A PROJECT REPORT ON

"A STUDY ON INDUSTRIALIZATION AND ITS IMPACT ON

ENVIRONMENT WITH REFERENCE

TO THANE CITY."

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of Bachelor in Commerce (Accounting and finance)

Under the Faculty of Commerce

By

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Mohanlal Raichand Mehta College of Commerce

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Amritlal Raichand Mehta College of Arts

Dr. R.T. Doshi College of Computer Science

NAAC Re-Accredited Grade 'A+' (CGPA : 3.31) (3rd Cycle)

Sector-19, Airoli, Navi Mumbai, Maharashtra 400708

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CERTIFICATE

This is to certify that **Ms. Vaishnavi More** has worked and duly completed his Project work for the degree os Bachelor in Commerce (Accounting and Finance) under the Faculty of Commerce in the subject of Management control and his project is entitled, **"A study on Industrialization and its impact on Environment with reference to Thane city."** Under my supervision.

I further certify that the entire work has been done by the learner under my guidance and that no part of it has been submitted previously for any Degree or Diploma of any University.

It is his own work and fact reported by her personal finding and investigations.

Guiding Teacher,
ASST. PROF. DR. KISHOR CHAUHAN

Date of submission:

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DECLARATION BY LEARNER

I the undersigned **MISS VAISHNAVI MORE** here by, declare that the work embodied in this project work titled **"A study on Industrialization and its impact on Environment with reference to Thane city",** forms my own contribution to the research work carried out under the guidance of **Asst. Prof. Dr. Kishor Chauhan** is a result of my own research work and has not been previously submitted to any other University for any other Degree/ Diploma to this or any other University.

Wherever reference has been made to previous works of others, it has been clearly indicated as such and included in the bibliography.

I, here by further declare that all information of this document has been obtained and presented in accordance with academic rules and ethical conduct.

Name and Signature of learner
Miss Vaishnavi More

Certified by,
Asst. Prof. Kishor Chauhan

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CHAPTER-I
INTRODUCTION

1.1. Introduction

Industrialization is the process of transforming the economy of a nation or region from a focus on agriculture to a reliance on manufacturing. Mechanized methods of mass production are an essential component of this transition. The positive characteristics of industrialization include economic growth, a more efficient division of labor, and a growth spurt in technological innovation. Industrialisation is the period of social and economic change that transforms a human group to an industrial society from an agrarian society, involving the extensive manufacturing reorganization of an economy. Industrialisation requires many key elements to grow on a significant scale. They are land, labour, capital technologies, and connections. People cannot grow into an industrial society without a generous supply of these essential elements and the capacity to coordinate with them. Industrialization can be driven by a combination of factors including government policy, labor-saving inventions, entrepreneurial ambitions, and a demand for goods and services. It has profound implications for the population, causing a wave of migration from small farms to cities and towns where jobs can be found. The most dramatic example in recent history is that of China, where government policy changes in the late 20th century led to the nation's transition from an economy based on subsistence farming to a global manufacturing powerhouse.

Industrialization is a transformation away from an agricultural- or resource-based economy, toward an economy based on mechanized manufacturing. Industrialization is usually associated with a greater average income and improved living standards.Early industrialization occurred in Europe and North America during the 18th and 19th centuries, and later in other parts of the worldNumerous strategies for industrialization have been pursued over time, with varying levels of success. Industrialisation (alternatively spelled industrialization) is the period of social and economic change that transforms a human group from an agrarian society into an industrial society. This involves an extensive re-organisation of an economy for the purpose of manufacturing.Historically industrialization is associated with increase of polluting industries heavily dependent on fossil fuels. With the increasing focus on sustainable development and green industrial policy practices, industrialization increasingly includes technological leapfrogging, with direct investment **in** more advanced, cleaner technologies. The effect of industrialisation shown by rising income levels in the 19th century. The graph shows the gross national product (at purchasing power parity) per capita between 1750 and 1900 **in** 1990 US dollars for First World nations (Europe, United States, Canada, Japan) and Third World nations (Europe in east, Southern Asia, Africa, Latin America).

The reorganization of the economy has many unintended consequences both economically and socially. As industrial workers' incomes rise, markets for consumer goods and services of all kinds tend to expand and provide a further stimulus to industrial investment and economic growth. Moreover, family structures tend to shift as extended families tend. In 1750, India produced nearly

25 % of the world's manufacturing output and was only outdone by China, which constituted 32.8 %. By 1880 however, India only took up 2.8 % of world exports, and after its independence from British colonization in 1947, it was one of the most poverty-stricken regions in the world. India's economic deterioration is particularly ironic, considering the industrial boom that Britain experienced during the same era. Nevertheless, from 1750 to 1947 India experienced modernization of its economy in various areas including agriculture, factory production, finance, and even film production. Though India did lose its edge in the textile trade and did in fact experience de-industrialization, its thriving "Bollywood" cinema market and automobile production in Hindustan are some notable examples of economic modernization.

Industrialization will be examined based on the modernization of India's economy in the following four major sectors of the economy: primary, secondary, tertiary, and quaternary. The primary sector deals with the extraction and production of raw materials, and entails farming and mining. The secondary sector takes the materials gained from the primary sector and transforms the raw materials into final goods such as textiles and automobiles. The tertiary sector involves the provision of services such as banking, finance, and cinema to consumers and businesses. Last of all, the quaternary sector usually appears the latest in a country's modernization process. It entails technological research and education. Since this paper deals with pre-colonial and colonial India, it is safe to assume that the quaternary sector will hardly be invoked.

The four major sectors will be examined in order. The paper will focus on how they developed throughout history through production rates and statistics until independence in 1947. Considering the special colonial history of India and its de-industrialization phenomenon, this paper also seeks to answer whether British colonialism harmful or beneficial to the modernization of India's economy.

1.2. Background

1.2.1. Origins of Industrialization

The Industrial Revolution began in Great Britain during the 1700s. At this time, the entire world was reaching the limits of traditional sources of fuel such as wood. Less than 10% of Great Britain was still covered in forest by this time, Japan almost destroyed all its forests, and China had deforested one thousand miles inland to keep up with the demand for wood. Alternatives to wood such as coal had been known for thousands and years and were mined in China long before any was discovered in Great Britain. However, unlike in China, the British discovered coal deposits in the 18th and 19th centuries which were extremely close to the surface.

The discovery of large and easily accessible coal reserves in Great Britain allowed the country to move away from wood as a fuel source before any other country. This alone would not have been very significant because wood was used for warmth and crafting metal but little else. Around the same time, the steam engine was developed which relied on a reservoir of water being heated which pushed a piston and could be used to power machines. If powered by wood, this would take far too much fuel to make profitable, however, with coal steam engines it was incredibly efficient.
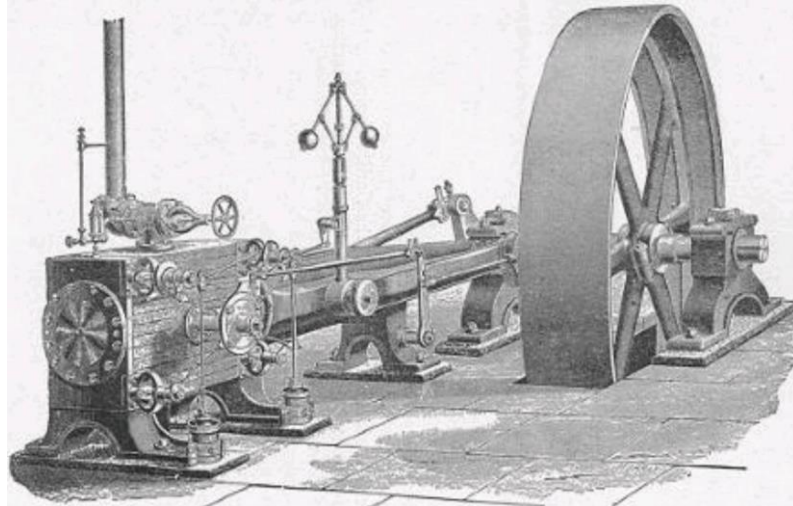
Steam engines existed before the widespread use of coal in England, but they were not practical.

Once steam engines had an efficient fuel source, the textile industry was the first to be mechanized. Clothing was extremely expensive and even though skilled laborers in India could make them cheaper than anyone else, British manufacturers were able to produce clothing for far cheaper and within decades became the main exporter of cloth in the world.

After the last stage of the Proto-industrialization, the first transformation from an agricultural to an industrial economy is known as the Industrial Revolution and took place from the mid-18th to early 19th century in certain areas in Europe and North America, starting in Great Britain, followed by Belgium, Switzerland, Germany, and France.Characteristics of this early industrialisation were technological progress, a shift from rural work to industrial labor, financial investments in new industrial structure, and early developments in class consciousness and theories related to this. Later commentators have called this the First Industrial Revolution.

The "Second Industrial Revolution" labels the later changes that came about in the mid-19th century after the refinement of the steam engine, the invention of the internal combustion engine, the harnessing of electricity and the construction of canals, railways and electric-power lines. The invention of the assembly line gave this phase a boost. Coal mines, steelworks, and textile factories replaced homes as the place of work. By the end of the 20th century, East Asia had become one of the most recently industrialised regions of the world. The BRICS states (Brazil, Russia, India, China and South Africa) are undergoing the process of industrialisation.

There is considerable literature on the factors facilitating industrial modernisation and enterprise development.

1.2.2. Industrialisation in India

The industrial revolution entered India in 1854 when Bombay opened its first steam-powered cotton mill in Asia. Initially, the growth was slow, and the expansion of these modernised cotton mills was not done until the 1870s and 1880s. India now has the world's sixth-largest economy.

Industrialisation provides greater opportunities for employment in small and large scale industries. In an industrial economy, industry absorbs underemployed and unemployed farmworkers, thus increasing community income.

It also helps in overcoming deterioration in terms of trade, bringing technological progress and providing the necessary elements for strengthening the economy.

1.3. Types of Industrialization

Industrialization is dependent on growth and innovation in at least four industries :
(A)Manufacturing

Industrialization began with the invention of machines that greatly increased the manufacture of goods.One such invention was the cotton gin, patented by Eli Whitney in 1794. Whether hand-cranked or steam-powered, the machine made it possible to greatly increase the speed with which cotton fluff could be separated from its seeds before being woven into cloth.
Another was the spinning jenny, a contraption that could multiply the number of spindles that a single spinner could handle at the same time to weave cotton or wool.
Perhaps the key invention of them all was the steam engine, an improved version of which was invented by Scottish engineer James Watt in 1763. Coal-powered steam engines drove the Industrial Revolution.

(B)Mining

Many of the great inventions of the 19th century were developed to serve the mining industry.
The first working steam engine was devised to help remove flood water from coal and tin mines, where they often disrupted production.
The first use for the steam-powered locomotive was to transport ore from mines.
Dynamite was patented in 1867 and was first used to blow up rocks that obstructed mining activities.

(C)Transportation
The 19th century was a period of unparalleled innovation in ways to transport goods from and to marketplaces. Among them:
The steam locomotive. The prototype, known as Stephenson's Rocket and introduced in 1829, served for the next 150 years as a template for the production of vehicles to haul raw materials and finished products.
The steamboat. The transport of goods and people was greatly expanded and speeded up with the introduction of the steamboat, which adapted steam technology to river craft.

(D)Retailing

Before contactless payments and self-service checkouts, there were innovations in retailing that were designed to appeal to 19th century shoppers.

The department store. The first "store for everything" was John Wanamaker's, a six-story retail wonderland that rose in the heart of Philadelphia in 1887.

The Sears catalog. It wasn't the first catalog but it was the first to reach practically every consumer in America with a vast range of goods, from children's clothing to prefabricated houses.

Patterns of Industrial Development

The pre-independent India, mostly characterised by backwardness, did not have an organized industrial sector. The Second World War made a small beginning in industrial development. Still the share of industries in the country's national income was relatively small. There had been a marked shift in the advancement of the industries after the implementation of five year Plans in independent India. The significant role of industrialization as the major channel of rapid economic growth and allround development has been recognized by the planners of modem India. Besides rapid growth and prosperity, the Indian strategy of development planning, inspired by economic nationalism, aimed at achieving self-sufficiency under the direction of the public sector. It also aimed to translate the economic growth into improved standard of living of the masses. Maximum production and full employment, and the attainment of economic equality were the long term objectives declared by the First Five Pear Plan.

The policies aimed at achieving econormc growth with distributive justice. Then the rapid development of industries and their diversification are considered to be absolutely necessary for development. The experience of state dominated development planning for a period of more than five decades has brought out many significant achievements in the growth and structure of Indian industries.

'Growth with social justice' has been the main objective of planning since 1951. It has been defined to be inbuilt in the production process so that the major beneficiaries of the development planning are the majority of the people and the rapid and diversified industrialization serves the needs of the masses by generating adequate employment and income distribution. The new policy environment focused on a mixed economy framework where the public sector will play a major role in building the industrial base of the economy with the objectives of accelerating growth, generating employment, reducing regional disparities, checking concentration of economic power and achieving self-reliance.

Modes of Industrialization

Different strategies and methods of industrialization have been followed over time, with varying degrees of success.

The Industrial Revolution in Europe and the United States initially took place under mercantilist and protectionist government policies that fostered the early growth of industry. These later adopted a

laissez-faire or free-market approach that encouraged foreign trade, providing new outlets for industrial output.

In the post-Second World War era, developing nations across Latin America and Africa adopted a strategy of import-substituting industrialization, which involved protectionist barriers to trade coupled with direct subsidization or nationalization of domestic industries.

Nearly at the same time, parts of Europe and several East Asian economies pursued an alternative strategy of export-led growth. This strategy emphasized the deliberate pursuit of foreign trade to build exporting industries and depended in part on maintaining a weak currency to make exports more attractive to foreign buyers.

In general, export-led growth has outperformed import-substituting industrialization.

1.4. Benefits of industrialization

Here are some common benefits industrialization may offer:
- The import-export market

Industrialization helps the country's economy maintain a balance of imported and exported goods. The ability to manufacture certain products on a large scale based on domestic resources made it possible to provide goods as exports to other countries. In return, the U.S. accepts imported goods from countries that produce an abundance of them. This trade balance allows for more access to a range of products and can contribute to lower market prices.

- Availability of goods

Industrialization makes it easier for companies to manufacture products in bulk. Before the use of machinery in the manufacturing process, employees made products by hand. Besides the potential health and safety hazards involved in manual production processes, they also took a significant amount of time. Industrialization continues to make these processes more efficient, particularly through the use of emerging technologies like automated equipment.

- Affordability of goods

By making goods more readily available, industrialization also makes them more affordable. When the demand for a product is high, companies have the responsibility of keeping up with it by producing an adequate supply. Before industrialization, this was more challenging, as it took longer to make products. With fewer products on the market, companies charged more so they could earn a profit. When companies can meet demand, consumers typically pay less because there are more goods available in the market.

- Increased jobs

The increased use of machinery in manufacturing facilities creates an increased demand for labor. When companies can make more products, they typically hire more employees to help them meet their goals and their customers' expectations. This can lead to a higher profit, which may also allow them to open multiple facilities, all of which require employees to run them. Besides manufacturing professionals, companies hire professionals in other fields, such as business, administration, sales and marketing to maintain operations.

- Improved medical care

Industrialization has led to the development of many technologies used in the healthcare field. As technology advances, it allows for the production of medical equipment like imaging machines, monitors and robot-assisted surgeries. Manufacturing facilities that rely on industrial machinery to produce goods make it easier for health care providers to access machinery that can help them diagnose and treat their patient.

1.5. Disadvantages of industrialization

Here are some potential disadvantages of industrialization and how organizations can resolve, prevent or minimize them:
- Global warming and climate change

One of the primary concerns about industrialization is its effect on global warming. As climate change continues to impact the health of the planet, many people are hesitant to support organizations that contribute to pollution. Global warming can also have a negative impact on the health of workers and consumers. Companies can minimize their negative contributions to climate change by adopting green initiatives, such as eco-friendly packaging and paperless facilities.

