Water resources of the Republic of Belarus 2023

NATIONAL AGENCY OF INVESTMENT AND PRIVATIZATION
REPUBLIC OF BELARUS

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1.1. General description of Belarusian water fund

All waters (water bodies) constitute state water fund of the Republic of Belarus. The water fund includes: a) surface waters (water bodies) – rivers, creeks, springs, lakes, ponds, reservoirs, canals, etc.; b) underground waters. All waters (water bodies) on the territory of the Republic of Belarus are exclusive state property of the Republic of Belarus.

The specifics of the geographical position of Belarus led to the formation of a developed hydrographic network, including rivers, lakes, canals, reservoirs and ponds. In total, 20,800 rivers and streams with a total length of 90,600 km flow on the territory of Belarus, which contain about 9 cubic km of water. The Vitebsk and Grodno regions are the most provided with water resources, the Gomel and Brest regions are the least.

The Baltic-Black Sea watershed passes through the territory of Belarus, which divides the country into 2 parts. Most of it (57%) belongs to the Black Sea basin, and 43% belongs to the Baltic Sea basin. The Black Sea basin includes the basins of the Dnieper (the largest in the country) and Pripyat (2nd largest). The Baltic Sea basin includes the basins of 5 major rivers: the Neman, the Western Dvina, the Western Bug, the Viliya and the Lovat River.

In total, 10 large rivers (more than 500 km) flow in Belarus: the Dnieper, Berezina, Pripyat, Sozh, Western Dvina, Neman, Western Bug, Lovat River, Horyn River, Viliya. Within the country, the length of the listed rivers is significantly less (table below). Another 41 rivers in Belarus belong to the category of medium (100-500 km), while the Narew, Styr River, Iput, Ptsich and Shchara rivers have a length of more than 300 km. The category of small rivers includes 1,452 rivers with a length of 10 to 100 km, and 19,300 watercourses with a length of up to 10 km belong to the category of creeks and together make up 93% of the total number of rivers.

Rivers of Belarus

River	River length, km		Basin area, km²	
	total	within the country	total	within the country
Dnieper	2145	700	504 000	67 460
Western Dvina	1020	338	87 900	33 150
Neman	937	436	98 200	34 610
Western Bug	772	169	73 470	9 990
Pripyat	*761*	*495*	121 000	50 900
Horyn	659	82	27 700	1 200
Sozh	648	451	42140	21 700
Berezina	561	561	24 500	24 500
Lovat	536	47	21 900	382
Viliya	498	276	25 100	10 920

Small rivers and creeks predominate among the watercourses (about 90%). Them being spread across the territory makes water resources available for widespread use. However, river flow is mainly formed by large and medium-sized rivers, along which large settlements and major industrial facilities are concentrated.

The number of water bodies to a greater extent (about 90%) is due to their natural origin (lakes). 85 reservoirs with a water surface area of 100 hectares or more have been created on the territory of the country. Liquid–type reservoirs are concentrated mainly in the southern part of the republic, and lake-type reservoirs are concentrated in the northern part. There are more than 1,500 ponds, which are mainly used for fish farming, as well as for recreational purposes.

In addition to reservoirs and watercourses, another type of natural water bodies – springs. They are also widespread throughout the country. Springs are vital sources of non-centralized drinking water supply.

Ecological state of surface water bodies

Over the past five years, there has been an upward trend of the ecological condition of surface water bodies – 72.4% of them have been assigned a good or higher ecological status. Significant man-caused impact is experienced by 1.2% of surface water bodies (its parts).

The quality of groundwater

The quality of groundwater, including mineral waters, and their reserves allow, in addition to meeting economic and drinking needs, to use such waters for therapeutic (resort and recreation) purposes with the use of more than 30 types of mineral waters, as well as to export water by bottling. Territorially, fresh groundwater is most intensively used in the Gomel, Mogilev and Minsk regions, and mineral water is used in the Vitebsk and Minsk regions.

Balance reserves of fresh groundwater

Currently, on the territory of the Republic of Belarus, the balance reserves of fresh groundwater have been explored and approved in the amount of 6.35 million cubic meters/day in categories A+B +C1 (or 2317.75 million cubic meters/year) at 609 deposits of fresh groundwater. At 605 deposits, the reserves of fresh groundwater have been explored and approved for household and drinking needs, four deposits - for technical purposes. The explored and approved reserves of underground mineral waters amount to about 62.13 thousand cubic meters/day.

1.2. Legal framework

Key ideas on managing water resources are presented in **National strategy on managing water resources in under the climate change until 2030.**

Main goal of the strategy is water security of the country, which includes:

• guaranteed water supply of standard quality of the population;

• water supply of economic sectors with consideration to efficiency of its use;

• safe discharge of wastewater into the environment with higher quality of purification;

• protection of life and property of the population, as well as sectors of the economy from natural emergencies caused by the negative impact of water.

Expected outcomes of the strategy:

• Availability of centralized water supply and sewerage systems - at least 93.2% and 79.3% by 2025 and 95% and 85% by 2030, respectively;

• The share of surface water bodies with good and higher ecological status - not less than 75% by 2025, 85% by 2030;

• Index of discharge of insufficiently treated wastewater into water bodies (compared to 2015) - no more than 30% by 2025, 0% by 2030;

• Extent of adoption of integrated water resources management - at least 80% by 2025, 100% by 2030;

• The share of the area of transboundary river basins covered by international agreements on cooperation to protect and use transboundary waters - at least 78% by 2025, 100% by 2030.

The main document regulating relations arising under ownership, use and disposal of waters and water bodies and aimed at protection of rights and legal interests of water users is the **Water Code of the Republic of Belarus**.

It establishes programs and measures for protection and use of waters, plans of water resources management, norms of permissible discharges and norms of water use, requirements for works carried out on water bodies, regimes of economic activities on water bodies.

Belarus has also signed a number of international treaties, which promote harmonization of water legislation with one of European Union countries: the Convention on the Protection and Use of Transboundary Watercourses and International Lakes of March 17, 1992, the Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes of June 17, 1999.

1.3. Research base

At the level of state and other programs, research is primarily aimed at finding innovative solutions in the field of technologies for water treatment and wastewater treatment, treatment and disposal of sewage sludge, research on technology for monitoring and forecasting the condition of surface and groundwater, including during emergency response, a comprehensive study of the responses of aquatic biological resources to natural and anthropogenic changes in aquatic ecosystems under changing climate conditions.

The National Water Resources Management Strategy defines the main scientific and scientific-technical research on water protection and rational use. They should be aimed at:

- development of existing and creation of new mechanisms of water resources management allowing to unite all spheres of water relations regulation with transfer of functions to one state management body (Water Committee);
- improvement of economic methods and mechanisms for rational water use;
- scientific support of conditions for the implementation of best available techniques, including the creation of a list of the best existing technologies in the field of water supply, sanitation and wastewater treatment;
- improving the system of accounting for groundwater extraction, surface water extraction and wastewater discharged into the environment, as well as methods of water sampling and measurements in the field of environmental protection;
- development of scientific bases for surface and groundwater monitoring, automated and information technologies in the field of water use and water monitoring;
- improvement of natural and anthropogenic risk assessment methods allowing to reduce damages caused by natural and man-made hazards;
- development of scientific bases for assessment of transformation of water regime, changes in qualitative and quantitative characteristics of water resources of the territory under the influence of urbanization.

The main scientific and research center in the field of water resources management in Belarus is the **RUE "Central Research Institute of Integrated Water Resources Use" (RUE CRIIWRU)**.

The main purpose of the RUE "CRIIWRU" activity is to ensure scientific and technological progress in the field of efficient use of water resources and their protection from pollution and depletion by developing new methods, technologies and means and making profit.

The following types of works are performed for state institutions and management bodies by the Republican Unitary Enterprise CRIIWRU:
1) development of databases, information systems, and management decision support systems in the field of the State Water Registry;
2) development of technical normative legal acts in the field of water resources use and protection;
3) assessment of current state of water resources in connection with global climate change, including issues of water protection
4) training of senior academic staff through postgraduate courses.

For local executive and administrative bodies:
1) development and scientific support of river basin water management plans;
2) development and adjustment of projects of water protection zones and coastal strips of water bodies;
3) carrying out works on stocktaking of water bodies of the Republic of Belarus.

Scientific research in related fields is also conducted by the Institute of Nature Management of the National Academy of Sciences of Belarus, the Institute of Housing and Communal Services of the National Academy of Sciences of Belarus and the State Institution "Republican Center for Hydrometeorology, Radioactive Pollution Control and Environmental Monitoring".

