

ASERS

Journal of Environmental Management and Tourism

Quarterly

Volume XIV

Issue 4(68)

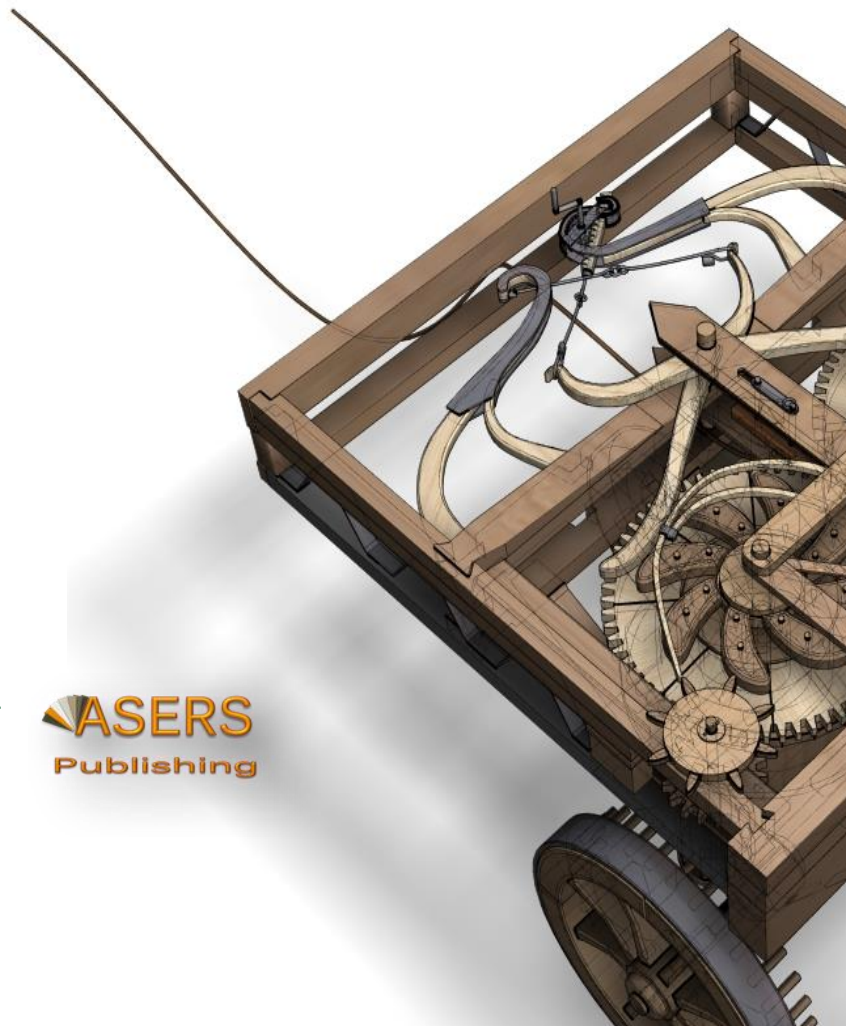
Summer 2023

ISSN 2068 – 7729

Journal DOI

<https://doi.org/10.14505/jemt>

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Journal of Environmental Management and Tourism is an interdisciplinary research journal, aimed to publish articles and original research papers that should contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences.

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DOI: [https://doi.org/10.14505/jemt.v14.4\(68\).06](https://doi.org/10.14505/jemt.v14.4(68).06)

Strategic Planning for Taiwanese Industrial Tourism Parks Themed on Local Characteristic Industries

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Suggested Citation:

Tai, H.I., Liu, L.-W., Yang, L.-S., Hsieh, C.-C. (2023). Strategic Planning for Taiwanese Industrial Tourism Parks Themed on Local Characteristic Industries. *Journal of Environmental Management and Tourism*, (Volume XIV, Summer), 4(68): 1942-1949. DOI:[10.14505/jemt.v14.4\(68\).06](https://doi.org/10.14505/jemt.v14.4(68).06)

Article's History:

Received 17th of February 2023; Received in revised form 7th of March 2023. Accepted 28th of April 2023; Published 30th of June 2023. Copyright © 2023 by ASERS® Publishing. All rights reserved.

