,000 MT may be developed for the proper storage of raw materials and finished products.

The external infrastructure of the park needs some improvements. The park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 3 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Dewanpasa: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Construction of a 2.5 km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to the closest NH	2.5 km	10,00,00,000
Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	45,00,000
Total cost:		**15,45,00,000**

The current industrial ecosystem supports sawmills and stone crushing units. However, Dewanpasa park, located in South Tripura, can prioritize the food production sector due to its proximity to raw materials like jackfruit. Apart from jackfruit, pineapple is also grown in the district which the park can source for processing. Further, its location in South Tripura makes access to international markets via Bangladesh's ports easy. Since food processing is largely export-oriented, the park can benefit from its geographic location.

Discussions with the TIDC and park tenants reveal that the waste generated in the park is collected and deposited at specific sites within the park. The municipality then collects and processes this waste after which it is deposited into landfills. Further, the nature of the industries located in the park is such that they do not generate highly polluting inorganic wastes. In the current scenario, the waste generated by sawmills and stone crushing units is organic and does not require treatment. The profile of the industries is expected to expand to include food processing units as well in the short to medium term. As the waste generated by such units will also be organic, capital expenditure towards solid waste management has not been assumed.

With food processing being the park's identified priority sector, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as cold storage and dry warehousing are proposed for development in the park. As identified in Chapter 5, cold storage of 110 MT is required per acre. Thus, an overall cold storage requirement of 4,400 MT is being proposed for the park. Besides this, similar benchmarking suggests development of 400 MT of dry warehousing for each acre of allottable land, hence 16,000 MT of dry warehousing has been proposed. Some of the sector's infrastructural needs are listed below –

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a cold storage facility with a capacity of 4,400 MT	4,400 MT	4,40,00,000
Development of a dry warehousing facility with a capacity of 16,000 MT	16,000 MT	3,20,00,000
Food Processing Training Centre	A gender inclusive FPTC with facilities for imparting training on post-harvest handling, preservation and specifically processing is required.	35,00,000
Total cost:		**7,95,00,000**

6.1.4. Other Parks

The following section provides information on parks where the amount of vacant allottable land is less than 4 acres. Considering this limited availability of land parcels, no major infrastructure projects have been identified for these parks.

Further, as the industrial units located in these parks are largely green category ones that do not generate polluting waste, large waste treatment infrastructure like ETPs and STPs are not required. The A.D Nagar, Dhajanagar, and Dukli industrial estates, for instance, house rubber- and bamboo-based industries. The organic wastes generated in these parks does not require treatment.

a) **A.D. Nagar Industrial Area**: is situated 1- 2 km from Agartala. Spread across 8.41 acres, it currently has ~ 34 industrial units alongside 38 industrial sheds operating on its premises. The park is suited to support bamboo and rubber-based industries. The details of the park are tabulated below.

Description	Details
Distance from Agartala	1-2 km connected by black top road/The is in very poor condition.
Distance from Railway connectivity	3km from Agartala Railway Station connected by black top road in poor condition.
Total number of industrial units	~22
Current Industrial ecosystem	Rubber and Bamboo

Description	Details
Total Industrial Land	8.41 acres
Total Allottable Land	3.89 acres
Total Vacant Allottable Land	1.77 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The park has various kinds of basic infrastructure needed by industries like a boundary wall, internal roads, streetlights, industrial sheds, drainage, water, and power. It supplies units with 15,000 gallons of water per hour, electricity, and gas. While there are no substations within the park premises, however it has been mentioned by TIDC that there is one substation currently supplying power to the industries in the park in close proximity. A summary of infrastructure facilities provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater for the existing industrial units
Water Supply Network	• 15000 Gallons per hour water connection to individual units
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premise but is present in close proximity outside the industrial park
Effluent Treatment Plant	• No Effluent Treatment Plant present
Natural Gas Connection	• Gas connections have been given to industries requiring the same
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

Considering the limited availability of land available for allotment and based on discussions with TIDC, 3 11 KV substations for common facilities in the park has been identified for development in the park. Since the current industrial profile in the park are greenfield in nature and the park does not have any large parcel of land available for allotment which will attract any polluting industry, no effluent treatment plant is being proposed for development. The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park –

A.D. Nagar Industrial Park: Critical Infrastructure			
Specifications	**Requirement**	**Specifications**	**Cost in INR**
Installation of 3 additional 11 kV electric stations	3	The park requires 3 additional 11 kV substations.	69,00,000

b) **Dhajanagar Industrial Area**: is situated 50 km from Agartala and spread across 52.37 acres. Currently, ~10 industrial units are situated within the park alongside 6 industrial sheds. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via highway at a distance of 50 km. The road's condition is currently bad.
Distance from Railway connectivity	8 km from Railway Station. Road connectivity to railway station is bad
Total number of industrial units	~23
Current Industrial ecosystem	Rubber and Bamboo
Total Industrial Land	18.79 acres
Total Allottable Land	2.372 acres
Total Vacant Allottable Land	1.56 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Dhajanagar Industrial Park provides a basic level of infrastructural support to industrial units. It has a partially built boundary wall and internal roads that cater to existing units not covering the entire park area. Units in the park have access to water though there are no tanks on the premises. Other available trunk infrastructure includes street lighting, industrial sheds and drainage. Individual industrial units have access to power with a line capacity of 11KV. Natural gas supply infrastructure also exists. The infrastructure facilities currently provided by the park are as follows –

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater to the existing industrial units
Water Supply Network	• Water connection to individual units but there is no water tank inside the premise
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premise but is present in close proximity outside the industrial park
Effluent Treatment Plant	• No Effluent Treatment Plant present
Natural Gas Connection	• No Gas Supply
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

This infrastructure, however, is not yet adequate to meet the needs of the park fully and must be developed further.

Owing to the low land availability in the park (less than 4 acres), no major infrastructure projects have been planned for the industrial park. However, following primary consultations with the TIDC, the need for electric substations was highlighted. Further since the current industrial profile in the park are greenfield in nature and the park does not have any large parcel of land available for allotment which will attract any polluting industry, no effluent treatment plant is being proposed for development. The park currently needs the following infrastructure:

Dhajanagar Industrial Park: Critical Infrastructure			
Specifications	**Requirement**	**Specifications**	**Cost in INR**
Installation of 3additional 11 kV electric stations	3	The park needs 3 additional 11 kV substations.	69,00,000
Total cost:			**69,00,000**

c. Badharghat Industrial Area: is situated 2-3km from Agartala and is the second largest industrial park in the state, spread across 52.37 acres. Currently, ~ 36 industrial units are situated within the park alongside 16 industrial sheds. Badharghat has facilities for metal and wooden furniture industries. Besides this, it can also focus on bamboo sector industries. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via highway. The industrial area is on the highway which is well maintained.
Distance from Railway connectivity	4 km from Agartala Railway Station connected by national highway
Total number of industrial units	~36
Current Industrial ecosystem	Metal and Wooden Furniture
Total Industrial Land	20.52 acres
Total Allottable Land	10.35 acres
Total Vacant Allottable Land	2.75 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Badharghat Industrial Park provides some critical supporting infrastructure to industrial units. Apart from a partial boundary wall and some internal roads, units have access to water (5,000 gallons per hour to individual units), power with a line capacity of 11KV, and gas supply. Other facilities include streetlights, industrial sheds, and a drainage system. The park does not however have an ETP on its premises.

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units

Infrastructure Assessment	
Internal Roads	• Internal roads are built to cater to existing industrial units
Water Supply Network	• 5,000 Gallons per hour water connection to individual units
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premises, but one is present in close proximity to the park
Effluent Treatment Plant	• No Effluent Treatment Plant present.
Natural Gas Connection	• Gas connections have been given to industries requiring the same
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

Since the current industrial profile in the park are greenfield in nature and the park does not have any large parcel of land available for allotment which will attract any polluting industry, no effluent treatment plant is being proposed for development.

d. Dukli Industrial Area: is situated 5 km from Agartala and spread across 52.37 acres. Currently, ~ 23 industrial units are situated within the park alongside 10 industrial sheds. It is best suited for rubber and bamboo sector industries. The details of the park are tabulated below.

Description	Details
Distance from Agartala	Connectivity to Agartala via Highway at a distance of 1km. The road condition is currently bad.
Distance from Railway connectivity	1 km from Agartala Railway Station
Total number of industrial units	~23
Current Industrial ecosystem	Rubber and Bamboo
Total Industrial Land	52.37 acres
Total Allottable Land	18.39 acres
Total Vacant Allottable Land	4.94 acres
Landowner	TIDC
Land Use	Land use conversion has been done

The Dukli park meets some immediate infrastructure needs of industries, including having a partially built boundary wall, internal roads that cater to existing units, and water, power, and gas supply. 5000 gallons of water is supplied to each unit hourly. Though it already has ~23 units, it does not yet have an ETP. Though the park does not have a substation, there is one close by. Since land availability is less than 5 acres, no infrastructure projects have been planned for the industrial park. Details of the current infrastructure provided at

the park are provided below.

Infrastructure Assessment	
Boundary Wall	• Partially built boundary wall encompassing existing industrial units
Internal Roads	• Internal roads are built to cater to the existing industrial units
Water Supply Network	• 5,000 Gallons per hour water connection to individual units
Access to Power	• Individual industrial units have access to power with a line capacity of 11KV. • There is no substation within the premise but is present in close proximity outside the industrial park
Effluent Treatment Plant	• No Effluent Treatment Plant present. However, it has been estimated that the park needs an ETP with a capacity of30 KLD.
Natural Gas Connection	• Gas connections have been given to industries requiring the same
Other Trunk Infrastructure	• Street Lighting • Industrial Sheds • Drainage

Since land availability is around 4 acres, no infrastructure projects have been planned for the industrial park. Further, the existing land parcels have already been allotted to industries

6.2. Infrastructural requirements of greenfield projects

There are currently six greenfield parks being developed in Tripura. These are the Jalefa and Lalchari IIDCs and the Sonamukhi, Nagicherra, Kathalia, and Bijoypur Industrial Areas.

These greenfield parks are evenly spread across the state with two each in the northern, southern, and western regions. The biggest of these projects, the Jalefa IIDC at Sabroom, as well as the Bijoypur industrial area, both in South Tripura district, will be able to benefit from the newly built Maitri Setu that will connect Sabroom region to Bangladesh's Chattogram port, which will increase economic activity in the region.

Figure 12: Jalefa SEZ, Sabroom

Each of these parks is suited to focus on specific sectors. Four parks, the Jalefa and Lalchari IIDCs, and the Bijoypur and Sonamukhi parks, can support food processing activities, while the Nagicherra and Kathalia parks can be for rubber and bamboo-based industries, respectively.

The priority sectors for these regions are as follows –

Industrial Region	Priority Sector
IIDC Jalefa	Food Processing
IIDC Lalchari	Food Processing
Sonamukhi Industrial Area	Food Processing
Nagicherra Industrial Area	Rubber Industry
Kathalia Industrial Area	Bamboo Industry
Bijoypur Industrial Area	Food Processing

The Lalchari and Sonamukhi parks can prioritize food processing as these parks have access to raw materials like jackfruit. Their proximity to key jackfruit producing regions is a major advantage for them. Apart from jackfruit, orange, pineapple, banana, lemon, Areca nut, and mango are also grown in the district which the parks could source for processing.

Similarly, the Jalefa park stands to benefit from its focus on food processing as the sector is export oriented. Its location, in Sabroom, gives it access to the Chattogram port in Bangladesh via the Maitri Setu, enabling access not only to markets in Bangladesh but to the larger South Asian region as well. Further, paddy, pineapple, jackfruit, banana, nuts, and mango are widely cultivated in the district. Access to the produce could help in the expansion of food processing activities at the park.
Meanwhile, Nagicherra park's proximity to Agartala leads to easy access to markets across the country as well as to Bangladesh. Further, its location, in West Tripura district, could ease access to raw material easily as West Tripura accounts for 40% of the total area under natural rubber cultivation in the state. The presence of a Horticultural Research Centre in Nagicherra also makes the site viable for rubber production as this could allow access to expert knowledge of plantation crops.

Owing to Tripura's hilly terrain, it is difficult to find contiguous land parcels. Hence investment is needed for land development and land filling activities to increase allottable land. As observed during site visits and subsequent discussions with field officers, Sonamukhi park has the highest land development cost while the Nagicherra park has the lowest cost.

While the parks all need similar basic infrastructure, including access to stable water and power supply, depending on the specific thrust sectors they are designed to support, there are certain key infrastructural elements they require. Those that will have food processing industries, for instance, will require warehousing facilities, cold chains, quality and FPO labs, truck terminals, and gender inclusive food processing training centres. Similarly, those parks with rubber-based industries will need access to testing facilities and extensive water supply while those with bamboo-based industries will require bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plant, and bamboo charcoal plants.

The infrastructure in these greenfield parks need to be developed as the parks primarily aim to overcome high production and transaction costs stemming from lack of infrastructure, along with the focused complementary interventions industrial agglomeration benefits.

Detailed assessment of infrastructure requirements of greenfield industrial parks is provided in detail below.

6.2.1. Food Processing Sector-Focused Industrial Parks

a. **IIDC Jalefa:** The basic details of the park are as follows–

Description	Details
Landowner	TIDC
Land Use	Land use conversion has been done

Discussions with the TIDC reveal that the park needs 3 km internal roads, and power and water supply lines. For better security, it could also install 20 CCTVs, and to improve safety outcomes, a fire safety system is needed. Further, it has been estimated that 39 signboards need to be put up across the park's premises. It has been estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of ~38.70 acres, an overhead tank of 2.5 Lakh litres has been proposed. Considering effluent requirement of 4.5 KLD per acre, the required ETP capacity for the park is 175 KLD. Assuming sewage generation is 80% of non-industrial water use, the required STP capacity has been identified as 3 KLD. 3 additional electric stations are required. Most critically, due to the peculiar topography of Tripura, which causes fragmentation of land parcels, land development and filling needs to be undertaken. The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park –

IIDC Jalefa: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 3 km intermediate carriageway of 5.5 m width	3 km	5,25,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of an overhead water tank and an underground water tank with a capacity of 1 Lakh litres each.	2,50,000 litres	1,80,00,000
Installation of 3 km electric lines	3 km	21,60,000
Installation of 3 additional electric stations	3	69,00,000
Development of a 4 KLD sewage treatment plant	4 KLD	80,00,000
Installation of 20 CCTVs	20	25,000
Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	42,00,000
Construction a 3 km drainage system	3 km	48,00,000
Development of a 175 KLD effluent treatment plant	175 KLD	1,75,00,000
Land development and filling of 20 acres	20 acres	80,00,000
Streetlights for 3 km internal roads	3 km	17,82,000
Fire safety system	1	19,50,000
Signage	39	19,500
Total cost:		**13,58,36,500**

The external infrastructure of the park needs some improvements. The park needs road connectivity improvement to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 3 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Jalefa: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 3km-long underground feeder line to connect the existing substation to the main grid	3 Kms	1,20,00,000
Construction of a 2km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to NH-8	2 kms	8,00,00,000
Total cost:		**14,20,00,000**

The Jalefa park will benefit from its focus on food processing as the sector is export oriented. Its location, in Sabroom, will give it access to the Chattogram port in Bangladesh via the Maitri Setu, enabling access not only to markets in Bangladesh but in the larger South Asian region as well. Further, paddy, pineapple, jackfruit, banana, nuts, and mango are widely cultivated in the district. Access to these fruits too will help the expansion of food processing at the park.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at Jalefa is expected to be restricted to food processing, and as the waste generated by such units is organic, capital expenditure towards solid waste management has not been assumed.

