INTRAZONAL AGRICULTURAL RESOURCES IN KURZEME PENINSULA

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Abstract

The paper focuses on the exposition of the research results on agricultural resources in Kurzeme peninsula–climatic resources, qualitative evaluation of the land, condition of land amelioration, topographic resources, and structural breakdown of farm land by types of use.
It is concluded that extremely various climatic and soil conditions govern in the region. The Southeast part of Kurzeme peninsula is displayed very favourably by the aggregate value of agricultural resources.
Labour productivity in Kurzeme has been analysed as well.
Key words: agriculture, factor, peninsula, resources.

Introduction

Encyclopaedical publication 'Pasaules zemes un tautas' (Lands and Peoples of the World, 1978) defines Kurzeme peninsula as the Northwest part of Latvia lying between the Baltic Sea in the West and the Riga Gulf in the East.

Latvian geographers (Latvijas ģeogrāfija, 1975) characterise Kurzeme peninsula and its intrazonal differences from climatic (Temņikova, 1958), relief, soil, and other aspects essential for agriculture (Brīvkalns et al., 1968).

The total length of the sea and gulf borderline is twice longer than its land borderline, where it verges on Dobele and Riga districts.

It is generally known that factors forming or determining agricultural production capability can be classified into six groups:

- climatic factors – quantity of solar energy, heat, moisture, length of the vegetation period, etc.;
- edaphic or soil-related factors – type of soil, mechanic content, amount and content of humus, reaction, content of plant nutrients, etc.;
- topographic or orthographic factors – relief, slope of hillsides, erosion, rockiness, configuration of fields, size of outlines, etc.;
- anthropogenic factors formed by humans due to ameliorative, culture-technical, technological, and other methods;
- social factors – education, professionalism, general intellectual development, social and public positions, and traditions;
- economic factors – energy resources (capacities of tractors, combines, and truck engines), premises, constructions, equipment, etc.

The study of nature, soil, anthropogenic, social, economic, and other factors, as well as general provisional study of conditions of Kurzeme region show that the intrazonal factors determining or forming agricultural production capability and structure of this region might be different and even extremely different. These aspects have stimulated more profound or profound complex research on each intrazone or micro-region, or sub-district of natural conditions.

K. Brīvkalns (1959), a researcher of soil and natural conditions, has displayed five sub-districts or intrazones of natural conditions (soils) in Kurzeme:

- coastal sandy lowland (1a) stretching along the coasts of the Baltic Sea and the Riga Gulf and covers the Northern part of the region;
- Western Kurzeme plain and hill land (2a) – parts of Liepāja and Kuldīga districts;
- Venta lowland (2 b) – a small zone in the territory of Kuldīga district;
- Eastern Kurzeme moraine plain (2c) – the most important and spacious agricultural zone covering the whole districts of Saldus and a large part of Tukums district;
- Northern Kurzeme hill land (2d) ending in a sandy lowland in Talsi district, and also stretching into Tukums district.

The borders of these intrazones do not coincide with the borders of districts, thus the agro-economic studies are made complicated, since statistical data are usually given by districts, while some data are available also by parishes.

Therefore also other internal classification of regions was searched for.

A. Boruks (Boruks et al., 2000) has split the parishes of Kurzeme into four sub-regions according to the suitability of their soils and natural conditions for agricultural production.

Other scientists (Špoģis et al., 2003) include Eastern Kurzeme into the region of commercial agriculture.

Geographers (Latvijas ģeogrāfija, 1975) separate several agricultural and economic districts in Kurzeme peninsula.

The comparison of scientific breakdowns revealed

both coherences and significant differences.

The aim of the paper is to study agricultural resources in edaphic, topographic, and climatic zones of Kurzeme peninsula and to assess the possibilities of primary sectors.

The objectives for the achievement of the set aim:

- to analyse the qualitative differences of climatic resources and soils in the districts of Kurzeme;
- to assess the structure of agricultural areas in the districts of the region;
- to study the resources created by anthropogenic factors;
- to analyse some of the labour productivity aspects;
- to evaluate the possibilities of agriculture by the total value of resources.

Other research objectives related to agricultural resources are not studied due to the limited scope of the paper.

Materials and Methods

The research comprises the use of two main sources – scientific literature and statistical data.

The methods of calculations, analysis and synthesis are used for the purpose of the research, while the methods of induction and deduction are applied for the interpretation of data and calculations.

Results and Discussion

1. Climatic resources

The capacity of climatic resources in Kurzeme is evaluated in two sections:

1) total especial resources of the peninsula;

2) differences of intrazonal climatic resources of the peninsula.

The most essential peculiarities and differences of the total climatic resources of the peninsula are well known not only by Latvian farmers. Many professionals have to accommodate themselves to and make a targeted use of these peculiarities and differences. However internal zonal differences are also of great importance.

