

Concept and criteria for recognition of single-industry towns

N. A. Tovma^{1*}, R. T. Naraliyeva¹, G. M. Muzhigova¹, M. Toiganbekova¹, A. Ashirova¹, and Z. B. Satkenova¹

¹Al-Farabi Kazakh National University, 050040 Almaty, Kazakhstan

Abstract. The revival of single-industry towns is one of the priority tasks for the development of any country. The goal is to study the theoretical aspects of the concept and criteria for recognizing single-industry towns for the development of conceptual ideas about single-industry towns and the achievement of the 11th UN Sustainable Development Goal - sustainable cities and towns. In the course of the study, when studying the concept of a single-industry town, a retrospective analysis was used and the method of system-bibliometric network analysis was applied, which allows to make a comprehensive analysis of scientific literature and determine the main theoretical foundations and identify gaps in the study of the revival of single-industry towns. Results of the study: the conceptual apparatus of the term "single-industry town" was analyzed on the basis of a retrospective analysis of the definitions of this concept, the author's approach to the concept of a single-industry town was proposed to achieve the goal of sustainable development, the criteria for identifying single-industry towns based on existing approaches were supplemented. The proposed recommendations will allow employees of akimats and ministries to develop effective plans and forecasts for the development of single-industry towns.

1 Introduction

The relevance of the topic is beyond doubt, since single-industry towns make a significant contribution to the development of the country's GDP. At the present stage of economic development, cities serve as a necessary area for the concentration of the economic and sociocultural potential of society, ensuring the optimal functioning of the economy of territories of various levels. (Krutikov V.K., Dorozhkina T.V., Tyutin D.V., Yakunina M.V., 2017).

The development of single-industry towns is associated with various problems: environmental, technological, infrastructural and economic. In this regard, there is a need to study, first of all, the theoretical aspects of the functioning of single-industry towns, because there is nothing more practical than a good theory that will help solve the problems of effectively using the potential of monofunctional urban systems. The development of such a theoretical and methodological approach implies the need for a retrospective and

* Corresponding author: nataliya-tovma@mail.ru

comparative analysis of numerous studies of single-industry towns and the direction of their restructuring. Confirmation of the relevance of the problem of single-industry towns is the deindustrialization of the single-industry town territory.

2 Literature review

The beginning of the study of the economy of single-industry towns was laid in the works of foreign researchers who introduced the terminological constructions "company town" (city of one company) and "single industry town", or "one industry town" ("city of one country") into scientific circulation. The first term was first used in the works of J. Allien (Aganbyan A.G., 2012) when analyzing the features of the economy of coal-mining, oil and timber cities and was subsequently used by J. Garner (Gorbunov V.S., 2017) to characterize single-industry towns in New England and H. Green in the course of research on the US economy in the era of industrialization. The second term was used to characterize single-industry towns with the subsequent definition of their specialization. So, for example, single-industry towns "mining town" stood out, specializing in mining "railway town" - in the field of railway transport, "college town" - in the field of educational services at a large university, "lumber towns" - in the field of wood production. Some authors single out "cities-factories" as one of the types of settlements, the economy of which is characterized by a high level of specialization of industrial production, which leads to a decrease in the population. Such an approach is based on the recognition of the presence of a city-forming enterprise, which determines all spheres of life, as an attributive feature of single-industry towns. This interpretation of the single-industry town was developed in the works of E.G. Animitsy, V.S. (Animitsa E.G., 2018), Perru F (Peru F, 2007), Pozdnyakova (Zh.S. Pozdnyakova, 2018), A.N. Makarov (A.N. Makarov, 2013). Proponents of this approach to the definition of a single-industry town focus on certain aspects of the interdependence of an urban settlement and a city-forming enterprise, which allowed them to characterize the monopsony nature of the local labor market (I.V. Manaeva, 2011), the innovative potential of the urban socio-economic system (V.A. Trifinov, 2006), instruments of socially responsible behavior of an enterprise, as well as social policy of state authorities and local governments (M.M. Murtazin, 2011).

A number of researchers, in interpreting the essence of single-industry towns, proceed from the composition of the risks of their sustainable development, supplemented by the risks of the external environment, which cannot become objects of effective management by public authorities due to the dependence of the choice of management technologies on the nature of the interaction of the local community with the city-forming enterprise (V.Ya. Lyubovny, 2009).