Since food processing has been identified as the park's priority sector, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as cold storage, dry warehousing, and a gender inclusive food processing training centre are proposed for development in the park. As identified in Chapter 5, a cold storage of 110 MT per acre leading to an overall cold storage requirement of 4,300 MT is being proposed. Besides this, similar benchmarking suggests development of 400 MT of dry warehousing for each acre of allottable land, hence 16,000 MT of dry warehousing has been proposed. The infrastructure needed for this includes –

Identified Additional Infrastructure Projects	**Specifications**	**Cost in INR**
Development of a cold storage facility with a capacity of 4,300 MT	4,300 MT	4,30,00,000
Development of a dry warehousing facility with a capacity of 16,000 MT	16,000 MT	3,20,00,000
Food Processing Training Centre	A gender inclusive FPTC with facilities for imparting training on post-harvest handling, preservation and specifically processing is required.	35,00,000
Total cost:		**7,85,00,000**

Considering its locational advantages and its high growth potential, it is recommended that the Jalefa IIDC be developed as a 'smart industrial park as has been discussed in Section 6.2.4. The estimated costs for the infrastructural requirements for the same are tabulated below—

Smart Infrastructure Required	Cost in INR
ICT network	15,00,000
Climate resilient utility corridors	7,50,00,000
Common facilitation centre	20,00,00,000
Public transport	4,00,000
SCADA	10,00,00,000
Total cost	**37,69,00,000**

b. **Sonamukhi Industrial Area**: The basic details of the park are as follows-

Description	Details
Landowner	TIDC
Land Use	Land use conversion has been done

The gap analysis of infrastructural needs of the industrial park reveals that the park needs a 15-km-long boundary wall, an internal road network of 14 km, and 20 CCTVs. Aside from this, to provide water to industrial units, it needs a water supply network and a pipeline of 15 km. To meet power supply requirements, eight (8) additional electric stations and a 15 km power line must be developed. One ETP and STP each may be developed to treat wastewater. In the case of the ETP, since food processing is the priority sector identified for Sonamukhi, it is estimated that the requirement of ETP will not be significant. Further since all the units in the park may not be requiring ETP facilities as industries involved in primary processing may not require such facilities. Hence it is being assumed that only 50% of the tenants will require ETP facilities. A 15 km drainage system is needed as well. Land development and filling is urgently required to create contiguous land parcels within the premises. As the Sonamukhi park covers a large area, water tanks with a total capacity of 5,00,000 litres have been proposed. However, during the site visit, as this is a greenfield project, the team was unable to access to the proposed sight. Thus, the land development cost has not yet been estimated. As the total allottable area is yet to be determined, the number of signboards required, and the cost of a fire safety system has not been estimated.

The table below provides further information on these needs-

IIDC Sonamukhi: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 15 km long compound wall	15 km	2,02,50,000

IIDC Sonamukhi: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 15 km intermediate carriageway of 5.5 m width	15 km	26,25,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of two overhead water tanks with a capacity of 1 Lakh litres each, and two underground tanks with a capacity of 1.5 Lakh litres each.	5,00,000 litres	3,60,00,000
Installation of 15 km electric lines	15 km	1,08,00,000
Installation of 8 additional 11 kV electric stations	8	1,84,00,000
Development of a 32 KLD sewage treatment plant	32	6,40,000
Installation of 20 CCTVs	20	25,000
Installation of 15 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	15 km	2,10,00,000
Construction a 15 km drainage system	15 km	2,40,00,000
Development of a 1,050 KLD effluent treatment plant	1,050 KLD	1,05,00,000
Land development and filling of 130 acres	130 acres	52,00,00,000
Streetlights for 15 km internal roads	15 km	89,10,000
Fire safety system	1	65,00,000
Signage	130	65,000
Total cost:		**94,95,90,000**

The external infrastructure of the park needs improvements. The park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 3 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

Sonamukhi Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	45,00,000
Total cost:		**5,45,00,000**

The Sonamukhi park will be developed as a food processing focused park. As identified in Chapter 5, a cold storage of 110 MT per acre leading to an overall cold storage requirement of 36,000 MT is being proposed. Besides this, similar benchmarking suggests development of 1,30,000 MT of dry warehousing for each acre of allottable land, hence 1,30,000 MT of dry warehousing has been proposed.

Further, based on the benchmarking in Chapter 5 and the study of other similar food processing parks in India, it has been found that truck terminals have been identified as one of the key infrastructure requirements for the food processing sector. This is because such terminals ensure the efficient transportation of raw materials for processing, essential to retaining their freshness during transportation. Thus, as Sonamukhi is being developed as a mega food park, a truck terminal is being proposed for this park as well. Apart from this, a gender inclusive food processing training centre and a food testing lab have also been identified as additional sector-specific infrastructure that will be required at the park.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at Sonamukhi is expected to be restricted to food processing-based, and as the waste generated by such units is organic, capital expenditure towards solid waste management has not been assumed.

The following table outlines some required additional infrastructure needed by the park in order to do so –

Identified Additional Infrastructure Projects	**Specifications**	**Cost in INR**
Development of a cold storage facility with a capacity of 36,000 MT	36,000 MT	36,00,00,000
Development of a dry warehousing facility with a capacity of 1,30,000 MT	1,30,000 MT	26,00,00,000
Truck Terminal	A truck terminal that houses a truckers' amenity centre is required in the park.	25,00,000
Food Testing Lab	A lab that will help meet quality control requirements both for raw material as well as end products is needed.	4,00,00,000
Food Processing Training Centre	A gender inclusive FPTC with facilities for imparting training on post-harvest handling, preservation and specifically processing is required.	35,00,000
Total cost:		**66,60,00,000**

c. **IIDC Lalchari**: The park has entered the first phase of development, and hence does not require land development and land filling. The basic details of the park are as follows –

Description	Details
Landowner	TIDC
Land Use	Land use conversion has been done

To fulfil infrastructural needs of industrial needs, the park needs a water supply network with main line pipes of 6 inches or 150 mm diameters, 8 11 kV power substations. It also needs an STP and an ETP. It has been estimated that 5 KLD of water is required on a per acre basis for industrial use in the park as per benchmarks identified in Chapter 5. Considering a total allottable area of 52.14 acres and considering effluent generation of 80% of water allotted for industrial use, the required ETP capacity for the park is 340 KLD. Assuming sewage generation is 80% of non-industrial water use, the STP capacity has been identified as 5 KLD. To ensure the park's security, 20 CCTVs must be installed on the premises. In order to comply with prevalent safety norms, a fire safety system is also needed. Finally, signboards to direct movement have to be installed as well. The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park -

IIDC Lalchari: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 10 km long compound wall	10 km	1,35,00,000
Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	7,00,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	3,15,00,000
Installation of 5 km electric lines	5 km	36,00,000
Installation of 8 additional 11 kV electric stations	8	1,84,00,000
Development of a 5 KLD sewage treatment plant	5 KLD	1,00,000
Installation of 20 CCTVs	20	25,000
Installation of 5 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	5 km	70,00,000
Construction a 5 km drainage system	5 km	90,00,000

IIDC Lalchari: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Development of a 340 KLD effluent treatment plant	340 KLD	3,40,00,000
Land development and filling of 25 acres	25 acres	10,00,00,000
Streetlights for 4 km internal roads	4 km	23,76,000
Fire safety system	1	26,00,000
Signage	52	26,000
Total cost:		**30,21,27,000**

The external infrastructure of the park needs some improvements. The park needs road connectivity improvement to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 3 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Lalchari: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	45,00,000
Construction of a 5 km-long dual lane external road with a width of 7.5 metres between industrial park road and Ambassa- Kamalpur road	5 kms	20,00,00,000
Total cost:		**25,45,00,000**

The Lalchari park could prioritise food processing as it will easily be able to access raw materials like jackfruit due to its proximity to key jackfruit producing regions. Apart from jackfruit, orange, pineapple, banana, lemon, Areca-nut, and mango are also grown in the district which can be sourced for processing. Besides catering to water, power, and connectivity requirements, the Lalchari park requires sector-specific infrastructure as well. Since food processing has been identified as the park's priority sector, based on the benchmarking in Chapter 5, additional such sector specific good to have infrastructure such as cold storage, dry warehousing, and a gender inclusive food processing training centre are proposed for development in the park.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at

Lalchari is expected to be restricted to food processing, and as the waste generated by such units is organic, capital expenditure towards solid waste management has not been assumed.

As identified in Chapter 5, a cold storage of 110 MT per acre leading to an overall cold storage requirement of 5730 MT is being proposed. Besides this, similar benchmarking suggests development of 400 MT of dry warehousing for each acre of allottable land, hence 20,850 MT of dry warehousing has been proposed. The additional infrastructure needs for this are listed below.

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a cold storage facility with a capacity of 5,700 MT	5,700 MT	5,70,00,000
Development of a dry warehousing facility with a capacity of 20,850 MT	20,850 MT	4,17,00,000
Food Processing Training Centre	A gender inclusive FPTC with facilities for imparting training on post-harvest handling, preservation and specifically processing is required.	35,00,000
Total additional infrastructure cost		**10,22,00,000**

d. **Bijoypur Industrial Area:** The basic details of the park are as follows –

Description	Details
Landowner	TIDC
Land Use	Land use conversion has been done

Before the development of internal infrastructure, land development and filling activities at the Bijoypur Industrial Area need to be completed. Following this, a 11-km-long boundary wall and an internal road network of 10 km must be developed. For security purposes, the park premises could have 10 CCTVs. To provide water access to industries, a water supply network and pipelines of 10 km are required while for power supply, three (3) additional electric stations and electric lines of 10 km are essential. For the processing of industrial refuse, an STP and ETP each may be constructed. For better safety outcomes on the premises, the installation of a fire safety system is also recommended. Additionally, a drainage system of 10 km is needed and 89 signboards are also required across the premises.

The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park -

IIDC Bijoypur: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 11 km long compound wall	11 km	1,48,50,000
Construction of a 10 km intermediate carriageway of 5.5 m width	10 km	17,50,00,000
Installation of a water supply network.	1	1,00,00,000

IIDC Bijoypur: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	3,15,00,000
Installation of 10 km electric lines	10 km	72,00,000
Installation of 3 additional 11 kV electric stations	3	69,00,000
Development of a sewage treatment plant with a capacity of 9 KLD	9 KLD	1,80,000
Installation of 20 CCTVs	20	25,000
Installation of 10 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	10 km	1,40,00,000
Construction a 9 km drainage system	9 km	1,44,00,000
Development of an effluent treatment plan with a capacity of 310 KLD	310 KLD	3,10,00,000
Land development and filling of 89 acres	89 acres	35,78,00,000
Streetlights for 10 km internal roads	10 km	59,40,000
Fire safety system	1	44,50,000
Signage	89	44,500
Total cost:		**67,32,89,500**

The external infrastructure of the park needs some improvements. External road development of 12 kms is being proposed for improve connectivity to nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 12 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Bijoypur: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Construction of a 12 km-long dual lane external road with a width of 7.5 metres between the gate of the industrial park and NH-8	12 kms	48,00,00,000
Installation of a 12 km feeder line to connect the existing substation to the main grid	12 Kms	1,80,00,000
Total cost:		**54,80,00,000**

It will be advantageous for the Bijoypur park to focus on the food processing sector as the sector is an export-oriented one. It's location in South Tripura makes access to the Chattogram port in Bangladesh via the Maitri Setu easier. Further, paddy, pineapple, jackfruit, banana, nuts, and mango are widely cultivated in the district, enabling unhindered access to the raw materials necessary for food processing. South Tripura has some edible wild plants whose growth is largely restricted to this region, namely passionfruit, which is used to make squash and preserves, and the Harabari plant whose fruit is used in pickles. Access to these fruits may be beneficial to the expansion of food processing as well.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at Bijoypur is expected to be restricted to food processing, and as the waste generated by such units is organic, capital expenditure towards solid waste management has not been assumed.

As mentioned before, food processing has been identified as the park's priority sector. Thus, based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as cold storage, dry warehousing, and a gender inclusive food processing training centre have been proposed for development in the park. As the industrial estate in Lalchari is being developed to support the food processing sector, it will not need a separate solid waste management system. As the refuse generated during food processing is organic, it does not need to be treated. Further, once the park becomes operational, the municipality will provide waste collection and disposal services. The solid waste generated in operational industrial estates across the state is currently collected at certain pre-decided spots across park premises from where it is picked up by the municipality. It is then dumped into landfills. The same system will enable the disposal of industrial solid waste.

As identified in Chapter 5, a cold storage of 110 MT per acre leading to an overall cold storage requirement of 8,900 MT is being proposed. Besides this, similar benchmarking suggests development of 400 MT of dry warehousing for each acre of allottable land, hence 35,600 MT of dry warehousing has been proposed. Details of the additional infrastructure required to support the food processing sector are listed below.

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a cold storage facility with a capacity of 8,900 MT	8,900 MT	8,90,00,000
Development of a dry warehousing facility with a capacity of 35,600 MT	35,600 MT	7,12,00,000

Food Processing Training Centre	A gender inclusive FPTC with facilities for imparting training on post-harvest handling, preservation and specifically processing is required.	35,00,000
		16,37,00,000

6.2.2. Rubber Sector-focused Industrial Parks

a. **IIDC Nagicherra**: The basic details of the park are as follows-

Description	Details
Landowner	Land is currently owned by third party individual
Land Use	Land conversion is to be done post-acquisition

The Nagicherra Park needs to undertake land development and filling activities to create allottable land parcels. Internal infrastructure needs that need to be met include the development of a 1 km boundary wall and internal roads, a water supply network, power supply networks, a 2-km-long drainage system, two STPs, and CCTVs for security purposes. Aside from this, the park requires warehousing facilities for efficient storage of raw materials and manufactured goods. It could also develop an external road which is critical for transportation of raw materials and marketable goods. Nagicherra, unlike other parks, does not require an ETP as it is expected that only non-polluting industries will function out of the park. Further, limited land availability is also a barrier to the construction of one. However, an STP is needed. Assuming sewage generation is 80% of non-industrial water use, the required STP capacity has been identified as 10 KLD. Also, a fire safety system as well as signboards are required as well.

The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park -

IIDC Nagicherra: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 4 km long compound wall	4 km	54,00,000
Construction of a 2 km intermediate carriageway of 5.5 m width	2 km	3,50,00,000
Installation of a water supply network.	1	1,00,00,000
Installation of two overhead water tanks with a capacity of 1 Lakh litres each	2,00,000 Litres	90,00,000
Installation of 2 km electric lines	2 km	14,40,000
Installation of 3 additional 11 kV electric stations	3	69,00,000
Development of a 10 KLD sewage treatment plant	10 KLD	20,00,000

IIDC Nagicherra: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Iron removal plant with a capacity of 1000 LPH	1 unit	50,000
Installation of 20 CCTVs	20	25,000
Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	2 km	28,00,000
Construction a 2 km drainage system	2 km	32,00,000
Land development and filling of 19 acres	19 acres	7,44,00,000
Streetlights for 2 km internal roads	2 km	11,88,000
Fire safety system	1	9,50,000
Signage	19	9,500
Total cost:		**15,23,62,500**

The external infrastructure of the park needs some improvements. The park needs road connectivity improvement to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 5 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Nagicherra: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Installation of a 5 km feeder line to connect the existing substation to the main grid	5 Kms	75,00,000
Construction of a 3 km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to NH-8	3 kms	12,00,00,000
Total cost:		**17,75,00,000**

Nagicherra's closeness to Agartala makes the park suitable for rubber production. The park has easy access to markets across the country. Further, its location, in West Tripura district, will allow it to access natural rubber easily as West Tripura accounts for 40% of the total area under natural rubber cultivation in the state. The

presence of a Horticultural Research Centre in Nagicherra makes the site viable for rubber production as it will be able to benefit from the centre's expertise in plantation crops.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at Nagicherra is expected to be restricted to rubber, and as the waste generated by such units will be nonpolluting in the short to medium term, capital expenditure towards solid waste management has not been assumed.

