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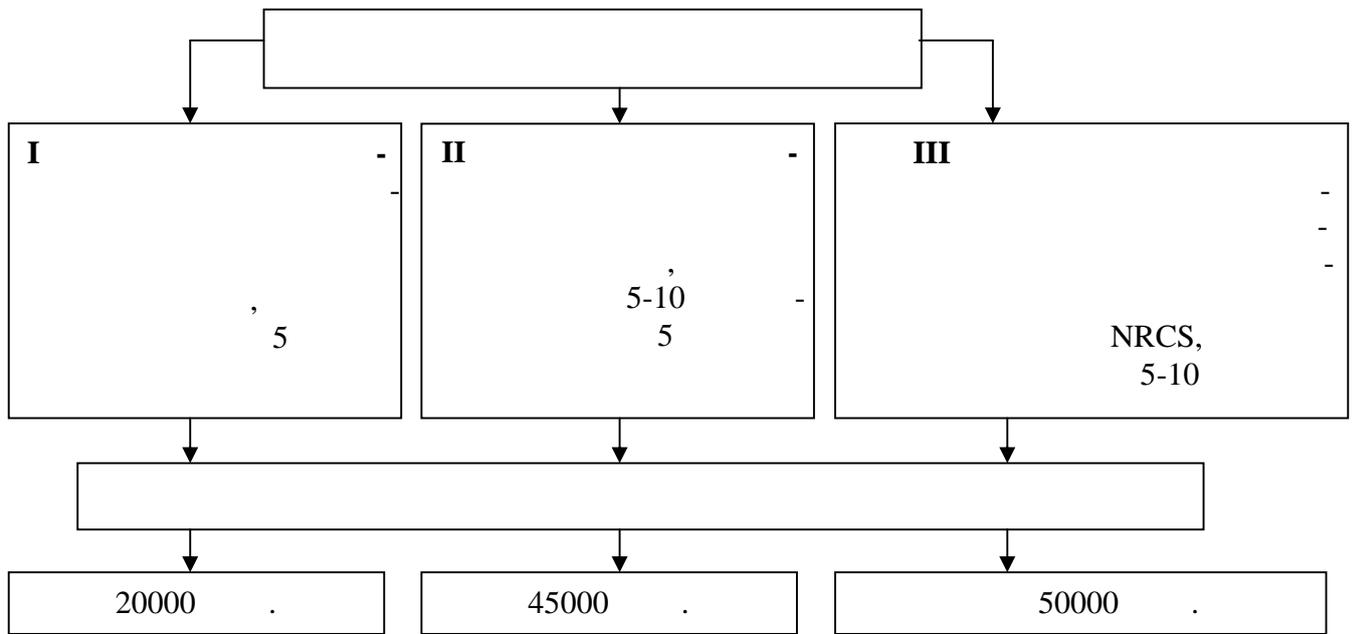
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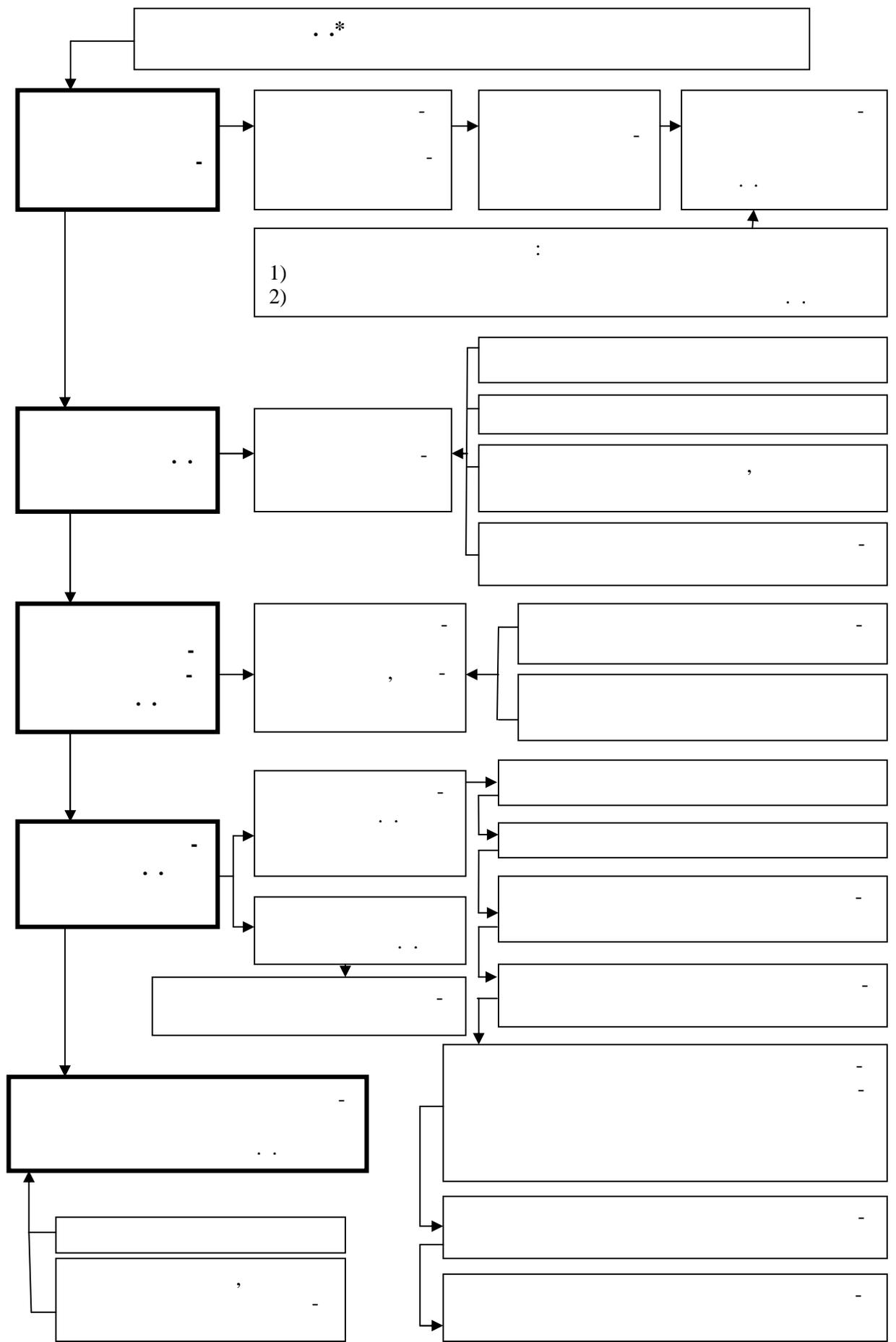
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## 2.1 Общие сведения

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## 2.2 Природные условия

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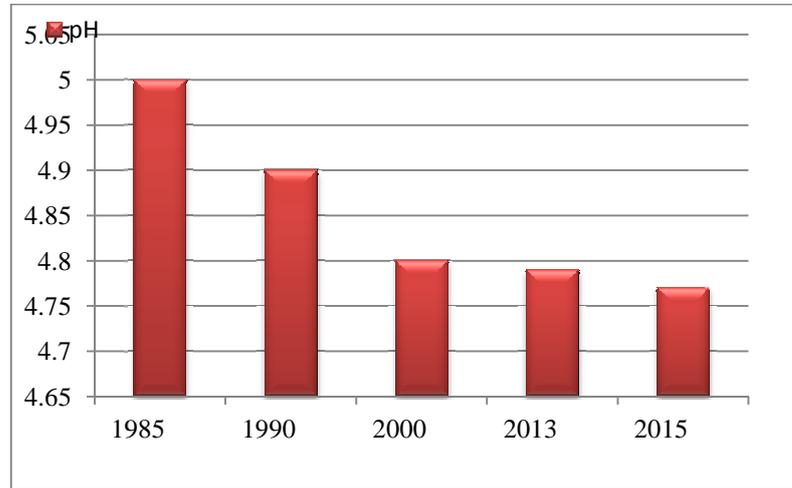
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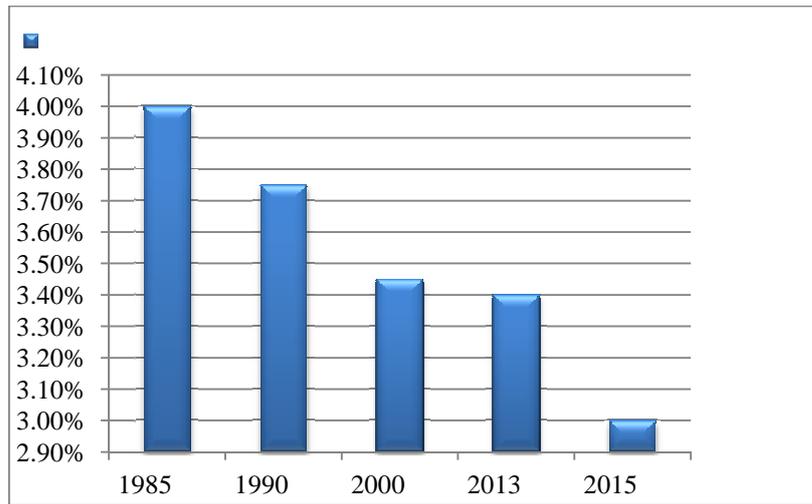


