

LITHUANIA



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General

Lithuania - officially the Republic of Lithuania - is one of the Baltic states in North-eastern Europe, situated along the south-eastern shore of the Baltic Sea. It is bordered by Latvia in the North, Belarus in the East and South, Poland in the South, and Kaliningrad Oblast (Russian exclave) in the Southwest. The country has an area of 6.53 Mha (million hectares) with in 2020 a population of 2.6 million, or 0.4 persons per ha (Wikipedia and United Nations, 2019).

Climate and geography

Lithuania's climate, which ranges between maritime and continental, is relatively mild. Average temperatures at the coast are $-2.5\text{ }^{\circ}\text{C}$ in January and $16\text{ }^{\circ}\text{C}$ in July. During summer, $20\text{ }^{\circ}\text{C}$ is common during the day, while $14\text{ }^{\circ}\text{C}$ is common at night. Winters can be very cold, $-20\text{ }^{\circ}\text{C}$ occurs almost every winter. Winter extremes are $-34\text{ }^{\circ}\text{C}$ in coastal areas and $-43\text{ }^{\circ}\text{C}$ in the east of Lithuania. The average annual precipitation is 800 mm at the coast, 900 mm in the Samogitia Highlands and 600 mm in the eastern part of the country. Snow occurs every year, it can snow from October to April. In some years sleet can fall in September or May. The growing season lasts 202 days in the western part of the country and 169 days in the eastern part. Severe storms are rare in the eastern part of Lithuania, but common in the coastal areas (source: Wikipedia).

Lithuania lies at the edge of the North European Plain. Its landscape was smoothed by the glaciers of the last ice age, and is a combination of moderate lowlands and highlands. The terrain features numerous lakes and swamps, and a mixed forest zone covers over 33% of the country.

Balodis *et al.* (1993) state that the total area of polders in Lithuania is about 53,000 ha, with areas ranging between 30 and 5000 ha. A distinction is made between winter polders and summer polders. In the winter polders (24,500 ha) the areas are protected by dikes all year round. In the summer polders (28,500 ha) de dikes only protect the lands in the period with vegetation. In fact one can wonder if the second group indeed concerns polders. However, Lukianas *et al.* (2006) shows that a number of the summer polders in the Nemunas Delta are provided with drainage pumping stations (Figure 1) and that the others drain by gravity.

Maziliauskas (2004) states that the polder systems in the Delta of the Nemunas River covers an area of 52,400 ha, including 47,600 ha in Silute District and 4800 ha in Klaipeda District.

Existing polders

According to Damušytė (2011) the age of Rusnė Island is estimated at 1100 years. It was formed when the Neman River deposited its sediments before flowing into the Curonian Lagoon. Therefore, its elevation does not exceed 1.5 m+MSL (mean sea level). One point in the island is 0.27 m-MSL, which is the lowest point in Lithuania (an earlier measurement by the Ministry of Agriculture placed it at 1.3 m-MSL). The island is subject to frequent flooding, particularly in spring due to ice dams. Floods and regular river flow deposit new sediments increasing the area of the island. Floodwaters are removed by pumping, using an extensive system of canals and polders. The dikes have not always been able to protect the polder against floods, such as the one in 1958.

Quast and Lukianas (1999) describe that beginning in 1740 under initiative of the Prussian king, Friedrich II, large polder systems based on Holland's land reclamation model were created on the lower courses of the Oder, Vistula and Nemunas rivers. The summer polders and winter polders and their names are shown in Figure 2. They also state that the area of existing polders in the Nemunas Delta is 39,000 ha.

Lukianas *et al.* (2006) and Bastiene and Saulys (2007) give a detailed description of the polders in the Nemunas Delta (Figure 2). After independence in 1990 several changes have taken place in the region. From the total of 32,500 ha about 82% is covered with 17 summer polders (26,500 ha), and there are 12 winter polders (6000 ha).

