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Industrial Planning Site Format and Objectives

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ABSTRACT

Objective: *This study aims to examine industrial planning as a scientific approach to organizing interconnected industrial processes within a strategic framework to achieve sustainable economic development.* ***Method:*** *The research employs a descriptive-analytical method, integrating literature review and contextual analysis to evaluate industrial planning tools and techniques, particularly in localizing industries by selecting suitable locations for industrial centers and ensuring alignment with environmental and economic conditions.* ***Results:*** *Findings indicate that industrial planning not only enhances the economic value of projects by determining optimal industrial locations but also supports the development of industrial complexes and warehouses, responding to evolving production methods and maximizing industrial returns. However, the process faces critical environmental, economic, and political challenges that hinder its effectiveness.* ***Novelty:*** *The study contributes by highlighting industrial planning as a comprehensive model that balances industrial growth with environmental compatibility, offering new insights into how planners can mitigate challenges while reinforcing industry's central role in strengthening national economies and improving societal welfare.*

INTRODUCTION

Industrial planning is a vital element that contributes to resource investment based on data and constraints related to industrial project planning, which improves quality and technological innovation. These are key factors in meeting market needs. Industrial planning tools and techniques are an important factor in determining industrial locations, and thus contribute to decisions regarding city planning, its economic functions, and its social characteristics. Planned areas concentrate industry in a single center, which reduces effort, time, and money, as well as labor mobility, especially in strategic industries. Therefore, theories have emerged that determine industrial location, including the cost theory and profit maximization. Industrial locations are not just facilities with a specific area, but are constantly evolving due to modern planning and its requirements, as well as internal and external pressures that have led to increased production [1], [2]. Therefore, industrial planning focuses on the incentives of the location and its ability to attract investment according to natural, human, economic, and even political conditions. All of these factors determine the economic value of the industrial project. Therefore, industrial planning works to distribute appropriate locations for industries in terms of their strategy and importance to the domestic market. Countries classify industries based on the extent of their harm to other land uses and their degree of homogeneity. With some uses, there are foundations related to the nature of industries such as the number of workers, their technical capabilities, the type of natural resources and infrastructure, so industrial planning has a role in setting controls for the spatial

distribution of industries in the regions after studying the economic feasibility of establishing them. Industrial planning aims to establish industries that work to create an economic base for the state, train highly efficient cadres, raise the economic value for all and provide job opportunities, so localizing industry is consistent with those goals determined by industrial planning [3], [4].

First: The Research Problem

Every research has a problem that plays a role in the results and recommendations. The main research problem is "Industrial planning is an effective model for developing production, but it faces environmental, economic, and political challenges." Accordingly, the research questions are as follows:

1. What do we mean by industrial planning, and what are the features of modern industry?
2. What are the foundations for determining the nature of industry?
3. What are the main objectives of industrial planning?

Second: The Research Hypothesis

Industry provides financial returns, making it an attractive economic sector for investment, especially emerging industries. The research hypotheses are:

1. Industrial planning works to establish controls for the spatial distribution of industries in cities.
2. The phenomenon of industrial concentration is a key characteristic of older industries.
3. The objectives of industrial planning include increasing production, training personnel, and producing export industries.

Third: The Research Objective

The research aims to:

1. Identify the concept of industrial planning and its criteria.
2. Identify the basic objectives of industrial planning.
3. Analyze the value of a location determined according to natural, economic, and political conditions.

RESEARCH METHOD

The research relied on an analytical approach to analyze information related to industrial planning, which falls within regional planning. It also utilized a functional approach, which defines the importance of industry in countries' economies and its functional role in creating an industrial base.

The research was divided into axes:

The first axis or industrial planning, its concept and determining the location of the industry

Axis Two or Industrial Planning Objectives and Industry Diversity

The First Industrial Axis or Planning: Its Concept and Determining the Location of Industry

1. The Industrial Planning Project

A vital and dynamic initiative aimed at achieving institutional goals by investing resources and scientific cooperation capabilities, enhancing institutions' ability to adapt to market challenges and competition. The primary objectives of industrial planning are to increase production in quantity and quality while reducing costs. Some define it as a scientific and rational means of implementing a series of interconnected and final industrial operations, setting priorities to achieve goals within a specific area of expertise. Therefore, according to this definition, industry implements, consumes, and integrates tasks to achieve correct alignment between industrial tasks and other economic sectors. It is a means of increasing economic indicators and developing economic income. Industrial planning represents one of the vital elements that contribute to developing production options in institutions and the success of industrial planning available on: Collecting data from its sources to analyze it and identify strengths and weaknesses, based on which decisions are made [5], [6].