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Наименование	Тип почв	Состояние
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	светло-серая лесная	лес
	серая лесная	лес
	серая лесная	поле засорено
	серая лесная	поле засорено
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	серая лесная	лес
	серая лесная	многолетние травы
	серая лесная	многолетние травы
	серая лесная	поле засорено
	серая лесная	многолетние травы
	серая лесная оподз	строения
	серая лесная оподз	лес
	серая лесная оподз	поле засорено
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КФХ "Муратов"	серая лесная оподз	многолетние травы
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	дерново-оподзоленная	лес
ООО "Мозаловская нива"	пойменно-дерновая оподзоленная	поле засорено
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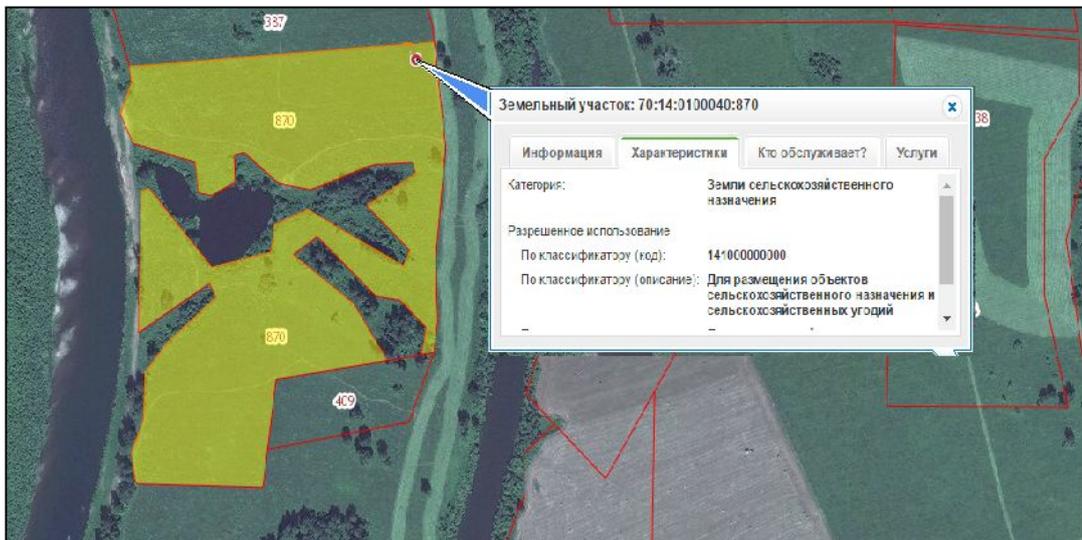
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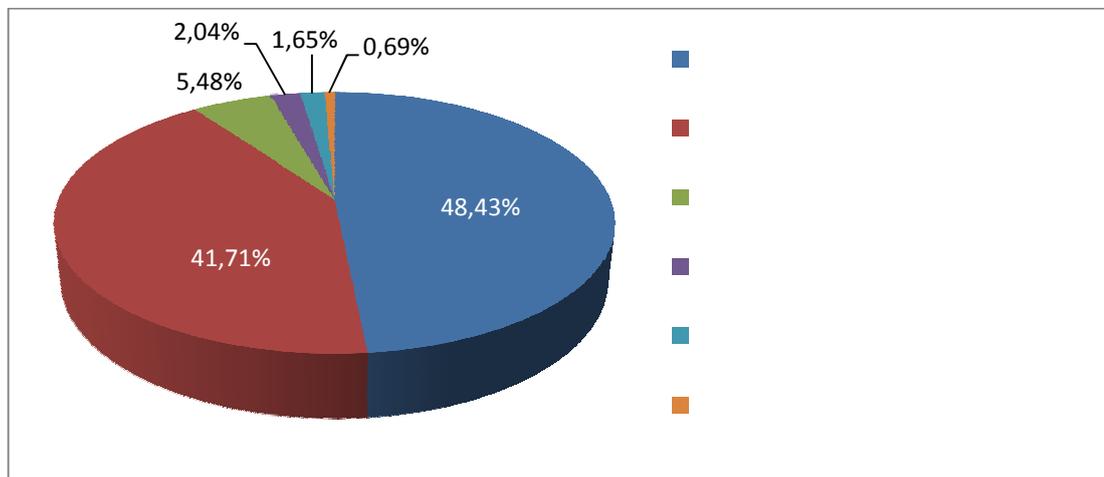
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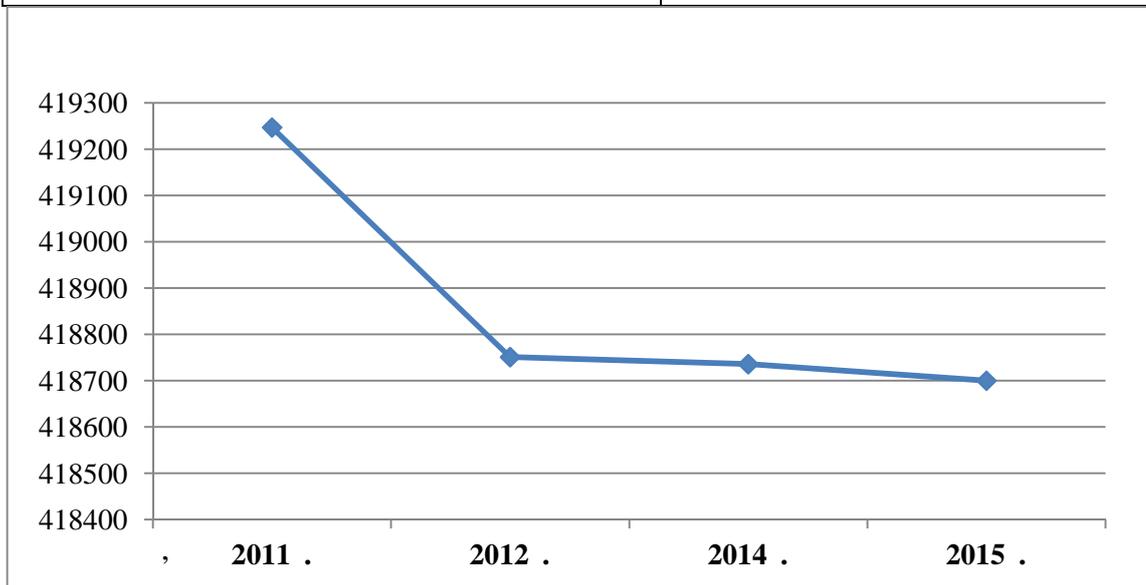


