

LAND RESOURCES FOR AGRICULTURAL PRODUCTION IN LATVIA

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Abstract

In the present research, the issue of land use is analysed in close relation to changeable environmental, social, and economic functions of land use. Based on an assumption that the *highest mission* of land use is to produce renewable sources, it was found that the total area used for producing these resources tended to decline, which was compensated by an increase in the area with higher solar energy accumulation capacity (forests). The effects of land reforms implemented in Latvia on the use of land for agricultural production were analysed in the present research. It was found that these processes negatively affected the development of farms in a long-term. The research proved that the changes in the sown area were directly related to the land reforms that were associated with political and historical processes in the country. By analysing the use of land resources after Latvia's accession to the European Union, it was found that the area of agricultural land stabilised, and it would be possible to produce agricultural products on an area of 2 mln ha, however, differences existed among the regions.

Keywords: land reform, land functions, farms, agricultural land

Introduction

The agricultural issue was topical throughout the entire human history. For a long period, a strategic issue of domestic policy in any country was who owned land and who and how worked it, as it was closely related to the existence and security of the country and the provision of its population with food. Although the boom of modern global trade allows any country to be provided with the necessary quantity of food in a short period and agriculture is not one of the most profitable industries in the world for a long period, the most prosperous world countries try to maintain agricultural production by means of planned support.

The fast integration processes taking place in the whole world make us seriously take into account the increasing effect of international processes on the domestic economy of any country. With the liberalisation of markets to a greater extent, only those industries and enterprises will exist and develop that will be able to produce cheap and competitive products, which, in its turn, will affect the use of land as a factor of production in the most direct way.

The existing processes in agriculture and the entire national economy, the continuous targeted reconstruction of the European Union's common agricultural and rural development policies, the influence of the World Trade Organisation on Latvia as its member country, the priorities of the United Nations Food and Agriculture Organisation's policy, other globalisation and international integration processes, the evolution of society and civilisation, an increase in the mobility of nations, inhabitants of the planet, businessmen, and employees, an increase in the total number of population, yet, unequal population increases across the world's regions and continents, changes in the standard of living of people, and other processes continuously and directly affect Latvia and both generate new ideas and set new objectives to science, and a great deal of them relate to the use of land.

The problem or topic of land use may be researched from many aspects and for various purposes, but the use of land for agricultural production is researched most often. In Latvia, many scientists have researched the use of land for agricultural production (Bokalders I., 1927; Kreismanis P., 1936; Brivkalns K., 1959; Boruks A., Brivkalns K. et al. 1967; Spoģis K., 1974, 1999, 2002. et al; Boruks A., 1982; Kirila K., 2002; Strikis V., 1999; Rivza B., 2003; Dobele A., 2004, 2009; Pilvere I. 2008, 2009, 2011, 2012; et al.).

The nature, role, need, and use of land and other theoretical aspects are widely discussed in theoretical and applied researches. The founder of the classical school of economics, Adam Smith (1723-1790), pointed that "... all wealth comes from the land. The skill, interest, and labour of the mankind increase the wealth of the entire society and country". Although the composition and structure of the factors of production have significantly changed since the century of Adam Smith and the role of land as a factor has comparatively decreased owing to an increase in the role of intellect, yet, the global and macroeconomic roles of land are great and diverse.

The technological progress, which encompasses all the factors of production and resources, makes people co-participants in these processes, demands from people greater intellectual capacity, and engages the anthropogenic factor in transforming and furthering natural processes, makes economic research on land more complicated. Besides, the most complicated task is to regulate the exchange of substances between the human society and the nature, including agriculture, forestry, waters, mineral deposits, tourism, and cultural values.

C.S.Christian and G.A.Stewart (1968) point to the surface of land, which exists in any location, as a product of evolution that emerged in the result of durable physical and biological processes, as these processes affected the initial geological parameters existing in the given location, as well as the climate factor. Land is a dynamic formation, therefore, describing it means to provide the characteristics of land in a given moment of time. Similar ideas are advocated by Englishman R.B.King (1970).

The progress of the factors of production and changes in their composition and extent occur today very dynamically in direct and also maybe close relation to the overall development of nations and their national economies.

Therefore, the majority of economic problems are not related to the general existence of land, but to the particular use of it. The economic, cultural, and social activity of people targets only one purpose – to satisfy their diverse wishes and to ensure their existence and reproduction. Their wishes may change, as one and the same piece of land may be used for various purposes.

