

Expansion features of Irkutsk suburban areas' development

E N Serebrennikov

Sochava Institute of Geography SB RAS, Irkutsk, Russia
Irkutsk Scientific Center of the Siberian Branch of the Russian Academy of Sciences,
Irkutsk, Russia

E-mail: togr2010@yandex.ru

Abstract. This article is devoted to the problems of spatial development of the suburban zone of the city of Irkutsk in post-Soviet realities. The paper presents some features of suburbanization in Russia, as well as geographic factors that influence the formation and development of the Irkutsk agglomeration, such as high dependence on the poly-highway; a special model of industrial development; Baikal factor. Particular attention is paid to the peculiarities of development in various directions and spatial differentiation of various types of suburbs. The reasons and consequences of such development are considered. A typology of the Irkutsk suburban area is presented based on the nature of the settlements with a brief description.

1. Introduction

Urbanization is becoming the leading process in the establishment of the chain and the system of migration. Cities are becoming the centers of population's gravity, points of regional development, and its primary foundation for human migration. During the development of urbanization processes in any large city there arise a moment, when the vector of migration movement alters from urban to suburban areas, in other words, a new urbanization stage takes place, it is called suburbanization [1].

Suburbanization is a process of the growth of suburban areas, as a result of people's migration from a central city or a countryside. Building "satellite" towns has become a classic form of suburbanization. "Satellite" towns are divided into two groups: industrial "satellite" towns and "bedroom" towns. In particular, industrial satellites are located mainly in the periphery of urbanized areas (i.e. away from central cities), although they are bigger and older. And vice versa, despite the fact that "bedroom" towns are younger (they started to develop only after the mass growth of car vehicles), almost all of them are generally located closer to the central city [2].

Russian suburbanization has certain features. When moving to the suburban areas, city dwellers of European countries sell their urban properties and regard their country house as the main residence. On the contrary, in Russia, such property is viewed as the second home, because when moving to a cottage, people prefer to pursue owning their urban flats. Russian urbanization is seasonal. Villages with gardens or dachas as well as country cottages form an alternative system of settlements: their quantity twice exceeds the number of rural settlements. The amount of country house settlements of different sizes is increasing [3]. In this case, it is appropriate to say that suburbanization did not indicate the spread of city lifestyle in rural areas but, on the contrary, it meant the establishment of rural lifestyle in cities [4].



In Siberian conditions, with its vast territories and far distances between major cities, agglomerations have become in a special demand. Due to satellite towns' close interaction and location agglomerations efficiently accumulate different objects of industry, science, social sphere, culture, etc [5].

2. The problem formulation

Irkutsk agglomeration includes both typical and specific features of the system organization, caused by peculiarities of city's location and development. Irkutsk is one of the oldest Siberian centers, developed mostly due to the construction of the Trans-Siberian Railway in the end of the 19th century. It used to perform a transit function instead of being the center of the surrounding area's development for a long time, and its potential for the region development was embodied in several highways within eastern and north-eastern directions. For a long time Kachugskiy Trakt (a highway) used to be the most essential one, leading to the Lena's upstreams, it lost its strategic role as a connector of inner districts of the region after the Tayshet-Lena railway had been built in the middle of the previous century. Expansion to the west of Irkutsk was restrained by western Sayan Mountains.

Thus, all Irkutsk "satellite" towns were situated along the Trans-Siberian Railway on the left bank of the Angara River. Besides, they were connected by the federal highway M55, therefore many industrial enterprises had been concentrating there: and towns had been growing. Rural settlements had been developing between the towns: Smolenshchina, Mamoni, Meget, Maksimovshchina. There appeared to be small rural villages outside the city, along the railway and away from industrial manufactures.

However, the situation on the opposite bank was different because of the lack of large highways, northern areas maintained ultimately agricultural relations with a myriad of villages and rural communities. After the collapse of the USSR and without the governmental support distant villages' inhabitants started to concentrate in settlements nearer to Irkutsk.

The features of Irkutsk geographic position have formed several peculiar factors for the suburban areas' development, distinguishing it from other Siberian centers, also being the centers of the regional territories' development.

