

Czech University of Life Sciences Prague

Faculty of Environmental Sciences



Farmland use in Russia and in the Czech
Republic – a comparative study

Author of the Thesis: Ekaterina Botova
Supervisor: Petr Sklenička, Ing., Ph.D.

© Prague 2016

Declaration

I hereby declare that the work presented in this thesis is, to the best of my knowledge, original work, except as cited in the text. I have listed all literature and publications from which I have acquired information. The research was completed with the assistance of Petr Sklenička.

Prague 7th of April, 2016

Ekaterina Botova

DIPLOMA THESIS ASSIGNMENT

Ekaterina Botova

Landscape Planning

Thesis title

Farmland use in Russia and in the Czech Republic – a comparative study

Objectives of thesis

To compare land use and agricultural structures between Russia and the Czech Republic. The comparison will be done at 3 levels – the national, regional and local (farm) level.

Methodology

- select study areas in the both countries (one for each level in each country)
- gain aggregated data for national and regional level
- gain parcel scale data for the local level
- analyse data and compute relevant metrics
- define improving measures for the local level
- discuss results
- conclude findings

The proposed extent of the thesis

min. 40 pages of text + figures, maps and tables

Keywords

land use; agriculture land; sustainability; Russia; Czech Republic

Recommended information sources

GRAAFF, J D. Soil conservation and sustainable land use: an economic approach. Amsterdam: Royal Tropical Institute, 1993. ISBN 9068320424.

JONGMAN, R. – MANDER, Ü. Consequences of land use changes. SOUTHAMPTON: WITPRESS, 2000. ISBN 1-85312-650-0.

KAISER, E J. – BERKE, P. Urban land use planning. Urbana: University of Illinois Press, 2006. ISBN 0-252-03079-6.

SCHOLTEN, H. – STILLWELL, J. Land use simulation for Europe. Kluwer: Kluwer, 2001. ISBN 978-1-4020-0213-7.

WHITBY, M C. – OLLERENSHAW, J. Land-use and the European environment. London; New York: Belhaven Press, 1988. ISBN 1852930357.

Expected date of thesis defence

2015/16 SS – FES

The Diploma Thesis Supervisor

prof. Ing. Petr Sklenička, CSc.

Supervising department

Department of Land Use and Improvement

Electronic approval: 5. 4. 2016

prof. Ing. Petr Sklenička, CSc.

Head of department

Electronic approval: 5. 4. 2016

prof. RNDr. Vladimír Bejček, CSc.

Dean

Prague on 07. 04. 2016

Official document * Czech University of Life Sciences Prague * Kamýcká 129, 165 21 Praha 6 - Suchbátol

Acknowledgement

I would like to thank prof. Ing. Petr Sklenička, CSc. for his valuable advice, technical assistance and dedicated leadership at the time of this thesis. I want to especially appreciate his patience with me, he is also one of the few people who have willingly invested their free time.

I would also want to thank Lubov Gorelysheva, the head of land department of Omsk Region, and Saule Makenova, the head of the department of cadaster and land management in the Omsk State Agrarian University for helping me to obtain the necessary data in the very short time.

Moreover, I thank my family and Julian Lannoy for their patience and support throughout my studies.

Lastly, I would like to thank the program Erasmus Mundus IAMONET – RU and Natalia Staurskaya for giving me the chance to study 2 years in CULS.

Prague 7th of April, 2016

Ekaterina Botova

ABSTRACT

The dynamics of the landscape structure development in Russia and Czech Republic for the last 10 years was described by studying of historical and current information sources. The attention was paid to the structure of agricultural holdings, its average and total size, forms of ownership and crop production. In the part dedicated to current agriculture are characterized Czech and Russian agriculture but in three different levels - regional, district and local. In addition, based on analysis of the farms were given possible ways to optimize the efficiency of productivity in ecological, economical and technical levels.

Keywords: Land use, agricultural holdings, structure of landscape, development of agriculture

ABSTRAKT

Dynamika vývoje struktury krajiny v Rusku a České republice za posledních 10 let byla popsána studiem historických i současných informačních zdrojů. Pozornost byla věnována struktuře zemědělských podniků, jejich průměrné a celkové velikosti, forem vlastnictví a rostlinné výroby. V části věnované aktuálnímu zemědělství se vyznačuje české a ruské zemědělství, ale ve třech různých úrovních - regionální, okresní a místní. Navýše se na základě analýz farem získali možné způsoby, jak optimalizovat účinnost produktivity na ekologické, ekonomické a technické úrovni.

Klíčová slova: land use, zemědělské podniky, struktura krajiny, vyvoj zemědělství

Table of Contents

1. Introduction	8
1.1 Aims of the thesis	9
1.2 Methodology.....	9
2. Literature Review	10
2.1 Agricultural farm development in Siberia	11
2.2 Agricultural farm development in Czech Republic	17
3. Analysis of the Omsk and Vysočina Region	24
3.1 General information.....	24
3.2 Climate and environmental conditions	26
3.3 Relief	28
3.4 Hydrology and vegetation	30
3.5 Soils	32
3.6 Development of agriculture	33
3.6.1 The dynamics of agricultural farms	33
3.6.2 The dynamics of structure of lands.....	36
3.6.3 Forms of ownership	37
4. Analysis of Azovo and Třebíč districts	40
4.1 General information.....	40
4.2 Types of soils.....	43
4.3 Agriculture.....	44
4.3.1 Structure of agricultural lands	44
4.3.2 Structure of cultivated area.....	46
4.3.3 Forms of ownership	47
5. Ananalysis of farms.....	49
5.1 Agricultural corportions	49
5.2 Optimization of land-use	51
5.2.1 Ecological optimization	54
5.2.2 Economical optimization	57
5.2.3 Economical optimization	58
6. Discussion and conclusion.....	60
7. References	66
8. List of graphs and tables.....	70

1. INTRODUCTION

Agriculture is one of the sectors that from the very beginning of human existence fulfills the function of providing food for the population, producing animal feed and other products. It may be described as an economic factor within the national economy of any given country.

Just as humanity itself, agriculture has undergone many stages of development that influenced its evolution within the company. As a result, agriculture became more important and can be now seen as part of the everyday life of citizens and also part of the state's economy. With an increase in population, an expansion in crop areas occurred as well as an urban sprawl. This particular situation did not make it easy to provide food for such a huge community. Different types of activities such as: varying degrees of intensity of land use, economic and political situation in the last few centuries have influenced the evolution of the landscape.

Nowadays, in my opinion, the solution to the problem of rational use of land takes a special place in the political sphere as well as in the minds of people that became more environmentally aware. At the moment, it remains relevant aspects of land redistribution in order to create conditions for equal development of various forms of land management, the formation of a sustainable economy, rational use and protection of the land.

The aim of optimization of land use is to find the most appropriate options for the use of the agricultural land on the basis of data about the properties of each land plot. From practice it is now known that mineral fertilizers give twice as more additional harvest than a land of low quality. In addition, low-quality land areas have consequently less favorable characteristics. The total amount of costs for crop cultivation is objectively increasing the share of the expenditure required to overcome the complex technological conditions. Therefore, one of the land-use optimization goals is to exclude from agricultural use the low-quality agricultural lands. As the result, unprofitable resources that were spent inefficiently on poor quality land can now be used onto better lands for a better crop cultivation and thus increasing the production efficiency.

This thesis argues about the study of differences and similarities of the landscape structure in Czech Republic and Russia on the basis of the characteristics of the pre-selected regions and localities. The results of this study presents the

differences in the landscape structure in different geographical levels and proposes possible economic and ecological improvements at a farm level.

1.1 The aims of the thesis

The main goal of this thesis is to determine whether there has been differences and similarities in the development of landscape structures in the Czech Republic and Russia through different time periods and different scales.

The main aims of the thesis are the:

- study of the selected research areas, its natural, climatic and environmental conditions plus its socio-economic status;
- analysis of the agricultural development in studied areas on a national, regional and local (farm) level.
- proposal of possible improvements for the optimization of land-use.

The objects of this thesis are the territories of Siberia and Czech Republic, more precisely the Omsk and Vysocina regions, the Azov German national district and Trebic district, the farms “Luft” and “Vycapy”.

1.2 Methodology

The study is based on the analysis of environmental conditions, hydrology, soils and agricultural development of agricultural holdings which covers its average size, land structure and forms of ownership.

While writing this diploma thesis, *the following methodology was used:* general information about the area, the soil survey materials, hydrology reports, reports on financial and economic activity of the agricultural organizations of the area, planning and cartographic materials, regulations, scientific literature, statistical data via Czech Statistical Office.

2. LITERATURE REVIEW

At all stages of development of the human society, land was, is and will be an essential, irreplaceable mean of production. The land area is the basis, the foundation of human life, human activity and society. The distinctive features of the land, as compared to other means of production, relates to its space limitation, location permanence and indispensability. While other means of production can be generated within the required quantities and sizes, the land surface cannot be expanded. Spatial limitations of the land as an objective property means that there is no limitation of its productive forces, but only the necessity and possibility of use of land within the limits defined by nature, which makes complex the task of organizing a science-based and rational use of lands.

Land is a part of the world's lands, which is suitable for practical use. It provides the basis for agricultural production, forestry, as well as for the formation of settlements, distribution of industrial enterprises, transport, communications and all other types of human land-based activities (Kochergina, 2007). Land is a specific kind of material resource to the property on which the world has specific and often high demands. This is understandable - the land is our basis, a storage of natural resources, a carrier infrastructure and ultimately - the breadwinner of all mankind, since most of the food is made from the ground (Kochergina, 1996).

Land properties become important for the owner and the buyer because while using the land for different purposes, they should take into account its location, size, shape, contours, topography, soil, technical arrangements, ecological environment and other characteristics. The physical properties of the ground, forming the fertility of its top layer such as the kind of soil, humus content, mechanical and chemical composition, thermal and water regime, existence of arable land, hayfields, pastures, etc. - are crucial for agricultural production.

From the perspective of a long-term development, the structure of the landscape becomes an image of the development of human society, its needs and possibilities (Mimra, 1993). While studying landscape structure, as told by Leipzig (1998), it is essential to recognize the landscape as a whole, that has properties that its individual parts have not. The best approach to analyze the landscape should be, as mentioned by Sklenička (2003), total (holistic). It must take into account the nature and purpose of the change of landscape features, as well as their size (Antrop

1998; Nassauer, 1995). The general aim of the majority of the changes in the landscape structure is mostly the process of obtaining the knowledge of continuity and stability in the monitored landscape structures (Sklenička, year not available).

Dynamics and landscape development correlates to some extent with the ecological stability. Landscape as a living system, responds to many stimulus (both regular and irregular). The presence of internal and external factors makes it impossible to talk about quite a constant state of equilibrium in terms of landscape. Steady state land best describes term dynamic (ecological) balance, which is the main manifestation of ecological stability (Sklenička, 2003). Environmental stability can be explained as the ability of ecosystems to balance the changes that are caused by external and internal factors and to store and reproduce their character through self-regulatory processes. This ability is reflected in the following two ways, minimal change for the interference or spontaneous return to its initial state. We talked about the ecological stability, just the presence of one of the above aspects (Michal, 1994).

2.1 Agricultural farms development in Siberia

The development and formation of agricultural farming has passed through a long historical path from the peasant household to a modern form of organization of the agricultural production. This research is based on the formation of farms in Western Siberia with a spread touch of information of Czech farms.

Saule Makenova and Veronika Mogileva (2001) in their article mentioned that Russian society has passed through 6 stages of the agricultural farms development that are shown in the following table:

Table 1. Stages of development of agricultural farms

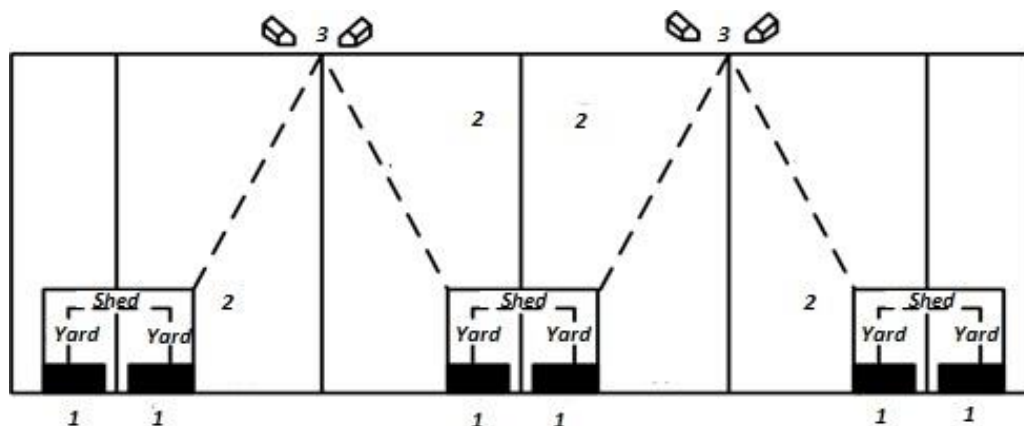
Stages	Periods	Characteristics
I	IX – XII	formation of peasant community
II	XII – beginning of XVII	feudal dependence of agricultural farms
III	XVII – beginning of XVIII	transformation of the peasant settlements by Peter I
IV	middle of XVIII – XIX	the conversion of farms as a result of the Stolypin agrarian reform
V	XIX – XX	the establishment of collective farms, state farms and individual peasant farms
VI	XXI – present	the formation of agricultural holdings in the conditions of marketplace

In the first stage of land relations, there was no land ownership as well as no technical, economic and legal organization of land use. By the end of the IX century, Ancient Russia had all the features of a feudal economy: domination of natural farming, personal dependence of the peasant to his lord, low level of production. Agriculture still used slash-and-burn cultivation, land rotation and the development of plough farming. The main forms of land use in Russia were communal and patrimonial land tenures.

During the second stage (XII – beginning of XVII century). Vladimir Bashmachnikov (1996) shares in his book “Peasant community and its evolution” that the Russian population that immigrated at that time to Siberia already had a long-lasting experience of arable farming, animal husbandry and handicraft industry. During the XVII century, the Russian population of Siberia laid the foundations of arable farming in the region. In the XVII century, the Tobolsk-Verkhoturksky farming region appeared, where by the end of the century were accounted about 5742 farm homesteads.

