Integrated Sustainable Development of Small Towns and Settlements

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Abstract. When we develop big cities, we forget about small cities and settlements. The rate of development of small towns is very low. You can change the trend of improvement and prosperity: direct efforts to the development of small towns. In our research, we consider the village of Shalya. It has a lot of potential, but it needs a push. After a survey of the population and our research analysis, we have chosen a certain territory and directions for its integrated sustainable development. As a result, we justified our project in terms of marketing and economic aspects. The new facility with elements of digitalization in Shalya will contribute to the development of the city and the use of similar technologies. Citizens’ lives will improve.

1. Introduction

Now in Russia there is a massive development of cities, their expansion and improvement. Cities such as Moscow, Saint Petersburg, Nizhny Novgorod, Kazan and Yekaterinburg have a high level of development in urbanism, culture and quality of life. Being the largest urban centers, they attract not only investors, but also the rural population (as a place of migration for further residence) [1].

Localities with a population of less than 10,000 are also subject to development. But their improvement is quite long in time. And the rate of population decline due to moving to cities is very high. Such cities lag behind the overall socio-economic development and are characterized by a low standard of living [2]. In this regard, there are problems of integrated sustainable development of small settlements, their transformation into full-fledged cities for comfortable living, where the influx of population will prevail over the outflow (especially now, after the pandemic).

In our research, we consider the integrated sustainable development of the territory designed in accordance with the national project "Smart city". The urban-type settlement of Shalya was chosen as the project object.

1.1. Relevance and practical significance

Integrated development of such localities as the village of Shalya will reduce the outflow of population from rural areas. At the same time, it will help attract investors, improve the quality of life of the population and transform the territory.
Based on the results of this research, we can draw conclusions about the need to develop the territory in one direction or another and take it as a base for the implementation of the project in Shalya.

1.2. Purpose and objectives of the study
The purpose of the study is the creation of marketing and economic feasibility of the project of Integrated sustainable development of the territory in Shalya.

The objectives of this study in accordance with the goal:
- Identify the territory for development by interviewing the population and analyzing the problems of the Shalya territory;
- Develop the main directions of territory improvement;
- Develop and describe the concept of the territory improvement project;
- Define methods and stages of project implementation;
- Calculate the cost of developing and implementing an improvement project;
- Consider the possibility of involving business representatives in our project and the implementation of modern digital technologies in urban process management.

The information base of the research was provided by legal acts, Internet resources, and the authors' own research.

1.3. Known results and hypotheses
The role of small towns in the state [3]:
1) Small towns connect rural areas and large cities;
2) They have important industry specifics;
3) They contain elements of the production sphere.

However, small towns are not able to fully develop their infrastructure due to budget constraints. Therefore, a negative image of the territory is formed, which contributes to the outflow of people [4]. This can be overcome by attracting funds to priority areas of activity, such as construction. Construction production is the basis for integrated sustainable development of territories. The variety of components of the construction complex helps to create a city with a high quality of life. Construction projects require investments that can contribute to the development of infrastructure in small towns [2, 5, 6].

Shalya is an urban-type settlement located 160 km from Yekaterinburg, in the South-West of the Sverdlovsk region. The population as of 2019 is 6,410. It covers an area of 4,852.20 km². Despite technical progress and industrial development in all regions of the Middle Urals, the amazingly beautiful nature of Shalya has preserved its pristine purity and freshness. Living in these places is extremely attractive. Clean air and ecology attract everyone.

The urban-type settlement of Shalya appeared relatively recently – in 1903. The organization of the settlement is connected with the beginning of survey work on the construction of part of the TRANS-Siberian railway on this site. From 1907 to 1909, a station, depot, water pump, railway station and residential buildings appeared in the village. A year later, the first trains started running on the railway tracks. Most of the population of the village was attracted to work on the railway [6].

2. Theoretical bases
2.1. Research methodology
The research is based on the analysis of the assessment of modern approaches to the formation of a comfortable urban environment. It includes forecasting and financial planning processes taking into account modern requirements for the formation of the urban environment, which allows you to design different types of complexes that meet the increased needs of the population. A marketing justification for the concept of the Shalya project has been formed, which includes clarification of the conceptual framework, prerequisites for the development of a sports complex development project, which takes
into account the positioning of the complex in the village, and allows determining the main directions of successful project implementation. Economic justification of the project was developed, covering financial and economic indicators, their efficiency and payback, simplicity and comfort of a sports complex that allows to solve problems of formation of a comfortable urban environment.

Methods of research are personal survey of local residents (to identify the main problems and preferences for the improvement of Shalya), observation (visiting the area to explore the local area), analysis of information sources during project development (consideration of ideas based on the experience of other cities), project modelling (in 2D and 3D format) and interviews with local authorities (discussion of the proposed idea).

2.2. SWOT analysis of Shalya

Ensuring the sustainable development of small towns is associated with various external and internal factors. For example, the lack of necessary communications or the lack of able-bodied population [5]. So our research started with SWOT analysis (see Table 1).

