Opportunities and Challenges for the Development of Industrial Cities proposed in Industrial Corridors. A Case-DMIC Corridor, Phase 1

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RESEARCH QUESTION

What are the opportunities and challenges for the development of industrial cities proposed in Industrial corridor project? Case – DMIC Corridor, Phase 1.

Abstract - *Urbanisation is a global multidimensional process, but to make it effective there is a need for planned urbanization. Urbanization often changes the human population densities by migration from rural to urban. It is estimated that by2050, India will be one of those cities in which the major population (almost 70%) will be living in cities. so, to manage this there is a need for 500 new cities. to develop.*

Also, India will be facing urban transition and economic transition to attain sustainability in growth and inclusion. There is growth in the service sector which provided employment opportunities to only skilled people. This has led to economic transition and the widened gap in living standards and the quality of life of people. So, to solve this, the government of India has planned to boost industrial development by developing industrial settlements and zones for industries and to generate employment opportunities. For, this industrial corridor and smart industrial cities are planned to develop under the Make in India campaign in which state will play a major important role.

The paper begins by introducing the industrial and urban infrastructure development (project/ policies) of the construction of industrial corridors. Followed by the industrial development of DMIC and its project of smart industrial city and examination of its urbanization effects. Also, opportunities and challenges faced inappropriate planning and implementation of these industrial cities with an example of the old planned city and new Greenfield smart city development and concluding with questions about the feasibility.

Key Words: Industrial Corridor, Smart Industrial City, Industrialization, NICDIT, Freight Corridor, DMIC

1. INTRODUCTION

Government of India when streaming development of the country has planned the development of the industrial corridor connecting the major cities in India. The government has approved the development of the five industrial corridor projects, to be implemented by the medium of the National Industrial Corridor Development and Implementation Trust (NICDIT).

The 5 industrial corridors are planted all over India, strategically focusing on inclusive development to thrust industrialization and planned urbanization. Efficient collaboration is provided by these industrial corridors among industry and infrastructure, which lead to an overall development economically and socially. Industrial corridors consist of:

Department of Promotion of industry and Internal Trade (DPIIT), Ministry of Commerce and Industry administer and control NICDIT for cumulative and equal growth of the 5 Industrial Corridors in India. In the year 2017, the Delhi Mumbai Industrial Corridor Project Implementation Trust Fund (DMIC-PITF) was re-named as National Industrial Corridor Development and Implementation Trust (NICDIT). NICD stands by project growth activities and appraisal also helps to approve and sanction the projects and to manage and direct all centric measures for the development of Industrial Corridor projects.

2.INDUSTRIAL CORRIDORS

Efficient collaboration is provided by these industrial corridors among industry and infrastructure, which lead to an overall development economically and socially. Industrial corridors consist of the speedy transportation network, Ports with cutting edge equipment for cargo handling, contemporary airports, Regions of economic importance, Logistic parks shipments hubs. While all these Knowledge parks were established focusing to cater to the industrial needs, which was an infrastructure that complemented, such as township or real estate, or urban establishments enabled framework.

The main economic booster in each of these projects is manufacturing units. Industrial Corridors are looked forward to fulfilling a major role in increasing the value added by the manufacturing sector from around 16% to 25% by 2025. The process of developing smart cities across these corridors is on-going. These cities, with futuristic infrastructure, will hold the advanced

workforce that is needed to boost up manufacturing-unit, later leading to planned urbanization.

