

Development Of Industrial Area (SUPA Industrial Park)

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Abstract— An Industrial area is an area zone and planned for the purpose of Industrial development. Areas allocated for industrial as per department of a town-planning scheme or environmental plan. The range of industries accommodated in a plan may include: light industry, service industry, and general industry hazardous, noxious or offensive industry, extractive industry. Standards are usually defined for industrial areas relating to access and roads, drainage, car parking, aesthetics, landscaping, buffer zones, noise levels, and air and water pollution.

The industrial revolution leads to the development of factories for large-scale production, with consequent changes in society. Originally the factories were steam-powered, but later transitioned to electricity once an electrical grid was developed. The mechanized assembly line was introduced to assemble parts in a repeatable fashion, with individual workers performing specific steps during the process. This led to significant increases in efficiency, lowering the cost of the end process. Later automation was increasingly used to replace human operators. This process has accelerated with the development of the new construction techniques and renewable sources.

In this project to develop industrial area by providing Industrial zoning, new construction techniques, infrastructure, renewable sources, waste management, air pollution control techniques, safety and security etc. to established a proper industrial area.

Keywords—Town Planning, Renewable Sources, Air And Water Pollution, Safety And Security

I. INTRODUCTION

The industrial revolution leads to the development of factories for large scale production with consequent changes in society.

Area located for industry within a town planning scheme or environmental plan. The range of industries accommodated in a plan may include light industry, service industry, general industry, hazardous, water front industry etc.

The adverse impacts caused by industrial expansion within the zone needs to be identified and assessed urgently to preserve the sanctity, spirituality as well as the biodiversity of the region by promoting the sustainable development of the surrounding communities in a deliberate and tactful way. In order to assess the situation, comprehensive information about the existing industries; land use planning for the promotion of livelihoods of the locals using non-carbon emissions sources of income generation; and preservation of cultural values of the Industrial area are needed to be integrated into the conservation and development plan of the region in order to reduce the environmental degradation.

In this regard, as per the Environmental Protection Act 1997, an Environmental Impact Assessment (EIA) is mandatory for the protection, conservation and sustainable management of the environment. The scope of the work

mentioned includes an assessment study of current industries and their impact on the region. This study puts

Forward the most effective ways to protect the environment from increasing pollution caused by the burgeoning industrial development and recommendations for environmental-friendly development initiatives in the region.

At the same time, industrial processes can have negative environmental impacts, causing climate change, loss of natural resources, air and water pollution and extinction of species. These threaten the global environment as well as economic and social welfare.

The concept of sustainability is becoming increasingly important all over the world. Governments, communities and industries are all working to prevent pollution and overconsumption from ruining the planet and the natural resources we all rely on. There is an urgent need to make all industrial products and processes 'sustainable', and also good for people and planet. Products are the source of all environmental problems. Major issues such as pollution, deforestation, species loss and global warming are all side-effects of the activities that provide consumers with endless consumer goods on the market today.

Sustainable design considers some of the harder questions collectively, such as need, equity, ethics, social impact and resource efficiency and thus, the role of design in achieving inter-generational equity. It is also intended to develop more environmentally benign products and processes. Unfortunately, in many past situations environmental effects were ignored during the design stage for new products and processes. However, change for any existing products is difficult.

II. METHODS OF THE STUDY

Environmental product development requires some fundamental changes in approach by designers. Design is the key intervention point for making radical improvements in the environmental performance of products. Designers must create a capability that goes far beyond visual appearance.

To develop products in a sustainable way, the designer must be able to assess which design solution is better from an environmental point of view. In this case, designer's responsibilities will become more difficult than before. The main purpose of this thesis is to help designers to comprehend the features of 'Sustainable Product Design'. In other words, this thesis aims, together with considering environmental issues, to determine the basic changes

occurring in design process and to lead the designer in the light of these principles.

- 1Waste water treatment
- 2Air pollution control
1. Safety & security
2. Use of renewable energy
3. Solid waste management.

III. DETAILS OF WORK DISSERTATION

A. Brief Description Of The Nature Of The Project

The proposed development of Supa Industrial Area (IA) of phase I & II, envisaged as an Industrial theme park with a vision of providing “Hassle free production environment” for the manufacturing of IT/BT Precision & Electronic Industries, Garment Industries, Rubber, Foundry Granite & Others and General Industries Such as Engineering Industries like Machine parts, Automobile industry, etc in Phase I. In Phase II, IT/BT & General Industries, Steel & Food Industries, Garment Industries, Agro based Industries, Pharmaceutical Industries, Power Producing Units & Granite Industries. The proposed site for the development of Supa IA of phase I & II comprises of semi urban and rural environment. The area earmarked for the proposed IA of phase I & II is about 945Ha of land. Presently the land is barren with degraded shrub in most of the area, while some land is also covered by agricultural activity.

