

# Natural resource potential in the development strategy of the region

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**Abstract.** The article considers the natural resource potential of the Tyumen region. The main peat deposits were identified, their useful properties and the possibility of further application in various sectors of the economy were determined. Prospects and mechanisms of peat processing will have a positive impact on the balanced development of the territory.

## 1 Introduction

Peat is an organic rock formed as a result of the death and incomplete decay of marsh plants in conditions of increased moisture with a lack of oxygen and a content of no more than 50% of mineral components per dry substance. Peat bogs are found in almost all countries, the total area of peat bogs in the world is 176 million hectares, peat reserves are 250 billion tons. The total area of peat deposits in Russia is 47.6 million hectares with peat reserves of 166.9 billion tons (31.4% of world reserves).

Peat is used in agriculture, animal husbandry, medicine, biochemistry and energy. It is used to make fuel, fertile soil mixtures and fertilizers, a medium for storing vegetables and fruits, insulation and packaging materials, absorbers – activated carbons used in sewage treatment, distillery and sugar production, peat coke for blacksmithing and metallurgy, medicines [1].

Peat is rich in humus, and humus is the basis of soil fertility. In peat, humus is contained in a bound state: it is difficult for the plant to pick it up from there [2]. When processing peat with alkali, humates, water-soluble compounds are released, and it is easier for the plant to consume them. Such materials are not only nutrition, but also excellent growth stimulants. In addition, humus is a good binder: it can bind degraded soils that are blown by the wind, or soils that are eroded by water.

The use of peat is influenced by its qualitative characteristics:

- Degree of decomposition – the content of a structureless part in peat, including humic substances and small particles of inhumified plant residues,
- Ash content - the ratio of the mass of the mineral part of peat remaining after calcination to the mass of dry peat,
- Acidity – the reaction of the medium,
- Natural humidity – water contained in peat.

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## 2 Materials and methods

Swamps and wetlands occupy 28.78% of the territory of the Tyumen region – 46091 km<sup>2</sup>. Among the regions of the Federal District, the Tyumen Region ranks second in terms of wetlands after the Khanty-Mansi Autonomous Region. The area and number of swamps and wetlands are variable, they depend on natural factors (water regime, climatic phenomena, waterlogging, etc.) and, to a lesser extent, anthropogenic (drainage of territories, etc.). Peat reserves in the south of the Tyumen region and their study are shown in table 1.

**Table 1.** Peat reserves in the south of the Tyumen region.

District	Number of deposits	The area of the deposit, hectares.	Total	Peat reserves, thousand tons		
				By category		
				A+B	C <sub>1</sub>	C <sub>2</sub>
Uvat	5	57252	254620	3258	124089	128173
Tobolsk	15	106261	353818	349023	4763	32
Nizhnetavdinsky	16	43452	146321	132451	13870	-
Yarkovsky	12	69381	184935	136368	48567	-
Vagaysky	21	58126	193440	45739	147701	-
Tyumen	22	94980	95283	20858	74425	-
Yalutorovskiy	17	24605	52753	52753	-	-
Yurginsky	7	2862	12332	8967	3365	-
Aromashevsky	8	1340	1206	919	287	-
Sorokinsky	-	-	0	-	-	-
Vikulovsky	15	16044	53323	40855	-	12468
Isetskiy	14	3064	7258	6201	1057	-
Zavodoukovsky	2	306	429	429	-	-
Omutinsky	3	759	2060	2060	-	-
Golyshmanovskiy	10	4144	8875	7802	1073	-
Ishim	9	626	656	505	151	-
Abatsky	5	468	0	-	-	-
Uporovskiy	15	2024	1184	532	507	145

In the Russian Federation, reserves are divided into 4 categories according to the degree of reliability, let's take a closer look at Table 2.

**Table 2.** Peat stocks by category.

Categories	Characteristic
category "A"	detailed explored mineral reserves
category "B"	previously explored mineral reserves
category "C1"	reserves of explored deposits of complex geological structure and poorly explored mineral reserves
category "C2"	promising, undiscovered reserves
Page number	Reference Body
Year	Reference Body (In brackets)

Tobolsk, Nizhnetavdinsky and Yarkovsky districts are the richest in peat.

The porous structure and capillarity make peat an ideal raw material for sorbents. The possibilities of high-tech sorbents are almost limitless. You can clean everything if you know what specific product the sorbent is made for. Peat can purify water due to its ion-exchange properties [3].

A true revolution with contradictory consequences occurred in 1961, when disposable diapers were released [4]. Disposable diapers quickly flooded the world due to their convenience and accessibility. However, over time, this "invention" turned into an environmental disaster, because every day tons of used diapers end up in landfills, polluting the environment. Once in a landfill, a disposable diaper decomposes for centuries, releasing dangerous substances that poison the soil and air. During the burning of discarded diapers, toxic compounds are released, including carcinogenic and mutagenic dioxins [5-11].

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The diaper market is constantly expanding, so today, in addition to traditional disposable diapers, there are a number of alternative types:

- Reusable diapers – made of textiles and fabrics of artificial or natural origin and have a layer that holds liquid,
- "Green" diapers – partially biodegradable and contain a small amount of plastic (in the lining or filler), and also do not contain chlorine, flavors, dyes and latex,
- Hybrid diapers are a cross between a reusable and a disposable diaper. They have a waterproof outer layer and disposable inserts. This reduces the amount of waste, since only liners get to the landfill. Liners can be made of materials that are partially decomposed and composted,
- Biodegradable diapers – made from completely natural, organic materials that decompose in nature in a short period of time.

One of the ways to reduce the waste of disposable diapers is the production of fabric reusable diapers. Also, sewing reusable diapers is a profitable niche. Environmental friendliness, a healthy lifestyle and a return to the roots have become a separate trend today, adjusted for today's realities and technological progress.