Based on the benchmarking in Chapter 5, additional sector specific good to have infrastructure such as testing facilities and dry warehousing are being proposed for development in the park to support the rubber sector. Benchmarking suggests the development of 400 MT of dry warehousing for each acre of allottable land, hence 7,400 MT of dry warehousing has been proposed. Among the additional infrastructure that the park needs for the rubber sector are –

Identified Additional Infrastructure Projects	Specifications	Cost in INR
Development of a dry warehousing facility with a capacity of 7,400 MT	7,400 MT	1,48,00,000
Testing Facilities for Rubber Products	Testing facilities for both chemical and physical testing) for all rubber /polymer products and facilities for their certification to any international standards are needed.	60,00,000
Total cost:		**2,08,00,000**

6.2.3. Bamboo Sector-focused Industrial Parks

a. **Kathalia Industrial Area**: The basic details of the park are as follows –

Description	Details
Landowner	TIDC
Land Use	Land use conversion has been done

After the completion of land and development and filling, the Kathalia Park requires a boundary wall of 6 km and internal roads covering 9 km. To fulfil water and power needs, it requires a water supply network and a 9 km pipeline as well as 3 additional electric stations and a 9 km-long electric line. To process industrial refuse, an ETP and an STP are needed. 10 CCTVs and a fire safety system are also needed. A 9km drainage system must be developed too. Further, the park requires 40 signboards.

The gap analysis has led to the following findings pertaining to infrastructural needs of the industrial park –

IIDC Kathalia: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Construction of a 6 km long compound wall	6 km	81,00,000
Construction of a 9 km intermediate carriageway of 5.5 m width	9 km	16,53,75,000

IIDC Kathalia: Critical Infrastructure		
Specifications	**Requirement**	**Cost in INR**
Installation of a water supply network.	1	1,00,00,000
Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	3,15,00,000
Installation of 9 km electric lines	9 km	68,04,000
Installation of 3 additional 11 kV electric stations	3	69,00,000
Development of a 4 KLD capacity sewage treatment plant	4 KLD	80,000
Installation of 20 CCTVs	20	25,000
Installation of 9 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	9 km	1,26,00,000
Construction a 9 km drainage system	9 km	1,44,00,000
Development of an effluent treatment plant with a capacity of 140 KLD	140 KLD	1,40,00,000
Land development and filling of 60 acres	60 acres	24,00,00,000
Streetlights for 9 km internal roads	9 km	53,46,000
Fire safety system	1	20,00,000
Signage	40	20,000
Total cost:		**51,71,50,000**

The external infrastructure of the park needs some improvements. The park is well connected to the nearest highway. There is no dedicated park level 33/11 KV substation. Hence a substation is proposed for development. Further the requirement of a feeder line segregation of 20 Kms has been assumed during discussions with the electricity department. Hence, the following necessary external infrastructure for the park.

IIDC Kathalia Industrial Area: Critical External Infrastructure		
Identified Infrastructure Projects	**Requirement**	**Cost in INR**
Installation of a 33 KV/11KV substation	1	5,00,00,000
Construction of a 4 km-long dual lane external road with a width of 7.5 metres between the gate of the industrial park and closest NH	4 kms	16,00,00,000
Installation of a 20 km feeder line to connect the existing substation to the main grid	20 Kms	3,00,00,000
Total cost:		**24,00,00,000**

Being in West Tripura, the park can focus on bamboo processing industries as its location allows it to access both regional and domestic markets easily. Further, there are two existent bamboo clusters run by the Tripura Bamboo Mission that produce aggarbattis in the district. This indicates the availability of both raw material and processing capacity. Benchmarking suggests a need for 400 MT of dry warehousing for each acre of allottable land. Hence, 4,400 MT of dry warehousing has been proposed for the park. Further, the development of a common facility for bamboo processing is also recommended.

Discussions with the TIDC and the tenants of operational industrial parks reveal that the waste generated in the parks is collected and deposited at specific sites within each park. The municipality then collects and processes this after which it is deposited into landfills. Owing to the existence of a solid waste disposal system for the state's industrial estates, such infrastructure has not been proposed. Further, as the profile of the industries at Kathalia is expected to be restricted to bamboo, and as the waste generated by such units is organic, capital expenditure towards solid waste management has not been assumed.

Some of the additional infrastructure required to support the rubber sector are listed below.

Identified Additional Infrastructure Projects	**Specifications**	**Cost in INR**
Development of a dry warehousing facility with a capacity of 4,400 MT	4,400 MT	4,40,00,000
Common Infrastructure for Bamboo Processing	Infrastructure for bamboo processing, including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant, could be developed.	1,50,00,000
Total cost:		**5,90,00,000**

6.2.4. "Smart Industrial Park" Infrastructure

The preceding section discusses the critical and additional requirements of the brownfield and greenfield industrial parks in Tripura. This section will examine certain "Smart Industrial Park" infrastructure that the parks could consider developing.

A smart industrial park uses ICT to improve every aspect of operations from efficiency to infrastructure that allows for fast internet speeds and connectivity. The recommendations for such infrastructure have been made based on the GoI's Department for Promotion of Industry and Internal Trade (DPIIT) Industrial Park Rating System (IPRS) parameters.

The IPRS was launched as a pilot exercise in 2018 with the objective of enhancing industrial infrastructure competitiveness and supporting policy development to enable industrialization across the country. This rating system was based on a framework that supported identification of enablers required for development of industrial infrastructure across the nominated parks in the country. The pilot rating framework was conceptualized across four pillars— internal infrastructure and utilities, external infrastructure and facilities, business support services, and environment and safety management. These pillars were divided into 34 parameters. 177 parks across 21 states were evaluated.

A more comprehensive framework, the IPRS 2.0, was launched in 2021. In Tripura, while two parks underwent self-evaluation, two others, the Bodhjungnagar Industrial Area and the R.K. Nagar Industrial Area, were selected for ranking. These two parks were ranked highly for their internal infrastructure availability. They ranked higher than the all-India averages in some fields. These included –

a. Provision of uninterrupted power supply
b. Provision of logistics infrastructure within park premises
c. Provides a commercial centre
d. Offers CCTV and other security systems
e. Has fully paved internal roads

Both parks were also ranked as being among the top performing parks within the NER on the basis of their business support facilities and environment, safety, and sustainability infrastructure. However, the rating system also helped in the identification of certain gaps, for instance, the inadequate provision of OFC connectivity to tenants. Based on the parameters of the IPRS, five areas requiring development or improvement have been identified –

i. **Provision of ICT facilities**: Existing research finds ICT infrastructure allows a business to function more efficiently and effectively, and to respond to customer needs promptly.[95] Further, ICT assists industries in several critical activities including design, manufacturing, R&D, and distribution and sales. The role played by ICT in industry makes its availability key to attracting investments. It is important, therefore, for parks to provide optical fiber cables connectivity to its tenants. While work to develop ICT availability has already begun in the Bodhjungnagar Park, similar work needs to be undertaken in other parks as well.

ii. **Development of climate resilient infrastructure**: As infrastructure networks are affected by the physical impacts of climate events, it is essential to build resilience to such impact. Ensuring that infrastructure is climate resilient helps in reducing direct losses as well as indirect costs of disruption in operation. Being a rain-prone region, Tripura too could benefit from developing such infrastructure.

Therefore, it could consider developing such infrastructure in the form of utility corridors. These are passages, underground or above ground, that carry utility lines such as electricity transmission, water supply pipes, and sewer pipes. They can also sometimes carry communications utilities like fiber optics. Parks in Tripura can develop such corridors that comprise junction boxes and covered trenches, carrying critical utility lines. Utility corridors could be provided up to the plot level to connect all utilities to the industry and avoiding as far as possible road damages.

Apart from being climate resilient, another major benefit of this is that utilities installation a single structure requires coordination which can help reduce the overall utility construction and installation time. This reduction in construction time can, in turn, reduce delay to the overall project and result in time and money savings for the parks.

iii. **Development of Common Facilitation Centres (CFCs)**: these refer to units providing a set of facilities for use by the industries within the parks. The DPIIT states that under broader support services, the parks could develop CFCs that accommodates various business facilitating services, including testing labs, certification centres, conference venues, and auditoriums. As such services are critical in supporting business activities, the provision of these will make Tripura's parks more attractive to investors.

[95] Information and Communication Technology in Business, Beirut Arab University.

Further, CFCs can have gender inclusive training centres. This will help in increasing women's participation in the state's workforce. A few ways in which training and skilling centres can cater to women's specific needs include—

a. Ensuring provision of separate male/female toilets at skilling and training centres
b. Providing childcare facilities (like creches) for working mothers
c. Developing gender-segregated training spaces
d. Offering training sessions with flexible timings of to help women accommodate the sessions into their schedules
e. Improving accessibility by providing safe transport to and from the training location as this has been seen to be a significant barrier to the uptake of training programmes among women.[96]

iv. **Public transport facilities**: Interconnected internal pedestrian and public transportation networks are an essential part of the external infrastructure of industrial parks as they improve connectivity to the parks. It is important that parks have such public transport linkages to facilitate easy workforce movement that is affordable. Studies have found that workers increasingly consider the availability of convenient public transportation options an added benefit for selecting one place of employment over another.[97] This is especially so when the place of work is far from city centres. Apart from improving connectivity, such facilities can also help parks take a step towards sustainability— the importance of such facilities is reiterated by its inclusion in the German Agency for International Cooperation's parameters for a sustainable park.[98] Parks in Tripura too can consider developing public transportation networks.

While developing public transport facilities, it is important to also take steps to create **gender inclusive transportation facilities**. This will help women access workspaces more easily. Some ways to achieve this are-

a. Designing public transport infrastructure with gender-responsive features like the provision of separate male/female toilets and larger capacity female toilets at stations
b. Establishing public transport schedules and pricing systems that respond to the needs of women users, including affordable ticketing for off-peak, multiple trips, and group travellers
c. Developing dedicated waiting spaces for women on platforms, bus stations
d. Providing women-only carriages
e. Developing well-lit and easily accessible pick up and drop off points, secured with CCTVs.

v. **Use of SCADA (Supervisory Control and Data Acquisition) systems in park operation and management**: To enable smooth park operation and maintenance, it is essential for industrial parks to monitor the utilities and facilities provided by them. The use SCADA systems make this process efficient and easier. The system comprises both hardware and software that facilitate data capture within industrial processes by connecting sensors that monitor equipment such as motors, pumps, and valves, to an onsite or remote server. SCADA systems will therefore not only allow the parks to provide high quality infrastructure over a long period but also allow for monitoring from multiple locations, making the process more convenient and efficient.

Apart from incentivizing investment in industrial parks through fiscal tools, it is critical to also provide enabling infrastructures to attract continued investments. Besides, higher rankings through compliance with the IPRS parameters will in themselves give parks a competitive edge over those with lower rankings.

In Tripura, the following industrial parks may be considered for development as smart industrial parks-

- Bodhjungnagar
- R.K. Nagar and
- IIDC Jalefa.

[96] Gender and skills development, UNESCO (2012).
[97] Public Transportation: A Key to Solving the Labor Crisis?, Colliers (2019).
[98] Planning for Sustainable Industrial Parks: environmental quality, technical quality, economic & social quality, GIZ and Indo-German Environment Partnership (2015).

The table below summarizes the infrastructure which can be developed to make the above parks smart industrial parks.

Identified Smart Infrastructure Projects
ICT network - Laying of optical fibre network in the park. The TIDC highlighted that an optical fibre network has already been laid in the Bodhjungnagar Industrial Area. This can be developed for the other two parks as well.
Developing climate resilient infrastructure: Climate resilient infrastructure can be developed by building utility corridors that contain water distribution mains, sewer lines, telecommunication lines, and electrical cabling. As such corridors are often underground, they can help reduce direct losses as well as indirect costs of disruptions in operation that are caused by weather events.
Common facilitation centres: infrastructure like testing laboratories, facilities for cleaning, grading, sorting, and packing, dry warehouses, specialized storage facilities, and cold storage units will be set up. The CFCs can also house gender inclusive training centres as this will help in increasing women's participation in the state's workforce.
Public transport facilities: linkages with public transport networks for worker mobility will be set up. It is important to also take steps to create **gender inclusive transportation facilities**. This will help women access workspaces more easily.
SCADA: systems to ease operation and monitoring to be implemented.

Based on the infrastructure identified in the discussion above, the cost of developing the same in the Bodhjungnagar, R.K Nagar, and Jalefa industrial estates has been estimated in the table below —

Table 20: Smart Infrastructure costing across 3 parks

Smart Infrastructure Required	Name of Park	Cost in INR
ICT network	Bodhjungnagar	An optical fibre network has already been developed by BSNL.
	R.K Nagar	50,00,000
	Jalefa	15,00,000
Climate resilient utility corridors	Bodhjungnagar	25,00,00,000
	R.K Nagar	25,00,00,000
	Jalefa	7,50,00,000
Common facilitation centre	Bodhjungnagar	20,00,00,000
	R.K Nagar	20,00,00,000

	Jalefa	20,00,00,000
Public transport	Bodhjungnagar	4,00,000
	R.K Nagar	4,00,000
	Jalefa	4,00,000
SCADA	Bodhjungnagar	10,00,00,000
	R.K Nagar	10,00,00,000
	Jalefa	10,00,00,000
Total Cost		**148,27,00,000**

7. Network Infrastructure & Logistics

7. Network Infrastructure & Logistics

Need for logistics park:

In addition to infrastructure requirements, logistics plays a huge role in the development and growth of priority sectors. In India, 13% of the total price of goods is attributed to logistics as compared to 8% in developed countries. To bridge this gap and increase the profits for manufacturers, a multi modal logistics park is essential.

Within Tripura, a land parcel near the Maitri Setu, in Sabroom, South Tripura district, is being looked at for the development of an 80-acre logistics park. There is also a proposed Land Port being developed at Sabroom (near Jalefa) which will help in faster processing of exports.

Sabroom is an ideal location for such a park. As the ADB's report on the proposed park, '**Feasibility Study of the Multimodal Logistics Park in Sabroom (Tripura)**', points out, the region has the locational advantage of having the shortest and the most direct link to Bangladesh's Chattogram port. In terms of connectivity with the rest of Tripura and the other states of the NER, the proposed MMLP site is connected to a highway via a two-lane district road. It is located adjacent to the Maitri Setu across the Feni River. However, as it is distant from the SEZ (~4 km away), a proposal for a rail connection is currently under consideration. The Sabroom railway station is ~3 km away from the site. However, the elevation profile between the two locations will present alignment and terrain challenges that could make developing a rail link a challenge.