The third period is characterized by the first use of cartographic basis for the land management and realization of state land survey works that also included Siberia. For the first time the government started to regulate the planning and development of cities and villages. The typical Russian village, before the XVIII century, had a conjoint development with small farmhouses of farm homesteads. In 1722, Peter I issued an important decree for the development of Russian villages named "About the structure of farm homesteads on special design". This drawing was attached to his decree (Figure 1).

Fig. 1. Structure of peasant yards



1 – dwelling, 2 – garden, 3 – barn

The main points of this decree were that: villages and hamlets had not to be built together, planning and development of towns and villages were to be made only within the approved drawings: between "nests" (the yards) to arrange gardens, the distance between the courts shall not be less than 30 yards (60 m). Barns had to be constructed no closer than 70 meters from the nearest farm buildings, residential buildings had to stand on the line of the streets that were gonna be made wider.

The attached drawing was the fragment of a residential neighbourhood of the village. The reconstruction of the villages was carried out by peasants who were given land parcels for development that was 8 times more expensive than arable land, which was a sharp brake for the reconstruction of villages. In general, the decrees of Peter I, as well as decrees issued after in the XVIII - XIX centuries played a major role in restoring order in the rural construction of the Russian Empire (Makenova, Mogileva, 2001).

The planning and development in different parts of Russia used a variety of methods taking into account climatic conditions. Normally the villages were located in the valleys and built compact. To avoid snowdrifts, streets were oriented towards the prevailing wind.

As for the agricultural farming during the XVII and at the beginning of the XVIII century it was represented as a courtyard with its inhabitants. Usually, the peasant household consisted of one family. The rural population worked on the land allotment. Arable plots varied in size, some plots (1654 year) were from 4-5 up to 20-27 of tithes (1-tithe = 1.0925 ha). The average size of the yard ranged from 3 to 6 tithes in the three fields (Kirkorova, 2008). City-fortresses (forts) were the focus areas of agricultural resettlement. In cities, there was a processing of agricultural raw materials and also the development of the grain market.

A specific feature of land use in the XVII century was a "mosaic" land arrangement with villages having a small amount of yards. For example, in 1710, almost 40% of villages were only 1 yard big, 27% - were 2 yard big and the others ranged between 3 to 5 yards, with the average number of families being around 11-12 people.

Public land survey in Siberia was first organized in the province of Tobolsk. It was organized only 100 years after its origin and the beginning of such works in the central parts of Russia. In Western Siberia during the XVIII century the

population of the fertile regions of Ob-Irtysh and the Altai steppe and its foothills was formed not only by new Russian landowners but also by redistribution of the Russian population inside Siberia due to the development of its southern regions. In the areas favourable for agriculture, the traditional Russian complex field crop-animal farming was being established (Okladnikov, 1962).

During the years between 1838 and 1861, the farmers need in land was allotted of 2444790 tithes (2.67 million of ha) from the free state land, 500 thousands of tithes (546.2 thousand of ha) had been set for settlement for 56,000 landless peasants. Thus, 52 millions of people (or 78.1 % of the population of the Russian Empire) became subsequently owners of landholdings.

The fourth stage is famous for the Emancipation reform. In the period of 1861-1917 we can observe the process of capital formation in the agricultural sector: the increase of cultivated area by ploughing the fertile land, the acquisition of machinery and equipment, the development of agricultural science and the increase of productivity. This is the period of formation of various forms of management in the village. Farms were created in a so-called "Prussian" style. They were mostly large landowners' farms, based on the use of hired labour and had hundreds of tithes of land. However, the Russian land farms were significantly different from Western European farms of "Prussian" style. The Russian landowners' farms were usually conducted of a mixed management. More numerous were farms of rich peasants ("kulaks"). Many of them were developed in an "American" way, so that they were represented as a farmers' type.

According to Alexander Chayanov (year not provided) a period of active formation and development of agricultural farms started in Siberia in 1865. During this period; we could notice the arrival of immigrants in the southern part of Western Siberia and the rapid development of new agricultural areas.

The immigrants brought with them new types of hard wheat and sugar beets, the horticulture was developing and industrial crops were grown. Moreover, the growth rate of commercial farming and animal husbandry highly increased, as well as the production of grain, oil, meat and other agricultural products. The crop area increased to 86%, which helped Siberia become one of the main grain-growing areas of the country (Chayanov, year not provided). The second most important occupation of the population of the region was cattle breeding. Settlers played a

significant role in the cultural development of animal husbandry building heated cattle yards, accommodating up to 200 cattle heads, in addition to improved winter feeding of animals, that increased their productivity. Some brought with them improved breeds of horses and started to organize cattle breeding farms.

During the revolution of 1905-1907 and at the beginning of the First World War (1914), the Stolypin reform began. This reform changed a lot of aspects of the typical Russian village. It strengthened the position of the rural bourgeoisie (kulaks) and the legal framework for the ownership of the landowners appeared. In the period between 1907- 1914, approximately 1530 thousands of people moved to Siberia. The average size of land parcel in this period increased from 21 to 57 hectares and was 2 to 3 times higher than the peasants had in the European parts. These new lands had sophisticated infrastructure such as the establishment of the location of villages, water sources, road, the identification of suitable lands for agriculture, the formation of suitable sites for the resettlement of individual families and communities. These works were interrupted due to the beginning of the First World War (Makenova, Mogileva, 2001).

Over 20 million of small farms were registered before the October Revolution in Russia. They included 65% of poor peasants, 20% of middle-class people and 15% of kulak farms. Around 1/3 of agricultural farms had horses, 34% had stock and 15% had crops.

Nikolay Makarov in his book “Peasant community and its evolution” (1920) points that the socialist revolution of 1917 changed the agrarian system in Russia. The decree of the land made a fundamental reorganization of the system of land use: Lands were withdrawn from private property and carried out to the state for the use of peasants only. The main objective of this phase was the collectivization of individual farms. During this period, the system of new land users was done in Siberia. The then created collective farms were provided with better conditions, than other land users, such as areas with a more compact form, more fertile land and a closer location of the land to human settlements.

After 1929 the state aimed at the creation of collective farms, liquidation of all forms of cooperation and private ownership. As a result, as Nikolay Bashmachnikov (1996) mentions individual farms were transformed into agricultural holdings.

The fifth stage is connected with the formation of collective and state farms and individual peasant farms. The implementation of measures to improve the land allowed the beginning of the work on an in-depth farm boundary in Siberia after 1929. After the war, surveying work continued on the territory of the Siberian land. This work was aimed at restoring the land collective and state farms, as well as to ensure the organization of the farm land.

In 1954, the government adopted a resolution in the eastern regions of the country to further increase the grain production and to reclaim the virgin and fallow lands. To implement this solution, wide-range and comprehensive surveys were carried out in Siberia. In addition, the work on inter-farm land management of state farms was organized (Okladnikov, 1962).

In Western and Eastern Siberia during the 1954-1960 period, nearly 9.6 million of hectares of land was reclaimed which included 1.5 million of hectares for the Omsk region alone. On these specific areas the crop area increased up to 60 %. Since 1956, the collective farms began to be reformed in state farms. The economic situation of farms due to the growing differences in prices for the industrial and agricultural products deteriorated so much that by the beginning of the 80s many of the collective and state farms had become unprofitable. As the result, the food problem became sharper and by the mid-80s the government had gone to extremelly unpopular measures such as the introduction of cards for a number of food products. The status of the agricultural sector required a fundamental change in policy.

An important element at this stage was the policy of consolidation of villages which aimed at creating vast agro-industrial complexes. As a result, at the same level of infrastructure development, a slow overgrowing of the arable and forage land began. We could, around that same period, see the process of ploughing the forest areas close to the central manors and the formation of large arable arrays (which were designed for powerful processing technology). As Lubov Kirkorova in her book "Peasant farms" (2008) says, the bad ecological situation in the steppe and forest areas started as the result of irrigation, salinization of the soil and groundwater pollution. Large-scale activities for the bogs destruction led to the disruption of the hydrological disturbed areas, which had a direct impact on the integrity of the landscape. The policy of the consolidation of farms meant that the agriculture land depended on the constant application of organic and mineral fertilizers and farm sizes

were determined by the profitability transportation of fertilizers from the central manor.

By the beginning of 1990s, the country began to show signs of economic stagnation, including in the Siberian territories. Therefore, the planned production was shown elements of market relations and the land-use sector began to develop the individual land use, including gardening.

In the sixth stage, during the 1990-1996 period, an active formation of peasant (farmer) households was created. At this stage, small family farms with diversified economy were built, as well as the formation of corporate farms that were formed on the basis of broken collective and state farms. From 1996 to today, the number of peasant (farm) holdings declined by 6.8%. However, in regions where farming is recognized as an integral part of the agricultural economy, it was a real help and the peasant (farm) holdings stabilized their position. This happened particularly in Western Siberia that included the Altai and Omsk regions. During this period in Siberia, a decrease of the number of peasant (farm) holdings (from 48000 in 1995 to 32 thousands in 2005) and an increase of the average size of land per farm (going from 66 to 124 hectares) was noticed due to the development of a specialized production and a technologized modernization (Makenova, Mogileva, 2001).

In 1994 the Russian Federation passed a re-registration of 95% of the collective farms; collective and state farms retained its former status but 34% of them got re-registered. The majority of the former collective and state farms (66 %) went through a radical reorganization that consisted of the creation on their basis of goods-producing farms of the new social type.

2.2 Agricultural farms development in Czech Republic

The history of the Czech Republic is in a sense quite similar as it was inhabited since ancient times. On the Czech lands once lived Celtic battle tribes and because of it was called "the fighting country" - Bohemia. At the beginning of our era, the north of the country was invaded by Germanic tribes. They headed further south and the Czech lands fell into the sphere of interests of the Roman Empire whom built, during the reign of Emperor Trajan (98-117 years), the well-known "Roman shaft" - a powerful line of fortifications of northern bastions which became the Mushove (South Moravia).

The development of the Czech Republic in the early Middle Ages was similar to the development of other European countries. Meaning that the cost of the state was mainly based on agriculture and cattle breeding. But during this period, we collected historical evidence that highlights the fact that trade was of great importance. Especially international trade that was made possible by the location of the country which was at the crossroads of many important trade routes.

It is there that, due to the significant development of agriculture and crafts, was formed the first Czech city. Starting in the 18th century, a union of tribes took place much faster than in the isolated mountains of western Bohemia thus considerably strengthening the economy of the South Moravian region. The flourishing agriculture increased the production of iron ore, which covered the country's demand for raw materials in order to produce tools and weapons that conducted a brisk trade with neighbouring countries (Rubtsov, 1995).

Gradually, the historical development of the center began to shift to the western regions of the Czech Republic. Most of the territory, owned and occupied by the Czechs tribe in the middle part of the country, was supported by a number of powerful castles and fortresses, of which the youngest region was Prague. This type of movement was noticed in Ancient Russia as well but in a different way as the formation of systems of agricultural settlements in Ural and Siberia started due to the population expansion to the east.

Medieval Czech Republic was a typical feudal country. Its rise in the XIV century was achieved at the cost of a severe exploitation of the masses. Most of the working population was made of feudal-dependent peasants which were the main producers of material values necessary for the existence of the whole society. The main occupation of the Czech population in the Middle Ages was agriculture. Its forms varied within certain areas of the country depending on the soil and climate, but it engaged a dominant place everywhere. By the XIII-XIV centuries, three-field system had spread everywhere. The leading winter crops were wheat and rye, as well as the addition of spring sown wheat barley, oats and millet. Large areas of land were occupied by crops of peas and turnips. At that time were not yet known Europeans potatoes, turnips replaced its role with good effectiveness. Turnips were grown primarily for animal feed, but the peas and lentils were also the main food of the poor. (Rubtsov, 1995)

In the XIV century, virgin lands were yet to be processed by anyone in some areas of the Czech Republic. In part, they were used as meadows and pastures for cattle, and another part of them gradually mastered by peasants for grain and other crops. Farmers had expanded the area cultivation. Since at the disposal of peasants was only given basic tools of agriculture, processing and working the wasteland demanded hard labour (Rubtsov, 1995). The results were then given to its appropriated owners, the lords. In the XIII-XIV centuries, the agriculture of the Czech Republic was marked by a rise. This was expressed in the developing of proper crop rotation, the improvement of tools and finally the increasingly frequent use of fertilizers. Low equipment agriculture and cruel feudal exploitation led to the fact that even under favourable climatic conditions, hard working farmers could provide only very low yields.

The agriculture of the Czech Republic also included the development of animal husbandry. The working cattle was mainly composed of oxen and horses. Dairy cattle were introduced by goats and cows. In the south, a lot of pigs were bred and in the north at the beginning of the XV century sheep flocks prevailed. In connection to the development of animal husbandry grass cultivation became of great importance.

With the reduction of the forest area, which was cut down on the spot where there were fields and orchards, the value of the remaining forests significantly increased. If before forests were owned by lords, feudal dependent peasants were still free to assemble as much needed firewood, burning coal, procure logs and firewood, drive tar and resin. Those same lords began to strongly restrict the farmers in the use of the forest resources and sometimes even deprived them of their forest land. The feudal lords began to start sawmills and coal pits, extracting from this a lot of income.

Thus, in the XIV century, the Czech Republic experienced a significant rise of the productive forces and turned into one of the most developed European countries. But it was still a feudal state, where the ruling class of feudal lords owned the main means of production - land - and brutally exploited peasants (Rubtsov, 1995). Material goods were mostly made by manufacturers and so Czech farmers were left in an extremely difficult situation. They served the feudal serfdom in the land, paid rents, government taxes and church levies with all kinds of natural goods

and cash leases. Only a small part of the peasants retained personal freedom, while the others ranged from different stages of feudal dependence up to complete serfdom. The contradiction between the feudal lords and the peasantry was an irreconcilable contradiction that could not be resolved peacefully. Czech cities were also the focus of sharp social conflicts. This situation happened because exploiters in the cities, feudal lords, church personalities were mostly Germans or foreigners. The class struggle in the Czech Republic was closely intertwined with the national struggle, which increased the overall tension in the country.

Agriculture plays a particularly key role in food security for the population. Agricultural production is one of the best possible use of natural resources and factors of production in farms on the territory. Changes in understanding how agriculture works is the result of a long-term development, not only in this sector, as well as in the developments of the creation of conditions for the very existence of human society (Bečvářová, Lechanová, 2006).

In the early 90s, the Czech economy saw significant changes in the conditions for further development due to the implementation of economic reforms. These changes mainly concerned shaping the national economic policy and defining the various sectors of the economy and the forms of state intervention in the economy. The progress of an economic reform in the Czech Republic was also affected by the significant changes in the external environment related to the overproduction of agricultural commodities in the EU countries and other overseas countries (Bečvářová, 2001).