This project involves the production (sewing) of cloth diapers, and the manufacture of disposable cartridges filled with sorbent from granulated peat. High absorbency, reliable protection against leaks, and absolute naturalness - these are the distinctive properties of a disposable, peat liner. The peat liner is completely biodegradable, subject to composting. Peat disposable absorbent liner is subject to composting in agriculture, private farmsteads, suburban areas, poultry and livestock farms. Peat has a porous structure that determines moisture and gas-absorbing properties, and is able to suppress bactericidal activity and pathogenic flora. Biodegradable plastics are obtained from plant raw materials, in six months soil microorganisms will process them to water, carbon dioxide or methane with a maximum of 10% residue, which can also be used in compost. One of the representatives of

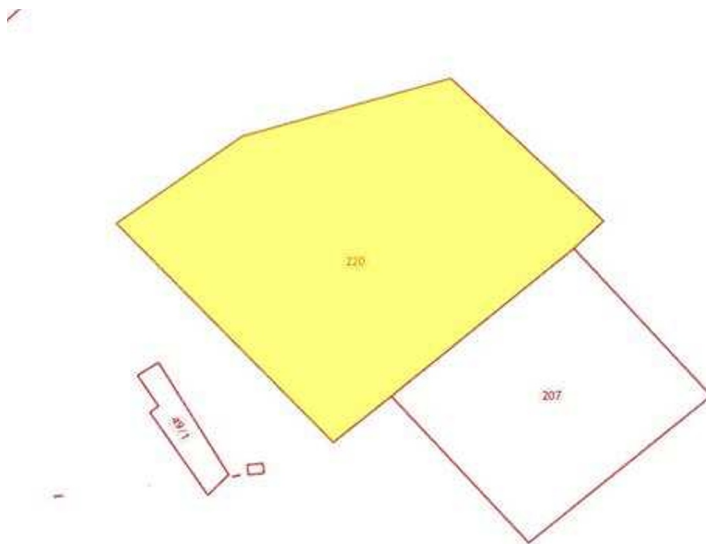
biodegradable bioplastics are polylactides, that is, polymers based on lactic acid formed after lactic acid fermentation of sugary substances.

Poly lactides, or lactic acid polymers, are obtained after fermentation of corn sugars or other biomass, are used quite widely, often mixed with starch for better biological decomposition and profitability of production. Products with a short service life are produced from polylactides: packaging for fruits and vegetables, eggs, delicatessen products and pastries, as well as surgical threads. The disposable cartridge is manufactured on an automatic line, where the cartridge is formed from a granular sorbent and a mesh of polylactide.

Compostable peat liners do not contribute to the formation of landfills, which corresponds to the principles of sustainable development.

### 3 Results

In the Tyumen region there is a list of land plots for the implementation of projects located on the territory of the Tobolsk municipal district. Among the types of permitted use, light industry is indicated, including textile production. The land plot is registered under cadastral number 72:16:0605001:220. It is located on the lands of settlements. Information about the land plot contained in the public cadastral map is shown in figure 1.

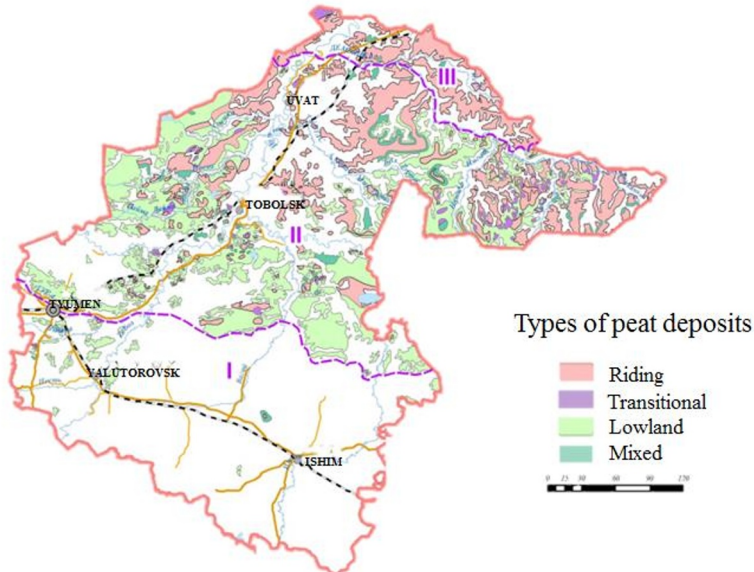


**Fig. 1.** Location of the land plot.

In accordance with the existing legislation, it is permissible to place textile production on the land plot.

### 4 Discussion

This section is devoted to discussing the results of the study. Peat-bog deposits are shown in Figure 2.



**Fig. 2.** Peat reserves in the Tyumen region.

The I-zone is located in the south and includes small peat reserves, mainly of low-lying type, which are characterized by small depths of deposits, ash content and significant agrochemical indicators such as phosphorus, potassium, calcium.

II - zone, located in the central part of the region, large reserves are represented, more than 1 billion tons.

III - the northern part of the region, which includes deposits of upland marshes.

## 5 Conclusion

In the Tobolsk district there are significant reserves of peat that can be used in various sectors of the economy and areas of production. The processing of peat and its further use in textile production will attract additional investor interest in the development of the territory, which will have a positive impact on improving the standard of living of the population, as it will provide the resident population with additional jobs.

The launch of a new production will favorably affect the competitive environment of the district, through the development of other industries that can use peat as the main component of the raw material base.

The placement of textile production on the territory of the Tobolsk district will positively affect the development of the territory, and the idle site will be involved in production.

The uniqueness of production and products, the absence of competitors in this industry, will contribute to the entry of products into the all-Russian and international market.

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