The research **aim** is to determine the possibilities for using land resources for agricultural production in Latvia. To achieve the aim, the following research **tasks** were defined:

- 1) To identify the functions of land use and to determine their topicalities in Latvia.
- 2) To investigate the historical trends in the use of land resources in agriculture in Latvia.
- 3) To determine the potential area of agricultural land to be used for agricultural production in Latvia.

Research **hypothesis**: the use of land resources for agricultural production was affected by the historical background of Latvia and determined by the existing processes at national and global levels.

The following research **methods** were employed in the present research: analysis and synthesis to study problem elements and to synthesise causal relationships or formulate correlations; scientific induction to logically systemise and theoretically explain results of empirical studies; statistical analysis methods (time series analysis, data grouping etc.); the monographic and descriptive methods.

1. Land functions and trends in the use of land in Latvia

In general, land is the basis for the existence and development of society and an interesting object of research in many branches of science: natural sciences, economics, sociology, geography etc. Each branch may have its own attitude to and understanding of land. In economics, land is one of the most important factors of production along with entrepreneurial ability, information, labour, and capital, although the proportion of land as a factor of production in the totality of the factors of production declines nowadays, as the roles and proportions of entrepreneurial ability, intellect, and information sharply increase.

In economics, *land* is understood as all *natural resources* that are not the result of human activity, and this term also includes mineral deposits, forests and waters, location, *agricultural land*, as well as climate and natural energy (wind, water, and solar energy). Therefore, land as a basis for social and economic activities of human society performs environmental, social, and economic functions, but these functions are dynamic and changeable and affect an increase in the role of agriculture in a direct way.

Social functions of land are diverse and important from various aspects:

- availability of natural resources,
- employment,
- life environment,
- density of rural population and other aspects.

Classics in economics have researched or assessed land as a *factor of production* and included it into the category of factors of inanimate nature, emphasising the role of natural prerequisites in any production process and in human existence in general, which identifies *economic functions* of land. Yet, it is clear that land plays the broadest role in agriculture. Agricultural land serves as:

- *territory* in which agricultural production is located;
- *object of labour* to which human labour and capital are applied while preparing for growing agricultural products;

- *means of production* that are applied to other objects and raw materials – green plants, microfauna and microflora – by regulating moisture, warmth, and the supply of nutrients.

Environmental functions of land become apparent in relation to the satisfaction of primary (existence) needs of people – a territory to live and the production of food and other raw materials which land can provide during a certain period – and based on the given techniques of exploration and acquisition of various resources. The environmental functions of land may be classified into two categories and studied from two aspects:

- the function of balance between the increasing human needs and the planet's potential for satisfying these needs;
- renewable energy production function.

The facts that the supply of land is limited while a great deal of the planet's population is half-starving or starving and the number of population rose unusually fast over the recent decades indicate that the environmental and social functions of land became more acute.

The use of land as the basis of human existence and a resource for the national economy, to a great extent, is determined by the potential of entrepreneurial ability and the skill to link, combine, and rationally exploit other resources, which leads to a situation that the majority of economic problems are not related to the general existence of land, but to the particular use of it.

Agricultural land, according to R.O.Whyte (1976), performs many functions. Land as soil participates in agricultural production as a resource with its agro-chemical, agro-physical, and other properties which include both nutrients for plants and the environment for their growth and development. Land is a basis on which a great diversity of ecosystems emerged: forests, grasslands, deserts, and others.

Based on the fact that the supply of land, as contrasted with labour, entrepreneurial ability, information, and capital, is limited, some early economists made pessimistic forecasts. In the end of the nineteenth century, Thomas Malthus believed that there were little possibilities to increase the standard of living, as human population had a natural trend to increase much faster than the output of food on a limited area of land.

It once more points to escalation between the environmental and social functions of land, as every additional million of population needs an adequate minimal territory to live and also food.

The highest mission of land use is to produce new or renewable resources by collecting and accumulating solar energy in plants – trees, field crops, and grasses in pastures and meadows.

In the world, many industries of national economy are based on the use of non-renewable and partially renewable sources (minerals, energy resources), the deposits of which are not unlimited. It is known that fossil energy resources become exhausted at a fast pace, and more research has to be done on renewable energy. According to researches in the world, land will be more needed for producing renewable sources in the future.

Renewable sources perform three strategically important functions in human society:

- the unique role in producing food,
- provision of raw materials to processing enterprises,
- production of ecological energy.