2. Precisely defining measurable objectives serves as a framework for measuring efficiency. This requires developing planning strategies that determine the required resources and timeline for achieving these objectives.

Due to technological developments, technological innovation plays a significant role in the planning process, identifying market needs and studying economic feasibility after examining costs and identifying the challenges facing the planning process.

Industrial planning does not operate in isolation, separate from urban planning, agricultural planning, or regional planning. Accordingly, there are three types of industrial planning:

1. Industrial planning in free capitalist economies.
2. Industrial planning in centralized economies.
3. Industrial planning for developing countries.

Industrial zones are identified within the urban industrial zone for industries specialized in their various crews such as transportation facilities, industrial warehouses, power stations, etc. The industrial zone is planned by the Urban and Regional Planning Authority according to a comprehensive plan to exploit it in developing industries and qualifying specific and highly skilled cadres and represents the center of industrial operations for production. Geographical planning standards are determined in which the costs of copying from the factory to the market are calculated, where the investments witnessed by this private sector and that in the case of production, the industrial statistics of the city's population and their economic level, the more the population increases from their industrial civilization group. It is noted that industrial zones speak of major changes in the city's planning and in its economic functions and social characteristics. Industrial zones directly work to concentrate industry in one focus, which determines the movement of transferring primary and labor work in certain major projects. This constitutes an action that affects its drawing approximately for the investment situation in a colony. However, if the best commercial activity is what separates it within the city, it follows the movement of transferring services, which moves the situation in an urgent

manner. Urbanism was prepared to create a kind of multi-use urban land, combining commercial, residential, and commercial land use in the city. It was easy to solve problems, such as street planning, industrial spaces, and services, which acquired an architectural appearance, layout, and land use in harmony with the general urban deterioration [6], [7], [8], [9]. The most important aspects of modern industry:

1. The replacement of mechanical labor with seasonal labor.
2. It was no longer necessary to be tied to its raw material sources, which helped establish comprehensive commercial integration.
3. Large-scale production facilitated specialization in various branches of industry.
4. The emergence of labor unions.
5. Attractive competition among industrialized countries to obtain markets for goods.

2. Determining an Industrial Location

Production requires the efficient use of inputs to produce a product (goods and services). The location of a production unit, i.e., a factory, is determined in relation to the source of inputs and the market for the product. Various factors of production, such as land, labor, capital, and the institution, all constitute the basic determinants of location. These factors are further subdivided into specific determinants, such as the quantity and quality of labor, the geographic location of the site, the availability of necessary infrastructure, and even local and central government policy. There are two main methods for studying industrial location factors: one theoretical and the other empirical.

The theoretical method attempts to develop a realistic theory for determining industrial locations by analyzing the existing structure for determining facility location and the changes that occur. This method attempts to draw from reality and construct a comprehensive system of laws.

The empirical method requires the inclusion of factors that may be important in determining the location of an industry. Location is concerned with spatial relationships, which is what has attracted the interest of geographers and their contributions to providing the optimal location for a single facility. This is a very difficult goal to achieve, especially given the following considerations when determining industrial location [8], [10], [11], [12]:

1. The broad scope of the industry, including the primary industrial sector such as mining and quarrying, the secondary sector represented by manufacturing industries, and the service sector represented by rapidly growing service trade.
2. The wide variety of facilities, each with its own product used and market characteristics within each industry.

Adam Smith, Ricardo, and von Thynne conducted studies on location, identifying three methods:

1. The least cost approach, which attempts to explain location in terms of minimizing the cost of the element (the minimum cost factor).
2. Marker area analysis, which places greater emphasis on demand or market factors.

