

# Development of Settlements Along Chinese-Russian Border (on the Case of Suifenhe-Pogranichny)

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**Abstract:** An interesting phenomenon is emerging on the border between Russia and China. Despite the fact that this territory has all the necessary conditions for active development and cooperation, there is an uneven growth and use of its potential. So, the Chinese side demonstrates an active buildout of territories and an increase in the population of the region, at the same time there is some inertia on the Russian one. This research analyzes the current state of the border area and the development of interaction between two countries on the example of Suifenhe and Pogranichny settlements. Suifenhe and Pogranichny were originally formed under the influence of the Chinese Eastern Road construction and the interaction between China and Russia, which significantly influenced the structure of the settlements and their architecture. Thus, the author considers the process of interaction as one of the settlements forming factors, which had (and still has) a significant impact on their structures. In this paper, the author considers populations, industries, transport systems, functions, landscape, fabric and space in different periods of settlements. The objects of a research are the settlements and as a subject this paper considers existing relationships between Suifenhe and Pogranichny and their reflection in structure, space and other aspects. In this work, 3 main methods are used - the analysis of research and practical experience in this area; historical background analysis and the cartographic method, which consists in a comparative analysis of maps of settlements of different stages. In the framework of this article, the hypothesis posed by the author is proved at the level of urban interaction. Also, author identified the main characteristic features, weak points and potential of settlements in various aspects, on the basis of which proposals are made for the further development of the settlements and relations between China and Russia through them.

**Keywords:** Cross-Border Cooperation, Border Settlements, Chinese-Russian Border, Interaction Analysis

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## 1. Introduction

### 1.1. Research Content and Research Methods

The study objects are the settlements of Suifenhe (China) and Pogranichny (Russia), and the subject is the process of interaction between these settlements (historically and at present) and its influence on the structure of settlements. Within the framework of this work, the main goal is to analyze the relationship between the settlements of Suifenhe and Pogranichny in different periods, to identify how the settlements influenced the structure of each other, and how interaction influenced various parameters of the settlement. To solve this problem, it is also necessary to analyze academic and practical experience in this area.

In this work, two main research methods are distinguished

- cartographic and literature analysis.

### 1.2. Background and Research Significance of Topic Selection

The development of border areas is an urgent problem for many countries, as well as strategies for cooperation. In general, the topic of cross-border cooperation is quite relevant on the modern world agenda. This type of cooperation is especially important for remote regions of the country, when interaction with neighboring regions of another country, due to various geographical features of the area or remoteness of the region, becomes easier and more effective than with the state center or other regions of the

country itself. Such trends are observed everywhere in the world, and in addition, they are also present in the neighboring territories of China and Russia.

Despite the importance of the territories of Suifenhe-Pogranichny, there is a significant imbalance in the development and its pace on the Russian and Chinese sides. In addition, Suifenhe-Pogranichny crossing plays an important role in the commodity-export and other relations between China and Russia, but the geographical potential of the territory and settlements is not fully used. Moreover, these settlements have not been studied under the prism of interaction at different levels and in different aspects simultaneously and systematically.

This research has collected significant amount of various data on the settlements under consideration, which includes cartographic data of different years and their analysis, the summation of historical data and existing government programs, the study of the structure of settlements. Such a deep study for these settlements was performed for the first time. In addition, the territory is considered as a kind of regional network, a special zone, functioning, planning structure, styles and traditions of which are formed under the condition of mutual penetration of cultures, which has an impact on all levels of urban planning and architecture.

At the same time, this work is of practical importance and can help to establish productive cooperation in settlements on the borders of China and Russia, which in general will have a fruitful impact on the development of the region.

## 2. Analysis of Collected Experience in the Field of the Research

### 2.1. Current Status of Research at Home and Abroad

The literature review is an important part of the research. This research considers various aspects of the topic, includes an analysis of case studies - territories where it was possible to achieve successful cross-border cooperation, as well as a study of the distinctive features of Suifenhe and Pogranichny. Based on research topics the literature reviewed for this work was divided into three blocks.

#### 1. General information about cross-border cooperation.

Examples, strategies, various aspects of cross-border cooperation in the world

The first group includes academic works and articles devoted to the analysis of cross-border cooperation cases and its features (economic, social, etc.). This group of academic works is quite extensive. Great experience in this area has been accumulated in Europe (to which a large number of academic works are devoted), where a high level of cross-border cooperation has historically been observed. In addition, a significant amount of the researches refers to the border areas of the United States and Canada, which also successfully cooperate and develop together. In this group the work of Feng Ge-qun "Study on the model of cross border co-operation in Europe – the case in Euroregion upper Rhine" is important, which explores the Upper Rhine Territory,

where the borders of Germany, France, and Switzerland meet. In this paper, the author examines in detail the prerequisites and history of formation, and the current state of the special zone in this territory. [1]

#### 2. Researchers of relations and cooperation between China and Russia in the border areas

The second group includes works devoted to the territories on the border between China and Russia. The problems of development of border areas are of concern to both Chinese and Russian researchers. Within this literature review, the academic works about urban planning, transport, sociocultural aspects of the region are the most valuable.