The first factor among them is a higher dependency from poly-highways including the Moskovskiy Trakt and the Trans-Siberian Railway. The second factor is focused on the fact that the postwar Irkutsk has become more than a center of just development but industrial one. The progressive model for Soviet expansion planning of territorial production complexes was implemented there. Agricultural manufacturing was not on the list of specialization industries of territorial production complexes, as a consequence, the agrarian development of the surrounding territory was being made without any control. In some cases, it remained in down-to-dated forms on collectivization and state manufacturing basis, in other cases, it became a victim of industrial plans and rural population were moved out into other places, as it happened after filling in the storage reservoirs of the large water-power plants.

The third factor is the lake Baikal's closeness, which influences on the system of resettlement around Irkutsk.

3. Research method and materials

The cartographic method was used for examination of Irkutsk rural areas, it allowed to detail the rural setting up to each horticulture or a separate homestead. The suburbs of Irkutsk City covers the areas of Irkutskiy, Shelekhovskiy and Angarskiy districts, meanwhile its essential part belongs to Irkutsk district.

Irkutsk rural population had increased in 30 thousand people for 20 post-Soviet years, enlarged almost by one and a half. According to the population Census of 2010, the population contained 84,3 thousand people. The fast growth of district population continued after the Census and by the beginning of 2016, the district population reached the number of 112, 1 thousand people [6]. The majority of Irkutsk district population live in the suburb area (25-30 min away from regional center), and its quantity keeps growing: since 2007 to 2010 the rate of district dwellers of the nearest rural

areas had grown from 72,1 % to 89%. The positive dynamics is noticed in the majority of municipalities of Irkutsk agglomeration suburbs- Markovskiy, Molodezhniy, Ushakovskiy, Smolenskiy, Maksimovskiy, etc.

Radically parting highways - Moskovskiy, Aleksandrovskiy, Kachugskiy, Goloustenskiy, Baikalskiy, Melnechniy, and Kultukskiy tend to be the core vectors of development. The most developed highways used to be Baikalskiy Trakt, Melnechniy Trakt and, Kultukskiy Trakt. There are several reasons for that: first, they are relatively eco-friendly and situated closer to the Angara's warm bays. Second, they have close communication and location to the city, this is common for Baikalskiy and Melnechniy Trakt. Kachugskiy and Aleksandrovskiy Trakt developed due to such factors as the reconstruction of already existed villages, and lower prices on land and property. The crucial factor is transport purchasing. For example, in Irkutsk the car rate had grown by 38,5% in comparison to 2009. In 2009 this indicator was 223,4 units per a thousand people, and in 2015 it reached 309,1 units per a thousand people. Thus, for example, Khomutovo village had an increase more than by 25% since 2012, Karluk - by 20%, Urik - by 14%.

It should be mentioned that the active migration of citizens and their city lifestyle to settled rural environment contributed to a number of innovations. This fact proves that these villages definitely can not be related to the rural setting. Some kinds of economic activities and small enterprises unfamiliar to rural area started to appear. Among them are cosmetology clinics, car services and car washes, fitness centers and large wholesale retail chains, grooming, etc.

Direction to Baikal - Listvyanka village is considered to be the most prestigious because of its closeness to warm bays of the Angara, developed infrastructure and ecology. This destination has a restricting factor though - Pribaikalskiy National park, it is still going to develop more actively. Even at this moment suburban roads are being reconstructed and lanes on the roads are being broadened. A myriad of high class cottage villages have been built on this direction.

Another direction to Baikal is Kultukskiy Trakt. Despite the fact that this highway is federal, there is no such intensive development of rural areas because of the close presence of Aluminum plant "IrkAZ SAUL" and the transit character of the highway. Two large settlements, Baklashi village and Vvedeshchina are situated away from the highway, near the Irkut river. And quite recently small cottages have appeared there within the programme of multi format building in Shelekhov town and neighboring territories of Shelekhovskiy district, such as Yasnaya Polyana, Gagarin, Familiya and others.

Direction to the north is Kachugskiy Trakt. Kachugskiy Trakt has always had agricultural importance, and after the collapse of USSR the population of distant rural villages started to locate nearer to vilages Karluk, Kuda, Khomutovo, Zapadnoe, Granovshina, etc. Oiyok is considered to be the latest village, about 40 km away from Irkutsk.