The segmented relief of Kurzeme greatly affects the weather conditions, and the processes of climate formation as well. The significantly increased amount of precipitation, lower temperatures, shorter frost free period and shorter vegetation period are observed in hilly lands.

Relatively heavier rainfalls are observed in Western Kurzeme highland (650 - 750 mm), while quite opposite situation is observed in Venta lowland, where there are few extra rainfalls, as Western Kurzeme highland mainly experiences more rainfalls. However, the amount of precipitation in Kurzeme hilly land is by 200 mm lower than in Vidzeme highland and by 100 mm lower than in Latgale (Справочник по климату, 1966).

On average the frost free period in Latvia fluctuates between 150 and 180 days in Kurzeme region and up to 125 - 140 days in the Eastern districts. Due to the analysis of the frost free period it is concluded that the shortest period is observed in the central parishes of Kurzeme peninsula, mainly in the parishes of Saldus district. Yet the longest frost free period is in the coastal zone.

However, the analysis of the number of sunny days affecting agricultural production leads to the conclusion that the sowings of the coastal parishes may accrue more solar energy, since sunny days govern in this zone. The smallest number of sunny days is observed in Kurzeme midland and its Northern part.

2. Land quality and value as the main edaphic resources

The study comprises the analysis of the data on the qualitative and cadastral values of soils in the districts of Kurzeme peninsula.

As it is seen from the data arranged in Table 1, regularities have been determined in the qualitative evaluation

Table 1

The qualitative and cadastral value of soils in the districts of Kurzeme peninsula

District	Assessment of field quality in points	Assessment of the quality of UAA in points	Coefficient of place location	Relative cadastral evaluation of UAA (Ludza district = 100%)
Saldus	43	41	1.00	152
Tukums	42	39	1.10	156
Talsi	41	37	1.00	137
Ventspils	41	37	0.97	133
Liepāja	40	38	1.00	143
Kuldīga	39	35	1.00	130
The lowest – Ludza	34	31	0.87	100
The highest – Jelgava	55	53	1.26	238

Source: A. Boruks (Boruks, 2003) and the arrangement done by the author

of soils: the best soils are in the Southeast part, while the evaluation decreases in hilly lands and sandy areas, especially in Kuldīga district.

Different results are obtained if soil indicators in parishes are compared. The analysis of the assessment of the utilized agricultural area (UAA) promotes the conclusion that the quality of fields reaches and exceeds 50 points in several parishes of Saldus and Tukums districts.

To give the idea on the presence of edaphic resources in Kurzeme, the data on districts of Ludza and Jelgava, having the most polarised evaluation of the soil quality, were included into Table 1.

The comparative analysis of the evaluation of UAA on the districts of Kurzeme region and Ludza district leads to the conclusion that the quality of part of soils in Kuldīga district is similar to Ludza district.

The soil quality level is consistent in Jelgava and only some parishes of Saldus and Tukums, yet in general the UAA in Jelgava district is by one third or 29.3 % higher than in Saldus district.

Tukums district shows better conditions for location, however the coefficient of location is by 0.16 units lower in comparison with Jelgava district.

3. Impact of topographic factors

The use of high-power, highly productive machinery, and modern technologies is a characteristic development feature of contemporary agricultural production. Such a tendency is economically impossible in hilly, segmented, small outlined, and stony areas, as well as in areas subjected to erosion.

This regularity proves that hilly lands of Northern Kurzeme and Western Kurzeme are more suitable for non-agricultural activities.

4. Structure of types for the use of agricultural areas

After the evaluation of soil, and the study of climatic and topographic resources the author's intention was to analyse the structure of types for the use of land, by means of calculation of the percentage of UAA, forests, bushes and other types of use out of total agricultural areas in the districts (see Table 2).

The data included into Table 2 leads to the conclusions that:

- the proportion of UAA is very diverse in the districts of Kurzeme;
- the largest proportion of UAA is located in the Southeast of the region, namely, in Saldus district, also in the parishes of Tukums district this indicator is only by 2 percentage points lower;
- only half of total land area is used for agricultural production in Talsi and Kuldīga districts;
- the most forested territories are located in Kuldīga district, where they together with brushwood cover 33 per cent of total agricultural area. Similar results are also seen in Talsi district, where the corresponding proportion reaches 34.5%;
- an original situation is observed in Liepāja district: although the proportion of forests is the smallest here, brushwood, swamps, and water cover a large part of the territory.

5. Anthropogenic factors

Land amelioration is the most important resource in this group.

Kurzeme, as well the other districts of natural conditions in Latvia, has a negative hydrothermal coefficient, since the average annual precipitation considerably exceeds evaporation.

Under the following circumstances, as it is generally known, land amelioration is needed for an efficient agricultural production. According to the statistics, land areas were extensively ameliorated in the 1970s and 1980s, but since 1990 land amelioration has been stopped.