From the standpoint of the first approach, the possibility of classifying the city as a single-industry town exists if one of the following criteria is met: the existence of one enterprise in the city with more than 5,000 employees, more than 50% of the city's population is employed at this enterprise, including members of their families. The status of the city in this case is not decisive in the presence of these signs in other settlements, which accordingly makes it possible to classify them as single-industry.

The second approach considers the concept of "single-industry town" more broadly in terms of the share of income coming from one or two city enterprises to the budget of the corresponding level. So if 30% of the revenue part of the city budget is formed as a result of the activities of the city's enterprise, then such an enterprise can be classified as a city-forming enterprise, and a settlement can be classified as a single-industry town.

The disadvantage of the approaches lies in their statistical nature.

The conducted analysis shows that in the presence of many studies devoted to various aspects of the functioning of single-industry towns, in modern economic science there is no

unified approach to the interpretation of key categories that reflect the most significant aspects of monofunctional urban systems, there is ambiguity in the criteria for classifying municipalities as single-industry towns, which creates significant difficulties in developing strategies for their development.

The goal is to study the theoretical aspects of the concept and criteria for recognizing single-industry towns for the development of conceptual ideas about single-industry towns and the achievement of the 11th UN Sustainable Development Goal - sustainable cities and towns.

Research objectives:

- analyze the conceptual apparatus of the term "single-industry town" based on a retrospective analysis of the definitions of this concept,
- to offer an author's approach to the concept of a single-industry town to achieve the goal of sustainable development,
- to supplement the criteria for the allocation of single-industry towns based on existing approaches,

Scientific novelty lies in the addition of the conceptual apparatus of the concept of a single-industry town, its types and selection criteria on the basis of a comprehensive study.

3 Methods

The study was carried out in two stages. At the first stage, the method of systemic bibliometric-network analysis was used, which makes it possible to make a comprehensive analysis of scientific literature and determine the main theoretical foundations and identify gaps in the study of the revival of single-industry towns. In addition, a retrospective analysis of single-industry towns was applied to develop a unified approach to this concept.

At the second stage, the hypothesis "The development of conceptual ideas about single-industry towns contributes to the creation of new knowledge about single-industry towns" was tested.

4 Results

4.1 The conceptual apparatus of the term "single-industry town" is analyzed on the basis of a retrospective analysis of the definitions of this concept.

To date, there is a variety of terms that characterize cities with city-forming enterprises and a single-industry economy, but there is no single generally accepted definition.

Many scholars have given appropriate definitions on the characteristics of a "single-industry town". For each definition, it is possible to single out the corresponding "grouping attribute", according to this attribute, the existing definitions of single-industry towns can be combined (Table 1).

Table 1. Definitions of the term "single-industry town"

Scientists and scientific communities	Definition
Antonova I. S.	A single-industry town is a relatively isolated community of compactly living people, which is part of a macrosystem, representing a special type of social organization, which is characterized by the systemic unity of the city and the city-

	forming enterprise and the monocentric nature of the economy associated with the performance of a certain socially significant function in the macrosystem.
Trugel I.D.	The fundamental basis for the functioning of single-industry towns is formed by city-forming enterprises
Harris R.	Proposes to use the umbrella concept of "industrial town" to describe this kind of municipalities. An industrial city is an urbanized place where industrial production dominates the local economy and more broadly: in the environment and social relations.
Krutikov V.K., Dorozhkina T.V., Tyutin D.V., Yakunina M.V.	The concept of "single-industry town" (gr. monos - one, only), as a rule, is understood as such a settlement, the life of which flows around one city-forming enterprise.
Khlestova K.S., Voronov A.S.	A single-industry town is an open, dynamic multi-level territorial system, the subjects of which are united by a common production and technological process and an industry market, which leads to a high share of their factor income and tax payments in the aggregate income and revenue part of the budget of the municipality.
Akhmetova E.Sh.	A single-industry town is considered as a complex territorial system of the life of the population, the components of which are continuous from their spatial environment.
Sokolinskaya Yu.A	A single-industry town is a territorial formation functioning at the expense of a city-forming enterprise; it is a structural unit of territorial division, limited by the presence of a mono-industry or mono-production; it is a mono-structural territory with a high share of employment (more than 50%) in one enterprise; the revenue part of the municipal budget from the work of one enterprise
Note- developed by the author	

Thus, a comparative analysis of the interpretations of the content of the category "single-industry town" shows that their authors proceed from recognition as a dominant quantitative feature or the presence of a relationship between the result of the activity of a city-forming enterprise and the revenue side of the local budget.