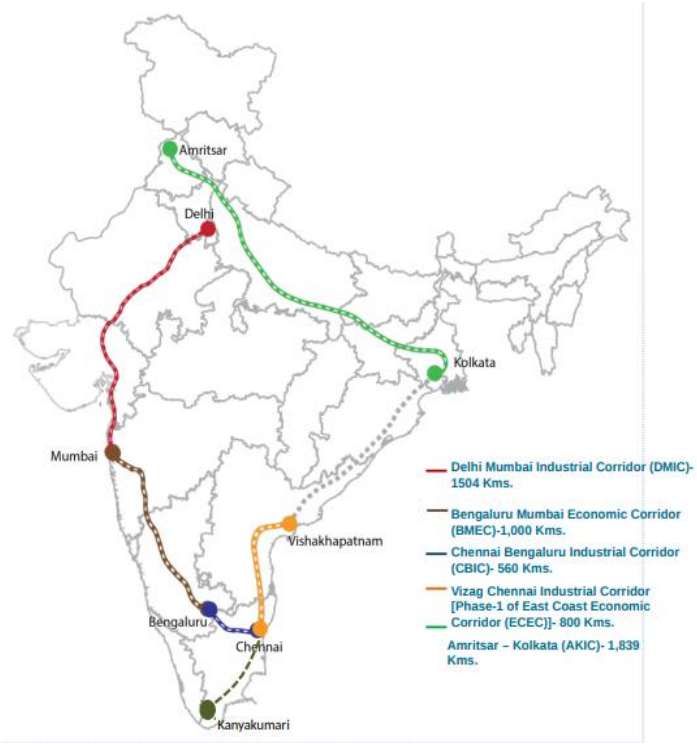

Fig -1: Industrial Corridors in India

Table -1: Five industrial corridors, India

SR.NO.	INDUSTRIAL CORRIDOR	STATES
1.	Delhi Mumbai Industrial Corridor (DMIC)	Uttar Pradesh, Haryana, Rajasthan, Madhya Pradesh, Gujarat, Maharashtra
2.	Amritsar Kolkata Industrial Corridor (AKIC)	Punjab, Haryana, Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, West Bengal
3.	Chennai Bangalore Industrial Corridor (CBIC)	Andhra Pradesh, Karnataka, Tamil Nadu, Kerala
4.	East Coast Economic Corridor (ECEC) with Vizag Chennai Industrial Corridor (VCIC) as Phase-1	West Bengal, Odisha, Andhra Pradesh, Tamil Nadu
5.	Bengaluru Mumbai Industrial Corridor (BMIC)	Karnataka, Maharashtra

2.1 Delhi Mumbai industrial corridor

The Delhi-Mumbai Industrial Corridor Project is the development of an industrial corridor that is sponsored by the state as an Industrial development Project. It is a project launched by the Government of India under the "Make in India" program. A total investment of around $100 billion is projected for this project which will develop a freight corridor connecting six states in India. It has aimed to develop Industrial regions and Industrial areas along its length. This project is aiming for the growth of industrial development in India also boosting economic development in the region.

The DMIC corridor has planned the development of Infrastructure and Industries with the development of greenfield future cities as Smart Industrial cities, Industrial Regions, and Industrial areas, all along with railway, road, port, and air connectivity between the states through which DMIC passes. Dholera SIR in Gujarat is one of the smart Industrial city developments which is a huge project.

Planning of the dedicated freight corridor is a backbone for the project as it would cut down the logistical costs of the manufactured goods. The transportation cost in India is high as the transference of goods from the northern part of India to the west coast takes around 12-13 days. The construction of this 1,483km-long dedicated freight corridor will benefit by reducing the time consumed for transport to 12-13 hours only and hence deducting the cost of transportation. Employment to around 100 million people will be provided by the development of this project. Hence this project assumes great importance in the development of the secondary sector in India.

The following Investment Regions are being developed in the first phase,

- Ahmedabad-Dholera Investment Region, Gujarat
- Shendra-Bidkin Industrial Park, Aurangabad, Maharashtra
- Manesar-Bawal-Investment Region, Haryana
- Khushkhera-Bhiwadi-Neemrana Investment Region, Rajasthan
- Pithampur-Dhar-Mhow Investment Region, Madhya Pradesh
- Dadri-Noida-Ghaziabad Investment Region, Uttar Pradesh
- Dighi Port Industrial Area, Maharashtra