- Increased income disparity

Industrialization has led to many jobs, but it can also contribute to the significant gap between socioeconomic groups. Wealthier populations typically own or manage large corporations, and those who work in the facilities often earn a significantly lower income. This can make the disparity between the groups larger, but companies can reduce these disparities by offering higher wages and complete benefits packages that make it easier for employees to succeed financially.

- Potentially hazardous working conditions

Just as working conditions before the current legal and industrial regulations existed were sometimes dangerous, those in today's factories can also present a hazard to employees. Advanced machinery has made it easier for companies to produce large quantities of products and hire more employees, but if used incorrectly, it can also cause injuries. Companies can prevent these potential dangers by

ensuring they keep working areas and safe, providing safety equipment to employees and providing comprehensive training to all team members.

- Decreased professional autonomy

Manufacturing professionals often complete many of the same duties as their colleagues, and automated processes rarely allow for creative problem-solving in the workplace. The lack of autonomy and ability to work independently can lead to employee burnout, which can make it challenging for companies to retain employees and for employees to experience job satisfaction. Companies can help minimize burnout by encouraging employees to share their ideas for process improvements and asking them for their feedback before making major changes.

- Rapid urbanization

When industrialization began in the U.S., cities grew larger quickly as employees moved closer to the facilities where they worked. This led to the fast urbanization of certain areas, and the sudden increase in population caused issues with food inaccessibility, high levels of stress and poor health among employees. Although some of these issues persist today in industrial areas, companies can help by creating policies that ensure overtime work is optional and employees receive benefits for themselves and their families. By caring for their employees, companies can maintain qualified, dedicated workers who care about their jobs and the company's goals.

1.6. Role/ Importance of Industrilization in India

The need for and role of the industrial sector have been fully recognized by the development thinking all over the world. Industrial sector through its forward and backward linkages with other sectors plays a very important role in achieving rapid growth and development. Most modern and rich countries have well developed industrial sectors through their early industrial revolution.

Industrialization means widespread development of manufacturing vast quantities of goods, employing a large number of people, promoting international markets, characterization of specialized skill, science, technology, increasing application of electrical, electronic, computer technologies to enhance productivity. Absence of such rigorous industrialization is the main reason for the backwardness of many poor countries too.

Hence, the modern development strategies attach more emphasis to rapid industrialization to achieve faster growth and progress. The following are some of the important needs for the industrial sector.

1. Raising Income:

Vigorous industrialization ensures a solid and sustained base to increase the national income of an economy. A larger share of national income of industrially advanced economies comes from the industrial sector.

2. Employment Opportunities

Availability of surplus labour and unemployment are the major challenges of development strategy. Industrialization uses the productive resources of the economy and expands employment opportunities which in turn will improve the income and well-being of the people.

3. Higher Living Standard

The increasing national income through industrialization helps to meet the demands of the people for industrial products. It is also expected to improve the standard of living of the people by increasing their per capita income. This is possible only through a well designed growth process.

4. Promoting Exports

Industrially advanced countries are able to export more and earn large foreign exchange. The income elasticity of industrial goods is very high than that of the primary goods. Hence, exports can be promoted to earn adequate foreign exchange by producing advanced industrial goods.

5. Capital Formation

Expanding employment opportunities, income generation through rapid industrialisation will also lead to increased saving and capital formation in the economy. This will help to diversify and expand the industrial base further through higher investment.

6. Technological Progress

Industrial sector will also promote technological progress through its course of development and expansion. The technological advancements and their dynamic contents provide the required elements to strengthen the economy as a whole.

7. Strengthening the Economy:

Industrialisation of the country can provide the necessary elements for strengthening the economy. In this regard the following points may be noted.
(a) Industrialisation makes possible the production of goods like railways, dams, etc. which cannot be imported. These economic infrastructures are essential for the future growth of the economy.
(b) It is through the establishment of industries that one can impart elasticity to the system and overcome the historically given position of a primary producing country. Thus, with industrialization we can change the comparative advantage of the country to suit its resources and potentialities of manpower.
(c) Through industrialization the requirements for the development of agriculture can be met. For example, improved farm-implements, chemical fertilizers, storage and transport facilities, etc., appropriate to our own conditions can be adequately provided only by our own industries.
(d) Industrial development imparts an economic dynamic element in the form of rapid growth and a diversified economic structure which make it a progressive economy.

(e) Providing for Security: Industrialisation is needed to provide for the country's security. This consideration becomes all the more critical when some international crisis develops. In such a situation, dependence of foreign sources for defense materials is a risky affair. It is only through industrial development in a big way that the national objective of self-reliance in defense materials can be achieved.

Factors of Industrialization

The factors affecting the location of industries are the availability of raw material, land, water, labour, power, capital, transport and market. Industries are situated where some or all of these factors are easily available. Sometimes, the government provides incentives like subsidised power, lower transport cost and other infrastructure so that industries may be located **in** backward areas. Industrialisation often leads to the development and growth of towns and cities.

Industrialization Factors
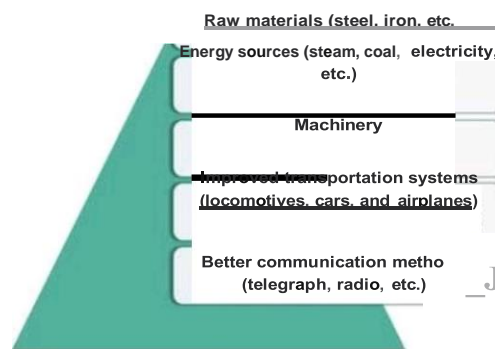
The factors affecting industrial productivity are inter-related and inter-dependent and it is a difficult task to evaluate the influence of each individual factor on the overall productivity of industrial units. The impact of certain important factors is briefly examined below:

(i).Technological Development

Technological development plays an important part in influencing industrial productivity. "The application of motive power and mechanical improvements to the process of production has accelerated the pace of industrialisation to an unprecedented degree, and has given us the vision of the vast and unexplored frontiers that still lie ahead of us in the realm of applied science and technology."
The technological factors include degree of mechanization, technical know-how, product design, etc. Improvement in any of the technological factors will contribute towards the increase in industrial productivity. In India, application of mechanical power, introduction of semi-automatic and automatic machines, improvements in the production processes, better Morale and Productivity integration of production processes and higher degree of specialisation have contributed a lot towards the increases in industrial productivity.

(ii) Quality of Human Resources

Manpower plays a significant role. In raising industrial productivity in most of the industries. If the labour force is not adequately qualified and/or is not properly motivated, all the steps taken to increase industrial productivity will have no result. The employees' performance and attitudes have an immense effect on the productivity of any industrial unit. Three important factors which influence the productivity of labour are (a) ability of the worker, (b) willingness of the worker, and (c) the environment under which he has to work.

(iii) Availability of Finance

The ambitious plans of an industrial unit to increase the productivity will remain mere dreams if adequate financial resources are not available to introduce technical improvements and give appropriate training to the workers
The greater the degree of mechanization to be introduced, the greater is the need for capital. Capital will also be required for investment in research and development activities, advertisement campaigns, better working conditions to the workers, up-keep of plant and machinery, etc.

(iv) Managerial Talent

The significance of managerial talent has increased with the advancement in technology. Professional managers are required to make better use of the new technological development. Since modem enterprises are run on a large scale, the managers must possess imagination, judgment and willingness to be imitative.
The managers should be devoted towards their profession and they should understand their social responsibilities towards the owners of the business, workers, customers, suppliers. Government, and the society this is essential if the managers want to manage their organizations effectively. The managers should have conceptual, human relations and technical skills in order to increase the productivity of the enterprise.

(v) Government Policy

The industrial policies of the Government have an important impact on the industrial productivity; The Government should frame and implement such policies which create favorable conditions for saving, investment, flow of capital from one industrial sector to another and conservation of national resources. Certain industries may be granted protection, and incentives may be given to the others for the development in view of the national interest.
The Government should follow the taxation policy which does not discourage the further expansion of business. It is also the duty of the Government to check the growth of monopolistic enterprises so that the interest of the consumers and the workers are not jeopardized.

(vi) Natural Factors

Natural factors such as physical, geographical and climatic exercise have a considerable impact on industrial productivity. The relative importance of these factors depends upon the nature of the industry, goods and services produced and the extent to which physical conditions are controlled. "The geological and physical factors play a very dominant role in determining the productivity of extractive industries likes coal-mining in which the physical output per head is greatly influenced by the depth of the coal-mines, the thickness of the coal seams, the topography of the region and the quality of coal available. In other industries like tailoring, grain-milling, hosiery, soap-making, confectionary, medium and coarse cotton manufacturing, etc., the geographical, geological and physical factors exercise little influence on productivity".

1.7. India's current problems regarding industrialisation

After evaluating important indicators for industrialisation and giving a summary of industrialisation since independence, we will now take a more detailed look at some specific areas for future industrial development in India.

- Infrastructure

Perhaps the biggest problem for doing business in India is the woeful state of its infrastructure. Consider this: it takes four days for a truck to travel the 900 miles between India's national capital New Delhi and its commercial capital Bombay. It takes months to get connected to the power supply in any Indian city, and several years to get a telephone connection in large cities.

Poor infrastructure is acting as a drag on the Indian economy, and the Indian government is now attracting private domestic and foreign investment to build the backbone of a modern economy. A recent report estimated that investment in infrastructure would rise from 5.5% of GDP in 1997, to about 7% in 2000/01. This includes massive improvements in telecommunications, power, energy, and transport. India has recognised the vital role telecommunications play in the growth of the economy. The Indian telecom sector was wholly under government ownership and control until recently and was characterised by under-investment and outdated equipment. There is vast potential for extending these services in India, which has one of the world's smallest telephone densities of 1.3 per 100 people, compared with the world average of 10 per 100. Advanced communication services such as fax, data transmission, and leased circuits are becoming increasingly common. Foreign collaboration is also being encouraged in cellular phones and paging systems. In the telecommunications sector, estimates for regional investment needs range from $40 billion a year, to as high as $70 billion a year by the end of the century.

The power problems are severe in India with three-hour-a-day power cuts and damaging voltage fluctuations that require companies to generate their own power. Investment in energy is a sound way of increasing manufacturing activity. If all 49 proposed private sector power projects are implemented, these would add a total of 20,000 megawatts to India's current capacity of 66,000mW. However it should be noted that India's energy demand is growing at 8-10% a year.

As part of India's liberalisation efforts, the transportation sector has been opened to private investment. The government is offering incentives to invest $4.7 billion to construct and operate bypass roads, highways, bridges, railways, and ports.

- Health and Education

HIV/AIDS is a newly emerging threat to India's public health. About 3 million people in India may be affected. Malnutrition also continues to impede India's development. Prejudices against women and girls are reflected in the demographic ratio of 929 females for every 1,000 males.

To support India's goal of achieving universal primary education, the World Bank is supplementing increased state government expenditure. This has boosted school enrolment, particularly among girls and disadvantaged children, and is improving the quality of instruction and learning achievement.

Amartya Sen reckons that India could enrol all its children in primary school by spending an additional 0.5-1% of GDP. Providing basic health and education is not expensive where labour is cheap. But health and education indicators, while showing some progress, still remain among the world's lowest.

- Public sector

Another big problem is India's notoriously bloated and inefficient public sector. The World Bank has turned down applications for power loans worth $750 million for projects in some states because of mismanagement in their government. Many electricity boards have become insolvent as a result of providing electricity at extremely subsidized rates and ignoring large-scale thefts of electricity. State governments have been unable or unwilling to take the politically unpalatable decisions needed to make their electricity boards viable.

The most telling evidence of the cost of delaying reform is the sheer effort companies have to expend to cope with the country's labyrinthine bureaucracy. For example, foreign investors continue to seek permission from the Foreign Investment Promotion Board, even though their plans are covered by the automatic approvals system.

- Corruption

An immediate threat to India's governance is not the tottering coalition governments or the BJP, but corruption. The combination of a state-run economy and weak political institutions created all too many opportunities for crooked politicians and bureaucrats.

Worse still for the business community is that the government itself is the fountain-head of corruption. This is particularly serious in view of the huge importance of the government sector in India's economy.

Corruption has become ubiquitous at all levels and is accepted by everyone. Many Indian businessmen feel that liberalisation of the economy will have no impact on reducing the corruption that has become so well entrenched. The influx of foreign companies is already unleashing a new wave of even greater corruption. A survey of 183 US firms conducted by the US embassy in 1995 revealed that US investors rated corruption in India as the third worst problem they faced after red tape and a lack of electric power.

The blame for the deluge of corruption in India lies in the lack of transparency in the rules of governance, extremely cumbersome official procedures, excessive and unregulated discretionary power in the hands of politicians and bureaucrats, who are prone to abuse it, and a lax judiciary.

- Tax Problems

Tax reforms have been seeking to transform India's tax system from one with high differential tax rates falling on a narrow base, into one with tax rates at moderate levels falling on a broad base. The 1995 fiscal budget reduced taxes on corporate income, and a major reform of excise taxes has been implemented to make it resemble a value-added tax more closely.

But the government's income is also constricted by an inefficient taxation system. Rural areas are not taxed because they contain such a large pool of voters and no government has had the political will to change this. Income tax is skilfully dodged.

This leaves the government with excise and customs duties, which represent two thirds of all taxes.

- Labour market

India needs greater labour market flexibility to make its companies more competitive and its economy more productive. Politically powerful labour unions have stifled most efforts at serious reform or privatisation of India's largest public sector enterprises, including most banks, all insurance companies, and many major industries, even though privatisation would probably cost the jobs of no more than 1.1% of the urban labour market. India's labour laws hinder efficiency and growth.

- Financial sector

India's financial sector still cannot effectively mobilise and mediate capital to respond to economic changes. The resulting high cost of capital makes Indian industry and exports less competitive. In spite of recent improvements, India's equity markets are still too thin and volatile to inspire great confidence on the part of domestic or foreign investors. Bond markets are practically non-existent. Liberalisation of the insurance industry, which would greatly improve the investing of India's substantial savings, now 26% of GDP, has been stymied. India's banking system remains flawed, with the dominant state-owned banks still carrying bad loans amounting to 15 to 25% of their total.

1.8. Industrialisation And Environment

The purpose of economic development in any region is to provide opportunities for improved living and jobs to people. While industrial development invariably creates more jobs **in** any region, possibilities of adverse effects on the environment also increase, if adverse effects are not reduced. Industrialisation has led to environmental degradation **in** terms of industrial pollution. With industries operating, a 100 per cent pollution-free environment is a myth. It is neither possible nor necessary. However, it is imperative to ensure that industrial units cause the least pollution. Adequate and effective pollution control measures are required so that adverse effects on the environment are minimised. Necessary technological know-how and institutional back up support are available in this regard.

Dust, smoke, fumes and toxic gas emissions occur as a result of highly-polluting industries such as thermal power plants, coal mines, cement, sponge iron, steel & ferroalloys, petroleum and chemicals.

In industry-specific clusters, these have not only become hazardous, but also cause irreparable damage to our ecology and environment, often breaching the environment's carrying capacity.

High emission levels of pollutants at industrial clusters have been reported in Raipur-Durg, Korba-Bilaspur, Vapi-Ankleshwar, Dhanbad-Bokaro, Vizag, Tarapur and Ludhiana. This is despite the fact that the number of power plants switched over to super-critical technology. Steel, cement, chemicals and petroleum refineries have adopted state-of-the-art technologies. There is an urgent need to review and rework the strategies of setting up industry-specific clusters based on comparative advantage. Agricultural and aquaculture practices present the greatest immediate threat to species and ecosystems around the world. Industries have a severe impact on the environment along with that rice industries also play a vital role in affecting the environment conditions. Globally Pollution, Deforestation and Global Warming are the main factors due to which the environment IS affected. The United States Environment Protection Agency and the European Environment Agencies are making different policies for the betterment and sustainable future of the upcoming life. The main thing to remember is that as technology is advancing it is contributing negatively towards the atmosphere and the environment. The Effective Advancement which has been made can be continued for a long time due to technology which is artificially contributing towards the environment. No Doubt advancement in technology has increased productivity of individuals which has helped to gain benefit. Economically industries have made positive effects but on the other hand due to industrialization pollution the life cycle of living beings is affected negatively.