Thus, a retrospective analysis of ideas about the patterns of development of single-industry urban systems proceeds from the recognition of the need to clarify the main areas of research in this area and determine the conceptual and territorial structures that reflect the features of ideas about single-industry towns. The analysis of the evolution of ideas about the attributive features of single-industry towns showed that there are a significant number of interpretations of approaches in the literature.

4.2 The author's approach to the concept of single-industry town to achieve the goal of sustainable development is proposed.

Thus, almost all researchers in the formation of the definition of "single-industry town" at the forefront put the dependence of the settlement on the functioning of the city-forming enterprise. At the same time, there is a need to specify the definitions in terms of clarification not only on a branch basis, but in relation to the life cycle of the city. All single-industry towns, as complex systems of socio-economic processes, develop according to the corresponding life cycles, and for each single-industry town, the standard of living of the population becomes its most significant feature.

The study of the legislative framework has shown that there is no legally fixed definition of the concept of "single-industry town".

Taking into account the above, it is proposed to understand a single-industry town as a city, the development of which is predetermined by the functioning of a large (city-forming) enterprise, oriented mainly to the external sales market and sustainable development. This definition not only singles out the main element of the city-forming enterprise in the city system, but also emphasizes the degree of influence of this element on the entire system. The development of cities in modern conditions is usually considered from the standpoint of sustainable development of the city, which ensures the safety of the population and a high quality of life. Since all systems should strive for sustainable development, the single-industry town should also strive for sustainable development.

4.3 The criteria for single-industry towns allocation based on existing approaches have been supplemented.

The problem of defining the concept of "single-industry town" is to formulate criteria for classifying a city as a multi-profile city. From the standpoint of the first approach, the possibility of classifying a city as a single-industry town exists if one of the following criteria is met: the existence of one enterprise in the city with more than 5,000 employees. More than 50% of the population is employed at this enterprise, including members of their families. All approaches to the selection of single-industry towns from the total number of cities come down to characterizing a limited list of criteria that characterize the main link of a single-industry town.

As noted by Tovma, N., Kazbekova, K., Shamina, L., Abisheva, K.-Z., Nurgaliyeva, A. (Tovma, N., Kazbekova, K., Shamina, L., Abisheva, K.- Z., Nurgaliyeva, A., 2020) it is necessary to take into account the development of e-commerce in the development of single-industry towns in particular.

In the world there are no uniform criteria for the allocation of cities. Thus, in the United States, cities include settlements with a population of over 2.5 thousand people, in Iceland - 200 people. In some countries, in addition to the population, population density, the level of infrastructure development and the structure of employment are taken into account (Krutikov V.K., Dorozhkina T.V., Tyutin D.V., Yakunina M.V., 2017).

According to Niyazbekova, S., Mottaeva, A., Kharesova, M., Turova, L. single-industry towns should develop sustainably and ensure the development of the transport industry (Niyazbekova, S., Mottaeva, A., Kharesova, M., Turova, L. , 2023).

Omarova, G., Sembayev, N., Niyazbekova, S., Krupnov, Y., Kochetkov, I. say that it is necessary to raise the image of single-industry towns, develop territorial development and transport. (Omarova, G., Sembayev, N., Niyazbekova, S., Krupnov, Y., Kochetkov, I. 2013).

As noted by Idrysheva, Z., Tovma, N., Abisheva, K.-Z., Murzagulova, M., Mergenbay, N., it is necessary to take into account the criteria for digital development in territorial

development and single-industry towns in particular. (Idrysheva, Z., Tovma, N., Abisheva, K.-Z., Murzagulova, M., Mergenbay, N., 2019).

Tovma, N., Nurgalieva, G., Dzhakisheva, U., ...Ussabayev, A., Aristambayeva, A., take into account the development of public-private partnership in the criteria for recognizing a single-industry town. (Tovma, N., Nurgalieva, G., Dzhakisheva, U., ...Ussabayev, A., Aristambayeva, A., 2019).