The park aims to create a one stop solution for all the logistic and warehousing solutions for the Northeast's trade with Bangladesh. Based on existing industrial areas in South Tripura, the processing area is ~ 45% of the total area.

The drivers pointing towards the need of logistic park are as follows -

Trade Potential – NER's land connectivity to the rest of India is only through the narrow stretch of the Siliguri Corridor, also known as the "Chicken's Neck". The movement of goods from Haldia port of West Bengal through the Chattogram Port in Bangladesh presents an alternate trade route between the NER and the rest of India. Further, India has signed several bilateral free trade agreements— including the India–Singapore Comprehensive Economic Cooperation Agreement (CECA) and India–ASEAN Free Trade Agreement, among others— where cooperation around trade facilitation measures is as important as around tariff measures. India is also part of several regional and multilateral arrangements in South and Southeast Asia, and is a member of SASEC, which looks at strengthening trade connectivity between the NER and Bangladesh, Bhutan, Nepal, and Myanmar as a key priority[99].

Cost saving potential in mainland trade – The road connectivity between Agartala and Kolkata is approximately 1500 kms. While connectivity between the Chattogram port to the Haldia port is approximately 338 nm. Further, Agartala is connected to Chattogram port through the Maitri Setu bridge at a distance of ~200 kms. The transportation by road requires a transportation time of 8-10 days and a transportation cost of Tk 7,200 -8000 per ton while the same being transported through Chattogram port will take a time of 5 days at a transportation cost of Tk 5,700 to 6,600[100]. Hence, this could lead to a huge saving in time as well as a cost reduction of approximately 8-20%.

Scope for value addition with enhanced access to raw materials – Most of the raw materials available in Tripura are being traded as unprocessed goods. The value chain analysis in the Industrial Strategy report also highlighted the scope for value addition in the processing of natural resources such as pineapple, jackfruit, bamboo, and rubber. With improved trade connectivity and reduced transportation costs, the products manufactured in Tripura will be competitive in international and national markets, increasing the scope for manufacturing in the region. The logistics park's development will further enhance the trading potential and also provide cost advantages in the region.

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[99] Under ADB's auspices, the SASEC program brings together Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, and Sri Lanka in a project-based partnership to strengthen regional integration by improving cross-border infrastructure connectivity for transport and energy, and facilitating faster and less costly trade among member countries.

[100] https://indiashippingnews.com/chittagong-port-can-be-a-transshipment-hub-for-northeast-india/

Increasing market access to other NER states – As per the NEEC report, to enhance trade and market connectivity and to improve regional connectivity within the NER region, various road and connectivity projects have been identified. The Sabroom region is connected to Agartala, Silchar, Guwahati, other towns in Assam, and the rest of India by NH 8. Further, the report also identifies upgradation of support networks which includes SH4 connecting Agartala to Sabroom via Sonamura and Belonia, the road connecting Amarpur and Sonamura via Udaipur, NH 108 between Manu and Simlung (border with Mizoram), and NH 208 between Kumarghat and border with Tripura.

There are a few key considerations that are to be considered for success of a logistic park

1. Freight Aggregation and Distribution

As shipping of smaller quantities of goods increases the overall cost of transportation, a need for aggregation can be seen. Small trucks collect local produce of goods and raw material and transport them to the nearby multi modal logistic park. From here the aggregated goods are delivered to logistic parks in various states and distributed to local manufacturers/ vendors accordingly.

2. Integrated Solutions and Value-Added Services

The services provided by multi modal logistic park are as follows –

a. **Core Logistic Services** – Services like warehousing, cargo aggregation and freight transportation services.

b. Value Added Services – Custom clearances, sorting, packaging, re packaging, IT services and assembling etc

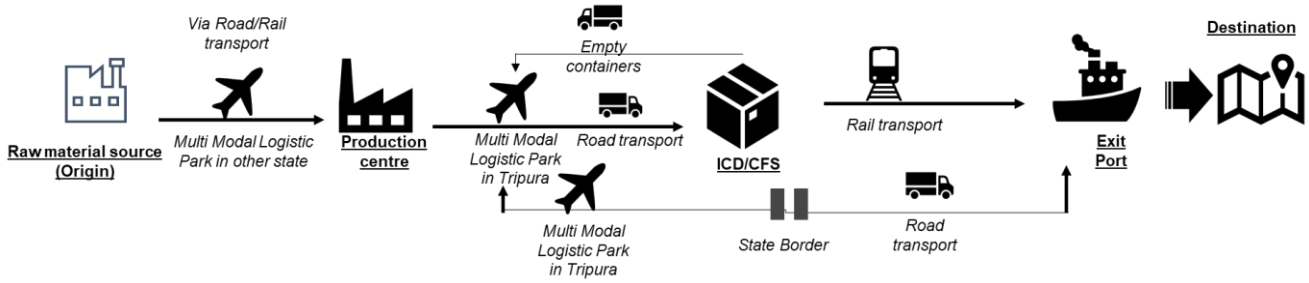
c. Support Services – Parking, Office Spaces, O&M services for trucks

3. Multi Modal Transport

Logistics parks with road and rail connectivity enable multimodal freight transportation. This aids freight transportation to shift from road to rail and waterways (wherever possible), thereby reducing the overall freight cost.

The logistics park will connect Tripura to other logistic hubs in India and will make it a one stop shop for all logistic related solutions.

Figure 13: Complete logistic solutions provided by multi modal logistic park



The logistics park will have various benefits for manufacturers, exporters, and consumers. Listed below are some of these benefits.

1. Reduction in transportation costs

The logistics park can reduce the overall transportation costs by ~10% by utilizing larger trucks which cost ~60% less and can leverage railway connectivity and transportation mode switching between roads, railways, and waterways. Railways would be preferred whenever possible as they cost ~45% less than roadways.

2. Reduction of congestion

Increased use of larger sized trucks will lead to a reduction of ~20% of congestion and help in the smooth flow of goods.

3. Warehousing Cost reduction

Relocating the warehouses currently operating inside the city to nearby or inside the logistics park (to be provided on low rental basis) situated on the outskirts of the city which are equipped with modern state of the art facilities will drive down warehousing costs and losses in storage and handling.

4. Reduction of pollution

Railways produce ~65% less CO2 than roadways in transporting similar quantities of goods. Similarly, large trucks emit 12% less CO2 during the transportation of goods. These small steps taken will lead to overall environmental benefits for the state.

7.1. Benchmarking the Infrastructure requirements for logistics park

7.1.1. Infrastructure requirements

The successful running of logistics parks requires excellent and well-planned infrastructure facilities. The Nagpur Logistics Park India is situated 22 km away from the heart of the city. The park is well connected by road and rail and airways. Located on the Nagpur-Mumbai and Nagpur-Delhi National Highway, the park aims to provide customized focus services. Currently, the Ajni Railway station is being developed as a multimodal cargo hub for domestic and export cargo movement.

The infrastructure offerings of the Logistic park are as follows

a. Truck Parking Facilities
b. Compound Wall with Barbed Wire Fencing
c. Fire Safety Equipment i.e. Fire Hydrant & Sprinkler etc.
d. 24/7 Round the Clock Security
e. Complete Power up back through High Capacity Gensets
f. Translucent Sheet for Natural Lighting
g. Wind Turbo Ventilators
h. Waste Management
i. Water Tanks with 5 Lacs Capacity
j. Weigh Bridge with 80 Tons Capacity
k. Setup of New Warehouse/Office/MHEs etc. on Amortization/Rental Basis
l. Equipped Conference Room
m. Skill & Knowledge Development for Process Enhancement
n. Canteen for Employee and Workforce
o. Bus Facility for Staff
p. Yard Management

The service offerings of the Logistics Park are as follows.

Warehouse Management

The robust warehouse management system at the facility provides for –

a. Storage, Order processing and Handling
b. Cold storage for specialty goods
c. Flexi warehousing based on seasonal demands
d. Trimix flooring with high load bearing capacity

Transport Management

The transport management services include –

a. Complete primary secondary and last mile transit solutions
b. Provision of Hydras and Cranes
c. Readily available fleet with shipment track and trace facility
d. Reverse logistics for returned goods

Technological and Communication Management

The communicational provided by the park aim to track and manage the shipments efficiently and include the following services –

a. Dedicated Telephone lines /leased lines/RF/Broadband etc. for IT connectivity.
b. Transport Management System & GPS for vehicle tracking
c. Customized ERP Software/Hardware for complete logistics Operation
d. Warehouse management system as per customer's requirement
e. Bar-Coding and Hand-Held Terminals

Value Added Services

The value-added services take care of customers not only in terms of logistics but also the compliances and other parts of the product delivery. The services offered are as follows –

a. Statutory & Regulatory Compliance assistance
b. Prepacking /Repacking / Kitting / Branding / Export Packaging as per customer specifications.
c. Contract manufacturing with cost reduction in Primary Movement.
d. Internal audit, Safety Audit and quality systems for process improvement and Inventory management
e. Packing & Procurement Consumable Solutions
f. Implementation team for SOP standardization/New Projects
g. Export Packaging after Branding or Standardization

Considering only the basic infrastructural needs of the proposed logistics park. the costing for it has been determined as follows-

Infrastructure	Requirement	Cost in INR
Boundary Wall construction	9	1,21,50,000
Cold Storage (3000MT)	1	39,90,00,000
Warehousing (10000MT)	10000	2,00,00,000
Weigh Bridge (80 ton)	80	15,14,667
Land Development and Filling	37.8	22,68,00,000
Water Supply System	1	1,00,00,000
	Total Cost	**66,94,64,667**

Beyond considering the basic infrastructural needs of the proposed MMLP, it is also important to consider the recommendations mentioned in the ADB's feasibility report to successfully take advantage of the proposed developments in Agartala. ADB's recommendations can be divided into the following categories:

1. **Devising effective transportation solutions for the NER**: It is important to develop the overall transportation linkages within the NER to fully realise the benefits of the proposed MLP. In order to do this, it is important to expedite the implementation of the Agartala–Akhaura rail link, including the upgrading of all critical sections between Kolkata and Agartala. As part of this, direct freight services could be commissioned between Kolkata and the Nischintapur trans-shipment facility. This would reduce the distance, time, and cost of freight, thereby benefiting trade in the region. The entire cost of the project, including the rail line in Bangladesh, will be borne by the Government of India. The Ministry of Development of North Eastern Region is financing the work on the Indian side and executed by IRCON, while the Ministry of External Affairs (India) is financing the work on the Bangladeshi side, which will be executed by Texmaco Rail and Engineering Limited.

Further, there is a need to establish clear guidelines and protocols for the use of the rail link, rolling stock, tariffs, etc. for direct freight traffic (general cargo and containers) between Kolkata and Agartala. The metric 'average daily wagon target balance' used for daily monitoring of wagon status as per the 'Fundamental and Subsidiary Rules for Interchange of Traffic between India and Bangladesh' needs to be revised. Also, cargo moving through Bangladesh should be treated as domestic transit cargo passing through foreign territory (as in the case of the Inland Water Protocol between the two countries).

Finally, infrastructure facilities at the ICP in Agartala must be developed further. With the commissioning of the Agartala–Akhaura line, the rail is likely to act as a catalyst for the facilitation of trade and the development of the MMLP. This will require the development of rail-side handling infrastructure at the ICP along with investments in handling, storage, and value-added infrastructure. A capacity expansion of cargo handling facilities at the ICP is already being proposed.

2. **Short- to Medium-Term Developments in Agartala:** The study recognises the need for the development of logistics facilities at the International Check Point in Agartala. This ICP may be developed as the centre of logistics services in the short to medium term as demand swells to meet the minimum viability requirements of an MMLP. Such developments must be accompanied by technology and process improvements that ensure efficient handling and seamless cargo operations.

Further, there is a need to integrate other logistics infrastructure in Agartala with the ICP. For isntnace, integration of the ICP at Agartala with the cargo operations at Raja Bir Bikram Airport through a cross-border zone development program and improvement of airside/terminal infrastructure will also play a key role in meeting the needs of cargo users.

3. **Short- and Medium-Term Developments in Sabroom**: Logistics infrastructure at the Sabroom ICP should be developed. Considering that existing road freight traffic is preferentially routed through Chattogram port and Sabroom, the ICP needs to have facilities like truck parking yards, warehouses, automated weighing, gate management, and security systems, especially given the constraints of developing a multimodal logistics park in Sabroom.

Logistics infrastructure at the Sabroom ICP should be developed. Considering that existing road freight traffic is preferentially routed through Chattogram port and Sabroom, the ICP needs to have facilities like truck parking yards, warehouses, automated weighing, gate management, and security systems, especially given the constraints of developing a multimodal logistics park in Sabroom.

Further, ensuring cost and process efficiency of using the ICP in Sabroom is important. For this, the seamless flow of goods across the border must be ensured which, in turn, will happen since the Sabroom ICP is equipped with 24x7 power supply, computers, information and communication infrastructure to ensure the availability of Customs Electronic Data Interchange System. This infrastructure upgrade at the ICP needs to be complemented by similar systems and processes in Bangladesh as well.

In addition, the authorities in India and Bangladesh need to ensure that the fees charged during transit (including at border crossings) are moderate and do not significantly increase the overall cost of logistics for trade.

4. **Long-Term Developments in Agartala**: In the long term, a multimodal logistics park needs to be planned near Agartala, seamlessly connected to the rail link to Akhaura. This MMLP must be planned, keeping in mind

seamless integration with the ICP and the rail yard in Nischintapur, in Bangladesh. Provision of storage, warehousing, distribution, value-added services, and empty container services in conjunction with the rail transshipment facility at Nischintapur will ensure maximum value addition and cost efficiency. Apart from reducing logistics cost and providing direct benefits to the local economy, the above recommendations will also maximize the benefits of infrastructure projects already under implementation, such as the industrial centres at PIA, the Agartala–Akhaura rail link, and the Nischintapur transshipment facility.

8. Summary of Infrastructure Costing

8. Summary of Infrastructure Costing

Considering all the brownfield, green field, and logistic park development projects the cost of development is estimated to be ~974 crores with greenfield projects contributing to ~61% of the cost, brownfield costing ~32 % of the cost and the remaining is attributed to the development of logistic park. [101]

Table 21: Summary of infrastructure costing park wise

Parks	Total available area in acres	Total Internal infrastructure cost	Total External Infrastructure cost	Total Good to have and smart industrial park cost	Total Cost in Crore INR
Bodhjungnagar Industrial Area	74.0	28.5	1.5	69.4	~ 99.4
RK Nagar Industrial Park	77.4	30.0	6.5	63.4	~ 99.9
IIDC Sarasima	4.4	6.5	5.2	2.2	~ 13.9
IIDC Santirbazar	16.3	9.6 4	22.4	2.1	~ 34.1
Kumarghat Industrial Park	8.0	17.5	8.3	3.4	~ 29.2
IIDC Dewanpasa	22.0	14.8	15.5	8.0	~ 38.0
IIDC Dharmanagar	34.0	4.0	5.1	1.9	~ 11.0
A.D. Nagar	0	0.69	0	0	~ 0.69
Dhajanagar	1.56	0.69	0	0	~ 0.69
IIDC Jalefa	38.7	13.6	14.2	78.5	~ 73.3
IIDC Lalchari	20.8	30.2	25.5	10.2	~65.9
Sonamukhi Industrial Area	130	95.0	5.5	66.6	~ 167.0

[101] The costing for infrastructure has been done on thumb rule basis and a detailed assessment needs to be conducted prior to actual implementation of the individual projects.