In all products of photosynthesis, plants accumulate only 0.1% of solar energy that reaches the surface of the Earth. Therefore, in the use of land, it is important to achieve a result that plants accumulate more solar energy to form their new organic substances. From the viewpoint of collecting and accumulating solar energy that has reached the surface of land, scientific studies on effective management of business, social, genetic, biological, photosynthetic, and other processes have to be supported, so that the biomass of plants can accumulate as much available solar energy as possible. It can be achieved by growing the most appropriate field crops, species of trees, or other plants and their sorts in every area of land, taking into account the agro-chemical and agro-physical properties of land and their compatibility or incompatibility with every plant.

Forests play a significant role in producing renewable sources.

By analysing the distribution of Latvia's total land area by group of plants producing renewable sources, one can find permanent changes and a certain trend as shown in Table 1.

Table 1

Latvia's land used for producing renewable sources in 1940-2011, ths ha

Year	Total area of land	Forest area		Agricultural land		Shrubs	Other area
		ths ha	% of total area	ths ha	% of total area		
1940	6457.3	1899.0	29.4	3713.6	57.5	...	...
1950	6457.3	1964.1	30.4	3352.3	51.9	294.3	846.6
1960	6458.9	2398.6	37.1	3076.5	47.6	112.7	871.1
1970	6458.9	2561.7	39.7	2907.8	45.0	78.4	911.0
1980	6458.9	2728.6	42.2	2580.6	39.9	164.7	985.0
1990	6458.9	2803.2	43.4	2567.0	39.7	140.0	948.7
2000	6458.9	2868.0	44.4	2484.9	38.5	112.0	994.0
2005	6458.9	2919.4	45.2	2460.8	38.1	116.2	962.5
2011	6448.2	2986.1	46.3	2402.7	37.3	111.5	946.9

Source: authors' calculation based on CSB and SLS data

According to the data of Table 1, several findings arise from the structure of land use in Latvia and the changes in its trends:

- Latvia's forest area constantly increases, and for more than 30 years forestry is the dominant use of land for producing renewable sources;
- with a significant increase in the area of forests, the annual accumulation of solar energy in timber and other forest products also rises;
- the total agricultural area decreased much faster and to a greater extent than the increase in the forest area;
- the share of agricultural land in the total land area of Latvia decreased from 57.5% in 1940 and 51.9% in 1950 to 37.3% in 2011;
- over the analysed period, the share of forests increased from 29.4% in 1940 to 46.3% in 2011;
- the absolute change in area is +1087.1 ths ha for forests and -1310.9 ths ha for agricultural land;
- the area of shrubs has widely changed, but mostly it is a phenomenon of transitional stage followed by the inclusion of such area in the forest area and its afforestation;
- a large area is included in the category *other area*, of which a third is the territories of infrastructure, business activity, residential buildings, and building construction – the areas which may not be used for producing renewable sources at all.

It characterises the situation with land use in Latvia for producing renewable sources: the total area for producing renewable sources has slightly declined, which is compensated by an increase in the area with higher solar energy accumulation capacity (forests). However, the sharp decrease in the agricultural area may significantly affect the production of agricultural products in the country, therefore, the issue of the standard of agricultural area management becomes topical.

These changes in the uses of land resources were caused by the destructive historical and political events in Latvia.

2. Historical background of farms in Latvia

The state of Latvia and its agriculture faced rapid changes in the 20th century; two land reforms were implemented. Both of them, to a great extent, were interrelated and similar, although these reforms were implemented under different historical, political, socio-economic, legal, and institutional systems they influenced the development of agriculture and farms in Latvia and in a direct way.

The land reform that presently is going to be completed in Latvia is the fourth agricultural reform which is carried out in this territory.

The *first land reform* (the so called peasant reform) started with the abolishment of feudalism in Russia in 1861 and is related to the distribution of the land of part of large landowners, mostly German country noblemen, among Latvian peasants; the land was surveyed and evaluated for redemption.

With the establishment of an independent state in 1918, the *second land reform* in Latvia (1920-1937) completely eliminated the management system existing since the Middle Ages in rural areas and towns, thus returning the land to its real owners and creating a stable economic basis for the new state of

Latvia. During this reform, the land legislation system was created and consolidated. The socio-economic, historical, and legal situation as well as further political processes and events fostered the announcement of a radical land reform in 1920. A decision was made to distribute the land of large landholders (country noblemen) among landless peasants and small peasants, paying no compensation to the former land owners for the nationalised land.