For enterprises and organizations:

1) development of projects to assess the environmental impact of engineering activities in river basins, including the placement of hydropower plants;

2) strategic environmental assessment (SEA) and development of environmental report on SEA;

3) providing methodological and practical assistance in the organization and implementation of wastewater and surface water accounting systems;

4) comprehensive assessment of environmental impact of enterprises and rationing of water use in enterprises;

5) development and substantiation of standards for maximum permissible discharges of pollutants into water bodies and municipal sewage systems;

6) development of instructions on organization of industrial environmental control at the enterprise;

7) calculation of norms of technological water consumption in public water supply systems;

8) calculation of norms of water losses and unaccounted discharges from public water supply systems;

9) evaluation of the possibility of placing (reconstructing) economic and other activities on water protection areas with development of water protection measures;

10) development of projects of justification of boundaries of underground water supply sources;

11) evaluation of volumes of unorganized additional inflow of water to municipal sewerage systems in settlements, development and substantiation of measures on reduction of its inflow to municipal sewerage systems;

12) assessment of the environmental condition of petroleum product storage, transportation and dispensing facilities.

1.4. Staffing

Personnel training is carried out within the framework of specialties "Nature protection activity" and "Water supply, water disposal and water resources protection". The objects of professional activity of specialists are systems and technologies of water supply and sanitation; systems of sanitary equipment of buildings and constructions; engineering systems and technologies of water resources protection; systems and technologies of building construction; research and development methods in the field of natural and technical sciences.

The main institutions of higher education that train specialists are the Sakharov International State Environmental Institute of the Belarusian State University (Department of Environmental Monitoring), Brest State Technical University (Department of Engineering Systems and Ecology), Belarusian State Technological University (Department of Chemical Technology and Engineering), Belarusian National Technical University (Department of Energy Construction), Belarusian State University of Food and Chemical Technologies (Mechanical Department).

These universities train specialists under postgraduate education programs.
The postgraduate education programs are also implemented by the Republican Unitary Enterprise "Central Scientific Research Institute Of Complex Use Of Water Resources" and the Institute of Nature Management of the National Academy of Sciences of Belarus.

According to data for 2021 in the sector "Water supply; collection, treatment and disposal of waste, activities to eliminate pollution" employed 29,056 people (0.88% of the total number of employees), in sectoral research - 6 candidates of science. The industry "Electricity, gas, steam, hot water and air conditioning supply" employed 128,608 people (3.89% of the total number of employees), including 18 PhDs.

1.5. Technologies

Belarus has developed the concept of basin management of water resources, which implies river basin management and improvement of the ecological status of surface water bodies. This makes it possible to improve water security of the country and determines basic technologies in water treatment, water supply and sanitation.

Currently, the population and organizations of the republic consume water from both underground and surface sources.

Artesian water
(underground sources of water supply)

Water from artesian sources is mainly supplied to consumers without additional purification and chlorine treatment. However, some water sources contain increased percentage of iron and manganese. Water from these sources is supplied to deferrization stations (DFS) located at the sites of pumping stations, where it is aerated and filtered, which allows to reduce the residual concentration of iron and manganese in water to 0.1 mg/dm3 when supplied to consumers.

Water from a surface source
(surface water supply source)

Water from a surface source, a reserve reservoir through gravity water pipelines goes to the water treatment plant (WTP), where it is treated before being supplied to the water supply network.

Technologies used for water purification:
1) **chlorination** - disinfection of water with sodium hypochlorite;
2) **coagulation** - the process is used to accelerate the sedimentation process in settling tanks and more complete extraction of particles during filtration (enlargement, clumping of impurities, formation of flakes). To automate the process, a modern automated process control system is implemented.

2. Characteristics of the hydrographic network of Belarus

An important hydrographic indicator is the density of the river network, which shows the length of watercourses per unit area. The average indicator of river network density in Belarus is 0,44 km/km^2 (for comparison, the average river network density in Russia is 0,3 km/km^2). It varies considerably in different regions of the country, from 0.52 km/km^2 in the north-west of Belarus to 0.26 km/km^2 in the south-east.

The relief of Belarus has determined the flat nature of the country's rivers. The average slope of small rivers can reach 2-3 m/km, that of medium-size rivers decreases to 0.5-0.8 m/km and that of large rivers to 0.1-0.2 m/km. Accordingly, the average flow velocity of rivers also changes: 0.8-1.5 m/sec, 0.5-0.7 m/sec, 0.1-0.2 m/sec.

All water mass of rivers and streams forms river runoff, the total volume of which in Belarus is 57.7 km^3. It is partly formed by atmospheric precipitation (36.4 km^3), partly brought in by rivers from outside the country. The share of the transit flow is 21.3 km^3. The river flow caused by precipitation in its turn is divided into the surface flow (23,4 km^3) and underground flow (13 km^3). Due to uneven precipitation over the years, river runoff fluctuates by +-30%.

Characteristics of river basins

The Dniepr basin occupies an area of 63.7 thousand km^2 (excluding the Pripyat), which is more than 30% of the territory of Belarus. The Dnieper has its source in the Valdai Upland in Russia, and its mouth is the Dnieper Firth of the Black Sea. The total length of the river is 2,145 km, in Belarus - 700 km. The biggest right tributaries of the Dnieper are the Drut and the Berezina, and the left tributary is the Sozh. In places of close occurrence of Devonian sediments in the Dnieper valley, the Kobeliak and Streshinskie rapids were formed. The average annual discharge of the basin rivers is from 7 l/sec per 1 km^2 (sources of the Berezina) to 3 l/sec per 1 km^2 on the border with Ukraine.

The Pripyat basin occupies an area of 50.9 thousand km^2 (25% of the country's territory). The river has its source in the Volyn region and flows into the Dnieper River near the Kiev reservoir. The total length of the river is 761 km, 495 km in Belarus. The Pripyat has more than 800 tributaries, the largest of which are: Styr, Goryn, Stviga, Ubort, Slovechna (right), Pina, Yaselda, Sluch, Ptich (left). The average density of the river network is 0,4 km/km2. The average annual river flow varies from 6 l/s from 1 km^2 in the north of the basin (sources of Ptich) to 3 l/s from 1 km^2 in the latitudinal part of the Pripyat.

The Neman basin occupies an area of 34,600 km^2 (17% of the territory of Belarus). The Nemanets River has its source in Belarus near the village of Verkh-Nyoman, Uzden district, at an altitude of about 180 m, and flows into the Curonian Bay of the Baltic Sea. The total length of the river is 937 km, 436 km of which in Belarus. The biggest right tributaries of the Neman in Belarus are the Western Berezina, the Ditva and the Kotra, while the left tributaries are the Shchara and the Zelvyanka. The average density of the river network is 0.47 km/km^2.

The basin of the Western Dvina occupies an area of 33.2 thousand km^2 (16% of the territory of Belarus). The Western Dvina starts from Lake Karakino in Russia and flows into the Gulf of Riga of the Baltic Sea. The total length of the river is 1,020 km, and within Belarus it is 338 km. The largest right tributaries are the Usviacha, the Obol, the Polota, the Drysa; the left tributaries are the Kaspla, the Luchesa, the Ulla, the Ushacha and the Disna. The average annual runoff of the rivers of the basin is large - 6-8.5 l/sec per 1 km^2.

The basin of the Western Bug occupies an area of 10,0 thousand km^2 in the south-west of the country (5% of Belarus). The river has its source in the Podolsk Upland in Ukraine and its mouth in the Zagrzyn Reservoir in Poland. For 169 km, the Bug is a border river with Poland. The total length of the river is 772 km. Its right tributaries are the Mukhavets and the Lesnaya. The average annual river flow does not exceed 4 l/sec per 1 km^2.

The Viliya basin occupies an area of 11,000 km^2 (5% of the country's territory). The Vilia is a tributary of the Neman, but flows into it on the territory of Lithuania. The river has its source near the village Velikoye Pole, Dokshitsky District, and crosses the border with Lithuania in Ostrovetsky District. The total length of the river is 498 km, 276 km of which in Belarus. The right tributaries of the Viliya are the Servech, the Naroch, the Stracha, the left tributaries are the Ilia, the Usha and the Oshmyanka. The average annual river flow is 6-8 l/sec per 1 km^2.

The Lovat River basin occupies the smallest area of 382 km^2, which is 0.2% of the territory of Belarus. The river has its source in Lake Zavesno in the Gorodok District and flows into Lake Ilmen in Russia. Lake Ilmen belongs to the basin of the Baltic Sea and is connected with it through the Volkhov and Neva rivers. The total length of the river is 536 km, but only 47 km in Belarus. The average annual river flow exceeds 8 l/sec per 1 km^2.

The Berezina basin covers an area of 24.5 thousand km^2 and is part of the Dnieper basin. The source of the Berezina is southwest of Dokshitsy, and the mouth is on the Dnieper north of Rechitsa. The total length of the river is 561 km (it is the 2nd longest in Belarus). It is the largest river, placed entirely from its source to its mouth in Belarus. Its right tributaries are the Haina, the Plissa, the Svisloch. Its left tributaries are the Bobr, the Klyava, the Olsa. The density of the river network is 0.35 km/km^2.

The river system includes 425 rivers with a total length of 8490 km. The average annual river flow ranges from 7 l/s per 1 km^2 in the north to 4 l/s per 1 km^2 in the south.

The natural hydrographic network of Belarus is supplemented by canals, which were built for transport purposes and connected the waterways of the Baltic and Black Seas.