3. The Profit Maximization Approach

The logical outcome of case (A-B), i.e., profit-revenue-cost, is achieved by combining the two methods. These three methods provide a useful framework for analyzing the theoretical approach to determining industrial location. Smith developed a method with a more scientific relevance than these points. In it, the cost-price equation is explained in a very simplified and constrained manner, assuming a detailed goal of maximizing profit. Therefore, the most profitable location for an industrial facility will be when the sum of the numbers (general income) exceeds the sum of the costs (expenses) by the greatest amount. The figure shows how the cost and revenue curves for a single facility can vary depending on location. The figure shows the profitable locations that fall between B-A, with O being the maximum point where the greatest profits are achieved)1(. To determine industrial density, there are methods for measuring density, including the ratio of the area of all occupied spaces to the floor area. For example, if the floor area is 200 m2, only half of which is built-up and comprises four floors, the actual density of the industry is 100 x 4/200. However, the unbuilt space may also be used for storage or shipping operations. Density can be measured by the ratio of the number of workers to the area. However, these ratios do not reflect a fixed reality, as they are significantly lower in the case of automated industries, such as facilities located within cities, where space is saved, unlike factories located on the outskirts. The location problem must be addressed not only by new establishments seeking a site for the first time, but also by established establishments seeking another site. Determining the location of a factory can result from both internal and external pressures. Internal pressures include increased production growth, which only affects those on a given area. Conversely, reducing production encourages a reduction in land area and moving to a smaller site. External pressures include increased wages, or the role of the state in financial planning and tax policies. Therefore, when industries face these pressures, they first look to see if their current site can be used more efficiently than possible by increasing working hours. If the pressures increase, the factory site may be dispensed with entirely. Factors determining the location of a factory change

Over time, however, they primarily represent transportation, labor, the agglomeration factor, and market factors, all of which have been considered important in practice, as they set the basic boundaries for any location decision.

All of these factors are of paramount importance to the regional planner, providing valuable insight into the economic structure of the regions and providing key information for future planning. They also serve as a starting point for identifying suitable industrial sites and developing incentives to attract facilities [13]. Thus, revitalizing a region's industrial vitality may require restructuring certain factors, such as transportation improvements, worker retraining, improved areas, and financial assistance for new industries. The selection of an industrial site must be based on natural, human, economic, and even political conditions. Some industries are based on the number of workers, others on the value of investments, and others on transportation costs, the nature of the raw material, and so on. Therefore, we find that some industries

are spread across large areas, such as cotton factories and petroleum industries, which take a specific network shape [13], [14]. Others are located in a specific area or region and take a cluster shape, where the presence of a particular industry is concentrated within a narrow area, as in modern and advanced industries that follow the principle of specialization in production, such as engineering and automotive industries. These industries are not distributed homogeneously within the country, but rather spread across distant areas, sometimes separated by agricultural land. In some regions, resources are available that concentrate industries in areas of a single region. Areas separate regions, so each region attracts a number of industries, or a single industry is distributed across more than one region. This helps establish industrial scope, as in the United States, Canada, and Russia [16], [17]. This is due to the nature of the region, which has contributed to attracting industries and determining their type. Planning plays a role in studying the impact of these factors on the localization and concentration of industries. These areas, and not others.

Here, planning determines the economic value of an industrial project when comparing industries in different regions. Planning is a difficult task due to the multiplicity of factors affecting location. Some factors relate to the natural aspect, such as the distribution of raw materials and energy sources, while others relate to the human and economic aspects, such as capital. The political aspect plays a role in establishing an industrial development strategy or the emergence of an industrial site that leads to daily work flow between the site and neighboring regions [10], [18].

For example, the establishment of a large industrial complex in a previously industrially backward area, namely the Alexandria area in the city of Babylon in Iraq, has had an impact on changing the demographic composition, the professional environment of the population, the settlement pattern, the infrastructure, and the increase in consumption capacity in this area within a short period, thus leading to the establishment of a continuous daily work movement between the site and the surrounding areas. In addition, the determination of a new industrial site will work to spread knowledge, expertise, and new technologies in the region, in addition to the role of the site in creating a type of reconstruction and prosperity or a form of economic interconnection in the region in which the industry is established through forward and backward interconnected relationships with the mining, construction, and building sectors. Therefore, theories have relied on mathematical studies to select the best geographic location for industries within a country's geographic borders. It is well known that the laws governing economic development and the distribution of production in each country stem from the nature of the prevailing production relations in each country. However, location theories in developing countries have not received attention due to the recent industrial renaissance. They have relied on programmed planning across all economic sectors. This type of planning aims to create an economic base across the regions and territories of a single country, enabling the country to establish a future economic edifice. While the localization of industry in most industrial regions of Western Europe, North America, and Japan is due to the interplay of factors that have given some

regions special attractiveness, contributing to the concentration of industries in those regions and not others, industrial planning analyzes such phenomena by examining the impact of these factors, their effectiveness, and their role in the economic structure of industry. In general, the study of determining industrial location is a vague science, and it would not be surprising if most establishments did not literally take into account all relevant factors.