Environmental Impact of Industries
Following are the Environmental impact of industries :
  • Depletion of Natural Resources

Natural Resources when consumed faster than its restoration is called as Depletion of NaturalResources. In simple words when the natural resources are used on a wider scale without seeing its replacement it may cause shortage. Natural Resources are commonly divided into two types, renewable resources and non-renewable resources. The mass production by the industries led to depletion leaving the environment permanently damaged.

  • Air Pollution

Solid Particles and different gases create a mixture which leads to Air Pollution. The mixture is mostly created due to emissions from different factories. Emission leads to the introduction of harmful materials into the earth's atmosphere which causes different diseases or damages the natural environment. The United States Environment Protection Agency and the European Environment Agency plays a vital role in the protection of the environment mainly due to the emissions or gases.

  • Water Pollution

Chemicals when directly or indirectly liquidated into water bodies without sufficient treatment leads to environmental degradation, this type of degradation is called Water Pollution. Water pollution damages the population, individual species along with that it also damages theEcosystems. It is

mainly caused due to the industrial wastages, most of the organization nowadays dispose of their wastages in the water bodies.

- Global Warming

Ongoing increase in the average temperature of the Earth's atmosphere is referred as Global Warming. It is believed that global warming has permanently changed the Earth's climate. The average temperature has increased mostly due to emission of carbon dioxide (CO_2) gas and other greenhouse gases. Global warming in general has increased the occurrence and severity of storms across the Earth.

- Climatic Changes

Changes in the average weather conditions are called as climatic changes. The climatic changes are mainly caused by the solar radiation, volcanic eruptions and certain human activities are also responsible for it. Globally climatic changes have led to different effects on the environment which may include loss of sea ice, accelerated sea level rise and more intense heat waves.
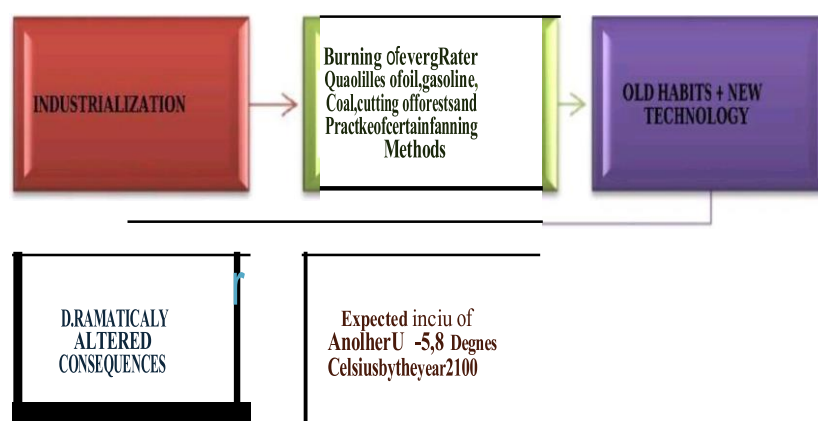
- Degradation of Land Quality

A Process in which the environment is affected by a combination of human made processes. Degradation of land is even referred as to environmental degradation which means the reduction of the quality and quantity of human activities. Land Degradation is mainly caused due to the weather activities and the industries that pollute or degrade the quality of soils.

- Generation of Hazardous Waste

Any waste that is harmful to health or the environment is called Hazardous waste. Hazardous wastes may include liquids, solids and gases. Hazardous wastes potentially affect human health and also the environment. The solid wastage of the industries contributes majorly towards the generation of hazardous wastes.

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- Deforestation

Deforestation means the demolition of forests permanently to make the land available for the usage purpose. It plays a vital role in the climatic changes, it leads to emission of greenhouse gases such as Carbon Dioxide (COz) which are harmful for the living beings. Deforestation also contributes towards Global Warming due to emission of different gases.

- Loss of Biodiversity

Various types of life or organisms found on earth that are present within an area, biome or planet are called Biodiversity. As compared to the older era the loss of biodiversity has increased rapidly due to the many factors, the factors may include degradation, climatic changes and different forms of pollution. According to the recent research conducted, there will be a huge loss in the species which are found.

- Generation of Methane Gas

Methane Gas is another gas which is included in the Greenhouse gas, this gas is emitted by human activities. Methane Gas is emitted naturally along with that it is also generated by industrial activities such as leakage from natural gas systems. Methane is more effective than the Carbon Dioxide gas and contributes more towards the radiation. Methane Gas if leaked it may absorb the sun heat which may lead towards the warming of atmosphere.

- Radiation Exposure

Energy that travels in the form of rays and particles occurring naturally due to the sunlight is called radiation. Radiation energy is emitted both inside the body and externally. The Radiation energy causes different health problems, the main problems which may be caused to the human being is cancer, skin bums and reduction in organic function.

- Noise Annoyance

Noise annoyance is the disturbing or excessive noise that may harm the balance of human or animal life. As the industry has revolutionized the noise annoyance or the noise pollution has increased and it has left a negative impact on the environment. Noise Annoyance has led to many health problems such as increased heart rate, increased blood pressure and hypertension.

Effects of different industries on Environment

Following chart give the short information about the effects of different industries on environment:

NAME OF INDUSTRY	EFFECTS ON ENVIRO MENT
CO STRUCTION INDUSTRY	Emission of carbon dioxide, methane and other waste products that pollute the air and are believed to contribute to global climate change. Global cement industry contribute 5% of global carbon dioxide emission.
ELECTRONICS INDUSTRY	This results in a large amount of hazardous household waste that is often irresponsibly discarded in trash. When electronics are not recycled properly, the raw materials them leech toxic chemicals into the ground, spoiling both water and food supply for decades, at least.
CHEMICALS INDUSTRY	Climate changes across the global fertilizers consists of substances and chemicals like methane, carbon dioxide, ammonia and nitrogen, the emission of which has contributed to a great extent in the quantity of greenhouse gases present in the environment. This in tum is leading to global warming and weather changes.
TEXTILES INDUSTRY	During the production of textiles a large amount of energy is used to power the factories. This then creates more pollution such as carbon dioxide. Dyeing, bleaching or adding finishes to fabrics often involve using highly toxic chemicals. Water used in process is pumped into rivers and sewage offering wildlife and humans. Growing raw materials such as cotton requires large amounts of pesticides. These pesticides are harmful and often affect birds, the water system and insects.
MINING INDUSTRY	Water pollution, Loss of Biodiversity, Soil erosion and pollution, Fonnation of sink holes.
FOOD AND BEVERAGE I DUSTRY	Food accounts for over a quarter (26%) of global gas emissions. Half of the world's habitable (ice and desert free) land is used for agriculture.
	70% of global freshwater withdrawals are used for agriculture.

How Does Industrialization Impact Society?

Industrialization creates jobs that draw people from farms and villages to cities where manufacturing takes place. However hard those jobs were, they were often preferable to the precarious existence of a small farming family.

The result is a new generation of urban consumers. Businesses of all kinds spring up to provide goods and services to these consumers. Over time, a larger middle class of artisans and shopkeepers emerges.

A large working class also emerged, and conditions were often much harsher for them. The evolution of labor unions is a direct result of the conditions faced by the powerless workers of the Industrial Revolution.

1.8. Brief of Thane District

    1.   General Characteristics of the District.

Thane is the third most industrialized district in the State. The Thane Belapur-Kalyan industrial belt is the Centre of highly sophisticated modem industries. The industrial growth in the district, however, is concentrated in this industrial belt. The district can be divided into three district parts. The first is the area under direct influence of Mumbai metropolis. This area is more or less suburban to the metropolis and includes Thane, Kalyan and Ulhasnagar talukas where a number of organized modem industries are concentrated. The second zone comprises the industrially developing areas of Vasai, Bhiwandi, Palghar and Dahanu. The third part includes the rest of the area of the district having conventional village industries, age-old cottage industries and primary processing agro-industries.

    2.   Location and geographical Area.

Thane, the northernmost district of Konkan, lies adjoining the Arabian Sea in the north0- west of Maharashtra States. It extends between 18*42" and 20*20" north latitude and 72*45" and 73*48" east longitude. Its northern limits adjoin the Union territories of Dadra, Nagar Haveli and the State of Gujarat while the district of Nasik and Ahmednagar to its east, Pune to the South -East, Raigad to the south and Mumbai Metropolitan to the South - West. The total geographical area of the district is 9558 Sq. KMS which is 3.11% of the total Maharashtra area.

    3.   Topography

Topographically, district can be divided into 3 parts:-
(1) In the Eastern Part of the district, Sahyadri ranges are spread and its north side the thick forest area is situated.
(2) The Central Region of the district is mostly flat area and Rice farming is done in this area.
(3) In the coastal part and 15 to 20 Kms, its area is cultivated for Vegetables, Fruits and high quality of grass.

    4.   Availability of Minerals

There is no major mineral or mining in the district. However, the mining activities in the district are confined to quarrying of stones and sand which is carried on especially at places which are near urban areas in Kalyan, Bhiwandi and Thane Tehsils. Deposits of reddish laterite clay are also found near Gokhivare in Vasai Tehsil. The clay is used for making bricks, tiles and cheap red glazed wares.

    5.   Forest

The total area under forest in the district is 3463 Sq. Kms which is 37.10% of total geographical area. Out of this total forest area, 80.51% area is spread in Shahapur, Palghar, Jawhar, Wada, Murbad, Dahanu and Vasai talukas and in remaining talukas it is spread only 19.49%.

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Sl. No	Name of th forest product	200 -2009		2009-2010		2010 -2011	
		Total produ-ction	T tal alue of ale	Total produ-ction	Total alue f ale	Total pr du-ction	Total value of ale
I.	Timber	6.79	7	1.4 0	11095	0.7 7	61 I
2.	Fire wood ('000'cubic mtrs.)	28.622	10592	5.250	972	4.4 7	4 49
3.	Bamboo (Nos.)	16176	266835	35			
4.	Grass (Qntls.)	1200		740	117	1660	176
5.	Gum (Qlsnt)	345	138	2100	134	2526	182
6.	Others	X	4798	X	3559		8217
	Total				23 77		19605

(Source: Thane District Industrial Survey, 2012

Thane District at Glance:

According to Administrative convenience, the State is divided in six regional divisions. The Thane district is included in Konkan Region Division. The district consists of 15 tehsils which are Thane. Vasai, Palghar, Dahanu, Talasari, Jawhar, Mokhada, Bhiwandi, Wada, Shahapur, Murbad, Kalyan, Ulhasnagar, Ambernath and Vikramgad.

At the district level, the Collector is the Administrative Chief and the Tehsil level. For rural development, Chief Executive Officer of Zilla Parishad, at district level and Block Development Officer at Block level, are in charge of the administrative.

Environmental Awareness Activities

Environmental Awareness is one of the important functions of the Board. Regional Office Thane is actively involved in environmental awareness activities. MPCB has organized special programs to commemorate World Environment Day at Tarapur and Thane. MPCB has identified environmental awareness in school children as an important area and has roped in major industries to organize special programs at following schools in the last two years.

1. New English School, Kalwa
2. Manish Vidyalaya, Kalwa
3. Bhavika High School, Kharegaon
4. New English School, Naupada (In association with Mukund Ltd.)
5. DAV Public School, Balkum
6. Majiwada High School, Thane
(In association with Nicholas Piramal Ltd.)
7. TMC Schools at Balkum and Majiwada

(In association with Color Chem Industries, Thane)
8. Saint Xavier's, Manpada, Thane
(In Association with M/s lndofil Industries, Thane)

Special areas of economic policy

After giving a rough overview of the history of industrialisation, this chapter provides more detailed information about the areas of human factors for industrialisation, structure of foreign investment, and the process of privatisation.

CHAPTER-2
RESEARCH AND METHODOLOGY

2.1. Introduction

Methodology in research is defined as the systematic method to resolve a research problem through data gathering using various techniques, providing an interpretation of data gathered and drawing conclusions about the research data. Research is the careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, "research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods."

Inductive methods analyze an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Research is conducted with a purpose to:

- Identify potential and new customers
- Understand existing customers
- Set pragmatic goals
- Develop productive market strategies
- Address business challenges
- Put together a business expansion plan
- Identify new business opportunities

2.2. Characteristics of Research

- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.

- The analysis is based on logical reasoning and involves both inductive and deductive methods.

- Real-time data and knowledge is derived from actual observations in natural settings.

- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.

- It creates a path for generating new questions. Existing data helps create more research opportunities.

- It is analytical and uses all the available data so that there is no ambiguity in inference.

Accuracy is one of the most critical aspects of research. The information must be accurate and correct. For example, laboratories provide a controlled environment to collect data. Accuracy is measured in the instruments used, the calibrations of instruments or tools, and the experiment's final result.

Tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.

2. Keep track of how often each of the main findings appear.

3. Make a list of your findings from most common to least common.

4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.

5. Prepare conclusions and recommendations about your study.

6. Act on your strategies.

7. Look for gaps in the information, and consider doing additional inquiry if necessary.

8. Review the results and consider efficient methods to analyze and dissect results for interpretation.

Learn more:
www.questionpro.com/blog/what-is-research/

QuestionPro

4. Evaluate a list of the strengths, weaknesses, opportunities, and threats identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.

6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary
8. Plan to review the results and consider efficient methods to analyze and interpret results.

Review your goals before making any conclusions about your study. Remember how the process you have completed and the data you have gathered help answer your questions. Ask yourself if what your analysis revealed facilitates the identification of your conclusions and recommendations.

Research aims

A distinction is often made between research objectives and research aims.
A research aim typically refers to a broad statement indicating the general purpose of your research project. It should appear at the end of your problem statement, before your research objectives.
Your research objectives are more specific than your research aim and indicate the particular focus and approach of your project. Though you will only have one research aim, you will likely have several research objectives.

(A) Industrial Development in the Thane Belapur Industrial Belt (TBIB):

Thane-Belapur Industrial Belt (TBIB)also known as the Trans Thane Creek Area (TTCA) is situated in Zone II of Mumbai Metropolitan Region Development Authority (MMRDA). It is one of the major industrial belts in the country. TBIB mainly covers a strip between Thane Creek on the west, reserved forest land on the east; CBD, Belapur on the south and Thane city limit on the north measuring approximately 162 sq.km. The industrial development in TBIB commenced in 1961, along with the declaration of Maharashtra Industrial Development Corporation (MIDC). The objective was primarily to promote chemical, engineering and other auxiliary industrial units. Subsequently MMRDA, along with City and Industrial Development Corporation (CIDCO) has developed a number of residential and commercial zones within this area, apart from a large number of villages that are situated in this belt.
Navi Mumbai's economic base was expected to be unique - more dependence on private sector activities like wholesale trading and processing activities in agricultural produce, iron and steel stockyards and wholesale markets, port based commercial and industrial activities, private and public sector offices, training and R & D centers in selected District Business Centers (DBCs) and Central Business District (CBD) and last, but not the least, the fast emerging industrial belts along Thane - Belapur Road and at Taloja. In fact, at the time of formation of CIDCO in 1970-71, the only economic input available was about 16,000 industrial jobs in the Thane - Belapur belt; huge amounts of money were being spent by each company in transporting their workers to and from Mumbai.