Ergakova Iana in her research sees the development of the territories of the Chinese-Russian borders through the creation of border towns-clusters [2].

U Dan Thanh looks at the border settlements between China and Russia from a completely different angle in his master's thesis [3]. The author explores the phenomenon of ethnic villages and their use as a driver of tourism development using the example of Shiwei Village.

Chu Nanchen explores the urbanization process and spatial patterns in Russia based on the idea that infrastructure development is important for effective economic development and cooperation between China and Russia [4].

A significant amount of information is presented in a series of articles by Ordynskaya Y. V. She examines the border areas of China and Russia and their interaction. She identifies risk factors, opportunities, strengths and weaknesses of the territory [5]. The author distinguishes 2 main trends in the patterns of new anthropogenic zones formation - linearly along the border between Russia and China and zonally, mainly for agricultural areas; as well as the main types of villages of the region [6]. In addition, in her works, Ordynskaya Y. V. compares the Russian-Chinese and Russian-Kazakh borders [7]. The author highlights the typologies of settlements that have developed in the neighboring territories of Russia and China, separately noting the emerging industrial clusters [8]; considers functioning government programs [9]; develops principles for the development of forms of settlements in border zones [10].

PENG Guang-yu from School of Business of Central South University [11] analyzes the situation that has developed on the basis of the Belt and Road Initiative, the problems and ways to solve them in cooperation between the two regions of Northeast China and Far East of Russia.

A significant number of academic works and publications include researches of various economic aspects of cooperation between China and Russia.

#### 3. Researches of the settlements of Suifenhe (China) and Pogranichny (Russia)

The third group of works includes all studies directly related to the settlements of Suifenhe and Pogranichny. It should be noted that there are not so many scientific works directly investigating these settlements (not necessarily in the field of urban planning and architecture). In addition, the Chinese city of Suifenhe has been explored more than its Russian neighbor Pogranichny.

Researchers are attracted by the touristic aspect of the area. One of the studies in this area is the work of Dong Yuying [11], which reviews resources for rural tourism in Suifenhe River.

Yu V. Ordynskaya and Kozyrenko N. E. research the settlements from the urban planning point of view. So, they are referring the Suifenhe-Pogranichny-Ussuriysk system to one of the 4 established growth poles. [12]. Moreover, they analyze the development mechanisms of border cities in the Northeast of China, highlighting the stages of "Market", "Bazaar", "Shop", "Department Store" [13].

Bondarenko Y. V. and Kozirenko N. E. consider the settlements of Suifenhe-Pogranichny as paired cities. The authors also describe the specific features of urban planning in Chinese cities [14].

Yu V. Ordynskaya, on the other hand, considers a couple Suifenhe-Pogranichny as a cross-border agglomeration (Suifenhe-Pogranichny-Ussuriysk) [10].

WANG Tian-bao from Tsinghua University [15] analyzes the change in the population of Suifenhe in the period from 1860 to 1917, which, according to the author, were influenced by Sino-Russian relations.

LI Jin-bo [16] points out the importance of mutual investments between Russia and China in the border areas, considers the existing problems and ways to solve them in this area on the example of Suifenhe.

Dai Yansen in "Research on Sino-Russian cross-border economic cooperation taking Heihe city, Suifenhe city, Dongning county and Hunchun city as subject" examines the economic aspects of cross-border cooperation between Russia and China on the example of several cities, including Suifenhe. [17]

LIU Zhengwei, et al. [18] explore the drivers of land use change in Suifenhe city and suburbs based on satellite imagery taken in 1990, 2000, 2011, 2016. Within the framework of this study, a canonical correlation analysis is carried out. Authors study the area's agriculture, namely arable land, forest area, terrain, trade factors.

JIAO De-yang et al. [19] considers the relationship between the development of cross-border trade and the use of land for construction in Suifenhe, concludes that the former leads to an increase in construction; also, the author gives recommendations for the development of Suifenhe in these areas.

The current state of land use in Suifenhe is explored by Zhi Ruizhi, et al. [20] Researchers offer ways to solve the existing problems of land use of the territory.

Land use analysis of Suifenhe using GIS technology was carried out by Li Dan, et al. [21]

Many of the above academic publications analyzed the already existing government programs that have an impact on the development of the Suifenhe and Pogranichny. Among them:

Russia:

- 1) Law on the Far Eastern Hectare. Russia [22];
- 2) Territory of advanced socio-economic development in the Russian Federation. Russia [23];

- 3) Territories of Advanced Development (TOR) [24]. China:

The creation of various economic and special zones for the development of territories, attracting foreign capital, developing industry, and so on, is a successful practice used in China. There is a wide range of different programs:

- 4) "Russian Street" China [25];
- 5) Economic and Technological Development Zones [26];
- 6) "Belt and Road" initiative. China [27];
- 7) Free economic zone [28];
- 8) Special Economic Zone [29];
- 9) Free Trade Zone [30];
- 10) Border Economic Cooperation Zones [31];
- 11) Export processing zone [32];
- 12) Cross-Border E-Commerce Zones [33];
- 13) Open Coastal City [34].