Canals

The Dnieper-Bug (Royal) Canal is the largest canal in Belarus, 196 km long. It connects the Pine River (a tributary of the Pripyat River) and the Mukhavets River (a tributary of the Western Bug). The construction of the canal and waterworks was carried out in 1775-1843. Subsequently, the canal was repeatedly reconstructed. The canal is used for transport purposes and at present.

The Berezinskaya water system has a total length of 166 km. It passes through lakes Plavno, Bereshch and Lepelskoe. It connects the rivers Berezina (Dnieper) and Ulla (Western Dvina). The construction of the water system was carried out in 1798-1812. The canal was used for transport purposes and timber ferrying until the beginning of the 20th century.

The Dnieper-Bug (Royal) Canal

Berezinskaya water system, Lake Plavno

Oginsky canal (Dnieper-Neman waterway) 54 km long was built on the initiative of Slonim magnate Michal Oginsky for transport purposes and timber floating. It connects the Shchara River (a tributary of the Neman River) and the Yaselda River (a tributary of the Pripyat River). The construction was carried out in 1767-1783. It passes through Lake Vyganoshchanskoe. Now it is used as a water intake for reclamation canals.

The Augustów Canal, with a total length of 102 km (22 km in Belarus), was also of transport importance. It connects the Neman River and the Black Gancha River (a tributary of the Bebzha and then the Vistula). The canal was built in 1824-1839. In 2004-2006, the Belarusian part of the canal was reconstructed. Currently used for recreational purposes.

The Vilaysko-Minsk water system was built in 1968-1976. It is a very complex hydraulic structure, 62 km long. It connects the Viliya (a tributary of the Neman) and the Svisloch (a tributary of the Berezina). The water system includes the largest reservoirs in the country (the Vileika and the Zaslavl), and 5 pumping stations, which raise water to 75 m. The water system is used for water supply of Minsk.

Mikashevichsky canal, 7 km long, was built in 1974-1980 to remove rubble from the Mikashevichsky quarry. It connects the river Pripyat. Pripyat and RUPE "Granite" (Mikoshevichi) and is used quite intensively for transport purposes at present.

Vileika-Minsk water system, the Svisloch River

Oginsky Canal

Water reservoirs and ponds

In order to solve water management tasks on the territory of Belarus, artificial water bodies were created: reservoirs and ponds. Reservoirs include water bodies with the volume of water more than 1 million m^3 and area of more than 100 hectares, and ponds less than 1 million m^3 and less than 100 hectares.

There are more than 150 water reservoirs on the territory of Belarus, with a total water surface area of 834 km^2, and more than 1500 ponds, with a total area of about 300 km^2. Reservoirs are distributed unevenly. Their greatest number is in the Pripyat and Dnieper basins, where there are few large natural lakes.

According to the type of formation reservoirs are divided into in-stream, lake and off-channel reservoirs. The most widespread in Belarus are in-stream reservoirs (52%), the share of lake reservoirs is 35% (mainly in Vitebsk region) and off-channel reservoirs 13% (mainly in Brest region). The purpose of water reservoirs is related to their use: water supply, landscaping, irrigation, fish farming, recreation.

In terms of water volume, 16 reservoirs contain more than 50 million m^3 of water each, including Vileika 260 million m^3, Lukomsk 243 million m^3, Zaslavsk 109 million m^3 and Osveisky 104 million m^3.

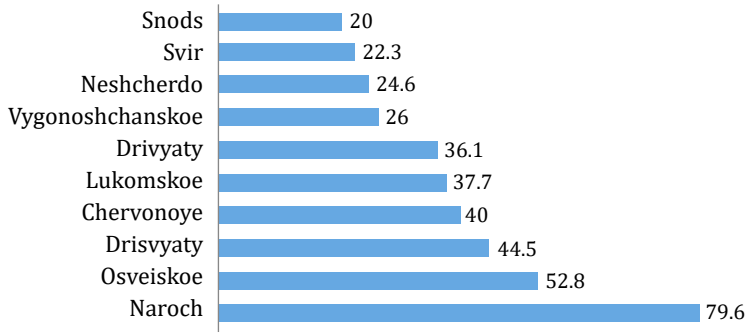
Characteristics of the largest water reservoirs in Belarus

Name	Area, km^2	Volume, million m^3	Depth, m	River, district	Type
Vileika	63.8	238	13	Viliya	In-stream
Zaslavsky	26.9	103	8	Svisloch	In-stream
Krasnoslobodsk	23.6	69.5	5.5	Moroch	In-stream
Soligorsk	23.1	55.9	4.5	Sluch	In-stream
Lubanskae	22.5	39.5	6.3	Oressa	In-stream
Chigirinskoye	21.2	60	9.1	Drut	In-stream
Selets	20.7	56.3	5.4	Yaselda	In-stream
Pogost	16.2	54.5	6.0	Pinsk	Lake
Loktyshi	15.9	50.2	4.9	Lan	In-stream
Svetlogorskoye	14.1	60	5.1	Svetlogorsk	In-stream
Zelvenskoye	11.9	28	7.5	Zelvyanka	In-stream
Osipovichi	11.9	17.5	8.5	Svisloch	In-stream

Lakes groups

A distinctive feature of Belarus is the large number of lakes different in area, depth and origin, so it is characterized by high lakes. There are about 10,780 lakes in the country. The total volume of water mass of all lakes in the country is about 7 km^3, and the total area of their water surface is about 1.6 thousand km^2.

The area of lakes in Belarus, km sq.



The area of lakes in Belarus varies from 0.01 km^2 to 79.6 km^2. Small lakes prevail. The share of lakes with the area of less than 1 km2 is about 90%, the share of lakes from 1 to 5 km^2 is about 9% and only 470 lakes have the area over 5 km^2.

The largest lake in terms of its water surface area is Lake Naroch (79.6 km^2), another 5 lakes (including the boundary lake Drisviaty) have an area of over 30 km^2. Only 22 lakes in Belarus have an area of more than 10 km^2.

An important indicator for determining water resources is the volume of water in lakes, which varies from 0.0001 to 710 million m^3. Lakes with the volume of water less than 10 million m^3 prevail in Belarus - 86%, and only 1% of lakes have more than 100 million m^3. The biggest volume of water is in the lake Naroch - 710 million m3, then follow the lakes Lukomskoje 249 million m^3 , Drivyaty 224 million m^3 and Ritchi 132 million m^3.

Lakes are also differentiated by their depth, which includes two indicators: maximum depth and average depth. Maximum depth of lakes in Belarus varies from 0.3 to 53.6 m. About 40% of lakes have the maximum depth not exceeding 5 m, and 11% - more than 20 m. The deepest lake is Dolgoe (Glubokskiy region) with the depth of 53.6 m; more than 50 m is the depth of Lake Richi. More than 80 lakes have a depth of more than 20 m.

Lakes are unevenly distributed over the territory of Belarus, so the lake area varies from 0.01 to 12%. Within the Poozero lakes, the average lake index is about 2.3%, and within the lake groups it is up to 12%. In the central areas of Belarus lakes are about 1%, and within the Belarusian Polessye 0.2%, despite a large number of oxbow lakes and presence of large residual lakes. In some places the lakes are located in groups.

Braslav group of lakes is located in the Braslav district, in the basin of the river Drujka and includes 31 lakes with a total area of 113.2 km^2. The total volume of water is more than 540 million m^3.
The depth of the lakes varies from 6 to 40 m. The largest lakes are: Drivyaty, Snudy, Strousto, Nedrovo, etc. The area of the drainage basin is 808 km^2.
The lake area is about 12%.

The Naroch group of lakes is located in the Myadel region, in the basin of the Naroch river and includes lakes Naroch, Myastro, Batorino and Blednoe, with a total area of about 100 km^2. The volume of water is more than 800 million m^3. The depth of the lakes is from 4 to 24,8 m. The area of the drainage basin is 279 km^2 and the lake area is about 10%.

Ushachskaya group of lakes is located in Ushachsky district, in the basin of the rivers Turovlyanka and Diva. It includes more than 60 lakes with a total area of 75 km^2 and water volume of more than 350 million m^3. The depth of the lakes is from 6 m to 26 m. The largest lakes are Cherstvyaty, Krivoye, Paulskoe, Otolovo, Yanovo, Gomel, etc. The area of the drainage basin is 803 km^2 and the lake area is up to 10%.

Obsternovskaya group of lakes is located on the border of Braslav and Miorsky districts, in the basin of the rivers Kharabrovka and Vyata. It includes 13 lakes with the total area of 32 km^2 and volume of water 140 million m^3. The depth of the lakes is up to 25 m.
The largest lakes of the group: Obsterno, Uklya, Nobisto, etc. Lakes of the group are 8%.