Abstract:

This study examined Puli Industrial Micro-Park for a case study. In line with Nantou County's efforts to promote itself as a tourism capital, the park was designed as an industrial cluster that is themed on industrial tourism. This study explored the planning and operation of Puli Industrial Micro-Park and conducted in-depth interviews to understand its development history and implementation performance. Finally, it summarized the key factors that contributed to the successful development of industrial tourism parks with local characteristics, namely self-liquidating capability, land price, park development characteristics, comprehensive park planning, and park cooperation with nearby industries.

Keywords: industrial parks; local characteristic industries; industrial tourism.

JEL Classification: L60; L83; R11.

Introduction

In Taiwan, a current challenge for regional industrial land use is addressing the needs of regional industrial development, and factors such as locational requirements (e.g., traffic conditions and public amenities), technology and labor supply, industrial supply chain, land acquisition method, industry and firm type, and the requirements for a firm to be based in an industrial park have all disrupted the supply and demand of industrial land. If the characteristics of a park do not meet the expectations of firms, it results in idle land. By contrast, popular industrial parks are characterized by high land prices that are unaffordable for firms.

Factors such as industrial land-related locational restrictions, the harmful effects of land speculation on industrial production, and the pollutive effects of existing illegal factories all reflect the challenges of supplying industrial land in Taiwan. Therefore, the government has attempted to develop new types of industrial parks that

are suitable for diverse production in Taiwan; this can increase the flexibility of industrial park development and industry localization.

To help industries with local characteristics to acquire small land plots, Taiwan's Ministry of Economic Affairs established industrial micro-parks for the development of local characteristic industries and promulgated the Directions for Subsidizing Industrial Micro-Parks with Local Industrial Development Funds in 2011. Industrial micro-parks are parks that are smaller than 10 ha, specifically built for industries with local characteristics and low-pollution small- and medium-sized enterprises, and established in accordance with the Regional Plan Act, the Urban Planning Law, the Statute for Industrial Innovation, and other related regulations. This method represents a crucial opportunity for achieving the innovative development of Taiwanese industrial parks.

On the basis of the aforementioned explanation, this study examined Puli Industrial Micro-Park for a case study. In line with Nantou County's efforts to promote itself as a tourism capital, the park was designed as an industrial cluster that is themed on industrial tourism. Therefore, the planning of the park must account for the layout of tourism factories and the professional operation of individual buildings and spaces, and diverse and flexible models should be applied to allocate public amenities, leisure spaces, and recreational facilities that supplement the tourism factories.

The present study analyzed the external environment of Puli Industrial Micro-Park, its internal space planning, and the participation of industries; it also summarized the key factors that contributed to the successful development of industrial parks with local characteristic. In the present study, the institutional changes made to Taiwanese industrial parks are first introduced, after which the case study is presented and the conclusion and suggestions are provided.

1. Institutional Changes Made to Taiwanese Industrial Parks

Taiwan has allocated more than 48,000 ha of land for industrial use, that is, 1.35% of the total land area of Taiwan. The gross domestic product (GDP) generated by Taiwan's industrial land accounts for 31% of its total GDP. By 2036, Taiwan will require an additional 3,000 ha of industrial land, indicating that industrial land contributes greatly to the overall economic development of Taiwan and that its demand will continue to exceed its supply in the future (Ministry of Economic Affairs 2020). The system and policy for industrial park development have always been crucial. Past strategies have focused on increasing the amount of land developed, whereas current land development planners must also consider social needs and nearby environmental changes while implementing dynamic plans and adjustments. In the 1960s, the system for developing Taiwanese industrial parks focused on incentivizing investments and, subsequently, on facilitating industrial upgrading. Current regulations are based on the Statute for Industrial Innovation; the public sector guides the change of the system to respond to changes in industrial development-related trends and environments. The focus of policies pertaining to the various stages of the system is presented in Table 1.