(B) The Corporation provides the following services to the units in its industrial areas:

a) Assured Water Supply: From among the various services provided by the Corporation, an assured pure water supply can be regarded as a unique specialty of the MIDC. The investment on the water supply scheme (Head works) made by MIDC is over Rs.5 crores with installed capacity of water supply of 25 MLD. For the purpose of regulating the water supply operations of the Corporation the Government of Maharashtra has prescribed a legal and financial relationship between the Government and the Corporation.

b) Maintenance of Industrial Areas: This is a municipal function requiring the Corporation to maintain the Roads, Street lights, Fire stations (in few areas) during the transitory period up to handing over of the industrial area either to Government or other agency as the Government may decide. The MIDC Act, vide Section 56, provides for the exits policy after the purpose of industrial development as contemplated in the Act is fulfilled. However, this has seldom become possible in the absence of a substitute agency to take over the responsibility, except **in** few cases like that of Marol, Wagle Estate, Pimpri Chinchwad etc. where the Corporation could hand over only the roads and street lights to local Municipal Corporations. **In** other areas, the Corporation carries on this function as a committed obligation. For this purpose the Corporation recovers service charges to defray the expenditure on such services.

c) Drainage (effluent disposal) and CETP Schemes: The Corporation has effluent disposal (drainage) schemes only **in** selected Industrial areas having chemical industries. Such schemes are designed to collect and discharge the treated effluent only. In such areas the Corporation recovers drainage cess to defray the expenditure on maintenance and to partially recover the capital cost. Also with a view to arrest pollution, the Corporation has started the operations like Hazardous waste Management and common effluent plants on Joint venture basis with the help of local industries associations.

(A) Population of the study

The population of the study covered the 40 units, in Thane city covering the growth of Industrialization and its impact on the environment.

(B) Area of the study

Research students have selected locations at the Industrial belt including Trans Thane Creek (TTC) . The TTC area spread over 2,562 Ha and the number of plots in TTC is 3824.TTC is a main concentration point by Industries for their set up in Thane City.

2.3. Methodology and sources of information

The present study is based on secondary sources of information. Data and information regarding geographical background of the study area, infrastructure, type of industrial production, industrial employment etc., have been collected from various secondary sources like District Statistical Outline, from various websites, from various statements available on internet, from various reports and from various research paper's, various departments statements and District Industrial Centre. Analysis reports on industrial wastes and pollutants. Environmental Impact Assessment (EIAs) Reports of various mines have been collect from Satellite images of industrial areas, and of the wastes emanating therefrom, have been taken from Google Earth available on the internet. Information from newspapers on all such aspects, whenever available, has also been collected and used.

The nature of this study is descriptive, explanatory, analytical, evaluative and prescriptive. Descriptive method has been used in giving the background information of the study area, industrial infrastructure and industrial structure. The explanation of industrial localization factors in the study area utilized explanatory method. Analysis reports of air, water, noise and soil samples have also been used. Evaluative method has been used in the studies on applicability of industrial location theories in the study area. Based on description, explanation, analysis, and evaluation some prescriptions/recommendations have been made towards the end. The data obtained from fieldwork ware classified and tabulated. In order to make the presentation more effective, cartographic-statistical techniques too have been used in the form of maps and diagrams.

2.4. Scope of the study

(A) Temporal Scope

For the purpose of data collection and study, the data has been collected from the present 40 units in Thane-Belapur Industrial Belt(TBIB). To calculate the trends in development of Industrialization in Thane city. For these last one decade data is considered. For review and other purposes references have been made about the history of Industrialization in Thane City.

(B) Functional Scope

The purpose of the study is to go in depth for contribution of Industrialization in Thane city at Thane Belapur Industrial Belt (TBIB). The study also intends to obtain further suggestions for improving existing industrial policies.

2.5. Significance of the study

Industrialisation is a chosen government strategy to diversify and empower the economy of a region, according to its resource endowment. In order to utilize the industrial potential in an area, its resource base has to be investigated and developed. An industrial geographer would also like to discover whether the industries located in a region follow any pattern or principle, so that it could be generalized and

applied to other areas of similar resource potential. Desert regions, generally, have scarce resources, population, and infrastructure for industrial development. It would be of interest to unravel the potential of industrial development; the factors and patterns of industrial location and industrial structure; and environmental effects, if any, of mining and industrial production, that have invariably been noticed to accompany industrialization in any given region.

The study area, Thane city on the North of Konkan Division. It has typical resource endowments of the Thar, including livestock, some sedimentary minerals and, of lately, agricultural production due to canal and tubewell irrigation in some areas. The aforementioned issues of industrial and environmental geography in Thane city, need to be addressed and tested in reference to this area too. Considering this, the research problem has been taken up in reference to Thane district. Such hybrid research in industrial and environmental geography would, arguably, further enrich the discipline of geography.

2.6. Objectives of the study

1. To evaluate the process of industrialization and industrial development till present time in the district.
2. To analyze and test the industrial location theories in context of the study area.
3. To analyze the industrial location in reference to the factors of localization.
4. To evaluate industrial structure and to analyze the direction of industrial potentialities.
5. To evaluate the effect of growth in industrial activities on geo- environment of Thane district.
6. To evaluate the environmental pollution due to industrial activities in the study area.
7. To suggest measures for development of environmentally balanced industrial activities.
8. To provide measures and suggestions.

2.7. Sample design and Sample size

All the 40 respondents in the local area of the study are covered as shown in Annexure- IL The original idea is to go on a census method which will cover all the units, Thane officials. When the research reached the practical side of the activity it was found that the response given to the data collection process does not fulfill the claim of having a census method of research. By consistent persuasion and personal contacts the research could have a response determining a favorable sample size. The sample size thus arrived is a stratified sample based on response received from the respondents.

*Sample Design
It is a sample design in which a population is partitioned into strata based on a certain characteristic that is known for every sampling unit in the population, and then selecting samples independently from each stratum.

*Sample Size

The sample size is defined as the number of observations used for determining the estimations of a given population. The size of the sample has been drawn from the population.)

2.8. Data collection and Processing

The study relied upon both primary and secondary data

Primary Data is collected by use of methods like structured questionnaires of the Industrilization (Annexure **-11).** Before finalizing the structured questionnaires the draft questionnaires were prepared which can facilitate in achieving required data for the study. While preparing the questionnaires, detailed consideration of review of literature, the objective of the study and Hypothesis were considered, in all two set of questionnaires were prepared. This could help in having insight to the existing facts required for the study.

Secondary data sources will include research reports published by CIDCO, District Industrial Development Corporation (DIDC), Regional development offices, articles published in national journals, magazine, and newspapers, Reports of various government departments, consultancy firms, published and unpublished Research work at various institutions.

(A) Analysis of Data

During the research, research students will use statistical techniques for analysis like SPSS Package, T-test, Chi-Square test and ANOVA etc.

(B) Data Processing

The collected data subject to the editing process by which purification of data could be achieved. Incomplete questionnaires and irrelevant answered questionnaires were edited from the collected data and constituted for Classification of data, Tabulation, Analysis of data and statistical Methods.

(C) Statistical Methods

Statistical Methods used for data analysis consist of Quantitative and Qualitative analysis. T-test, ANOVA and Descriptive statistics are used in the study. The SPAA package was used for statistical analysis.

(D) Reporting method

The study gets reported in a ,,Popular Method" of reporting. The statistical part of the report is in ,,Technical Method of Reporting". Over all the reporting consists of the use of tables, diagrams (pictograms, pie-diagramme, histograms etc.), photographs and other visual presentations.

2.8. Limitation of the study

1. The study only deals with Industrialization and its impact on the environment in Thane City at Thane-Belapur Industrial Belt (TBIB).
2. The study deals specifically with 100 Small and Medium Enterprises (SME) units in a category of Engineering, Chemicals, Pharmaceuticals, Textile and Others.
3. The study also deals with some units which existed after 2000 but which are now functioning in the CIDCO area in Thane..
4. The study does not include Large Scale Enterprises (LSE) in Thane-Belapur Industrial Belt (TBIB) in Thane.
5. As the study requires data from SME units all over the Thane-Belapur Industrial Belt (TBIB) in Thane region, the cost and time constraints have put certain limitations including sample size. But every attempt is made to keep the spirit of the objectives and research methodology.
6. The reliability of the study may depend on the authenticity of the data supplied by the respondents.

2.9. Operating terms

1. Registered factory
Factories registered under the Factories Act of 1948, employing 10 or more workers using power or those employing 20 or more workers without using power respectively.

2. Investment
Investment also means the money that is invested with an expectation of profit. This may be invested either on fixed capital or on working capital.

3. Land Acquisition
It is a developmental practice to acquire land by local peoples for the development of that region

4. Incentives
It is a monetary benefit given to the company for promoting their business.

5. Productive Capital
The capital induces the production of goods and services. It is the blend of both fixed capital and working capital.

6. Sole proprietorship

Sole proprietorship is a form of business organization in which an individual invests his own capital, uses his own skill and intelligence in the management of its affairs and is solely responsible for the results of its operation.

7. Partnership

Partnership can be defined as the relationship between persons who have agreed to share the profit or losses of the business carried on by all or any of them.

8. Workers

Workers are persons who are mentally or physically exerted their labour for remuneration and wages

9. Production

Production means creation of utility through transforming the raw material into final product.

10. Excise duty

Excise duty is a tax on manufacture or production of goods. Excise duty on alcohol, alcoholic preparations, and narcotic substances is collected by the State Government and is called "State Excise" duty.

11. Sales tax

A sales tax is a consumption tax charged at the point of purchase for certain goods and services.

12. Marketing

The process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives.

13. Tiny units: Tiny units are those undertakings, which have investment in plant and machinery not exceeding Rs. 5 lakh and are located in towns with a population of 50,000 or below.

14. Ancillary industries: Ancillary industries are defined as those units that have an investment not exceeding Rs.75 lakh on fixed assets (for plant and machinery).

15. Village Industries:

Village industries have been defined as small industrial units in villages and small towns with a population not exceeding 50,000 and involving utilization of locally available natural resources or human skill.

16. Cottage Industries:

Cottage industries are domestic industries in the initial stage. These are managed mostly by artisans and skilled artisans and are involved in traditional activities such as agriculture, handlooms, and handicraft.

17. Power Infrastructure:
It includes infrastructure in power or energy supply.

18. Fire Prevention:
It is a service provided for preventing the company from the fire hazards

19. Fire Protection:
It includes the different techniques for protecting the company from fire incidents.

20. Waste Management:
Management of industrial waste for maintaining environmental safety.

21. General Safety:
It covers all safety practices for industrial workers.

22. Environmental Safety:
It covers the area of approach for balancing ecology.

23. Technical Consultancy
It is a consultancy for technical matters given to the enterprises.

24. Labour Force Participation Rate
The labour force participation rate is the portion of the working population in the 16-64 years' age group in the economy currently in employment or seeking employment.

CHAPTER-3
REVIEW OF LITERATURE

3.1. Introduction

The literature review is a written overview of major writings and other sources on a selected topic. Sources covered in the review may include scholarly journal articles, books, government reports, Web sites, etc. The literature review provides a description, summary and evaluation of each source. It is usually presented as a distinct section of a graduate thesis or dissertation.

There have been several works, especially in economics and also in economic geography, on the locational aspects of industries. Geographers have also adopted theories developed **in** other disciplines.

They have worked on the applicability of these theories **in** different geo-economic

settings too. Established locational theories emphasize selection of optimum or ideal locations by the manufacturers, i.e., the industry is set up at the places where minimum cost and maximum market value is obtained. The most effective and seminal work has been that of Weber (1909) who propounded his minimum cost theory by assuming three generalizations about the complex, real world. He assumed fixed locations of raw materials, of market centers and of labour, which is found at fixed locations in unlimited quantity and at fixed rate. Weber classified raw materials into gross (weight-losing) and pure (non weight-losing) in order to determine the minimum cost locations. He also classified raw materials into localized and ubiquitous for determining optimum locations. He concluded that gross raw materials attract locations at raw material source, while pure raw-material based industry tends to locate near markets areas.

3.2. Purpose of the literature review

The purpose of the literature review is to provide a critical written account of the current state of research on a selected topic:

- Provide foundation of knowledge on topic.
- Identify areas of prior scholarship to prevent duplication and give credit to other researchers.
- Identify inconsistencies : gaps in research, conflicts in previous studies, open questions left from other research
- Identify the need for additional research (justifying your research).
- Identify the relationship of works in context of its contribution to the topic and to other works.
- Place your own research within the context of existing literature making a case for why further study is needed.
- Identifies areas of prior scholarship.

- Places each source in the context of its contribution to the understanding of the specific issue, area of research, or theory under review.
- Describes the relationship of each source to the others that you have selected.
- Identifies new ways to interpret, and shed light on any gaps in, previous research.
- Points the way forward for further research.

3.3. Types of Review of Literature

There are many types of literature review. The choice of a specific type depends on your research approach and design. The following types of literature review are the most popular in business studies:

A) Narrative literature review

Also referred to as traditional literature review, critiques literature and summarizes the body of a literature. Narrative review also draws conclusions about the topic and identifies gaps or inconsistencies in a body of knowledge. You need to have a sufficiently focused research question to conduct a narrative literature review.

B) Systematic literature review

Requires more rigorous and well-defined approach compared to most other types of literature review. Systematic literature review is comprehensive and details the timeframe within which the literature was selected. Systematic literature review can be divided into two categories: meta-analysis and meta-synthesis.

- Meta-analysis

When you conduct meta-analysis you take findings from several studies on the same subject and analyze these using standardized statistical procedures. In meta-analysis patterns and relationships are detected and conclusions are drawn. Meta-analysis is associated with deductive research approaches.

- Meta-synthesis

Meta-synthesis, on the other hand, is based on non-statistical techniques. This technique integrates, evaluates and interprets findings of multiple qualitative research studies. Meta-synthesis literature review is conducted usually when following an inductive research approach.

C) Argumentative literature review

As the name implies, examines literature selectively in order to support or refute an argument, deeply embedded assumption, or philosophical problem already established in the literature. It should be noted that a potential for bias is a major shortcoming associated with argumentative literature review.

D) Integrative literature review

Reviews, critiques, and synthesizes secondary data about research topic in an integrated way such that new frameworks and perspectives on the topic are generated. If your research does not involve primary data collection and data analysis, then using integrative literature review will be your only option.

3.4. Components of the literature review

The literature review should include the following:

Objective of the literature review
Overview of the subject under consideration.
Clear categorization of sources selected into those in support of your
particular position, those opposed, and those offering completely different arguments.
Discussion of both the distinctiveness of each source and its similarities with the others.

3.5. Steps in the literature review process

Preparation of a literature review may be divided into four steps:

Define your subject and the scope of the review.
Search the library catalogue, subject specific databases and other search tools to find sources that are relevant to your topic.
Read and evaluate the sources and to determine their suitability to the understanding of the topic at hand (see the Evaluating sources section).
Analyse, interpret and discuss the findings and conclusions of the sources you selected.

3.6. Reviews of Indian Authors

Aishwarya Deshmukh, N Shaikh, Neelam Soni, Urmila Kumavat

Since the industrial revolution, there has been a constant increase in global warming effect due to emission of CO_2. Development of green belts in urban areas can act as an effective sink of CO_2 and can help in managing extra carbon in the atmosphere. Thus green belts of cities are required to assess for carbon sequestration potential. For present work, the green campus of Vidya Prasarak Mandal **(VPM)** of Thane (Maharashtra, India) has been selected. It is situated along the bank of Thane creek. It covers 13.5 acres in heavily polluted metropolitan city of Thane. It has a thick green cover of 398 trees that can bear considerable capacity to trap CO_2 in the form of biomass. Hence carbon sequestration by trees of **VPM**

campus is evaluated by a non destructive method. The study indicated considerable potential of **VPM** campuses to mitigate carbon of metropolitan cities.

Babasaheb R Thorat, Pankaj Prasad, Anirudh Ram

The impact of industrialization and anthropogenic activities on the heavy metal accumulation in a moderately polluted Ulhas estuary, Mumbai is presented here. The estuarine pollution was evaluated based on the enrichment factor of heavy metals in four sediment cores collected between the river embayment and upstream locations. The results showed that the concentrations of Cr, **Mn,** Fe, Co, Ni, Cu, Zn, and Hg in the top 20 cm of the three downstream cores (Core 1, 2, 3) were very low, whereas core 4 collected in the upstream location showed ...