3. Water availability

3.1. General characteristics of water resources availability

The main challenge of water security is finding a balance between economic needs and environmental considerations with respect to water use. Globally, the most important challenges include the scarcity of freshwater relative to available and projected demand and the unsustainable use of water for irrigation purposes in the agricultural sector. In addition, many regions, including the EU, due to the high concentration of industrial activities, are facing the need to reduce the negative impact of industrial wastewater discharges on the environment. Belarus has a high level of specific water availability compared to the global average and less intensive industrial activities compared to the EU. The biggest challenge for the country is to increase the efficiency of water use by end-users, especially households and water-intensive industries such as food production.

In Belarus the share of water consumption for agricultural purposes (36%) is lower than the world average (69%), but higher than the European average (25%), while the share of water consumption for industrial purposes (25%) is higher than the world average (19%), but more than twice as low as in Europe (54%). Households are the main water consumers in Belarus (39%), significantly higher than the European and the global averages (21% and 12%, respectively).

Households are the main consumers of water in Belarus, surpassing industry and agriculture, in the structure of water consumption of which the main volume of fresh water is used for the needs of the fish pond industry. Water consumption by fishery ponds is several times higher than water consumption by other agricultural sub-sectors of the country.

Water availability in the country (by average annual total river runoff) is 6.1 thousand cubic meters of water per capita per year and is at the level of the average European value.
This is significantly higher than in some neighboring countries (Poland and Ukraine).

However, administrative regions of Belarus and districts differ significantly in the level of water resources availability. Population and economy of the country are concentrated in Minsk region, the central region of the country. However, surface water availability in this region (on average 7,6 km^3 /year) is lower than in the neighboring regions, especially in comparison with the eastern regions: Mogilev region (14,6 km^3 /year), Vitebsk region (18,1 km^3 /year) and Gomel region (31,5 km^3 /year). However, by the level of ground water availability in general Minsk region is the leader (10 700 m^3/day), as well as Vitebsk region (10 260 m^3/day). Explored groundwater reserves in other regions are much smaller.

3.2. Main indicators of the water flow account

The water flow account describes flows that reflect water withdrawals from the environment, the use of water in economic activities, and the return of water to the environment.

Water withdrawal from the environment includes water withdrawn from surface water bodies and extracted from underground water bodies, including estimated data on water extracted by households living in apartments (houses) not equipped with plumbing.

Account of water resources flows, million cubic meters

	2017	2018	2019	2020	2021
Water withdrawal from the	1 417.2	1 407.7	1 364.8	1 333.7	1 428.8
Including:					
Surface water bodies	586.2	581.1	555.9	529.4	612.1
Underground water bodies	831.1	826.7	808.9	804.3	816.7
Water for distribution and use	1 266.5	1 264.8	1 222.5	1 194.3	1 283.4
Wastewater in treatment plants	685	684.1	681	671.8	684.8
Return flows of water to the environment	1 096.3	1 064.8	1 040.8	1 027.3	1 084.0
Including:					
To inland waters	10 753	1 045.8	1 020.0	1 007.0	1 064.3
Including:					
Surface water bodies	912.3	897.3	881.1	869.1	921.2
Underground water bodies	163	148.5	138.9	137.9	143.1
Evaporated withdrawn water, transpiration and water remaining in the products	321	342.9	324	306.4	344.8

Water for distribution and use, i.e. water directly involved in the economic activity of the country, is the volume of water withdrawn from the environment, minus losses and unaccounted expenses, as well as water extracted not for use (for example, mining water).

Wastewater in treatment plants represents the volume of wastewater passed through the treatment plant, treated using soil treatment methods and other in-situ treatment methods. Return flows of water to the environment reflect the volume of both used and unused water returned to the environment, as well as its losses and unaccounted expenses.

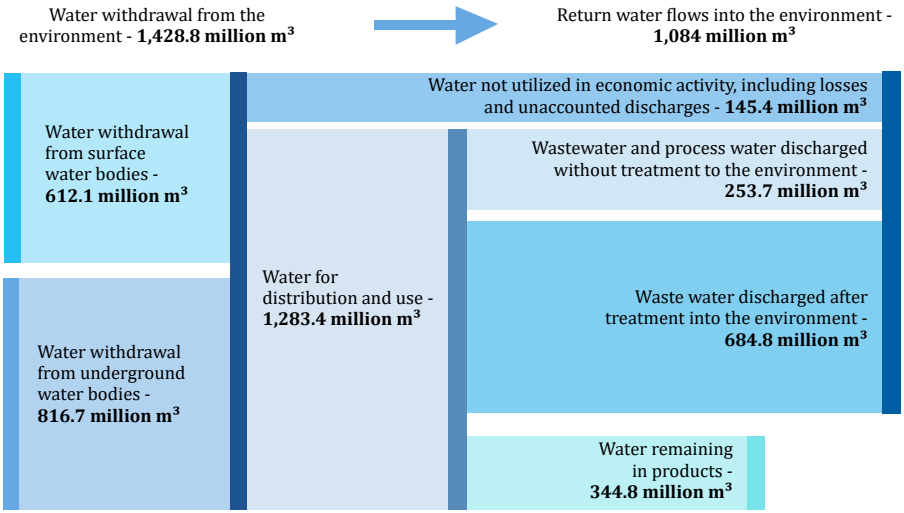
The volume of evaporated withdrawn water, transpiration and water remaining in the products represents the difference between the volume of water withdrawn from the environment and the return flows of water into the environment.

Between 2017 and 2021, withdrawals from the environment increased by 0.82%. At the same time, there is a 1.73% decrease in withdrawals from groundwater sources and a 4.42% increase in withdrawals from surface bodies. Percentage of distribution and use of the withdrawn water remains at the level of 89-90%. The volume of wastewater in the treatment facilities remains at the level of 53-54% of water distributed and used in economic activities. At the same time return water flows into the environment is 75-77% of the water intake.

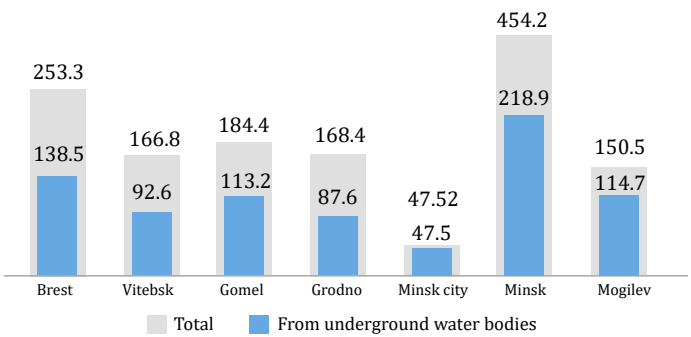
Agriculture, forestry and fisheries (31.29%); manufacturing industry (16.27%); electricity, gas, steam, hot water and conditioned air supply (8.40%) account for the largest volume of water withdrawn for distribution and use.

Water supply, waste collection, treatment and disposal (73.15%); manufacturing industry (14.63%); supply of electricity, gas, steam, hot water and conditioned air (9.62%) account for the largest volume of wastewater in the treatment plants.

Visually, water use in the republic looks as follows.



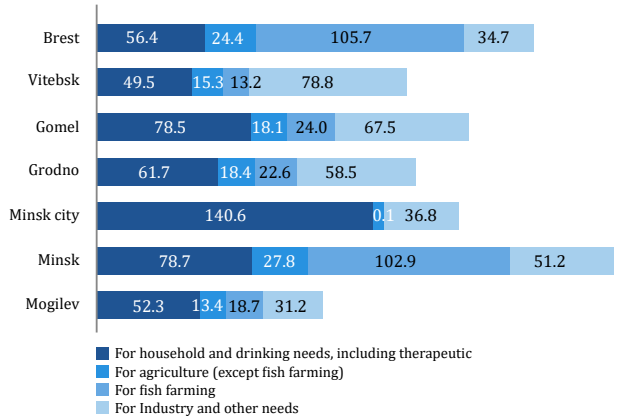
Water extraction (removal) from natural sources by region and the city of Minsk in 2021
(million cubic meters)



The largest volume of water extraction from natural sources is in Minsk region (about 32% of total extraction). In Brest region - about 18%, in Gomel region - about 13%. In Minsk city about 3% is extracted, but almost entirely from underground water bodies.

The structure of water consumption varies by region. Thus, in Minsk city, Gomel, Grodno and Mogilev regions most of the water is used for domestic and drinking needs, in Brest and Minsk regions - for the needs of fish farming, in Vitebsk region - for the needs of industry.

Water use by regions and the city of Minsk in 2021
(million cubic meters)



3.3. Engineering infrastructure

The capacity of the centralized water supply systems of the republic is greatly exceeded and amounts to 4.3 million m^3 of water per day, while on average only 1.6 million m^3 of water per day is provided, i.e., slightly more than 1/3 of the capacity installed is used. The system consists of 10,197 artesian wells, 598 deferrization stations and 38,200 km of water pipelines and water supply networks. The level of physical deterioration of most of the water supply system (42-43%) often leads to deterioration of tap water quality.

Despite the use of centralized water supply and sanitation systems of excessive capacity in the country as a whole, the population of many small rural settlements does not have access to centralized drinking water supply systems.