Parks	Total available area in acres	Total Internal infrastructure cost	Total External Infrastructure cost	Total Good to have and smart industrial park cost	Total Cost in Crore INR
Nagicherra Industrial Area	18.6	15.2	17.8	2.0	~35.0
Kathalia Industrial Area	40.3	51.7	24.0	5.9	~ 81.6
Bijoypur Industrial Area	89.5	67.3	54.8	16.4	~138.5
Logistics Park in Sabroom	80.0	-	-	-	~ 67
Overall Costs					**~955**

While the table above highlights the overall cost of developing each park, the table below provides the total cost of each identified critical infrastructure project.

Table 22: Summary of project-wise infrastructure costing

Identified Internal Infrastructure Project	Costing Description	Total Cost in Crore INR
Boundary wall construction	INR 13,50,000/km	~8.0
Internal road construction	INR 1,75,00,000/km	~104
Drainage	INR 16,00,000/km	~10
Water supply network	INR 1,00,00,000/unit	~12
Water pipeline	INR 14,00,000/km	~9
ETP	INR 1,00,000/KLD	~26
STP	INR 20,000/KLD	~1
Overhead and underground water tanks	INR 45,00,000 to INR 90,00,000/unit	~.20
Electric substation	INR 23,00,000/substation	~11
Gas supply line	INR 5,00,00,000/kms	~15
Electric line	INR 7,20,000/km	~5

CCTVs	INR 1250/unit	~0.03
Streetlights	INR 18,000/unit	~3
Land development and filling costs	INR 40,00,000/km	~130
Cold storage	INR 10,000/MT	~67
Warehousing	INR 2,000/MT	~67
Identified External Infrastructure Project	**Costing Description**	**Total Cost in Crore INR**
Feeder line	Feeder line	~12
External two-lane road of 7.5 m width	INR 4,00,00,000/km	~134
33Kv/11 KV substation	INR 5,00,00,000/unit	~60
Fire safety system (including reserve tank, hydrants, and pumps)	INR 50,000/acre	~3
Signage	INR 500/unit	~0.02
Identified Good to have and smart industrial park projects	**Costing Description**	**Total Cost in Crore INR**
Climate resilient utility corridors	3 industrial parks	~58
Common facilitation centre	3 parks	~60
Public transport	4,00,000 per park	~0.12
SCADA	INR 10 crores per park	~30
Testing Facilities for Rubber Products	INR 60,00,000 per center	~3
Common Infrastructure for Bamboo Processing	INR 1.5 Crores per park	~6
Food Processing Training Centre	INR 35 lakhs per park	~2
Others including logistics park	-	~99
Overall Costs		**~ 955**

9. Phasing and Action Plan

9. Phasing and Action Plan

In the section above, the infrastructure needed for the development of the of the priority sectors in each park in Tripura have been identified. Since industrial demand in the region is phased out over a period of 15 years, the phasing of land parcel development too be based on rising industrial demand. Hence, considering the overall requirement, the industrial development phasing of these projects has been divided into three main stages. The framework on which the phasing is based is based on the factors explained below.

Typically, to attract investments to industrial parks, it is crucial to develop critical and 'good-to-have' infrastructure. The infrastructural interventions required across Tripura's industrial parks have been presented in detail in the preceding section. They have been classified into critical internal and external infrastructure and good-to-have infrastructure, which includes some sector specific needs-

a. Critical infrastructure refers to the infrastructure that is most vital for the functioning of industrial units in the parks. Examples of internal infrastructure include power and water supply, trunk infrastructure like streetlighting and industrial sheds, and ETPs and STPs, while external roads and feeder lines are examples of critical external infrastructure.

b. Good-to-have infrastructure is needed once the critical internal and external infrastructure of a park has been fully developed. Such infrastructure acts to further facilitates the operation of industry in a location and includes business support services like ICT infrastructure, gender inclusive skill development centres, and common facilitation centres (CFCs) that accommodate various business support services (such as testing labs, certification centres, conference venues, auditoriums etc.).

The sector-specific good-to -have infrastructure has been identified based on the benchmarking discussed in Section 5.

While the infrastructure needs listed above are all required to make parks investment ready, considering real-world financial and resource-based constraints, it is important to make targeted infrastructure investments that maximise value while also ensuring financial sustainability. The phasing of industrial park development in Tripura has been planned with these considerations in mind. The phasing plan is based on the following two parameters –

a. **Criticality of the infrastructure:** as can be seen from the categorisations of the necessary infrastructure presented above, the development and provision of some infrastructure needs to be prioritised. This includes all internal and external infrastructure, such as roads, boundary walls, CCTV installations, water and power supply, and waste treatment plants (ETPs and STPs), as these are the most urgently needed to attract investments and support industrial operations. Alongside these, some sector-specific infrastructure, like cold storage facilities and warehousing units, need to be developed as well as these will enable the development of identified priority sectors such as food processing.

Other 'good-to-have' infrastructure can be developed as investor interest in the parks swell. These fulfil various secondary considerations of investors as they act to facilitate business operations. However, they should ideally be developed after the more basic needs of industries in the parks have been fulfilled.

Besides catering to these infrastructural requirements, some parks can also be developed into "Smart Industrial Parks". The infrastructural interventions needed to do this may be pursued after all the other more urgently required infrastructure has been fully developed.

The phasing of infrastructure development, therefore, should be based on the centrality of the projects in supporting the parks' financial sustainability. The more basic infrastructure should be developed as a priority, while other infrastructure can be developed later, as the parks begin to develop and attract more investors.

b. **Current level of development in the parks:**

There are 11 brownfield industrial parks in Tripura. The total area available for allotment in these parks is ~200 acres. It has been observed that in most of these, the basic internal infrastructure is well developed. The development of these parks could be prioritised as there are large parcels of land available for allotment and

the TIDC has already made significant investments in such parks. Further, the development or improvement of any remaining basic infrastructure could be undertaken in the initial phase as the time and investment required to make these parks investor ready is minimal when compared with the relatively undeveloped greenfield parks in the state.

The lack of 'good-to-have' and sector-specific infrastructure in brownfield parks can be addressed once the critical needs have been met.

After completing development of all brownfield industrial parks, greenfield parks which are not yet operational, but which have already attracted partial investments and strategically important projects, such as logistics parks. will be prioritised for the development of critical as well as sector-specific infrastructure.

Finally, any remaining greenfield projects will be taken up for development based on various factors such as park size, land acquisition status, land use change status, acquisition of environmental clearances. Considering the sensitive nature of the region, priority will be given to large parks where land acquisition is complete, and all clearances have been obtained.

1	Brownfield parks to be given preference
2	Location of the Park - Parks situated in districts where investors find it more attractive / Strategically important parks
3	Parks which are not operational but are under development
4	Parks where land acqusition is complete and clearances have been obtained
5	Greenfield parks which are strategically important
6	Greenfield parks which have larger in size
7	Projects identfied as good to have infrastructure in each industrial park

Based on the framework outlined above, the phasing plan for industrial development is shown in the table below. The plan has three clear phases –

a. Phase I (1-3 years): Parks which are brownfield in nature, located in high output districts and parks which are not operational but already under development, will be prioritized. The critical infrastructure, both internal and external, in these parks will be developed or improved. Warehousing and cold storage facilities, where absent, will also be developed.

Further, considering the growth potential of the Jalefa park, it will also be developed during the first phase though it is not a brownfield park. Owing to its advantageous location in South Tripura, which will give it access to Bangladesh's Chattogram port, fast tracking the development and operationalization of the park will help facilitate the growth of the food processing sector in Tripura.

Strategic projects – The state's existing logistics players will find it difficult to cater to the supply and demand of the industries. Hence, the development of a logistics park is essential to handle the volume of goods and keep logistics costs low. The development of such a park has been proposed in an 84-acre plot just beside the Jalefa IIDC, in South Tripura.

b. Phase II (3-5 years): Development – the already identified greenfield projects will be developed. The critical internal and external infrastructure in the parks will be developed. Warehousing and cold storage facilities will be developed as well.

Expansion – Based on the land uptake and growth of priority sectors, new greenfield projects identified for respective sectors will need to be developed. This will be done in the second phase as the development of the overall industrial ecosystems of the relevant sectors will have taken place because of the growth of brownfield parks Such an approach will ensure that the state sees sustained growth to achieve its objective of industrial development.

c. Phase III (after 5 years): In the last phase, any remaining greenfield projects will also be developed and the TIDC is advised to undertake the development of 'good-to-have' infrastructure identified in the previous sections to create a conducive environment for sector stakeholders not only in Tripura but in the entirety of the Northeast region.

Further, the Jalefa SEZ and the Bodhjungnagar and R.K Nagar parks will be developed into Smart Industrial Parks.

A summary of the projects to be pursued during each phase has been provided in the table below.

Table 23: Phasing of industrial development

Projects	Brownfield Parks and Jalefa Industrial Park	Greenfield Parks	Logistics Park
Development of critical infrastructure	Phase I	Phase II	Phase I
Good-to-have Infrastructure: Cold storage and warehousing facilities	Phase I	Phase II	—
Good-to-have Infrastructure: business facilitation services like testing and gender inclusive training centres	Phase III	Phase III	—
Smart Park Infrastructure for the Bodhjungnagar, R.K Nagar and Jalefa industrial estates	Phase III	Phase III	—

Phase I: A summary of the cost of developing brownfield parks during Phase I based on the above criteria is shown in the table below.

Table 24: Phase 1 infrastructure costing

Name of Park	Total available area in acres	Total Cost in Crore INR
Bodhjungnagar Industrial Area	74.0	~ 44
RK Nagar Industrial Park	77.4	~ 42
IIDC Sarasima	4.4	~ 13
IIDC Santirbazar	16.3	~ 34

Name of Park	Total available area in acres	Total Cost in Crore INR
Kumarghat Industrial Park	8.0	~ 28
IIDC Dewanpasa	22.0	~ 38
IIDC Dharmanagar	34.0	~ 9
A.D. Nagar	0	~ 0.69
Dhajanagar	1.56	~ 0.69
Jalefa	39	~ 35
Total Cost of Phase I Projects		**~ 244**

From the table above it can be seen that the R.K Nagar, Dewanpasa, and Bodhjungnagar industrial estates require the highest investments among Tripura's brownfield parks. The following section outlines the specific projects to be undertaken during Phase I at each park to provide a picture of the infrastructural interventions needed in each brownfield park.

Name of Park	Projects to be developed during Phase I	Costing (INR)
Bodhjungnagar Industrial Area	• Construction of a 2 km long compound wall • Construction of a 4 km intermediate carriageway of 5.5 m width • Installation of a water supply network • Installation of an overhead water tank with a capacity of ~690 litres • Installation of 4 km electric lines • Installation of 10 additional 11 kV electric stations • Installation of 3 km additional gas supply lines • Development of a 22 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. Construction a 4.5 km drainage system • Development of a dry warehousing facility with a capacity of 29000 MT • Development of a cold storage facility with a capacity of 8000 MT • Installation of a 10 km feeder line to connect the existing substation to the main grid	~ 44
R.K Nagar Industrial Park	• Construction of a 2 km long compound wall • Construction of a 4 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of 4 km electric lines • Installation of 5 additional 11 kV electric stations • Installation of 3 km additional gas supply lines • Development of a 7 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 5 km drainage system	~ 42

	• Development of a 330 KLD effluent treatment plant • Installation of a 33 KV/11KV substation • Installation of a 10 km feeder line to connect the existing substation to the main grid • Development of a dry warehousing facility with a capacity of 29000 MT	
IIDC Sarasima	• Construction of a 2 km long compound wall • Construction of a 1 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of 1 km electric lines • Installation of 2 additional 11 kV electric stations • Development of a 2 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 1 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 1 km drainage system • Development of a 90 KLD effluent treatment plant • Installation of a 33 KV/11KV substation • Installation of a 30 km feeder line to connect the existing substation to the main grid • Development of a dry warehousing facility with a capacity of 7900 MT	~ 13
IIDC Santirbazar	• Construction of a 5 km long compound wall • Construction of a 2 km intermediate carriageway of 5.5 m width Installation of a water supply network. • Installation of water tanks with a total capacity of ~ 2,50,000 Litres • Installation of 3 km electric lines • Installation of 3 additional 11 kV electric stations • Development of a 1.5 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm • Construction a 3 km drainage system • Development of 85 KLD effluent treatment plant • Installation of a 33 KV/11KV substation • Installation of a 4 km feeder line to connect the existing substation to the main grid • Construction of two dual lane external road with a width of 7.5 metres (4 km and 200 m) • Development of a dry warehousing facility with a capacity of 7600 MT	~ 34
Kumarghat Industrial Park	• Construction of a 1 km long compound wall • Construction of a 4 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of 4 km electric lines • Installation of 2 additional 11 kV electric stations • Development of a 2 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of streetlights • Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	~ 28

	• Construction a 4 km drainage system • Development of a 110 KLD effluent treatment plant • Installation of a 33 KV/11KV substation • Installation of a 3 km feeder line to connect the existing substation to the main grid • Land Development and filling of 15 acres • Construction of a 700 m-long dual lane external road with a width of 7.5 metres • Development of a dry warehousing facility with a capacity of 9700MT	
IIDC Dewanpasa	• Construction of a 1 km long compound wall • Construction of a 4 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 100000 litres • Installation of 4 km electric lines • Installation of 5 additional 11 kV electric stations • Development of a 4 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of streetlights • Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 4 km drainage system • Development of a 180 KLD effluent treatment plant • Installation of a 33 KV/11KV substation • Installation of a 3 km feeder line to connect the existing substation to the main grid • Construction of a 2.5 km-long dual lane external road with a width of 7.5 metres • Development of a cold storage facility with a capacity of 4400 MT • Development of a dry warehousing facility with a capacity of 16000 MT	~ 38
IIDC Dharmanagar	• Construction of a 1 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 100000 litres • Installation of 1 km electric lines • Installation of 2 additional 11 kV electric stations • Development of a 0.5 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 1 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 1 km drainage system • Installation of a 33 KV/11KV substation • Installation of a 500 m feeder line to connect the existing substation to the main grid • Development of a dry warehousing facility with a capacity of 1800 MT	~ 9
A.D Nagar Industrial Park	• Installation of 3 additional 11 kV electric stations	~ 0.69

Dhajanagar Industrial Park	• Installation of 3 additional 11 kV electric stations	~ 0.69
Jalefa Industrial Park	• Construction of a 3 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of a water supply network. • Installation of water tanks with a total capacity of 250000 litres • Installation of 3 km electric lines • Installation of 3 additional electric stations • Development of a 4 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of streetlights • Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 3 km drainage system • Development of a 175 KLD effluent treatment plant • Land development and filling of 20 acres • Installation of a 33 KV/11KV substation • Installation of a 3 km underground feeder line to connect the existing substation to the main grid • Development of a cold storage facility with a capacity of 4300 MT • Development of a dry warehousing facility with a capacity of 16000 MT	~ 35
Total Cost:		~ 244 crores

Most brownfield parks require incremental improvements to basic infrastructure— like the development of boundary walls and internal roads. Most parks also require water tanks even though they are currently able to provide water to individual units from tanks nearby.

No infrastructure projects, apart from the installation of additional electrical stations, have been planned for parks with low space availability. This includes the A.D Nagar and Dhajanagar parks.