After 1989, an integral part of the entire national economy became the reform of property relations in the agrarian sector. The aim was, for example, the transformation of the state and cooperative ownership of private or superior ownership rights over user (Toman, Cudl, Tucek, 2012). According to Bečvářová (2001), the restoration of the ownership of land was almost 100 % made out of agricultural land, although it was necessary to solve this problem in relation to the rest of movable and immovable property. Ownership relationships to the land and agricultural property were restored through:

- Property restitution
- Transformation of Agricultural Cooperatives
- Privatization of state-owned property

Restitution can be described as the transfer of ownership of the state back to natural persons under the redress of grievances, which were due in the period from 25 February 1948 until 1 January 1990. There was a restoration of land ownership in the agricultural and forest land fund, in residential, economic and other buildings belonging to the original farm. Authorized persons who could use this right until 31. 1. 1993 were citizens of the Czech Republic (in the case of the death of their heirs) residing on the territory. State or legal entities (state farms, cooperatives) were required to return the property.

The largest form of restoration of ownership in the Czech agriculture is precisely the **transformation of agricultural cooperatives**. The original farm cooperatives were converted into cooperatives where the method of conversion was determined by the transformation law. In certain cases, the destruction of agricultural cooperatives was due to the failure to request for a change in the commercial register by the time deadline.

The transformation process covered more than 1,200 cooperatives and more than 60% of the total agricultural land. The aim of the law was to create conditions for the appearance of family farms, especially in the allocation of equity cooperatives among the beneficiaries. In cooperatives, the land was left to the owners and the soils began to be managed by commercial companies and natural persons.

There was still a process of transformation after 1993, especially the change of corporate forms with efforts to stabilize capital firms.

According to the principles of the economy, the process of transformation from state ownership to private ownership occurred in the state primary agricultural enterprises and enterprises in the food industry. **The process of privatization** in agriculture was very difficult. It was necessary to handle the privatization projects that had been entrusted to the Ministry of Agriculture. According to the rules of law, privatization of state enterprises could take place in the form of public auctions, tender, direct sales, voucher privatization and free transfer (Bečvářová, 2001).

In the years 1990 - 2010 a fundamental change affecting the Czech agriculture occurred. Throughout the Czech agrarian sector some primarily political and legislative changes emerged as a new national economic system and changes in ownership. The liberal market was seen as the only rational path that would lead to meet the needs of society. Because of this restitution, which disrupted production and

organizational structure, the debt of the Czech agriculture persists to this day. The Czech market was dominated by dozens of foreign companies that entered it to achieve their own benefit. A considerable part of experienced professionals from agriculture was gone, because in some cases, the priority was given to speed before professionalism (Toman, Codl, Tucek, 2012).

The year 1993 was an important period of preparation for the possible integration into the European structures and in 2004 the Czech Republic succeeded to join the European Union (Boháčková, Brozova, 2010). Increasing costs of technical changes and time-consuming training was caused by intensive negotiations aiming to accelerate the adoption of Czechoslovakia into the European Community.

The law on the protection of agricultural land no longer applied and arable land was transformed into a construction area, which was preceded by a substantial decline in agriculture and especially in arable lands. Czech farmers and food producers have been discriminated against because of massive imports of food and agricultural products, as some products imported from abroad were sold at a lower price than what was offered by local producers. The factors that mention or breach above the optimal structure of agriculture have an impact on decreasing the number of workers in the agriculture field.

Further development, structure, economy and performance of Czech agriculture has affected a gradual integration into the European Union. At first, there was a long-term adaptation principles of the Common Agricultural Policy and then it subsequently took the full European agricultural model (Toman, Codl, Tucek, 2012). The Czech Republic's accession to the EU was made from forms of support, regulation of the agriculture and the overall framework subject to the rules and limits of the Common Agricultural Policy (Bečvářová, Jurica, 2008).

In 2004, after joining the EU, the number of farms declined significantly. In the years 2000 to 2004 their number declined by an average of 0.08%. A large change occurred in the years 2004 - 2009 when the loss amounted to 3%. For the Czech Republic it is typical to have a large number of farms, but with very small acreage of cultivated land (Zdráhal, Bečvářová 2013).

Visible changes were reflected in the economic conditions of farmers, the rational decision-making of agricultural producers affected the limits of the common

agricultural policy and expanded the relevant markets (Bečvářová, Lechanová, 2006).

The process of expanding the market was a positive influence on the development of the economy, which can be characterized under these three headings:

- Expansion to support greater market differentiation leading manufacturers to increase production at the most efficient operators.
- Increased competition in the wider market, enabling an improvement in the distribution of production factors towards the most efficient operators.
- Rapid development of science, development of new products or technologies, which require increasing competition and larger common market.

The changes above lead to an increase in factor productivity growth performance and greater differentiation of businesses within the broader concept of the economy (Bečvářová, 2008).

3. ANALYSIS OF THE OMSK AND VYSOČINA REGIONS

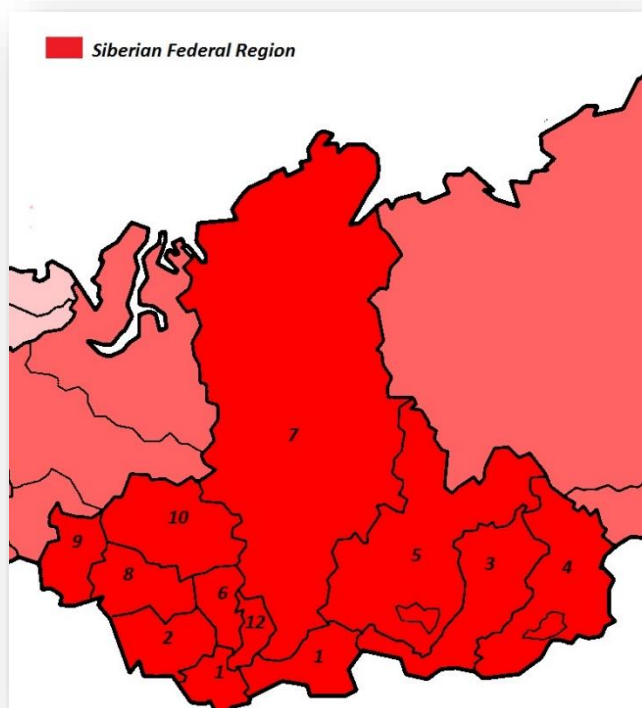
In this chapter we will compare the environmental and agricultural situations of the Omsk Region and Vysočina Region. Firstly, we will analyse some general information about them and then we will be going into a more detailed version of both regions to spot differences and highlight similarities.

3.1 General information

The Omsk Region is part of the Russian Federation and is included in the Siberian Federal District (Fig. 2). It is located in the south of the West Siberian Plain in the region of the Middle Irtysh. The territory of the Omsk Region is bordered on the west and north by the Tyumen region, in the east by the Tomsk and Novosibirsk regions and borders with Kazakhstan from the south and south-west.

Fig. 2. Location of the Omsk Region as a part of Russian Federation

Table 2. General characteristics of the Siberian regions



№	Name	Area, Thousands of ha
1	Altai Republic	9290,3
2	Altai Region	16799,6
3	Republic of Buratya	35133,4
4	Zabaikalsky Region	43189,2
5	Irkutsk Region	75270,8
6	Kemerovo Region	9572,5
7	Krasnoyarsky Region	72367,1
8	Novosibirsk Region	17775,6
9	Omsk region	14114
10	Tomsk Region	31439,1
11	Tuva Republic	16860,4
12	Republic of Khakassia	6156,9

The Omsk region was formed in 1934. The area size is 141.1 thousand sq. km. Its population reaches an estimate 2.1 million people. The territory of the region occupies the 11th place among the 16 Russian regions of the Siberian Federal District, or more precisely represents 5.7% of its area. The Omsk Region includes 32

administrative-territorial units and 6 cities of regional importance (table 2). The administrative centre of the Omsk region is the city of Omsk; its population is more than 1.1 million people.

The Vysočina Region is located in the central part of the Czech Republic on the border of Bohemia and Moravia and covers an area of 795.7 square kilometres. The territory of the region is administratively divided into 5 districts, 15 administrative districts of municipalities and 26 districts of authorized municipal offices. Significant territorial changes affected the territory on January 1st 2005, when a total of 25 municipalities were transferred to the South Moravia region. This change was primarily related to the district Žďár nad Sázavou, from which 24 villages belonged compared to just one village from the Třebíč district. As a result, due to administrative changes that reduced the acreage of the region by nearly 13,000 hectares, the population fell by more than 7 thousand people. Municipalities of the Vysočina region contribute to 11% of the total number of municipalities in the Czech Republic. Most villages in the region are directed by the district of Třebíč. The Vysočina region, with its 34 cities, represents 5% of the total number of cities in the Czech Republic and contributes significantly (20%) to the total number of townships in the country. The Vysočina region is divided into 1,263 cadastral regions.

The Vysočina Region with its 510,000 inhabitants (data from the 01. 01. 2014) is among the less populous regions of the Czech Republic (the third smallest in terms of population after Karlovy Vary and Liberec) and contributes to 4.9% of the total C.R population. While the population is twelfth in terms of inhabitants for the population of the Czech Republic, its total area ranks number 1 in the country (8.6%). It possesses a very low population density; around 75 people per km² (compared to the average of the CR of 133 inhabitants per km²) which is after the South region the second lowest value among the other regions.

Tab. 3 Vysočina Region and its general characteristics 2012

Name / Territory	Czech Republic	Vysočina Region
Number of inhabitants	10505 445	511 937
Population density on 1km ²	133	75
Number of municipalities	6 251	704
Number of parts of municipalities	15 060	1 402
Number of cities	594	34
The number of cadastral registers	13 026	1 263



Fig 3. The location of Vysočina Region in Czech Republic

To sum up, we realized the difference in size between the two regions. The Omsk region is about twice as big as the Vysočina region and it also quadruples its population. Just like the density of inhabitants, which is clearly higher in the Czech region 75/km² to 14/km², the percentage it owns of the country's total population is also bigger 4.9% to 1.4% than the one for the Omsk region.

3.2 Climate and environmental conditions

Due to the change of the geographical landscapes and different agricultural development of the territory, there are four main natural and agricultural zones in the Omsk Region: the steppe, the southern forest-steppe, the north steppe and the north region.

The climate is typically of extreme continental character. The main features of temperature regime are severe winters and warm summers. In the south, it has shorter but even hotter summers and a short frost-free period. The average temperature in January is -19-20 ° C, the minimum on some days can reach down to -46-52 ° C. In July it goes up to 17-19° C and the maximum is in the 37-42° C range.

The climate is characterized as dry and lacking moisture. Average precipitation is small – 250-50 mm and in the more southern areas - 250 mm per year. Adverse climate factors are summer drought in June and even July, accompanied by large dry air and dry winds. Most of the precipitation (75 - 80%) of the annual amount falls in summer. Besides during the first half of the summer their amount is relatively small but reaches its maximum in July. The snow cover forms in

late October - early November. The duration of the snow covers on average ranges from 145 to 175 days. The prevailing wind directions in all areas are western and south - western.

Adverse weather events, which also bring damage to agriculture, include hail, strong winds with dust storms, late spring and early autumn frosts. During the winter it also includes a snowstorm and ice. Particularly dangerous are the dry hot winds, which cause wind erosion so-called dust storms that creates significant damage to the agricultural production in the area. This indicates that the climatic conditions in the region lead to the further development of agriculture mainly in the way of intensifying the development of water and land reclamation, implementation of a system of measures to combat land desertification and the introduction of intensive technologies.

The Vysočina region is climatically a temperate zone with average annual temperatures of 6-8°C and an average annual rainfall of around 660 mm. It possesses a very Central European type of weather that will not see many big variations over seasons. The 4 main seasons are pretty well marked in the Vysočina region as in the Czech Republic by their consistent characteristics. Chill winters, rainy springs and autumns and slightly warm summers. The wettest month for the Vysočina region is identical with Czech Republic. The month where the most precipitation happens is May, by a bigger margin in the capital than in the rest of the country. We also notice that it rained more often during the year 2014 in only the Vysočina region compared to the long-term average precipitation for the period between 1961-1990.

The Vysočina Region has moderate temperatures all year long that range between - 3°C to 19°C. Its hottest month on average has been the month of July closely followed by August. This statement is not surprising at all considering that those are summer months. The biggest deviation from 2014 compared to the long-term temperature average has happened in the months of March where it has gotten 3.9°C hotter.

Judging from the information we just analysed, we can conclude that the Omsk region is much drier than its Czech counterpart and that its temperatures are also much more extreme oriented, both in the warm months and in the winter months. These climate characteristics impact immediately the environment where some type of vegetation and soils cannot grow or be exploited with the same

intensity in one region or the other as we will see later in this chapter.

3.3 Relief

The Omsk Region is characterized by its differences in elevation that range from 100 meters high to more. This area is mostly made out of plains and affects deeply the climate and vegetation of its individual parts. The hills that plays a big role in the climate formation of the south part of the Omsk Region is the Kazakhastansky low hills. It possesses many deep depressions that border the southern part of the domain with the Priityshskay ridge that is exceeding the rest of the territory by 20 to 60m. (fig 4).



Fig. 4. The relief of the Omsk Region

Source –the program “maphill”

The surface area of the Vysočina region includes hills of the highlands. Its relief is dominated by plateaus, valleys, flat ridges that progresses towards the edge of the highlands into the deep carved valley. To evaluate correctly the impact of the relief on the territorial organization of the agricultural production, we need to check the degree of dissection of the territory, both of gullies and ravines. Water erosion

can happen on its surface because of its medium deep and deeply dissected territory that amounts to around 47% of the total area. We can find the most heavily dissected lands of the region on the right bank of the Irtys river. These lands have a natural increase of the partition coefficient going from 0.25 to 1.50 and in some cases even up to 2.5 m².

The highest point of the Vysočina region is the peak of Javořice of the Javořická highlands. This peak is 837 meters high and lays in the south of the Jihlava district. However, its lowest point can be found where the southeast part of the Třebíč district leaves the region of the Jihlava River and stands at 239 meters tall. The Vysočina region belongs to the geomorphological area called the Central Bohemian board also called the Moravian Highlands. It is one of the largest boards of the country and is part of the Czech Highlands province that includes the western part of Moravia and the whole territory of Bohemia. In the Vysocina Region, we can find 2 protected landscape areas: The Iron Hills and Mountains.