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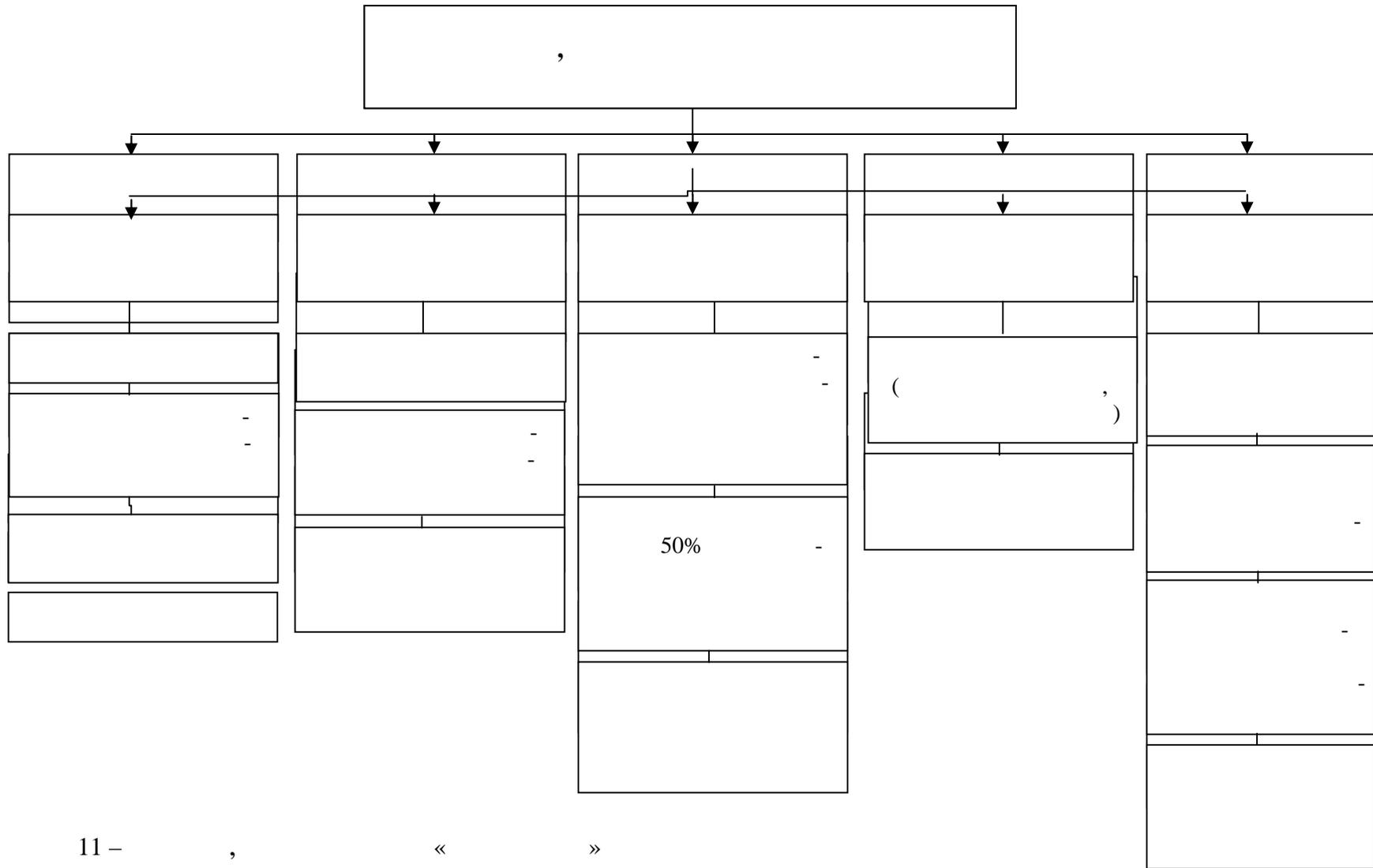
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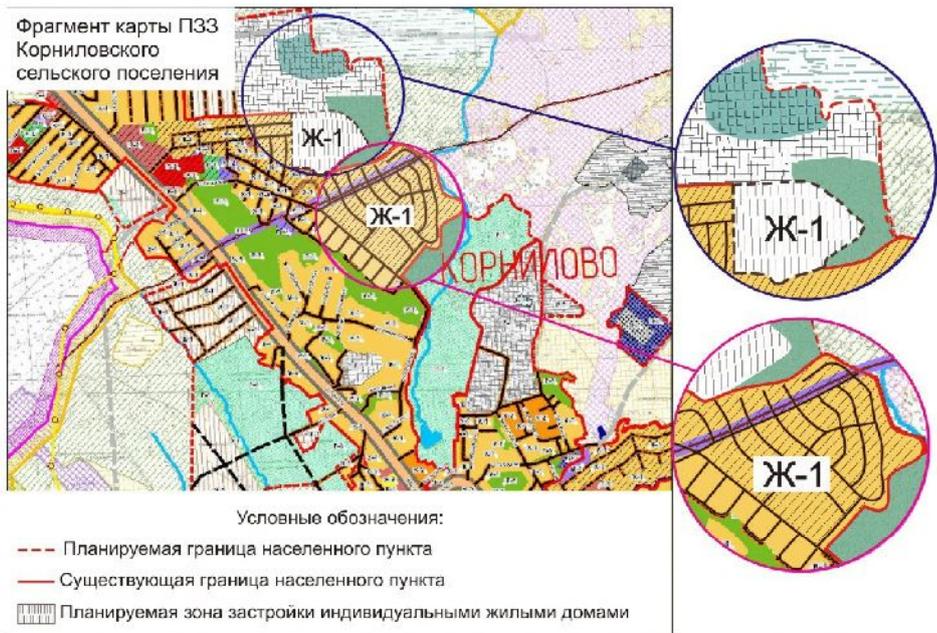
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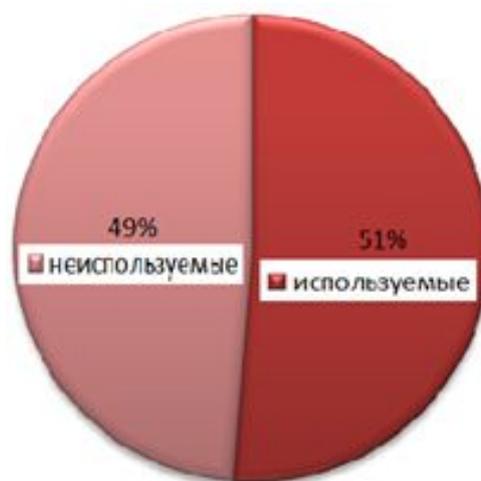
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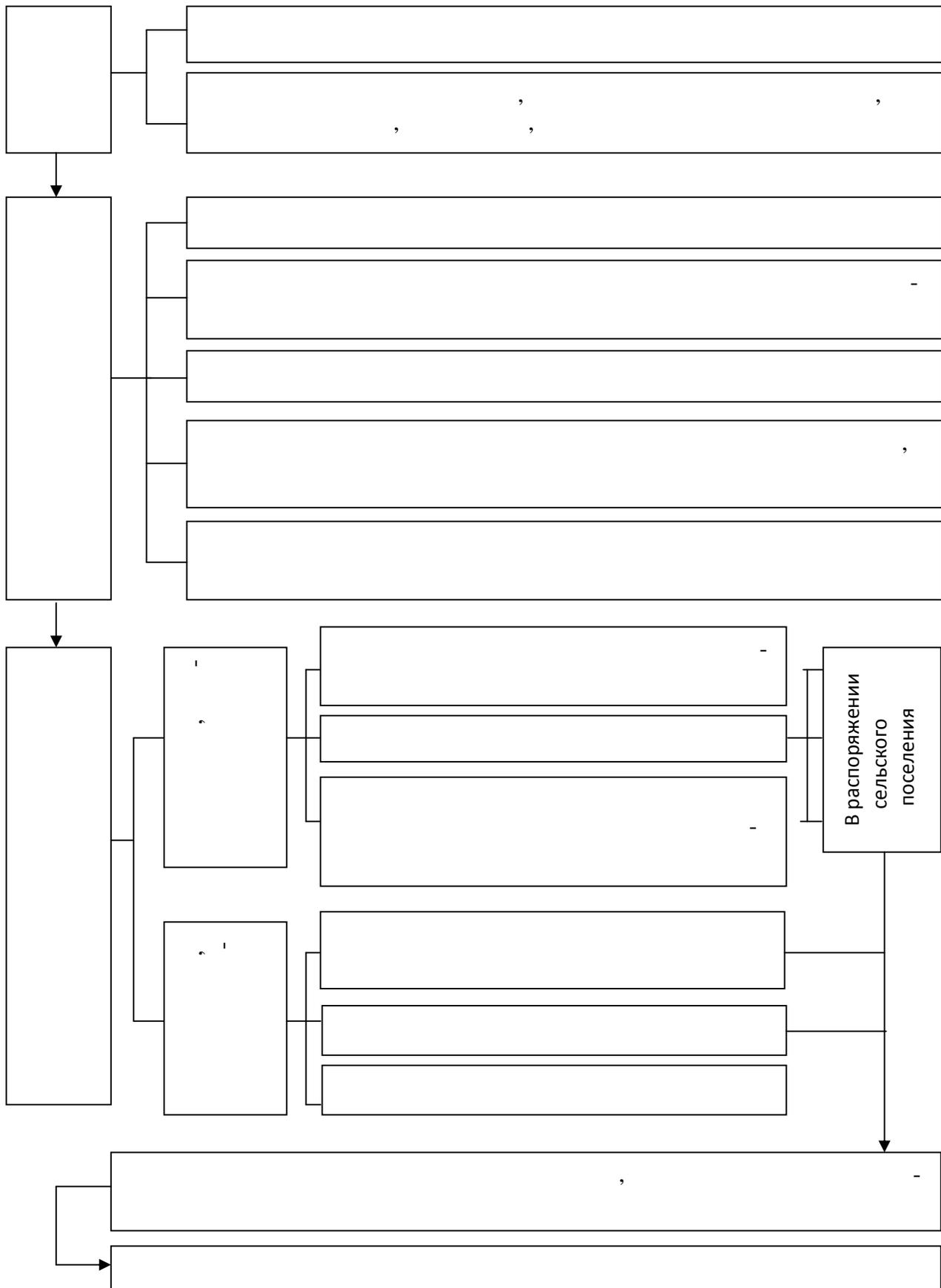