The manufacturing industry of Taiwan is aiming to maintain its key, long-term position in the global industrial chain. However, the industry must overcome challenges pertaining to the global industrial division of labor and competition from the development of Industry 4.0. The government responded by proposing the Production 4.0 policy, which focused on increasing the technological competitiveness of domestic industries and improving the quality of production spaces. Local industrial parks can help enterprises to utilize land, attract industrial investment, and form an industrial cluster with deep global and local connections. They can also facilitate industrial innovation and the development of a sustainable environment, which are crucial for modern economies. The system for developing Taiwanese local industrial parks is affected by environmental changes, social pressure, and multiple challenges, and it has undergone multiple system changes and adjustments. However, industries still require and expect the optimization of system innovation and resilience, which are necessary for increasing industrial competitiveness and integrating local communities or even diverse social dynamics (Hsieh 2012). Given that sustainable development is a key global focus, the development of local industrial parks must address the United Nations' Sustainable Development Goals (SDGs), such as SDG 9 (*i.e.*, Industry, Innovation, and Infrastructure) and SDG 11 (*i.e.*, Sustainable Cities and Communities). SDG 9 includes the building of basic infrastructure that can prevent disasters, facilitate inclusive and sustainable industrialization, and promote innovation. The concept of industry, innovation, and infrastructure refers to the building of resilient basic infrastructure. SDG 11 refers to the building of inclusive, safe, adaptive, and sustainable cities; it requires the development of infrastructure to be balanced with the sustainability of the society, economy, and environment (Wu 2018; OECD 2022).

Table 1. Focus of system and policies for Taiwanese industrial parks at various stages

Time	Policy	Industrial development guidance	System supply	System demand
1960s~80s	Statute for Rewarding Investment	Factor-driven and labor intensive	The purpose of the policy was to enable the Ministry of Economic Affairs to strengthen Taiwan's economy. The measures included incentivizing investments and introducing tax preferences for specific industries.	This policy focuses on providing comprehensive tax preferences to incentivize investments and attract industries to base themselves in industrial parks and contribute to the creation of an agglomeration economy.
1990s~2010s	Statute for Facilitating Industrial Upgrading	Investment-driven and capital and technology intensive	The purpose of the policy was to enable the central authority responsible for the relevant enterprises to liberalize and internationalize the economy. The measures included introducing tax preferences to facilitate industrial upgrading, ensuring a stable supply of industrial land, and building comprehensive basic infrastructure in industrial parks.	This policy focuses on introducing incentives for meeting the needs of strategic industries and the public facilities in industrial parks and implementing the service functions of industrial parks.
2010s~20s	Statute for Industrial Innovation	Innovation-driven and knowledge and innovation intensive	The purpose of the policy was to enable the central and local governments to cooperate and optimize Taiwan's industrial structure for global soft power projection and to provide diverse policies for promoting industrial innovation.	This policy focuses on responding to needs pertaining to developing and managing various types of industrial parks while ensuring environmental sustainability and the intergenerational justice of social development.

Source: The data are compiled from several studies (Ministry of Economic Affairs 2020; Chin; Ko and Lai 2013)

On the basis of the aforementioned changes and trends pertaining to the system for developing industrial parks, the present study referenced several case studies to summarize the following seven points regarding system innovation (Ministry of Economic Affairs 2020; Hsieh 2012; Juang 2016; Hsiao 2019):

1. With the transition of smart manufacturing from centralized control to decentralized but stronger control, industrial development is characterized by small-scale development and diversification. Unnecessary restrictions on the development of traditional industrial parks should be loosened.

2. An innovative mechanism that employs complex functions, flexible land use plans, and even floating zones must be implemented.

3. The space planning of the production environment in industrial parks should focus on landscape greening and safety functions and disaster prevention functions; it also should focus on becoming an efficient production environment and creating a friendly, comfortable, and healthy interactive environment.

4. The land in industrial parks should be used per integrated plans that enable environmental and ecological protection coordination, the shared usage of regional resources, and the integration of complementary functions.