Fig. 5. The relief of the Vysočina Region, source –the program “maphill”

This part gives us the knowledge that the Omsk region is a much more elevated type region with its peaks and valleys whereas the Vysočina region lays less high from the ground level. Also, the relief of the Omsk region is significantly more abrupt than its Czech comparative and thus permits less space for good agriculture production.

3.4 Hydrology and vegetation

The Omsk region rivers belong to the basin Irtysh, which is a water-line that crosses the territory from south to north. In the southern part of the area the river network is very poorly developed compared to its north section where there is a network of tributaries branched left and right of the Irtysh basin. All the rivers belong to the type of plain with floods in spring. There are a large number of lakes in this area that amounts to the 211.2 thousand of ha. They vary in the degree of mineralization, in the south they consist mostly from salted water and in the north from fresh water. More than two million hectares of land in the northern part of the area are occupied by marshes, which are to some extent a potential resource of farmland.

The nature of the spread of vegetation in the region is due to the variety of climatic factors and human activities. More than 60 % of the northern part of the area is covered by forest. The vegetation of the central part of the region is a typical steppe. Birch trees and groves are interspersed with meadows steppe fields are presented as forb-grass communities. The forest vegetation of this area is of great anti-erosion importance, which gives a more sustainable agricultural economy.



Fig. 6. Rivers going through the Omsk Region

Source – Ministry of Agriculture of RF, 2014

The southern part of the area is characterized by heavy ploughing and intensive development of the agriculture. In this connection, the steppe is now preserved only in small patches near the pins and inconvenient for farming areas.

Along with indigenous zonal types of forests and steppes, the central and northern parts are presented with marsh and saline soils that have intrazonal vegetation.

The Vysočina Region, from southwest to northeast, as well as the historical border of Bohemia and Moravia are all majorly European watershed. Rivers are important water sources for water areas. The region is the source area of important Czech and Moravian rivers and goes through the main European watershed line of Elbe – Danube. Rivers belong to the drainage area of the North Sea and Black Sea. At first the water flows were built for flood water reservoirs, some of which are important sources of drinking water from a nationwide perspective (fig. 7).



Fig. 7. Water areas of the Vysočina Region

On the Jihlava river was built the water reservoir of Dalešice that owns the highest dam in the Czech Republic (100m). The Vysočina region has a large number of ponds. The biggest of them is the Velké Dářko pond that is located in Žďár nad Sázavou. The region is attractive for its rather low air pollution and relatively healthy forests. The size (nearly 6,800 square kilometres) of the Vysočina region ranks among the regions of above- average size - only four counties are vaster.

All three sites are confined to spots of base-rich soils in predominantly acidic environments of the Rokytná, Jihlava and Chvojnice river valleys. Downy oak forest vegetation is well developed here and includes many thermophiles species, some of which reach their distributional limit here in Moravia. The study

acknowledges the importance of thermophiles communities for the biodiversity of the Vysočina region.

One of most telling things we can notice is that in the Omsk region there are a lot more lakes and marshes due to the size of the region compare to the Vysočina one. Both regions are covered quite heavily with forests. They have different types of forests within themselves but it still represents a big part of the vegetation. Our estimate is that the Vysočina region has a healthier type of vegetation because it has been influenced by kinder weathers and has a cleaner air and soil to grow than in the high steppes of the Omsk region.

3.5 Soils

The overall assessment of natural conditions for agriculture is not only the climate, altitude, slope of the territory and its exposure but also the depth and stoniness of the soil profile. All these criterias are connected with the production capabilities of the agricultural land. According to these characteristics, the territory has substandard natural conditions for crop production.

The soil cover of the Omsk region is characterized by significant diversity and colourful composition within the different zones and districts (Table 4).

The steppe zone is characterized by the spread of chernozems. Arable land here is 81.5 %, including 70, 8 % of chernozem. Arable lands of the steppe zone are located in large patches. The left bank of the Irtysh River is mainly occupied by loamy ordinary chernozems. Watersheds have a variable composition of the soil.

Table 4. The specific weight of the soil in the zones of the Omsk region (%)

Soils	In the region	Steppe	South-steppe	North-steppe	North
Chernozem	23,7	70,8	44,8	11,8	0,4
Dark grey and forest	4,3	0,4	1,1	7,9	4,5
Sod-podzol	2,6	–	–	1,2	5,9
Solonized and deep solonetic	7,5	10,3	17,2	10,9	–
Solonetic and solonchak	10,3	11,6	15,6	19,8	0,1
Meadow	5,6	0,6	0,5	10,7	5,8
Bog	20,1	0,6	1,7	17,8	38,4
Other	25,9	5,7	19,1	19,9	44,9

In the southern forest-steppe zone, arable lands are also located in larger patches. The farms of this region compared with the ones from the south area show typically an increase in forest coverage. Wood is represented by small groves on the southern part of the zone and larger forested areas are located in the northern zone.

Arable soils in the northern forest-steppe zone occupies 31.8% of the total land area, including black soil - 11.8%, solonized and deep solonetic - 10.9%, dark - grey and grey forest - 7.9%.

Soils purposed for grasslands and pasture are 32%. On the territory of the northern forest, there can be found a lot of lakes and swamps that combined makes the wetlands reach 35 %. Marshes are located with the large patches, sometimes within small isolated areas. On the marshes grow different types of sedges which are called reeds and among them are low manes. There are also moss bogs.

In the Vysočina region a total of five areas of soil formation can be distinguished. These are areas of the occurrence of sandstones and weathered on the platforms and structural terraces. They have long been exposed to surface erosion and are still susceptible to it. Others are areas of occurrence of loessial loams, mostly without lime. There are the most fertile soils, mainly brown soils. The third area is presented by relics of old river terraces with stony brown soils. The fourth case is on surfaces of slope and sediments of sandstones are situated podzol and sloping land. In areas affected by landslides occurs pseudogley. The fifth group contains the areas in the valleys of alluvial deposits which moisturizes profusely groundwater. Moreover, the amount of clay is presented and sometimes even peaty, but also often superimposed. Soil forest land are mostly nutrient-poor, low productivity areas, with permeable sand that outweigh clayish loessial soils.

One of the main similarities with the two regions is the wetness of their soils. It is also worth saying that large patches of forest land can be found in both regions which gives them a more stabilizing aspect of their correspondent soils.

3.6 The development of agriculture

3.6.1 The dynamics of agricultural farms

Started in 1991, the land reform introduced big changes in land relations in the Omsk region: the state owned monopoly on land was liquidated, the basis of a mixed economy of agricultural sector was established, the land market started to

function and the structure of agricultural producers changed in the direction of increasing the individual sector of agricultural (peasant) farms and private farms.

However, many issues of this reform were still not brought to conclusion. The land market and its infrastructure were in a stage of formation. It required improving the enforcement practice of the land legislation, including its regards to the agricultural land. The reserve of improvement of socio-economic efficiency of the use and protection of the main wealth of the region - the land was not exhausted, ensured the constitutional rights and guarantees for land parcels.

The dynamics of the development of farms in the Omsk region is characterized by two processes. On the one hand, since 1995, there is their quantitative reduction and on the other - the growth of the agricultural land. But at the end of the year 2013, there was a slight reduction in the area of agricultural land. With the reduction of the number of farms and an increase in the area occupied by them, a positive phenomenon happened - the increase in the average size of private (peasant) farms. This fact indicates that the process of land concentration of agricultural farms was put in the hands of more effectively managing farmers (table 5, fig. 8 and 9).

Table 5. The dynamics of agricultural farms in the Omsk Region

Year	Total amount	Total area, thousands of ha	Average size, thousands of ha
1999	6865	645	94
2000	6505	667,4	102,6
2001	6251	736,3	113,5
2002	5889	709,3	125
2003	5685	744,3	130,9
2004	5363	754,6	140,7
2005	5192	771,2	148,5
2006	4969	784,9	154,3
2007	4628	781,3	164,9
2008	4686	799,4	166,9
2009	4496	783,3	170,6
2010	4477	770,7	168,6
2011	4229	744,4	173,5
2012	4215	743	173,7

Fig. 8 The dynamics of the whole amount of agricultural farms in the Omsk region

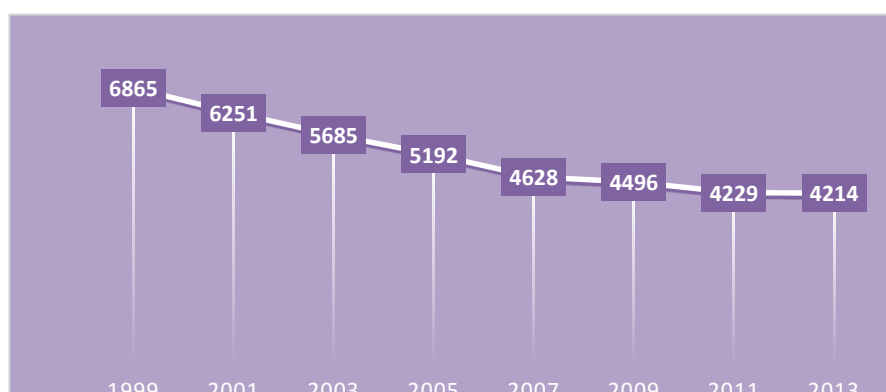
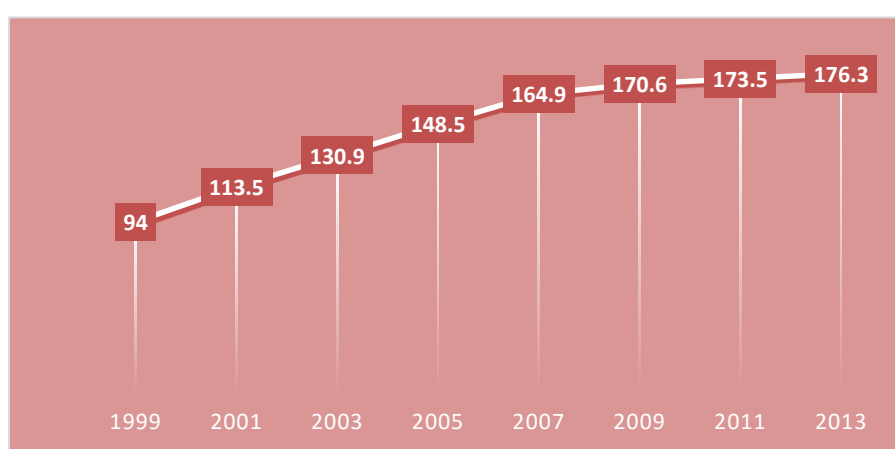


Fig. 9. The dynamics of the average size of agricultural farms in the Omsk region



The size structure of farms managed according to hectares is not very different from that of the Czech Republic. The only visible difference is the holdings going from 0 to 4.99 ha in the Czech Republic which stands at 51% of these enterprises compared with the 46% of the region. In other categories, the structure of enterprises in the region is almost identical as to the Czech Republic.

In the Vysočina region, but also in the Czech Republic, according to table 6 there are many small businesses that form insignificant proportion of agricultural land and vice versa. There are also businesses with an area of over 500 hectares, which accounts for 92.2% of the total utilized agricultural land.

Table 6. The dynamics of agricultural farms in the Vysočina Region

	Agricultural holdings	None	0-4,99 (ha)	5-9,99	10-49,99	50-99,99	100-499,99	500 and more
2009	4,329	172	1,930	490	1033	296	219	189
2010	4,176	172	1,916	417	957	300	222	192
2011	4,230	159	1,938	433	963	312	233	192
2012	4,303	201	1,960	445	967	298	241	191
2013	4,296	190	1,929	456	984	299	249	189
2014	4,270	152	1,920	478	971	308	252	189

The table also shows us that the bigger the agricultural holding the more chance it has of staying compact and living through time. Whereas the smaller ones tend to be reduced bit by bit.

3.6.2 The structure of lands used by agricultural holdings

Analyzing the next level- the structure of lands that agricultural holdings used in the Omsk Region, we can see from table 7 that from 2007 to 2014 an increase in the area size of agricultural holdings occurred, going from 83.0 % to 85.9 % - these were mainly agricultural lands, including arable land. It is a positive fact that in the agricultural land used by agricultural holdings there are 0.7 hectares of drained grasslands. The negative effect is the presence of 1,5 thousand hectares of fallow land, which was reduced to 1 thousand hectares by the year 2012.

We also can notice that the wooded area nearly lost all its size during those 7 years going from 13.9 thousand of ha to only 2.5 in 2014. This is due to the reduction of the total area of the Omsk region and the development of the agriculture in the region, taking land that previously was wooded and using for its own purposes. The same can be said for the grassland area but with a lesser drop.

Table 7. Structure of lands, used by agricultural holdings in the Omsk Region

	2007	2008	2009	2011	2012	2013	2014
Total area	781,3	798,8	783,3	744,4	743,0	742,8	738,7
where farmland	763,0	782,3	767,1	733,6	732,2	732,2	733,2
Incl. arable land	648,6	671,6	661,9	635,1	633,7	634,3	635,1
Fallow	1,5	1,4	1,3	1,0	1,0	1,1	1,3
perennial plantings	0,1	0,1	0,1	0,1	0,1		
Grassland	66,0	63,4	59,3	55,8	55,4	54,5	54,5
Pasture	46,8	45,8	44,5	41,6	42,0	42,3	42,3
Wooded area	13,9	13,1	12,4	7,0	7,0	7,5	2,5
Trees and shrubs	0,8	0,6	0,6	0,6	0,6		
Water area	0,3	0,3	0,3	0,3	0,3		
Building area	0,2	0,2	0,1	0,1	0,2		
Roads	0,5	0,5	0,5	0,5	0,4		
Wetlands	2,4	2,2	2,2	2,2	2,2		
Other	0,2	0,2	0,1	0,1	0,1	3,1	3

In the Vysočina Region from the table 8 we can note that while the total area of the region very slightly increased over the 6-year period, some notable distinctions were seen through the lands. First of all, the agricultural land portion lost

almost 2500 has to the non-agricultural land over that time frame. It was mainly due to the decline of the arable land and the escalation of the forest land. The number of orchards dropped by a bit more than 1% while the number of vineyards remained the same.