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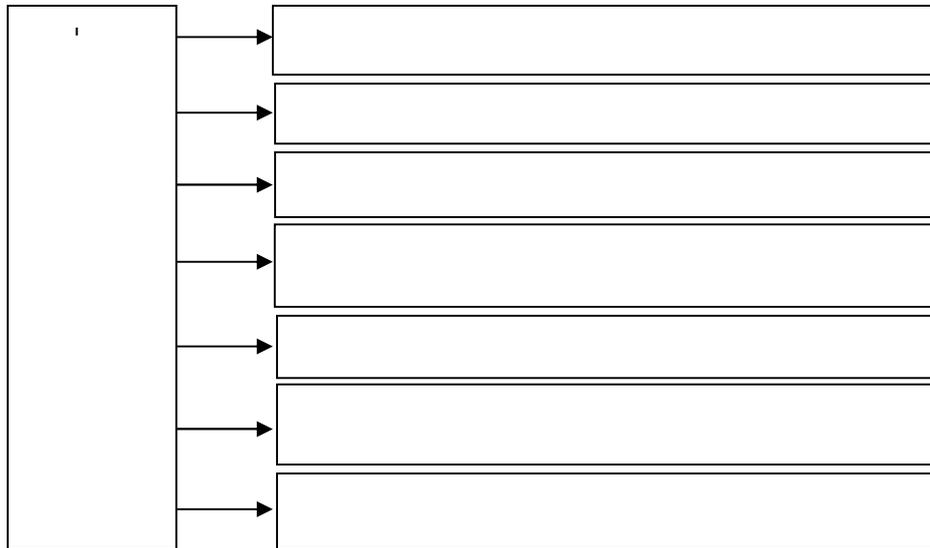
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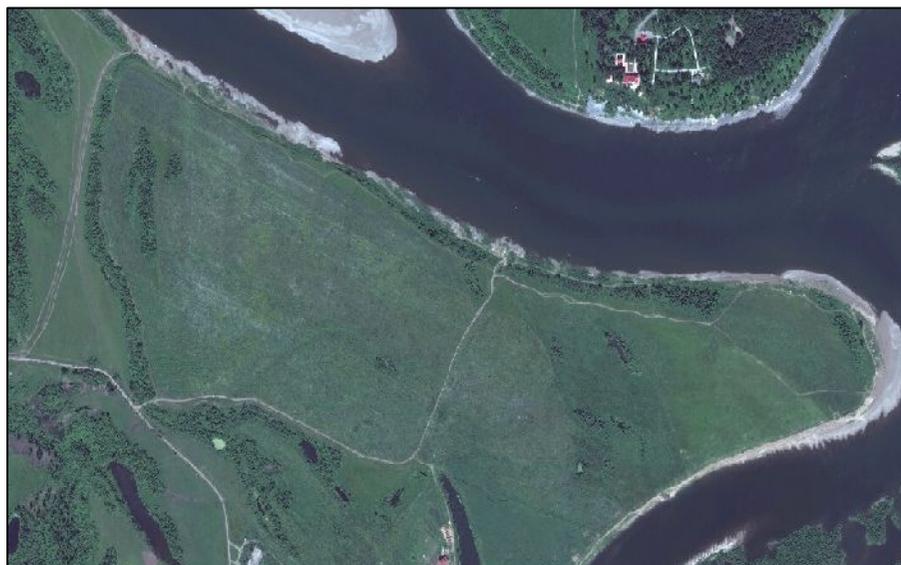
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**Местоположение:** Томский район, окр. с. Корнилово