3.4. Efficiency and rate of water extraction (use)

The efficiency of water extraction (use) is calculated as the ratio of the economic result (e.g., gross domestic product, gross value added) to the volume of water resources involved in economic activities (e.g., the amount of water extraction from the environment).

Efficiency of withdrawal (use) of water resources

	2017	2018	2019	2020	2021
Republic of Belarus	59.3	61.6	64.5	65.7	62.6
including:					
agriculture, forestry and fishing	15.8	15.9	18.5	19.4	17.1
mining industry	19.9	16.3	18.7	20.2	20.9
manufacturing industry	108.3	114.4	110.3	109.7	111.7
supply of electricity, gas, steam, hot water and conditioned air	17.6	19.5	20.1	23.1	23.8
water supply; collection, treatment and disposal of waste, activities of elimination of pollution	1.3	1.3	1.3	1.3	1.2
construction	355.4	458.2	480.5	279.3	326.5
services sector	1 502.6	1 691.1	1 750.4	1 876.3	1 933.4

Positive dynamics of indicators reflects the growth of the efficiency of water extraction (use) over time and indicates a weakening of the correlation between economic growth and water consumption, although it does not always indicate a reduction in total water consumption or a reduction of the negative effects of water use.

The highest efficiency in the use of water resources is observed in services, construction and manufacturing industry, the lowest - in water supply, waste collection, treatment and disposal; agriculture, forestry and fishing, as well as in the supply of electricity, gas, steam, hot water and conditioned air.

The intensity of freshwater extraction (use) is characterized by the index of water resources exploitation, as well as water consumption per capita.

Intensity of withdrawal (use) of water resources

	2017	2018	2019	2020	2021
Renewable fresh water resources (total river runoff), cubic km	60.4	55.0	37.3	38.1	49.8
Renewable fresh water resources (total river runoff) per capita, thousand liters per day	17.5	16.0	10.8	11.1	14.7
Water resources exploitation index (annual runoff), per cent	2.3	2.6	3.7	3.5	2.9
Water withdrawal from the environment per capita per day	410.5	408.6	396.9	389.5	420.8

The index of exploitation of water resources is calculated as the percentage ratio of the value of water withdrawal from the environment to the value of renewable fresh water resources. In turn, renewable fresh water resources include water flows formed on the territory of the country and coming from the territory of neighboring states, cumulatively representing the total river flow.

The value of the water resources exploitation index is interpreted as follows:
- less than 10% - water stress is weak, available water supply is not seriously stressed;
- 10-20% - water stress is moderate;
- 20-40% - medium-high water stress
- above 40% - acute water stress characterized by depleting water consumption.

In other words, a high level of water stress reflects water scarcity. According to the data in Belarus, water stress is weak, which means that there is no water deficit.

4. Water market review

4.1. Main World Trends

Water is a renewable resource. It is estimated that about 25% of the available renewable fresh water resources are now used. If the present average per capita consumption will proceed, by 2050 use of world fresh water reserves only due to population growth will reach 70 % and more. So, for last 80 years the total consumption of fresh water has increased in 10 times at increase of the population in 2,5 times. At the same time only 35 km^3 of fresh water is available, which is 2.5% of all water sources in the world. Fresh water suitable for domestic and potable consumption is 0.1% of the total water balance of the planet.

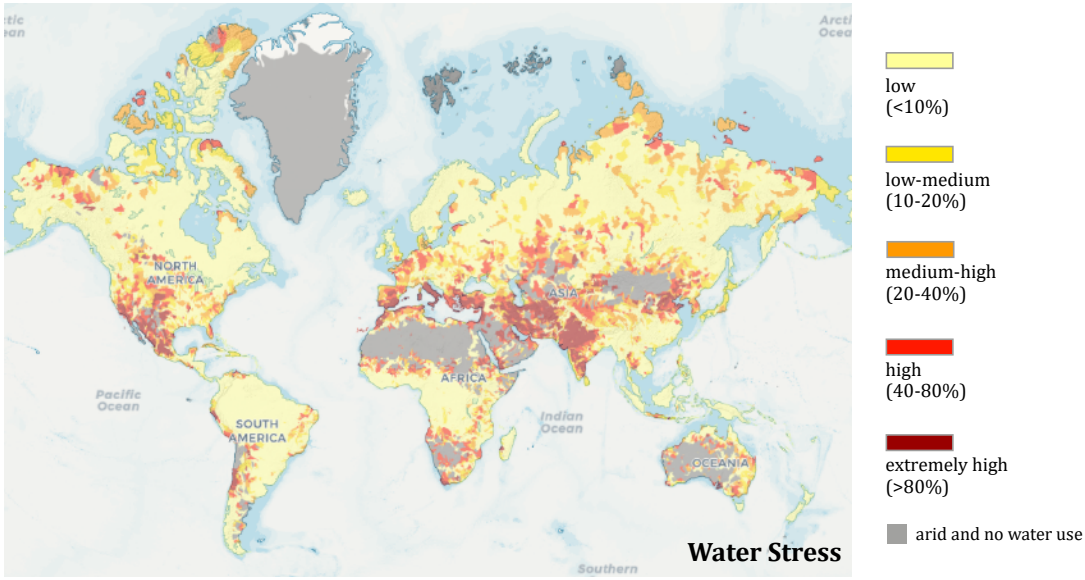
The structure of the world's fresh water resources is as follows: snow and glacial covers (Arctic, Antarctic, Greenland) - 69%; ground and underground water available for extraction - 30%; rivers, lakes, reservoirs - 0.5%. At least 65-70% of all atmospheric precipitation returns to the atmosphere and falls again. Every year about 2100-2500 km^3 are replenished. However, the total amount of precipitation is not evenly distributed. In the percentage ratio ocean and sea surface accounts for 79%, land surface - 19%; rivers, lakes, reservoirs - 0,5%.

Taking into account the size of territories and their hydrological characteristics, the regions of the planet differ significantly in terms of water resources (%): Latin America - 30-32; Asia - 25; Organization for Economic Cooperation and Development (OECD) countries - 20; Sub-Saharan Africa and former Soviet Union countries - 10 each; Middle East and North America - 16 each. The most supplied with water resources (km^3): Brazil - 8,233, Russia - 4,508, USA - 3,051, Canada - 2,902, Indonesia - 2,838, China - 2,830, Colombia - 2,132, Peru - 1,913, India - 1,880, Congo - 1,283, Venezuela - 1,233, Bangladesh - 1,211, Myanmar - 1,046. The states adjacent to the Sahara Desert, all of North Africa, the center of Australia, South Africa, the Arabian Peninsula, Central Asia, and Mexico experience a significant deficit of fresh water. The following states practically lack their own water resources (m^3/person): Kuwait, 11; Egypt, 43; United Arab Emirates, 64; Moldova, 225; Turkmenistan, 232.

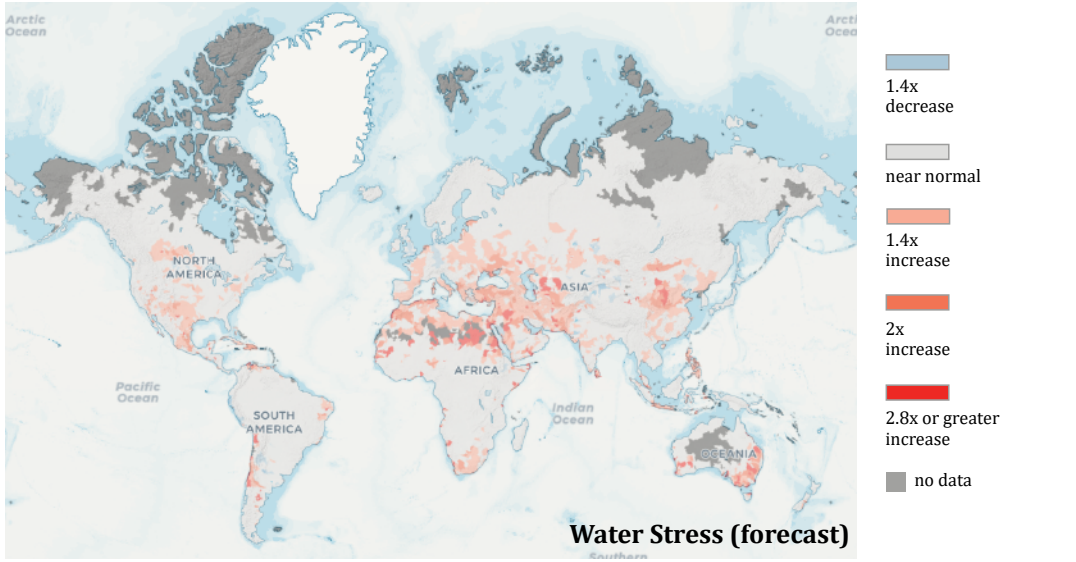
The volume of water used for personal consumption depends on the region and the standard of living in the country. Over the last 10 years it ranged from 20 to 500 liters per day per person. A significant volume of water also goes to supply people with food. 2.5-3 thousand m^3 of water is consumed daily per one person with a traditional diet of industrialized countries.