5. A joint management mechanism for public facilities in industrial parks should be promoted to maintain public facilities and ensure their quality.

6. The focus should be on establishing collaborations and exchanges relating to external resources; smooth interactions with nearby communities, commercial areas, and public spaces should be achieved.

7. After the establishment of industrial parks, rolling-wave reviews should be conducted to review the use of park land and the flexibility of the usage of building floor areas. The provision of updates regarding industrial parks and related rewards and incentives can guide the development of three-dimensional urban industrial parks.

2. Case Study

2.1 Research Method

The present study conducted a case study and in-depth interviews to analyze and understand the planning and operation of Puli Industrial Micro-Park. First, a macro perspective was adopted to investigate the industrial development in Nantou County and Puli Township; thereafter, in-depth interviews were conducted to understand the development history of the case and its implementation performance. This study interviewed the agencies responsible for planning and design for the park, several firms based in the park, and several firms that may base themselves in the park in the future. During the interviews, the content discussed included regulations, the external environment outside the park, and the planning and outcome pertaining to the park. The present study employed a semi-structured questionnaire that was developed on the basis of its research purpose, and raised questions during the interviews to clarify responses that warranted further investigation. Notes and audio recordings were taken during the interviews, and the collected data were then compiled and transcribed for further analysis. The study respondents were key stakeholders during the initial planning and development of the park. The present study employed purposive sampling and interviewed six respondents; their background data are provided in Table 2. The interviews were conducted between June 2022 and October 2022.

Table 2. Background data of respondents

Code	Category	Background
A	Public sector	Professional governmental consultant
B	Investor	Private business operator
C	Investor	Private business operator
D	Investor	Private business operator
E	Planning agency	Private planning agency
F	Development agency	Private development agency

2.2 Case Introduction

2.2.1 Background

Puli Industrial Micro-Park is located in Puli Township, Nantou County, Taiwan. Nantou County is located at the geographic center of Taiwan, and its mild climate, vibrant agriculture, and abundant natural resources have enabled it to establish a flourishing tourism and recreation industry. The manufacturing industry of Nantou County mainly comprises light-industry producers of agricultural products, forest products, and industrial products that use raw materials; numerous tourism factories are also based in Nantou County. These factories engage in production and manufacturing operations, but they are also open to tourists and regarded as famous tourist destinations in Taiwan. Puli Township is also known as the heart of Taiwan. Its special natural and cultural environments have led to the formation of unique local industries (e.g., Puli Shaoxing wine, butterfly handicrafts, natural lacquer, handmade paper, and an iron smelting street) and the development of crucial local cultural assets and special industrial and recreational resources. The recent opening of the National Freeway 6 has improved the transportation network of Puli, attracted tourists to visit the township, and attracted firms to invest and develop in Puli.

Nantou County and Puli Township's local food processing industry is one of their core industries, and the industry has integrated with their recreational agricultural industry, tourism industry, and cultural and creative industry to revitalize traditional manufacturing industries and increase their value. The local food processing industry is an industry that has a strong potential for development.

Puli Industrial Micro-Park occupies an area of approximately 5 ha, and it has the advantages of a suitable location and high accessibility in terms of transportation. It was initially planned as an affordable housing project, which was cancelled because of reduced demand. To improve land use and integrate resources within the county, the Nantou County Government followed the guidance of the central government and actively provided assistance to Nantou County's industries with local characteristics. Traditional factories were converted to tourism factories in accordance with the Statute for Industrial Innovation and its associated regulations. Puli Industrial Micro-Park was planned to facilitate the innovation of Nantou County's local industries, improve its industrial environment, and enhance its industrial competitiveness.