The socio-political justification of the land reform was very essential. The land reform enabled reduction in the proportion of landless and small peasants in rural areas, focusing on medium-size farms which were mostly managed by their owner's family. Thus, the share of farmers and their family members exceeded the share of landless owners (Table 2), forming a broader medium class in rural areas.

Table 2

Changes in the number and proportion of land owners and landless peasants in Latvia during the second land reform

Year	Land owners and their family members		Landless peasants and their family members	
	Number, ths	%	Number, ths	%
1897	419.0	38.8	660.5	61.2
1925	797.8	70.9	327.5	29.1
1930	962.0	78.8	260.0	21.3

Source: *Latvian statistical atlas, 1938*

During a short period, owing to the increasing demand for agricultural goods in the European and world markets and the support of Latvia's government, agriculture became the leading industry of the national economy. Latvia's new farms proved their production capability, profitability, and competitiveness. The broad stratum of land owners in rural areas was one of the most important guarantors of domestic stability and economic growth in Latvia.

Forests, to a great extent, remained the property of the government in the result of this reform. It enabled the strengthening of financial basis in the poor country, and the status of state forests allowed selling timber necessary for new farms at a lower price, otherwise the establishment and development of many new farms would be impossible without this government support.

Table 3

Percentage distribution of farms by land area in Latvia in 1923 and 1939

Area of farms, ha	1923		1939		Change in 1939 compared with 1923	
	number	%	number	%	number	%-points
Less than 2	15833	8.2	17877	7.6	+2044	-0.6
2 – 10	62896	32.4	61176	26.1	-1720	-6.3
10 – 30	73814	38.1	114860	48.9	+41046	+10.8
30 - 50	20848	10.8	24899	10.6	+4051	-0.2
50 – 100	17956	9.3	14696	6.3	-3260	-3.0
100 and more	2394	1.2	1096	0.5	-1298	-.07
Total	193741	100.0	234604	100.0	+40863	x

Source: *authors' calculation based on Latvian Agriculture, 1939*

During the land reform, fragmented and unviable farms were not formed, but only farms that were able to exist and work at the agricultural machinery and technology level of that period were established. In the 1920s and 1930s, both the agricultural area and the number of farms increased, reaching a total of 234.6 thousand in 1939 (Table 3). There were changes in the groups of farm size: the number of small farms with less than 2 ha increased, while their proportion decreased. The fastest increase was observed for the farm group that was called family farms, namely, those having an area of 10-30 ha, reaching a total of 114.9 thousand or 49.0% of all farms. The number and proportion of large farms with an area of more than 50 ha decreased from 10.5% in 1923 to 6.8% in 1939.

The land was mainly farmed by its owners together with their family members. The share of landless peasants and hired workers was 61.2% in rural areas in 1897, while in 1923 – only 23.2% of the total rural population. The share of rented farms was small and accounted for 10-11% of their total number. The number of rented farms did not tend to increase. Of course, the agricultural reform of 1920-1927

did not solve all rural social problems; it did not provide land to all people wanting it, and a large number of landless peasants still existed. However, the number of landless peasants declined 2.6 times compared with the end of the 19th century (Zušēvics J., 1994).

The *third land reform* began at the end of 1940 with forced collectivisation, and the land was again expropriated from its owners. This land reform fully eliminated what was achieved in the first two land reforms.

First of all, in 1940-1941 as well as in 1944-1947, a pseudo land reform was carried out, the purpose of which was agricultural collectivisation. At the end of 1949, the agriculture of Latvia was collectivised.

The majority of families of the most successful and capable farmers were deported from Latvia.

Private property on land was eliminated in Latvia, the land was nationalised and belonged to the state. Latvian farmers were transformed from land owners into simple land users one more time. Farmers were alienated from land, and their attitude to and responsibility for work was undermined.

Table 4

Number of farms and the agricultural area in Latvia in 1950-1989

Land users	1950	1953	1960	1970	1980	1989
Collective farms:						
Number	1794	1474	1099	653	321	363
Total land area, <i>ths ha</i>	....	....	2729	2387	2062	2171
Agricultural area, <i>ths ha</i>	2585	2684	1941	1627	1300	1362
Agricultural area per 1 collective farm, <i>ha</i>	1441	1821	1766	2492	4050	3752
State farms:						
Number	57	82	167	220	215	199
Total land area, <i>ths ha</i>	....	....	919	1345	1657	1452
Agricultural area, <i>ths ha</i>	91	117	638	950	1050	912
Agricultural area per 1 state farm, <i>ha</i>	1596	1427	3820	4318	4884	4583

Source: authors' calculation based on land balance data of Latvia SSR in 1950, 1953, 1960, 1970, 1980, 1989

In the beginning, the established collective farms were small, yet, they were gradually increased in size (Table 4) by carrying out rural industrialisation and constructing large cattle sheds and multi-apartment residential houses. Although the occupational power succeeded in increasing agricultural output by exploiting extensive management methods, it, at the same time, ruined the traditional rural lifestyle and business management in Latvia. Rural residents were moved to villages, and thousands of individual farmsteads were eliminated.