Niyazbekova, S., Anzorova, S., Tochieva, L., ...Dzholdosheva, T., Supaeva, G. take into account the environmental criterion that affects the development of single-industry towns. Many cities are in an ecological disaster and this factor affects the development of single-industry towns (Niyazbekova, S., Anzorova, S., Tochieva, L., ...Dzholdosheva, T., Supaeva, G., 2023).

Thus, the following criteria for the development of single-industry towns can be distinguished:

1. The presence of an enterprise or several enterprises operating within the framework of a single production and technological process that employs more than 25% of the economically active population in their main job.
2. The presence in the settlement of an enterprise or several enterprises operating within the framework of a single production and technological process, which account for more than 50% of industrial production.
3. The presence in an urban-type settlement of enterprises of a certain industry profile, as a rule, creating a situation of economic mono-profile
4. Additional criteria for classifying settlements as single-industry: the share of taxes and fees received by the budget of the municipality from an enterprise or several enterprises operating within the framework of a single production and technological process located in a settlement is at least 20% of the total taxes and fees received by the budget of the municipality from all organizations and enterprises.

The analysis carried out allows us to identify a limited number of criteria for classifying a settlement as a single-industry one. As well as highlighting the specific features inherent in a single-industry settlement: the share of employees in a city-forming enterprise in the total number of employees in a given settlement. active population, share of employed.

However, these formal features (enterprises that employ more than 25% of the population and others) may, firstly, may change legislatively, depending on the goals and objectives of the country's economic development, and secondly, may underestimate the degree of influence of a particular enterprise on the city's economy. Thus, it is supposed not to consider the criteria as a certain reality, but to assess the degree of influence of the enterprise on the city's economy.

As can be seen, the criteria for assessing the status of single-industry towns are linked only to forecast risks, while there is no criterion that assesses the current state of the economy of diversified territories and its main parameters. We believe that it is possible to divide single-industry towns into three criteria (table 2).

Table 2. Criteria for recognition of single-industry towns

Category of single industry town	Indicators
Category 1 (low socioeconomic status (all indicators are valid simultaneously))	it is planned to lay off workers at least 10%; – unfavorable market conditions in the industry; – the level of registered unemployment is 2 or more times higher than the average unemployment rate;

	<ul style="list-style-type: none"> - the population assesses the socio-economic situation as unfavorable; - life cycle
Category 2 (medium socioeconomic status (all indicators are valid simultaneously))	<ul style="list-style-type: none"> - there is information about the planned release of workers more than 3% of the average number of employees; - the unemployment rate exceeds the average unemployment rate; - life cycle
Category 3 (stable socioeconomic status (all indicators are valid simultaneously))	<p>the city-forming enterprise carries out its production activities;</p> <ul style="list-style-type: none"> - lack of information about the planned release of workers in an amount exceeding 3%; - the level of registered unemployment does not exceed the unemployment rate; - the population assesses the socio-economic situation as favorable, - functioning digital economy, - functioning transport,
Note - developed by the authors	

We believe that it is necessary to supplement the criteria for referring to single-industry towns. In our opinion, such a criterion should be linked, first of all, to the life cycle of a single-industry town. In this case, it is possible with a high degree of probability to predict the scenario for the development of a single-industry town, depending on the period of its life cycle. This approach will directly assess the opportunities for the development of a single-industry territory, taking into account its potential.

As a result, we can conclude that the hypothesis posed in the study was confirmed. It is assumed that the new classification will help regional and local authorities to form a differentiated policy for the sustainable development of single-industry towns.

5 Source of financing

This research has been funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (BR18574200 « The revival of monotowns in the conditions of the creation of New Kazakhstan on the basis of territorial marketing»).

6 Conclusion

Thus, we have given the concept of a single-industry town, which is proposed to be understood as a city, the development of which is predetermined by the functioning of a

large (city-forming) enterprise, oriented mainly to the external sales market and sustainable development. The criteria for the selection of single-industry towns have been supplemented. The factors influencing the development of single-industry towns are determined. The development of these proposals contributes to the economic development of single-industry towns.