One can observe the growth of population there (table 1). Citizens of this district saved quite a strong connection with the land and the household. This direction leads to the Baikal but because objects are too far away from each other, it can only serve as a transit for tourists. And the majority of population will pursue to concentrate in the limits of 25 km from the city.

Suburban areas can be viewed as melting pots for population, changing its structure. If previously they used to be rural citizens, who migrated closer to the city, now they are citizens, who are aimed to live in the suburbs. And, in this case, directions that are not connected with large highways are in high priority.

People seek for the life in the suburbs and do it according to their financial abilities and needs. For some people it is cheap accommodations with affordable municipal transport, for others it is a country house with a small patch of land, situated 20 minutes away from the city and someone values his personal townhouse in a prestigious village with the diverse infrastructure [7].

According to the character of the settlements, Irkutsk suburbs are divided into three zones (figure 1). The first zone is the nearest to the city settlements forming with the city a single system of migration. There the municipal transport is developed in greater extent, also objects of social sphere and all types of infrastructure. In other words, they are bedroom communities, located behind the

official edge of the city but creating one unity with it. The second zone is the suburbs in its common definition, means housing owning in the outskirts (a house, a cottage), and a personal car. The third zone are satellites forming boundaries of the suburbs (Oiyok, Listvyanka, Bolshoy Lug).

Table 1. Dynamics of the population in Irkutsk suburban areas

Settlement	1985 yr	1996 yr	2010 yr	2012 yr	2016 yr	Increase in % 2010-2016 yr
Vector on the Baikal / Listvyanka						
Molodezhnyj	246	329	6640	7170	8337	25,5
Novaya Razvodnaya	no data	no data	1313	1395	1687	28,5
Dzerzhinsk	1896	1385	2277	2477	2665	17
Novolisiha	282	218	528	562	740	40,1
Pivovariha	1581	2206	3506	3729	4111	17,2
Bol'shaya Rechka	no data	2300	2612	2667	2952	13
Vector to the North						
Karluk	1573	1879	2572	2793	3356	30,3
Homutovo	3705	4289	12872	13793	16445	27,7
Oyok	2953	2802	3678	3797	4013	9,1
Vector to the East						
Bol'shoj Lug	5900	5500	5015	5085	5322	6,1
Olha	no data	no data	1744	1855	2064	18,3
Smolenshchina	1789	2011	3214	3470	4162	29,5
Markova	2300	3900	6930	11365	20627	197
Vector to West						
Meget	8700	8000	8828	8873	8863	0,4
Mamony	1167	1311	3154	3178	4345	37,7
Malaya Elanka	395	452	774	776	917	18,4

One can see in the picture that only the first one forms more or less coherent picture of the suburbs, when further there is an abrupt differentiation between highways. Meanwhile, the land between highways is weakly developed or even unoccupied.

4. Results and Discussion

Currently, several types of the development of suburban areas exist. The first type is the decline of villages' growth due to land purchasing or inheriting properties by relatives-citizens. The second type is the development of low-rise buildings, new districts, and bedroom communities. The third one is typical suburban villages with poly-capital buildings, seasonal for living in them. All three types of suburban development are appropriate for Irkutsk, but the character of expansion migration and its optimization is highly individual, as the expansion strongly depends on linear-nodal migration structure.

Of the core factors of suburbanization is its car purchasing. In 2009 this indicator was 223,4 unit per a thousand people, and in 2015 it reached 309,1 unit per a thousand people, i.e. had grown by 38,5%. Mass character of citizens' migration to suburb areas revealed the lack of space quite quickly, it led to the massive cultivation of the lands situated outside the boundaries of localities. Intensive construction of homesteads on the agrarian lands promoted the enlargement of the suburban areas by several times [8].

As a consequence we notice rapid development of unoccupied areas along the major highways. Meanwhile new directions of suburban development are restrained by the lack of funding in infrastructure that would allow compensating linear character of the development; to decrease the

overload of current routes; and to allocate in even proportions the populations, objects of social sphere, entertaining and shopping centers.