Apart from developing brownfield parks in the state, the first phase will also involve the development of a Logistics Park in Sabroom, in South Tripura. A land parcel near the Maitri Setu is being looked at for the development of the logistics park. There is also a proposed Land Port being developed at Sabroom (near Jalefa) which will help in faster processing of exports. The park aims to create a one stop solution for all the logistic and warehousing solutions for Northeast trade with Bangladesh. The basic infrastructure requirements for the proposed park are given below.

Infrastructure	Total cost in Crore INR
Construction of boundary wall of 9 kms	~67
Development of 3000 MT of cold storage.	
Development of a dry warehousing facility with a capacity of 10,000MT	
Development of Weigh Bridge with 80 tonnes capacity	

Land Development and Filling	
Installation of water supply system	

The development of these parks will conclude Phase I of the phasing plan.

Phase II: This phase will involve developing already identified greenfield projects. The critical internal and external infrastructure in the parks will be developed. Warehousing and cold storage facilities will be developed as well.

Further, based on the land uptake and growth of priority sectors, new greenfield projects identified for respective sectors will need to be developed. This will be done in the second phase as the development of the overall industrial ecosystems of the relevant sectors will have taken place because of the growth of brownfield parks Such an approach will ensure that the state sees sustained growth to achieve its objective of industrial development. Development of ground is a prerequisite for starting of any construction activity at site. Site preparation shall consist of cutting, removing and disposing of all materials such as bushes, shrubs, stumps, roots, grass, weeds, top organic soil, rubbish etc., from the proposed park area so that the sub-base on which the infrastructure is developed is well prepared. The task shall include necessary excavation, backfilling of pits resulting from uprooting of trees and stumps to required compaction, handling, salvaging, and disposal of cleared materials etc. Apart from this, all critical internal and external infrastructure needs to be developed in the greenfield parks. This includes power and water supply networks, security provisions like boundary walls and CCTVs, and waste treatment infrastructure (ETPs and STPs). The park-wise infrastructure projects for Phase II, involving the development of greenfield parks, is given below.

Name of Park	Projects to be developed during Phase II	Costing (INR)
Sonamukhi IIDC	• Construction of a 15 km long compound wall • Construction of a 15 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 500000 litres • Installation of 15 km electric lines • Installation of 8 additional 11 kV electric stations • Development of a 32 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 15 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 15 km drainage system • Development of a 1050 KLD effluent treatment plant • Land development and filling • Installation of a 33 KV/11KV substation • Installation of a 3 km feeder line to connect the existing substation to the main grid • Development of a cold storage facility with a capacity of 36000 MT • Development of a dry warehousing facility with a capacity of 130000 MT	~162 crores
Lalchari IIDC	• Construction of an 10 km long compound wall • Construction of a 4 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 4,00,000 Litres • Installation of 5 km electric lines • Installation of 8 additional 11 kV electric stations	~66 crores

	• Development of a 5 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 5 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 5 km drainage system • Installation of a 33 KV/11KV substation • Installation of a 3 km feeder line to connect the existing substation to the main grid • Installation of streetlights • Construction of a 5 km-long dual lane external road with a width of 7.5 metres • Development of a cold storage facility with a capacity of 5700 MT • Development of a dry warehousing facility with a capacity of 20850 MT	
Bijoypur IIDC	• Construction of a 11 km long compound wall • Construction of a 10 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 4,00,000 Litres • Installation of 5 km electric lines • Installation of 8 additional 11 kV electric stations • Development of a sewage treatment with a capacity of 9 KLD • Installation of 20 CCTVs • Installation of streetlights • Installation of 5 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 5 km drainage system • Development of an effluent treatment plan with a capacity of 310 KLD • Land development and filling of 89 acres • Installation of a 33 KV/11KV substation • Installation of a 3 km feeder line to connect the existing substation to the main grid • Construction of a 12 km-long dual lane external road with a width of 7.5 metres • Development of a cold storage facility with a capacity of 8900 MT • Development of a dry warehousing facility with a capacity of 35600 MT	~138 crores
Nagicherra IIDC	• Construction of a 4 km long compound wall • Construction of a 2 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 200000 Litres • Installation of 2 km electric lines • Installation of 3 additional 11 kV electric stations • Development of a 10 KLD sewage treatment plant • Installation of 20 CCTVs • Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 2 km drainage system	~ 34 crores

	• Installation of streetlights • Land development and filling of 19 acres • Installation of a 33 KV/11KV substation • Installation of a 5 km feeder line to connect the existing substation to the main grid • Construction of a 3-km-long dual lane external road with a width of 7.5 metres • Development of a dry warehousing facility with a capacity of 7400 MT	
Kathalia IIDC	• Construction of a 6 km long compound wall • Construction of a 9 km intermediate carriageway of 5.5 m width • Installation of a water supply network. • Installation of water tanks with a total capacity of 4,00,000 Litres • Installation of 9 km electric lines • Installation of 3 additional 11 kV electric stations • Development of a sewage treatment plant with a 4 KLD capacity • Installation of 20 CCTVs • Installation of streetlights • Installation of 9 km water pipelines where the diameter of the pipes is 6 inches or 150 mm. • Construction a 9 km drainage system • Development of an effluent treatment plant with a capacity of 140 KLD • Land development and filling of 40 acres Installation of a 33 KV/11KV substation • Installation of a 20 km feeder line to connect the existing substation to the main grid • Construction of a 4-km-long dual lane external road with a width of 7.5 metres • Development of a dry warehousing facility with a capacity of 4400 MT	~80 crores
Total cost:		~80 Crore

All the greenfield parks excluding Lalchari require extensive land development and filling. A summary of the estimated costs of Phase II developments are provided below.

Table 25: Phase 2 infrastructure costing

Name of Park	Total available area in acres	Total Cost in INR
IIDC Lalchari	20.8	~ 66 Crore
Sonamukhi Industrial Area	130	~ 162 Crore
Nagicherra Industrial Area	18.6	~ 34 Crore
Kathalia Industrial Area	40.3	~ 80 Crore
Bijoypur Industrial Area	89.5	~ 138 Crore

Total Cost of Phase II Greenfield Projects	~80 Crore

Phase III: This phase will involve developing good to have infrastructure in all brownfield and greenfield industrial parks in Tripura. Prioritization of could be taken up based on the extent of land demand for each industrial park.

Further, based on the land uptake and growth of priority sectors, good to have infrastructure projects identified for respective sectors could be developed. This will be done in the third phase as the development of the overall industrial ecosystems of the relevant sectors will have taken place as parks will start attracting investments Such an approach will ensure that the state sees sustained growth to achieve its objective of industrial development. Based on the benchmarking in chapter 5, sector specific infrastructure has been identified which can developed as part of this phase. Based on the sectors mapped to each park and the specific infrastructure required for development, the table below provides the sector-specific infrastructure requirements of each park.

Table 26: Phase 3 infrastructure costing

Name of Park	Identified 'Good-to-have' Infrastructure	**Total Cost in INR**
Brownfield Parks		
Bodhjungnagar Industrial Area	Testing Facilities for Rubber Products	0.6 Crores
IIDC Sarasima	Testing Facilities for Rubber Products	0.6 Crores
IIDC Santirbazar	Testing Facilities for Rubber Products	0.6 Crores
R.K Nagar Industrial Park	Testing Facilities for Rubber Products	0.6 Crores
R.K Nagar Industrial Park	Common Infrastructure for Bamboo Processing	1.5 Crores
Kumarghat Industrial Park	Common Infrastructure for Bamboo Processing	1.5 Crores
IIDC Dharmanagar	Common Infrastructure for Bamboo Processing	1.5 Crores
IIDC Dewanpasa	Food Processing Training Centre	0.35 Crores

Greenfield Parks		
Jalefa Industrial Park	Food Processing Training Centre	0.35 Crores
Sonamukhi IIDC	Food Processing Training Centre	0.35 Crores
Sonamukhi IIDC	Truck Terminal	0.25 Crores
Sonamukhi IIDC	Food Testing Lab	4 Crores
Lalchari IIDC	Food Processing Training Centre	0.35 Crores
Bijoypur IIDC	Food Processing Training Centre	0.35 Crores
Nagicherra IIDC	Testing Facilities for Rubber Products	0.6 Crores
Kathalia IIDC	Common Infrastructure for Bamboo Processing	1.5 Crores
Total Cost of Phase III Infrastructure Projects		**~15 Crores**

Further Phase III will also entail development of smart industrial parks. The development of Jalefa SEZ and Bodhjungnagar and R.K Nagar parks as Smart Industrial Parks. A smart industrial park uses ICT to improve every aspect of operations from efficiency, to infrastructure that allows for fast internet speeds and connectivity. The infrastructural requirements for this have been listed in the table below.

Identified Smart Infrastructure Projects
ICT network – Laying of optical fibre network in the park. TIDC highlighted that optical fibre network has already been setup in Bodhjungnagar. But for the other two industrial parks can be developed
Climate resilient infrastructure – Development of utility corridors with lines for water distribution, sewerage, telecommunication, and electricity by the side of the carriageway all along the road will be developed. Adequate space shall be reserved for each of these utilities.
Common facilitation centre – these centres will provide a set of facilities for common use by the industries within the parks. These units will accommodate various business facilitation services, including testing labs, certification centres, conference venues, and auditoriums. Special attention will be paid to developing gender inclusive training and skill development centres.

Public transport facilities – For the facilitation of workforce movement, interconnected internal pedestrian and public transportation networks will be developed as these are an essential part of the external infrastructure of industrial parks. Special attention will be paid to developing gender inclusive transportation facilities to widen workplace access for women.
SCADA – such systems will be developed to monitor the utilities and facilities provided by the parks to allottees.

The cost of developing smart industrial infrastructure in the three selected parks is given in the table below —

Table 27: Smart infrastructure costing summary

Smart Infrastructure Required	Name of Park	Cost in INR
ICT network	R.K Nagar	50,00,000
	Jalefa	15,00,000
Climate resilient utility corridors	Bodhjungnagar	25,00,00,000
	R.K Nagar	25,00,00,000
	Jalefa	7,50,00,000
Common facilitation centre	Bodhjungnagar	20,00,00,000
	R.K Nagar	20,00,00,000
	Jalefa	20,00,00,000
Public transport	Bodhjungnagar	4,00,000
	R.K Nagar	4,00,000
	Jalefa	4,00,000
SCADA	Bodhjungnagar	10,00,00,000
	R.K Nagar	10,00,00,000
	Jalefa	10,00,00,000
Total Cost		**1,48,27,00,000**

A phase-wise summary of the costs of the infrastructural interventions mentioned in the preceding sections is given in the table below.

Table 28: All phases infrastructure costing

Projects	Brownfield Parks and Jalefa SEZ	Greenfield Parks	Logistics Park
Development of critical infrastructure and Good-to-have Infrastructure: Cold storage and warehousing facilities	Phase I (INR ~244 Crore)	Phase II (INR ~480 Crore)	Phase I (INR ~67 Crore)[102]
Good-to-have Infrastructure: business facilitation services like testing and gender inclusive training centres	Phase III (INR ~15 Crore)		—
Smart Park Infrastructure for the Bodhjungnagar, R.K Nagar and Jalefa industrial estates	Phase III (INR ~148 Crore)		—

[102] Development of Logistics park will be funded by the Central Government under development of ICP

10. Investment Plan

10. Investment Plan

10.1. Framework to identify projects which can be developed as PPP

Priority projects may be screened for their potential to achieve better value for money if implemented as PPPs. To avoid the risk of sinking resources into the analysis and structuring of a non-feasible PPP project, TIDC may screen the project for PPP suitability to test whether the project makes sense as a PPP, provided that it has been satisfactorily tested as economically sound or sensible.

Several governments have established tools and checklists to support such screening. The ADB recommends that projects be put through an initial PPP project screening process to identify areas where private sector technical, operations, skills, involvement, and/or financing can be maximized, and where governments can leverage its technical support and financial resources most effectively. In this context, it has prepared a Generic Public–Private Partnership Screening and Project Selection Checklist, as shown below, which has been found suitable for use by TIDC as well.

Table 29: Generic Public–Private Partnership Screening and Project Selection Checklist[103]

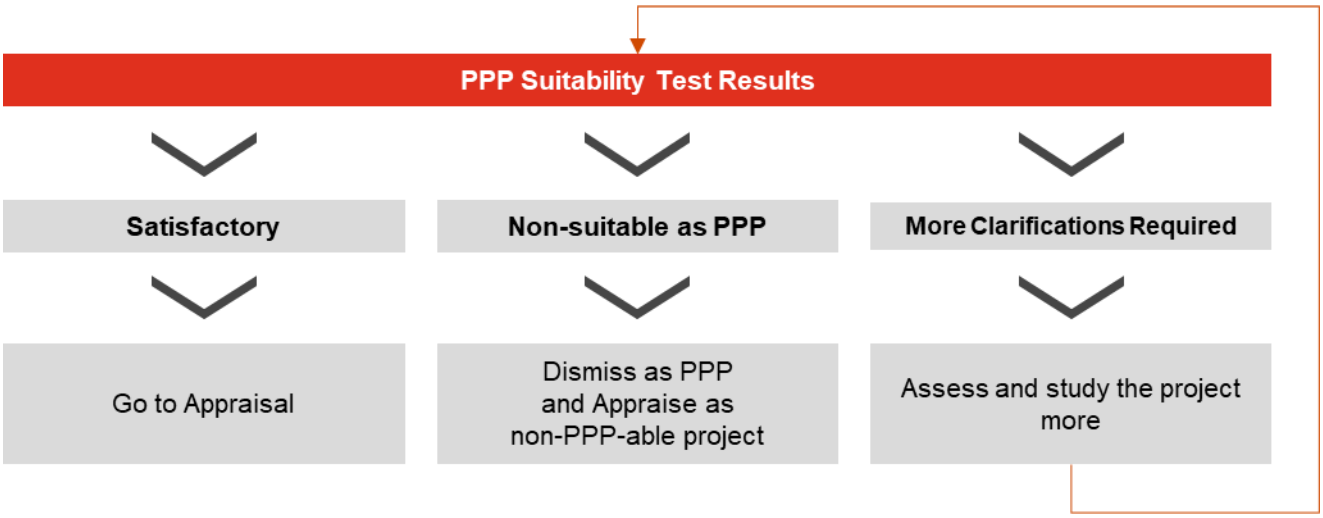
Screening Criteria	Yes or No
Is the project a clear government priority (mentioned in a national development plan)? Do initial assessments (budget plans) indicate that the government's agency can afford to make required payments for or support this project over its entire life (7, 10, 15, 20+ years)?	
Does the project require large, new capital investment (>$XX million)?	
Does the project require long-term maintenance, measurable performance and/or operations, and periodic renewals?	
Does initial analysis indicate that the project is technically, economically, and environmentally feasible?	
Are innovative structures available that can make the project affordable?	
Have international, regional, or national public–private partnerships been developed in the same sector?	
Has the private sector indicated interest?	
How comfortable is the private sector in assuming the risks associated with the project? If not, can the risk be structured so that a creditworthy counterparty or the government itself can provide some support?	
Are revenue streams clearly identifiable (from government, directly from public users, or a combination of the two)?	
Can project performance be measured in clear, quantifiable outputs and key performance indicators?	