2.2.2 Planning Philosophy

2.2.2.1 Positioning

Puli Industrial Micro-Park was developed to promote industrial transformation and upgrading, and it was planned such that the local food processing industry and applied biotechnology industry were the main and supplementary industries, respectively. The firms based in the park received assistance that helped them to establish the operation model of a tourism factory; consequently, Taiwan's first industrial cluster themed on tourism factories was formed in Nantou County. Industrial tourism concepts and strategies and the servitization of manufacturing were implemented to enable manufacturing industries to provide tourism services and initiate their industrial transformation, thereby contributing to the development of the unique industrial history and culture of Puli Township and Nantou County. Factories and firms that were interested in implementing industrial transformation and upgrading were able to apply new ideas, transition from generating income through manufacturing to generating income through tourism, and meet the market demand for diverse tourism.

2.2.2.2 Types of Industries Discussed in Present Study

Two types of industries are discussed in the present study. The first type comprises the local food processing industry, applied biotechnology industry, and other related industries. The second type comprises supportive industries, such as the accommodation, catering, postal service, and creative and artistic performance industries. They can increase the benefit and value of industrial development in the park.

2.2.2.3 Land Use Plan

The land use plan of Puli Industrial Micro-Park is compliant with current regulations. In addition, to maintain low-density development in the park, a considerable amount of land in the park was set aside for pedestrian space and green landscape; this aspect of the plan demonstrates the park planners' emphasis on creating an ecological landscape and subverts the stereotypes of traditional industrial parks. The land use types of the park and their purposes are presented in Table 3.

Table 3. Land use types

Use zoning	Category of land use	Category of usage	Purpose	Area (m ²)	Percentage (%)
Industrial zone	Type D Construction land	Industrial land (1)	Land set aside for factories (for industrial production) or related industries	25,536.50	51.04
	Special purposes	Service center and sewage treatment facilities	Land set aside for multifunctional facilities for administration, management operations, industrial and commercial services, parking services, and sewage treatment services	408.90	0.82
		Industrial land (2)	Land set aside for supportive industries, such as the accommodation, catering, sport, and recreational service industries, which serve to support the industrial development and overall operation of the park	4,591.07	9.18
	Irrigation and drainage	Detention pond	Land set aside for engineering facilities (e.g., drainage, flood control, detention pond, silt detention basin, and green belts [ecological conservation] facilities)	4,785.57	9.56
	Protection and conservation	Green belt (1, 2)	Land set aside for green belts, ecological conservation, drainage facilities, water wells, and other water supply facilities	9,445.58	18.88

Use zoning	Category of land use	Category of usage	Purpose	Area (m ²)	Percentage (%)
	Transportation and communication	Road (1, 2)	Land set aside for roads in the park and pipelines for other public facilities	5,266.11	10.53
Total				50,033.73	100.00

2.2.3 Current Development of Puli Industrial Micro-Park and Expected Benefits

The planning and design of the park was completed in 2017, and its construction began in the same year. The park's service center and public facilities were completed in May 2019, and it officially commenced operations in September 2019. More than 40% of the land in the park were sold before the park was opened; however, the park's business underperformed because of the recent COVID-19 pandemic. As of October 2022, eight plots of industrial land (1) have been sold, and only one plot of industrial land (1) remains unsold. During the sales period, the price of the land plots was reduced by 10% because local businesses indicated that the original price was higher than the market price at that time point.

The firms currently based in the park have started to build their factories, and each firm is planning to establish tourism factories that tourists can visit, experience, and shop in while accessing recreational and leisure services. The park is the first industrial cluster in Nantou County and Taiwan to be themed on tourism factories.

Overall, the park achieved its goal and facilitated the establishment of industries with local characteristics in Puli Township. After the firms started to operate, they can create more than 500 job opportunities for the local community, generate a production value of NT\$1.8 billion annually, and revitalize NT\$650 million of assets for the Nantou County Government.

3. Research Discovery and Analysis

1. In accordance with the Statute for Industrial Innovation and the Regulations for Entrusted Application for Establishing, Planning, Developing, Leasing, Selling, and Managing Industrial Parks, the Nantou County Government allowed public and private businesses to apply for and undertake the responsibilities of establishing, planning, developing, leasing, selling, and managing industrial parks. To reduce the financial burden of the county government, these public and private businesses were responsible for obtaining all the funding required. Although these public and private businesses had to raise their own funding for industrial park development, they could profit from agency fees. Therefore, the aforementioned development strategy is a win-win scenario from a financial perspective.