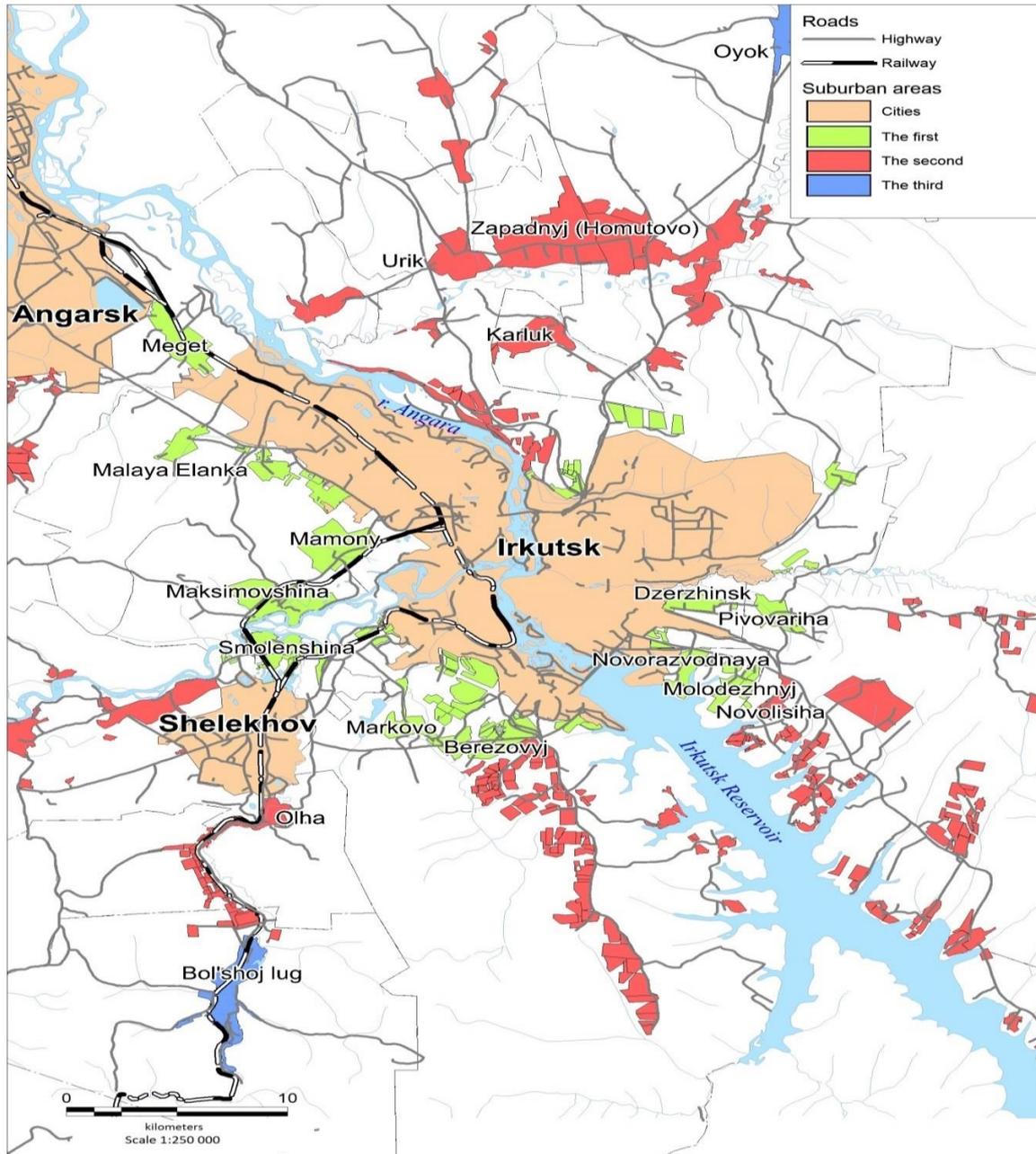


Figure 1. Irkutsk suburban area

Methods that can be provided in this case are the restriction on traffic of personal transport in the city center; it is of utmost importance to develop the system of public transport in technological as well as in logistic way. other methods include the creating new bypass routes of public transport on less loaded road sectors, searching for faster and more comfortable routes to key city's places, eliminating of duplicating routes, creating car stations for intercity transport beyond overloaded transport highways, increasing of quantity of public transport vehicles. Another urgent goal is raising the attractiveness of pedestrian zones with the help of the development of greenery, creating comfortable sidewalks, pedestrian crossings.