Such tendencies lead to water deficit - water stress. As a result, cost of water resources increases from year to year. According to the standards calculated by UNESCO, it is considered critical to use more than 10% of annual fresh water reserves. Now intensity of water resources use in a number of countries has irreparably exceeded the threshold values (%) established by the world community: Egypt, 97; Israel, 84; Germany, 27; USA, 19.

Water stress in the world context is given below.

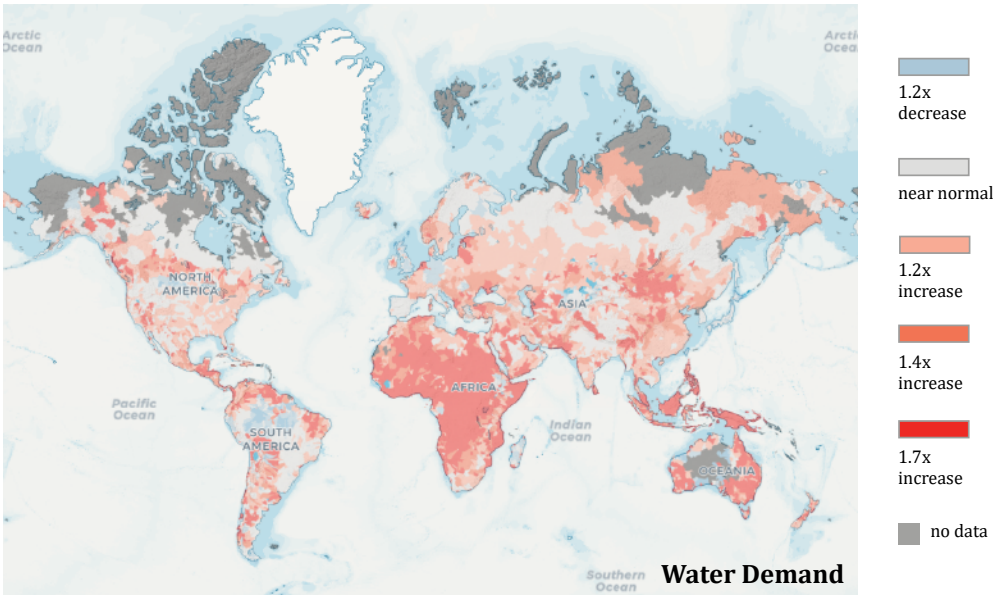


According to optimistic projections, the change in water stress levels by 2040 will be as follows.



Water stress will increase by 1.5-3 times in Southern and Northern Africa, Southern and Western Europe, Front, Central, part of Eastern, Southern and Southeastern Asia.

This situation also determines the demand for water (calculated on the basis of water withdrawal / water demand).



The overall demand for water will increase by 1.2-1.7 times. The exception will be the countries which are the most supplied with water resources.

The growth of demand is explained by the fact that the main water consumption is in agriculture, energy, industrial production and municipal water consumption. More than 70% of them are taken by agriculture. This means that the more food is produced, the higher the water consumption. This is especially true for those countries that use hydroponics - Israel, countries of the Arabian Peninsula, and South Africa. High volumes of future water consumption are a function of future food production. This idea is laid in the concept of virtual water - water that went to create a finished product (for example, a cup of coffee is 140 liters of water, a hamburger is 2600 liters of water).

Energy is impossible without water, since water is the main coolant and driving force (hydropower). The extraction of mineral and raw energy resources also requires significant volumes of both groundwater and surface water. Moreover, the energy industry generates large quantities of water unfit for use (e.g., mine water).

Manufacturing is an active consumer of natural water. The largest volume is consumed by the steel, chemical, petrochemical, pulp and paper, and food industries.

Consumption in the municipal sector depends on the level of urbanization and the number of total urban population. More than half of the population lives in urban agglomerations, where utility systems are mostly overloaded and about 20% of city dwellers do not have access to quality water. The resulting estimate of the average annual consumption of water by residents of agglomerations is 292 tons of water per person in a year, of which water consumption is 0.5 tons of water per person per day; the volume of sewage is 0.3 tons of water per person a day.

As a result, quality drinking water is a commodity. In the structure of the price of goods in agriculture, energy, industrial production and public utilities, water occupies a significant volume. For example, in 2013 Israel was buying Turkish water at $0.7 per cubic meter; at the beginning of 2022, the purchase price was $0.92 per cubic meter.

In 2022, the profits of companies that sell drinking water were about $2 trillion/year. The global bottled water market is expected to reach $403.5 billion by 2026, growing at a compound annual growth rate of 14.1%.

The global drinking water market is controlled by 10 major corporations. The largest of them are: Vivendi Universal (Veolia Environnement), Suez (Suez Environnement), Saur Group, Thames Water (RWE), Bechtel-United Utilities.

World leaders Vivendi Universal and Suez Environnement deliver drinking water to water to more than 200 million customers in 150 countries. For example, Veolia Water provides water and wastewater treatment to homes and businesses. The company has more than 103 million people on its balance sheet for drinking water supply alone and 70 million people for wastewater treatment from estimated discharges. The company's turnover is over 12.6 billion euros. Veolia Water is present in the markets of 69 countries.

A promising market for sales of natural drinking water is tanker, pipeline and hydroelectric supplies. This market is still in its formative stages. The most popular sales scheme is the sale of water services. The sale of water can take place within the context of shared use of transboundary water resources. For example, reservoirs and hydraulic structures are located in one country, while the main user and payer of water resources is another country. Today, Turkey is the leader in tanker supplies of drinking water. The main buyers are: Israel, France, South Cyprus.

Examples of direct interstate sales of unbottled water not encouraged by the UN and its committees are states in the arid climate zone:

1. Iran and Kuwait entered into an agreement to supply water through a 540-kilometer pipeline from Iran's Karun River to Kuwait. The deal is for thirty years to supply river water in the volume of 90 million m^3/year. The cost of the contract is $2 billion

2. In 2013 Turkey began construction of a water pipeline that will connect the country with Northern Cyprus. The cost of the project is $484 million.

3. Israel and Turkey signed a 20-year contract in 2002 to supply river water from Manavgat River in Turkey to Israel. It provides 50 million m^3/year of water for $35 million.

4. Turkey and Jordan concluded an agreement-project "Disi Amman Water Conveyance". It is designed to supply 0.27 million m^3/day. Project cost is $950 million.

One of the striking examples of domestic water supply projects is the project of water transfer from the Yangtze River to northern regions of China in the volume of 250 km^3/year to meet the water needs of the developing economy and population. To date, the central beam is nearly complete, and the other two beams, the eastern and western, are scheduled to be operational in 2030.

4.2. Belarus' external water trade

Export and import of water (without sugar and sweeteners) is carried out under HS codes 220110 Mineral and aerated water and 220190 Other waters, including natural or artificial mineral waters.

The export of mineral and carbonated water accounts for an average of 82% of waters, while other waters account for 18%. Russia, Latvia, Lithuania and Ukraine account for the main exports (an average of 98% of total water exports). Between 2017 and 2021, just over $30 million worth of water was exported. In 2021, $7.3 million worth of water was exported (in 2017, $4.4 million).

The entire range of countries by water exports (in thousands of U.S. dollars) is shown in the table below.

Export of water

Top 5 countries in 2021, thousand dollars

Trade partner	2021	Share of the country in total water exports
Russia	4007.9	55.0%
Latvia	1250.7	17.2%
Ukraine	1148.9	15.8%
Lithuania	773.0	10.6%
Estonia	19.9	0.3%

Imports of mineral and sparkling waters account for an average of 73.5% of waters, while other waters account for 26.5%. The main imports - an average of 93% of the total imports of waters - account for Russia and Georgia, and taking into account France, Italy and Ukraine - 99%. Between 2017 and 2021, just under $89 million worth of water was imported. In 2021, $19.7 million worth of water was imported ($13 million in 2017).

Imports by trading partner country in thousands of dollars are shown in the table below.

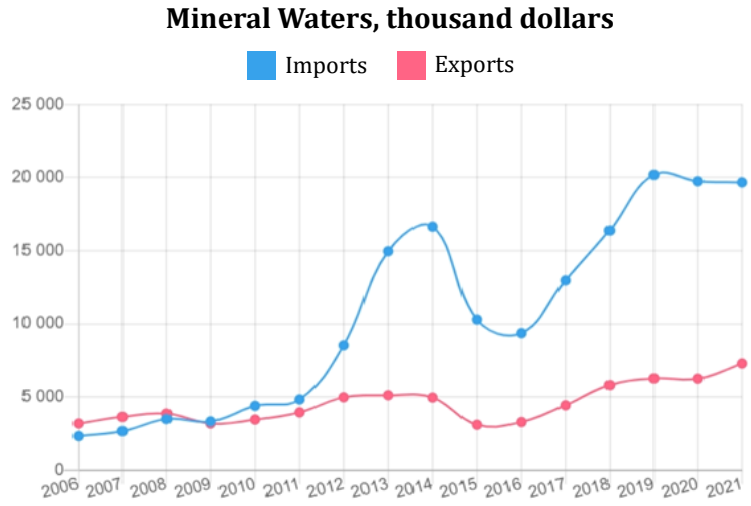
Import of water

Top 5 countries in 2021, thousand dollars

Trade partner	2021	Share of the country in total water imports
Georgia	9 441.4	48.0%
Russia	8 981.2	45.7%
France	628.7	3.2%
Italy	290.1	1.5%
Ukraine	180.4	0.9%

In general, import of water under HS code 2201 "Mineral waters" exceeds export 3 times on average. This trend became evident in 2011.

