

# Analysis of Industrial Clusters Infrastructure and Recommendations

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## ABSTRACT

The aim of this paper is to present ANALYSIS OF INDUSTRIAL CLUSTERS INFRASTRUCTURE AND RECOMMENDATIONS in emerging markets, taking Ha noi case in Vietnam as an example. By using qualitative and synthesis methods, no matter what point of view, In recent years, the construction of industrial cluster infrastructure in Hanoi has made a lot of progress, but there are still many shortcomings. The planning must have the right perspective and vision on industrial cluster development and construction of industrial cluster infrastructure. Last but not least, Existing industrial clusters in the green belt area continue to exist but limit development, gradually converting to high, clean technology accordingly

**Keywords :** Industrial Clusters, Infrastructure, Recommendations, Solutions

## I. INTRODUCTION

Building industrial clusters infrastructure, including technical infrastructure and social infrastructure, plays a very important role in the formation and development of industrial clusters. In recent years, the construction of industrial cluster infrastructure in Hanoi has made a lot of progress, but there are still many shortcomings such as: The quality of industrial cluster development planning and infrastructure construction planning is still low;

Infrastructure is not guaranteed to be synchronous and modern; The capital mobilization mechanism for infrastructure construction is still unreasonable, leading to a serious lack of capital; Infrastructure for environmental treatment and protection is still weak and not taken seriously...

In that context, the author chose the problem: Infrastructure construction of industrial clusters in Hanoi as the topic of his doctoral thesis.

### 2. Research purpose of the thesis

- Systematize the main theoretical issues on industrial clusters and the construction of industrial

cluster infrastructure, in order to create a basis for studying the current situation and solutions for building infrastructure of industrial clusters in Hanoi;

- Describe and analyze the current situation, evaluate the advantages, achievements, limitations and shortcomings in building industrial cluster infrastructure in Hanoi, and the causes of those limitations and shortcomings;

- Propose some main measures to build industrial cluster infrastructure in Hanoi;

To accomplish the above purpose, the thesis will focus on clarifying some of the following main issues:

(1) Concept and role of CCN.

The difference between the world's popular conception and Vietnam's conception of industrial technology.

The path to forming CCNs

Types of industrial cluster, the role of industrial cluster in industrialization, modernization, competition, new rural development, regional and local development.

(2) Criteria reflect the situation of industrial cluster infrastructure construction

(3) Factors affecting the construction of industrial cluster infrastructure.

(4) Policies of the State of Vietnam impact the construction of industrial cluster infrastructure.

(5) Experience in developing industrial clusters and building industrial cluster infrastructure of some countries and some provinces of Vietnam, thereby providing experiences for developing industrial clusters and building industrial cluster infrastructure in Hanoi.

1. Methodology

By using description, qualitative analysis including synthesis and inductive methods. Combined with:

- Synthetic analysis method based on theoretical documents, practical reports, and legal documents related to the topic.

2. Previous studies

Mozaleva & Ivanova (2023) mentioned:

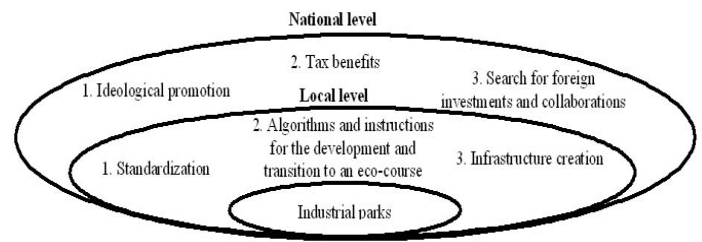


Fig 1 - Industrial park in level

Next, We analyze in below table :