[103] Source: Asian Development Bank. Public–private partnership operational plan 2012–2020: Realizing the vision for Strategy 2020—the transformational role of public–private partnerships in Asian Development Bank operations, 2012

Similarly, the online toolkit for PPPs in India provides a good overview of the PPP project screening process. The Indian Ministry of Finance's online PPP toolkit includes a PPP suitability filter that guides the user to consider the various parameters, as well as the support of the public sector for the project (including an assessment of the public sector capacities to implement the project as a PPP). It also considers potential barriers to project implementation (based on information from the pre-feasibility study) and other factors, such as the expected effort and resources needed to develop the PPP.

The next stage after screening, is to evaluate the screening results. The following framework explains the possible results of the PPP screening process:

Figure 14: Framework for PPP Screening Criteria[104]



The result of the suitability test may be one of the following;

- The project appears to be sound as a PPP and can move on to the next stage;
- The project is not suitable as a PPP. Appraising the project for traditional procurement methods is recommended if a public budget is available; and
- The project is missing relevant information, or there is a need to clarify some uncertainties. In this case, TIDC states the project's weaknesses and recommends a further analysis.

Screening ensures that the project is better prepared for procurement, that uncertainties are identified, and that the necessary resources are duly accommodated for a more reliable procurement process. If the screening has been satisfactorily conducted, TIDC will avoid the risk of unnecessarily consuming resources.

10.2. Classification of projects which can be developed under PPP

The projects identified for development in Tripura can be classified into 3 major categories

1. Internal projects
2. External projects
3. Value added projects

Internal projects – Internal projects include those which are necessary infrastructure built inside the park. The projects include development of roads, sewage treatment plant, water supply network, power supply network etc. Based on past experiences PPPs have been successfully implemented in development of STPs/ETPs. The Nagpur Reuse Project, a PPP model has now become India's largest wastewater project as it involved collection of 200 MLD of sewage from rivers and augmenting a 100 MLD STP to 200 MLD with Reuse of treated water as final goal. Vishvaraj Environment Pvt. Ltd. was selected through a competitive bidding process for 30 years. Entire project was built though 100% private investment making it the largest and the first STP on

[104] Source: APMG International

PPP model. It needs to be noted that such a development was possible due to guaranteed offtake of reuse of treated water by MAHAGENCO in their power plants. Similarly, PPP mode of development for STP for Mission Clean Ganga is also under implementation. As part of this development, a hybrid annuity model is adopted. Hence a detailed analysis during the feasibility stage could help in identifying parks where such facilities could be developed on PPP basis.

External infrastructure – External projects mainly include connectivity projects to the nearest highways/gateway. Considering the current projects identified in Tripura, there are only 2 major roads identified as external projects needed for development. While a traffic study may be conducted to identify the PPP potential of the roads, it may be noted that the projects are under the ambit of central agencies such as the NHAI and BRO. It may be prudent to leverage central funds to develop the external network.

Value added projects – Projects which help in attracting investments and are needed for development of targeted sectors but are not mandatorily required for development of park are classified as value added projects. Such projects include cold storages, logistics parks, warehousing etc. Such projects have been successfully executed by private sector and have the potential of being developed under PPP basis. For example, Karnataka State Agricultural Produce Processing and Export Corporation Limited has partnered Hubli-based Ken Agritech Pvt Ltd to form the new joint venture company, Tropicool Foods Pvt Ltd, to set up its first individually quick frozen (IQF) freezing unit for processing mango and vegetables at Hubli. Similarly, FCI also intends to enhance their warehousing capacity through development of Silos under PPP mode. However, a detailed analysis on the revenue potential and financial feasibility based on the framework explained in section above will help in identifying and shortlisting projects which can be developed under PPP basis.

The table below lists the infrastructure projects in Tripura's industrial estates that can be developed through PPPs model. It also lists the infrastructure that can be developed through PPPs at the Jalefa SEZ.

Serial No.	Name of Park	Projects that can be developed as PPPs
1	Bodhjungnagar Industrial Area	• STP • 8,000 MT cold storage facility • 29,000 MT warehouse • Testing Facilities for Rubber Products
2	RK Nagar Industrial Park	• 59,000 MT warehouse • ETP • STP • Testing Facilities for Rubber Products • Common Infrastructure for Bamboo Processing (including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant)
3	IIDC Sarasima	• ETP • STP • 7,900 MT warehouse • Testing Facilities for Rubber Products
4	IIDC Santirbazar	• ETP • STP • 7,600 MT warehouse • Testing Facilities for Rubber Products
5	Kumarghat Industrial Park	• ETP • STP • 9,700 MT warehouse

		• Common Infrastructure for Bamboo Processing (including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant)
6	IIDC Dewanpasa	• ETP • STP • 16,000 MT warehouse • 4,400 MT cold storage • Food Processing Training Centre with facilities for imparting training on post-harvest handling, preservation and specifically processing
7	IIDC Dharmanagar	• ETP • STP • 1,800 MT warehouse • Common Infrastructure for Bamboo Processing (including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units, vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant)
8	IIDC Jalefa	• ETP • STP • 16,000 MT warehouse • 4,300 MT cold storage • Food Processing Training Centre with facilities for imparting training on post-harvest handling, preservation and specifically processing
9	IIDC Lalchari	• ETP • STP • 20,850 MT warehouse • 5,700 MT cold storage • Food Processing Training Centre with facilities for imparting training on post-harvest handling, preservation and specifically processing
10	Sonamukhi Industrial Area	• ETP • STP • 1,30,000 MT warehouse • 36,000 MT cold storage • Food Processing Training Centre with facilities for imparting training on post-harvest handling, preservation and specifically processing
11	Nagicherra Industrial Area	• STP • 7,400 MT warehouse • Testing Facilities for Rubber Products
12	Kathalia Industrial Area	• ETP STP • 4,400 MT warehouse • Common Infrastructure for Bamboo Processing (including bamboo stick-making facilities, Bamboo Plastic Composite (BPC) facilities, strand woven bamboo block units,

		vacuum pressure treatment plants, resin/glue plants, and bamboo charcoal plant)
13	Bijoypur Industrial Area	• ETP • STP • 35,600 MT warehouse • 8,900 MT cold storage • Food Processing Training Centre with facilities for imparting training on post-harvest handling, preservation and specifically processing

11. Conclusion

11. Conclusion

In conclusion, this document provides a detailed infrastructure assessment for industrial parks in Tripura. The need for internal as well as external infrastructure has been highlighted in the report. Additional importance has been provided for strategic projects such as SEZ in Sabroom, logistics park in South Tripura considering the importance of such developments.

Considering the proximity of raw materials, proximity to demand centres, land availability and ecosystem availability the identified priority sectors have been mapped to each industrial park. Further based on benchmarking exercise the following infrastructure over and above the basic infrastructure such as roads, power, water, sewage treatment etc. has been identified which needs to be developed to make the parks attractive to attract priority sector investments.

Priority Sector	Sector Specific Infrastructure required
Bamboo	Bamboo stick-making facility, Bamboo Plastic Composite (BPC) facility, Strand woven bamboo block unit, Vacuum pressure treatment plant, Resin/Glue Plant, Bamboo charcoal plant
Food processing	Warehousing, cold storage, Quality and FPO Labs and Food Processing Training Centre
Rubber	NABL accredited testing centre for Rubber /Polymer products

An infrastructure gap assessment for each industrial park was conducted to identify the infrastructure needs and assess the approximate cost of development of each industrial park. Based on stakeholder consultations, national benchmarks and discussion with TIDC officials, the costing for all infrastructure projects has been identified. In addition to infrastructure requirements, logistics plays a huge role in development and growth of priority sectors. In India 13% of the total price of goods is attributed to logistics compared to 8% in developed countries. To bridge this gap and increase the profits for manufacturers a multi modal logistic park is proposed. Based on a benchmarking exercise infrastructure requirement for development of multi model logistics parks is also assessed. Considering the same, infrastructure development cost for industrial parks in Tripura is summarized below

Parks	Total available area in acres	Total Cost in Crore INR
Bodhjungnagar Industrial Area	74.0	~ 99.4
RK Nagar Industrial Park	77.4	~ 99.9
IIDC Sarasima	4.4	~ 13.9
IIDC Santirbazar	16.3	~ 34.1
Kumarghat Industrial Park	8.0	~ 29.2
IIDC Dewanpasa	22.0	~ 38.0
IIDC Dharmanagar	34.0	~ 11.0
A.D. Nagar	0	~ 0.69
Dhajanagar	1.56	~ 0.69
IIDC Jalefa	38.7	~ 73.3

Parks	Total available area in acres	Total Cost in Crore INR
IIDC Lalchari	20.8	~65.9
Sonamukhi Industrial Area	130	~ 167.0
Nagicherra Industrial Area	18.6	~35.0
Kathalia Industrial Area	40.3	~ 81.6
Bijoypur Industrial Area	89.5	~138.5
Logistics Park in Sabroom	80.0	~ 67
Overall Costs		**~955**

Further since the industrial development shall be over a period of 15 years, the land parcel development is also phased over a period of 15 years. Hence considering various factors such as status of the project, size of the parks, land acquisition status, land use change, environmental clearances etc, the development of parks in Tripura has been classified into 3 phases which is summarised in table below

Phase	Description of Activities
Phase I (1-3 years)	Parks which are brownfield in nature, located in high output districts and parks which are not operational but already under development. **Strategic projects** - State's existing logistic players will find it difficult to cater to the supply and demand of the industries. Hence the development of logistic park is essential for handle the volume of goods and keep the logistic costs low.
Phase II (3-5 years)	**Expansion** – Based on the land uptake and growth of priority sectors new greenfield projects identified for respective sectors need to be developed. This will make sure that the state has sustained growth to achieve its potential
Phase III (After 5 years)	In the last phase any remaining greenfield projects are also developed and TIDC is advised to undertake the development of good to have infrastructure identified in the previous sections to create a conducive environment for sector stakeholders not only in Tripura but entirety of Northeast.

Finally, the report concludes by providing an investment plan and action plan by identifying a framework to identify projects which can be developed under PPP mode. Based on past experiences, it is recommended that implementation of ETPs/STPs along with sector specific infrastructure such as warehouses and testing centres could be developed under PPP mode while basic infrastructure such as roads, transportation infrastructure etc. shall be developed by the Government. However, a detailed analysis on the revenue potential and financial feasibility based on the framework explained in section above will help in identifying and shortlisting projects which can be developed under PPP basis.

12. Annexures

12. Annexures

Detailed Costing: phase wise, project wise and industrial park wise

Phase 1				
Industrial Park Name	Infrastructure	Project Description	Capacity	Cost in INR
Bodhjungnagar	Internal Infrastructure	Construction of a 2 km long compound wall	2 km	2700000
		Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	70000000
		Installation of a water supply network.	1	10000000
		Installation of 4 km electric lines	4 km	2880000
		Installation of 10 additional 11 kV electric stations	10	23000000
		Installation of 3 km additional gas supply lines	3 km	150000000
		Development of a 22 KLD sewage treatment plant	22 KLD	440000
		Installation of 20 CCTVs	20	25,000
		Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	4200000
		Construction a 4.5 km drainage system	4.5 km	7200000
		Development of a cold storage facility with a capacity of 8000 MT	8000 MT	80000000
		Development of a dry warehousing facility with a capacity of 29000 MT	29000 MT	58000000
		Fire safety system	1	14,500,000

		Signage	73	36,500
	External Infrastructure	Installation of a 10 km feeder line to connect the existing substation to the main grid	10 km	15000000
RK Nagar	Internal Infrastructure	Construction of a 2 km long compound wall	2 km	2700000
		Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	70000000
		Installation of a water supply network.	1	10000000
		Installation of 4 km electric lines	4 km	2880000
		Installation of 5 additional 11 kV electric stations	5	11500000
		Installation of 3 km additional gas supply lines	3 km	150000000
		Development of a 7 KLD sewage treatment plant	7 KLD	140000
		Installation of 20 CCTVs	20	25,000
		Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	4200000
		Construction a 5 km drainage system	5 km	8000000
		Development of a 330 KLD effluent treatment plant	330 KLD	33000000
		Development of a dry warehousing facility with a capacity of 29000 MT	29000 MT	58000000
		Fire safety system	1	7,350,000
		Signage	74	37,000

	External Infrastructure	Installation of a 10 km feeder line to connect the existing substation to the main grid	10 Kms	15000000
		Installation of a 33 KV/11KV substation	1	50000000
IIDC Sarasima	Internal Infrastructure	Construction of a 2 km long compound wall	2 km	2700000
		Construction of a 1 km intermediate carriageway of 5.5 m width	1 km	17500000
		Installation of a water supply network.	1	10000000
		Land development and filling of 4 acres	4 acres	16000000
		Installation of 1 km electric lines	1 km	720000
		Installation of 2 additional 11 kV electric stations	2	4600000
		Development of a 2 KLD sewage treatment plant	2 KLD	40,000
		Installation of 20 CCTVs	20	25,000
		Installation of 1 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	1 km	1400000
		Construction a 1 km drainage system	1 km	1600000
		Development of a 90 KLD effluent treatment plant	90 KLD	9000000
		Fire safety system	1	9,89,000
		Signage	17	8,500
		Development of a dry warehousing facility with a capacity of 7900 MT	7900 MT	15800000

	External Infrastructure	Installation of a 1 km feeder line to connect the existing substation to the main grid	1 Kms	1500000
		Installation of a 33 KV/11KV substation	1	50000000
Santirbazar	Internal Infrastructure	Construction of a 5 km long compound wall	5 km	6750000
		Construction of a 2 km intermediate carriageway of 5.5 m width	2 km	35000000
		Installation of a water supply network.	1	10000000
		Installation of a 1 Lakh litre overhead water tank and a 1.5 Lakh litre underground tank	2,50,000 Litres	18000000
		Installation of 3 km electric lines	3 km	2160000
		Installation of 3 additional 11 kV electric stations	3	6900000
		Development of a 1.5 KLD sewage treatment plant	1.5 KLD	30,000
		Installation of 20 CCTVs	20	25,000
		Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm	2 km	2800000
		Construction a 3 km drainage system	3 km	4800000
		Development of 85 KLD effluent treatment plant	85 KLD	8500000
		Development of a dry warehousing facility with a capacity of 7600 MT	7600 MT	15200000
		Fire safety system	1	950,000
		Signage	8	4,000

	External Infrastructure	Installation of a 4 km feeder line to connect the existing substation to the main grid	4 Kms	6000000
		Installation of a 33 KV/11KV substation	1	50000000
		Construction of a 4 km-long dual lane external road with a width of 7.5 metres between state road to national highway and Construction of a 200 m dual lane external road with a width of 7.5 metres from the boundary wall to the state road	4.2 kms	168000000
Kumarghat	Internal Infrastructure	Construction of a 1 km long compound wall	1 km	1350000
		Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	70000000
		Installation of a water supply network.	1	10000000
		Installation of 4 km electric lines	4 km	2880000
		Installation of 2 additional 11 kV electric stations	2	4600000
		Development of a 2 KLD sewage treatment plant	2 KLD	40,000
		Installation of 20 CCTVs	20	25,000
		Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	4 km	5600000
		Construction a 4 km drainage system	4 km	6400000
		Development of a 110 KLD effluent treatment plant	110 KLD	11000000
		Development of a dry warehousing facility with a capacity of 9700MT	9700 MT	19400000
		Fire safety system	1	1,213,000
		Signage	22	11,000