P Abhyankar, S Ambade, R Patwardhan

The five rivers in Pune city are, Mula, Mutha, Pawana, Ram and Dev River. Mutha river originates, in the Western Ghats at a village named Vegare, about 45 km to the west of Pune city, India. Mutha River has two tributaries, Ambi and Moshi. There are two dams on Mutha River, at Temghar and at Khadakwasla. Increasing urbanization coupled with industrialization during the past few decades are depleting aquatic ecosystems. With the rapid increase in the population of the city and the need to meet the increasing demands of human and industrial consumption, the available water resources of the city are getting depleted and the water quality has deteriorated. Mutha River is polluted due to the discharge of untreated sewage and industrial effluents. Present study was undertaken to study the level of pollution in Mutha River of Pune city. Water samples were collected from 20 different locations on Mutha river across the city. Various physico-chemical parameters were checked. Biochemical Oxygen Demand (BOD) is an important water quality parameter as it provides an index to assess the effect that the discharged waste water will have on the receiving environment. A comparative account of BOD values at various locations was taken to establish the pollution level of Mutha River in Pune city.

JS Sudarsan, Harshavardhan, K Jyothi Priyanka Reddy, Manepalli Karun, Ayushi, Sri Chaitanya Varma, Radhika Kumkumwar

Our environment is being subjected to drastic changes since past few years. The growing intensity of people in several urban clusters and their ever-increasing demand of basic resources like quality of food, air, water and hygiene surroundings are challenging and increasing day by day. In urban cities like Pune, these requirements of human are not yet fully organized and managed. It can be said that the city is in a zone of earnest mismanagement of natural resources in many forms especially the universal solvent going to become an explicit solvent in the future years to come. This is mainly due to Lifestyle change of users and increasing per-capita demand are projecting future years of water scarcity. Rigorous expansion in the urban cities are ravaging the existing local sources of water and polluting the water table. In addition to this, industrialization is integrating supplemental damage to water eco system. At

the present rate of uncontrolled growth rate, expansions and behaviour of society, the water resources are in peril of depletion. In order to overcome such situations, the cognizance in people about rainwater harvesting system and storm water management system should be made realized. Because it is expressed that even in one tier cities like Pune, the cost-effective system such as both rainwater harvesting and storm water management is not sympathizing and is shooting problem in every monsoon season such as flooding and inundation and in summer the water scarcity also prevailing in many locations. To ascertain its significance a questionnaire was floated with data in support of Rainwater harvesting importance, need and benefits among the local residence of Pune city. The bottom-line of the output is that more than 70% people residing in the city area are not aware of the rainwater harvesting system and its significance. Estimation was done from the data collected of rainwater that could be harvested for the year from the study area location. This study also highlights the need for adopting the various smart technologies in managing the water scarcity, either the rainwater or the supplied potable water for efficient and controlled water management strategies.

Priyanko Das, K Sandeep Vamsi, Zhang Zhenke

Urban heat island (UHi) is one of the essential climatic phenomena on the land surface induced by urbanization due to the difference in albedo, surface roughness, and heat-flux exchange. The study tries to examine the application of quantitative remote sensing of UHi, which could encourage our comprehension about urban/suburban environmental conditions and its association with urbanization in the Kolkata city. Kolkata is one of the most populated cities in the world and seventh-most populated city in India. Overpopulation over the years increased the human-made structures as well as industrialization in the Kolkata city, which replaced the vegetation and land cover area, extending it to the city outskirts impacting the UHi. Analyzing the MODIS and ERA-Interim remote sensing data from 2008 to 2017 provides a cost-effective and time-consuming methodology for spatio-temporal analyses of land surface temperature (LST) distribution. For urban climate-related studies, canopy urban heat island (CUHI) is studied based on air temperature. The validation results indicate that the surface urban heat intensity (SUHI) during the summer months reveals an average heat island effect of 1.5 K during the daytime and 0.4 K in the night time. Furthermore, this study shows there is a slight significant relationship between urban heat and vegetation index. However, the growth of vegetation distribution may impact the UHi, and the high LST correlated to the presence of high particulate matter in the area.

Jitendra Kumar

This study examined the urbanization, industrialization and land transformation surrounding National Highway-48 in the National Capital Region of Delhi. Over the last 20 years, this region has experienced rapid urban growth, industrialization and land transformation. Its urban expansion has fluctuated over time, indicating future urban dynamics. This highway from Delhi to Mumbai is a part of the Delhi- Mumbai Industrial Corridor (DMIC) project. It is India's most ambitious infrastructure development programme, aiming to transform new industrial cities into "Smart Cities" by integrating next-generation

technologies. This study covers 2637 sq km area surrounding NH-48 from Gurugram city to Sotanala industrial location in Behror, a 127 km stretch in the NCR with a buffer of 10 km. It covers sixteen urban centres, including Gurugram, Garhi Harshru, Bhondsi, Manesar and Pataudi in Gurgaon District, Rewari, Dharuhera, Bawal, Rampura, Ghatal Mahaniawas, Aakera and Maheshari in Rewari District, Bhiwadi, Shahjahanpur, Neemrana and Behror in Alwar District. Landsat satellite images, census data, state and district industrial profiles of Haryana and Rajasthan and city/regional development plans have been used for meaningful analysis.

Jyoti Rani, Sudesh Chaudhary, Tripti Agarwal

Present study was conducted to assess the impact of industrialization on heavy metals contamination in agricultural soils of Sonepatin the state of Haryana and a satellite township of New Delhi. A total of 23 agricultural soil samples, collected from different locations inthe study area were analyzed for pH, total organic carbon (TOC), and heavy metals (Al, Cd, Cu, Cr, Pb, Ni, Zn, Mn, Co, and Fe). Soil samples had an average pH of 7.81±0.25 with TOC values ofO. 59±0.12 percent. Average metal concentrations followed theorder asFe> Mn> Zn> Ni> Cr> Cu> Pb> Co> Cd with concentration values (mg/kg) as 17977> 325> 91> 52> 44> 34> 32> 2> 1. The contamination factor (CF) and geo-accumulation index analysis revealed that the agricultural soils were contaminated with Cd, Pb, Mn, Ni, and Zn. A moderate potential ecological risk was found in most of the soil samples due to the presence of Cd. Interpretation of enrichment factors (EFs) showed that Cd, Mn, and Zn were mainly anthropogenic in origin while Ni and Pb were having both anthropogenic and crustal origin. The health risk index on inhabitants due to exposure to heavy metals in agricultural soils was calculated for oral, dermal, and inhalation pathways and the values obtained were below 1, showing no significant health effects due to direct exposure

Vishal Panghal, Asha Singh, Rohit Kumar, Gayatri Kumari, Pradeep Kumar, Sunil Kumar

Soil contamination by various heavy metals is a significant global environmental problem. The problem is more severe in the rapidly industrializing and developing countries like India, posing significant health risks. This study was undertaken to measure heavy metals contamination of soil in industrial clusters developed by Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) and various traffic junctions of Rohtak City. Risk assessment and characterization of heavy metals in soil was carried out using contamination factor (CF), pollution load index (PLI), and potential ecological risk index (RI). A total of 32 soil samples were collected from various locations and heavy metals were analyzed using atomic absorption spectrophotometer (AAS). The average value of heavy metals like Cd, Fe, Zn, Ni, and Cr in soil was 7.54 ± 5.89, 209.80 ± 137.44, 127.39 ± 80.43, 21.57 ± 24.02, and 17.05 ± 10.73 mg/kg, respectively. The mean values of contamination factor (CF) for Cd, Zn, Ni, Cr, and Fe were 37.68, 1.00, 0.44, 0.24, and 0.005, respectively. The values of the potential ecological risk index (RI) were 1130.4, 2.20, 1.00, and 0.48 for Cd, Cr, Zn, and Ni, respectively. Cadmium (Cd) presented the highest ecological risk index in comparison to other heavy metals. The mean geo-accumulation (Igeo) indices for heavy metals were ranked as follows: Cd> Zn> Ni> Cr> Fe. Principal component analysis

(PCA) showed that 78.27% variation was caused by the first five principal components (PCs). The interpolation of spatial distributions of soil heavy metals highlighted that contamination values for most metals increased towards the western side of the city. The present study reveals that a higher concentration of cadmium was found in soils of Rohtak urban area. It could be due to the presence of metal processing and plating industries in the surveyed area and a lack of strict industrial norms.

S Selvam, P Muthukumar, S Venkatramanan, PD Roy, K Manikanda Bharath, K Jesuraja

Two weeks after the world health organization described the novel coronavirus (SARS-CoV-2) outbreak as pandemic, the Indian government implemented lockdown of industrial activities and traffic flows across the entire nation between March 24 and May 31, 2020. In this paper, we estimated the improvements achieved in air quality during the lockdown period (March 24, 2020 and April 20, 2020) compared to the pre-lockdown (January 1, 2020 and March 23, 2020) by analyzing PM2.5, PMlO, SO2, CO, NO2 and 03 data from nine different air quality monitoring stations distributed across four different zones of the industrialized Gujarat state of western Indian. The Central Pollution Control Board (CPCB)- Air Quality Index (AQI) illustrated better air qualities during the lockdown with higher improvements in the zones 2 (Ahmedabad and Gandhinagar) and 3 (Jamnagar and Rajkot), and moderate improvements in the zones 1 (Surat, Ankleshwar and Vadodra) and 4 (Bhuj and Palanpur). The concentrations of PM2.5, PMlO, and NO2 were reduced by 38-78%, 32-80% and 30-84%, respectively. Functioning of the power plants possibly led to less reduction in CO (3-55%) and the declined emission of NO helped to improve 03 (16-48%) contents. We observed an overall improvement of 58% in AQI for the first four months of 2020 compared to the same interval of previous year. This positive outcome resulted from the lockdown restrictions might help to modify the existing environmental policies of the region.

3.7. Reviews by Foreign Authors

Peter G Goheen

The growth of great cities and the industrialization of their econ-omies were central themes of the nineteenth-century American experience in the decades after 1840. Long-established commercial centers were becoming industrialized and new manufacturing cities were growing rapidly. This novel correlation of urbanization and industrialization which strikingly characterized the nineteenth century in America pertained as well to every country where high levels of economic development were attained during the last century. Observed first in England, soon thereafter in the United States, and by 1900 in Canada and some of the countries of Western Europe, this observation on the nature of nineteenthcentury urban development, originally formalized by astute observers during the last century, has been confirmed and quantitatively docu-mented. Perhaps the best known interpretation of this relationship is that offered in support for a stage theory of economic growth. **1** From this perspective, industrialization has been identified as the process in which the requisite rise **in** the rates of capital formation and investment

accrues, thereby permitting the take-oft into self-sustained growth. This widely held account of the role of industrial expansion focuses on the national context and upon the economic sectors within which growth occurred. But industrialization was measurable not only in terms of national economic indexes. It was a cause and a consequence of urbanization. I want to focus on the particular milieu where these events transpired and to suggest several ways in which the principal themes of this story-population growth, industrial productivity and transportation technology-can be interpreted.

Neil D Hamilto,

American agriculture is changing rapidly-becoming more concentrated, more technically advanced, and more integrated with the input and marketing sectors. Thomas Urban, President of Pioneer Hi-Bred International, Inc., the world's largest supplier of hybrid seed, believes that"[production agriculture in the Western World is now entering the last phase of industrialization-the integration of each step in the food production system. The production is rapidly becoming part of an industrialized food system." 3 He describes industrialization as the process whereby the production of goods is restructured under the pressure of increasing levels of capital and technology in a manner which allows for a management system to integrate" each step in the economic process to achieve increasing efficiencies in the use of capital, labor, and technology." 4 But the thought that American agriculture is in the final stages of becoming industrialized is not a welcome

Landry Signe

By 2030, business-to-business spending in manufacturing in Africa is projected to reach $666.3 billion, $201.28 billion more than in 2015. This report discussed the evolution and prospects of manufacturing and industrialization in Africa. It ultimately offers business leaders an overview of Africa's biggest opportunities in the manufacturing sector, discussing trends, drivers, perspectives, and strategies for effective investment by 2030. It provides policymakers with some options likely to attract private investors, accelerate manufacturing and industrial development, and contribute to growth and poverty alleviation, facilitating the fulfillment of the Sustainable Development Goals and the African Union's Agenda 2063. While policy solutions are likely to differ across countries, manufacturing and industrial development will be central to Africa's ability to meet its development goals.

Ekundayo Peter Mesagan, Foluso Akinsola, Motunrayo Akinsola, Precious Muhammed Emmanuel

We employ the pool mean group method of estimation and panel causality to investigate the effect of financial integration and industrial development on pollution in 36 African countries between 1990 and 2019. Result shows a unidirectional causality running from industrial development to financial integration and pollution in Africa. Also, the panel regression shows that financial integration insignificantly abates pollution in the short run, but significantly worsens the long-run pollution in the

continent. Again, the result indicates that industrial development insignificantly heightens pollution in both periods, while interplay between financial integration and industrial development exerts a negative impact on both short- and long-run pollution in Africa. The study recommends that African leaders should harness the benefits of financial integration to accelerate African industrial development and ensure the full implementation of environmentally sustainable policies to checkmate pollution emissions.

Eric Evans Osei Opoku, Olufemi Adewale Aluko

With growing industrialization comes environmental concerns. Thus, we are motivated to offer empirical insights into how industrialization affects the environment. Using ecological footprint to proxy environmental degradation, we examine the heterogeneous effects of industrialization on the environment. We utilize data from 37 African countries from 2000 to 2016 and use the quantile regression model for panel data. The results show a noteworthy heterogeneous environmental effect of industrialization. Industrialization is found to increase.

Xuyi Liu, Junghan Bae

Journal of cleaner production 172, 178-186, 2018
This study investigates the causal linkage among CO2 emissions per capita, energy intensity, real GDP per capita, industrialization (share of industrial value added in GDP), urbanization (share of urban population in total population), and share of renewable energy consumption in China over the period from 1970 to 2015. We employ autoregressive distributed lag (ARDL) technology to test the co- integration and short- and long-run estimates, and apply the vector error correction model (VECM) to analyze the directional causality among the time series data. The estimates of long-run parameters indicate that 1% augments of energy intensity, real GDP, industrialization, and urbanization increase CO2 emissions by 1.1%, 0.6%, 0.3%, and 1.0%, respectively. Long-run feedback Granger causalities exist among emissions, real GDP, and industrialization. Thus, our main policy suggestions are as follows:
(i) to encourage green and sustainable urbanization, as it increases economic growth but not at the expense of environmental degradation; (ii) to strategically adjust and optimize the industrial structure;
(iii) to improve the efficiency of energy use and technological innovation; and (iv) to increase the proportion of renewable energy in total energy consumption.

Asif Raihan, Almagul Tuspekova

Greenhouse gas (GHG) emissions, especially carbon dioxide (CO2) emissions, contribute significantly to global climate change, which in turn threatens the environment, development, and sustainability. The current study examines the nexus between Russia's energy consumption, industrialization, and forest cover in terms of the country's total CO 2 emissions. The Autoregressive Distributed Lag (ARDL) bounds testing technique and the Dynamic Ordinary Least Squares (DOLS) methodology were used to examine time series data from 1990 to 2020. Evidence of cointegration between the variables was found

using the ARDL bounds test. An increase of 1% in energy consumption and industrialization is predicted to result in an increase of 1.3% and 0.23% in CO 2 emissions in Russia. In addition, it has been estimated that a 1% increase in forest area might lead to a 4.29% reduction in CO 2 emissions in the long run. This article proposed policies to reduce emissions in Russia and assure environmental sustainability through the use of renewable energy sources, green industry, and sustainable forest management.

Mohammad Mafizur Rahman, Nahid Sultana, Eswaran Velayutham

High level of carbon emissions is still a policy agenda because of its detrimental effect on environment. CO_2 emissions are growing quickly in emerging countries with the high energy consumption, industrial activities, and rapid globalization. So, it is important to examine the roles of emission-inducing factors in these countries. To this end, this research investigates the dynamic effects of energy intensity, renewable energy, industrialization, urbanization and international trade on carbon intensity in the 25 largest emerging economies of the world. The study is based on the data period of 1990-2018, where the Pool Mean Group (PMG) estimation technique of the panel Autoregressive Distributed Lag (ARDL) approach is used, along with different diagnostic tests. The findings are, in the long-run, carbon intensity is increased by energy intensity and industrialization, and decreased by renewable energy use and urbanization. An increase of one unit in energy intensity and industrialization increased carbon intensity by 2.616 unit and 0.002 unit, respectively. Conversely, carbon intensity reduced by 0.003 unit with an increase of one unit in renewable energy and urbanization. In the short-run, carbon intensity is positively associated with energy intensity only with a coefficient value of 0.811. Therefore, an increase in renewable energy production and use, and enhancement of green technology for industrial production can be viable options for carbon reduction.