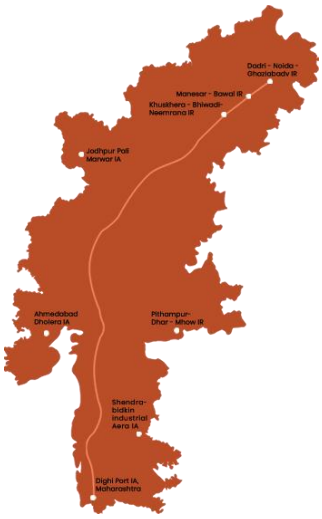

Fig -2: Industrial investment regions on DMIC

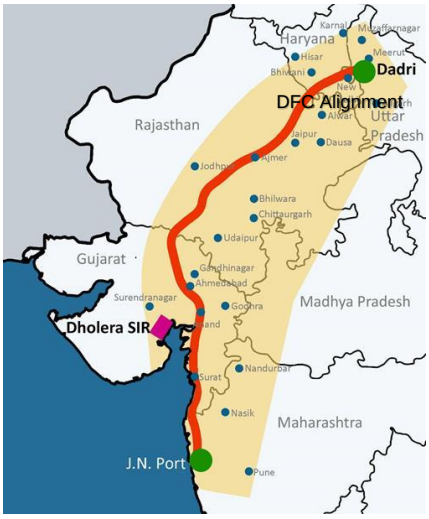

Fig -3: Industrial regions and cities proposed on DMIC

Vision - The DMIC images to be Model Industrial Corridor falling under international standards and emphasizing on boosting the growth of the manufacturing sector and services. It sees to stand in the competitive market internationally and increasing foreign investments in the country. DMIC in mere plans to be 'Global Manufacturing and Trading Hub' achieving sustainable development.

Goals- The developmental planning of the Delhi-Mumbai Industrial Corridor objects to achieve

- Double employment prospective in five years.
- Thrice the time industrial output in five years.
- tetrad exports from the region in five years.

Prospects for Employment and Infrastructure - The construction of this project can bring up to 3 million employment opportunities in the manufacturing sector of the country and overall, around a 100miliion people will be served with the occupation. The nearest influence zone will be able to generate the maximum employment opportunities and also the in states from where this corridor passes.

2.2 Industrial City

Tony Garnier, put forth the foremost notion of the industrial city, he was a French architect and socialist. New industrial city by Tony Garnier's was a planned industrial city, each zone was divided into residential zones, factory zones, green belts. He focused on building the structure in RCC. The city planning of Tony Garnier's city consisted of lengthy, tapered lots flowing east-west, broad-unbar spaces were used to divide buildings, walkers were exclusively given levels, and houses were constructed with roof gardens.

Now, the cities where the major economy of the city is based on the industries and their manufacturing, production, and related services can be termed as industrial cities. City when accommodating industries within its boundaries and becomes the center for it. It also becomes the second home for wage labourers and products on processes are held here.

The growth of industries, labourers, etc. leads to the infrastructural growth of the city. Subsidiary urban needs and functions start to build up in that area. Banking facility, wholesale markets, and retail markets, transportation, and communications grow to increase productivity in factories and quality of life in that area. The growth of the industrial city can be understood by a rapid population increase and In-migration. not only this, socio-cultural activities, infrastructural growth, and growth of industries go hand in hand and simultaneously.

3. CASE STUDY OF JAMSHEDPUR CITY

At the inception of the 20th century, Jamshedpur, an industrial city now located in one of the major industrial regions of India and was established. It is located in the eastern region (Chhota Nagpur Plateau). It became one of the most industrially advanced regions in India after the setup of the tata steel industry in Jamshedpur. Historically, the city Jamshedpur got its origin as a company town. The setup of steel city Jamshedpur was a new idea in urbanism practiced in India in 1907. In 1911, when Delhi was the upcoming capital, the town was setup with modern town planning principles, and living style, land use pattern, and the economy was being planned and taking shape as an industrial town. It was Jamshedpur. Initially, the development of Jamshedpur was done with the initiative of commencement of industrial growth in the region, Indians capitalized and built Jamshedpur by using resources present in the vicinity.

Jamshedpur city was planned to set up an iron steel plant and industries in this city. during its early years, it got its name from the founder of the steel production unit, Sir

Jamshedji Tata. The industry city had rich deposits of iron ore and coal mines in its region. Gurumahisini hills of Mayurbhanj (presently a district of Odisha) was founded with rich deposits of iron and coal. Thus, this locally available resource leads to the setup of an iron and steel plant at Sakchi village in Singhbhum district which is 72 km from the hills. The site had good connectivity to the other areas through the railway line. The nearest railways available were Kalimati railways station that was on the Bombay-Calcutta route. Hereby increasing opportunities for transportation.

3.1Planning stages of Jamshedpur city

Planning of Jamshedpur city was done in seven stages because of the increase in the production of the steel plant due to World War I and World War II and thereby increasing the number of workers employed.