	External Infrastructure	Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	4500000
		Installation of a 33 KV/11KV substation	1	50000000
		Construction of a 700 m-long dual lane external road with a width of 7.5 metres from the boundary wall of the park to the nearest highway	700 mts	28000000
Dharmanagar	Internal Infrastructure	Construction of a 1 km intermediate carriageway of 5.5 m width	1 km	17500000
		Installation of a water supply network.	1	10000000
		Installation of an overhead water tank with a capacity of 1 Lakh litres	100000 litres	4500000
		Installation of 1 km electric lines	1 km	720000
		Installation of 3 additional 11 kV electric stations	3	6900000
		Development of a 0.5 KLD sewage treatment plant	0.5 KLD	10,000
		Installation of 20 CCTVs	20	25,000
		Installation of 1 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	1 km	1400000
		Construction a 1 km drainage system	1 km	1600000
		Fire safety system	1	228,000
		Signage	5	2,500
		Development of a dry warehousing facility with a capacity of 1800 MT	1800 MT	3600000
	External Infrastructure	Installation of a 500 mts feeder line to connect the existing substation to the main grid	500 mts	750000

		Installation of a 33 KV/11KV substation	1	50000000
Dewanpasa	Internal Infrastructure	Construction of a 1 km long compound wall	1 km	1350000
		Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	70000000
		Installation of a water supply network.	1	10000000
		Installation of an OHT of 1 Lakh litres and UG tank of 1.5 Lakh litres.	250000 litres	18000000
		Installation of 4 km electric lines	4 km	2880000
		Installation of 5 additional 11 kV electric stations	5	11500000
		Development of a 4 KLD sewage treatment plant	4 KLD	80,000
		Installation of 20 CCTVs	20	25,000
		Installation of 4 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	4 km	5600000
		Construction a 4 km drainage system	4 km	6400000
		Development of a 180 KLD effluent treatment plant	180 KLD	18000000
		Fire safety system	1	2,000,000
		Signage	34	17,000
		Development of a cold storage facility with a capacity of 4400 MT	4400 MT	44000000
		Signage	34	17,000

		Development of a dry warehousing facility with a capacity of 16000 MT	16000 MT	32000000
	External Infrastructure	Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	4500000
		Construction of a 2.5 km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to the closest NH	2.5 km	100000000
		Installation of a 33 KV/11KV substation	1	50000000
AD Nagar	Internal Infrastructure	Installation of 3 additional 11 kV electric stations	3	6900000
Dhajanagar	Internal Infrastructure	Installation of 3 additional 11 kV electric stations	3	6900000
IIDC Jalefa	Internal Infrastructure	Streetlights for 3 km internal roads	3 km	1782000
		Construction of a 3 km intermediate carriageway of 5.5 m width	3 km	52500000
		Installation of a water supply network.	1	10000000
		Installation of an overhead water tank and an underground water tank with a capacity of 1 Lakh litres each.	250000 litres	18000000
		Installation of 3 km electric lines	3 km	2160000
		Installation of 3 additional electric stations	3	6900000
		Development of a 4 KLD sewage treatment plant	4 KLD	8000000
		Installation of 20 CCTVs	20	25,000
		Installation of 3 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	3 km	4200000

		Construction a 3 km drainage system	3 km	4800000
		Development of a 175 KLD effluent treatment plant	175 KLD	17500000
		Land development and filling of 20 acres	20 acres	8000000
		Development of a cold storage facility with a capacity of 4300 MT	4300 MT	43000000
		Development of a dry warehousing facility with a capacity of 16000 MT	16000 MT	32000000
		Fire safety system	1	1,950,000
		Signage	39	19,500
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 3km-long underground feeder line to connect the existing substation to the main grid	3 Kms	12000000
		Construction of a 2km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to NH-8	2 kms	80000000
Phase 2				
Industrial Park Name	Infrastructure	Project Description	Capacity	Cost in INR
Sonamukhi Industrial Area	Internal Infrastructure	Construction of a 15 km long compound wall	15 km	20250000
		Construction of a 15 km intermediate carriageway of 5.5 m width	15 km	262,500,000
		Installation of a water supply network.	1	10000000
		Installation of an overhead water tank with a capacity of 16000 KLD	16000 KLD	400000000
		Installation of 15 km electric lines	15 km	10800000

		Installation of 8 additional 11 kV electric stations	8	18400000
		Development of a 32 KLD sewage treatment plant	32	640000
		Installation of 20 CCTVs	20	25,000
		Installation of 15 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	15 km	21,000,000
		Streetlights for 15 km internal roads	15 km	8,910,000
		Construction a 15 km drainage system	15 km	24,000,000
		Development of a 1050 KLD effluent treatment plant	1050 KLD	10500000
		Land development and filling	130 acres	520000000
		Development of a cold storage facility with a capacity of 36000 MT	36000 MT	360000000
		Development of a dry warehousing facility with a capacity of 130000 MT	130000 MT	260000000
		Fire safety system	1	6,500,000
		Signage	130	65,000
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	4500000
IIDC Lalchari	Internal Infrastructure	Construction of an 10 km long compound wall	10 km	13500000
		Construction of a 4 km intermediate carriageway of 5.5 m width	4 km	70000000

		Installation of a water supply network.	1	10000000
		Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	31500000
		Installation of 5 km electric lines	5 km	3600000
		Installation of 8 additional 11 kV electric stations	8	18400000
		Development of a 5 KLD sewage treatment plant	5 KLD	100000
		Installation of 20 CCTVs	20	25,000
		Installation of 5 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	5 km	7000000
		Construction a 5 km drainage system	5 km	9000000
		Development of a cold storage facility with a capacity of 5,700 MT	5,700 MT	57000000
		Development of a dry warehousing facility with a capacity of 20850 MT	20850 MT	41700000
		Streetlights for 4 km internal roads	4 km	2376000
		Fire safety system	1	2600000
		Signage	52	26,000
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 3 km feeder line to connect the existing substation to the main grid	3 Kms	4500000
		Construction of a 5 km-long dual lane external road with a width of 7.5 metres between industrial park road and Ambassa- Kamalpur road	5 kms	2E+08

Bijoypur Industrial Area	Internal Infrastructure	Construction of a 11 km long compound wall	11 km	75600000
		Construction of a 10 km intermediate carriageway of 5.5 m width	10 km	175,000,000
		Installation of a water supply network.	1	10000000
		Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	31,500,000
		Installation of 10 km electric lines	10 km	7,200,000
		Installation of 3 additional 11 kV electric stations	3	6900000
		Development of a sewage treatment with a capacity of 9 KLD	9 KLD	180000
		Installation of 20 CCTVs	20	25,000
		Installation of 10 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	10 km	14,000,000
		Construction a 9 km drainage system	9 km	22400000
		Development of an effluent treatment plan with a capacity of 310 KLD	310 KLD	31000000
		Land development and filling of 89 acres	89 acres	357800000
		Streetlights for 10 km internal roads	10 km	5,940,000
		Fire safety system	1	4,450,000
		Signage	89	44,500
		Development of a dry warehousing facility with a capacity of 35,600 MT	35,600 MT	71200000

		Development of a cold storage facility with a capacity of 8,900 MT	8900 MT	89000000
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 12 km feeder line to connect the existing substation to the main grid	12 Kms	18000000
		Construction of a 12 km-long dual lane external road with a width of 7.5 metres between the gate of the industrial park and NH-8	12 kms	480000000
Nagicherra Industrial Area	Internal Infrastructure	Construction of a 4 km long compound wall	4 km	5400000
		Construction of a 2 km intermediate carriageway of 5.5 m width	2 km	35000000
		Installation of a water supply network.	1	10000000
		Installation of two overhead water tanks with a capacity of 1 Lakh litres each	200000 Litres	9000000
		Installation of 2 km electric lines	2 km	1440000
		Installation of 3 additional 11 kV electric stations	3	6900000
		Development of a 10 KLD sewage treatment plant	10 KLD	2000000
		Installation of 20 CCTVs	20	25,000
		Iron removal plant with a capacity of 1000 LPH	1 unit	50,000
		Installation of 2 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	2 km	2800000
		Construction a 2 km drainage system	2 km	3200000
		Land development and filling of 19 acres	19 acres	74400000

		Fire safety system	1	950,000
		Streetlights for 2 km internal roads	2 km	1188000
		Signage	19	9,500
		Development of a dry warehousing facility with a capacity of 7,400 MT	7400 MT	14800000
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 5 km feeder line to connect the existing substation to the main grid	5 Kms	7500000
		Construction of a 3 km-long dual lane external road with a width of 7.5 metres between the entry gate of industrial park to NH-8	3 kms	120000000
Kathalia Industrial Area	Internal Infrastructure	Construction of a 6 km long compound wall	6 km	8100000
		Construction of a 9 km intermediate carriageway of 5.5 m width	9 km	165375000
		Installation of a water supply network.	1	10000000
		Installation of one overhead water tank with a capacity of 1 Lakh litres and two underground water tanks with a capacity if 1.5 Lakh litres each	4,00,000 Litres	31500000
		Installation of 9 km electric lines	9 km	6804000
		Installation of 3 additional 11 kV electric stations	3	6900000
		Development of a sewage treatment plant with a 4 KLD capacity	4 KLD	80,000
		Installation of 20 CCTVs	20	25,000
		Installation of 9 km water pipelines where the diameter of the pipes is 6 inches or 150 mm.	9 km	12600000

		Construction a 9 km drainage system	9 km	14400000
		Development of an effluent treatment plant with a capacity of 140 KLD	140 KLD	14000000
		Land development and filling of 60 acres	60 acres	2.4E+08
		Streetlights for 9 km internal roads	9 km	5346000
		Fire safety system	1	2,000,000
		Signage	40	20,000
		Development of a dry warehousing facility with a capacity of 4400 MT	4400 MT	44000000
	External Infrastructure	Installation of a 33 KV/11KV substation	1	50000000
		Installation of a 20 km feeder line to connect the existing substation to the main grid	20 Kms	30000000
		Construction of a 4 km-long dual lane external road with a width of 7.5 metres between the gate of the industrial park and closest NH	4 kms	1.6E+08
Phase 3				
Industrial Park Name	Infrastructure	Project Description	Capacity	Cost in INR
Bodhjungnagar Industrial Area	Internal Infrastructure	Testing Facilities for Rubber Products	1	6,000,000
IIDC Sarasima		Testing Facilities for Rubber Products	1	6,000,000
IIDC Santirbazar		Testing Facilities for Rubber Products	1	6,000,000
R.K Nagar Industrial Park		Testing Facilities for Rubber Products	1	6,000,000
		Common Infrastructure for Bamboo Processing	1	15,000,000
Kumarghat Industrial Park		Common Infrastructure for Bamboo Processing	1	15,000,000
IIDC Dharmanagar		Common Infrastructure for Bamboo Processing	1	15,000,000
IIDC Dewanpasa		Food Processing Training Centre	1	3,500,000
Jalefa Industrial Park		Food Processing Training Centre	1	3,500,000
Sonamukhi IIDC		Food Processing Training Centre	1	3,500,000
		Truck Terminal	1	2,500,000

		Food Testing Lab	1	40,000,000
Lalchari IIDC		Food Processing Training Centre	1	3,500,000
Bijoypur IIDC		Food Processing Training Centre	1	3,500,000
Nagicherra IIDC		Testing Facilities for Rubber Products	1	6,000,000
Kathalia IIDC		Common Infrastructure for Bamboo Processing	1	15,000,000

Ground Water Quality Report

Sl. No.	Characteristics	Requirement as per IS : 10500:2012		Result							
		Acceptable Limit	Permissible Limit	Sabroom	Belonia	Santirbazar (Ward No-5)	Santirbazar (Ward No-4)	Santirbazar (Ward No-13)	Santirbazar (Ward No-2)	Ambassa	Udaipur
Physical & Chemical Parameters											
1	Temperature of the sample in ◦c	-	-	-	-	-	-	-	-	-	-
2	Turbidity (NTU)	1	05	0.12	5.4	4.32	4.2	3.11	1.2	2.4	14
3	Color in Hazen unit	5	15	-	-	-	-	-	-	-	-
4	Physical appearance	-	-	-	Slight hazy	-	-	-	-	-	-
5	Taste and Odour	Unobjectionable	Objectionable	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	-	-
6	pH	7.0 to 8.5	<6.5 or >9.2	6.67	6.90	6.89	6.78	6.68	6.84	7.1	7.2
7	Total dissolved solids (mg/l)	500	2000	-	-	91	98	86	67.8	286	-
8	Total hardness as $CaCO_3$ (mg/l)	200	600	40	64	54	48	62	52	46	46

Sl. No.	Characteristics	Requirement as per IS : 10500:2012		Result							
		Acceptable Limit	Permissible Limit	Sabroom	Belonia	Santirbazar (Ward No-5)	Santirbazar (Ward No-4)	Santirbazar (Ward No-13)	Santirbazar (Ward No-2)	Ambassa	Udaipur
9	Chlorides (as Cl) (mg/l)	200	1000	9	35	12	13	10	12	0.05	20
10	Sulphates (as SO_4) (mg/l)	200	400	-	-	-	-	-	-	-	-
11	Fluorides (as F) (mg/l)	1	1.5	-	-	-	-	-	-	-	-
12	Nitrates (as NO_3) (mg/l)	45	45	-	-	-	-	-	-	-	-
13	Calcium (as Ca) (mg/l)	75	200	-	-	-	-	-	-	-	-
14	Magnesium (as Mg) (mg/l)	<30	150	-	-	-	-	-	-	-	-
15	Arsenic (as As) (mg/l)	0.01	No relaxation	-	-	-	-	-	-		
16	Iron (as Fe) (mg/l)	0.1	1	0.312	0.90	0.78	0.67	2.72	0.18	0.57	0.5
17	Manganese (as Mn) (mg/l)	0.05	0.5	-	-	-	-	-	-	-	-
18	Copper (as Cu) (mg/l)	0.05	1.5	-	-	-	-	-	-	-	-
19	Aluminium (as Al) (mg/l)	0.03	0.2	-	-	-	-	-	-	-	-
20	Alkalinity as $CaCO_3$ (mg/l)	200	600	34	102	44	42	36	40		56

Sl. No.	Characteristics	Requirement as per IS : 10500:2012		Result							
		Acceptable Limit	Permissible Limit	Sabroom	Belonia	Santirbazar (Ward No-5)	Santirbazar (Ward No-4)	Santirbazar (Ward No-13)	Santirbazar (Ward No-2)	Ambassa	Udaipur
21	Free Residual Chlorine (mg/l)	0.2	>1.0	-	-	-	-	0	0	-	-
22	Zinc (as Zn) (mg/l)	5	15	-	-	-	-	-	-	-	-
23	Phenolic compounds (as Phenol) (mg/l)	0.001	0.002	-	-	-	-	-	-	-	-
24	Anionic detergents (mg/l) (as MBAS)	0.2	1	-	-	-	-	-	-	-	-
25	Mineral Oil (mg/l)	0.01	0.03	-	-	-	-	-	-	-	-
26	Dissolve oxygen as O_2 (mg/l)	06 or >06	No relaxation	-	-	-	-	-	-	-	-
27	Total Coliform Bacteria (MPN)	0 (Zero) no./100 ml	0 (Zero) no./100 ml	0	-	-	-	0	0	-	-
28	Fecal Coliform Bacteria (MPN)	0 (Zero) no./100 ml	0 (Zero) no./100 ml	-	-	-	-	0	0	-	-

Site visit pictures

Dhajanagar

Santirbazar

Thank you