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**Космоснимок 2014 г.**  
**Местоположение:** Томский район, с. Корнилово,  
мкр. Зеленая Долина



Космоснимок по состоянию на 2016г.  
Местоположение: Томский район, окрестности д. Барабинка



Данные из ПКК по состоянию на 2016г.  
Местоположение: Томский район, д. Барабинка, мкр. Долина Ягод





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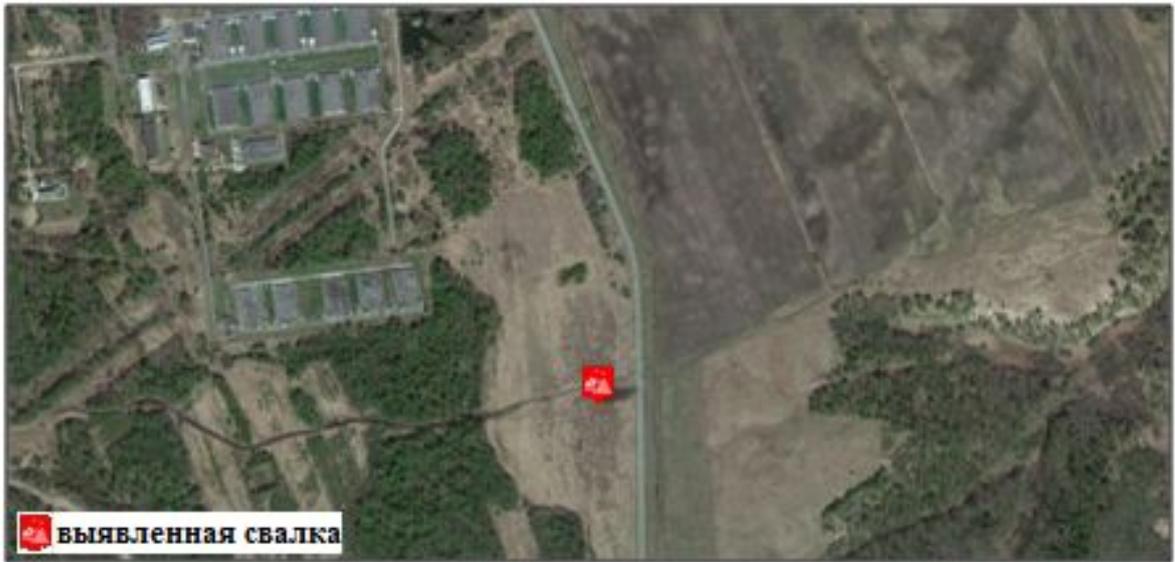
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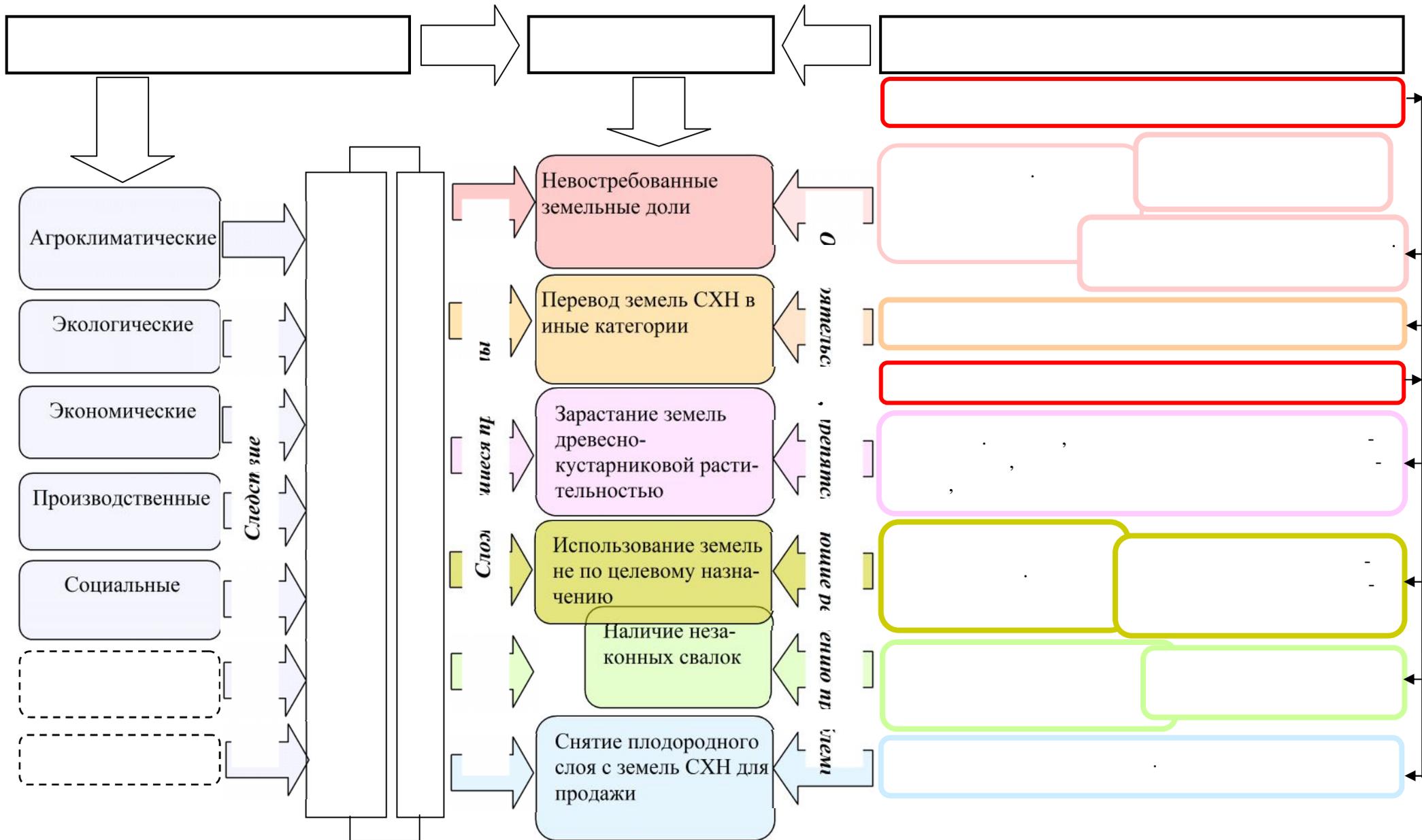
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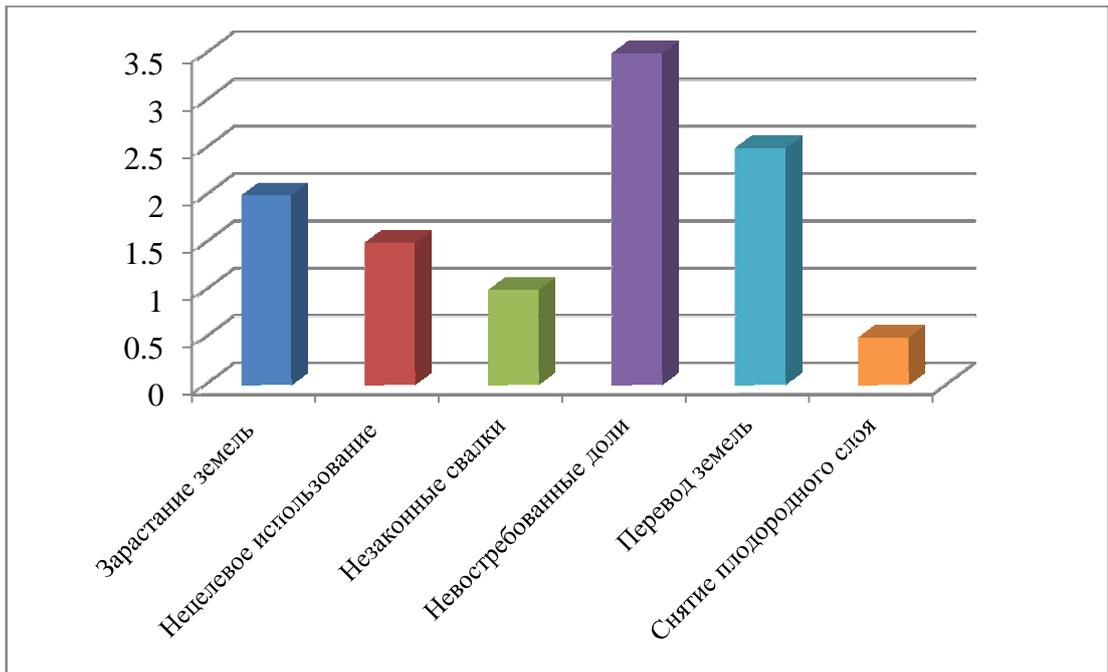
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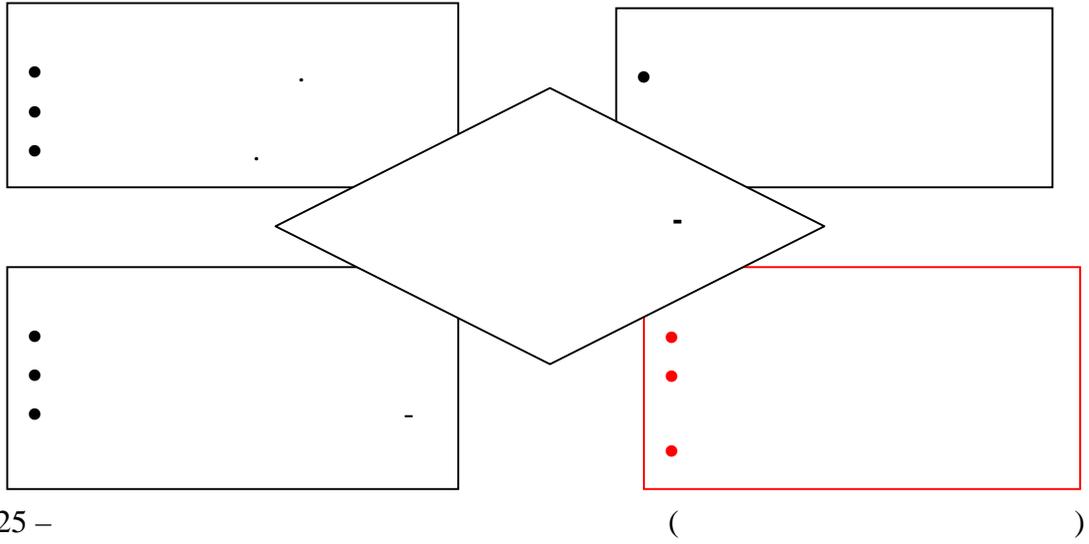
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## 5.1 Анализ выявленных вредных факторов при разработке и эксплуатации проектируемого решения

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## 2 Characteristic of object of research

### 2.1 General information

The Tomsk area borders in the south – on the Kemerovo region, in the north – on Asinovsky and Krivosheinsky districts, in the east – with Zyryan and Asinovsky, in the West – on Shegarsky and Kozhevnikovsky districts [49] (fig. 1).



Figure 1 – Arrangement of the Tomsk area

Features of the Tomsk area are:

- proximity to the regional center,
- mobility of city line,
- lack of own regional center.

In Tomsk the area agricultural production in this connection he is quite often called "supporter" of Tomsk is well developed.

### 2.2 Environment

Climatic conditions. The condition of lands of municipality is in direct dependence on his geographical arrangement, the environment and technogenic processes happening on this territory. Climate of the Tomsk region in general continental and cyclonic, with long severe snow winter and in the warm short summer, the short transition and bezmorozy periods, considerable daily allowance and annual amplitudes; alternations of cyclonic and anti-cyclonic types of weather during the whole year are characteristic. The main climatic indicators (temperature, distri-

bution of rainfall) are defined by dynamics of air masses within the West Siberian Plain [50].

The Tomsk area is located in moderately warm, moderately humidified agroclimatic area. This agroclimatic area occupies a subtaiga zone and part of the northern forest-steppe in the most southern part of the area that promotes favorable farming (fig. 2).