"The Statute for Industrial Innovation is the foundation of current industrial park development. Actively introducing private resources is better because the county government lacks financial resources." (Respondent A)

"Regarding land use planning, the plan for the Special District of Southern Tainan Science Park introduced the concept of floating zones and development permits when it was formulated more than a decade ago, and land was reserved for flexible use to attract private investment and development. The plan became the first in Taiwan to use the build-and-transfer method to attract private funding and implemented a case-by-case sales measure to help the private sector achieve a financial balance and reduce the government's investment risk and financial burden with respect to. Of course, Puli Industrial Micro-Park is much smaller, and the aforementioned development method is not directly applicable. However, maintaining flexible and diverse plans and facilitating open exchanges between internal and external resources and park activities can better meet future development needs." (Respondent E)

2. Puli Industrial Micro-park occupies an area of approximately 5 ha. The industrial land of the park accounts for less than 70% of its total area (approximately 3.3 ha). Because the average cost of development was higher, the land price of the park was higher and, thus, less attractive, resulting in an extension of the sales period for the land.

"The land price of the park was evidently higher than that of nearby industrial land; therefore, some firms waited for the county government to lower the price." (Respondent D)

3. Before the development of Puli Industrial Micro-Park, the land on which the park was built was idle and only used for temporary exhibitions. Puli Township has diverse industries, and it is renowned for various local specialties, such as its liquor, water, flower, and agriculture. Puli Township's tourism industry has flourished in recent years, and its local industries require space for their factories. For the Nantou County Government and the local community, the development of the park allowed for the effective utilization of land resources, provided the land required for development of industries with local characteristics, and helped local traditional industries to upgrade or transform themselves to enhance their industrial competitiveness and revitalize the local economy.

"The site was originally intended for affordable housing, then it became the site for holding the Puli Flower Carnival exhibition. It was used for 2 months each year and remained idle for the rest of the year. Nowadays, land resources are precious and should be used actively on the basis of surrounding environmental conditions." (Respondent A)

"This is a successful development despite the difficulties and setbacks. In accordance with the original development philosophy, industries with local characteristics were first invited to base themselves in the park, particularly restaurants that emphasized the use of local ingredients and shops that sold souvenirs favored by tourists. These famous firms are of different sizes, but follow their own brand management philosophies and principles. We reached a consensus after many rounds of in-depth communication, and during this process we slightly adjusted the development of the park to accommodate the needs of firms." (Respondent E)

4. Puli Industrial Micro-Park was well planned and had a service center that was specifically responsible for public facility management, building maintenance, product exhibition, tour guide supervision, and safety control measures for factories. The park had a green belt that buffers and isolates the industrial park and its surrounding environment and meets needs pertaining to ecological conservation and recreational space. The implementation of sewage treatment for factories can alleviate the problem of environmental pollution. The firms based in the park can engage in production, use land within the park, and expand easily; the comprehensive public facilities and beautiful environment of the park improve its quality and enhances its industrial competitiveness.

"The park fully complies with regulations, and the planning and design of the park's public facilities, green belt, drainage, and pollution prevention were based on its topography and terrain. In general, the park is ideal for firms to operate sustainably." (Respondent A)

"Early industrial parks focused on locational requirements and the needs of production environments, and they did not meet sustainable development needs. In recent years, Taiwan has transitioned to modernized industrial park planning and development. The functions of a park are complex. For land use planning and the establishment of public facilities, one must consider the integration and sharing of external environments, and the rights of stakeholders that must be considered and evaluated are also becoming increasingly complex." (Respondent F)

"During the planning and development phase, which occurred in the past few years, we invited professional experts and scholars to provide practical suggestions. For the planning of the park, we aimed to integrate and create a leisure space that integrates local culture and landscape with public art while maintaining local characteristics. We strived to develop local characteristic industries, cultural and environmental educational knowledge, and experiential activities, and we also integrated local cultural and ecological packages to entice tourists to stay overnight." (Respondent E)

5. The positioning of Puli Industrial Micro-Park accounts for the characteristics of local industries, and its establishment allows for the commercial activities of nearby industries to be integrated. This positioning also accounts for the current sixth-industrialization trend, and it is aimed at establishing an operation model for tourism factories. The park is expected to drive regional consumption and increase local investments in regional agricultural products and related industries, thereby facilitating the development of local secondary and tertiary industries and creating additional job opportunities.