B. Identification and Assessment of Environmental Impacts

Primary impacts due to industrial activities focus on physical features such as air, water, and soil. As stated in the limitation of this study, getting scientific data and information to complete the impact assessments is a major challenge. However, the study tries as much as possible to show the primary impacts by assessing the primary information and data in terms of scientific analysis (laboratory analysis in the case of water and soils), reviewing the scientific literature, and also by evaluating the local community’s perception about the industrial impacts.

IV. DATA COLLECTION AND PREPARATION OF MAPS

Primary data or information on the public’s attitude and experiences regarding the impacts of industrial expansion on bio-physical and socio economic features etc., was collected from the field by using some key research tools such as focus group discussions, transect walks with relevant stakeholders, key informant interviews, field observations and survey questionnaires. Likewise soil and water samples were also taken for analysis.

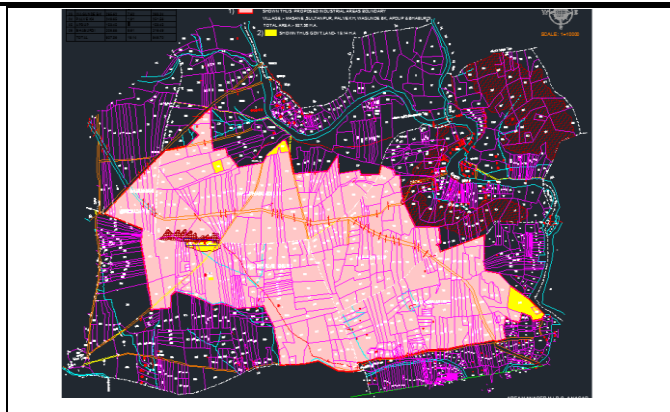


Fig: Map of Supa Industrial Area

A. Expert Consultation

Since the EIA required information on a variety of topics, the study attempted to hold consultations with concerned experts to understand their point of view regarding the critical issues.

B. Field Observation

This was conducted in order to observe the physical, biological, socio-economic and cultural environmental impacts of new supa industrial establishment. A team comprising of representatives from the study team and key informants and the field enumerator conducted the transect walk. The observation and transect walk was done along with the field enumerator and representatives from local communities. The delineated base map of the SPZ was verified in close coordination with local stakeholders and communities. The environmental impacts caused by industrial activities experienced and seen by the local communities were marked on the base map during the transect walk in the field. The local stakeholders, including industry authorities, government officials, local leaders, communities, journalists etc., were aware about the concept of SPZ and the location of the existing industries. The thematic maps like land use maps, base maps etc., were verified and changes were made as per the field observations.





Fig: field observations

V. THE STUDY AREA

The proposed Supa IA project site of comprises of semi urban and rural environment. The area earmarked for the proposed IA of phase I & II is about 950 ha of land. Presently the land is barren with degraded shrub in most of the area, while some land is also covered by agricultural activity.



Fig:Study Area

VI. LIMITATION OF THE STUDY AREA

1. EIA guideline 1997 steers the environmental impact assessment for any new development project to be establish however this study was carried out for the impact assessment Of the current operational industries located in the study area based on the guideline and the act
2. The study was conducted within a very tight time schedule and with limited resources due to such constraints only a rapid analysis was possible.

3. Because of limited time and a lack of monitoring equipment, data in regards to air, water, soil and noise pollution has been constrained.
4. Getting meteorological data such as wind profiles and ambient temperature of the study area was also one of the limitations of the study. As a result the analysis of dispersions, diffusion and transportation of particular matter and emissions has been limited.

VII. DESCRIPTION OF THE ENVIRONMENT

The existing environmental status for various/environmental attributes within 10 km radius from the proposed Supa IA has been studied. To compute the impacts that are likely to arise due to the proposed activities of the proposed IA. The proposed IA as the centre, a radial distance of 10 Km is considered as 'study area' for data collection and environmental monitoring. The scope of the existing studies includes detailed characterization of following environmental components, which are most likely to be influenced by the proposed IA.