Thus, Belarus has quite a significant potential for import substitution of mineral water.



4.3. Key producers of mineral and drinking water in Belarus

In Belarus, about 40 producers are engaged in the production of waters.

The main producers are: UE "Darida", RUE "Minsk Crystal", OJSC "Gomel Distillery", JLLC "AquaTriple", JLLC "Malinovskiy Distillery "Akvadiv", OJSC "Vitebsk Distillery "Pridvinje", CJSC "Minsk Soft Drinks Plant", UE "Coca-Cola Beverages Belarus", JV LLC "Frost and K".

As a rule, these are food industry enterprises that produce alcoholic and non-alcoholic beverages.

5. Investment potential and "water opportunities"

5.1. Investments and investment attractiveness of the industry

Hydropower
In Belarus there are opportunities to use the potential of water resources more effectively at different levels. In 2016-2020 RUE CRICUWR conducted a large-scale study to re-estimate the hydropower potential of medium and small rivers in Belarus, which are promising for the location of hydropower plants. The studies were conducted on the basins of the Western Dvina, Dnieper, Pripyat, Neman, and Western Bug rivers. As a result, 1170 promising sites for the deployment of facilities on 267 medium and small rivers of Belarus have been identified.

The study showed that the estimated hydropower potential of medium and small rivers is a total of 294.3 MW. Taking into account already placed and planned HPPs on large rivers (Neman, Western Dvina and Dnieper) the potential of all rivers of Belarus is 441 MW. The most promising areas for the creation of hydroelectric power plants are the basin of the Western Dvina, the upper Dnieper basin and the lower Neman basin. These areas are characterized by favorable topography and good water availability.

Water transport.
Another possibility of efficient use of water resources is the development of internal water transport, as well as lake and river tourism and recreation. This fact is well illustrated by the viability of existing canals in Belarus, which are used both for industrial purposes and for tourism and recreation.

Vitebsk hydroelectric power

Bottled water
Belarus possesses considerable underground water reserves of ecologically pure waters. By the ionic content and mineral composition, the Belarusian waters are subdivided into several classes: bicarbonate, sulfate, chloride, complex composition. Some waters contain biologically active components increasing their value: hydrogen sulfide, iron, bromine, iodine, fluorine. Waters with increased content of iron, hydrogen sulfide, sodium hydrogen carbonate, silicon and other useful elements in terms of mineralization could become attractive for the development of domestic business in the future. There are four artesian basins with such water reserves: the Baltic, Orsha, Pripyat and Brest. However, they are used at 2-3%, mainly for domestic needs, despite the huge export potential.

Most of the deposits are prepared for development: 408 deposits of fresh water and 246 of mineral water. This is about 15% of the potential reserves. There are 262 exploited fresh groundwater fields and 136 mineral water fields. Fresh waters are mostly intensively used in Gomel, Mogilev and Minsk Regions. Mineral waters are in Minsk and Vitebsk regions. The greatest variety of ground waters is observed in Brest and Gomel regions.

It is economically profitable to develop the springs located closer to the ground surface. Where there are springs, wells are drilled or there may be deposits, there is often no infrastructure. If there is one, the chance of developing the deposit increases significantly. Regional surveys are financed from the budget, and specific exploration work is performed at the request of a potential investor and at his expense.

Porechye health resort

Recreation, sports and tourism
Belarusian mineral waters have therapeutic properties. This can be used in tourism - building a treatment / health center next to the mineral water source.
A striking example is the Porechye Sanatorium - it stands on the same water horizon as Druskininkai.

5.2. Export potential of the industry and prospects of industry development

Bottling of water

Water refers to the industry of non-alcoholic beverages. The capacity of the water market grows globally and makes about 250 billion dollars. The leaders in consumption are the USA, China, Western European and Latin American countries. The European market is geographically close to Belarus. In Europe, the export price of water from environmentally friendly sources reaches $800 per ton. The export price of a ton of water from Belarus averages $300-350, and the price of depreciated water reaches $900-1000.

If the delivery distance is more than 400 kilometers, the price for the consumer rises by 30%. In the structure of the cost of a bottle of water, the cost of water in it is about 1%. About 7-9% are expenses related to bottling, consumer and transport packaging. The remaining costs are certification, logistics, transport and marketing. It should be noted that the production of non-alcoholic beverages in the country is low-margin, on average from -2 to +3% of profitability.

At the moment Belarus produces about 40 liters of bottled water per person. Overall, the capacity of the Belarusian market is about 0.4 million cubic meters per year in terms of fresh water bottling and 0.14 million cubic meters in terms of mineral water bottling. 80% of the market is occupied by domestic producers (Darida, Minskaya, Frost), the rest is occupied by imported producers. The latter, as a rule, sell their products through retail.

A promising niche is the extraction and bottling of ultrapresse waters. They have lower mineralization (up to 100 mg/l) than drinking water (3 times). Such waters are found only in some areas of Polesie (between the rivers Stviga and Uborti, Slucha and Pticha, Tsna and Lani). In the whole area of distribution ultrapresse waters are used for the needs of domestic and drinking water supply and are exploited by means of mine wells and artesian wells. Such sites are established within Lelchitsy and Zhitkovichi districts of Gomel region, Luninets district of Brest region and some others.

Ultrapresse water is a valuable natural resource. It is actively used for bottling all over the world (in Finland, Germany, Italy, France, Great Britain). The most famous springs are the spa waters of Spa Reine in Belgium. Belgian "Spa Reine" is one of the famous brands of bottled ultrapresse drinking water. Another famous brand is the Norwegian water "Voss".

In terms of both salinity and the content of the main components of the chemical composition and pH value, the waters of European countries are similar to our ultrapresse waters. The lowest mineralization, which was found in the Belarusian ultrapresse waters is 15 mg/l. Such water is ideal for baby food, as infant formula already contains a set of components necessary for an infant, so water with high mineralization in this case, it is desirable not to use.

For this reason, ultrapresse water is in particular demand on the world market. And the price of such a product is high. However, research of such water reserves and its chemical composition is necessary.

Now ultra-fresh water is imported to Belarus from abroad. Development of our own deposits requires investments, including research of water reserves. According to preliminary estimates it is millions of tons of ultrapresse water. Moreover, ultrapresse water is a renewable resource.

River navigation

The total length of waterways in Belarus suitable for navigation is about 2135 km. However, the share of water transport in the total volume of cargo turnover of the country is less than 1%, while in the EU countries water transport takes from 10 to 40%. Moreover, under Decree No. 133 of February 28, 2008 "On the accession of the Republic of Belarus to the European agreement on the most important inland waterways of international importance," Belarus must maintain the ability of ships with a draught of 2.5 meters for 60% of the navigation period on the international route E-40, which connects the Black Sea and Baltic Sea, which at present is not implemented. The restoration of this water transport connection increases the transit attractiveness of this route, connecting Belarus, Ukraine and Poland. The route can become one of the main trade and tourist routes in Europe (over 2,000 km long). However, there are pitfalls here - part of the route passes through the Chernobyl NPP exclusion zone (70 km), through the territories of specially protected areas, natural and archaeological monuments.

Hydropower and thermal power
Belarus has a number of hydroelectric power plants (HPPs) on the Neman and Western Dvina rivers. The estimated hydropower potential is 294.3 MW, including for the Dnieper basin - 124.1 MW, Western Dvina - 71.1 MW, Neman - 53.6 MW, Pripyat - 41.1 MW, Western Bug - 4.4 MW. However, since 90% of the water flow consists of small rivers, the development of small hydropower has become a promising direction. Belarus is an innovator in the construction of small hydropower plants. For example, only Minsk has a cascade of 5 small HPPs, working in automatic mode.

Separately, it is worth noting that in 2017 the first private mini hydropower plant was built. It was located on the river Issa on the site of an inactive hydraulic structure, formerly owned by the Slonim cardboard and paper plant Albertin. The capacity of this HPP is 200 kW. A little over $415 thousand was spent on its construction. Now the mini hydroelectric power plant provides power to 25 houses in the Albertyn neighborhood of the town of Slonim. The experience of the similar installations in the neighboring countries has been taken into account. The experience of the similar plants in the neighboring countries shows that such projects pay for themselves in 5-6 years and their service life is 40-50 years.

Another promising direction is the use of underground heat of deep-water sources by means of modern heat pump installations. As the practice of EU countries shows, the use of water with a temperature of 7-10 ºC is sufficient for heating low-power consumers (for example, such as the private sector). At present, the total capacity of such geothermal installations exceeds 4 MW. At the moment there are several points on the ground surface in the country, which are close to the underground sources of hot water (in Brest and Gomel regions the depth is up to 1.5 km). About 200 heat pumps are already installed and used in the country.