Neglected amelioration systems cease functioning and thus local small swamps occur in the fields. Similar swamps occur also when branches or sections of drainage pipes become blocked and crash.

The data analysis has been performed considering

Table 2

The structure of types for the use of agricultural areas in Kurzeme in 2002

Districts	UAA, %	Forests, %	Bushes, %	Other, %
Saldus	69.7	21.6	1.6	7.1
Tukums	67.5	22.5	1.4	8.6
Liepāja	65.3	20.4	3.4	10.9
Ventspils	62.6	27.9	1.6	7.9
Kuldīga	55.9	33.1	2.0	9.0
Talsi	55.4	32.6	1.9	10.1

Source: table made by the author according to the data of the State Land Service

Table 3

The situation in land amelioration in the districts of Kurzeme

Districts	% of total UAA		
	ameliorated UAA	of which the reconstruction, or repair of amelioration systems is needed	new amelioration needed
Saldus	71.5	3.6	4.7
Liepāja	66.6	5.2	45
Talsi	57.0	6.2	3.2
Tukums	53.6	3.9	4.2
Kuldīga	46.3	2.5	3.4

Source: results of Agricultural Census of 2001 in Latvia (2001)

the especial importance of this resource. The results of the analysis are included into Table 3.

Several conclusions may be drawn according to the data grouped in Table 3:

- the activity of Kurzeme districts has been very diverse, as the proportion of ameliorated areas in Saldus districts almost twice exceeds the respective proportion in Kuldīga;
- the planners of that time have used recommendations expressed by scientists and specialists, who proposed that land first of all had to be ameliorated in the best soils, like in Saldus district;
- according to the assessment of land owners, the reconstruction and improvement of amelioration systems is needed in large areas.

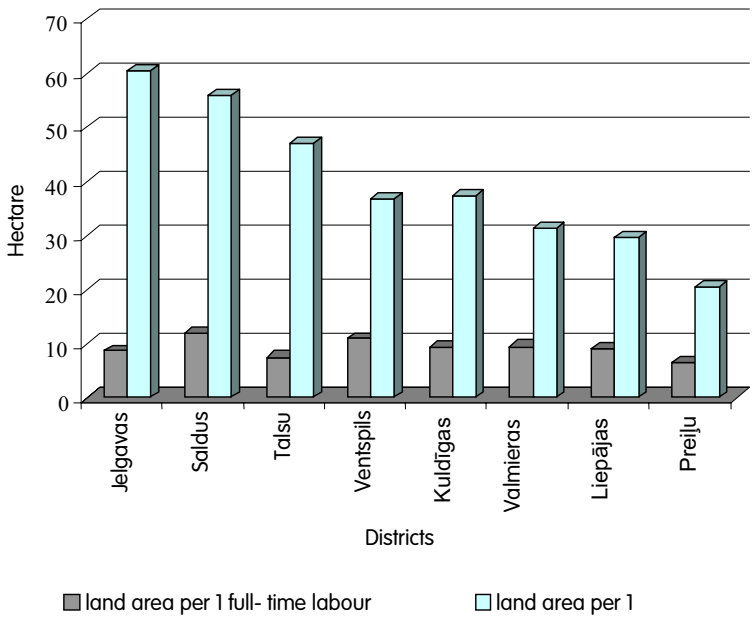
6. Labour force resources and labour productivity

Labour resources and labour productivity are formed due to the interaction of social and economic factors.

The analysis of the structure of employed persons shows that the number of employed has a coherence with the structure of areas.

However, these data do not disclose labour productivity.

Therefore further special calculations were done, and results are depicted in Figure 1. The assessment of calculations presented in Figure 1 is done due to the concept that differences in labour productivity greatly describe various used land areas per each full-time employed person and per each person employed in general. Total work regime is characterised by the figure how many farm land areas are cultivated by one person employed in agriculture.



Source: calculations and construction done by the author (Structure of Rural Farms in Latvia, 2004)

(Legend: hectares, land area per 1 full-time labour unit; land area per 1 employed)

Figure 1. Agricultural land area per 1 employed person and 1 full-time labour unit in 2003.

The research includes also one the most characteristic district from the other regions for the purpose of comparison and evaluation of labour productivity of Kurzeme inhabitants.

Several conclusions have been drawn according to Figure 1.