Byron Quito, Maria de la Cruz del Rio-Rama, Jose Alvarez-Garcia, Amador Duran-Sanchez

Debates on how growth and urbanization affect the environment have been intense, but they lack the global perspective. Therefore, this research examined those relationships, and to a greater extent other forms of global environmental degradation, such as foreign direct investment (FDI). It also explored the relationships between industrialization and technologies. The results, using Westerlund cointegration and quantile regressions over the period 1995-2017, show cointegration and regional heterogeneities in the environmental transmissions of economic development, industrialization, renewable energy, urbanization and FDI. The results show that economic development generates more environmental degradation in all quantiles at a global level, whereas urbanization and renewable energy reduce environmental degradation in all quantiles, with the highest effect being in the upper quantiles. On the other hand, industrialization affects the lower quantiles negatively and significantly but affects the upper quantiles positively. Finally, the empirical analysis supports the paradise haven or pollution halo hypothesis (PHH) for the 40th, 50th, 60th and 80th quantiles. This suggests that FDI inflows have a detrimental effect on the host country for these quantiles. Therefore, among the objectives of the policies are to give priority to more sustainable economic growth processes, which contribute to reducing

environmental degradation, and furthermore to reinforce strict environmental laws on investment inflows and to build sustainable urbanization and industrialization processes for countries.

Yusuf Saad Sani, Ibrahim Yunusa Abubakar, Saifullahi Bala Adam, Mridul Dharwal, Pooja Singh, Pallavi Sharma

This study analyses the relationship between economic growth and environmental degradation **in** Nigeria (1981-2019). It also examines the effect of industrialization and energy consumption on the environmental quality in the nation. The study utilizes mainly a secondary data; the unit root test shows that carbon emission is stationary at level, while economic growth, industrialization and energy consumption achieve stationary at first difference. Consequently, the Auto Regressive Distributed Lag (ARDL) model, results reveal that economic growth and energy consumption have positive relationship with environmental degradation, while the industrialization has negative or inverse relationship with it. Therefore, the study recommends that there should be adoption of sink enhancement strategy which involves filtering out greenhouse gases.

Bassem Kahouli, Kamel Miled, Zouhair Aloui

This study tries to explore empirically the nature of the link among energy consumption, environmental degradation, trade, industrialization, urbanization, and economic growth concerning the Kingdom of Saudi Arabia's economy for a time series of data spanning from 1971 to 2019. To investigate the cointegration, the long-run relationship, and to decide the direction of causality we apply the Autoregressive Distributed Lag and the Vector Error Correction Model technologies. Our empirical findings reveal that a rise in energy consumption and environmental degradation increases economic growth; however, energy has a significant contribution to the deteriorating environment. Besides, results show the presence of a feedback effect in the long-run among the different variables. In the short-run, energy use, trade, and urbanization, Granger causes economic growth; while growth, environment, industrialization, and urbanization Granger causes energy consumption. The Saudi policymakers must consider the leading role played by trade, urbanization, and industrialization in improving economic growth and harming environmental quality by launching efficient energy policies.

3.8. Research Gap

Gaps in the Literature are missing pieces or insufficient information in the research literature. These are areas that have scope for further research because they are unexplored, under-explored, or outdated.Research gap of Industrialization and Environmental degradation has been the main distress in recent years due to the drastic effect of climate change. To determine the thorough impact of industrialization and for-eign direct investment on environmental degradation, this study utilized the data of fifty-five countries of the Asia-Pacific region from 1995 to 2020. The main proxy for the

environmental indicator was CO2 emissions, whereas other proxies, methane, GHG, and nitrous oxide emissions, are also used to measure environmental degradation. Accord-ing to the literature, the results show that FDI, in general, has a significant negative impact on the environment and causes to increase in methane and CO2 emissions. In gen-eral, the effects of industrialization, measured in terms of industrial and manufacturing variables, on the environment, were significantly associated with the environment but the size of the impact is moderate. The EKC hypothesis has been described in most of the results by independent vari-ables, particularly economic growth that found statistically significant along with positive relationship, which postu-lates that economic growth is a cause for the degradation of the environment by increasing emissions of GHGs, CO2, methane, and nitrous oxide. It is also found that population growth puts the environment at risk, but long-term FMOLS statistics are not consistent with ARDL estimates of popula-tion parameters. The environmental impact of opening to trade varied and the impact depended on the environmental proxy used. Therefore, the strict application of environmental guidelines or the adoption of a new policy is the key to ensuring the quality of the environment.

CHAPTER-4
DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

Definition of research in data analysis: According to LeCompte and Schensul, research data analysis is a process used by researchers to reduce data to a story and interpret it to derive insights. The data analysis process helps reduce a large chunk of data into smaller fragments, which makes sense.

Data analysis is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, and is used in different business, science, and social science domains. In today's business world, data analysis plays a role in making decisions more scientific and helping businesses operate more effectively.

Data mining is a particular data analysis technique that focuses on statistical modeling and knowledge discovery for predictive rather than purely descriptive purposes, while business intelligence covers data analysis that relies heavily on aggregation, focusing mainly on business information. In statistical applications, data analysis can be divided into descriptive statistics, exploratory data analysis (EDA), and confirmatory data analysis (CDA). EDA focuses on discovering new features in the data while CDA focuses on confirming or falsifying existing hypotheses. Predictive analytics focuses on the application of statistical models for predictive forecasting or classification, while text analytics applies statistical, linguistic, and structural techniques to extract and classify information from textual sources, a species of unstructured data. All of the above are varieties of data analysis. Data integration is a precursor to data analysis, and data analysis is closely linked to data visualization and data dissemination.

Three essential things occur during the data analysis process the first is data organization. Summarization and categorization together contribute to becoming the second known method used for data reduction. It helps find patterns and themes in the data for easy identification and linking. The third and last way is data analysis - researchers do it in both top-down and bottom-up fashion.

On the other hand, Marshall and Rossman describe data analysis as a messy, ambiguous, and time-consuming but creative and fascinating process through which a mass of collected data is brought to order, structure and meaning.

We can say that "data analysis and data interpretation is a process representing the application of deductive and inductive logic to research and data analysis."

Data analysis is the process of analyzing data in various formats. Even though data is abundant nowadays, it's available in different forms and scattered over various sources. Data analysis helps to clean and transform all this data into a consistent form so it can be effectively studied.

Once the data is cleaned, transformed, and ready to use, it can do wonders. Not only does it contain a variety of useful information, studying the data collectively results in uncovering very minor patterns and details that would otherwise have been ignored.

So, you can see why it has such a huge role to play in research. Research is all about studying patterns and trends, followed by making a hypothesis and proving them. All this is supported by appropriate data. Further in the article, we'll see some of the most important types of data analysis that you should be aware of as a researcher so you can put them to use.

Analyze data in research

Researchers rely heavily on data as they have a story to tell or problems to solve. It starts with a question, and data is nothing but an answer to that question. But, what if there is no question to ask? Well! It is possible to explore data even without a problem - we call it 'Data Mining', which often reveals some interesting patterns within the data that are worth exploring.

Irrelevant to the type of data researchers explore, their mission and audiences' vision guide them to find the patterns to shape the story they want to tell. One of the essential things expected from researchers while analyzing data is to stay open and remain unbiased toward unexpected patterns, expressions, and results. Remember, sometimes, data analysis tells the most unforeseen yet exciting stories that were not expected when initiating data analysis. Therefore, rely on the data you have at hand and enjoy the journey of exploratory research.

4.2. Significance/Importance of Data Analysis in Research

Data analysis is important in research because it makes studying data a lot simpler and more accurate. It helps the researchers straightforwardly interpret the data so that researchers don't leave anything out that could help them derive insights from it.

Data analysis is a way to study and analyze huge amounts of data. Research often includes going through heaps of data, which is getting more and more for the researchers to handle with every passing minute.

Hence, data analysis knowledge is a huge edge for researchers in the current era, making them very efficient and productive.

Structuring Of Finding From Different Resources

As per assignment help experts, unintentionally scientific misconduct is likely to have resulted in poor research construction and its follow up. Ideally, investigators should have a basic understanding of the rationale behind the analysis over others. Also, researchers performing data analysis should be aware of challenges of reliability and validity so that the structuring of findings takes place efficiently.

4.3. Types of data in research

Every kind of data has a rare quality of describing things after assigning a specific value to it. For analysis, you need to organize these values, processed and presented in a given context, to make it useful. Data can be in different forms; here are the primary data types.

- Qualitative Data
- Quantative Data
- Categorical Data

Following are the brief information about the above data :

► Qualitative data

When the data presented has words and descriptions, then we call it qualitative data. Although you can observe this data, it is subjective and harder to analyze data in research, especially for comparison. Example: Quality data represents everything describing taste, experience, texture, or an opinion that is considered quality data. This type of data is usually collected through focus groups, personal qualitative interviews, or using open-ended questions in surveys.

► Quantitative data

Any data expressed in numbers of numerical figures are called quantitative data. This type of data can be distinguished into categories, grouped, measured, calculated, or ranked. Example: questions such as age, rank, cost, length, weight, scores, etc. everything comes under this type of data. You can present such data in graphical format, charts, or apply statistical analysis methods to this data. The (Outcomes Measurement Systems) OMS questionnaires in surveys are a significant source of collecting numeric data.

► Categorical data

It is data presented in groups. However, an item included in the categorical data cannot belong to more than one group. Example: A person responding to a survey by telling his living style, marital status, smoking habit, or drinking habit comes under the categorical data. A chi-square test is a standard method used to analyze this data.

There are five major types of data analysis used by researcher to interpret data out of which text analysis is predominant.
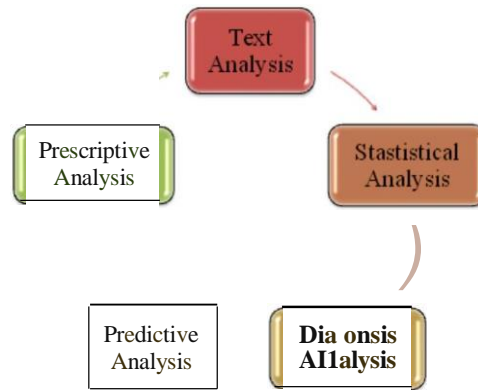
TYPES OF ANALYSIS

Text Analysis :

Also referred to as Data Mining is a method used to discover the pattern among voluminous data sets using data mining tools. This is best known for transforming raw data into business information

Statistical Analysis :

By using past data collection, statistical data analysis is performed. It is applicable to analyze and summarize numerical data and frequency of categorical data. You can also find the same data via selecting a different sample

Diagnostic Analysis :

This is a form of advanced data analytics used to determine why the particular event has happened. It is further classified using different techniques such as data mining, data drilling, data discovery and its correlations.

Predictive Analysis :

To identify likelihood futuristic outcomes based on past data, predictive analysis is performed using machine learning techniques. The goal of data analysis is beyond describing why it happens to provide the best assessments of what will happen in future.

Prescriptive Analysis :

It helps the business to define the course of action using machine learning. It uses data to determine the near outcomes using a variety of tools. Most of the driven data within the business have to go through the prescriptive analysis.

4.4. Tools used for interpretation of data

The statistical techniques used to analyze secondary data are no different from those used to analyze other types of data. The main differences are in collection and preparation. Once the data is reviewed and prepared, the analysis process continues as usual.

There are tons of data visualization tools available, suited to different experience levels. Popular tools requiring less efforts used in interpretation of data are :

I.Google Forms
2.Excel sheets

Data analysis & visualization techniques to be used
For more insights the analysis is accompanied with charts which includes bar diagrams, graphical representations to visualize performance and progress of wheat exports.

1) Charts for Comparison Over Time

Bar charts:
A Horizontal Bar Chart uses rectangular bars to present data. Horizontal Bar Charts are used for displaying comparisons between categories of data.

Pie chart:
A pie chart is a circular statistical graphic, divided into slices to illustrate numerical proportions. In a pie chart, the arc length of each slice is proportional to the quantity it represents.

4.5. Methodology & Sources of Data.

- Nature of the study - The study is based on the descriptive and explanatory data.

- Research area - The research is going to be conducted in Thane city

- Duration of the Study - It is approximately 3 months.

- Sample Size - For the study a sample of 40 people has been selected on the basis of convenient sampling for the purpose of the research.

4.6. Data Interpretation

<u>4.1 Age</u>

Table 1

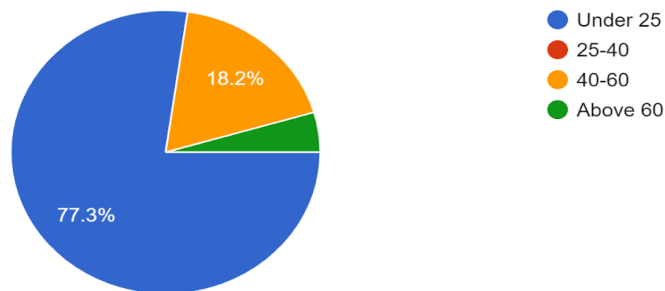| Age	Number of Respondents	Number of Respondents (In%)
Under 25	17	77.3%
25-40	0	0%
40-60	4	18.2%
60 Above	1	4.5%

Age
22 responses

Figure 4.1

▶ In Figure 4.1, represents the age wise classification ofrespondents.

▶ In the above diagram Pie-chart, represents the age group of the respondents.

▶ The diagram of Pie-chart shows the presentation in numbers and numbers in precentage form.

▶ As per the above Pie-chart diagram there are most respondents is from age between under 25 is 17 and 04 respondents are between 40-60.

In between 25-40 there are 0 and in there are only 1 respondents above 60

4.2 Female and male

Table 2

Gender	Number of Respondents	Number of Respondents (In%)
Female	13	59.1%
Male	9	40.9%

Gender
22 responses
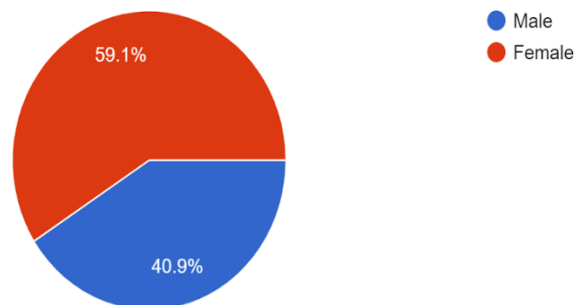
Figure 4.2

► The above figure 4.2, shows the gender wise distribution of data.

► Figure 4.2, respresents the gender wise classification of respondents.

► In the above diagram of Pie-chart Blue colour shows the male and Red colour shows the Female wise classification and their respondents in number and in percentage.

► In the above Pie-chart we can clearly see that there are 13 female respondents and 9 male respondents.

4.3. Are you aware about industrialization?

Table 3

	Number of Respondents	Number of Respondents (In%)
Yes	11	50%
No	1	4.5%
Maybe	10	45.5%

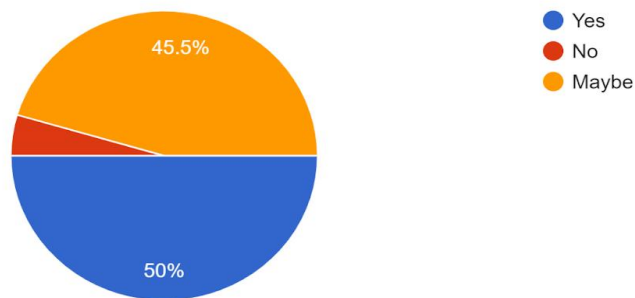Are you aware about environmental Industrilization?
22 responses

Figure 3

► In Figure 4.3, represents awamess about industrilization among respondents.