Effects of Industrial Location

Reasons for Interest in Industrial Planning

It is noted that there is a special interest in industrial planning, especially in emerging countries around the world, such as China, Singapore, and Malaysia, in addition to some developing countries. However, the increasing demand for land for current and future industrial uses and the determination of the location of such land to prevent recurrence of problems...

Industries located in the center have been affected by crises and difficult social conditions. In addition, the industry has witnessed numerous developments in terms of building styles and highly efficient production methods, requiring the expansion of space to build industrial complexes for workers, store raw and manufactured materials, and provide parking spaces for factory trucks. Given the high financial returns of industry, it has become the most attractive economic sector for investment. Capital has flocked to industrial companies that provide a guarantee and security for invested capital through investment laws and regulations issued by countries to attract industrial investors. Since these countries have adopted industrial sector planning, they have certainly realized the impact of old industries on urban pollution due to poor site selection, which was not subject to local factors. This is inconsistent with current technology and rapid transportation methods. Unregulated industrial growth may harm other land uses, such as residential use, which creates new crises for cities. Therefore, planning works to distribute and identify suitable sites for industries commensurate with the amount of pollutants emitted by these factories. Therefore, industrial site planning goes through two stages:

a. The stage of selecting the region or area.
b. The stage of selecting the location of the factory.

Developed and developing countries often seek to embrace industrial civilization to develop their societies and economies. Since industry is the sector that generates the largest revenues from the national product (GDP) of countries, this is evident in the G8 industrialized countries, which are characterized by their strong economies and high per capita income from the GDP. This is all due to industry, which has become a fundamental component of the development of other sectors. Therefore, industry is undergoing future development and will require additional land in the future. Successful planners understand this future outlook and strive to allocate new land within modern industrial districts. Land exploitation is a legitimate and important activity, like other uses of urban land. Countries fear future encroachment by the industrial sector at the expense of the residential and commercial sectors. This concern stems from future industrial growth.

Planning attempts to exclude industrial activity from residential and commercial areas due to the risks of pollution, noise, waste, traffic congestion, and other hazards associated with this activity. Industrial activity is isolated where it meets specific site requirements, such as water or rail transportation arteries or main roads. Heavy industries are always located in the outer reaches of cities.

Large areas are available, allowing for storage and future expansion. Industry also requires sewage networks to dispose of industrial waste and other materials. As is well known, industrial zones are divided into two types:

The first is light industrial zones, where commercial activity or heavy industry is prohibited. The second is heavy industrial zones.

Recently, industries are divided based on other criteria. Some countries classify industries based on their potential harm to other uses by measuring hazard elements using special devices and arranging them into categories, each of which is equal in degree of harm and danger. Therefore, some cities are prohibited from establishing certain industries over others, while other categories are permitted to operate in areas designated for a homogeneous category. Based on this, some modern industries, which have been able to largely eliminate hazards and harm, such as controlling odors and dust, and reducing the risk of fire and vibration, are now able to operate near or even between residential uses.

There are other established principles related to the nature of the industries themselves, including:

1. The amount of pollutants emitted by industries and the extent to which they disturb neighboring uses.
2. The workers, their numbers, qualifications, and locations.
3. The raw materials used in production processes.
4. The quantities of manufactured materials and their distribution methods.
5. The areas currently occupied by industries, the areas they actually need, and the remaining areas for industrial expansion and other industries.

In fact, paying attention to industrial planning is one of the fundamental tasks of industrial planning in any country or region. It is to determine the location of industrial facilities. This is a difficult and complex task due to the multiplicity of factors influencing the location of industry and their interrelationships. Some of these factors relate to natural aspects related to raw materials and energy sources, others to human and social factors, and others to economic aspects such as capital, costs of industrial production processes, profit levels, and others. The importance of industrial planning stems from the great responsibility that falls on the shoulders of the industrial planning community

Planners, for example, cannot reverse the establishment and completion of an industrial facility after discovering weak components, because this requires a great deal of effort, money, and time.