Summary: The analysis of the literature shows that there are a significant number of successful examples of cross-border cooperation that could be analyzed and whose experience can be useful for the development of border areas and settlements of China and Russia. The greatest experience, both practical and academical, has been accumulated in Europe, where a significant number of special zones of cross-border cooperation are now operating. Many cross-border cooperation studies cover aspects of economics, sociology, production, transport system and more. Also, the analysis of the literature shows that the interaction on the Chinese-Russian border and cross-border cooperation in the region are at the initial stages of development. A significant number of studies are focused on the economic and political life of the region, at the same time, the main city-forming and infrastructural trends and features have been studied.

Most of the researches on the Suifenhe-Pogranichny area consider economic, political or social aspects, while spatial analysis, research in the field of urban studies and architecture are few. Suifenhe has been studied more and comprehensively compared to the Pogranichny. This also applies to the spatial analysis of these territories. In addition, despite the fact that many studies note the dependence of the economic, social, and industrial development of each of these two settlements on the level of cross-border cooperation and development of the neighboring settlement, there are not many studies that would consider the structure of settlements together, from the standpoint of interaction. Most studies either focus on only one of the settlements, or on large areas, highlighting common large structures, such as, for example, an agglomeration. At the same time, the collected literature proves the importance and relevance of cross-border cooperation for the world in general and for the territory under consideration in particular. The analysis of the literature also includes an analysis of the government programs operating in the region aimed at developing various aspects of life. A certain imbalance was revealed not only in the pace of development of the territory, but also in the measures taken by the states. Thus, on the Chinese side, there are more special programs. In addition, research interest to Suifenhe is higher. There is a need for a comprehensive and

joint study of the territory of Suifenhe and Pogranichny, based on integration.

## 2.2. World-Wide Experience of Cross-Border Cooperation

Cross-border cooperation concept is a key element of the EU policy towards its neighbors. It supports sustainable development along the EU's external borders, helps reducing differences in living standards and addressing common challenges across these borders. It was first recognized as such in the European Neighborhood and Partnership Instrument (ENPI) regulation.

CBC has three main objectives:

- 1) promoting economic and social development in border areas,
- 2) addressing common challenges (environment, public health, safety and security),
- 3) putting in place better conditions for persons, goods and capital mobility [35].

An analysis of the worldwide experience of Cross Border Cooperation is important in this research, as it helps to identify the basic principles, development paths that the regions under consideration have already experienced, in addition, using their example, one could study possible problems and difficulties of this kind of cooperation.

Case 1. The Upper Rhine tri-national region



Figure 1. THE UPPER RHINE TRI-NATIONAL REGION [36].

Countries: Germany, France, Switzerland

Regions concerned: France - Grand EST Region; Germany - Länder of Baden-Württemberg, Rheinland-Pfalz (Rhineland-Palatinate); Switzerland - Cantons of Basel-Stadt, Basel-Landschaft, Solothurn, Jura, Aargau. Everything started with the cooperation in trade and goods transfer and then developed to a successful case of tri-national cooperation in different spheres of frontier life such as education, economic, culture. The Upper Rhine region is the place of well-developed areas of each country (Germany, France, and Switzerland) and has a long tradition of cooperation. This region has a developed system of cooperation [36].

Case 2. EUREGIO. Germany - Netherlands



Figure 2. EUREGIO AREA [37].

Countries: Denmark, Germany

«The Rhine-Waal Euroregion is a Dutch-German public body with 55 member organizations, including municipalities, regional governments, and chambers of commerce from the border region. The Rhine-Waal Euroregion's most important goal is to improve and intensify cross-border collaboration, both economically and socially» [37] in the region Denmark and Germany use the tactics of cross-border cooperation in a wide range of areas: the fight against climate change, Youth policy, healthcare and medicine, tourism and logistics, public transport, business support and more. For the development of all the above areas, various projects are being created.

Case 3. Ems Dollart Region



Figure 3. EMS DOLLART REGION [38].

Countries: Netherlands, Germany

Numerous meetings, events are held here, joint projects of the two countries are being implemented. The Ems Dollart Region also functions as a government agency with a chairman, an executive board, and members. Among the

projects operating in this territory there are projects in the field of labor market, bioeconomy, green sector, sustainable development [39].

#### Case 4. Meuse–Rhine Euroregion



Figure 4. MEUSE–RHINE EUROREGION [40].

Countries: Belgium, Germany, Netherlands

According to the development strategy released in 2020, Meuse-Rhine Euroregion is developing as a creative innovative region based on developed strong networks. One of the strategies is education and work "without borders". Another important direction is cooperation in the field of art and culture. Also, in the region, Interreg has been established - EMR funding fund, whose work is aimed at supporting initiatives for development and cooperation, so more than 500 projects have already been launched in the Meuse-Rhine Euroregion [41].