The main wealth of the district is forests. Hence, there is a good development of the forest industry and agriculture (animal husbandry, grain farming, feed production). The Chalet is home to the Ural optical and mechanical plant, the Shalya construction Department, the Asphalt and concrete plant and the Shalya bakery. Also, the residents of Shalya are proud of the graduates of the Shalya children's youth school. Athletes from Shalya show themselves at both regional and international competitions.

| Strengths | Weaknesses |
|-----------|------------|
| 1. Availability of territory expansion potential; | 1. Distance from the administrative centers of the region; |
| 2. Mostly ecological territory with forests and rivers; | 2. Deterioration of urban utilities and engineering infrastructure; |
| 3. Favorable investment climate, potential for agricultural development; | 3. Insufficient quality of road infrastructure; |
| 4. Availability of road funds; | 4. High budget subsidies; |
| 5. High level of youth sports training; | 5. Small number of public places; |
| 6. Active position and participation of local residents in projects to improve the Shawl; | 6. Lack of developed sports grounds; |
| 7. Low market value of agricultural land plots | 7. Low qualification personnel |

| Opportunities | Threats |
|---------------|---------|
| 1. Development of tourist infrastructure; | 1. Increasing urbanization; |
| 2. The development of sports potential; | 2. Lower living standards; |
| 3. inclusion of Shawls in regional investment projects for integrated development of territories; | 3. Lack of maintenance of the territory in proper form; |
| 4. Introduction of innovations; | 4. Degradation of the territory |
| 5. The government support the development of small towns | |

The presence of a mountain landscape contributed to the creation of a ski track for athletes and Amateurs. In the cold weather of the city, it is difficult to find places for sports in this area. Local stadiums do not meet international requirements, and in winter classes are simply impossible. The lack of a functioning sports complex creates a significant barrier to the development of sports in the area.
3. Research part. Identification of the territory for integrated sustainable development of the territory

3.1. Survey of local residents
To confirm our observations, a survey was conducted among the local population, including athletes and their coaches. The survey was conducted online on April 2-5. Questions that were asked to local residents:

1. Do you play sports?
2. Are you satisfied with the number of sports fields in the Chalet?
3. What do you think if a new sports ground/complex is necessary in Shalya?
4. What sports facilities are attractive to you? (with a choice of answer)
5. Where is the best place to place this object?

A total of 100 people participated in the survey, including schoolchildren. Link to the survey: https://docs.google.com/forms/d/18wS_mDxyDE_D2CVFZepO4aNuAf0NoYonX-rz0U5m-dA/edit.

As a result, our assumption about the need for sports facilities was confirmed. According to the results of the survey, 90% of respondents are not satisfied with the number of sports grounds and facilities in the Chalet. At the same time, 96% believe that it is necessary to build a new sports complex. Based on this, it was decided to propose and justify the concept of the sports complex project.

3.2. Choosing a territory and its characteristics
According to residents, it does not matter where exactly the sports facility will be, the main thing is its availability (67% of respondents answered this way). Such an interesting opinion is associated with the small area of the village and the ability to get to any place in the Chalet without any difficulties. The presence of a hilly landscape contributed to the uneven distribution of the inhabitants of Shalya. Therefore, there are many empty or abandoned territories that require improvement.

Based on the respondents’ suggestions and our observation, we have identified the territory that is best suited for the implementation of our idea. In the southern part of Shalya, near the foothills, there is a field that used to be the «Luch» stadium / football field. No one has been playing sports at the former stadium for a long time, this area is used as a landing site for a helicopter or walking cows.

Cadastral number of the land plot 66: 31:2201010:688.

When studying the information on this territory, the following information was found from the Decree of the head of the Shalya district of 13.03.2009. "Strategy of socio-economic development of the Shalya city district for the period up to 2020": "a land plot was Allocated and its surveying was carried out for construction according to a standard project of a sports and recreation complex in a Chalet at the «Luch» stadium. Shalya city district was included in the Federal program for the construction of a football field with artificial turf in the village of Shalya " [8]. However, this project was not implemented for unknown reasons.

The area of this territory is about 20,000 m². This is enough to build a small sports complex/facility on this territory. Nearby there are residential buildings and a kindergarten, which is fenced.

3.3. Main directions of improvement
To form the directions of improvement of this territory, we offered local residents several ideas:

- Bike stunt track;
- Swimming pool;
- Indoor court (ice Palace);
- Outdoor stadium;
- Indoor arena (treadmills and exercise equipment);
- Sports and entertainment center for children.

Based on the survey, we found out which structures are more interesting to local residents. This is an outdoor stadium, a swimming pool, a sports and entertainment center for children and an indoor
arena. Some of these objects have a similar purpose. For example, an outdoor stadium and an indoor arena. A sports and entertainment center for children can be based on one of the objects. So we decided to replace the children's center with an Ice Palace.