- The area of UAA per 1 person employed in agriculture varies extremely by the districts analysed: in Jelgava district it is 3 times larger than in Preiļi district. A slightly smaller difference is seen between Saldus and Preiļi districts. The farm size, the level of their commercialisation, technologies applied, and content of sectors are the factors creating the mentioned differences.
- All the districts experience diverse difference between the land area per one employed and per 1 full-time labour unit.
- The highest general labour productivity is seen in Jelgava district, but in Kurzeme region it is seen in Saldus district, where each employed person manages the largest land areas which amount to 56 hectares here.
- Talsi district, where this area is only by 16 % smaller than in Saldus district, comes right after Saldus district by the total number of employed persons. Though the area managed by one full-time unit is much lower in Talsi district.
- The lowest total labour productivity out of all Kurzeme districts is observed in Liepāja district, and the difference from Saldus district is large.
- Jelgava district is a leader in bench districts, while Preiļi district has the smallest amount of land per one employed person. The large number of employed in agriculture and many small-scale farms might be the cause for the mentioned result in this district.

7. Total assessment of agricultural resources

Summarising several main agricultural resources, A. Boruks (2003, 2004), an economist and scientist of soils, has determined total evaluation of agricultural conditions for each parish.

Additionally land areas are analysed in order to draw conclusions. These calculations show even larger differences among districts, since land areas favourable for agriculture in Kuldīga district amount only to 18%, while in Saldus district – already to 78%.

The mentioned author has divided all parishes into four groups: the most favourable conditions for agriculture, good, average, and unfavourable conditions for agriculture.

Assuming that the assessment of A. Boruks (2004) is scientifically well based and correct, it was used also for the clarification of intrazonal differences in Kurzeme. The data are arranged in Table 4.

According to A. Boruks' assessment there are no single parish in Kurzeme, where agricultural conditions are the most favourable as they are in Jelgava, Dobele and Bauska districts, where almost the majority of parishes being most favourable for agriculture are located.

This breakdown is disputable. K. Špoģis (2003) considers that in the Southeast part of Kurzeme soil and nature conditions are well suitable for intense commercial activities in agriculture and includes them into the main commercial and agricultural region – Zemgale.

Several conclusions have been drawn due to the data summarised in Table 4:

- parishes with conditions favourable for agriculture cover three fourths of Saldus district, and half of Tukums district, while good agricultural territories can be found also in Liepāja and Talsi districts (ca. 40%);

Table 4

The breakdown of Kurzeme parishes by the capacity of agricultural resources

Districts	Favourable conditions for agriculture		Average conditions for agriculture		Unfavourable conditions for agriculture	
	number of parishes	their land area, ha	number of parishes	their land area, ha	number of parishes	their land area, ha
Saldus	14	97,415	4	27,196	0	0
Liepāja	12	92,580	12	103,828	1	11,347
Tukums	9	79,009	7	63,086	0	0
Talsi	7	46,779	8	59,747	2	21,260
Kuldīga	4	28,305	14	126,726	0	0
Ventspils	3	24,232	7	43,386	2	8528
Total number	49	368,320	52	423,969	5	41,135
%	44	x	51	x	5	x

Source: calculations done by the author (Boruks, 2004)

- the soil district 2c greatly coincides with 2-4 micro-region, which has soils and the most important soil features suitable for efficient agriculture;
- the sub-district of Venta lowland is agriculturally heterogeneous: its Southern part includes Saldus district with the characteristic good soils, while the conditions in the Northern part are just average, in micro-regions 3–14 with Gleyed soils;
- the highland of Northern is divided into three parts: its Northern part is unsuitable for efficient commercial agriculture, while its Southwest part is adjacent to a micro-region with good conditions for agriculture, which is the continuation of good conditions for agriculture of Saldus and Tukums districts, and its end –Northern borderline;
- the areas of eroded soils in Kurzeme districts vary a lot: in Liepāja district these areas amount to 13.5 thousand ha, in some parishes of Tukums district – to 7.4 thousand ha, while in Saldus district, especially in its Northern part, they amount to only 1200 ha;
- the assessment of intrazonal differences leads to the statement that they are large or even extreme, since the proportion of Group 2 parishes (with good conditions for agriculture) fluctuates between 22% in Kuldīga district and 78% in Saldus district;
- half of the parishes of the spacious Liepāja district is included into Group 3 or group with average conditions for agriculture;
- the land areas of parishes are very diverse, thus convincing;

Conclusions

1. Total climatic resources of Kurzeme region are favourable for agriculture, but they greatly vary among the interzones of the region.

2. The qualitative land assessment in Kurzeme interregions differs and fluctuates from the South to North of the peninsula. The most valuable soils can be found in the Southeast part of the region.

3. Topographic conditions are obstructive in the hilly lands of Kurzeme.

4. The proportion of utilised agricultural areas in Kurzeme fluctuates between 55 per cent in the most forested district of Talsi and 70 per cent in Saldus district.

5. The number of persons employed in agriculture varies within the region. The highest indicator of labour productivity is observed in Saldus district, which has the largest number of parishes favourable for agriculture.

6. The condition of land amelioration is different by districts, though amelioration systems are not functioning any more in large scales, as since 1990 amelioration in Latvia has been stopped.

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