#### Case 5. International Peace Garden. Canada-USA



Figure 5. INTERNATIONAL PEACE GARDEN [42].

Countries: Canada, USA

International Peace Garden was opened in 1932 with the support of the National Horticultural Association as a place where international meetings, conferences and events would be held. The territory of the park is divided by the province of Manitoba of Canada and the state of North Dakota of the USA, and is a symbol of friendship between these two countries. An international border passes through the park,

but visitors do not need to go through any customs check-points. The International Peace Garden is an example of a jointly developed and jointly operated infrastructure between two countries.

**Summary:** An analysis of cross-border cooperation examples showed that the most successful regions cooperate in a whole range of areas, cross-border cooperation in them affects all spheres of life and human activity. Infrastructure is especially important for it. First of all, all the considered zones have developed transport systems that allow moving freely around the region. Another important characteristic of all regions is a developed social policy, cooperation in the field of education and labor markets. In addition, special organizations have been created in many regions that oversee cross-border cooperation and help implement initiatives for the development of the region. The documents of most of the regions examined indicate that cultural differences, differences in laws and customs constituted significant difficulties in joint cooperation, which were solved by joint measures and compromises.

### 3. Introduction into Settlements (Area) of the Research

#### 3.1. Justification of the Settlement's Selection and Common Information of Them

Suifenhe and Pogranichny were selected for this study. Firstly, because of the uniqueness of this region is due to the history of its development, the Pogranichny and Suifenhe itself appeared as part of the Chinese Eastern Railway, the railway, the purpose of which was to build relations Russia and China. Secondly, a large cargo and passenger flow between the two countries passes through this area. Also, a trend of cooperation between Suifenhe and Pogranichny has already formed, and there is a mutual influence of Chinese and Russian cultures on each other.



Figure 6. SITUATION SCHEM OF THE SETTLEMENTS POGRANICHNY-SUIFENHE (author's scheme).

The distance between Suifenhe and Pogranichny is 21 kilometers.





Figure 7. POGRANICHNY-SUIFENHE MAP (author's scheme).

### 3.1.1. Suifenhe

Suifenhe is a northeastern Chinese (Heilongjiang province), with area of 460 square meters, and population of more than 60 thousand residents. The city has direct communication with the settlements of both China and Russia due to railway and bus stations. "By bus you can get to Harbin, Vladivostok and Ussuriysk, Khabarovsk, Bikin, Komsomolsk-on-Amur. Distance to Pogradichny - 21 km, Vladivostok - 230 km, Nakhodka - 270 km. Railway connects Suifenhe with major cities in the northeast of China, as well as Primorsky Krai of Russia. Through the Mudanjiang station, this section of the track connects with the North-South railway line (Jiamusi - Dalian), along which an express train runs. Distance to the border 2 km. The tourism sector stands out with a high importance. Suifenhe is popular for shopping, but the entertainment industry is also actively developing here, and national parks are being built in the vicinity of the city to attract tourists. The city has a sufficient number of public institutions, including customs, tax administration, people's government, administrations of various spheres (trade, land use, finance, etc.), police, banking institutions. Currently different industries play an important role in the settlement development. First of all, the processing of timber coming from Russia, transport and logistics services are the most valuable. Also, in the city there are sewing factories, various trade enterprises.

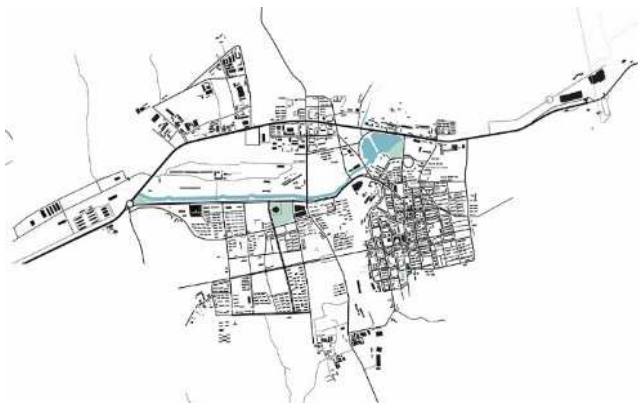


Figure 8. SUIFENHE MAP (author's scheme).

### 3.1.2. Pogradichny

Pogradichny locates in the southwestern part of Primorsky Krai, 15 km from the Chinese-Russian border, and its population is about 10 thousand people. The urban-type settlement Pogradichny is the administrative center of the district of the same name. Grodekovo railway station, which connects the village with the city of Ussuriysk and China through Suifenhe, is also here. The Pogradichny bus station provides connections to Suifenhe and nearby Russian

settlements, such as Ussuriysk, Sergeevka, Razdolnoye, Vladivostok, and more.



Figure 9. POGRANICHNY MAP (author's scheme).