► According to Pie-diagram, we can say that 50% respondents means 11 respondents are aware about environmental industrilization.

► And **10** respondents means 45.5% respondents have little bit aware.

4.4 Thinking of industrilization create scarcity of resources in industrial area?

Table 4

	Number Of Respondents	Number Of Respondents (In%)
Agree	18	81.8%
Disagree	1	1%
Neutral	4	18.2%

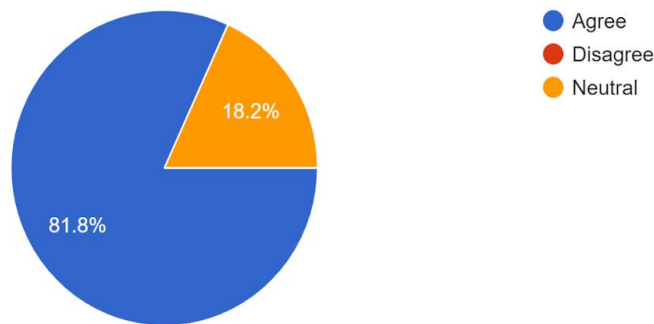Do you think industrilization create scarcity of resources in industrial area?
22 responses

Figure 4

▶ Figrues 4.4 is about the scarcity of resources in industrial areas.

▶ 18 respondents are Agree with the industrilization create scarcity of resources in industrial areas.

▶ 01 respondents are Disagree and 14 respondents out of 22 have neutral opinion.

4.5 <u>Do you think planting trees near mining industry stop the soil erosion?</u>

Table 5

	Number of Respondents	Number Of Respondents (In%)
Agree	11	50%
Disagree	10	45.5%
Neutral	1	4.5%

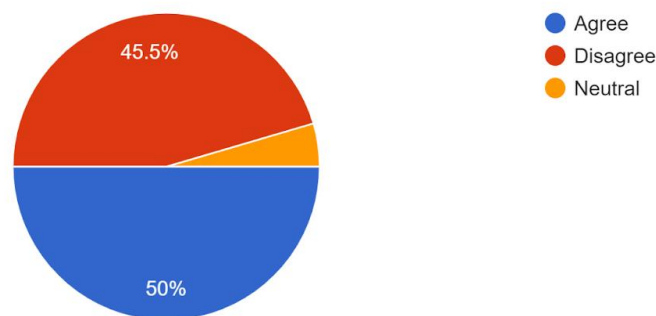Do you think planting trees near mining industry stop the soil erosion?
22 responses

Figure 5

► Figure 4.5 represent opinion about thought of planting tree mining indusrty stop the soil erosion.

► Out of 22 reaponsdents 11 respondents think tree plantation helps to stop soil erosion due to mininf industry.

► 10 respondents out of 22 think there is relation between planting trees and soil erosion therefore they disaree with above statement.

► Out of 22 respondents only 1 respondents have a nuetral thoughts of planting trees stop the soil erosion near mining industry.

4.6 Does indusrties takes serious efforts for managing industrial waste in thane?

Table 6

	Number of Respondents	Number of Respondents (In%)
Agree	15	71.4%
Disagree	03	14.3%
Neutral	04	14.3%

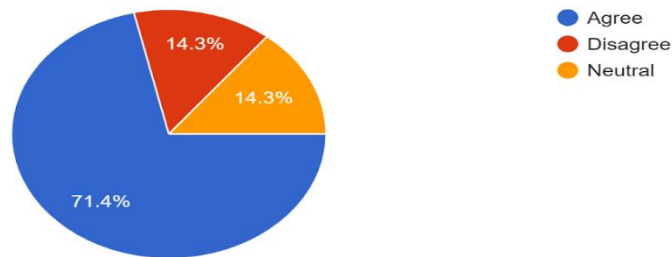Does indusrties takes serious efforts for managing industrial waste in thane?
21 responses

Figure 6

▶ The above diagram shows tabout does industries take serious action or efforts for managing the waste obtain from the industries.

▶ In figure 4.6, represent thought of respondent about the industries take serious efforts for managing industrial waste of industries.

▶ 71.4% respondent i.e. 15 respondents think taht induatry take serious action or efforts for managing industrial waste in thane city.

▶ 03 respondents are totally disagree that they think industry does not take any serious effort or action for managing indus waste

▶ And out of 22, 04 respondents have neutral thoughts about managing the waste by industries.

4.7 Are you satisfied with drainage facility by industries?

Table 7

	Number Of Respondents	Number of Respondents (In%)
Yes	14	66.7%
No	02	9.5%
Maybe	05	23.8%

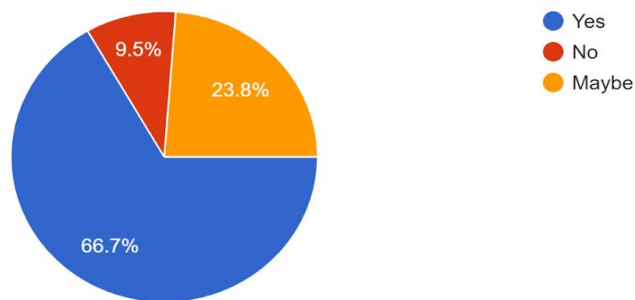Are you satisfied with drainage facility by industries?
21 responses

Figure 7

▶ Figure 4.7 represents satisfaction of Respondents towards drainage facilities by industries.

▶ Only 14 respondents out of 22 are satisfied with the drainage facility of industries and 02 respondents are dissatisfied with drainage facility of industry.

▶ And 23.8% i.e 05 respondents have neutral opinions about the drainage facility of industrial.

4.8 Does industries provide proper influent collection and disposal of waste in Thane?

Table 5

	Number of Respondents	Number Of Respondents (In%)
Agree	13	61.9%
Disagree	01	4.8%
Neutral	07	33.3%

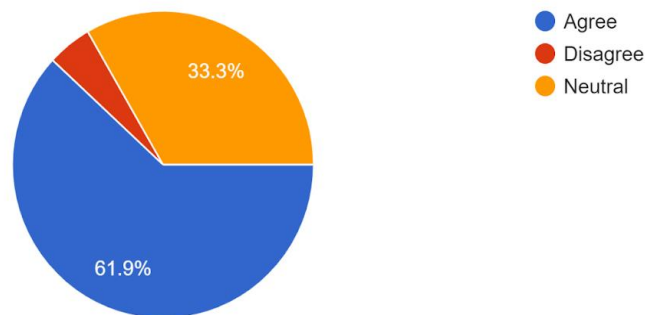Does industries provide proper influent collection and disposal of waste in Thane?
21 responses

Figure 8

▶ Figure 4.8 represents about the industries provide proper influent collection and disposal of waste in Thane

▶ It shows the opinions about disposal of industrial waste.

▶ 13 respondents out of 22 think that industries does proper influent colleand disposal of waste in Thane.

▶ 4.8% respondents are disagree with a above statement and out of 22, 07 respondents have neutral opinions.

4.9 Does indusrties takes serious efforts for managing industrial waste in thane?

Table 9

	Number Of Respondents	Number Of Respondents (In%)
Agree	12	57.1%
Disagree	01	4.8%
Neutral	08	38.1%

Does indusrties takes serious efforts for managing industrial waste in thane?
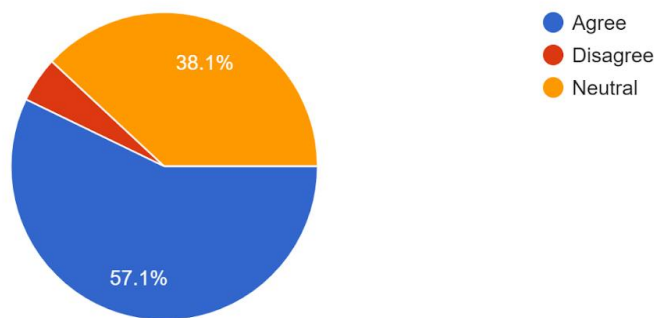21 responses

Figure 9

- ► The above diagram shows about does industries take serious action or efforts for managing the waste obtain from the industries.

- ► In figure 4.6, represent thought of respondent about the industries take serious efforts for managing industrial waste of industries.

- ► 57.1% respondent i.e. 12 respondents think that industry take serious action or efforts for managing industrial waste in thane city.

- ► 1 respondents are totally disagree that they think industry does not take any serious effort or action for managing industrial waste.

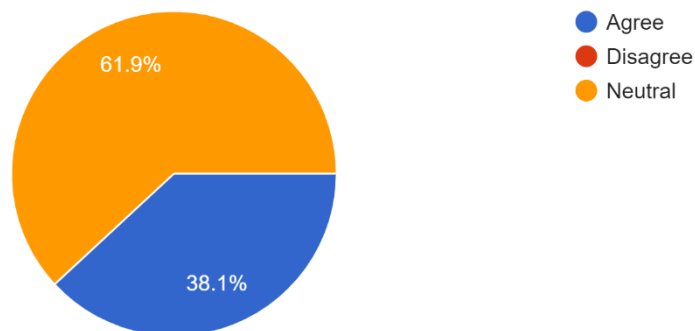► And out of 22, 08 respondents have neutral thoughts about managing the waste by industries.

4.l0Does MIDC provides proper environmental infrastructure for controlling industrial pollution?

Table 10

	Number of Respondents	Number of Respondents (In%)
Agree	08	38.1%
Disagree	01	1%
Neutral	13	61.9%

Does MIDC provides proper environmental infrastructure for controlling industrial pollution?
21 responses

Figures 10

► In Figures 4.10 represents opinions of MIDC provides proper environmental infrastructure for controlling industrial pollution.

► 08 respondents out of 40, are agree that they think MIDC provides proper environmental infrastructure for controlling industrial pollution.

► 1% i.e. 01 respondents are disagree and 13 respondents out of 22 have neutral thoughts about the industrial environmental pollution.

4.11 Are you happy with the performance and evaluation of CEPT(Centre for Environment Planning & Technology) by MIDC in Thane?

Table 11

	Number of Respondents	Number of Respondents (In%)
Yes	11	50%
No	02	4%
Maybe	10	45.5%

Are you happy with the performance and evaluation of CEPT(Centre for Environment Planning & Technology) by MIDC in Thane?
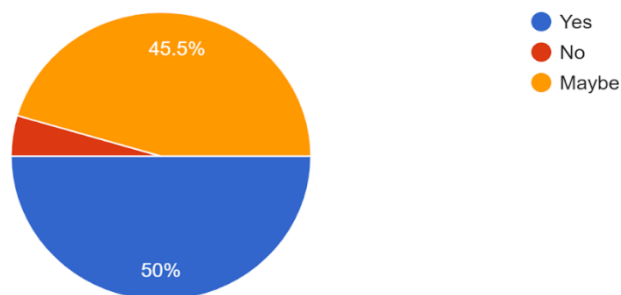22 responses

Figure 11

▶ Figure 4.11 represents that the satisfaction level of Respondentstaht they are happy with performance and evaluation of CEPT (Centre for Environmental Planning and Technology) by MIDC.

▶ 11 respondents ate happy with performance of CEPT. And 10 respondents have neutral thoughts for the performance and evaluation.

▶ And only 02 respondents are not happy with a performance and evaluation of CEPT.

4.12 Does MIDC provide proper environmental infrastructure for controlling industrial pollution?

Table 1

	Number of Respondents	Number of Respondents (In%)
Agree	08	38.1%
Disagree	01	1%
Neutral	13	61.9%

Does MIDC provides proper environmental infrastructure for controlling industrial pollution?
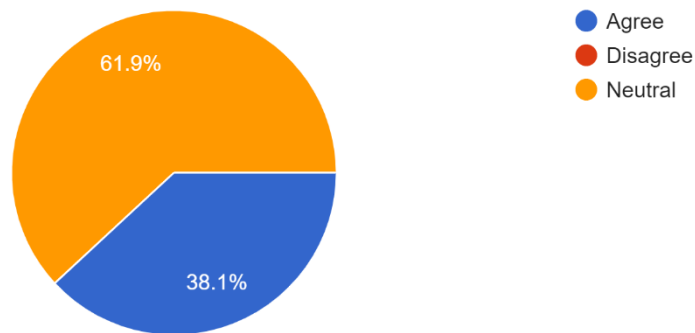21 responses

Figure 12

► In Figures 4.12 represents opinions of MIDC provides proper environmental infrastructure for controlling industrial pollution.

► 08 respondents out of 22, are agree that they think **MIDC** provides proper environmental infrastructure for controlling industrial pollution.

► 1% i.e. 01 respondents are disagree and 13 respondents out of 22 have neutral thoughts about the industrial environmental pollution.

4.13 Is industrilization helps to create employment opportunities in the city?

Table 13

	Number of Respondents	Number of Respondents (In%)
Yes	21	95.5%
No	1	5.5%
Maybe	0	0%

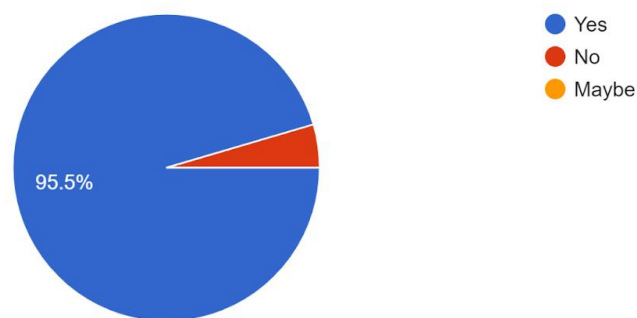Is industrilization helps to create employment opportunities in the city?
22 responses

Figure 13

▶ The above figures 4.13 shows that the industrialization helps to create employment opportunities in our area i.e. Thane.

▶ There are the 21 respondents out of 22 response that yes its helpful for creating employment opportunities.

▶ But there are 0**1** respondents who respond that the industrialization in city cannot helpful for creating employment opportunities in Thane city.

▶ There respondents who respond in maybe the industrialization helpful for creating employment opportunities in Thane city.

4.14 How the waste water affects the health?

Table 14

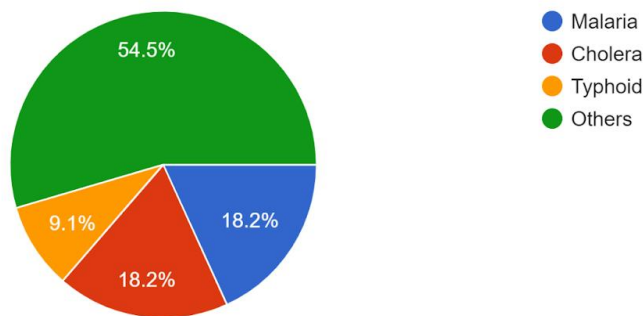|	Number of Respondents	Number of Respondents (In%)
Malaria	04	18.2%
Cholera	04	18.2%
Typhoid	02	9%
Others	12	54.5%

How the waste water affects the health?
22 responses

Figure 14

▶ From figure 4.14 we can say that howthe waste water affects the helath of the people.

▶ There are 18.2% respondents of malaria and there is 18.2% affected by cholera also.

▶ 9% respondents are think that the peoples are affected by typhoid also.

▶ There are handful responses i.e. 54.5% are come from respondents that they are thinking that others infection can affect the health.

4.15 How is the level of water pollution from industries?

Table 15

	Number of Respondents	Number of Respondents (In%)
High	08	36.4%
Low	0	0%
Medium	14	63.4%

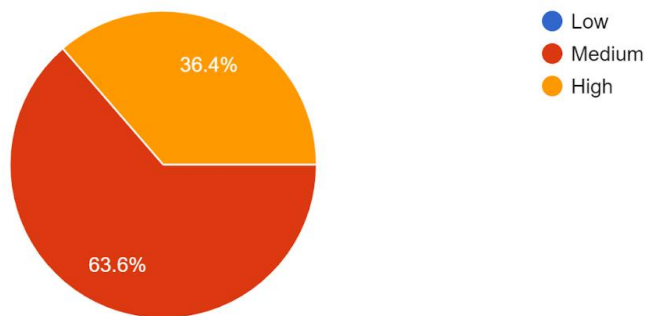How is the level of water pollution from industries?
22 responses

Figure 15

► The above diagram of pie chart shows the level of water pollution creates by industries.