Table 8. Structure of lands, used by agricultural holdings in the Vysočina Region (ha)

	2007	2008	2009	2011	2012	2013
Total Area	679,543	679,547	679,556	679,560	679,571	679,567
Agricultural land	411,649	411,288	410,917	409,911	409,470	409,161
including arable land	318,738	318,384	317,962	316,832	316,504	316,251
gardens	10,117	10,146	10,169	10,189	10,196	10,205
orchards	637	627	629	632	630	630
permanent grasslands	82,153	82,127	82,154	82,255	82,137	82,069
hop gardens	-	-	-	-	-	-
vineyards	3	3	3	3	3	3
Non-agricultural land	267,924	268,259	268,638	269,649	270,101	270,406
including forest land	206,348	206,465	206,601	206,842	206,977	207,160
water body areas	11,607	11,668	11,717	11,870	11,977	12,010
build up areas	8,498	8,458	8,588	8,717	8,761	8,790
others	41,471	41,579	41,733	42,220	42,385	42,447

One of the first things we can mark down is that the total area for both regions suffer different fates. The Vysočina region almost did not move in terms of size while the Western Siberia region lost around 9.5% of its total area. A slow reduction of the arable land for both regions is also worth mentioning although the downside was more marked for the Omsk region. The grassland area was cut by 20% in the Omsk region while it basically remained untouched for its Czech counterpart.

The most important thing that this part shows us is that both regions go through a similar process of "Less is better and bigger is more efficient". We conclude that the agricultural holdings in the Omsk Region and in the Vysočina Region tend to decrease in number but increase in size due to legal engagements from both countries that want to maximize profits and give their lands to more efficient farmers.

3.6.3 Forms of ownership

The formation of agricultural farm lands occurs both by providing them with the ownership of the land, a lifetime inheritable possession, use, lease, and due to the partition of land in respect of shares in the common ownership of the land plot of

land for agricultural purposes. In addition, agricultural holdings are provided with the land to other citizens and corporates with the right of use and rent (table 9).

*Tab.9. Forms and types of ownership of agricultural holdings in the Omsk Region
(thousands of ha)*

Years	Total area, Thousands of ha	where lands were used, that are in						
		Ownership		State ownership				Ownership of other citizens and corporates, and authorities
				Total	Among them on the right of			
		Natural persons	Cooperati ons		lifetime inheritable possession	use	lease	
2005	789,5	195,7	175,4	124,2	1,3	15,6	107,3	294,2
2006	784,9	185,9	179,4	107,3	1,1	15,3	90,9	312,3
2007	781,3	185,0	179,4	105,8	1,1	15,3	89,4	311,1
2008	799,4	165,0	163,7	119,3	1	14,0	104,3	351,4
2009	783,3	196,4	160,9	112,1	1	14,0	97,1	313,9
2010	770,7	203,2	140,3	113,9	1,1	13,8	99,0	313,3
2011	744,4	189,5	138,3	104,3	1,1	8,9	94,3	312,3
2012	743,0	200,6	135,2	104,6	1,1	8,9	94,6	302,6
2013	742,8	195	140,6	105,6	0,9	8,7	96	301,6
2014	738,7	190,7	139,3	109,4	0,9	8,7	99,7	299,3

Judging from this table we can immediately point out that the amount of land owned by cooperatives decreased of 20% over the 10-year time frame while the one owned by citizens only dropped by 2%. The state ownership total saw a loss of nearly 15 thousand has of land meant to be used as agricultural holdings with a clear depression noted in both used or leased. We can see that 40.5% of the total area in 2014 was owned by citizens, corporations and authorities.

In the Vysocina region based on the data present in the table below, we can analyse that 75% of the agricultural area total belongs to legal persons where the slight majority (49.9%) comes from cooperatives. The rest is divided between joint stock companies (31.6%) and companies with limited liabilities (18.5%). The other 25% of the area is used by natural persons that almost entirely (96%) are agricultural entrepreneurs.

So basically the agricultural land of the Vysonia region is owned in order by first cooperatives (37.6%), then by natural persons (24.6%) and joint stock companies (23.8%), leaving the rest to companies with limited liabilities that own around 14% of the total area.

Table 10. Forms of ownership in Vysočina Region (2013)

CR, Region	Agricultural holdings, total	By legal form					
		Natural persons	Of which: Agricultural entrepreneur – natural person	Total	Legal persons from which		
					Limited liability companies	Joint stock companies	Cooperatives
Vysočina	2.410	2.119	1.683	291	107	66	97
	Utilized agricultural area, total (ha)						
Vysočina	359.848	88.770	85.250	271.078	48.945	85.678	135.371

The other main point given by this chart is that cooperatives might not be big in numbers, only 97 in 2013, from the 2410 agricultural holdings present in the region, but accounts for a lot of the agricultural land. Whereas the natural persons group that represent 87.9% of the total of agricultural holdings owns legally a very smaller part of the agricultural area.

One of the most revealing details about both regions is that the agricultural land is owned by citizens or entrepreneurs for about a quarter of the total but that the main land owner remains cooperatives and authorities in the case of the Omsk region.

4. ANALYSIS OF THE AZOV GERMAN NATIONAL DISTRICT AND TŘEBÍČ DISTRICT

The goal of this chapter is to analyze the same districts but via a microscopic type of view. We will evaluate the Azovo German national district of the Omsk region and study the similarities and differences it has compared to the Třebíč district of the Vysočina region.

The previous chapter introduced the many contrasts and resemblances that the Russian region had with its Czech correspondent. Now we will make a similar research at the departmental level and evaluate if the same tendencies appear or if there will be new conclusions by the end of this stage.

4.1 General information about the districts

The Azov German national municipal district of the Omsk region is located in the southern part of the forest-steppe zone of the Omsk region. It stretches from north to south over 68 km and from west to east over 32 km (fig.10).



Fig. 10 Location of the Azov German National district

Roads of republican as well as regional importance connecting Vladivostok to Moscow passes through the district. The distance from the district center of Azov to the regional one is around 45 km. The territory of the region occupies 1.4 thousand

sq. km. In this area there are 8 rural administrations: Azovsky, Alexandrovsky, Berezovsky, Gaufsky, Zvonarevokutsky, Prishibsky, Sosnovsky, Tsvetnopolsky and 28 settlements.

The region has a population of 24.1 thousand people (1.2% of the total population of the Omsk region). The population density reaches 16.6 people per 1 sq.km. Its ethnic composition is as follows: Russian - 61%, German - 20%, Kazakh - 8%, Ukrainian - 5% and others - 6% (Fig. 11) .

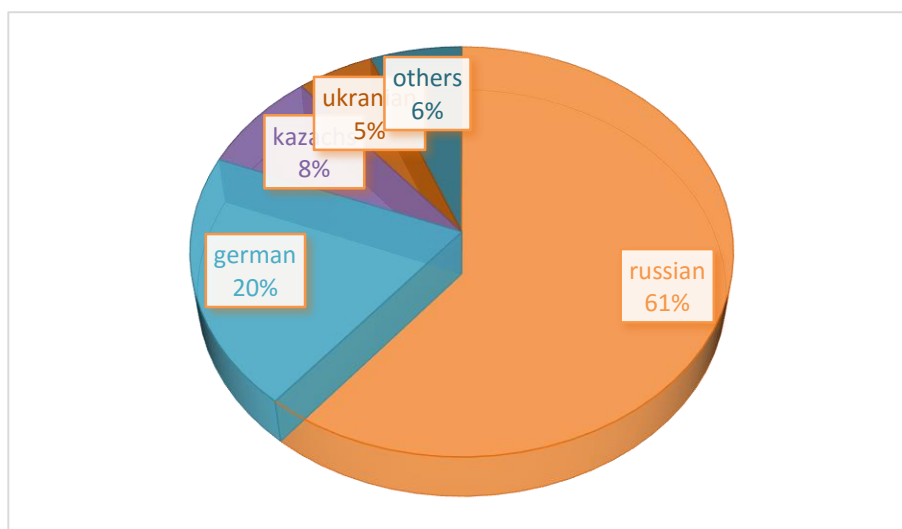


Fig.11 – Structure of the national composition of the population of the Azov district

One of the major achievements of the region is the fact that the Azov German district retained the positive trend of the natural population growth. The natural increase in 2013 was registered at 199 people and the immigration made the district gain 375 more people. As a result, the resident population increased by 0.6 thousand and in 2013 was set at 24.1 thousand.

Table 11 is a brief review of the district: the land area of the Azov district is estimated at 139,979 hectares. It has a population of 24.1 thousand people with a density rate of 16.6 per km². The main transport system in the district is the use of cars. A polluted and non-ecological type that shows us how much more work needs to be done in Azov and in the Omsk region in general. A few solutions to this problem will be given later by the end of this chapter.

Table 11 – General data of the Azovo district

Indicator	Unit of measurement	Data
Total area	ha	139979
Population	Thousands of people	24,1
Population density	p./km ²	16,6
Number of rural administration	pieces	8
Number of settlements	pieces	28
Distance to the regional center	km	49
The maximum distance from the district center to the center of the village administration	km	45
Transport system	type	cars

The Třebíč District is a district in the Vysočina Region and the whole district is situated in Moravia (fig. 12). Its capital is the city of Třebíč. The Třebíč District was created as an administrative unit in 1855. The last reorganization of the district happened in 1948 and 1960. Since then it got separated from only a few municipalities. Its total area is 1463km². The population in 2015 was up to 112 076 people.

The climate is terrestrial, rougher and more humid at higher elevations of northern and north-western parts of the district. It is however drier and warmer in the east and southeast. Long-term average temperature of the district varies from about 7.2 to 7.9 degrees Celsius and the average rainfall reaches around 500 mm (of which during the growing season get to about 375 mm). The amount of rainfall negatively affects the rain shadow of Jihlava Hills.

Although most of the region is a classical terrain of the highlands where they are prerequisites for intensive development, the agriculture somehow decreased. There are some differences at the district level in the balance of the soil. The predominant character of the landscape, with their character earmarks in the southern part of the district Třebíč, belongs to the less fragmented, warmer and more favorable for agricultural production of the Jevisovicka upland.

The altitude of the district is about 500 m which is a blunder but also the yearly resultant, especially during the summer months of June and July, of a small number of rainfall making the conditions for agriculture very difficult. This situation requires more care and tenacity from farmers.



Fig. 12 The location of the Trebic district

Through the Třebíč district mainly flows the river Jihlava. The other rivers of relative importance are the Rokytá, Oslava, Jevišovka and Želetavka rivers.

Of all the districts of the region, the Třebíč district is the most deforested. Forests account for just over a quarter of its territory. Extensive forest complexes can be found in the west and northwest parts of the district, but also in the east and southeast areas along the streams of the Jihlava, Celebrations, Chvojnice and Rokytá rivers.

4.2 Types of Soils

The main types of soils of the Azovo district as presented in Figure 13 are meadow-chernozem (32953ha or 27,6%), meadow-chernozem with solonchak (40527 ha or 33,9%), meadow-chernozem with solonetz (33497 ha or 28%), meadow steppe solod (775 ha or 0,02%) and meadow-chernozem solonetz (11799 ha or 9,9%).

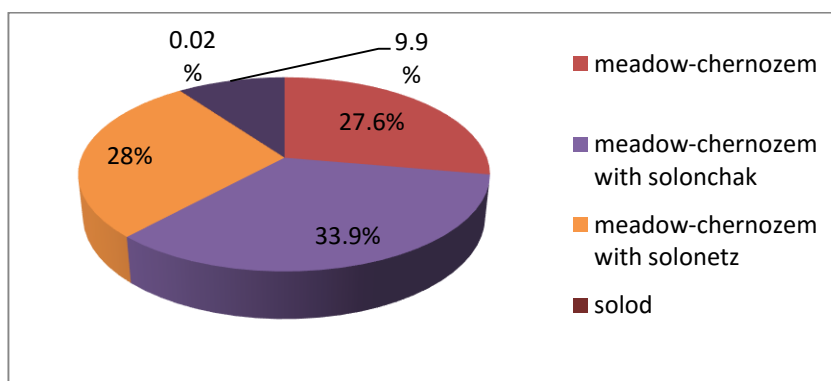


Figure 13 - The structure of the soil cover of the Azov district

As for the Třebíč district, the soil types are very different. There are soils with light sand, sandy loam and clay. Of these soils, there is a considerable part of the underclass soil and thus impermeable soaked soil. The soil classification is not the same kind as in the lowland regions. This is due to a very good tradition of farmers maintaining the integrity of the ecology in individual municipalities in the district to remain largely like its original size, and therefore being indivisible.

On the flat parts are located the islands of pseudo clay or heavier clay. Lower platforms and upper boundary slopes of the central Vysočina cover an area of the typical forms of cambisols, often with clay parts. On the boundary slopes, there can usually be found typical cambisols. They have the largest representation in the area of Třebíč. On the loessial and clay places are located typical islands of luvisols with other subtypes and further brown earth soil with different subtypes. On clay platforms with variable alternation are based the pseudo clays. On the rocky places there are different subtypes of litosols and rankers. They are characterized by a higher proportion of the skeleton including stony ground. The stocks of soil nutrients are from weak to moderate.

In general, the Třebíč District is considered to be the most agriculturally favorable area of the region with the highest proportion and percentage of arable land. In this region, the Southeast region is the warmest and the fertile brown soil dominates it. Most of the region is located in a moderately warm climate with plenty of rainfall. Most of it contains brown soil suitable for growing less demanding crops.

4.3 Agriculture

4.3.1 Structure of agricultural lands

The area of agricultural land of the total land area of the Azov district for the year 2014 (119523 ha) occupied 116002 ha (97 %), while arable land area was 104052 ha (89.6 %), grassland and pastures were 4236 ha (3.7 %) and 6021ha (5.1 %) respectively. Table 12 shows the development of the structure of agricultural land. Judging from this table we can estimate that the total area of the land has decreased to 13940 ha due to the withdrawal of 13915 ha of forest area and 25 ha of other lands.

Table 12. The dynamics of the structure of lands, used by agricultural holdings in the Azovo district

	2007	2008	2009	2012	2013	2014
Total area	133463	133463	133463	119548	119548	119523
where farmland	116002	116002	116002	116002	116002	116002
Including arable land	104052	104052	104052	104052	104052	104052
fallow	332	332	332	332	332	332
perennial plantings	1361	1361	1361	1361	1361	1361
grassland	4236	4236	4236	4236	4236	4236
pasture	6021	6021	6021	6021	6021	6021
forest area	13915	13915	13915	0	0	0
Trees and shrubs	772	772	772	772	772	772
Water area	366	366	366	366	366	366
Building area	233	233	233	233	233	233
Roads	1507	1507	1507	1507	1507	1507
Wetlands	412	412	412	412	412	412
Other	256	256	256	256	256	231

Of all the districts of the Vysočina region, the agricultural land occupies the largest part of the area, particularly in the Třebíč district (63.8%). In 2013 it contained 146.306 ha of fields, which represented 64 % of the agricultural land (93271 ha) and 36% of the non-agricultural (53035ha). Table 13 shows the dynamics of the structure of the total lands in the district. We can notice that the total area has increased by 3 ha, but the agricultural land decreased of 411 ha, whereas non-agricultural saw a boost of 411 ha in the same time period.