**Figure 2 – An arrangement of the Tomsk area in the territory of the area**

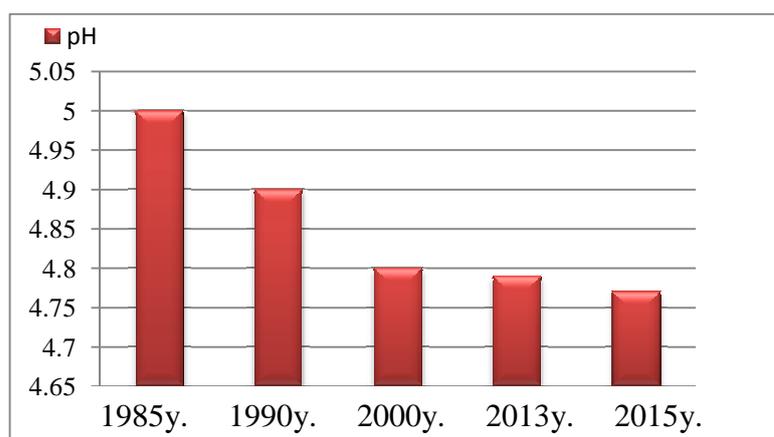
Negative impact on a condition of lands of SHN is exerted by such adverse phenomena of weather as low air temperatures, plentiful and long rainfall, blizzards, a hail, ice, strong winds.

Soil conditions. The soil cover is various and presented by 12 types of soils among which prevail gray forest (42%), podsollic (20%), gray forest gley (18%), alluvial and cespitose (4%), marsh (3%), generally heavy mechanical structure [49].

Soils of the Tomsk area generally srednekisly with the average indicator on degree of acidity 4,9. Reaction of the soil environment 5,5 - 6,0 is necessary for the majority of crops. For maintenance of acidity at an optimum level it is necessary to carry out the basic and the supporting lime application [7].

In Tomsk the area the area sour and the srednekislykh of arable soils the average indicator of acidity of soils of 4,77 (fig. 3) occupying now 80% of the surveyed territory steadily increases. Increase in the areas with sour reaction of the environment should be considered as the negative phenomenon of change of level

of fertility of soils. This process is to a certain extent connected with insufficient volumes of lime application in previous years and absence them now.

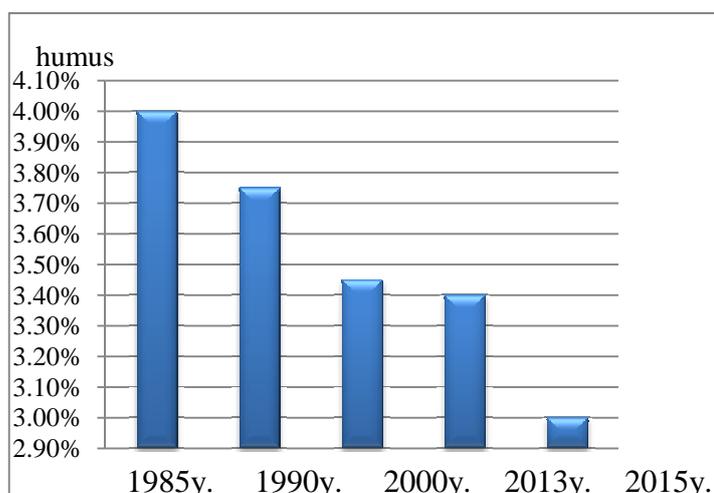


**Figure 3 – Acidity of soils in farms of the Tomsk area by years [on 7].**

The soil cover of the Tomsk area differs in a big variety in the form of a humic profile that indicates their fertility [51].

The maintenance of a humus in soils is defined by conditions and nature of pochvoobrazovatelyny process, the number of the organic weight coming to the soil. Biological features of cultivation of cultures, their agrotechnology and other factors. On the maintenance of a humus in soils the level of potential fertility and possible changes in them in the course of agricultural use is estimated.

According to data of agrochemical inspection of agricultural grounds, it should be noted that the maintenance of one of the most important indicators of fertility, a humus - decreases. His average contents decreases from 4% in 1985 to 3,0% in 2015 (fig. 4)



**Figure 4 – The maintenance of a humus in soils of farms of the Tomsk area by years [on 7].**

The reason of decrease in a humus in soils – is explained by extremely small introduction of organic fertilizers.

Determine the negative processes proceeding on lands by total components of climatic and soil conditions, the hydrological mode. If high degree of a zalesyonnost of territories and heavy mechanical structure of the soil interfere with distribution of a wind erosion, then the part of an arable land on slope lands is subject to wash-out of a fertile layer of earth and is predisposed to an ovragoobrazovaniye during snowmelt and downpours.

A significant amount of rainfall at insufficient heatsecurity and low size of evaporation promote distribution of the rehumidified and boggy soils, overgrowing by their marsh and shrubby vegetation. Besides, the part of agricultural grounds which for several years isn't used in agricultural production grows with wood and shrubby vegetation. According to data on inventory of lands of SHN of the Tomsk region the similar situation is rather extended (fig. 5).

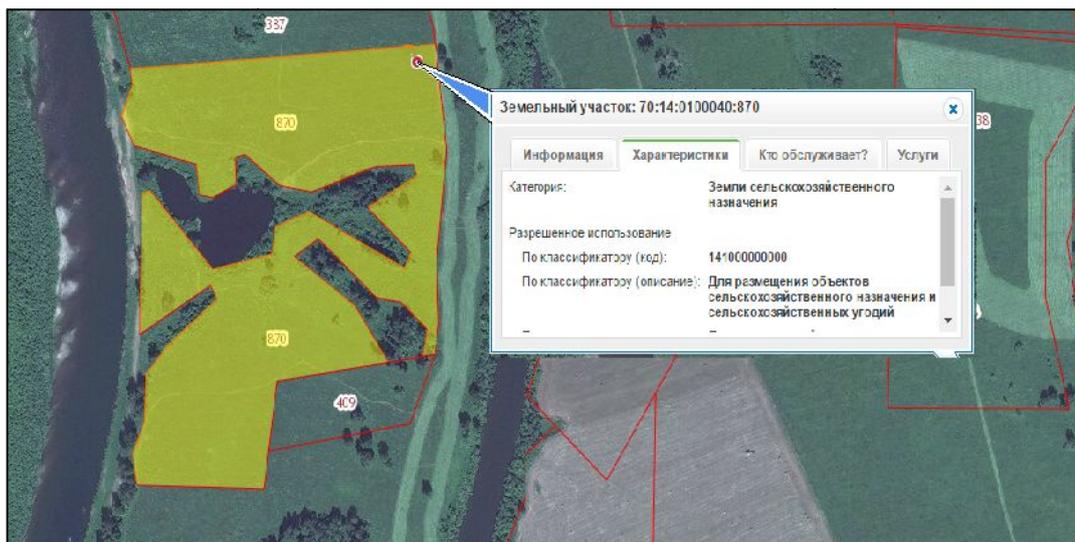
Name	Type of soil	Status
LLC "Pedigree manufactory "Zavarzino:"	gray forest soil	area obstruction
	gray forest soil	forest
	gray forest soil	forest
	gray forest soil	forest
	gray forest soil	perennial grass
	gray forest soil	perennial grass
PFE "Muratov"	gray wooded soil	building
	gray wooded soil	forest
	gray wooded soil	area obstruction
	gray wooded soil	perennial grass
	gray forest soil	forest
	gray wooded soil	perennial grass
LLC "Mozalovskuy niva"	gray forest soil	wheat
	gray forest soil	wheat

**Figure 5 – the Fragment of table "Data of Agricultural Grounds of the Tomsk Area" [7]**

It is necessary to consider that spatial shortcomings, such as a strip farming, an izlomannost of borders, a vkraplivaniye, etc. also are characteristic of many fields of the Tomsk area.

In fig. 6 the land plot with the broken borders, with a type of the allowed use is represented: for placement of objects of agricultural purpose and agricultural

grounds, located in Tomsk the area. Such configuration of the land plot interferes with effective land use.

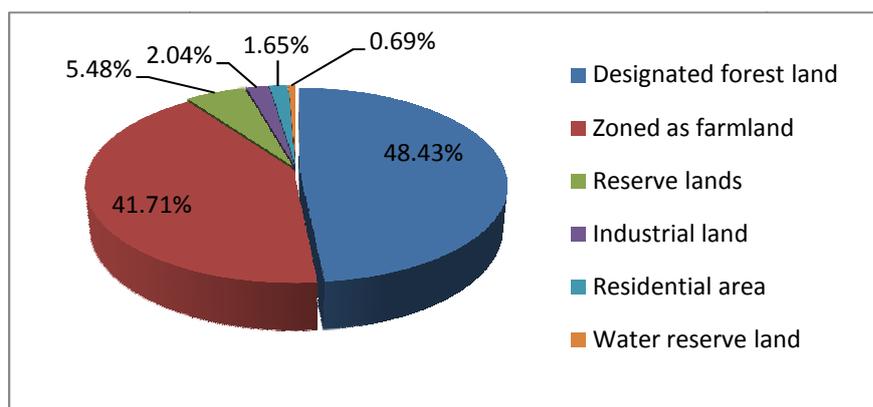


**Figure 6 – An example of the land plot with the wrong configuration.**

When scheduling on lands SHN of the Tomsk area it must be kept in mind their resource potential, the main tendencies in development of quantitative and qualitative characteristics, features of land management and relevance of information which is available in the database.