However, despite the fact that large-scale industrial agricultural production was politically preferred at the state level, rural residents produced a significant share of agricultural products on their home farms during their time free from their main work. Maintaining their private initiative and agricultural production in rural areas, the most entrepreneurial rural residents significantly succeeded in gaining additional income from their home farms, as a shortage of quality food products was observed in food stores in Latvia. The need to improve the provision of residents with food forced the government to depart from the basic dogma in agriculture in the USSR – agricultural industrialisation and collectivisation. In 1988, the establishment of individual farms was allowed; as a result, the sizes of collective farms decreased already in 1989.

After the restoration of independence in 1990, one of the first tasks of the state was to restore ownership on property as one of the key economic and political factors as well as to restore justice, within limits, for the former legitimate owners or their heirs. The *fourth land reform* began in Latvia with passing the law “On Land Reform in the Rural Areas of the Republic of Latvia” on 21 November 1990. Thus, prerequisites were created for establishing independent agricultural enterprises, and the ownership on land was secured.

Based on the legislation, many of the former and new land applicants wished to acquire land for use, submitting requests for land allocation in rural areas. Residents of the Republic of Latvia applied for land for various purposes, but most of the land was requested for agricultural uses – the establishment of farms and home farms.

The Parliament of the Republic of Latvia passed the law “On the Completion of Land Reform in Rural Areas” on 30 October 1997, which marked the completion of the first stage of land reform in rural areas.

Table 5

Distribution of land by ownership in Latvia after the land reform

Status of land ownership	1997		2012	
	area, ths ha	share in total area of Latvia, %	area, ths ha	share in total area of Latvia, %
Owned land	1100.7	17.0	4897.2	75.9
Land use	5041.9	78.1	97.7	1.5
Free state land/land for completing the land reform	316.2	4.9	18.0	0.3
Land belonging to the national or local governments	x	x	1435.3	22.3
Total:	6458.8	100.0	6448.2	100.0

Source: authors' construction based on SLS data

The structure of agricultural land use significantly changed during the land reform, as many small farms and home farms, which became the dominant ones, were restored or established anew instead of the former collective farms. These processes affected both the standard of agricultural land management and the output of agricultural products. Yet, according to Table 6 data, the concentration of agricultural production on large-size farms was observed, as farms with an area of 100 ha and more used 47% of the total area of utilised agricultural area (UAA) in 2010.

Table 6

Grouping of agricultural holdings by utilised agricultural area (UAA), %

UAA area on holdings, ha	2003		2007		2010	
	of total number of holdings	of total area of UAA	of total number of holdings	of total area of UAA	of total number of holdings	of total area of UAA
Less than 0.9	15.2	0.5	9.4	0.3	5.1	0.1
1.0 – 4.9	26.7	9.0	33.2	5.9	28.5	3.9
5.0 – 9.9	22.5	14.0	23.7	10.8	27.2	9.0
10.0 – 29.9	19.4	27.5	23.8	24.8	27.8	21.1
30.0 – 49.9	2.8	9.4	3.9	9.3	4.8	8.3
50.0 – 99.9	1.7	10.2	2.5	11.1	3.3	10.4
100.0 – 199.9	0.7	8.1	1.1	9.9	1.7	10.7
200.0 – 499.9	0.3	9.0	0.6	11.3	0.9	13.4
500.0 and more	0.1	12.5	0.3	16.7	0.5	22.9

Regardless of undeniable achievements of the fourth land reform, its implementation also faced serious problems, and these problems, to a great extent, were specific to all countries that undergo a similar transition period.

The researches show that the land functions and the implementation of land reforms may be regarded as a component of national policies, as the use of land is associated with the development of society and economic growth orientated towards political stability. The goal of land policies is to create political, legal, and economic conditions for developing real properties established in the result of reforms and for increasing their value, which promotes, at the same time, the preservation of land and other natural resources, their sustainable exploitation, and increases in returns on them.