Table -2: Planning stages of Jamshedpur

PLANS	YEAR	CONCEPTS
SahlinandKennedyPlan	1912	Small industrial town
Temple Plan	1920	Full-fledged industrial township
Stoke's Plan	1936	Expansion of Templeplan with emphasis on housing
Koenigsberger's Plan	1944-45	Garden city+ neighbourhood unit in planning circles.

Sahlin and Kennedy Plan was the first plan for Jamshedpur city as an industrial setup. This Tata steel plant was designed by Julian Kennedy and Axel Sahin. The placement was done in a way to keep dust opposite the wind direction to avoid dust from the industries to flow towards the city. The nomenclature to the roads was done alphabetically and numerically grid wise. Housing wasn't a prima facie motive which leads to unhealthy living conditions. The second plan to developed viewing the location of the steel plant and its prior existence. It was the work of Fredrick C. Temple who was a sanitary officer of states. his focus of the design was the living style of local tribes, Letchworth's garden city concept for the city plan, and NewEarswick's industrial planning for a rural area. in the city gravitational sewerage system, natural drains at parkways, green open spaces at every 4th residence block were considered as the problem solver. The 3rd plan was a result of the need for housing in Jamshedpur and was inspired by Earnest Burgess. It was popularly known as the Stokes Plan. It supported growth in segments adjacent to transport routes. The division was housing was done as per working class such as officers in the North, workers in the North and west nearby villages, Sakchi and Kadima. As a consequence of which residence were now open to smoke and dust. This lead to unhealthy living conditions which therefore required another plan for the city of Jamshedpur. With the arrival of Otto Keonigsberger Plan, the garden city concept came into being which focused on the removal of informal settlements that were developed industrial areas. So, he gave a proposal for developing garden suburban the forest slopes of Dalma Hills which could provide housing for 200 MIG families but they must travel 7 miles daily for their work. It intended to place housing units with a green cover and at an assured distance from industries. After all this plan, the population grew in Jamshedpur and the Jamshedpur urban agglomeration was the result.

Jamshedpur Urban Agglomeration (JUA) - The Tata steel plant is the core of the Jamshedpur city employed great numbers. When the expansion took place, multinucleated form was planned to focus on reducing the commuting distance to work. Housing was provided in nearby 4 villages named Jojobera, Golmuri, Sidhgora, Baridih for the employees. The informal settlements on the fringes of the industrial area were now developed as planned housing colonies. The master plan for JUA, covered the core of Jamshedpur, Adityapur, Mango, Jugsalai, and seven villages, covering a total area of 149.23 sq. km.

3.2 Effective factors in Jamshedpur industrial city development

Jamshedpur is an industrial city with different planning stages. Many major factors affected Jamshedpur to develop as an industrial town. First is the availability of resources. Jamshedpur was located in major industrial regions of India also had rich deposits of iron and coal. Second, having good connectivity to nearby cities and areas. It also had the availability of road and railway linkages. It helped in the transportation of goods and commuting possibilities for workers. Later, Tatanagar Junction was developed as a railway junction. Also, national highways, NH32, NH33, 4 lane Expressway (Adityapur- Kandra Road) connects Jamshedpur to Barbil. Sonari Airport is the nearest airport which was later developed. The third factor that helped in development was the availability of water as a resource. Jamshedpur is located at the convergence of two rivers Kharkai and Subarnarekha and also has many lakes in its proximity which are a continuous supplier of water.

Besides growth, certain factors were the reason for the decline. The growth of the iron and steel industry lead to an increase in employment opportunities but decreased the living standards of the city. This led to unhealthy living conditions and people started finding better places of work. So, there was a gradual decline of this industrial city, Jamshedpur recovered by balancing all the aspects

and also won the title for Global Compact City in 2008 continuing its success years.

4. CASE STUDY OF DHOLERA, SMART INDUSTRIAL CITY

Planning for the development of Special Investment Regions (SIRs) which are full-fledged with world-class infrastructure along the Delhi Mumbai Dedicated Freight Corridor (DFC) is done. The first proposal for a special investment region under Delhi Mumbai industrial corridor which runs along the dedicated freight corridor is the Dholera Special Investment Region (DSIR) in Gujarat.

Dholera special investment region has proposed the development of Dholera as an industrial city. Dholera is a greenfield smart industrial city that is planned and located in good proximity to other major cities. The influence region of DMIC is 150km band and cholera special investment region is proposed within it. It is around 95 km from the dedicated freight corridor alignment. The development proposal for DSIR is done in a rural area which is around 920 sq. km in area. It includes 19 villages of Dhandhuka Taluka and 3 villages of Barwala Taluka. Covering around a total of 22 villages of Ahmedabad District of Gujarat.