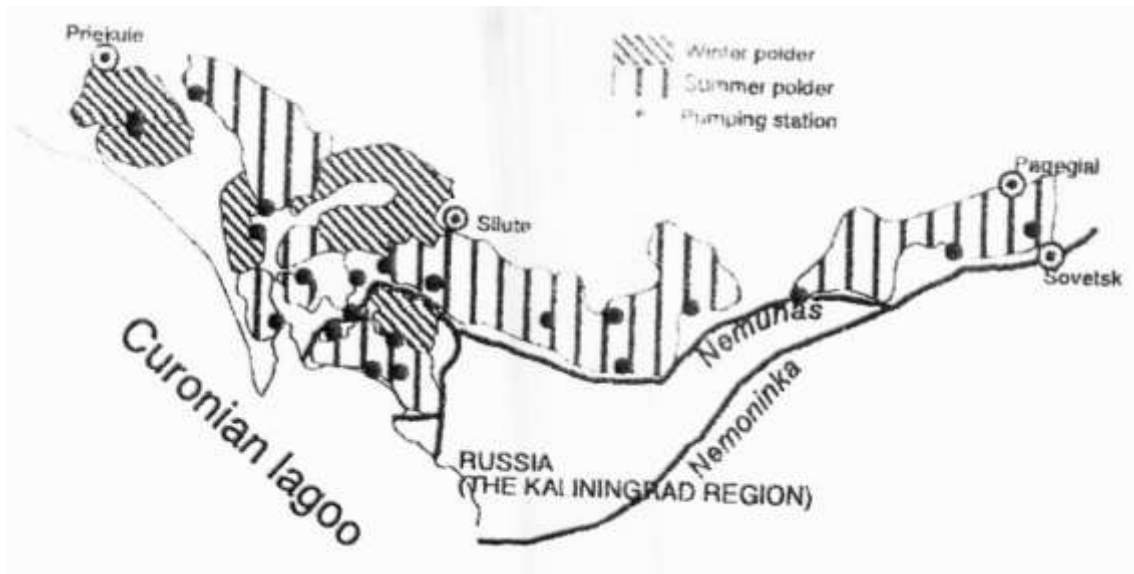


Figure 1. Polder areas and pumping stations in the Nemunas Delta (Quast and Lukianas, 1999)