Table 1- Previous studies

Authors	Year	Results, contents
Li Fang	2023	Against the backdrop of global industrial transfer, industrial parks undertake environmentally polluting industries and promote rapid development of regional economies. With the mature development of industrial parks and the restriction of resources and energy, green transformation of industrial parks has become particularly important. The results show that (1) the coordinated development of industry and the ecological environment in industrial parks must rely on active participation from relevant governance entities, including enterprises and the park itself. (2) The factors that influence enterprises and parks to jointly promote green development include capital investment, technological progress, and industrial structure adjustment. However, capital investment has the most significant impact on green development. Based on these

		findings, we propose that the government should increase green capital investment on the one hand. On the other hand, positive and effective measures should be taken to promote enterprises' green technology innovation and industrial structure adjustment and upgrading to achieve a win-win situation for both environmental protection and economic development.
Mozaleva & Ivanova	2023	a revised model of state support for industrial parks was developed within the framework of the concept of sustainable development, which can be implemented in Russia. The model consists of three stages of support, which are initiated at various levels of government, impacting both the federal and regional levels, as well as the actions of private investors. It is proposed to increase the use of indirect state support, creating favorable conditions for private investors. This approach is expected to result in more efficient investment utilization, enhanced competitiveness of enterprises, and a shift towards an environmentally-focused approach in industrial parks.
UNIDO	2021	An industrial park serves as a strategic government-developed instrument for implementing industrial policies, with the primary goal of attracting investments and fostering overall economic growth and development. They have several differences from clusters, industrial zones, and other types of production agglomerations in a specific territory.

(source: author synthesis)

## II. MAIN FINDINGS

### A. Classification of Industrial Clusters

Industrial clusters are quite rich and diverse and can be classified according to the following bases:

a- Based on nature, in the United States and some European countries, industrial technology is divided into 3 types:

(1) Technology clusters: These clusters tend to be high-tech, applying economic and technical knowledge well. Typically, Silicon Valley Industrial Complex (USA) has famous universities and research centers.

(2) Clusters based on long-standing know-how: These clusters are based on traditional activities, maintaining the advantage of long-standing know-how, spanning many years, they are often industry specific. For example CCN in London.

(3) Clusters based on relative advantage: These clusters are created because of some relative advantage they may have in being attached to a

geographical location. For example, wine production clusters such as some countries such as France, Italy, Chile or California (USA) have favorable conditions to grow good grape varieties.

B. Vietnamese dictionary defines "Infrastructure is the entire system of works such as roads, power lines, water supply, drainage, waste... in relation to built works and houses." built in that area. In my understanding, "infrastructure" is specialized works that serve production and social life, and "infrastructure" is also works, but built in a certain area where As we speak, the scope mentioned in "infrastructure" is narrower than "infrastructure".

Thus, it can be understood that infrastructure is a specific part of the technical facilities in the national economy with the basic function and task of ensuring the general conditions necessary for the process of economic development. The production and extended remanufacturing process takes place normally and continuously. Infrastructure is also defined as the totality of physical, technical, and architectural

facilities that serve as the foundation for socio-economic activities to take place normally.

The entire infrastructure/infrastructure can be divided into many different types based on different criteria. Detail:

- If based on the socio-economic field, infrastructure can be divided into: infrastructure serving the economy, infrastructure serving social activities and infrastructure serving social activities. security and defense service. However, in reality, there are few types of infrastructure that purely serve economic activities but do not serve social activities and vice versa.

- If based on the division of the national economy, infrastructure can be divided into: infrastructure in industry, agriculture, transportation, post and telecommunications, construction, financial activities, banking, healthcare, education, culture - society...

- If based on residential area and territory, infrastructure can be divided into: urban infrastructure: rural infrastructure; Marine economic infrastructure, infrastructure in the delta, midlands, mountainous areas, key development areas, big cities...

### C. Sonobe – Otsuka model (Japan)

Based on a series of studies on industrial clusters in many different fields such as textiles, motorbikes, household electrical appliances... in many countries around the world such as Japan, Taiwan, and China. Sonobe and Otsuka discovered that the development process of CCNs in different places has many similarities. On that basis, Sonobe and Otsuka developed an endogenous industrial development model. According to this model, industrial clusters develop through three stages: the "initiation" stage, the "quantitative expansion" stage, and the "quality upgrading" stage.