1. Meteorological conditions
2. Ambient Air Quality
3. Noise Levels
4. Water Quality (Surface + Ground water)
5. Soil Quality

A. Air environment

The ambient air quality was monitored in the impact area as per the guidelines prescribed by the MRTP. The prime objective of the existing air quality study was to assess the base line ambient air quality within 10 Km radius from the proposed Supa IA. To control air pollution in Supa industrial area by using new technology (sensor).

New system will be based on IOT. It will consist of web based monitoring system. A system will monitor the hazardous gases that are emitted by industries across the supa IA area. It simultaneously provide data to authority and organization. The main objective of the work is designing microcontroller based toxic gas detecting and alerting system. The hazardous gases like LPG, propane and other hazardous gases and any chemical leakage accident were sensed and displayed each and every second on the LCD display. If these gases exceed the normal level then an alarm will get generated immediately and also an alert message (SMS) is sent to the authorized person through the GSM

B. Noise Environment

Noise can be defined as unwanted sound or sound in the wrong place at the wrong time. It can also be defined as any sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is

otherwise annoying. The definition of noise as unwanted sound implies that it has an adverse effect on human beings and the environment, including land, structures, and domestic animals. Noise can also disturb natural wildlife and the ecological systems and it was transmitted through gases, liquids, and solids. The weather conditions which could potentially absorb, reflect, or focus the sound such as wind speed, direction, temperature inversions. The Environment/health impacts of noise can vary from Noise Induced Hearing Loss (NIHL) to annoyance depending on loudness of noise levels and tolerance levels of individual.

C. Soil Quality

The present study on soil quality establishes the existing characteristics within 10 km radius from the proposed IA of phase I & II. The study has been addressed with the following objectives.

1. To determine the existing soil characteristics.
2. To determine the impact of the industrial activities on soil characteristics
3. To determine the impacts on soils for an agricultural productivity point of view

D. Land use study

Studies on land use aspects play an important role in identifying sensitive issues and to take appropriate action to maintain ecological balance in the study area. The pattern of land utilization and its statistics are given in table.

Description of land use	Area in hectors
Large Scale industry	200.05
Medium Scale Industry	95.56
Small scale industry	70.33
Amenities	90.36
Water bodies	14.84
Land Project Affected Person	64.64
IT Industry	40.58
Commercial	28.63
Residential	42.84
Open Spaces	41.10
Road	150.34
Japanese Park	75.38
Area under green belt	31.35
Total	946

VIII. ZONING THE LAND USE AND GUIDELINES FOR DEVELOPMENT

The study area has been classified into different zones on the basis of several criteria like bio-physical characteristic of the study area, the local community's perception on the sustainable development of the region, sensitivity of the region due to carbon emission industries, government decisions related to the development of the city heritage etc. The guidelines for the development of the classified zones have been formulated based on the

conservation and protection principles and approaches, findings of the study, other relevant replicable examples etc.

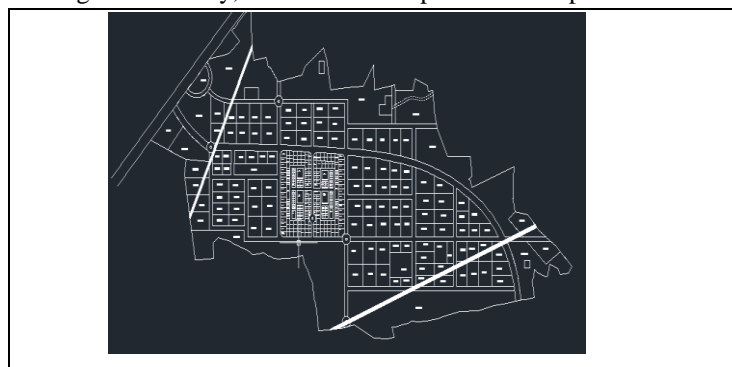


Fig: Developed plan

A. For small-scale developments

Environmental Factors: Scale, design, materials, landscaping, off-setting benefits (e.g. the new wildlife habitat to benefit or not), location, technologies and resource consumption (is the scheme designed to minimize water, energy, waste, sewage, effluent, noise, light, low impact technologies?), green practices-biodegradable products; does it seek to minimize the use of private transport?

Social Factors: Relationship with the community, whether a scheme supports the local people; impact on cultural traditions – will the scheme support or undermine cultural traditions that identify the community's social space, circulation patterns; diversity – will the development activity support a diverse social community.