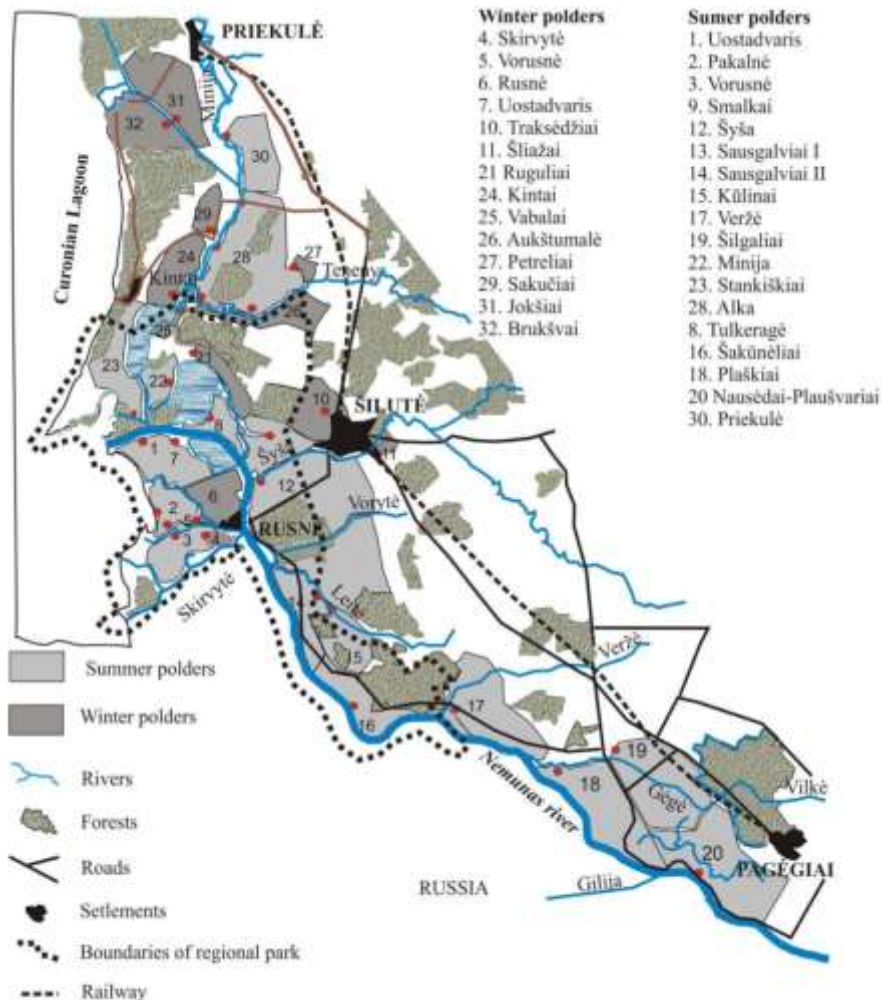


Figure 2. The Nemunas Delta and its polders (Lukianas et al., 2006 and Bastiene and Saulys, 2007)

In the Nemunas Delta there is the Uostadvaris Polder Museum. This museum shows the basic technology with which Nemunas farmers have tried to keep the waters at bay. General characteristics of the polders in Lithuania are shown in Table I.

Proposed polders

No proposed polders have been identified.

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Table I. General characteristics of existing polders in Lithuania

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation In m+MSL	Land use
Minijos Polder	1929	685	RLL				
Žuvintas Lake	1960	216	RLL	54° 28' N	23° 38' E	85	Agriculture
<i>Winter polders</i>							
Oostadvaris	1907	35	RLL	55° 20' N	21° 18' E	-4	Agriculture
Aukštumale			RLL	55° 24' N	21° 23' E	0	Agriculture
Brūkšvai			RLL	55° 31' N	21° 15' E	-3	Agriculture
Jokšiai			RLL	55° 31' N	21° 17' E	-3	Agriculture
Kintai			RLL	55° 25' N	21° 17' E	-3	Agriculture
Petreliai			RLL	55° 26' N	21° 27' E	0	Agriculture
Ruguliai			RLL	55° 22' N	21° 22' E	-3	Agriculture
Rusne			RLL	55° 19' N	21° 22' E	-3	Rural area
Sakučiai			RLL	55° 28' N	21° 21' E	0	Agriculture
Skirvyte			RLL	55° 17' N	21° 20' E	-2	Agriculture
Šliažai			RLL	55° 21' N	21° 30' E	7	Urban
Traksedziai			RLL	55° 21' N	21° 26' E	-4	Agriculture
Vabalai			RLL	55° 24' N	21° 18' E	-4	Agriculture
Vorusne		40	RLL	55° 18' N	21° 20' E	-3	Agriculture
<i>Summer polders</i>							
Šyša	1912	3095	RLL	55° 19' N	21° 24' E	-4	Agriculture
Alka		4887	RLL	55° 27' N	21° 24' E	-2	Agriculture
Kūlinai			RLL	55° 14' N	21° 30' E	0	Agriculture
Minija			RLL	55° 22' N	21° 18' E	-4	Agriculture
Nausedai-Plaušvariai			RLL	55° 7' N	21° 53' E	2	Agriculture
Pakalne			RLL	55° 18' N	21° 19' E	-4	Agriculture
Plaškiai			RLL	55° 9' N	21° 45' E	0	Agriculture
Priekule			RLL	55° 29' N	21° 23' E	-1	Agriculture
Šakūneliai			RLL	55° 12' N	21° 30' E	0	Agriculture
Sausgalviai I			RLL	55° 16' N	21° 26' E	-1	Agriculture
Sausgalviai II							
Šilgaliai			RLL	55° 10' N	21° 48' E	1	Agriculture
Smalkai			RLL	55° 21' N	21° 24' E	-4	Agriculture
Stankiškiai			RLL	55° 23' N	21° 15' E	-1	Agriculture
Tulkerage			RLL	55° 21' N	21° 21' E	-3	Agriculture

Uostadvaris			RLL	55° 20' N	21° 17' E	-4	Agriculture
Verže		3625	RLL	55° 12' N	21° 37' E	1	Agriculture
Vorusne			RLL	55° 17' N	21° 20' E	-3	Agriculture
Total polder area		50,972					
• Winter polders		24,500					
• Summer polders		28,500					

*) RLL = reclaimed low-lying land; LGS = land gained on the sea; DL = drained lake