## 3.2. History Background of Suifenhe and Pogradichny

### 3.2.1. Suifenhe

The history of the development of Suifenhe can be considered from the agreement between China and Russia in 1896, after which the active construction of the Chinese Eastern Railway began, which was a continuation of the Trans-Siberian Railway; before that, there were small scattered villages on the territory of the city. The station developed at a very active pace, a customs office was opened here, and soon consulates of various countries, such as Russia and Great Britain, began to appear in the city. During this period of development, the Suifenhe settlement was called the "village of flags", where trade flourished. In 1931, Japanese military invaded Manchuria, and the territory of Suifenhe was occupied, after which the state of Manchukuo was created, which the USSR did not recognize. So, in 1936, cooperation and trade were interrupted. However, after the liberation of the northeastern part of China, Suifenhe again experienced a period of prosperity and active trade. In 1949, Suifenhe customs house officially began to work and played an important role in the import and export of various materials. However, after the Cultural Revolution, the importance of the settlement decreases, trade is significantly reduced. In 1983, Suifenhe resumes active trade with the USSR and cooperation with Pogradichny. In 1987, Suifenhe received the status of an experimental cross-border trade development zone. The 90s of the 20th century can be called the new period of active prosperity of the settlement, when all trade relations are actively renewed and a large number of new enterprises and businesses appear. In 1992, Suifenhe received the status of an open port city.

### 3.2.2. Pogradichny

The history of the development of the village begins in 1898, when the Grodekovo station (part of the Chinese Eastern Railway) was opened on its territory. "In 1903, Grodekovskaya had 123 residential yards, two mills, a church, six shops, a drinking establishment, and 754 people lived. By 1914, 10 Chinese

manufacturing shops appeared in the village, a shop of the Ussuri Railway Employees' Consumer Society, and Shilnikov's pasta factory. Several major fairs were held annually». In 1918, a general gathering of residents took over Soviet power, but the outbreak of the Civil War affected and the village. In 1926 Pogranichny (then the village of Grodekovo) became the center of the district. A controversial time in the history of the settlement was the 30s of the 20th century, when many farms were dispossessed, which caused many foreign residents (mostly Koreans) to leave. However, this period was also marked by industrialization, so several enterprises and appeared in the village. With the collapse of the USSR in 1991, many of these enterprises collapsed as well and currently are not functioning. In 1958, the village received its current name Pogranichny.

## 4. Analysis of Relations Between Suifenhe and Pogranichny on the Urban Level (BIG SCALE)

### 4.1. Historical Interaction Process Between Suifenhe and Pogranichny

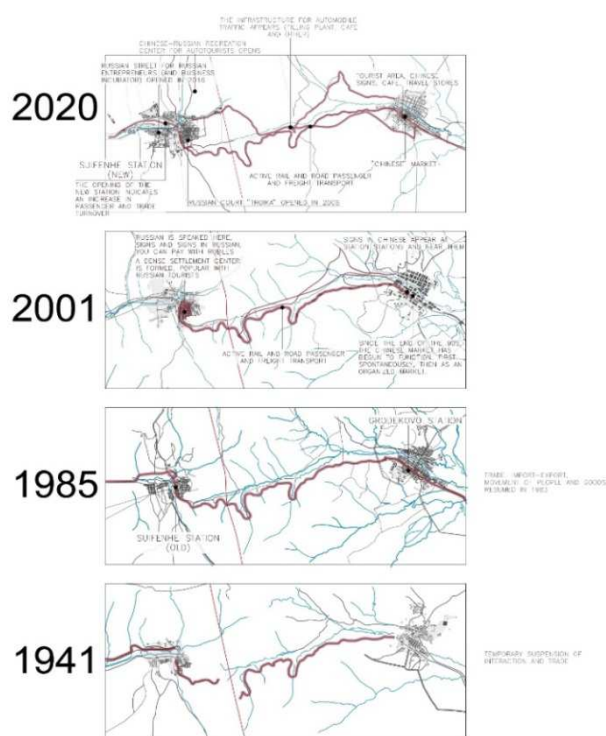


Figure 10. INTERACTION BETWEEN SUIFENHE AND POGRANICHNY IN DIFFERENT AGES (author's scheme).

Interaction was always an important factor in the formation and development of Suifenhe and the Pogranichny. It was suspended during the Japanese occupation of Suifenhe, but relations resumed in 1983, when China and Russia again began to actively trade with each other. During this period, the basis of Interaction were railway stations. The active phase of interaction is the 90s of the 20th century, during this period the “Chinese market” is actively developing in

Pogranichny, first as chaotic and spontaneous outlets, which eventually grew into a full-fledged and organized market.

The Chinese side, in turn, during this period actively adhered to the policy of openness and cooperation with Russia. The city creates attractive conditions for business and investment. A tourist zone is being formed in Suifenhe, which is aimed at attracting Russian tourists, almost everybody speaks Russian here, and you can pay in rubles. Russian names are used on shop signs. In 2016, Russian Street opened in Suifenhe, spaces for entrepreneurs from Russia, organizations specializing in the interaction between China and Russia, helping entrepreneurs begin to work.