Table 13. The dynamics of the structure of lands in the Třebíč district

	2007	2008	2010	2012	2013
Total Area	146,303	146,296	146,299	146,311	146,306
Agricultural land	93,682	93,611	93,462	93,304	93,271
including arable land	82,146	82,069	81,902	81,644	81,622
grassland	9,136	9,137	9,156	9,254	9,240
vineyards, gardens, orchards	2,400	2,405	2,209	2,406	2,409
Nonagricultural land	52,621	52,685	52,837	53,007	53,035
including forest land	39,553	39,557	39,575	39,593	39,622

4.3.2 The structure of cultivated area

In the Azov district the structure of the cultivation areas in the year 2014 has not changed significantly compared to previous years, although some innovations have appeared. In recent years, direct harvesting was widely practiced creating a relative purity of the fields. This method is economically and organizationally beneficial. The total cultivated area of arable land is 104052 ha, of which 13942.9 ha were under ley farming, 84594.2 ha were occupied by crops, on 104 ha soybeans were planted, sunflower occupied 936 ha and 4370 ha were devoted to canola (Figure 14).

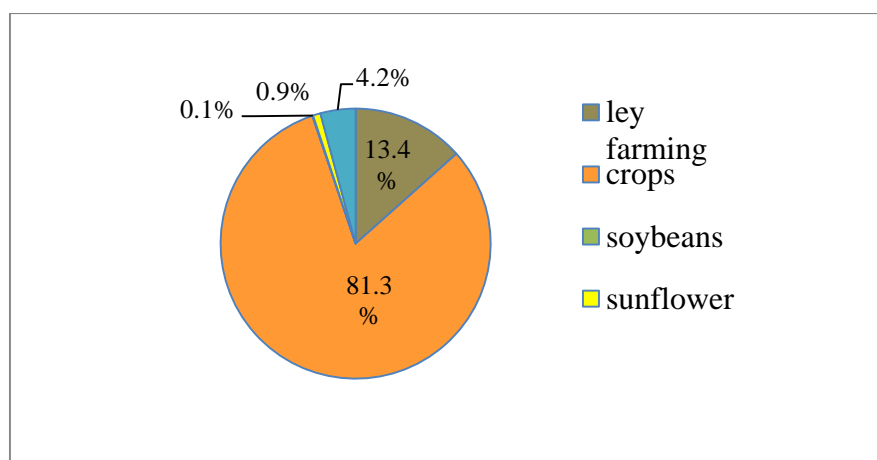


Figure 14 – Structure of using of arable land in Azov district, source - author

In the Třebíč district the crop rotation is potato based mostly because of the large number of distilleries in the district and its need for more than 1,000 wagons of potatoes per year. That is why, during the crop rotation, a considerable part of the acreage is devoted to potatoes. Except them, the main crops are rye, oats and also wheat, that is very widespread especially lately due to a disproportionate price range.

Out of the top four production areas (corn, sugar beet, potato and mountain) corn is not represented in the Třebíč district. The table 15 shows the dynamics of the structure of production areas. The biggest share of the total agricultural land area consists of potato (94.4%), which has slightly decreased in 2008 of 3103 ha in comparison with 2005. The area of sugar beet covered 5.1 % in 2008 and the share of the hill production areas is the lowest at 0.5% of the total production.

Table 15. The dynamics of production areas of Třebíč district

	2005	2008
Sugar beet, ha	4744	4736
%	4.9	5.1
Potatoes, ha	91496	88393
%	94.6	94.4
Mountain, ha	484	482
%	0.5	0.5

4.3.3 Forms of ownership

The forms of ownership in the Azov district are represented by state, natural persons and corporations. Table 16 shows the dynamics of the changes in ownership from 2007-2014 years. Basing on this table, we can assert that the only notable positive change during the 8-year period was that the percentage of area owned by natural persons increased slightly, going from 72.8% to 73.5%. On the other hand, the only reduction visible on the table is exhibited by corporations, that have lost 8.3% of their original owned land and 0.9% of the total area over the 8-year time frame. The area owned by the state did not change.

Table 16. The dynamics of forms of ownership in Azovo district

	2007	2008	2009	2012	2014
Total area	133443	133463	133463	133463	132323
Including natural persons	97211	97356	97356	97356	97356
%	72.8	72.9	72.9	72.9	73.5
corporations	7665	7540	7540	7540	6400
%	5.7	5.6	5.6	5.6	4.8
state	28567	28567	28567	28567	28567
%	21.4	21.4	21.4	21.4	21.5

Table 17 – Business entities (citizens) using the land in the Azov district on January 1, 2014

Name of business entities, using the land	Amount	Total area	
		ha	%
Agricultural farm holdings	31	36577	76,1
Private entrepreneurs	2	396	0,8
private subsidiary farms	8535	1924	4,0
Gardeners and gardening associations	18610	1531	3,2
Citizens having land plots allocated for individual housing construction	56	8	0,02
Citizens involved haying and grazing	6638	7273	15,1
Citizens, land owners	3	39	0,1
Citizens, owners of land shares	28	326	0,7
<i>Total</i>	<i>33745</i>	<i>48076</i>	<i>100</i>

Analyzing the data presented in Table 17, we can conclude that the entity using the largest area of land is the agricultural farm holdings that reach the 76 % mark. The formation of agricultural farm holdings in Russia was essentially the first event in the agrarian transformation creating an alternative to collective and state farms in the form of management. The second biggest user of land in the district is the citizens involved in haying and grazing the land. They are far more superior in numbers compared to the agricultural farm holdings, 6638 to 31, but only use 15.1% of the land, which shows us how dominant the farm holdings are in the sector.

As for the Třebíč district we can see that in 5 years the amount of agricultural land as well as arable decreased of 2611 ha and 3769 ha respectively. The agricultural land provided by the right of ownership has increased by 238 ha, the most noticeable change was for the rented area – agricultural land decreased for 2049 ha and arable land – for 2015 ha, and as for the land rented from others, we can notice both decrease in agricultural and arable land of 5004 ha and 5801 ha respectively. Not utilized area mostly did not change. The data is presented in table 18.

Table 18. The dynamics of forms of ownership in Třebíč district

year	Total area (ha)		Including							
			By right of ownership		Rented by others		Not utilized area		Rented from others	
	Agricultural Land	Including Arable	Agricultural	Including Arable	Agricultural	Including Arable	Agricultural	Including Arable	Agricultural	Including Arable
2005	87914	79899	14375	13032	2504	2392	176	5	76255	69264
2010	85303	76130	14613	13045	455	377	107	1	71251	63463

The other main points given by this chart is that cooperatives might not be big in numbers, only 97 in 2013, from the 2410 agricultural holdings present in the region, but accounts for a lot of the agricultural land. Whereas the natural persons' group that represent 87.9% of the total of agricultural holdings owns legally a very smaller part of the agricultural area.

One of the most revealing details about both regions is that the agricultural land is owned by citizens or entrepreneurs for about a quarter of the total but that the main land owner remains cooperatives and authorities in the case of the Omsk region.

5. ANALYSIS OF FARMS

5.1 Agricultural corporations and dotation to agriculture

According to the data provided by the Rosreestr Office of the Omsk region, the main business entities (individuals and organizations) that use land in the Azov district are "Azov", "Rus", "Zvonarevokutskoe", "Novoazovsk", "Prishib", "Tsvetnopolie", "Golden ear", 31 agricultural farm holdings, 8535 private subsidiary farms and other subjects.

The formation of agricultural farm holdings in Russia was essentially the first event in the agrarian transformation creating an alternative to collective and state farms in the form of management. Reformation of agricultural enterprises has led to a radical change in land use by the agricultural enterprises. By the time of the land reform, collective farms and state farms were sufficiently large and compact areas with no significant deficiencies, to hold the same legal status of land use. After the land reform, joint-stock companies, partnerships, co-operatives have had view plots interspersed with numerous foreign land uses: agricultural farm holdings, land previously allocated to the rural administrations, etc. The land is in use in private property rights, lease or sublease, state, transmitted to rent or use. (Rogatnev, 2002)

The understanding of the agricultural organization is made easier by the very good qualities of local farmers. Agricultural cooperatives today in the Třebíč district are not only supportive but also the pride of the agriculture for the entire Czech Republic. The leading role was taken by the Hospodářské cooperative from the district of Třebíč that made in the final year an estimated 800 wagons of grain. This number stands among the first teams on this matter in Moravia. Sales of fertilizers, fodder and other goods are growing all the time as well.

In 2010, in the district 503 subjects were employed, of which 431 were individuals and 72 entrepreneurs. From these were 27 cooperatives, 837 joint stock companies and 37 limited liability companies. Altogether the Třebíč district farmed 85,303 hectares, of which 22,520 hectares were managed by natural persons, 14,825 hectares by limited liability companies, 6,076 hectares by limited companies and cooperatives farmed on 41,857 hectares of the total farmland (Source ČSÚ).

In order to increase the number of small businesses, ensuring a healthy employment rate and as part of a long-term target program: "Development of small

and medium-sized businesses in the Azov German national municipal district of the Omsk region in 2010-2014", was held a competition in 2013 for the provision of grant support to small entrepreneurs for opening their own businesses at the expense of the local budget. The funds under the program amounted to 220 thousand rubbles. The competition was won by 2 individual entrepreneurs that presented the following projects: "Creative Workshop" and "Meat semi-finished products."

In 2014 and in order to promote the development of small business, a grant it was planned to provide a grant support to the advancement of entrepreneurship. In addition, trying to solve the issues of the development of agricultural sector in the Azov German National district, was implemented long-term programs in agriculture such as:

- The program for the development of fodder production and animal husbandry;
- The program to improve soil fertility;
- The program of development of labour market in agriculture.

Agricultural organizations of the district purchased agricultural equipment and technology that amounted to 145 million rubbles, 3 warehouses for grain storage and a new milking parlour for 1000 cows in Azov that became one of the best in the Omsk region.

As for the Třebíč district, since the year 2004 when Czech Republic became part of the European Union the changes were also reflected in agriculture. The agricultural sector started to participate in European funds grants. Subsidies to Czech Republic were divided into two basic groups according to the source that the financial sector paid. Farmers can obtain money from European funding programs to which Czech Republic contributes and national subsidy programs which are fully paid by its budget. Both grant programs are handled and paid by the State Agricultural Intervention Fund.

Money from these funds should support agricultural production and its development. In the Třebíč district there are several example that received such grants –the agricultural cooperations "Výčapy", "Hrotovice", "AGROCHEMA", "Budišov", "Dešov", "Hrotovice", "Kouty", "Okříšky" that amounted to more than 1 million CZK (Ministry of agriculture, 2012).

Peasant union is the first and largest self-help financial institution in the district of Třebíč. It has over 800 members and a nearly 15 million CZK deposit. It is

managed by farmers with the desire and need to develop the agriculture industry.

Now we will look at 2 of agricultural farms deeply, analyze it and compare its profitability.

5.2 Analysis of agricultural farms in Russia and Czech Republic

Agricultural farm holding "Luft" is considered to be the largest farm in the Azovo district and was founded in 1994. It grows wheat, barley, peas and soy, sunflower and rapeseed but also produces pork at an industrial volume. The range of crops each year is represented by more than 20 varieties and hybrids of 6-7-year-cultures. It conducts its own barley seed, wheat, oilseed rape. Modern technologies allow carrying out all the necessary process steps in the area of over 17 thousand ha in optimal agronomic terms. This farm started from 24 ha of arable land and now it grew to the level of agricultural holding of 18 000 ha of agricultural land, milk farm and mill. The whole farm "Luft" can be called the hallmark of the district as there are also elevators, dryers and foder plant (personal interview with the owner).

«No till» a so-called modern technology in agricultural production is today used by this farm. This is the soil conservation farming. The main principle of "No till" is that a field must be constantly covered with plants or crop residues. And it is required continuous accumulation of residues on the fertile layer. This will allow the land to effectively resist erosion. In this situation, including nutrient management, there will be an environmental control of weeds, diseases and pests, moisture will remain in a desired amount for the soil. The main advantage of this modern technology is to obtain yields even in drought years.

Table 19 shows us the dynamics of the results and productivity of the farm. The best figures in the farm are the 27.9 c/ha of grains and legumes. We can also see that the amount of sunflower has increased by 4 times, rape – by approximately 2. In 2011, the first place plants grown were sunflower and wheat (4 thousand of ha respectively), the second were barley and rape and on the third place were soy and corn. In the near future there will be a new rape seeding plant and that is why the Luft farm decided to increase the cultivation of this plant up to 2 thousand of ha. In addition we can notice that in 2011 started to be held a pig production and also had a daily weight gain of 600 grams. To conclude, we can see that the farm is developing rapidly opening new opportunities in agrobusiness and adding new

technologies and thus increasing the production profitability. According to the last years' data, income has increased from 15.000.000 rubbles to 64.000.000 rubbles (for comparison with CZK – 20.000.000) (Source – personal meeting with the owner)

Fig. 15. The territory of the farm "Luft", Fig. 16. The owner of the farm

Source - personal interview with the owner



Table 19. The dynamics of the agricultural farm "Luft"

Name	2007	2011
Plant growing	18.5	18.5
Wheat	8	4.5
Sunflower	0	4
Barley	6	2.2
Rape	1.2	2
Soy	2.5	1.5
Production profitability, %	120	120-180
Production of flour, t	10 000	10 000
Animal husbandry		
Pig population	0	11 500
Finance and HR		
Income, mln rub	150	N-p
Total loan, mln rub	150	150
Investments to animal husbandry, mln rub	0	132
Staff	100	50
Average salary, rub	14 000	n-p

Source - personal interview with the owner

Agricultural cooperative "Výčapy" is one of the biggest farms in the Třebíč district. The original collective farm "Niva" was located in Výčapy and was transformed after 1989. It had an original 3500 ha of land and the reason for

becoming an independent individual farm, where farmers currently managing the land on a total area of 2457 ha, was that there were permanent grasslands in the surrounding municipalities. In 2010, they became part of the Agro 2000 Ltd. and the number of employees dropped from the original 110 to just 70 members.

