

Factors affecting plant location



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Plant Location. Facility location is basically a right location for manufacturing, having sufficient access to suppliers, workers, transportation, etc. Facility location is a business decision critical for the any firm. There are several factors which affect the decision regarding facility location which includes competition, cost and other related effects. It is considered to be a scientific method.

Considering globalization phenomenon prevalent in today's environment the factors like cost, infrastructure, labor skills, government policies and environment are placed important. The advantage of right location ensures absolute access to customers, human resource, transportation, etc. it also guarantees success to the organization in this global competitive environment.

Benefits in Location

You get a thorough knowledge of all the factors involved in the production, and ways through which the materials that are needed in the production can easily be accessed.

When you do a proper location analysis for your facility you will also come across alternate substitute materials that are readily available and will cost less.

You can save a lot on transportation cost for materials, labor, import and export.

The materials will be available at a comparatively low cost.

The best way to get a task done is by finding out ways through which the task can be done. Location analysis helps you in those aspects.

Allows to you differentiate between practical positions to place your facility. Like for example, you cannot build a hazardous facility in a residential area.

Gives you access to cheap labor, and needed raw materials like water electricity and many more.

Helps in a smooth running of an organization, by seeing to that all that is possibly needed is readily and easily available.

Also has very easy access to production, distribution and sale of the products.

Allows you to outperform your competitor's facilities

Once the optimal plant location is decided it becomes easy to overcome any hindrances which the firm might face in future ensuring smooth working of organization. It helps in planning and future decision making.

Features of a good plant

The first feature of a good plant layout is to have such a plant which has lower material handling cost.

The storage facility for the material used in production should be in close proximity of factory to reduce time and money.

A location facilitating the function of supervisor to coordinate various activities effectively.

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Scope for any kind of adjustment and extension can be easily implemented.

Factors Affecting Plant Location Decision

The pattern of layout varies from industry to industry, location to location, and plant to plant. Different types of layout are used, and selection of a particular type of a plant is influenced by the relationship among materials, machinery and men. Other factors- such as the type of product, the type of industry and management policies- also influence the layout. Some factors which affect the layout are as follows:

Materials- By material we mean providing storage facility and movement of materials through production facility in an efficient manner for manual or mechanical operations or even chemical processing. The type and size of storage, as also the type of materials equipment cranes, trolleys and pipelines depend upon:

The type of raw materials used i. e., whether raw material is solid or liquid, light or heavy, small or large; and

The availability or scarcity of materials even when this is affected by seasonal variations and market conditions.

In certain concerns which use heavy raw materials, as in the manufacture of road rollers, heavy overhead cranes are required.

Usually raw material is considered to visualize the paths of materials flow or movements, and then to eliminate cross-covers, long distances and back tracking. The best path is determined, around which the layout is planned.

Product - A layout is designed with an objective to produce a good or finished product. The product can be heavy or light, big or small, liquid or solid and also its position in regard of the location influences the layout. If we consider the case of locomotives and in ship-building, the product is stationary; but machinery and men are moved to the product. Again, the layout requirements for assembly a watch are different from those for the assembly of an airplane.

The sales/demand for a product determines the volume of production and therefore the quality and size of the equipment, the area of the storage space, and other facilities which, in turn, determine the type of layout.

Worker - The layout designer should also consider the type, position and requirement of employees. The position of employees, that is, whether they remain stationary or moving, also influences the layout.

Employee facilities, such as health and related services, feeding and related services, locker rooms and lavatories influence the layout significantly.

Employee safety, too should receive due consideration.

Machinery - The type of product, the volume of its production and the type of process and management policy determines the size and type of machinery to be installed which, in turn, influences the plant layout.

Production is the combination and manipulation of men, materials and machines. It is essential to determine which of these elements are used depends on their relative costs and on the production process selected. It is essential to determine which of the elements would be stationary and which

would be in mobile during the process of production. The alternatives which help in determining what factor to move are as follows:

To move the workers and the product from work station to work station;

To move the product from one work station to another, keeping machines and workers stationary; or

To move the worker and the machine to the product, this is held at the location. The layout or arrangement of machine should be planned to suit the alternative used in plant.

Type of Industry- the type of industry and the method of manufacturing process exercises a significant influence on plant layout.

Industries can be:

Synthetic

Analytical

Conditioning

Extractive

Extractive industries involve the separation of one element from another, as in the case of metal from the ore. A conditioning industry involves a change in form or physical properties. Metal working industries, foundries, and leather tanning concerns condition their raw materials to have the end products. An oil refinery, for example, yields naphtha, gasoline, paraffin, tar

and kerosene. A synthetic industry, also called the assembling industry, involves the production of the product by the use of various elements.