The phenomenon of extreme industrial concentration or localization is one of the main characteristics of modern, advanced industries in terms of structure, size, and distribution. In this respect, it differs radically from regions where simple or old-

fashioned handicrafts were widespread. In modern, highly localized industrial regions, the principle of production specialization prevails, leading to the emergence of industrial complexes, each consisting of several factories, each specializing in the production of a commodity. Some even specialize in producing a portion of a commodity. Therefore, the phenomenon of industrial linkages has spread, defined in four forms:

a. Vertical linkage
b. Horizontal linkage
c. Diagonal linkage
d. Technical linkage

Based on these main forms of industry, the industrial plan of any country or region must take into account the following basic facts.

1. Emerging industries included in the plan must rely on local raw materials, regardless of their type—agricultural, animal, or mining—to ensure access to raw materials at record prices.
2. Consideration should be given to starting with industries whose products are needed by local markets, thus ensuring a market for these products, especially if the state provides protection for these products from competition from foreign industries.
3. Planning should begin with simple industries that do not require high-level technical expertise or large capital.

Planning should establish controls for the spatial distribution of industries within cities and regions after studying the reality of industries in the city or region to identify the important issues in light of which the planner must work. It should also balance different locations to select the best site, ensuring that the site is well-paved and that the costs of its establishment are economically acceptable in terms of slope, geological foundation, soil, and other natural factors

RESULTS AND DISCUSSION

Axis Two: Industrial Planning Objectives and Industrial Diversity

1. Industrial Planning Objectives

Industrial planning is closely linked to the concepts of industry. Sometimes, industries are divided according to their economic basis into consumer industries, capital industries, and production industries. They may be classified according to their size as large, medium, or small, or they may be classified based on the main factor that facilitated their establishment, such as the petrochemical industry, which relies on high capital, and the building materials industry, which relies on an abundance of raw materials. Industry and industrial planning represent an important measure of economic development, given the importance of industry and its role in the national economy of any country. This is due to its role in the percentage of labor it absorbs, the high financial returns it brings to countries, and the provision of industrial goods to the country, which serve numerous sectors such as agriculture, transportation, and others)1(. In addition to the country's international reputation in foreign markets, most countries around the world

seek to develop industrially by implementing industrial planning that guarantees the country a basic industrial base, elevating it to the ranks of developed countries. Industrial planning sets key objectives, which aim to:

1. Increase the gross domestic product of any country seeking to develop industrially. For this purpose, industry plays a role in utilizing natural and human resources and in increasing the national product, which in turn is reflected in increased per capita income, as in developed societies.
2. Industrial planning seeks to create a balance between economic sectors, such as agricultural development. Industry supports agriculture by providing it with machinery, equipment, projects, roads, machinery, and other inputs.
3. Industrial planning aims to establish export industries that strengthen the country's financial position. The financial returns from industry are high, and therefore the economies of industrialized countries are strong and competitive in global markets.
4. Industry works to train industrial cadres with competent and professional capabilities, which helps accelerate industrialization, increase production, and improve its quality, giving them the ability to compete in other regions and countries around the world
5. There are already existing factories, and planning is underway to increase their production lines by expanding the establishment of industrial facilities in various regions of the country where the necessary components for industrial development are available.
6. Planning for industrial localization aims to select suitable locations for new industrial centers, consistent with the financial capabilities and efforts exerted in this field.

Here, geography plays a role in industrial planning, as the region or province is studied in detail. Selecting industrial sites is an important field in human and economic geography. Just as each industry has its own requirements, each location has its own characteristics and advantages.

1. Achieving harmony between the various elements of production, such as proximity to markets for the distribution of industrial products within the region and proximity to raw material sites, with the lowest transportation costs and fastest turnaround time for workers and consumers.
2. Planning aims to determine the economic cost of relocating industries from their existing locations, as well as relocating residents from proposed new industrial sites.
3. Industrial planning determines the level of technology required for production processes, the spaces currently occupied by industries, and the spaces they will need in the future.