Economic Factors: Resource users – does the project support sustainable resource use in the area; employment – will the project employ local people and use local skills; produce – will the project make a demand of local goods and products; Servicing – will the scheme make reasonable demands on public services.

B. For large-scale developments:

Environmental Assessment: Monitoring operations and safeguards over pollution – where there should be an effective monitoring and compliance system. Credible plans and secured funding for restoration and after-use treatment to remove the threat of pollution and or polluted water. Determine alternative ways of meeting needs. Different type of schemes (e.g., energy conservation can be an alternative to new generating capacity; assess the different location or route outside the area if so argue for this alternative.

C. Road side greenery & social forestry (green belt)

Supa IA has large network of roads. Road side is to be designed for its road side greenery. There is only way to absorb the carbon and reduce global warming and other pollutants and also controlling the surrounding area temperature. Especially in industrial location a great emphasize is made to grow trees and plants to keep the environment clean and neat and present a pleasant

appearance. To fulfil these requirement, it is proposed to plant avenue Trees with Tree guards. Supa IA has 2 types of road as per their road widths so this road has their cross sections in which services are provides such as carriage way, footpath, drainage gutters, electricity poles, lamps etc. after completing this services much are is still remain empty in this area of road sides is designed a simply way. In start Supa IA has in 1st stage plots are plotted and zoned areas no community now. So whenever plots and other zones are allotted to the owner. Then this area is made artificial green areas having commercial wood plants like saagwan& other not natural because it is hard to maintain and site cleaning purpose. The supa IA ha a green belt of 15 m wide around the community area boundaries. This all provisions of greenery and green zones has purposes are as follows

- Trees absorb pollutants moderate the impact of human activities by for example absorbing pollutants releasing oxygen.
- The contribute to the maintenance of a healthy urban environment by proving clean air, water and soil.
- Green vegetation has been shown to lower wall surface temperature by 17°c which lead to a reduced air conditioning load by an average 50%.
- The improve the urban micro climate and maintain the balance of the industrial natural urban environment.
- They preserve the local natural and cultural heritage by proving habitats for a diversity wild life conserve a diversity of urban resources.

Physical Benefit:

1. Urban forests act as temperature buffers providing shade in the summer, and wind breaks in the winter in addition to reducing noise pollution and CO2 levels, and providing a habitat for wildlife.
2. Urban greening offers improvements in air, water, and land resources by absorbing air pollutants, increasing water catchment in floodplain surfaces, and stabilizing soils.

Social Benefits

1. Green spaces provide a refreshing contrast to the harsh shape, colour, and texture of buildings, and stimulate the senses with their simple colour, sound and smell.
2. Particular types of green space may offer a bigger diversity of land uses and opportunities for a wide range of activities, help to foster active lifestyles, and can be of real benefit to health.
3. Well-managed and maintained green spaces contribute to social interaction by creating opportunities for people of all ages to interact.
4. Urban green spaces emphasize the diversity of urban areas by reflecting the different communities they serve and meeting their varying needs.

5. They enhance cultural life by providing venues for local festivals, civic celebrations and theatrical performances Urban green spaces provide safe play space for children, contribute to children's' physical, mental and social development and play an important role in the basic education of schoolchildren with regard to the environment and nature.

Planning Perspective

1. From the planning perspective, a hierarchy and network of quality green spaces integrating residential areas with commercial and other uses improve the accessibility and attractiveness of local facilities and employment centres.
2. Well-designed networks of green spaces help encourage people to travel safely by foot or by bicycle for recreation.
3. Furthermore, well-designed urban green spaces provide a barrier to noise and can effectively function as visual barriers

Green Belt (Buffer):

In Supa IA a green belt of 15m around the community and outer periphery of the area is provided. This Green Belts Include green girdle, park belt, rural belt, rural zone, agriculture belt, country belt and agriculture green belt. Agriculture belt, rural and country belt are synonymous terms and they refer to a stretch of the counter side around and between towns separating one from the other. These areas are predominantly farm lands and they support agriculture and related functions. They may or may not be in ownership of the town/city/local body. Green girdle, rural zone and park belt represent a similar idea, concept and function as the green belt. A green belt is defined as an area of land predominantly agricultural in character and located around the proposed urbanisable limits of the urban centre (town/city/) and legally established in order to:

- Check the further growth of built up areas;
- Preserve neighbouring towns from merging into one another; or
- Preserve a special character of area.

Green Strip:

A green strip is developed on a vacant land for example land under high tension power supply lines. It is also developed along the arterial roads separating residential areas from other uses.

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