Each type of an industry is classified further into intermittent industries and continuous industries. This classification is based on method of manufacturing. The former type of industries manufactures different components on different machines and assembles them to get end-products. Continuous industries uninterruptedly produce one or two products of a standardized nature. It is needless to emphasize that the layout designer should keep in mind the type of industry and the method of the manufacturing process while planning a layout.

Comparative Analysis of three firms

For this research I have considered three companies as follows and their plant location along with sales and marketing showrooms are discussed as follows:

Maruti Suzuki

Tata Motors

Kohinoor Foods Ltd

Maruti Suzuki- Maruti Suzuki India Limited which is commonly known as Maruti and formerly as Maruti Udyog Limited. It is an automobile manufacturer in India. Being a subsidiary of Japanese automobile and motorcycle manufacturing unit Suzuki forms a major part of Indian market share of automobile industry. In November 2012[update], it captured a

market share of 37% as a leading producer of Indian passenger car market. Maruti Suzuki manufactures a large range of cars starting from 800, Esteem and Alto, to hatchback Ritz, A-Star, Swift, Wagon R, Zen and sedans DZire, Kizashi and SX4, in the 'C' segment Eco, Omni, Multi Purpose vehicle Suzuki Ertiga and Sports Utility vehicle Grand Vitara. The company's headquarters are on Nelson Mandela Road, New Delhi. In February 2012 the company recorded sales of ten million in India.

Manufacturing facilities

The manufacturing facility of Maruti Suzuki in India is two. Both facility in total have production capacity upto 14, 50, 000 vehicles in a year. In a recent meeting consisting of Gujarat chief minister and Suzuki Motor Corp chairman & CEO Osamu Suzuki, the Chairman said that the work on car manufacturing plant at Mandal near Ahmedabad will start soon. Maruti Suzuki will set up second plant in Gujarat acquiring 600 acres of land.

Gurgaon manufacturing facility

One manufacturing facility is in Gurgaon which has three fully integrated manufacturing plants covering area over 300 acres (1.2 km²). These three plants have a capacity of 350, 000 vehicles annually but with improvements in productivity it has increased manufacturing upto 900, 000 vehicles annually. The Gurgaon facilities also manufacture 240, 000 K-Series engines annually. The entire facility is equipped with more than 150 robots, out of which 71 have been developed in-house. The Gurgaon Facilities manufactures the 800, Alto, WagonR, Estilo, Omni, Gypsy, Ertiga and Eco.

Manesar manufacturing facility

The Manesar manufacturing plant was established in February 2007 and covered a wide region consisting of over 600 acres (2.4 km²). Initially the production capacity was 100,000 vehicles per year but later production capacity was increased to 300,000 vehicles annually in 2008. The production capacity was further increased by 250,000 vehicles taking total production capacity to 550,000 vehicles annually. The Manesar Plant produces the A-Star, Swift, Swift DZire, SX4 and Ritz.

On 25 June 2012, Haryana State Industries and Infrastructure Development Corporation demanded Maruti Suzuki to pay an additional Rs 235 crore for enhanced land acquisition for its Haryana plant expansion. The agency reminded Maruti that failure to pay the amount would lead to further proceedings and vacating the enhanced land acquisition. Here clearly government intervention is visible which does affect the working of any organization.

Sales and service network

As of 31 March 2011 Maruti Suzuki has 933 dealerships across 666 towns and cities in all states and union territories of India. It has 2,946 service stations (inclusive of dealer workshops and Maruti Authorised Service Stations) in 1,395 towns and cities throughout India. It has 30 Express Service Stations on 30 National Highways across 1,314 cities in India. What can be seen is that the company manufactures the product i.e. any car model in any of the two manufacturing facilities and sells it across the country. Here the plant location is different from its marketing area. The automobile companies like Maruti have a large number of showrooms across India for selling purposes.

All these information regarding model, price and their showroom location is available on their website.

Service is a major revenue generator of the company. Most of the service stations are managed on franchise basis, where Maruti Suzuki trains the local staff. Other automobile companies have not been able to match this benchmark set by Maruti Suzuki. The Express Service stations help many stranded vehicles on the highways by sending across their repair man to the vehicle.

(2) Tata Motors (Tata Nano)

The second company I have considered for the assignment is Tata motors and particularly the Tata Nano car which faced a lot of controversy for its plant location. Earlier the plant was supposed to be in Kharagpur in West Bengal.