The location of the site has many essential resources available. On the eastern side of the site is the Gulf of Khambhat. Two rivers are flowing, on the northern side is River Sukhbhadar and on the southern side is the River Utavali. The site has many industrial centres nearby naming Ahmedabad, Vadodara, Surat, Rajkot, and Bhavnagar. Connectivity of the site is there via all modes of transport. It has linkage to ports of Gujarat through national highways. It has connectivity to the airport at Ahmedabad. The primary route that currently exists to connect to the regional road network is State Highway 6. It also connects Ahmedabad in the north and Bhavnagar in the south. There are state highways that connect but no railway line connection is yet there in the existing scenario. The land use of the site is majorly agricultural land, which is both privately and government ownership. The land use comprises coastal areas along the Gulf of Khambat, forest land, ponds, land for cattle grazing, and village settlements.

DSIR is well planned with a residential area, industrial and economic zone & tourism. Also, proper planning for civic amenities and services including hospitals and medical services, schools, fire services, public parks, markets and shopping places, playgrounds, entertainment areas along facilities for solid and liquid waste management is there. The total number of residential units planned is 5,00,000 to back the requirements for around 20,00,000 population and employment opportunities are provided to around 8,27,000 people.

4.1 Major Schemes and Proposals Influencing the Project

- Dholera International Airport
- Bharuch -Dahej Investment Region (BDIR)
- Gujarat International Finance Tec-City (GIFT)
- Improving State Highway 6
- Proposal for connecting Gandhinagar – Ahmedabad – Dholera in Metro Phase II
- CONCOR Logistics Park at Khodiyar, Gandhinagar
- Natural Gas Pipeline
- Revised Development Plan, AUDA, 2011 & City Development Plan, Ahmedabad (2006- 2012)
- Kalpasar Freshwater Reservoir Project

4.2 Effective factors in Dholera smart industrial city development

Availability of Maximum Government Land. It is a great factor to speed up the development of the project. As maximum government land eases the step of land transfer for the project and thereby results in the fast development of the project.

Dholera Industrial city had many major cities like Ahmedabad, Bhavnagar, Vadodara, Rajkot near to it. It has good connectivity to these cities which themselves will serve as a market to DSIR.

DSIR had facility and connectivity to Seaport &International Airport which enhances the movement and makes it convenient for trade and commerce.

Availability of Existing Linkages both roads and railways are there to Dholera industrial smart city. Linkages and well-planned connectivity form the backbone of Industrial or investment regions. They are the driving force and promote growth.

Several Villages and Populations getting affected is one of the major factors. It is convenient to plan for community development when the number of people in the selected area is less.

Administrative Village Boundary - Special investment region when developed in a region brings growth and development in the area and improves infrastructure facilities and generates employment opportunities which benefits the people to a great extent. So while delimiting the special investment region it is necessary and advisable to delineate as per village administrative boundaries to avoid the distress of any kind being it between people or administration.

Environmental Habitat - CRZ Area and Velavadar Black Buck National Park- In the case of DSIR, the other site selected for SIR, were near coastal area and thereby having coastal regulation zone. The alternatives selected

for the Special Investment Region area were all located near the coastal area. Also, the Velavadar Black Buck National Park area, located in Bhavnagar district was near the site. This development of DSIR will harm the ecosystem, create disturbance in the balance of flora and fauna, and will affect the environment. Hence eventually attracted coastal zone regulations.

5. OPPORTUNITIES

The industrial corridor is an industrial development project planned for a dedicated area which will enhance the infrastructural development and growth of the area. It is developed aiming to create centers for industrial growth. Proposal for Smart Industrial City is an opportunity to develop the city on large land parcels with high-class infrastructure, social amenities, planned communities, smart governance, and great employment opportunities.

DMIC corridor builds smart industrial cities, Industrial Clusters, and manufacturing industries which tend to come up together to create industrial corridor which will enhance the industrial development in the country specifically the states along DMIC i.e. Uttar Pradesh, Haryana, Rajasthan, Madhya Pradesh, Gujarat, Maharashtra.