### **2.3 The conditions causing need of the translation of the land plot from lands of agricultural purpose in other categories**

Now generally all land plots of the Tomsk area are referred to certain categories of lands (fig. 7).



**Figure 7 – Distribution of acreage of the Tomsk area on categories [5]**

The maximum space is occupied by lands of forest fund (48,4%). The earth of agricultural purpose occupy 41,7%, the earth of other categories – from 0,7 to 5,5%.

Due to the development of the industry, housing and road construction, carrying out communications there is a need for change of already approved categories of the land plots. According to reports of the Tomsk area from 2011 on 2015g.g. the acreage of forest fund and water fund was left without changes (tab. 1) [2-5], and lands of agricultural purpose – was significantly reduced (fig. 9).

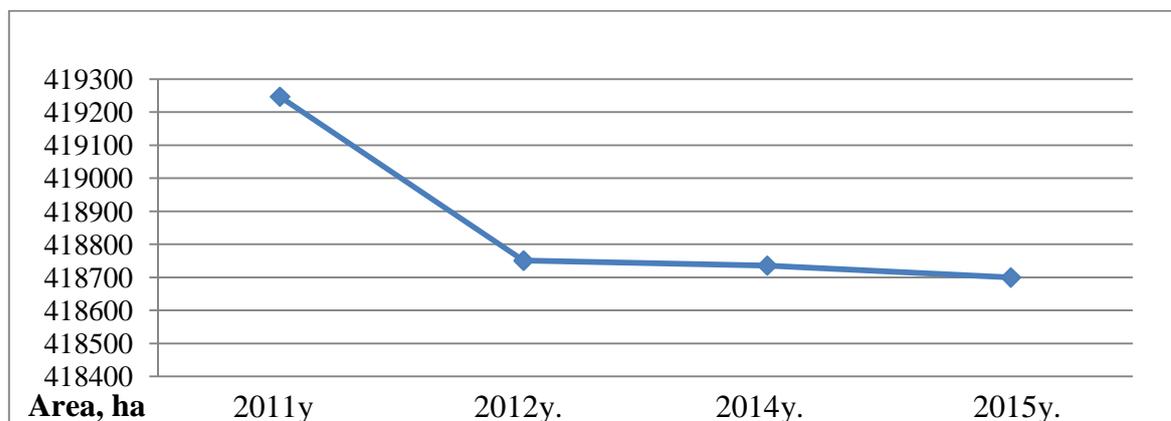
As the land fund of the Tomsk area for this period remained invariable (1003885 hectares), according to tab. 1, reduction of lands of SHN has happened due to transfer to lands of the industry, to lands of settlements and to lands of a stock.

**The table – 1. Change of acreage of the Tomsk area on categories from 2011 on 2015y.y. [2-5].**

Zoned as	2011y.	2012y.	2014y.	2015y.
	Area, ha			
<b>Designated forest land</b>	486196	486196	486196	486196
<b>Zoned as farmland</b>	419247	418751	418736	418700
<b>Reserve lands</b>	55020	54979	54979	54979
<b>Industrial land</b>	20111	20443	20458	20494
<b>Residential area</b>	16354	16559	16559	16559
<b>Water reserve land</b>	6957	6957	6957	6957
<b>Land reserves Tomsk area</b>	1003885			

The acreage of agricultural purpose for the specified period significantly was reduced (fig. 8).

As the land fund of the Tomsk area for this period remained invariable (1003885 hectares), according to tab. 1, reduction of lands of SHN has happened due to transfer to lands of the industry, to lands of settlements and to lands of a stock.



**Figure 8 – Dynamics of change of acreage of agricultural purpose in Tomsk the area**

In fig. 9 the reasons promoting "opportunity" to the translation from lands of agricultural purpose in other categories are presented. Conditionally they can be divided into five groups:

**Reason 1. Agroclimatic conditions**

1.1. Degradation of soils. Now in many farms the rates of degradation of soils connected with deficiency of investments made in agricultural production have sharply grown. The main types of degradation in the area are chemical (impoverishment by a humus and batteries) and physical degradations (destruction of a fertile layer at construction, littering by waste). According to data of the monitoring which is carried out by agrochemical service of the Tomsk region, the amount of the introduced fertilizers are less, than it is required (tab. 2).

**The table 2 – Monitoring of use of fertilizers in 2013 and 2014 [6,7].**

Mineral fertilizers	Need on 2013y. th. tonnes.	Accrual with 01.01.2013y, th. tonnes.	Need on 2014y. th. tonnes.	Accrual with 01.01.2014y. th. tonnes
All, include	<b>44,611</b>	<b>3,300</b>	<b>5,22</b>	<b>3,418</b>
Azotes	27,890	3,152	4,69	2,729
Phosphorus	0	0,118	0,28	0,596
Potassium	12,096	0,030	0,25	0,093
Of which:				
Ammonia nitrate	12,700	2,861	3,74	2.513
Carbonyl diamide	13,100	0,244	0,828	0.104
Ammonium sulfate	2,090	0	0	0
Chloride of potassium	12,096	0	0,18	0

1.1.1 Overgrowing by wood and shrubby vegetation. In 2015 in Tomsk the area the department of the state land supervision has revealed 756 hectares who have undergone overgrowing by weed and wood and shrubby vegetation [52]. Overgrowing of soils wood and shrubby vegetation leads to decrease in fertility of soils since under such vegetation podsolic process as a result of which fertility worsens develops. In fig. 11 the example of overgrowing of lands of SHN in the territory of the Tomsk area is given by wood and shrubby vegetation.



**Figure 11 – Example of overgrowing of lands of agricultural purpose of the Tomsk area**

Moreover, in case of return of overgrown lands to agricultural production carrying out mechanical actions for a raskorchevka of this vegetation in the course of which the fertile layer of earth is broken is required and decreases her on fertility.

1.1.2 Degumifikacion of soils. The intensive decrease in content of nutrients, the happening acidulation of soils connected with istoshchitelny use of lands are inherent practically in all regions of the Russian Federation. As a result of agrochemical inspection decrease in content of mobile phosphates in Tomsk the area is revealed [7]. Increase near squares with sour reaction it is necessary to consider the negative phenomenon of change of level of fertility of soils. This process is connected with the insufficient volume of lime application in last years. One of indicators on preservation of soils is the balance of the mineral elements brought in the soil.