3. Use of land resources and the potential possibilities for agricultural production in Latvia

The use of land resources for agricultural production may be researched from two aspects:

- land use in *quantitative* or territorial sense;
- *quality* of use of any land area, crops grown and harvested on these areas.

Quantitative indicators are analysed in the present research. One of the basic indicators characterising the use of land for agricultural production is sown area.

Table 7

Sown area of crops in Latvia in 1913-2011

Year	Total sown area, ths ha	Absolute increase in sown area, ths ha		Arable area, ths ha	Share of sown area in total arable area, %
		<i>from base year</i> $\Delta_{m(b)}$	<i>annual</i> $\Delta_{m(a)}$		
1913	1395.9	-	-	...	...
1940	1964.4	+568.5	+568.5	2171.4	90.5
1950	1413.4	+17.5	-551.0	1747.5	80.9
1990	1627.0	+231.1	-46.6	1687.4	96.4
1995	930.2	-465.7	-264.4	1712.6	54.3
2000	881.1	-514.8	-31.2	1851.1	47.6
2003	851.1	-544.8	-30.0	956.4	89.0
2005	979.3	-416.6	+128.2	1091.8	89.7
2010	1102.7	-293.2	+123.4	1173.4	93.9
2011	1086.7	-309.2	-16	1158.0	93.8

Source: authors' calculation based on CSB data

Several conclusions and interpretations may be derived from the statistical data of Table 7 and the authors' calculations:

- the total sown area changed in Latvia in the analysis period of almost 100 years;
- the area changes were periodic and both increasing and decreasing trends were observed;
- there were three periods of increase in the sown area:

the **first period** – after the agricultural reform in the independent Republic of Latvia in the 1920s and 1930s when the total sown area reached almost 2 million hectares;

the **second period** – after the World War II until the late 1980s, but the previous highest level was not reached;

the **third period** – after Latvia's accession to the European Union; beginning with 2004, a small, but continuous increase in the sown area was observed.

- There are two periods of decrease in the sown area:

the **first period** – during the 1940s and 1950s, which is related to the World War II and the nationalisation of land and the collectivisation of agriculture during the Soviet period. The sown area decreased by more than 0.5 million hectares in this period;

the **second period of decrease** – during the period 1990-2003, after the restoration of independence of the Republic of Latvia and its transition to a market economy. Besides, a very sharp decrease occurred in 1995 when several elements of market economy started functioning and the structure of markets for agricultural products changed. In this period, in total, according to Table 7, the total sown area decreased almost by half or 0.7 million hectares.

- In general, two positive trends may be observed over the entire period of analysis:

first, the sown area decreased in 2011 compared with 1940 and accounted only for 55.3% of the total area in 1940, yet, a stable trend of increase in this area is observed, which indicates positive changes in the use of land and agricultural output;

second, owing to changes in the total sown area and arable area, the quantitative level of the use of arable land, which shows the proportion of arable area in sown area, changed within a broad range: it accounted for 47.6% in 2000, while in 2011 it rose to 93.8%.

Given the fact that natural conditions, experiences, and traditions determine also the development of livestock industry in Latvia, the general trends in the management of agricultural area are important. Agricultural land in Latvia includes: arable land, pastures, meadows, and orchards. Changes in the agricultural area over a long period are presented in Table 8.

According to the calculations, the area of agricultural land declines in Latvia, and the issues of the standard of and trends in the management of this land become topical. A unique situation emerged in Latvia that there is no economic activity on a large area of agricultural land. The unutilised agricultural area started increasing very fast with the beginning of the land reform in 1990. In 2000, the unutilised agricultural area exceeded 0.9 million ha or 39.5% of the agricultural area, but in the next period the

level of use of land increased and in 2011 the unutilised agricultural area decreased to approximately 0.5 million hectares.