Smart industrial city development will provide development of the area that was earlier a backward region or was left undeveloped. This will boost the economic growth in that region and lead to urbanization. Urbanization in those areas will be facilitated by the smart and intelligent living. This smart industrial development will fulfil the social infrastructure facilities, create a healthy environment for living, sustainable development will be encouraged, quality of life index of the city will be much high as compared to the traditional organic city. These cities will have smart infrastructure development, city-wide WIFI, and a fibre-based network for communication facilities, city-wide sensors network for traffic systems, pollution sensors, and leak detection sensors for safety and security purposes. Also, the city integrated operation centre will be developed for intelligent analysis of city services, city infrastructure, and city governance.

Industrial cities being planned under the influence zone of the Delhi-Mumbai Industrial corridor will take the advantage of transportation and connectivity. Good connectivity to other parts of the country enhances the demand and supply chain of the manufactured goods and also a human resource. The transportation of goods and connectivity will also improve the import and export of manufactured goods globally. Therefore the cost of goods and quality can be maintained. Western Dedicated freight corridor along DMIC will decrease the travel time and cost of transportation, which will be utilized by maintaining the quality of the product in the global market. Good industrial development will increase employment opportunities in the industrial city leading to the growth of the economy of the people in the cities.

Also, cities are planned and located considering people in this region to experience maximum growth and positive impact while minimizing the number of villages and population getting affected.

6. CHALLENGES

The fund estimated for the complete project of an industrial corridor is 100 billion dollars. The Japanese government is investing in the initial stages, the amount of 4.5 billion dollars. It is at 40 years of the loan period with an interest rate of 0.1 per cent. According to the union budget of February 2020, the Indian government will be investing an amount of 12 billion rupees which will develop the basic infrastructure. Further investment is expected from the private players which are around 90 per cent of the investment. So the challenge that the smart industrial city development and corridor will face is what will encourage the investment of private players in that new area.

It is projected that when the initial development will take place the land prices in those areas will go up. This will bring investments from private players. Another stakeholder except the government bodies believes that bringing private players for investment may violate the existing rules.

According to the constitution Article 243Q, it is stated that a body of bureaucrats and private companies will form a Special Purpose Vehicle which will govern each smart city that is along DMIC. It is the same as these Special Purpose vehicles used to govern the Special Economic Zones. This may lead to deferment of elected bodies i.e. municipalities and gram panchayat, which will suspend the democratic power in these areas or cities and will be governed by a single managerial body or an individual.

The other challenge faced by the cities is in acquiring land. People with land ownership in those undeveloped areas or local people do not agree to transfer land to the government. They believe the government will not be able to fulfil the promises they make. They fear this industrial project will lead to loss of land and livelihood from them. It is very difficult to convince the local people that this project will generate employment opportunities for them.

Planning for a new city is possible. But developing a new city takes almost 30- 40 years, which is just like setting a New Mumbai, Noida, or Chandigarh. Execution of the plan for city development should only be done when all the plans, policies, and engineering are prepared with all details and approved. It is complex to follow but this is what DMICDC is aiming to do.

Smart Industrial Cities being a new concept in India is facing various challenges. Good governance and fast services and approvals are required for the project. Acquiring and pooling of land from the state government itself is a slow and time taking task. Also, there is a need for all stakeholders and state governments to agree to facilitate the cities with good infrastructure, governance, and institutions. Also, the operation and maintenance of these new cities is a new challenge.

Overall, it's a long term process and plan. Resources utilization until that time will be a challenge. So, planning for these new smart industrial cities should be handled in a sustainable manner considering all stakeholders.

7. CONCLUSIONS

Smart Industrial city projects should be designed efficiently and effectively, taking into consideration the local people as the main subject. If done so the local community and people will come up as a very beneficial resource to the industrial cities. But it is mandatory to understand, the gap between the rural and urban populations should not be widened with this development. Cautious planning is the need to maintain equality among all people irrespective of class, caste, creed, sex, etc.

Smart Industrial city development is a future of industrial cities in India. Planning for this industrial development in our country is ambitious but at the same time is logical. There are varied socio-economic conditions, infrastructural and cultural differences from region to region, and Implementation of this industrial plan is a little difficult task in our country. These industrial cities will turn out to be feasible if there are increase and hike in land values. Also, growing needs and the economy can make our country stand in the global market, and hence this industrial city development will boost the development in India.

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