4. Practical part

4.1. Concept of environmentally oriented development of the territory

The eco-friendly atmosphere is very suitable for recreation and sports, but there is no suitable place for this. In this project, we want to solve this problem by building a multifunctional sports complex based on the Smart city project. It will be based on the following principles:

- Balanced operation of all equipment;
- Recording of all events with a detailed report and indication of the working device;
- Continuous monitoring of the operation and condition of all equipment;
- Immediate notification of residents about the occurrence of an emergency.

This will help people exercise safely and comfortably.

Modern information technologies are a necessary element in the development of small towns. Digital tools will speed up the transition of a small city to a new and modern city. The standard of living and skills of employees will increase [9]. Thanks to the Federal project "Digital region", the implementation of digital technologies and solutions in our project will accelerate, as well as eliminate digital inequality in the regions, which will make the life of residents of Shalya as safe, convenient and comfortable as possible.

4.2. Urban development project and analysis of engineering networks

The territory we selected belongs to the public and business zone, or rather to the zone of physical education and sports facilities. Residential areas are located nearby. In accordance with Rules of land use and development of the municipality of Shalinsky city district, land plots that are in municipal ownership can be provided to individuals and legal entities, if this plot is formed. This requirement is met. Permission is also required to use this land plot, which can be obtained when developing a project and submitting it to the local administration [10].

The analysis of engineering networks focused on the study of the Summary plan of engineering networks of Shalya. So, the good location of the land plot for development does not cause difficulties for connecting all the necessary engineering infrastructure [11, 12].

4.3. External appearance of the territory

Using the 3D visualization program, we built a 3D model of the sports complex (see Fig. 1-2).

The territory is divided into different zones. At the entrance there is a Parking lot where every visitor to the sports complex can Park their car (see Fig. 3).

To the right of the Parking lot is a 65x45 m² building with a 50x20 swimming pool. Men's and women's changing rooms and showers are located along the pool. On the left is an indoor ice court 95x50 (60x30 m² ice court). In it, residents of Shali will be able to skate and play hockey and other skating sports all year round.

Behind the pool there is a 90x45 m² football field and 3-4 running tracks 1.22 m wide (see Fig. 4).

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At the corner with a swimming pool and a football field, there is a small Park with a pond where anyone can walk and enjoy nature (see Fig. 5-6).
The sports complex looks compact and beautiful. Having a choice for sports, beautiful architecture, design and modern style will attract both local residents and residents of other cities and regions.

4.4. Economic feasibility
The economic feasibility of our project is as follows:
  1) Thanks to our sports complex, the attractiveness of Shawls will be increased, this will contribute to the construction of new residential areas;
2) A lot of new jobs will appear in the sports complex, which will help reduce the outflow to larger cities, such as Ekaterinburg;
3) Thanks to the installation of surveillance cameras, the number of crimes will be reduced, it will be safer to move around the streets;
4) Creating Parking spaces will make the area more comfortable for car owners;
5) Due to the appearance of many sports facilities, residents of Shalya will be able to play sports from childhood, thereby taking up their free time, which will help reduce crime.

We hope that our project will be the starting point from which the ennobling of the entire Shalya will begin.

The project involves the construction or installation of an open stadium with bleachers and a football field, ample Parking, Green Park with playgrounds for children of different ages and horizontal bars, Indoor ice court and swimming pool, Landscaping of the territory by creating lawns and flowerbeds on the territory of the Park, Lanterns and benches in the Park, Bins with waste separation system and Surveillance system. The preliminary cost of the project is about 700 000 000 rubles.

Shalya has developed many municipal programs for 2018-2024 and determined the budget that the Shalinsky city district is ready to spend. Our project is suitable for two municipal programs (source: Budget for citizens of the Shalinsky city district):
- "Formation of a modern urban environment on the territory of the Shalincky city district for 2018-2024". The budget is 164 thousand rubles;
- "Socio-economic development of the Shalinsky city district until 2023". Subprogram "Development of physical culture, sports and youth policy in the Shali city district until 2023". The budget is 2652 thousand rubles.

The customer will be the administration of the Shalinsky City district.

4.5. Investors and local authorities
To implement our project, we need to attract investors. Potential investors can be both local entrepreneurs and the state. The sustainable development of small towns requires a regulatory process on the part of local authorities [9]. To get the opinion of local authorities, we decided to hold a meeting with the mayor of Shalya, Dmitry Mashenkin, and present our project. The interview was conducted by Daria Shalina on 15.06.2020. The representative of the local authorities agreed on the need to build a new construction complex and was impressed with our project.

5. Results and suggestions
When creating our project, we relied on the preferences of residents of the landscaped area and formed the main directions for the integrated development of the urban environment.

Our project involves the creation of a multifunctional sports complex, which will be surrounded by greenery and playgrounds. As a result of improvement, the urban-type settlement of Shalya will become an attractive place for sports training and competitions, and the complex will become a place of recreation for everyone.

The total cost of improvement of the quarter will be about 700 000 000 rubles. At the same time, our sports complex will use digitalization tools: a modern video surveillance system, smart lights, and an Internet site. Customers will be able to watch videos and practice at home, which is important during the pandemic.

A new construction complex in a small town will be the starting point for creating a megalopolis.

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