In the initial stages, some businesses haphazardly copied imported products. If these businesses are successful, their products and production processes will be copied (followed) by other businesses. Because copying from domestic businesses will be much easier

than copying imported products, there will be many businesses involved. When the number of businesses increases, it is also time for CCN to move into phase two. Next, due to the increase in the number of businesses and their supply capacity, the selling price of the product and the profit of the business will decrease. To prevent profits from falling, some businesses will be forced to continue to innovate, for example producing higher quality products. To produce higher quality products, businesses must use better quality input materials and improve production processes. At the same time, these businesses will also find ways for customers to more easily recognize their higher quality products by labeling their products, opening their own stores, or selling through exclusive agents. These comprehensive improvements are often carried out by the business at the same time, and when the business is successful, CCN will move to the third phase.

In this model, Sonobe and Otsuka emphasize the transition from stage two to stage three. CCN will automatically move to stage three when businesses are forced to make comprehensive improvements because profits decline due to competition from other new businesses entering and due to widespread product copying. However, businesses will not be able to make those improvements and CCN will not be able to move to phase three if in phase two CCN does not attract a diverse human resource including skilled workers, , engineers, entrepreneurs, and traders. This is the key factor determining the transformation and development of industrial clusters.

Sonobe and Otsuka's industrial development model based on industrial clusters may not reflect all of what has been happening in industrial clusters in Vietnam, but the core part of the model (the process of industrial cluster transitioning from the open phase expanding the quantity to the quality improvement stage) has important implications for policy making to promote the development of existing industrial clusters in Vietnam.

Hanoi City has developed a master plan for industrial

cluster development and detailed planning for industrial cluster infrastructure construction to 2020, with a vision to 2030. This is an important basis for industrial cluster development and implementation of industrial cluster infrastructure construction. However, the quality of the plans developed and approved is not high, showing: i) There is no close and organic connection between the industrial cluster development planning and the City's socio-economic development master plan. Towns and districts with land planning, rural industry development planning, and population planning; ii) The need for land use has not been fully forecast and calculated, so some industrial clusters that have just completed construction have asked for additional areas or to change the purpose of establishment and development of the industrial clusters; iii) The feasibility of some plans is still low; iv) The suspended planning still exists; v) The organization and methods of planning and management still have many shortcomings. Therefore, along with planning and supplementing planning, it is necessary to attach importance to improving the quality of industrial cluster development planning and detailed planning for industrial cluster infrastructure construction..

(Nguyen Dinh Trung, Dinh Tran Ngoc Huy et al, 2023)

### III. DISCUSSION AND CONCLUSION

If according to the definition of ISO 9000: 2000: "Quality is the degree to which a set of inherent characteristics meets requirements", then it can be understood that the quality of planning is the degree to which a set of characteristics of The planning meets the requirements of infrastructure construction and industrial cluster development in a sustainable and effective direction.

The quality of planning can be evaluated by the following main criteria:

□The planning must have the right perspective and vision on industrial cluster development and construction of industrial cluster infrastructure.

□Industrial complex development planning must be associated with the City's general goal: Industrial cluster development planning to ensure the implementation of the Capital's socio-economic development goals, contributing to determining industrial and service growth. services, transforming the capital's economic structure towards industrialization and modernization. Currently, the City's policies on the construction and development of industrial clusters are as follows:

- Industrial complexes located in inner-city districts and nuclear urban areas according to the capital region's planning gradually convert their functions to urban, service or change their nature to clean industry and high-tech industry.

- Existing industrial clusters in the green belt area continue to exist but limit development, gradually converting to high, clean technology accordingly.

- For new industrial clusters, development will be considered with a long-term vision in the direction of ensuring sustainable development; Prioritize clean industries that use high technology, cause little environmental pollution, have high added value, have large investment scale, and are highly efficient. For industrial clusters that do not have complete infrastructure, the City needs to expand land funds for those industrial clusters to complete their projects. For industrial clusters that do not meet the planning requirements, they will definitely not be allowed to expand. In addition, the City needs to have a policy to support investment in the construction of technical infrastructure of industrial clusters from the budget to reduce investment costs, allocate funds to build technical infrastructure outside the fence, and ensure safety. ensure security and attract businesses to invest.

- Relocate establishments and factories causing environmental pollution in the inner city to suburban areas.

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