On the cultivated land were grown mainly winter wheat, winter barley, winter rape, corn and spring barley. In the animal husbandry department, the cooperatives focused on cattle breeding for milk production, but in 2011 breeding pigs were cancelled due to the low purchase prices, as well as in many other farms.

In the past, cooperative belonged among to the major producers of potatoes with its own kind of potato, currently purchasing the feedstock and the resulting product - potato flour - supplied a significant portion in the Slovak market and to the eastern Moravia one.

Table 20. Area and yield of main crops in the farm Výčapy

	Winter wheat		Winter barley		Spring barley		Corn for grain		Winter rape	
	Area (ha)	Yield (t/ha)	Area (ha)	Yield (t/ha)	Area (ha)	Yield (t/ha)	Area (ha)	Yield (t/ha)	Area (ha)	Yield (t/ha)
1999	919,5	5,7	135,3	4,5	251,2	4,3	-	-	345,4	3,1
2000	959	4,7	92,4	4,7	351,9	2,6	-	-	387,9	2,6
2001	1028,6	5,7	116,2	5,7	417,1	3,8	-	-	414,7	3,2
2002	887,8	5,1	162,1	2,4	257,1	4,1	100	8	423,5	2,5
2003	806,9	3,8	148,8	3,1	361,7	3,3	103,3	5,7	359,9	1,3
2004	864,2	7,0	168,4	5,7	319,5	5,6	62	5,7	304,4	3,5
2005	832,7	6,1	127,7	5,8	300,9	4,3	93,1	7,6	321,4	3,3
2006	841,6	5,3	123,4	4,6	399,4	2,9	77,4	7,4	313,4	3,9
2007	804,5	4,8	151,8	4,8	277,3	3,1	70,0	7,3	351,0	3,5
2008	826	5,5	122	4,5	220	4,1	73,1	7,5	377	3
2009	843,5	5,3	157,4	5,2	130,9	4,9	131,2	9,6	373,8	3,6
2010	799,3	5,5	113,3	5,7	145	3,9	72,4	7,7	392,4	3,6
2011	838,9	6,1	109,8	4,3	117,2	4,7	38,3	7,8	371,8	2,7

Table 20 shows us the crop production over a 13-year period in terms of land use and tons made per ha. Judging by this data we can point out that the crop that was produced in the most quantity overall was corn. This was done consistently throughout the years with the less amount of land being used. Corn production has

remained quite stable from what we can judge, starting at 8 t/ha in 2002 and just dropping to 7.8t/ha in 2011. This feat is even more remarkable because it used only 2.6 % of the land used for agricultural means. The current crop using the most of territory is winter wheat. Using in 2011 more land (838.9 ha) than all other crops combined 637.1ha, while producing on average 2 tons less than corn per year.

5.3 Optimization of land-use

The effectiveness of the use of land as a major factor in agricultural production depends not only on the land properties itself, but also the quality of the environment, which includes natural, social and economic characteristics. Natural conditions, especially climate determine bioclimatic potential. Social conditions, availability, organization and quality of the labor force create employment possibilities. The result and effect of management decisions in the field of agricultural land use is closely linked not only to the scope and quality of these conditions, but also to the organization of land use and technical potential of its organization.

Optimizing the land use in the farm management is an important step into improving the system of agriculture in its ecological status with the help of a legal organization that will conduct studies of economic efficiency for the proper organization of land use.

The next step for our research will be to determine the positive and negative sides of the farms and proposals of its improvement in in economic and ecological parts.

5.3.1 Ecological optimization

To ensure a rational use of land, to make sure that it is being used as a natural complex and to recreate the properties of the main components of the landscape, we need to have a deep and correct evaluation of the ecology within those lands. Land with a higher productivity means to take risks with its ecology and landscape. But it should not always be the case, the development of degradation processes and the research about soil fertility should be main issues that allows us a more efficient way to use the land.

The location of the farm “Luft” can be named as a zone of risky farming. From 2012 to 2014 the amount of precipitation was very low, this fact affected the

crop productivity of the farm. Soils situated in this zone are not favourable for agricultural use as they usually lack mobile forms of phosphorus and nitrogen. Instead they are supplied by large quantities of potassium, making the level of natural soil fertility pretty low (private interview).

Given the fact that the farm is under poor weather conditions, to have an effective growing experience, its goal should be focused on the use of organic and mineral fertilizers. In zones with insufficient amounts of water, introducing moisture-holding granules that will improve the physical properties of compact soils, help reduce water evaporation and protect the nature of contaminants in groundwater, is becoming a true necessity. All of this to increase plant growth and create a ground optimal for their absorption.

Another issue that concerns both of the farm is erosion control problem. The situation especially worsened in the farm "Výčapy" as it is situated on medium to deep dissected territories where water erosion can happen with violence frequently. The main measures to eliminate water erosion are the followings:

- contour farming
- soil tillage across the slope to a depth of 20 to 22 cm.
- carrying out pre-winter plowing and slotting.
- carrying out seeding across the slopes.
- slopes steeper than 12° change into continuous perennial grasses formation.
- complex of hydraulic engineering activities, creation of water-detention and drainage shafts and other special devices.

Soil treatment substantially modifies its properties. Whether they are biological, chemical or physical, the task of this treatment will be to combine the prevention of water and win erosion with moisture retention, weed control and the creation of optimal physical properties of plants.

In the zone of the farm "Luft", there are particularly dangerous dry hot winds, that can be also called dust storms which cause wind erosion and thus significant damage to the agricultural production in the area. Further development of agriculture should be mainly focused in the way of intensification on the basis of the development of water and land reclamation, implementation of a system of measures to combat land desertification and the introduction of intensive technologies. For soil protection from water erosion it is necessary to carry out soil protection measures

such as:

- an erosion control territory organization, which establishes the structure and the total area of the land, the engineering of protective forest plantings, land for afforestation and hydraulic erosion control structures. This measures can find out the causes of erosion, the degree of its manifestation and its expansion.
- soil conservation crop rotations with short rotation and the presence of the bare fallow at a rate of 20 to 50 % of the arable land.
- zone tillage, where seeds of agricultural plants are placed in the strips that are cut off with a particular width across the erosion-dangerous winds instead of on the whole fields.
- soil protection technology for the cultivation of grain and other crops that with the use of an anti-erosion equipment will preserve after-harvesting residues. This helps to protect the soil from wind erosion, accumulation of moisture against drought and increase in crop productivity.
- reduction the number of mechanical tillage.
- radical and surface-level improvement of meadows and pastures.

Taking into account the shortage of budget funds allocated to the agricultural branch, the acquisition of the necessary amounts of mineral fertilizers for the farms in the near future can be difficult. With their absence, it is necessary to explore all possibilities for efficient use of organic, green manure and straw. For these purposes, it is recommended to use green manure on legumes, rape, wrapping their green mass in the beginning phase of flowering.

The use of green manure (clover, rape) leads to improve the soil structure, activate microbiological processes, accelerate accumulation of nutrients. The use of compost, green manure and organic fertilizer can be the solution for the conservation and improvement of soil fertility and, hence, to increase agricultural production.

Along with anti-erosion organization of the territory and with the development of soil conservation crop rotations, other elements of conservation farming systems should be taken into consideration:

- the use of an anti-erosion complex equipment and tools for basic pre-tillage and seeding.
- replacement of the mechanical treatment in order to destroy weeds by chemical methods.

-rational use of chemicals (fertilizers, herbicides, fungicides).

Lack of proper care and mistaken use of grasslands and reclamation leads to deterioration of the species composing the vegetation. First of all, on the grasslands, it is necessary to conduct the clearing of trees and shrubs in late fall or early winter, as the performance of hedge trimmers increases at that time of the year. When clearing the bush, a protective strip of trees and shrubs should be left in the place where possible water erosion situations could come up.

If the arable land is saline and have waterlogged areas, it is recommended to introduce the crop rotation which is environmentally stabilizing. The instance of environmentally stabilizing crop rotation are both soil protection and phytomeliorative rotations. These are done with soils rich in perennial and annual grasses with band placement of industrial crops, rocker fallow and performing other anti-erosion measures. Phytomeliorative rotations are designed on saline and waterlogged soils with the saturation of crops that are resistant to salinity, waterlogging and facilitate neutralization (regulation) of these types of violations.

The main reason for the decline of soil fertility is a quick reduction of the agrochemical works, which in recent times have been substantially reduced. The system of fertilizers in the crop rotations system is a set of organizational, economical, agronomical and engineering measures for the retention, storage, preparation and application of fertilizers in farming. It includes the distribution of organic and mineral fertilizers on the fields and crops, the combination of different types of fertilizer, the time of application and the methods of sealing. Each farm must have a system of fertilizers taking into account the planned crop productivity, the supplies of mineral fertilizers and the mineral reserves of local fertilizers.

5.3.2 Economical optimization

From the obtained data of the all farms we can notice that there is a reduction in crop production. In the “Luft” farm, it was presented by wheat and soy that decreased in 2 times and barley in 3 times and in the “Výčapy” farm this fall set for winter barley and rape. This inability to preserve the previous volumes of production can be the reason of the difficult financial situation, the lack of funds for the payment of wages, which could force agricultural organizations to restructure and

reduce the number of employees. This can be subjected for the “Luft” farm that reduced the amount of its employees in half in a 4-year period.

The economic condition of land-use is valued for its production efficiency. The main indicator is the assessment of profitability. If the profitability is less than zero than the production is obviously not profitable. This situation can be explained by the high production costs and low selling price. The negative profitability situation is not observed in both farms. However, there is always a need to increase it. To improve the profitability of grain production, agricultural organizations need through the development and introduction of technological and organizational activities to reduce costs on production and improve its technology. In order to reduce the production costs, grain farmers should reduce product transportation as well as manufacturing operations.

So, the increase in productivity is possible through the introduction of new technologies, application of fertilizers, use of chemical plant protection and carrying out anti-erosion measures aswell as cost saving methods.

5.3.3 Technical optimization

Along with the ecological and economical optimization of land use in agricultural approach, technical optimization plays an important role as with the us of new technologies farmers can not only save their time, but improve soil conditions, save and preserve the landscape in its natural form and increase their production efficiency.

There are a few new thechnologies, such as telematics. This program works with the following principle: the farmer can install a map on a device which will show the location of all his operated vehicles, their level of fuel, how much chemicals have been used, the amount of crops being harvested and keep a farmed informed on the technical ptoblems the machinery and vehicles might have. Some types have also naviation system that allows their owner to immediatly receive the coordinates to their operating system and reach the correct conclusions in a very short amount of time. This type of technology helps the farmer keep their high-priced equipment safe and sound but also maintain a high level of efficiency. Thus raising their overall profitability. To combine with telematics, farmers can now use soil and

crop sensors that will show them specifically what they need to do in order to maintain a healthy eco-system on their lands.

During the past decade, a steady development of high-flex tires has been made available to farmers in order to cover more acres faster with their bigger machines. These new type of tires transfer the weight of the heavy equipment onto a larger area, thus reducing the damage made to the soils.

Another use of new technologies is the resultant of the advancement in the biological field. With the creation of drought-resistance crops for example. This type of crop will stabilize yields and use less water for growing plants, which in return will be good for the farmer's finance and good for the environment as well.

Nowadays, with technologies replacing human activities and labor also comes faster and better results in the farming industry. Biological and technological improvements are necessary to push the boundaries of the agricultural world into the new century and reach levels of productivity never attainable before.

6. DISCUSSION AND CONCLUSION

The aim of my studies and coming to Czech Republic was to gain the knowledge of how the land is being used in Europe and to acquire the knowledge of its optimization. I thought that Czech Republic is a good example for the comparison because Czech Republic has similarities in its development from a historical point. Going through the history of communism, a tendency that influenced heavily both countries, we for example can see that the land was not being effectively used enough by society. But that due to better legislation and management, land-use became more developed as shown in my research. During my academic courses in Russia I read many scientific articles concerning soil optimization problems, erosion, chemical pollution, waterlogging, and much more but always there were not enough of analysis about how to optimize the agricultural situation in my country.

Land is a natural complex, mean of production and recreation and a basic economic resource for the society. The global socio-economic transformation of both of the countries that happened in the last decade led to a deep crisis in the agriculture sphere that dramatically worsened the conditions of agricultural production. We can observe a reduction in the area of arable land, a change of land use conditions, a large decrease in the grain harvest over the years, an intensification of their dependence on climatic factors etc. For a healthy recovery and a long-term efficient functioning of the agricultural economy, it is necessary to engage all of the agricultural land resource potential in production and organize its rational use and protection.

Always when we want to solve some problems we can not look for consequences but causes, how processes work in nature. It is essential to clearly distinguish which of them are caused only by nature and which are anthropogenic. This tendency will allow a correct land-use and measurements to restore the properties of any damaged land. Moreover, we should take into account the changes in priorities in the agricultural technology policy to use resources more efficiently, improve the technological level of production, use the scientific potential and consider the local climatic conditions of the region to significantly increase its agricultural production. Based on the analysis of this thesis we can make the following conclusions:

First of all, from the evaluation of the national level we realized that the historical stability of agricultural holdings is determined by their need for a strong

economic formation, starting from natural production to the main form of organization of agricultural producers. For instance, we noticed in my country and in the Czech Republic that a massive shift of population happened, when from the central parts of the countries to their regions millions of people moved onto a new land. People and their economic activities affected the natural landscape. Then further large-scale development of fallow lands in the XX century, during the socialism influence, led to these extremely not favorable environmental consequences: wind erosion, dust storms, which were accompanied by the loss of fertility on arable land. This experience has shown the necessity of taking into consideration the environmental factors for agricultural production. With the appearance of collective and state farms, the anthropogenic load on the environment has increased and in the current conditions with the existence of various forms of collective agricultural enterprises it worsened.

The analysis of the historical stages of the formation of the farm sector showed that agriculture is more efficient to manage on large private allotments. Thus, farmers are the only potentially effective and sustainable subject of agricultural production on the market. Only they, on the condition on the rights of ownership, could be vitally interested in the preservation of the natural resources of their farms and they can in certain conditions not also increase but use the land properly.