"The park was developed as an industrial tourism park. Therefore, as a cluster for tourism factories, the overall space planning, operation, and management of the park should be achieved through long-term cooperation between the public and private sectors. Cultural and environmental education can enhance the recreational experiences of tourists, develop quality-oriented thematic industrial tourism, and encourage people to reduce their use of nonrenewable energy and production of waste, thereby ensuring environmental quality while promoting and facilitating the development of the local economy and acquisition of benefits." (Respondent C)

"In the post-pandemic era, industrial tourism resources must exhibit more differentiation and attractiveness. They must also promote more friendly social interactions and service interfaces. Puli is a tourism town with rich local characteristics. Therefore, the park can expand the integration of local cultural and ecological resources and local cultural tourism." (Respondent A)

"We are a renowned business based in Central Taiwan. After we discovered that Puli Township, which has a rich culture and a transportation network that is becoming increasingly accessible, was leveraging private investments to codevelop Puli Industrial Micro-Park on the basis of the philosophy of revitalizing idle spaces, we decided that this was the time to fulfill our social responsibility and develop industrial tourism. The development of the park represented our implementation and expansion of environmental, social, and governance practices. By

actively investing in the establishment of the park, we hoped to integrate local cuisines, agriculture, and tourism; demonstrate diverse elements; and bring more changes to Nantou County.” (Respondent B)

“Because of the catastrophic impact of the 921 Earthquake, the small town of Puli has continued to rebuild for many years, and its efforts have revitalized the local economy and restarted the development of tourism industry to attract more tourists. In recent years, it encountered a growth bottleneck, and the impact of the COVID-19 pandemic has brought gloom to the local tourism industry.” (Respondent D)

Conclusion and Suggestions

Through a system investigation, in-depth interviews, and a case study analysis, the present study identified the following factors that contributed to the successful development of the park:

1. Self-liquidating capability: In general, local governments have limited funding. Therefore, whether an industrial park can break even after it is leased or sold and whether the private sector can provide the investment required for industrial park development are key points related to self-liquidating capability that must be considered.

2. Land price: The government establishes industrial parks to promote local development. Therefore, for land price, the cost of land development and the market should both be considered, and negotiations among multiple parties should be flexible, particularly those involving local representative firms.

3. Park development characteristics: International examples of regional revitalization should be referenced. In addition, the needs of industries with local characteristics during the initial planning and analysis phase should be consistent with the operations of firms and be different from those of other regions.

4. Comprehensive Park planning: The resources of the internal and external environments of the park should be integrated. An industrial park should provide the public facilities required for industrial development and provide the amenities and recreational space required by stakeholders.

5. Collaboration of park with nearby industries: The properties of local industries should be fully considered to integrate the commercial activities of nearby industries, form an industrial cluster, and enhance competitiveness.

Finally, the present study proposes two suggestions:

1. During the development of the industrial park, its land price was high because of the high ratio of public facilities. This factor greatly affects small-scale industrial parks and the willingness of firms to base themselves in an industrial park. This study suggests that a competent authority can set aside a special budget for subsidizing industrial park development and responding to local changes and loosen the regulations for isolation facilities and green belt buffering, thereby reducing the development cost of industrial land and increasing its affordability.

2. Local characteristic industries are usually smaller and must develop collectively in industrial clusters. Therefore, during the initial phase, a local government must consider various factors carefully and use established special sites or industrial themes for planning. In addition to providing the required hardware and space, a local government should also provide the relevant software and assistance, particularly in the context of youth entrepreneurship. They should apply innovation to transform local communities, generate innovative energy, and create development opportunities for local communities.