7 Acknowledgment

The article was prepared under the program BR18574200 "Revival of single-industry towns in the context of the creation of New Kazakhstan based on territorial marketing" within the framework of program-targeted funding of the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

References

1. V. K. Krutikov, T. V. Dorozhkina, D. V. Tyutin, M. V. Yakunina, *Monotown, Teaching aid*. Kaluga: Publishing house of AKF "Polytop", **158**, 15 (2017)
2. A. G. Aganbyan, *Modernization of the real sector of the economy: spatial aspect, Region: economics and sociology*, **4**, 7-44 (2012)
3. V. S. Gorbunov, *Using the J von Thünen Model in the Modern Regional Economy*, *Moscow Economic Journal*, **2**, 22-40 (2017)
4. E. G. Animitsa, *Conceptual approaches to the development of a single-industry city development strategy*, *Yekaterinburg*, 81 (2010)
5. F. Perroux, *Economic space: theory and applications*, *Spatial Economics*, **2**, 77-93 (2007)
6. Zh. S. Pozdnyakova, *Monotowns: from survival to support and development*, *Young scientist*, **24**, 160-163 (2018)
7. A. N. Makarov, *The evolution of a single-industry city as an infrastructural potential for innovative import substitution*, *Regional Economics: Theory and Practice*, **41(320)**, 53-57 (2013)
8. I. V. Manaeva, *Monotowns: issues of terminology*, *Modern problems of the socio-economic development of Russia: materials of the scientific-practical conference in 2 vol.*, Belgorod, **T2**, 140-143 (2011)
9. V. A. Trifanov, *Problems of innovative development of city-forming enterprises in the conditions of single-industry cities*, *Proceedings of the Tomsk Polytechnic University*, **3**, 198-202 (2006)
10. M. M. Murtazin, *Development of single-industry towns in the context of modernization: political and legal experience of the Republic of Tatarstan*, *Moscow* (2011)
11. V. Ya. Lyubovny, *Monoprofile cities in a crisis: state, problems, possibilities of rehabilitation*, *Moscow*, 110 (2009)
12. I. S. Antonova, *Dynamic approach to assessing the process of diversification of the economy of a single-industry city*, *National interests: priorities and security*, **13(3)**, 431-441 (2017)
13. I. D. Turgel, V. V. Zinovieva, *On the issue of choosing criteria for determining city-forming organizations in single-industry towns (Russian and foreign experience)*, *Bulletin of the Research Center for Corporate Law, Management and Venture Investment of Syktyvkar State University*, **4**, 51-60 (2017)

14. R. Harris, Industrial City, International Encyclopedia of Human Geography, 383–388 (2009)
15. K. S. Khlestova, A. S. Voronov, Retrospective analysis of ideas about single-industry towns and their role in the development of the national economyPublic administration. Electronic Bulletin, **77**, 229-24511 (2019)
16. G. Omarova, N. Sembayev, S. Niyazbekova, Y. Krupnov, I. Kochetkov, *Management of marketing activities of the transport sector in the context of sustainable development*, E3S Web of Conferences, **371**, 05054 (2023)
17. S. Niyazbekova, A. Mottaeva, M. Kharesova, L. Turova, *Sustainable development of transport systems and development of economic cooperation between countries*, E3S Web of Conferences, **371**, 04039 (2023)
18. S. Niyazbekova, S. Anzorova, L. Tochieva, T. Dzholdosheva, G. Supaeva, Environmental Aspects of Innovative Development of Industrial Sectors, Lecture Notes in Networks and Systems, **575 LNNS**, 50–58 (2023)
19. Z. Idrysheva, N. Tovma, K.-Z. Abisheva, M. Murzagulova, N. Mergenbay, *Marketing communications in the digital age*, E3S Web of Conferences, **135**, 04044 (2019)
20. N. Tovma, K. Kazbekova, L. Shamina, K.-Z. Abisheva, A. Nurgaliyeva, *Modern Trends of Development of Electronic Trade in the Conditions of Digital Econom*, E3S Web of Conferences, **159**, 04039 (2020)
21. N. Tovma, G. Nurgaliyeva, U. Dzhakisheva, A. Ussabayev, Aristambayeva, A. Developing an accounting system: Under the macroeconomic and microeconomic model of economic relations between business entities. example of hospitality management, Journal of Environmental Management and Tourism, **10(8)**, 1893–1905 (2019)
22. E. Sh. Akhmetova, *Social assessment of the quality of the environment in a single-industry city*, Socio-economic and technical systems: Conf. Kama Polytechnic Institute, **14**, 22 (2006)
23. Yu. A. Sokolinskaya, Economic security of a single-industry town: monograph, Moscow, UNITY-DANA, 135 (2020)