Secondly, based on my analysis made on the regional level, we can assert that both regions differ greatly in size and population. This plays a big role into how the land will be used and owned by the state or citizens. The Omsk region doubles in size the Vysočina region and has about 4 times more people. But given this facts, it is worth mentioning that the Vysočina region has a higher population density than the Russian one, where there can be found vast lands with very little to none population. The soil structure of Omsk is quite fertile – the major part of the region is covered by chernozem, which is a favourable environment for agricultural activities. The fact that the agriculture got worse in general is that it suffers very drastic temperature changes throughout the calendar year and long-term severe winters lasting over 5 months whereas the Vysočina region has a much kinder weather overall.

As for the agriculture sector, in the Omsk region we can observe a big decline in the amount of agricultural farm holdings (approximately 3000 units),

although we also noticed an increase in the total area of the farms and in the average size of the agricultural holdings. This could have happened through farm merging or through the expansion of bigger farms at the expense of smaller ones. In the Vysočina region, we could see similar tendencies such as: a decrease in the amount of agricultural holdings and the increase of larger farms in favor of smaller farms. In both regions, the total area of arable land slightly decreased and there were no notable changes within the form of ownership.

Thirdly, I compared precisely the Azov German National district with the Třebíč district and analyzed 2 farms that are situated on the territory of both districts. It is worth mentioning that the Azov district is home of some important routes that connect major parts of Russia and Siberia. This point makes it easier to understand why its natural population growth is continuously increasing, immigrants as well as people from a lot of different ethnicities live there making it a semi-cosmopolitan district. The Třebíč district is situated in the southern part of the Vysočina region and in a more elevated environment. These two very important characteristics impacted the soil classification as well as the way the land is being used. The semi-monoculture formed by the growing of potatoes in the district is obviously part of the resultant of those previous 2 attributes.

In regards with agriculture, we can notice a similar tendency for both regions: the reduce of the total amount of agricultural land, precisely in the Azov district was done in favour of the wooded area. The total area of arable land in both of the districts decreased and that was the reason of the decline in crop production and profitability over the years of the farms. Thus, they required specific actions to improve the ecological situation of the land and optimize the land-use.

Identifying and assessing environmental risks, as well as taking into account the use of land in the areas of farms, in terms of environmental rationalization should be recommended by the following activities: adjust the crop rotation system, apply top soil treatment methods, limitate water and wind erosion, implement new technologies of land-use etc. Another way to optimize the use of land by farmers and their properties is by the installmentof monetary actions. These actions will only happen if the politicians and people above realize the radical need in resources farmers have. With new technologies and money to spend on better equipment, farmers would be more prepared to face the difficulties that come with farming. Also,

they will be able to counter the obstacles that bad weather brings in a much more efficient way. Therefore, legislators have to cooperate within themselves to find enough subsidies in order to match the needs of farms in the regions. Unfortunately, after private interview in July 2015 I understood that this situation is a lot more hazardous and difficult for Russian farms as they almost have no access to such allowances.

One of the main problems that the Czech Republic and many small European countries have is that since joining the EU, they have had to face a much more competitive market. Nowadays, such countries have to fight to get clients and potential customers in order to sell their goods at advantageous prices. They have to compete with big nations such as China, the US or Russia that have a lot more variety and quantity of goods available, but also with less developed countries where the manufacturing and exportation costs are so much lower than in the Czech Republic. Citizens of the Czech Republic have a wider variety of products and food at their reach than ever before. They can, for example, buy corn coming from Brazil that will cost them less than nationally produced corn. The same analysis can be made with other goods such as milk, fruits, meat or vegetables. While sometimes this fact is being reversed by the way the economy goes, the struggle the farmers have, to make a good income, is becoming bigger and bigger.

The profitability of farms is set on how much they can sell and to what price. To sell more, they need to reduce their prices and reach the same level other international companies have set theirs. This is done to stay competitive but in the end they won't be making more profits because the benefits will be lowered and they will be fighting against bigger companies with more equipment and means of production.

To conclude, I would like to say that agricultural activity is a complex process that provides land use and arrangement of the territory on which the condition is the consideration of climatic and economic conditions of areas. Nowadays, there is a decrease in attention to ecological and environmental issues from the government. Most of the land users and landowners try to receive the greatest benefit for themselves while using the land, not caring about the condition and at what level of fertility they leave the land. Therefore, I agree with professor Azizova (2007) that there is a need in a differentiated approach to the organization of the territory of

agricultural enterprises and that it is necessary to follow the principles of land management, organization of the rational use and protection of land, which requires the development of land management projects.

I also share the point of view of Yuri Rogatnev in the article "Formation of the concept of modern land management", where he tries to rethink the current state of affairs and suggest new directions for the development of land for the property management. The object of land management changes and becomes not land but property.

Finally, project proposals developed in this thesis are aimed to improve current organization of the land. Their implementation will enhance the efficiency of agricultural production and improve the living conditions of rural residents of Russian and Czech areas. I am ready to share the results of my analysis in Czech Republic with my collegus from Omsk University who are expecting it.

“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health. Without proper for it we can have no community, because without proper care for it we have no life” (Wendell Berry).

7. REFERENCES

Literature and journals

1. Antrop M., 1998: Landscape change: Plan or chaos? *Landscape and Urban Planning*, 155 – 161 pp.
2. Antrop M., 2004: Landscape change and the urbanization process in Europe. *Landscape and Urban Planning* 67: 9 –26 p.
3. Bashmachnikov V., 1991: Farm and evolution of peasant farms and agricultural cooperatives of Russia: stages of formation, *Bulletin of Agricultural Science*, 101-109 pp.
4. Bečvářová V. et A. Juřica, 2008: Koncepce pilířů I a II SZP v dotační politice ČR, Brno: Mendelova zemědělská a lesnická univerzita v Brně, 70 p. ISBN 978-80-7375-252-1
5. Bečvářová V. a kol., 2008: Vývoj českého zemědělství v evropském kontextu, Brno: Mendelova zemědělská a lesnická univerzita v Brně, 62 p. ISBN 978-80-7375-255-2
6. Bečvářová V., 2001: Zemědělská politika, Brno: Mendelova zemědělská a lesnická univerzita, 116 p. ISBN 80-715-7514-3
7. Beranová M et A. Kubačák, 2010: Dějiny zemědělství v Čechách a na Moravě, Nakladatelství Libri, Praha, 430 p.
8. Boháková I. et I. Brožová, 2010: Ekonomika agrárního sektoru, Praha: Česká zemědělská univerzita, 122 p. ISBN 978-80-213-2026-0
9. Davis J.H et R.A. Goldberg, 1957: A Concept of agribusiness, Boston, Mass: Research Division, Harvard Business School, 136 p.
10. Dyková E. et V. Matalová, 2002: Pre-accession strategy of Czech agriculture towards EU: proceedings of international seminar, Praha-Průhonice: Research Institute of Agricultural Economics, 282 pp. ISBN 80-85898-97-7
11. Kirkorova L., 2008: Peasant farmer economy: transformation processes, land use problems, *APK: economy, management*, №4, Perm, 35-40 pp.
12. Kochergina Z., 1996: Problems of land management and land cadastre in the implementation of land reform: restrictions, encumbrances in land use, Omsk: OmGAU, 31 - 37 pp.
13. Kochergina Z, 2007: Landscape-ecological bases of rationalization of land (on

- the materials of the forest-steppe zone of Omsk area), Omsk: OmGAU, 224 p.
14. Kochergina Z, 2007: Assessment of landscape structure for land management purposes, Omsk, OmGAU, 120 p.
 15. Kryukova N., 2012: About the need to maintain and optimize the use of agricultural land, Voronezh: Bulletin of Voronezh State Agrarian University, №2 (33), pp. 311 - 314
 16. Míchal I., 1994: Ekologická stabilita. Veronica, Brno, 275 p.
 17. Mimra M., 1993a: Biodiversity conservation landscape and its predisposition. Vesník 5:273 – 275 pp.
 18. Nassauer J., 1995: Culture and changing landscape structure. Landscape Ecology 10, 229 – 237 pp.
 19. Macků J., 1926: Zemědělství západní Moravy, Nákladem Okres. hospodář. – lesnického spolku v Dačicích, Dačice, 51 p.
 20. Makarov N, 1920: The farm and its evolution, Moscow, 392 p.
 21. Makenova S. et V. Mogileva, 2001: The evolution of farm production in Russia, Omsk: Omsk State Agrarian University, 12-18 pp.
 22. Mogileva V., 2012: Farm holdings in the planning structure of rural settlement, Omsk: Scientific Bulletin of Omsk, № 2 (114), 253-257 pp.
 23. Okladnikov A., 1962-1969: History of Siberia in 5 volumes, Academy of Sciences, Novosibirsk, 53-82 pp.
 24. Rogatnev Y., 2009: Theoretical and methodological bases of land management in the conditions of formation of market relations in Western Siberia, Omsk: publishing house OmGAU, 278 p.
 25. Rogatnev Y., 2006: Formation of the concept of modern land management, Omsk: OmGAU, 190-195 pp.
 26. Rogatnev Y., 2002: Problems of formation of the market of agricultural land use in Siberia, Agrarian Russia, N 4, Omsk
 27. Rubtsov B., 1995: Hussite wars, Moscow, 7-51 pp.
 28. Sklenička P., 2003: Základy krajinného plánování. Nakladatelství Naděžda Skleničková, Praha, 321 p.
 29. Sklenička P., Šálek M., 2008: Ownership and soil quality as sources of agricultural land fragmentation in highly fragmented ownership pattern. Landscape Ecology 23: 299 – 311 pp.

30. Timonina S., 2007: The role of land management in the implementation of anti-crisis programs of financing rehabilitation of the agricultural organizations of Omsk Region, Real estate: administration, use, maintenance, engineering and surveying software inventory, Omsk: OmGAU, 120-125 pp.
31. Toman M.; Codl M. et P. Tuček, 2012: České zemědělství, ISBN: 978-80-86874-39-5, 50-74 pp.
32. Uhlíř J. et E. Nováčková, 1984: Zemědělství na Třebíčsku včera a dnes, Pobočka ČSVTS při Okresní zemědělské správě v Třebíči ve spolupráci se Západoslovanským muzeem, Třebíč, 84 p.
33. Vilikovský V., 1936: Dějiny zemědělského průmyslu v Československu od nejstarších dob až po vypuknutí světové krise hospodářské, Nákladem ministerstva zemědělství republiky Československé, Brno, 915.p.

Internet Sources

34. Chayanov A.: The organization of peasant farming. Online: <http://a-v-chayanov.narod.ru>.
35. Czech Statistical Office, Vysočina Region, Statistická ročenka 2007-2014, online: www.czso.cz/
36. Historie v datech. online: <http://www.adw.cz/cs/166-historie-v-datech.aspx?sid=30&lid=112>
37. Official page of Vysočina Region, online <http://www.kr-vysocina.cz/zakladni-informace/d-4000087/p1=1206>>
38. Official page of Ministry of agriculture, year: 2012, Dotace. online: www.eagri.cz/public/web/mze/dotace/
39. Sklenička P., year not available: Sledování změn krajinné struktury při obnově krajiny narušené povrchovou těžbou. Zpráva k projektu Obnova mimoprodukčních funkcí zemědělské krajiny (NPV1R44058), online: http://investor.kr-ustecky.cz/reregionsmezinarodni_konference_most/C2E02TCZ.PDF, cit. 15.1.2013
40. Státní zemědělský intervenční fond, Seznam příjemců dotací, online: www.szif.cz/irj/portal/anonymous/spd
41. Report on the achieved values of indicators for assessing the effectiveness of local government of Azov German national municipal district of the Omsk region

in 2013 and the planned values in the 3 - year period, issued by V. Sabelfeld,
online: <http://azov.omskportal.ru>.

42. Reports on the state and use of land in the Omsk Region in the period of 2007-
2014 and the annex to the reports. Online: www.rosreestr.ru

43. Zpravodaj, ZD Výčapy, 1999-2011, online:
www.szif.cz/irj/portal/anonymous/spd

44. Vaše internetová brána do Evropy, Reformy společné zemědělské politiky,
online: <http://www.euractiv.cz/zemedelstvi0/link-dossier/reformy-spolen-zemdlsk-politiky/>

8. LIST OF FIGURES AND TABLES

- Table 1 “Stages of development of agricultural farms”
- Table 2 “General characteristics of the Siberian regions”
- Table 3 “Vysočina Region and its general characteristics 2012”
- Table 4 “The specific weight of the soil in the zones of the Omsk region (%)”
- Table 5 “The dynamics of agricultural farms in the Omsk Region”
- Table 6 “The dynamics of agricultural farms in the Vysočina Region”
- Table 7 “Structure of lands, used by agricultural holdings in the Omsk Region”
- Table 8 “Structure of lands, used by agricultural holdings in the Vysočina Region (ha)”
- Table 9 “Forms and types of ownership of agricultural holdings in the Omsk Region (thousands of ha)”
- Table 10 “Forms of ownership in Vysočina Region (2013)”
- Table 11 “General data of the Azovo district”
- Table 12 “The dynamics of the structure of lands, used by agricultural holdings in the Azovo district”
- Table 13 “The dynamics of the structure of lands in the Třebíč district”
- Table 14 “Structure of using of arable land in Azov district”
- Table 15 “The dynamics of production areas of Třebíč district”
- Table 16 “The dynamics of forms of ownership in Azovo district”
- Table 17 “Business entities (citizens) using the land in the Azov German National district on January 1, 2014”
- Table 18 “The dynamics of forms of ownership in Třebíč district”
- Table 19 “The dynamics of the agricultural farm “Luft”
- Table 20 “Area and yield of main crops in the farm Výčapy”
- Figure 1 “Structure of peasant yards”
- Figure 2 “Location of the Omsk Region as part of RF”
- Figure 3 “The location of Vysočina Region in Czech Republic”
- Figure 4 “The relief of the Omsk Region”
- Figure 5 “The relief of the Vysočina Region”
- Figure 6 “Rivers going through the Omsk Region”
- Figure 7 “Water areas of the Vysočina Region”
- Figure 8 “The dynamics of the whole amount of agricultural farms in the Omsk region”
- Figure 9 “The dynamics of the average size of agricultural farms in the Omsk region”

Figure 10 “Location of the Azov German National district”

Figure 11 “Structure of the national composition of the population of the Azov district”

Figure 12 “12 The location of the Trebic district”

Figure 13 “The structure of the soil cover of the Azov district”

Figure 14 “Structure of using of arable land in Azov district”

Figure 15 “The Territory of the farm “Luft”

Figure 16 “The owner of the farm “Luft”