First time the top level management of Tata motors thought to locate their plant in Kharagpur which are located in west Bengal. But when the chairman of Tata motors Mr. Ratan Tata has calculated all the logistics costs it was not preferable along with ancillary units. After that they have selected more four - five places like Howrah and Hugli. But further according to Mr. Tata it was not preferable. That time Mr. Tata was thinking that the plant should be located to near Kolkata city, near any railway station and national highway. So after the consultation he came to conclusion to set up their plant in Singur, West Bengal. Which was only 40 km of Kolkata, 35 km of Howrah station and a little far from national highway. But for set up their factory Mr. Ratan Tata needed approximately 1000 acres land. The plant was moved to <https://assignbuster.com/factors-affecting-plant-location/>

Gujarat after the controversy in Singur. The Gujarat plant came under severe criticism from sections of society, due to a large amount of soft-loan offered by the Gujarat government. The Gujarat government offered a loan of Rs. 9570 Crores, with a meager interest rate of 0.1% and with the loan to be paid back in 20 years. The government also promised to build a four-lane road and give exemption on electricity duty, registration and transfer charges of land. The government also promised to put up a waste disposal plant, supply natural gas through a pipeline and provide 100 acres near Ahmedabad for a township.

The opposition parties alleged mass corruption in the project. The opposition is also claiming that the project is actually heavily subsidized by the people to the tune of Rs. 60,000 per car, which is more than half of the initial offer price of the car.

Government influences: Both positive and negative incentives to motivate an entrepreneur to choose a particular location are made available. Positive includes cheap overhead facilities like electricity, banking transport, tax relief, subsidies and liberalization. Negative incentives are in form of restrictions for setting up industries in urban areas for reasons of pollution control and decentralization of industries.

Kohinoor Foods Ltd

Kohinoor Foods Ltd's rice factory is located at Murthal in Haryana. It is one of the largest mills in the country with maximum milling capacity of 50 metric tonnes per hour. Also the plant is ISO 9001: 2000, HACCP and BRC certified with EUFSA and USFDA compliant. The factory is fully automated starting

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from the entire chain of processing till its final packaging. It is considered to use world's best technologies and equipment for churning out rice grains that are impeccable.

The manufacturing facility has a strong scientific procurement system. The company entered into contract farming to ensure balanced agri produce and ensure control on the value chain of basmati. The company has hired a special technical team of procurement personnel that takes care of the produce. The entire chain is documented to the minutest detail ensuring 100% traceability as per international norms.

Considering about the company the location was decided on following grounds:

The company required a large area of about 36 acres along with a huge storage space to keep the stock safe and fresh until sold. The company was able to rank itself as a largest storage capacity owner with storage space of about 20000 metric ton of rice and 50, 000 metric ton of paddy. The factory has a production capacity of 1000 metric ton per day. It had a requirement of at least 5 milling lines. Also huge and advanced machinery was a requisite and its placement was important factor which had an impact on decision relating to plant location. The machine included mechanical dryer with paddy drying capacity of 1000 metric ton per day, a semi automated packing plant with imported metal detectors and check weighed system with a self sufficient power generator to ensure smooth production. The major advantages available to Kohinoor Foods Ltd to locate their plant in Manesar are as follows:

Natural or climatic conditions. The climatic conditions in Manesar are favorable for the growth of rice as rice requires a large amount of water which is not a much of problem in that particular location. Also in case of not favorable climate the advanced structure and technology ensures the adequate temperature.

Transport costs-in obtaining raw material and also distribution or marketing finished products to the ultimate users.

Access to market: small businesses in retail or wholesale or services should be located within the vicinity of densely populated areas.

Availability of Infrastructural facilities such as developed industrial sheds or sites, link roads, nearness to railway stations, airports or sea ports, availability of electricity, water, public utilities, civil amenities and means of communication are important, especially for small scale businesses. Haryana is a well developed area with good transport facility making it a desirable location.

Availability of skilled and non-skilled labor and technically qualified and trained managers. The availability of good manpower makes it a suitable location.

Banking and financial institutions are located nearby. Among the various infrastructure facility is banking facility making smooth financial transactions with suppliers and customers.

One study of location considerations from small-scale units revealed that the native place or homelands of the entrepreneur was the most important

factor. Heavy preference to homeland suggests that small-scale enterprise is not freely mobile. Low preference for Government incentives suggests that concessions and incentives cannot compensate for poor infrastructure.

Comparative analysis of three companies is as follows:

Parameters

Maruti Suzuki

Tata Motors (Tata Nano)

Kohinoor Foods Ltd (Basmati Rice)

Location

Gurgaon and Manesar

Singur, Gujarat

Murthal, Haryana

Government approval

Important and vital, faced some controversies

Area

Climate conditions

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—

Skilled and unskilled Labor

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Transportation

—

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(close proximity to suppliers of raw material)

Market access

(showrooms all over India)

(showrooms all over India)

(access to nearby retailers and wholesalers)

Growth of Region

(Gurgaon is an emerging region and potentially customers with high standard of living)

(Gujarat contributes a lot in GDP and is a flourishing market)

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(Rice has demand all over India)

The table above states the factors affecting the decision of a firm relating to its plant location. Comparing the three firms some factors affects the decision of all three firms and some affects only one amongst them.