### 4.2. Population

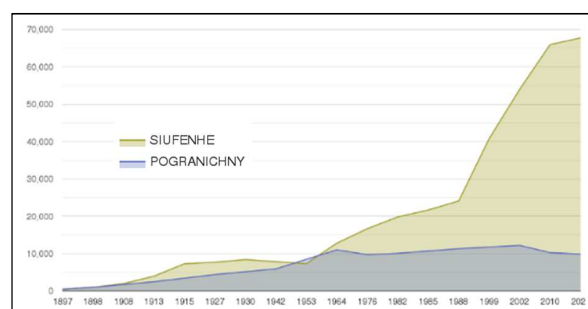


Figure 11. POPULATION CHANGES IN DIFFERENT AGES (author's scheme).

In the development of the population of the settlements, one can trace the period of major key changes. From 1988 to the present, the population of Suifenhe began to grow rapidly. In the early 90s, active trade, the development of the tourism sector, export processing began in Suifenhe. These reasons can explain such a large increase in population in the city. In Pogranichny, however, fluctuations in the number of inhabitants were observed, but there were no such dramatic changes. In recent years, the population of Pogranichny has been gradually decreasing, so it is necessary to create new jobs and business conditions in order to attract people.

### 4.3. Industry

#### POGRANICHNY

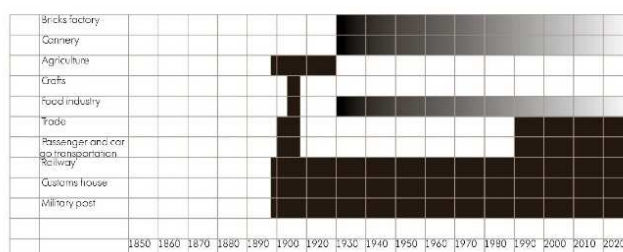
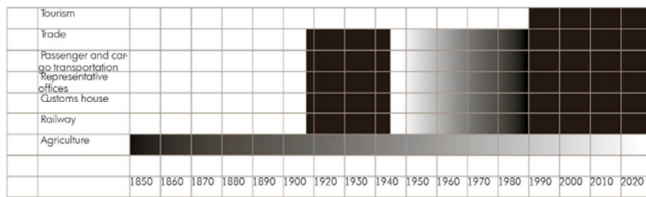


Figure 12. INDUSTRY IN POGRANICHNY IN DIFFERENT AGES (author's scheme).

The development of the village and its enterprises began with the creation of the Grodekovo railway station in 1898, thanks to which, starting from 1900, active freight and passenger traffic began between Russia and China. The

existence of a relationship between the enterprises of Pogranichny and Suifenhe in this period is confirmed not only by the development of trade, but also by the presence of 10 Chinese manufactories in Pogranichny (in 1914). The beginning of the rapid development of the village and its relationship with China was interrupted in 1918 by the Civil War; the long-term consequences of which was the ruin of many households and agricultural manufactories in 1930. However, in the same year many new enterprises appeared, including a bakery, a brick factory, an oil depot, a power plant, and a cannery. Currently, the main areas are passenger and freight transportation (both road and rail), customs and railway maintenance, trade, and agriculture.



**Figure 13. INDUSTRY IN SUIFENHE IN DIFFERENT AGES** (author's scheme).

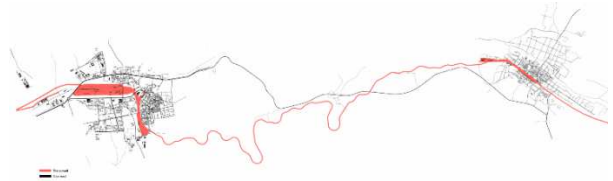
The development of relations between the two settlements over the past couple of years has been negatively affected by the coronavirus pandemic and the restrictions associated with it. At the same time, in connection with the aforementioned events, the connection between the settlements also appeared, as Suifenhe entrepreneurs spoke of the fact that the absence of Russian tourists was quite sensitive for their businesses, and the importance of goods from China was manifested in Pogranichny. Chinese side is currently experiencing a high rate of development, significant investments are pouring into this territory, numerous various enterprises are being built, and there is a tendency to develop cross-border cooperation with Russia.

At the same time, there is some inertia on the Russian side. Primorsky Krai, which includes Pogranichny, is one of the region's most remote from the center of the country, this fact affects the level of its development. In recent years, there has been an active development of the region, investment of financial resources, large construction projects. But so far, for the most part, this has concerned larger settlements compared to Pogranichny. There are responses aimed at interaction and trade with China, such as the creation of free trade zones, but the industrial infrastructure of Pogranichny can hardly be called complicated and developed.

