**Systematic analysis of the essential characteristics of the concept “economic and technological development zone”**

*Li Wenjun*

Southern Federal University, Rostov-on-Don, Russia

**Abstract.** Based on the empirical data on the development of special economic zones in countries with developed and developing economies, this article illustrates the positive effect of the state regional development policy and confirms the effectiveness of the technology under study. The purpose of this article is to determine the essence of the Economic and Technological Development Zones and to identify their main characteristics. To achieve this goal, a systematic review was chosen as a research method using the meta-analysis method, in accordance with which a selective study of 76 publications included in the free search engine for scientific publications was carried out, within which, according to the selected criteria for the structure of the article, the age of the source, the presence in the keywords of the research object as well as the availability of the results of theoretical and empirical analysis, 26 publications were selected, the meta-analysis of which made it possible to identify the essential properties and characteristics of the category Economic and Technological Development Zone. The main condition for the successful implementation of the Development Zones project is the creation of industrial symbiosis, taking into account the environmental aspect and the adaptation of the Development Zone strategies to the institutional conditions of specific countries and regions.

**Keywords:** Economic and Technological Development Zone, spatially-oriented preferential policy, industrial symbiosis

1 **Introduction**

Nowadays, all countries around the world implement policies to create and manage different types of zones: economic development zones, duty-free zones, technological development zones, etc., which aim to address the issue of economic growth fueling of the country and regions. On the one hand, the purpose of their implementation is the improvement of the spatial distribution of the population, for example, in developed countries, while, on the other hand, it is aimed at fueling the industrialization and further growth, with a subsequent rebalancing of territories in developing countries.

---

1 Corresponding author: li.wenjun@mail.ru
The key to success of this policy is the positive correlation between local industrial production and the use of economic development zones, even though in some cases, development zones do not lead to an increase in production in proportion to the land occupied by the host territories [1]. For example, according to the results of the study, carried out in France, the French Urban Development Zones (ZFUs) programme had only a marginal impact on employment. On the other hand, in the USA, the Federal Enterprise Zone program illustrates a strong positive relationship between policies that support an agglomeration economy and employment. Other studies have not found a strong correlation between the results of the development of territorial economies and place-based policies [2]. The China’s relevant policy, which dates back to the 1980s and consists of the formation of industrial parks that include a significant number of types of industrial clusters, resulted in the creation of a huge number of Chinese development zones, which has accelerated its integration into the global economy [3]. As early as 2007, although China’s 54 National Economic and Technological Development Areas (NETDAs) occupied less than 0.5% of the territory, they managed to attract 23% of foreign direct investment and accounted for 5% of China’s gross domestic product (GDP), 4% of its tax revenue and 15% of its international trade [4].

By 2010, there have already been 90 national-level zones. They have effectuated a gross domestic production worth 433 billion USD or 6.7%, and if we consider the economic contribution of industrial parks at all levels, the percentage of their value exceeds 60% of the national ratio [5]. Currently, there are 219 national-level Economic and Technological Development Zones (ETDZs) across the country, accounting for more than 10% of China’s total GDP. Specified industries with a foreign presence in a particular location empower domestic companies with “product innovation” and do not supplant “domestic investment” [6].

However, despite the active application of spatially-oriented preferential policies by different countries around the world, different terminology and indicators for the designation of Development Zones are used in the scientific and professional environment. This actualizes the problem of studying the essence and content of the category “Economic and Technological Development Zone”, which will level the confusion in the global professional environment, caused by a variety of different interpretations and translations, and determine the main characteristics of this phenomenon.

2 Materials and methods

In order to identify the content and essence of the concept of the Economic and technological development zone, a systematic review of the literature was carried out using the meta-analysis method.

For this, a manual search in the Google scholar database was made for scientific articles, published over the past 15 years, from 2007 to 2023. Further, the author identified the following criteria for selecting articles: the structure of the article (Abstract (summary); Introduction; Materials and methods; Organization of the study; Results; Discussion; Conclusion; Conclusions; References); the age of the source (no more than 15 years); the presence of the terms “Economic and Technological Development Zone, Technological Development Zone, Development Zone” in the keywords; availability of the results of theoretical and empirical analysis of the concept of the Economic and Technological Development Zone.

Based on the specified criteria, 26 articles were selected, the analysis of which made it possible to determine the essence and content of the category “Economic and Technological Development Zone” (ETDZ).
3 Results

During the study, the main aspects and elements of the concept “Economic and Technological Development Zone (ETDZ)”, which are presented in Table 1, were identified and analyzed.

Table 1. Analysis of specified characteristics.