Assistance in the development of hydropower projects (in general, any energy projects) is provided by the Association "Renewable Energy". For reference: installed capacity of renewable energy sources (RES) in Belarus has increased five times for the last 9 years - from 120 MW to 608 MW by the end of 2022. The volume of RES electricity generation increased from 274 to 1275 million kWh.

Use of surface water bodies for recreation, sports and tourism

Surface water bodies shall be used for recreation, sports and tourism. Such objects are indicated in the Water Cadastre and determined by decisions of local executive and administrative bodies. At present, the most perspective direction is therapeutic and recreational. The potential of water areas of rivers is used insignificantly. The priority is given to lakes, around which there is no developed infrastructure for recreation.
At the moment slightly more than 50 lakes are involved in the industry. However, given that there are 1.5 thousand lakes in the country, the recreational potential is huge. Another promising direction is fishing, including sport fishing.

6. Investment climate

General guarantees

Belarusian legislation provides the following basic guarantees to investors:

- the right of private property and its protection without discrimination
- protection against illegal actions of state bodies, which violate rights of investors and/or cause losses
- equality of rights for national and foreign investors
- free repatriation of profits
- protection of investments against nationalization and requisitioning

By law, nationalization can only be carried out on the basis of public necessity and subject to appropriate compensation. Compensation for nationalized property must be paid in a timely manner and include the value of the nationalized property and other losses caused by nationalization. The legislation also establishes a number of circumstances under which requisitioning is possible. These are mainly emergencies such as natural disasters, accidents, epidemics and epizootics, as well as when the public interest requires these measures.

Investment agreement

- VAT deduction in full amount
- exemption from import duties and taxes on import of technological equipment, raw materials and materials into the territory of the Republic of Belarus
- exemption from reimbursement of losses in forestry and agricultural production

Small and medium-size cities, rural territories

- exemption from income tax for 7 years
- exemption from real estate tax for 7 years
- exemption from import customs duties on imported (imported) goods contributed to the statutory fund, from the date of manufacture of which not more than 5 years have passed for some commodity items
- exemption from profit tax in the part of profit received from sale of goods of own production; exemption from income tax for 7 years

Bremino-Orsha

- 0% VAT and duty on customs
- 0% corporate tax for 9 years
- 0% property tax for 20 years
- 0% VAT for 15 years at realization, rent (leasing) to residents of real estate objects till 1 January 2033
- 0% income tax, tax on dividends and similar income for 5 years from the announcement of profits (for the founders of resident companies and joint ventures)
- 0% tax on dividends and similar income from the date of declaration of profits up to 1 January 2033 (for joint ventures if accrued from a management company)
- 5% on royalties until January 1, 2028

Industrial park "Great Stone"

- exemption from income tax on revenue from the sale of goods (works, services) of own production within ten years from the date of registration as residents
- exemption from property tax on properties
- exemption from tax on land plots
- until 1 January 2027, the income tax rate is 9%
- full deduction of VAT amounts charged for imported goods (works, services) as well as property rights used in designing, construction and equipping of buildings and structures in the Industrial Park
- exemption from customs duties and VAT on goods (production equipment, components and spare parts, materials and raw materials) imported to Belarus for the implementation of investment projects

Free economic zones (FEZ)

- exemption from profit tax when selling products for export and to other FEZ residents
- exemption from real estate tax on properties in FEZ within three years of registration
- exemption from land tax and land lease for the period of design and construction, but for no longer than 5 years from the date of registration. Exemption irrespective of the direction of their use (if sold for export or to other FEZ residents)
- exemption from payment for the right to conclude a land plot lease agreement

The choice of preferential treatment will depend on a number of factors and components of the investment project, such as the need to create infrastructure facilities, export orientation of the project, implementation of innovative technologies and many others.

More detailed information about the business environment, investment opportunities in the Republic of Belarus can be found on the website of the National Agency of Investment and Privatization of the Republic of Belarus at www.investinbelarus.by/en/business-environment, as well as to get necessary advice and assistance in implementation of the investment project in Belarus by contacting representatives of the Agency at the contacts specified on the website www.investinbelarus.by/en/contacts.

7. Investment projects for implementation in the Republic of Belarus

Investment projects and proposals for implementation in the industry:

1. Artesian well of mineral water.

Project location: the territory of industrial site No.2 of OJSC "Vityaz",
34 P. Brovki St., Vitebsk.
Total investment costs: 3.5 million euros.

Project description: the enterprise offers joint production of mineral water. There are wells of artesian water (104 m deep, debit well 120 m^3/h - put into operation in 2008) and mineral water (535 m deep, debit well 6 m^3/h, mineralization degree - 15 g/dm^3). Chemical composition of water corresponds to the best samples produced in the country. Areas - up to 19 000 m^2 are reserved for organization of production (need to be reconstructed). Expected forms of investments: joint production, lease, sale.

2. Artesian well of mineral water

Project location: territory of "VNN-Plus" Ltd, Belynichi, Mogilev region.
Total investment costs: 1.2 million euros.

Proposed production and bottling of mineral water at a well with a depth of 248 m, well debit 72 m^3/h. Water belongs to the category of medium mineralization. "VNN-Plus" LLC has vast production (800 m^2) and storehouse (1000 m^2) areas for organization of mineral water bottling manufacture, where the corresponding production line and finished product storage can be placed.

3. Construction and organization of operation of a health-improving complex "Zhivaya Voda" combined with a workshop for production and bottling of mineral and drinking water.

Project location: Klichevsky District, Mogilev Region, right bank of the Olsa River.
Total investment costs: 25 million dollars.

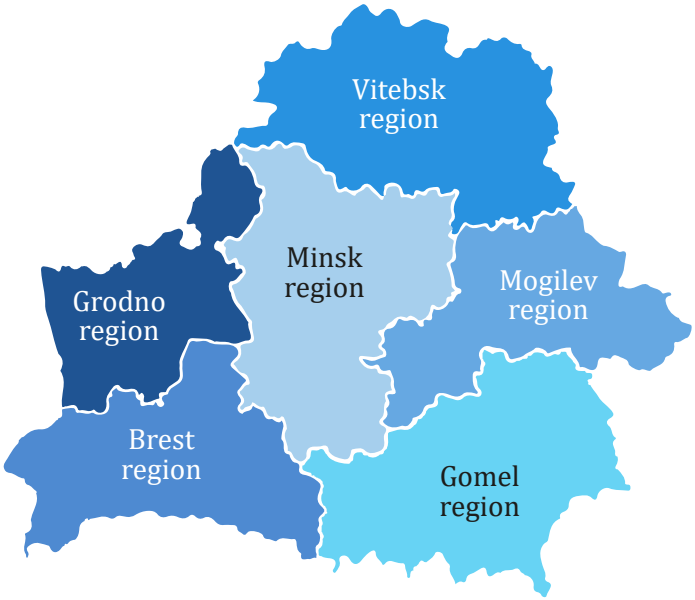
Concept of the project: medical and health complex "Zhivaya Voda" (land plot area - 35 hectares, located on the right bank of the river Olsa); sports and tourist complex "Zhivaya Voda" (land plot area - 25 hectares, located on the bank of the rowing channel); enterprise for water production (three wells with mineral and drinking water, including mineral water of low 4 (g/dm^3) and high mineralization (10 g/dm^3). The project also includes the construction of a solar power station - the electricity produced will be used for the needs of the complex with the sale of surplus electricity to the power supply company - an agricultural complex with an automated complex of greenhouses for the year-round cultivation of organic vegetables, herbs, mushrooms and berries.

4. A factory manufacturing and bottling plant for natural mineral and children's drinking water of the highest category.

Project location: Srednie Pechi village, Lelchitsy district, Gomel region.
Total investment costs: 1.7 million dollars.

The main aim of the project is to develop the deposit of ultrapresse and fresh drinking ground water with mineralization from 15 to 50 mg/l.

7.1 Investor Roadmap



Investment projects and PPP
>1000

Investment ideas
>700

Concessions
9

Manufacturing sites and real estate
>900

Land plots
>1000

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More investment projects and ideas, as well as land plots and real estate objects for the implementation of investment projects can be found on the interactive portal "Investor's Roadmap"

National Agency of Investment and Privatization

The Agency is a state institution that provides assistance at no cost or foreign investors interested in launching a business in Belarus:

- provision of information about investment opportunities, preferential regimes and benefits granted, economic sectors and legislation
- provision of up-to-date information about investment projects
- assistance in selection of sites and premises
- search for prospective partners for investment projects, arranging meetings and negotiations for establishing cooperation
- providing a platform for negotiations and support during negotiations
- organization of visits to the Republic of Belarus (schedule development, visa support)
- representation of investor's interests during negotiations with governmental representatives concerning implementation of investment projects, as well as improvement of investment climate in the Republic of Belarus
- aftercare

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