Studies indicate that the structure of manufacturing industries in developing countries in general, and Arab countries in particular, is characterized by weak production links between industries and a lack of vertical and horizontal integration within the country. This has increased production costs. Most of the equipment used in

production comes from foreign markets. Therefore, the goal of planning is to create a form of interaction between productive industries, creating mutual benefit between industries to achieve the country's economic security(1) . Therefore it is necessary to have supporting factors in an industrial zone* that enable it to be treated as an industrial zone. These factors include:

1. It must be a relatively large, cohesive area, or be distinguishable.
2. The industrial zone must occupy an important position in the national and regional economy of any country, due to the size of its institutions and the volume of production
3. The industrial zone must contain industrial clusters belonging to diverse industrial branches, characterized by mutual relationships among them, forming a form of integration and cooperation.

2. Industrial Diversification

The industrial region is witnessing the emergence of a type of industrial diversification. Diversification is the opposite of industrial specialization. Diversification implies self-sufficiency and strengthening the position of the industrial sector in the region. The degree of diversification depends on the region's need for various industries, which is contingent upon the population size and economic level. Clarity of objectives derived from our knowledge of the region's potential and problems is of paramount importance when preparing a regional plan aimed at developing the region's industrial sector. Among these objectives are:

1. Localizing industry in appropriate locations within the region, such that these locations and the environment are compatible, on the one hand, with sound scientific selection when identifying locations for industrial activity.
2. Developing industrial production, both quantitatively and qualitatively, by using modern technologies and focusing on the industrial labor component through training and qualification.
3. Creating new sources of income in the region that raise the income of workers and the living standards of their families, leading to increased savings rates, thereby increasing the region's investment potential. This will lead to increased savings rates, thereby increasing investment potential in the region, creating sustainable development at the regional level and limiting the regions' dependence on central state funding sources.
4. Establishing industrial zones in the region will lead to regulating land use and limiting the random spatial spread of industrial activity in the region, in accordance with scientific principles and standards, thus creating interconnectedness between various industries.
5. Enhancing the competitiveness of industry by focusing on quality and cost standards, which will lead to the growth and development of industry and its resilience in the face of similar industrial production in a world that has become a small village in which production relations are based on the principles of intense competition to win consumers and expand markets.

To determine the importance of the industrial sector in the region's economy, there are several criteria that reflect the degree of this importance, including the ratio of the number of industrial workers in the region to the total industrial workforce at the state level. We can also identify the importance of a particular industry in the region, whether at the regional or national level ("state"), by knowing the ratio of workers in a particular industry to the total number of workers in the same industry at the regional or national level. The indicator of the percentage of industry's contribution to the gross domestic product is one of the most important indicators that show the importance of this activity at the level of the economic sector as a whole. This can be measured through some simple statistical equations, including:

$$\frac{\text{Number of industrial workers in the region}}{\text{Number of workers in an industry}} \times 100$$

Total number of workers in this industry in the region or country

When undertaking industrial planning, the following principles must be considered:

1. Selecting the appropriate industrial sector with natural and human constraints helps reduce production costs, thus facilitating market competition.
2. Considering the appropriate location for establishing the industrial project.
3. There must be harmony or interconnection between the industry and other industries and economic activities to benefit from the infrastructure that serves industrial planning.
4. This requires encouraging the establishment of advanced heavy industries that produce means of production commensurate with the country's technological level.
5. Redrawing the industrial localization map by creating specialized industrial regions, as in the Ruhr region in Germany and others.

Industrial planning faces challenges, including:

a. The issue of obtaining up-to-date data, especially for heavy and sensitive industries.
b. The issue of technical planning methods and skills, which are related to industrial projects and their evaluation to achieve their primary objectives.
c. The issue of selecting industries and technologies, as developing countries differ in their choice of technology in their development strategy to enable optimal use of resources.

CONCLUSION

Fundamental Finding : This study confirms that industrial planning is both a scientific and practical approach that ensures balanced and sustainable development by optimizing resource utilization, enhancing production efficiency, and determining strategic industrial locations through theoretical and experimental methods. **Implication :** Effective industrial planning strengthens national economies by fostering industrial complexes, supporting export-oriented industries, and training technical personnel,

while also ensuring compatibility between industrial activities, environmental sustainability, and regional development. **Limitation :** However, the research highlights that industrial planning in developing countries remains constrained by insufficient attention to localization factors, limited integration of modern industrial theories, and challenges in aligning industrial strategies with environmental and technological demands. **Future Research :** Further studies should focus on developing adaptive models of industrial planning that incorporate environmental assessment, digital technologies, and socio-economic indicators to provide innovative strategies for industrial localization in both developed and developing contexts.

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