► There are very few respondents i.e. 08 respondents think that the water pollution cannot done by industries on high level.

► The respondents who think that the medium level of water pollution done by the industries are 14 respondents i.e. 44.7%.

► Only 0 respondents are think that level of water pollution done by industries in low.

4.16 What is the type of waste water produced by the industries?

Table 16

	Number of Respondents	Number of Respondents (In%)
Chemical	19	86.4%
Physical impurities	03	13.6%
Others	0	0%

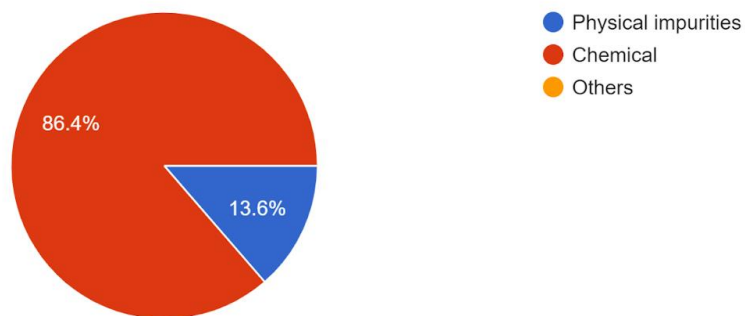What is the type of waste water produced by the industries?
22 responses

Figure 16

▶ In bar graph 4.16 shows that the type of waste water produced by the industries.

▶ There are **19** respondents who respond that the chemical type pf waste water is produced by the industries.

▶ 03 respondents out of 22 who respondents who respond that the physical impurities are produced by the industries.

▶ And others are 0 who think that other type of water is produced by the industries.

4.17 Where the industries throw their waste?

Table 17

	Number of Respondents	Number of Respondents (In%)
Near the industries	07	31.8%
Roadside	04	18.2%
Frontiers of industrial scale	08	36.4%
Remote area	03	13.6%

Where the industries throw their waste?
22 responses

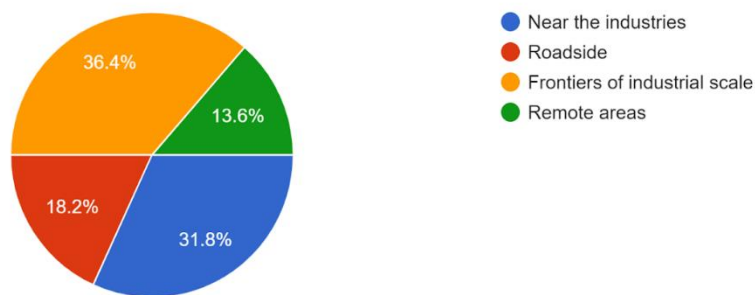Figure 17

► From the figure 4.17 that is it it bar graph tells that the industries throw their waste.

► There are 31.8% respondents respond that industries throw their waste near the industries.

► 36.4% & 18.2 respondents that they throw their waste both frontiers of industrial scale and roadside.

► Only 13.6% respondents think that or respond that the industries throw their waste near area.

4.18 Do you think Industrilization helps india for development?

Table 18

	Number of Respondents	Number of Respondents (In%)
Yes	19	86.4%
No	0	0%
Maybe	03	13.6%

Do you think Industrilization helps india for development?
22 responses

Figure 18

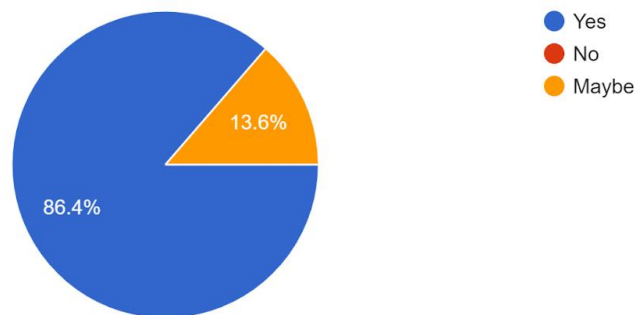▶ The figure 4.18 that is pie diagram shows that the industrialization helps India for development.

▶ There are 20 respondents who Respond yes Industrialization helps India for development.

▶ But there are 8 respondents who respond No Industrialization cannot helps India for development.

▶ 12 Respondents who respond maybe for the question that what we think that lndustrilization helps India for Development.

4.7.Conclusion

From the above survey questions we can say that there are 40 respondents that we collect from the data from them through survey. We can say that they response in various ans from the point of view. The survey questions proposes a holistic view of the significance of data analysis in academic research. It has covered several dimensions from the respondents point of view that entail the part of data analysis incorporated to understand the pattern like text analysis, diagnostics analysis, statistical predictive analysis, prescriptive analysis. This also discussed how meta-learning tools are being utilized to segregate the macro problem of research into micro one. It has also highlighted how researchers use data analysis norms to understand the nature of variables also to determine the power of statistics. Thus it can be said, either it is qualitative research or quantitative data analysis has successfully applied to infer the findings and interpretation results.

CHAPTER-5
CONCLUSION

5.1. Introduction

In this chapter, major findings of the work, discussion of the hypothesis and recommendations, based on the analysis, fieldwork and other works have been presented. Voluminous literature is available in the areas of development of Thane role in industrial development. The large coverage of literatures provides valuable contribution that can be adopted as a benchmark to achieve the maximum satisfaction in the area of development of SME. The research methodology was formulated to conduct the research through Descriptive and Analytical method of research. The primary and secondary data were collected as per the standard practices adopted in conducting social research. The structured Questionnaire was developed based on the review of literature and objectives of the study. The contribution of Industrilization in the areas of land acquisition and allotment, infrastructure, fire safety measures, safety and security measures, consultancy and incentives in the development of Industrilization in Thane City, could enable to have a better understanding of development of SME in India in addition observation method and personal interview were conducted to have required input for the research.

The research study was conducted with set of objectives of objectives of Hypothesis and Null Hypothesis as mentioned in the first chapter. Research methodology laid the base for quantitative and qualitative analysis of data which could help in arriving at findings and to develop the strategies for the enhancement of MIDC support to SME in Thane City.

5.2. Conclusions

Conclusion of Industrialization and Environmental degradation has been the main distress in recent years due to the drastic effect of climate change. To determine the thorough impact of industrialization and foreign direct investment on environmental degradation, this study utilized the data of fifty-five countries of the Asia-Pacific region from 1995 to 2020. The main proxy for the environmental indicator was CO_2 emissions, whereas other proxies, methane, GHG, and nitrous oxide emissions, are also used to measure environmental degradation. Accord-ing to the literature, the results show that FDI, in general, has a significant negative impact on the environment and causes to increase in methane and CO_2 emissions. In gen-eral, the effects of industrialization, measured in terms of industrial and manufacturing variables, on the environment, were significantly associated with the environment but the size of the impact is moderate. The EKC hypothesis has been described in most of the results by independent vari- ables, particularly economic growth that found statistically significant along with positive relationship, which postu-lates that economic growth is a cause for the degradation of the environment by increasing emissions of GHGs, CO_2, methane, and nitrous oxide. It is also found that population growth puts the environment at risk, but long-term FMOLS statistics are not consistent with ARDL estimates of

population parameters. The environmental impact of opening to trade varied and the impact depended on the environmental proxy used. Therefore, the strict application of environmental guidelines or the adoption of a new policy is the key to ensuring the quality of the environment.

5.3. Recommendations

The study area of the Thane district has a great, unexploited potential for development of non-metallic minerals. There is a need for scientific and systematic geological survey of sedimentary minerals of the district so that new mineral areas may come to light. Till date, local entrepreneurs have used their experience and efficiency in discovery of available minerals, removal of overburden and in mining of minerals.

5.4. Suggestions

The effluent collection system is a very important part of overall effluent management. MIDC has initiated steps to replace the old network with HDPE in major chemical zones. Further, it is observed that the existing effluent collection sump- I and pumping at this sump is inadequate to collect the entire effluent for its planned disposal. This is mainly due to commissioning of new water intensive industries like textiles in its catchments. MPCB has brought this aspect to the notice of MIDC for necessary augmentation of the collection network. There is also a need for development of an engineered outfall system at Navapur for sea disposal of treated effluent. There is also a need for development of arrangements for disposal of non-hazardous solid waste for industries as well as the dense habitation developed around Thane city. MIDC has now been surrounded by human habitation from all sides and therefore it is urgently required to provide green belt all around MIDC. The Thane city area also needs a major beautification drive in view of the debris, excavations and dirt observed everywhere. It is therefore necessary that steps are taken for improvement in aesthetics of the industrial area which is the pride of Maharashtra.

Suggestions to reduce effects of Industrilization

- Policies to control pollution
- Planned Industrial Growth
- Use of new Technologies
- Efficient Waste Disposal
- Less use of Natural Resources
- Use the method of recycling
- Industry Site Citation
- Stricter Laws and Enforcements

Suggestions to control water pollution by industries

- Every litre of waste water discharged by our industry pollutes eight times the quantity of freshwater
- Treating effluents and hot water before releasing them in ponds and rivers.
- By recycling and reusing water in two or more stages, water usage can be minimised.
- To meet water requirements, it is important to carry out rainwater harvesting.
- Biological process is the secondary treatment.
- There needs to be legal regulation of groundwater resources, wherever there is threat of overdrawing groundwater resources by the industry.

Suggestions to control air pollution by industries

- We can reduce air pollution by conserving energy by turning off lights, computers, air conditioners and other appliances when not in use.
- Encourage your employees to use public transport or you can arrange a bus from a common point for your employees.
- When purchasing a vehicle for your company consider buying most efficient, lowest polluting or if possible zero emission electric vehicle.
- Encourage employees to use bicycle for daily commute.
- Ensure drivers in your company obeying traffic laws, speed limits, maintaining vehicles properly and keeping optimum air pressure in tyres.
- GO green by limiting the use of paper as it may save some trees.
- Encourage activities like planting trees once a year among employees.
- Boosting performance of boilers can sharply reduce air pollution from industry.
- Switching from coal, oil to natural gas reduced operating costs and extend plant's life by eliminating corrosion from fuels
- to identify irregularities in pollutants level in air and keep your pollutants level within limits

Suggestions to reduce pollution by transport industries:

Pollution from vehicles is a major cause of health problems such as asthma. We all benefit from clean air. No matter who you are, there are actions you can take to help reduce the amount of pollution that comes from cars. Everyone, from kids to adults, can help make a difference. Here are some things that you can do.

1. Ride a bike or walk.
If you are only going a short distance, consider riding a bike or walking instead of driving. You can get exercise and enjoy the fresh air while getting where you need to go!

2. Take public transit.
If you need to go somewhere that is along a bus or light rail line, consider taking public transit instead of going in a car.

3. Carpool.
When going to school or work, try to carpool together with other people who are headed in the same direction. You can save money and reduce the amount of fuel burned at the same time.

4. Avoid idling.
When idling, you waste fuel by burning it when you aren't moving. If you will be in the same spot for more than a minute or two, consider turning off your vehicle's engine (as long as it is safe to do so)

5. Use alternative fuels.
Alternative fuels are cleaner than regular gasoline or diesel. Alternative fuel vehicles include electric vehicles and flex-fuel vehicles that can use ethanol blends. Most new electric vehicles now have a range of over 100 miles, which meets most people's daily commuting needs. Plug-in hybrid electric vehicles and extended range electric vehicles use gasoline as well and therefore do not have a range limit. Flex- fuel vehicles can use ethanol blends that are up to 85% ethanol and regular cars that are newer than 2001 can use ethanol blends that have up to 15% ethanol. Ethanol is made from crops such as corn and helps support American farmers.
None of these options work for everyone all the time. But all of us can take steps to reduce pollution from cars and trucks.

Suggestions to control industrial pollution in Thane are as follows

- Particulate matter in the air can be reduced by fitting smoke stacks to factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators.
- Smoke can be reduced by using oil or gas instead of coal in factories.
- Machinery and equipment can be used and generators should be fitted with silencers.
- Pollution check certificates should be made compulsory.
- Machineries used in the industries can be redesigned to increase energy efficiency and reduce noise. Noise absorbing material may also be used.

Major Findings

There are several industrial location theories, which can be evaluated with regard to the present world in general, and the study area in particular. Weber's theory is based on the least cost location, which is determined on the basis of transport cost. It also considered the role of cheap labour and agglomeration

economies in the change of location of industries. Improvement in transport has changed the scenario but. Factors of industrial localization in Thane City are historical development, resource availability, cheap labour, infrastructure and capital, and governmental policies. Till the end of 19* century, wool and milk were the mainstay of the economy of Bikaner state. In the first half of the 20 century, handicrafts including woolen carpets, cotton textile, iron works also began. Innovative historical. There was a lull in industrial development till late 1960s when an electrical insulator and sanitaryware unit was set up. The first industrial area, Wagle Estate, was established around this time. Government incentive played its important role in further development. Now industrial areas have been developed in different parts of the district.

Most of the industries in the study area are micro and small-scaled. Medium and large scale units are few indeed. Based on raw material used, most of the industries belong to agricultural and mineral categories, followed by livestock-based units. There are other demand- based industries too. The industries in the study area are dispersed, although several industrial areas too have been developed.

The industries situated in industrial areas, developed with infrastructural facilities by MIDC, have also grown with years. There are 10 MIDC and 2 co-operative Industrial Estate are industrial areas in the district. The industrial areas of Thane city (Thane, Kalyan, Ulhasnagar, Bhiwandi, Vasai are the industrially developed), Industrial Growth Centre at Wagle Estate are most important with regard to the number of units, employment provided and the investment done. The Wagle Estates industrial areas dominate in respect to the number of units and employment generation. Wagle estate has specialized in mineral based industries and agro, livestock based units. The industries in the study area use raw material mainly from the region itself The goods produced are sent within the district, Thane and also to other parts of the country. The industries employ local as well as outside labour, the skilled labour is brought from outside the study area.

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APPENDICES

1. **Link* https://forms.gle/LHprAX4uq6wU4vvv5**

2. **Age**
o Under 25
o 25-40
o   40-60
o Above 60

3. **Gender**
o Male
o Female

4. **Are you aware about environmental Industrilization?**
o Yes
o No
o Maybe

5. **Do you think industrilization create scarcity of resources in industrial area?**
o Agree
o Disagree
o Neutral

6. **Do you think planting trees near mining industry stop the soil erosion?**
o Agree
o Disagree
o Neutral

7. **Does indusrties takes serious efforts for managing industrial waste in thane?**
o Agree
o Disagree
o Neutral

8. **Are you satisfied with drainage facility by industries?**
o Yes
o No
o Maybe

9. **Does industries provide proper influent collection and disposal of waste in Thane?**
o Agree
o Disagree
o Neutral

10. **Does indusrties takes serious efforts for managing industrial waste in thane?**
o Agree
o Disagree
o Neutral

11. **Does MIDC provides proper environmental infrastructure for controlling industrial pollution?**
   o Agree
   o Disagree
   o Neutral

12. **Are you happy with the performance and evaluation of CEPT(Centre for Environment Planning & Technology) by MIDC in Thane?**
o Yes
o No
o Maybe

13. **Does MIDC provides proper environmental infrastructure for controlling industrial pollution?**
o Agree
o Disagree
o Neutral

14. **Is industrilization helps to create employment opportunities in the city?**
o Yes
o No
o Maybe

15. **How the waste water affects the health?**
   (Multiple Choices Question)
o Malaria
o Cholera
o Typhoid
o Others

16. **How is the level of water pollution from industries?**
o High
o Low
o Medium

17. **What is the type of waste water produced by the industries?**
o Physical impurities
o Chemical
o Others

18. **Where the industries throw their waste? (Multiple Choice Question)**
o Near the industries
o Roadside
o Frontiers of industrial scale
o Remote areas

19. **Do you think Industrilization helps india for development?**
o Yes
o No
o Maybe