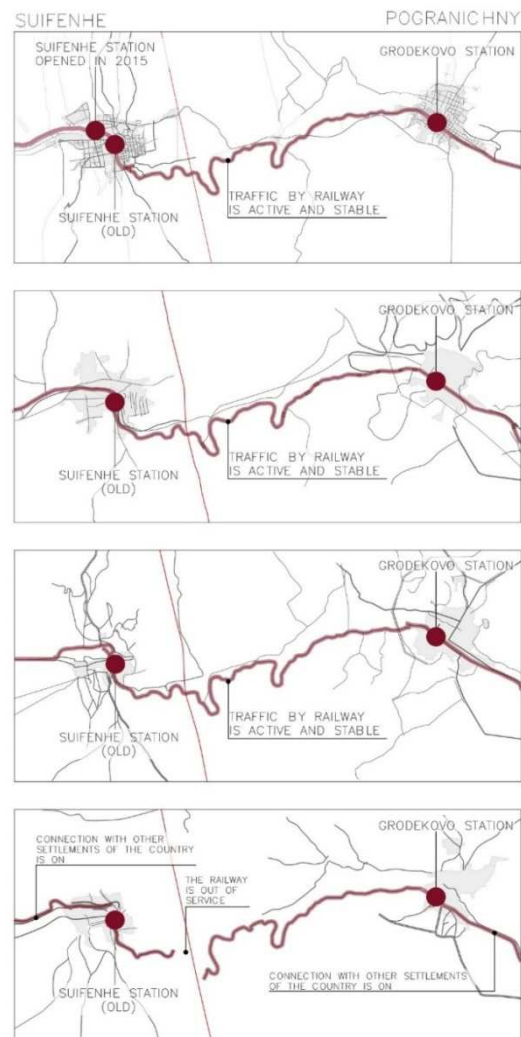
#### 4.4. Transportation

Currently, railway communication is carried out between the settlements, and most of the railway trade between the countries is carried out through Suifenhe-Pogranichny. The railway provides commodity-export relations, freight and passenger traffic. Automobile communication is also developed, along the highway, where (by analogy with railways) both freight and passenger transportation are carried out. Also, an important transport system part is that

Suifenhe and connecting links of the Suifenhe-Manchuria and Pogranichny-Ussuriysk-Vladivostok. Therefore, the development of the transport system between Pogranichny and Suifenhe, as well as within these settlements, is extremely important for the development of the respective regions of the two countries. In the research of the historical development of the transport system, its relative stability was revealed, there was some disruption of transport arteries during the period of Japanese occupation, however, at all other stages, the transport structure was maintained and used. Also, the railway and its stations are key city-forming factors for settlements. So, the stations are located in the center of the settlements, and the territories next to them were actively used in all the historical periods under consideration.



**Figure 14. CURRENT STAGE OF TRANSPORT SYSTEM** (author's scheme).



**Figure 15. TRANSPORT SYSTEM IN DIFFERENT AGES – RAILWAY** (author's scheme).







stable part of the fabric can also be distinguished, and it includes the central part of the settlement, as well as the voids of the railway tracks and the space near the river. During comparing of the fabric of these two settlements, then by now, Suifenhe is much more densely built up, and the park areas are ennobled, while in Pogranichny there is less density, more wastelands, and most of the so-called park areas are wild and not ennobled.

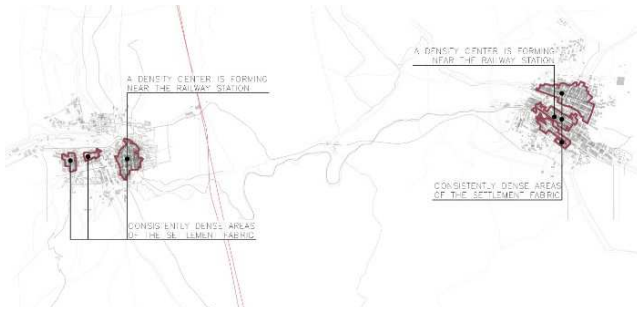


Figure 22. FABRIC SYSTEM IN PROCESS IN 1941-2020 PERIOD (author's scheme).

In addition, due to the peculiarities of the settlements, the passage of railway lines and rivers through them, they are clearly divided into zones and districts. Currently several major construction projects are underway in Suifenhe. In Pogranichny the division into districts is strong too. The river and the areas adjacent to it form a barrier separating Pogranichny and its northern area. The northern and southern parts differ significantly in their structure. The center of Pogranichny is located on the south side of the river, there is a higher density of buildings, administrative and commercial facilities are concentrated, this part of the settlement in its structure is an urban-type settlement, while the northern part in its structure looks like a village, where the living typology is represented mainly by private one-level houses on individual plots of private households. It is necessary to improve the territory of the river and integrate it into the general structure of Pogranichny. Also, even in the administrative center of the settlement, the fabric is not so dense. In Pogranichny there are many wastelands and areas requiring improvement. The second rupture in the fabric of Pogranichny is caused by the railroad tracks, more connections need to be made through them. Currently Suifenhe and Pogranichny occupy approximately the same area, although the population of Suifenhe is almost 6 times larger. This is explained by the fact that the Chinese city is built up more densely and high-rise, while in Pogranichny a large area is occupied by individual households with plots for vegetable gardens. It is necessary to compact the fabric of Pogranichny, to improve the interconnectedness of its parts.