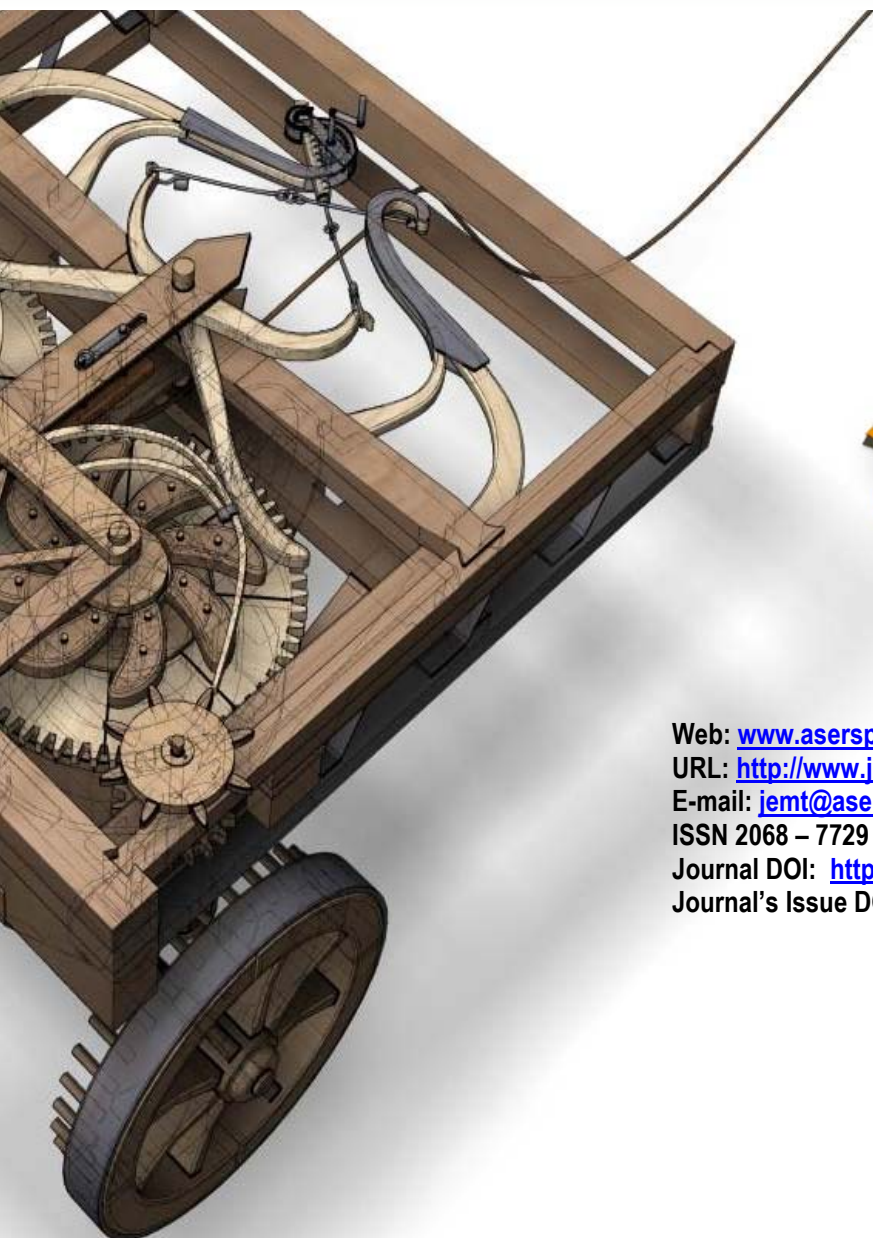
Acknowledgements

Thanks to the professionals who provided important information to this research and assisted in reviewing the paper. Above all, we would like to thank two anonymous reviewers and the editor for their comments.

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ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/jemt>

Journal's Issue DOI: [https://doi.org/10.14505/jemt.v14.4\(68\).00](https://doi.org/10.14505/jemt.v14.4(68).00)