Table 8

Land use for agricultural production in Latvia in 1940-2011

Year	Agricultural area (AA) <i>ths ha</i>	UAA <i>ths ha</i>	Unutilised agricultural area	
			<i>ths ha</i>	<i>% of AA</i>
1940	3713.6	3499.8	213.8	5.8
1950	3352.3	2760.1	592.2	17.7
1960	3076.5	2640.3	436.2	14.2
1970	2907.8	2805.5	102.3	3.5
1980	2580.6	2544.2	36.4	1.4
1990	2567.0	2501.1	65.9	2.6
2000	2486.0	1504.7	981.3	39.5
2005	2460.8	1705.2	755.6	30.7
2011	2402.7	1815.9	566.8	23.6

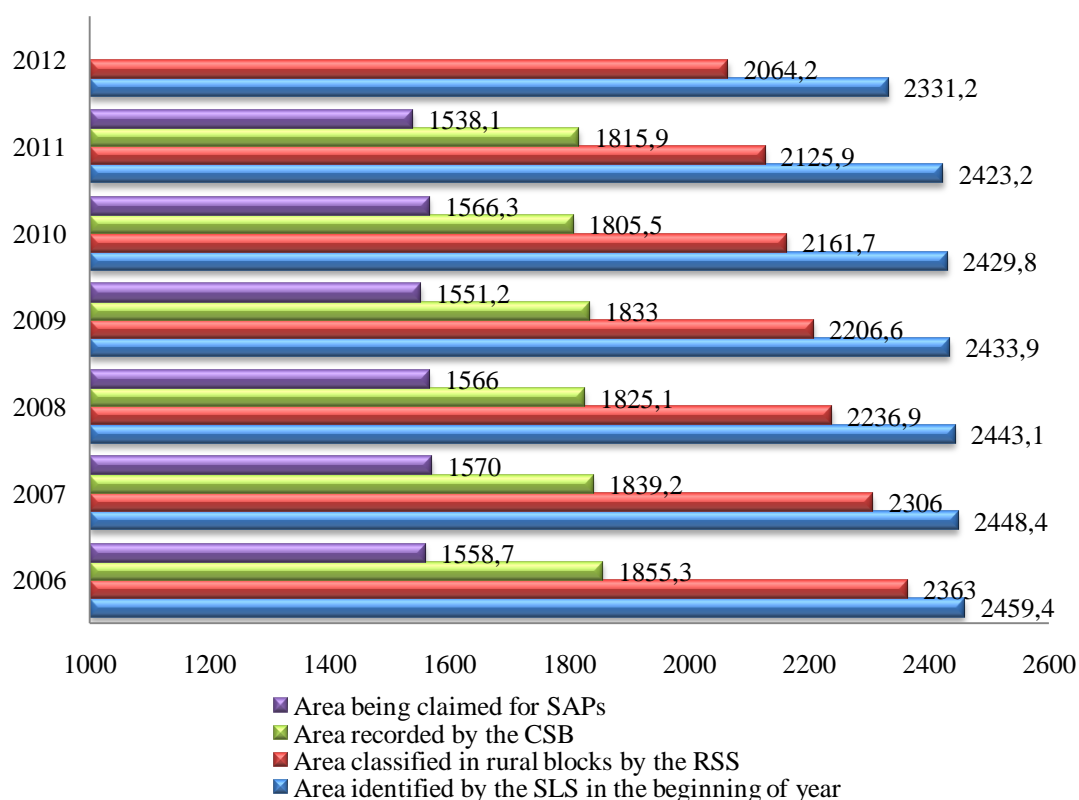
Source: authors' calculation based on CSB data

One of the causes of such a process and result is the key principle and goal of the land reform – to return the land to the heirs of former owners – part of which had no skill, ability, and wish to use the land for agricultural production – as they worked in other fields and industries. Another part of such heirs lives somewhere else in the world. Not all of them want to sell or exploit their usually small holdings, and many such holdings are located in inconvenient or uninteresting places.

The positive trends that began in 2005 set a task to determine the area to be used for producing agricultural products in Latvia in the future.

Information on the real situation with agricultural land may be obtained from data of the State Land Service (SLS), the Central Statistical Bureau (CSB), and the Rural Support Service (RSS).

The agricultural area recorded in registers and information systems of various Latvia's institutions are different (Figure 1).



Source: data of the research "Assessment of the Efficiency and Possibilities of Use of Agricultural Land"

Figure 1. Area of agricultural land available in various registers in Latvia in 2006-2012, thousand ha

According to the SLS, there were slightly more than 2.42 mln ha in Latvia in 2011, while the geographic information system of the Rural Register of the RSS shows only 2.13 mln ha classified in rural blocks; the difference is 297.3 thousand ha. In the beginning of 2012, the difference between the area registered by the SLS and the area of rural blocks recorded by the RSS decreased to 267 thousand ha. The data of the SLS showed a decrease of 128.2 thousand ha or 5.2% in the period 2006-2012, whereas the area of rural blocks recorded by the RSS decreased by 298.8 thousand ha or 12.6% in this period.