These methods are being embodied within the agglomeration program “Safe and qualitative roads”. In accordance with the Resolution of the Government of the Russian Federation of 10.10.2016 No. 1050 "On the Organization of Program Activities in the Government of the Russian Federation".

In the process of Irkutsk agglomeration's formation and development, one of the most crucial moment is creating unified real estate market in Irkutsk, Angarsk, Shelekhov, and corresponding districts. Developed market of real estate in the region is characterized by presence of large property developers, and capacity to implement big projects of complex building. A high priority task of agglomeration is urbanizing territories between existing towns, in the long-term perspective it might lead to the establishment of the de-facto unified locality with uninterrupted town building.

If forecasting further direction of the building complex's development within the frames of Irkutsk agglomeration, when choosing the patches for small-scale residential building (from separate buildings up to several neighborhoods) investors and property builders will prone to patches of land, located beyond city boundaries or directly near to its boundaries- in the suburban zones. Because such building assumes smaller expenses on infrastructure as well as smaller expenses on marketing promotion of the projects.

5. Conclusion

Nowadays suburban areas are being developed actively as a zone of population migration and as a zone of additional functions and detachment of particular functions away from the city-center.

One can notice the increasing number of localities, being parts of Irkutsk agglomeration. Positive dynamics is caused by their location near large cities of the agglomeration. The dynamic way of suburban transformation proves the existence of complicated system of massive agglomeration's cooperation. The character of «balance wheel» migrations changes when suburban citizens seek for a job in the central city, and town citizens gradually purchase real estate outside the city having saved their workplaces. Suburbanization forms a new quality of the territory and a new quality of life. The crucial effect of Irkutsk agglomeration's development is its interaction with mutual complementary agglomerations of peripheral zones (agricultural, touristic-recreational, specially protected territories). Periphery of agglomeration's areas near the Baikal is a part of the Baikal national park. The territories of agro-food specialization are developing in Usolskiy and Cheremkhovskiy districts, also, in neighboring to Irkutsk vicinities of the Ust-Ordyn Buryat District. While agrarian territories are significant within the boundaries of Irkutsk region, the Baikal touristic-recreational zones have an important meaning not only in local and regional ways, but also in international one.

Agglomeration processes are controversial. On the one hand, a gradual population's concentration takes place within the whole Irkutsk region. As one of the most economically developed zone, Irkutsk city agglomeration (ICA) attracts population from less developed regional districts. From the other hand, an active de-concentration is going on the territory of the agglomeration: Irkutsk citizens move from overloaded places to less populated localities of the suburb, which offers more attractive life conditions. For the past decades, suburban area of ICA has increased significantly. A greater number of people migrating to the suburb causes new difficulties, wherein earlier existing problems of rural areas are still unsolved.

Two contrary directions for the development can be found in ICA building. In Irkutsk city and its neighborhood there is a highly intensive concentration of residential zone with high-rise buildings. Its consequences are the overload of the existing systems and the infrastructure, the lack of greenery and recreational zones, the discomfort of the environment in general. At the same time, there is a process of extensive enlargement of suburban area with private low-rise houses on patches of land. The area and population is quickly growing, the infrastructure and communications become insufficient for such number of people. Besides, valuable agricultural and recreational territories are being destroyed. Thus, the irrational usage of ICA's regional resources leads to the environment, uncomfortable for people living.

Taking into consideration all the factors above, the following localities with high population growth rate have the greatest potential for the development: Khomutovo direction (Khomutovo

village, Zapadny, Urik, Kuda, Granovshina, Pozdnyakova) can be a center of agrarian manufacturing; Markovo village and its outskirts; Meget village; Molodezhniy village and its outskirts. These territories were allotted for creation of zones with the high rate of residential building. Besides, social infrastructure and new workplaces have to be created in these territories.

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