#### 4.8. Space

In general, over the 40 years under consideration, the size of Suifenhe increased significantly, while Pogranichny was more stable and did not change dramatically in size. In both settlements, there were and still are tears in the fabric caused

by railway lines. Like the fabric of the settlements, the space in both cases changed over time, mainly on the periphery of the settlements, while some areas were consistently important at different stages of development.

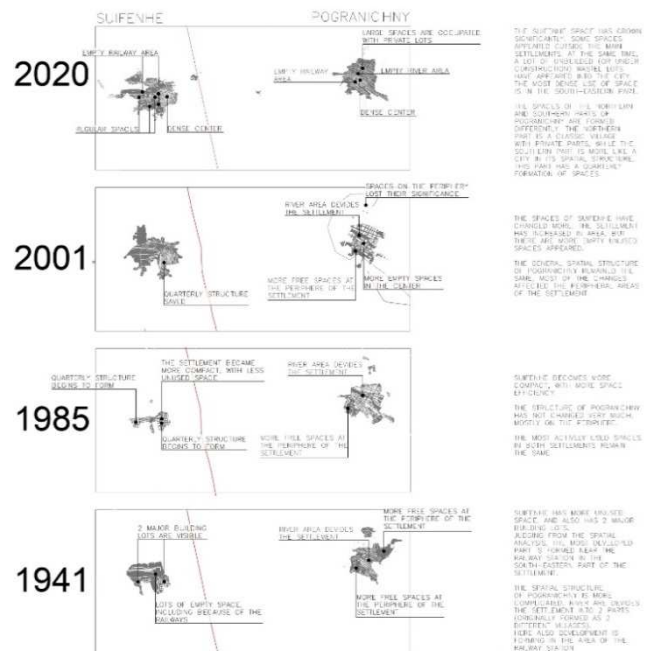


Figure 23. SPACE SYSTEM IN DIFFERENT AGES (author's scheme).



Figure 24. SPACE SYSTEM IN PROCESS IN 1941-2020 PERIOD (author's scheme).

## 5. Conclusion

The analysis of the structure of settlements was carried out according to a number of specific qualities: population, industry, transportation, function, landscape, fabric, space. The analysis revealed many specific features of the structure of the settlements, which were formed under the influence of interaction between Suifenhe and Pogranichny. So, the main factor for the formation and development of both settlements is the railway. Railway stations and related infrastructure facilities are the basis of industry and functional zoning of the settlements. During the considered periods of development of Suifenhe and Pogranichny, railway stations were the main driver of interaction and cooperation. The settlements also influenced each other in the process of formation of fabric and space. So, for example, throughout all the periods under consideration, the most densely built-up



areas of Suifenhe coincided and coincide with areas that are attractive to Russian tourists. Urban Scale analysis also shows that for the past 30 years Suifenhe has been more oriented towards partnership with Russia, this can be seen in the number of economic measures taken here, the development of the fabric of the settlement, its industries. In the same years, changes were also taking place in Pogranichny aimed at cooperation with China, but they were not as pronounced. This fact also contributed to the development of an imbalance in the development of settlements. At the Urban Scale level, important characteristics of the territories that affect the successful cooperation of the two settlements were identified:

- 1) Currently an imbalance has formed in the pace of development, the development of the industry and the population between Suifenhe and Pogranichny.
- 2) Currently the population of the Chinese city exceeds the population of Pogranichny by about 6 times. In order to promote the development of enterprises and trade in Pogranichny, measures are needed to attract a new residents and entrepreneurship to Pogranichny.
- 3) The settlement industries also developed unevenly. At the first stages of the formation of settlements, one can trace a significant relationship between the enterprises of the Chinese and Russian sides. However, over time, it became necessary to create new industries in Pogranichny, and a enlarge cooperation of settlements industries functioning and development.
- 4) The transport system is the basis of cross border cooperation. In the case of these two settlements, the railroad is a key, which played an important role in the process of interaction during different periods of the functioning of the settlements. The road network also developed. However, it is necessary to improve the quality of infrastructure, increase the capacity of stations (especially in Pogranichny).
- 5) Since the main city-forming driving factor of both settlements was railway stations, some similar trends were formed in the functional zoning of the settlements. The functional structures of the settlements are similar, but Suifenhe has more diversity, and the residential areas are mostly mixed-use spaces.
- 6) The impact on the landscape of the territory by settlements mainly occurred due to the spaces occupied by buildings and infrastructure. Arable lands also had a significant impact. It should be noted that at different stages of the formation of the settlements, their size and dimensions changed, but there were also relatively stable areas.
- 7) Currently the recreational potential of Suifenhe has been used to a greater extent than in Pogranichny. In the Chinese city, monasteries, tourist bases are arranged, the river zone is used as a park and a promenade, and an artificial reservoir is arranged. It is also necessary to improve the area near the river in Pogranichny and include it in the fabric of the city.
- 8) For the further development of settlements, it is necessary to eliminate imbalances, create favorable conditions for

cooperation, business, accommodation, travel.

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