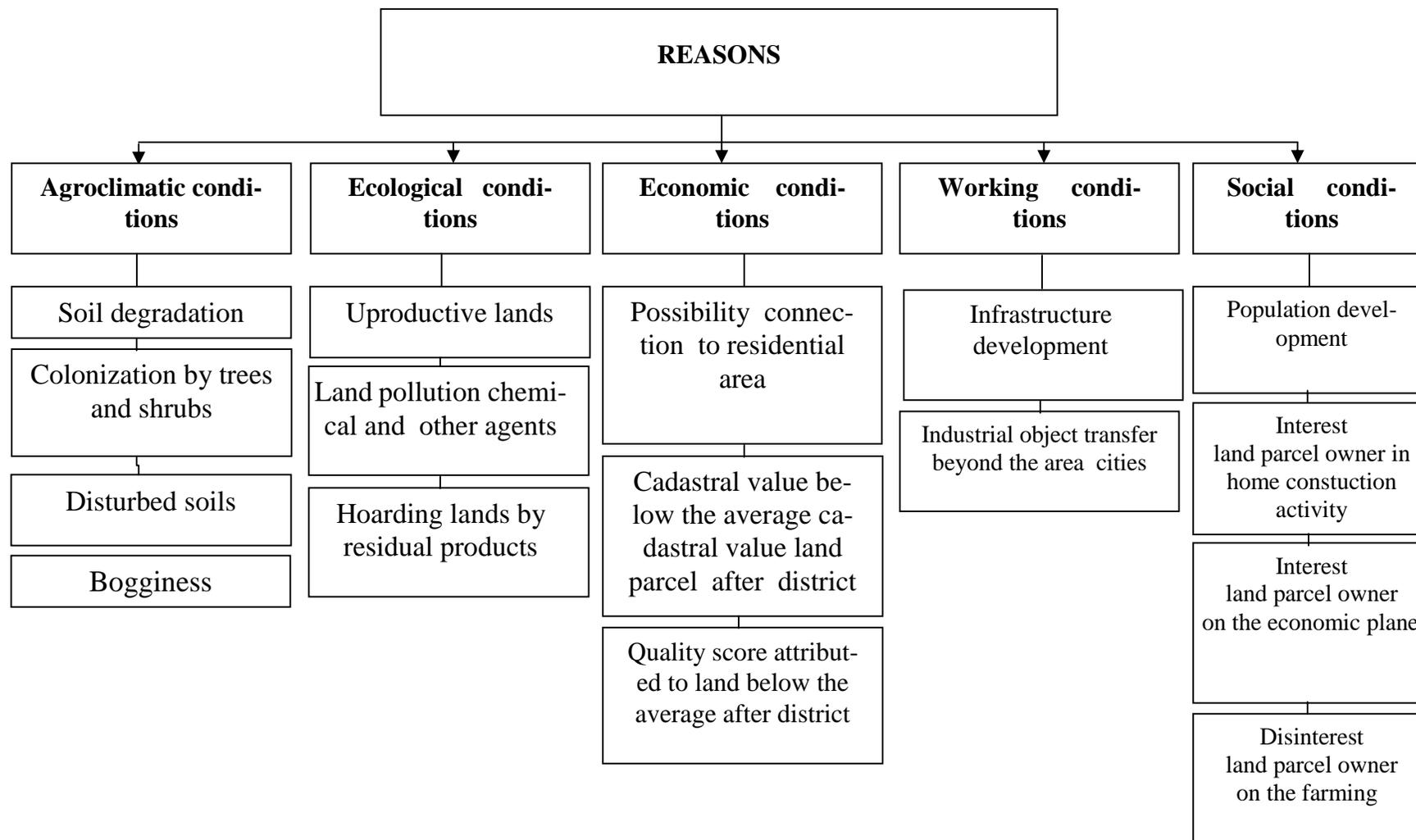


Figure 9 – The reasons promoting "opportunity" to the translation from lands of the agricultural purpose (AP) in other categories.

1.1.3 Bogging. The soil cover of the Tomsk area is created with the specific features defining his individual traits, in particular, the raised hydromorphism caused by marshiness of the territory. The geographical position and sharply continental climate cause natural processes which inherent in the Tomsk area: remoistening, bogging, water erosion. Especially negative processes are shown on agricultural grounds.

## 2. Ecological conditions

2.1. Existence of unproductive lands. To unproductive lands carry the lands occupied with intraeconomic roads, communications, linear constructions, lands which are unsuitable for production of agricultural production. In the course of their use there are a pollution and littering of the land plots.

Negative impact of production objects on a condition of soils became characteristic of the territories adjoining the industrial enterprises, automobile routes and oil pipelines. In 2015 department of the state land supervision (The Department of the Federal Service for Veterinary and Phytosanitary Surveillance for the Tomsk region (Rosselkhoznadzor) has been revealed on lands of agricultural purpose of 11 places of littering by production wastes and consumption [52].

2.2. On lands SHN are noted pollution cases by chemical and other substances and connections, littering of lands production wastes and consumption. Use of chemicals and pesticides leads to violation of a normal cycle of renewal of an occupation layer of the soil;

## 3. Social and economic conditions

3.1. Possibility of accession of lands of agricultural purpose to lands of settlements. According to subitem 3 of the Art. 7 No. 172-FZ of 21.12.2004 the translation from agricultural grounds is possible in exceptional cases, one of which is – establishment or change of line of the settlement, and a transfer for this reason is made irrespective of the value of these lands [53] that exerts negative impact on preservation of especially valuable agricultural grounds.

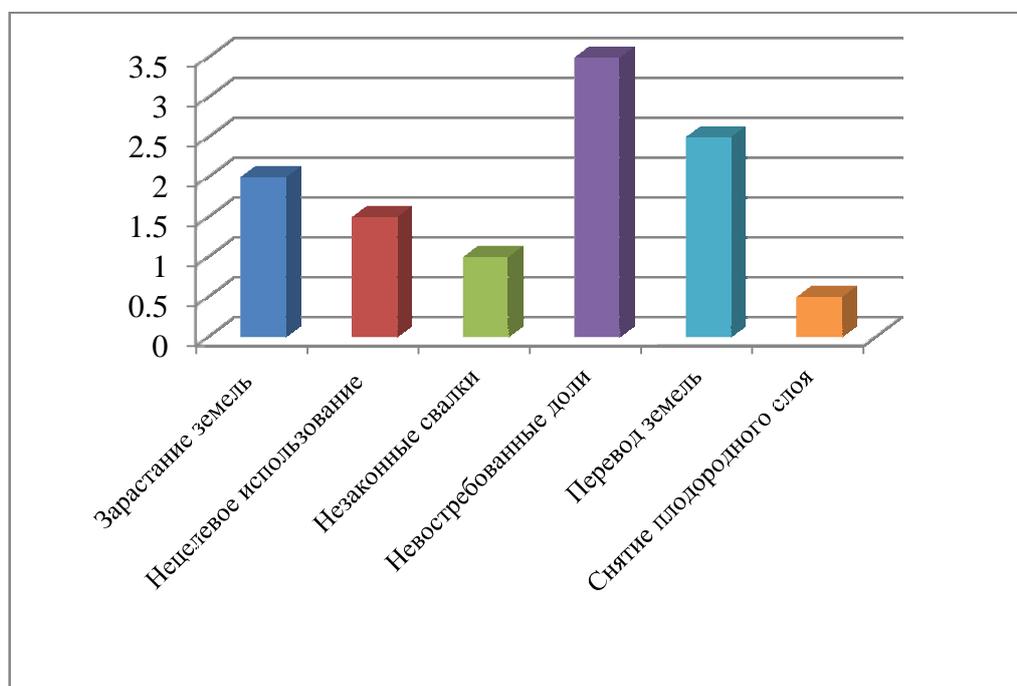
In fig. 11 the fragment from "Rules of land use and building of the Kornilovsky rural settlement" on which the red dashed line has noted the planned increase in borders of lands in the agricultural purpose inhabited to points at the

expense of lands is presented. According to data of PKK, land massifs of agricultural purpose are already divided into the land plots under individual housing construction.

3.2. The point of site class and cadastral cost of the earth are one of the defining factors of a possibility of "translation" of a site of the agricultural purpose relating to the farmland - they have to be [53] below the average levels characteristic of municipal district.

Carry lands which cadastral cost exceeds 10% above the average level of the cadastral cost which has developed in concrete municipal district to especially valuable agricultural grounds. In view of lack of open access to similar data to establish implementation of this law it is problematic.

Undoubtedly, in Tomsk the area it is necessary to carry fields of the Siberian research institute of agriculture and peat which are included into "Agricultural Grounds of Skilled and Production Divisions of the Research Organizations and Educational and Skilled Divisions of Educational Institutions of the Higher and Secondary Vocational Education, State Sortoispytatelnykh of Sites" group to especially valuable agricultural grounds.



**Figure 11 – The planned increases in lands in settlements at the expense of lands SHN**

4. Working conditions. The translation from lands of agricultural purpose to lands of settlements and the earth of the industry is promoted by such reasons as:

4.1. Development of infrastructure, including construction of linear constructions).

For example, in the 1980th years on lands of agricultural purpose in the territory of the Kornilovsky rural settlement the gas pipeline has been constructed. Since 2009 the land plots began to translate under individual housing construction. And for today this territory is built up with individual houses

4.2. Development of the industry.

5. Social conditions. It is possible to distinguish from the social conditions promoting transfer of lands of SHN to lands of settlements:

- interest of owners in cottage construction;
- interest of owners of land shares in an economic benefit;
- lack of interest of owners in farming;

Not used the earth of agricultural purpose in Tomsk the area are first of all the half-received land tax in budgets of settlements, deterioration in an ecological situation, considerable cost of reproduction of soils. The modern economical and political situation connected with sanctions demands ensuring food security of the country in general [54] and regions, in particular, and assumes:

- growth of reliability of national food system;
- minimization of influence of agroclimatic conditions on provisioning of the population [55];
- development of expanded reproduction of the main food;
- social development of rural areas.