Yet, according to the CSB, the UAA totalled 1815.9 thousand ha in 2011, which is 310 thousand ha more than the area recorded by the RSS and 607.3 thousand ha more than that recorded by the SLS.

One can assume that the data on the area of rural blocks recorded by RSS show the real resources available for agricultural production more precisely. The RSS conducted a survey of agricultural area in two years (2010 and 2011). The RSS visually surveyed units of agricultural land, the area of which exceeds one hectare. In accordance with these rules, agricultural land is not maintained in good agricultural and environmental condition if the grass on it has not been mowed, harvested, or chopped and spread at least once until 1 September of the current year.

In accordance with the RSS methodology, a field is unmanaged if more than 70% of the total area of it is not maintained in good agricultural and environmental condition, and unmanaged areas are classified into several categories: unmanaged and overgrown land and land for construction. It will not be possible to use these lands for agricultural production in the nearest future, and they may be used for other purposes.

Latvian scientists (Pilvere I., Kaufmane E., Baumanes V., 2012) have conducted a research and determined the potential area to be used for agricultural production in the future. This research showed that 1954 thousand ha might be exploited, i.e., not more than 2 million ha of the area currently managed and maintained in good agricultural condition. The managed area, according to the calculation, totalled 2064.2 thousand ha in 2011. The managed area increased by 46.5 thousand ha or 2.35% if compared with 2010. The largest increase was observed for the area groups from 5 to 100 ha.

Based on this research and the assumption, the total area of land in Latvia was calculated, taking into consideration the managed area and the area not used for agricultural production for every region.

Table 9

Potential area for agricultural production in Latvia

Region	Managed area	Farmed area	Potential increase in the utilised area	Total area for agriculture	
				ha	% of AA
Pieriga	263 549	201 375	59 018	260 393	80.1
Vidzeme	441 975	324 473	109 199	433 672	84.8
Kurzeme	391 646	30 9125	77 990	387115	86.5
Zemgale	425 546	355 861	68 456	424 317	89.0
Latgale	501 657	375 879	118 625	494 504	77.2
Total	2 024 373	1 566 713	433 287	2 000 000	83.3

Source: authors' calculation

Taking into account all the above-mentioned conditions, the agricultural area to be used for agricultural production in Latvia was calculated. Five planning regions were established for planning the development of the country and ensuring cooperation in Latvia, whereas six statistical regions with Riga city as a special region were set for information collection purposes. Given the fact that the land in Riga is not exploited for producing agricultural products, the statistical regions were used in the calculation. In terms of territory, each of three regions – Vidzeme, Latgale, and Kurzeme – occupy more than a fifth of the country's territory. By territory, the regions of Zemgale and Pieriga are smaller. The regions differ not only in area, but also in agricultural land quality as well as demographic trends and capital concentration.

The above-identified conditions and the calculation showed differences in the agricultural area used for agricultural production in the regions (Table 9). The most intensive use of land is specific to Zemgale region having the most fertile soils. The lowest proportion of land available for agriculture is in Pieriga region, which is related to the use of land as living space, and in the coastal territories of the Baltic Sea. In Latgale region, the present and potential standard of management of agricultural land is determined by the quality of land in this region as well as the overall economic development level.

Conclusions

1. Land as a basis for social and economic activities of human society performs environmental, social, and economic functions, however, the *highest mission* of land use is to produce new or renewable resources by collecting and accumulating solar energy in plants. Latvia's forest area constantly increases, and for more than 30 years forestry is the dominant use of land for producing renewable sources, while the share of agricultural land in the total land area of Latvia decreased from 57.5% in 1940 and 51.9% in 1950 to 37.3% in 2011.
2. The four land reforms implemented in Latvia affected the area of utilised land resources and the kinds of land use; as a result, both the agricultural area and its management standard declined. The diametrically opposite goals of the land reforms determined large changes in the sown area. Latvia's accession to the European Union in 2004 and further processes promoted an increase in the sown area and the stabilisation of the use of agricultural land.
3. According to the information available at several databases and the findings of research conducted in Latvia, the area for producing agricultural production might reach 2 mln ha in the nearest future. It means that the managed area might increase by more than 433 ths ha, but the location of these fields is not homogenous in the regions of Latvia. The agricultural area (89%) will be managed most intensively in Zemgale region, whereas in Latgale region these lands will be transformed into other uses or exploited for producing other products.

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