<table>
<thead>
<tr>
<th>Specified aspect / Element of the concept Economic and technological development zone (ETDZ)</th>
<th>The frequency of occurrence of the specified characteristics</th>
<th>List of articles where the specified characteristics occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A sociotechnical phenomenon (SF) in which technologies can be actors in a network of activities involving other active forces in society and the economy</td>
<td>Absolute number – 1 Relative number -4%</td>
<td>Alex Faulkner [7]</td>
</tr>
<tr>
<td>The technological zone is not tied to political and geographical boundaries. The approach “metamanagement” (MM) is used.</td>
<td>Absolute number – 2 Relative number -8%</td>
<td>Alex Faulkner [7]; Jauhiainen, J. S., Moilanen, H [8]</td>
</tr>
<tr>
<td>Cross-cutting sectors of established products (CCS)</td>
<td>Absolute number – 1 Relative number -4%</td>
<td>Alex Faulkner [7]</td>
</tr>
<tr>
<td>Regulatory Approach to Innovation Management (RAIM)</td>
<td>Absolute number – 3 Relative number -12%</td>
<td>Alex Faulkner [7]; Huang Xiao Ping [9]; Zhu Lilong, You Jianxin, Zhang Jiantong [10]</td>
</tr>
<tr>
<td>Industry systems approach focusing on the role of non-firm organizations (OSA)</td>
<td>Absolute number – 3 Relative number -12%</td>
<td>Alex Faulkner [7]; Cigdem Varol, N. Aydan Sat, Asli Gurel Ucer, Gulsen Yilmaz [11]; Şimşek, K. &amp; Yildirim, N. [12]</td>
</tr>
<tr>
<td>Environmental Dimension of Sustainability (ETDZ) (EA): - based on the theory of dynamic conceptualization of sustainability,</td>
<td>Absolute number – 5 Relative number -19%</td>
<td>Huang Xiao Ping [9]; Yang Li, Lei Shi [21]; Geng, Y., Liu, Z., Xue, B. [14];</td>
</tr>
</tbody>
</table>
based on the concept of environmental sustainability; 
- environmental efficiency of industrial symbiosis is ensured by the “system integration economy”

<table>
<thead>
<tr>
<th>Concept</th>
<th>Absolute number</th>
<th>Relative number</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>State regulation (regional, local) of the use of innovative products in industries and sectors of the country’s economy (SRUIP)</td>
<td>4</td>
<td>-15%</td>
<td>Huang Xiao Ping [9]; G Zheng, E Barbieri, MR Di Tommaso, L Zhang [14]; Zhu Lilong, You Jianxin, Zhang Jiantong [10]; Ke Wang [22]</td>
</tr>
<tr>
<td>The development efficiency of ETDZ is to simultaneously take into account the progress of science, technology, environment and economic growth (PC)</td>
<td>1</td>
<td>-4%</td>
<td>Zhao, Y., Shang, Jc., Chen, C. [23]</td>
</tr>
<tr>
<td>The rules governing local economic activity are different from those in the rest of the country – “State Plan, Market Control” (SP-MC)</td>
<td>3</td>
<td>-12%</td>
<td>G Zheng, E Barbieri, MR Di Tommaso, L Zhang [1]; DZ Zeng [16]; Ke Wang [18]</td>
</tr>
<tr>
<td>Geological boundaries ETDZ (GB)</td>
<td>1</td>
<td>-4%</td>
<td>Zhe Liu, Yong Geng, Pan Zhang, Huijuan Dong, Zuoxi Liu [25]</td>
</tr>
<tr>
<td>An industrial park within which several or dozens of types of industrial clusters are created (IP)</td>
<td>2</td>
<td>-8%</td>
<td>Zhe Liu, Yong Geng, Pan Zhang, Huijuan Dong, Zuoxi Liu [25]; Ma, YF., Goo, YJ. [26]</td>
</tr>
<tr>
<td>The unintended process of the influence of companies belonging to the ETDZ on the dynamics of the political environment (ICPE)</td>
<td>1</td>
<td>-4%</td>
<td>Yan, Z.J., Zámborský, P. and Liang, H. [5]</td>
</tr>
<tr>
<td>Two management strategies for Development Zones (MS): “top down” and “bottom up”. China is characterized by “Top down”, Europe is “bottom up”</td>
<td>2</td>
<td>-8%</td>
<td>Zhiji Huang, Canfei He, Shengjun Zhu [27]; Jauhiainen, J. S., &amp; Moilanen, H. [8]</td>
</tr>
</tbody>
</table>

Source: Compiled by the author.

At the next stage, the cross-occurrence of the characteristics of the concept “Economic and Technological Development Zone” was studied (Table 2).

**Table 2.** Cross-occurrence of characteristics of the concept of customer experience, (%).
As a result of the data obtained, it can be concluded that the Economic and Technological Development Zones are based on the concept of a spatially oriented preferential policy, which involves the use of state rules that regulate economic activity, which are different from the country, aimed at attracting foreign investment and their placement, as well as the use of innovative products in industries and sectors of the economy. The basic principle underlying the policy of state regulation of innovations is decentralization. In accordance with this concept, ETDZs are created and implemented under the complex fulfillment of the following conditions: concentration of economic resources, production, industrial clusters in a specific territory of a particular region (geographically close), having environmental and logistical advantages, developed infrastructure (large land areas, proximity to the exit to sea, natural resources, logistics and transport capabilities, human capital, technological advances). Their sustainability depends on the ecological efficiency of industrial symbiosis.

Source: Compiled by the author.
4 Discussion

Despite the widespread opinion regarding the characteristics of the Economic and Technological Development Zones, associated with the principle of geographical proximity of industrial clusters included in this zone, this judgment is usually translated into studies on countries with developing economies. In countries with developed economies, the researchers are trying to move away from geographic and political binding in the organization and management of zones, relying on the new opportunities of information, communication and computer technologies in the functioning of the economy, they consider it as cross-cutting sectors of established products, where technologies can be actors in a network of activities, including other active forces of society and the economy. However, this approach is not supported by data on the effectiveness of this model for constructing ETDZs and their implementation in emerging economies.

5 Conclusion

The understanding of the essence, content, principles of sustainability of the Economic and Technological Development Zone will effectively scale up the practice of implementing state projects for the creation and implementation of development zone projects in the long term and will lead to the subsequent optimization of innovation, entrepreneurship, improvement of the investment climate, development of social capital and overcoming the limited potential of technological innovations, which will make it possible to move to a qualitative economic growth of the country.

References