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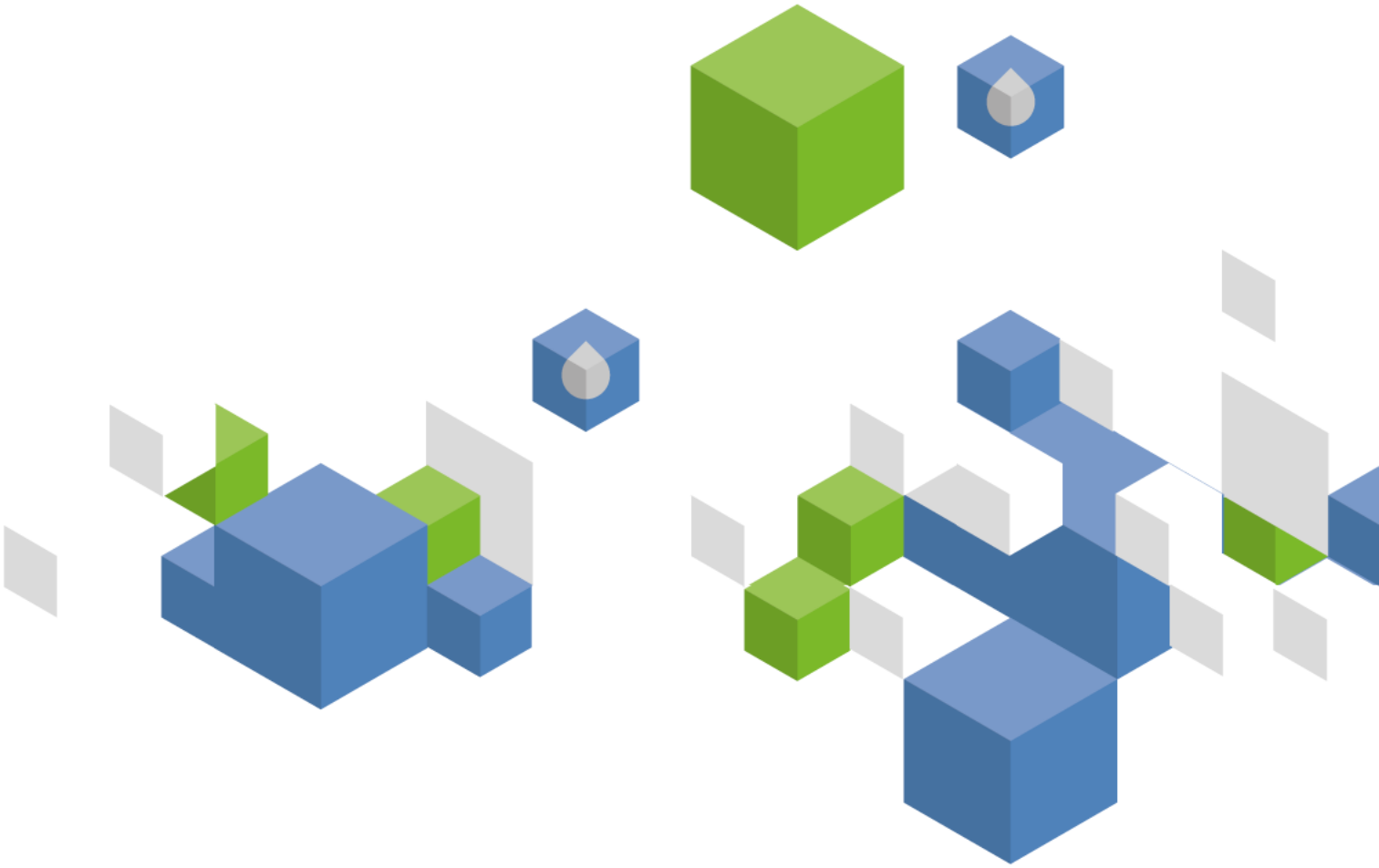

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Belarus

GEOGRAPHY, CLIMATE AND POPULATION

Geography

Belarus is a landlocked country in Eastern Europe with a total area of 207 600 km2. It is bordered in the northeast and east by the Russian Federation, in the southeast and south by Ukraine, in the southwest by Poland and in the northwest by Lithuania and Latvia. It declared its independence from the Soviet Union on 25 August 1991. For administrative purposes, the country is divided into six provinces (oblasts): Brest, Gomel, Grodno, Mogilev, Minsk, Vitebsk; and 1 municipality: Minsk City.

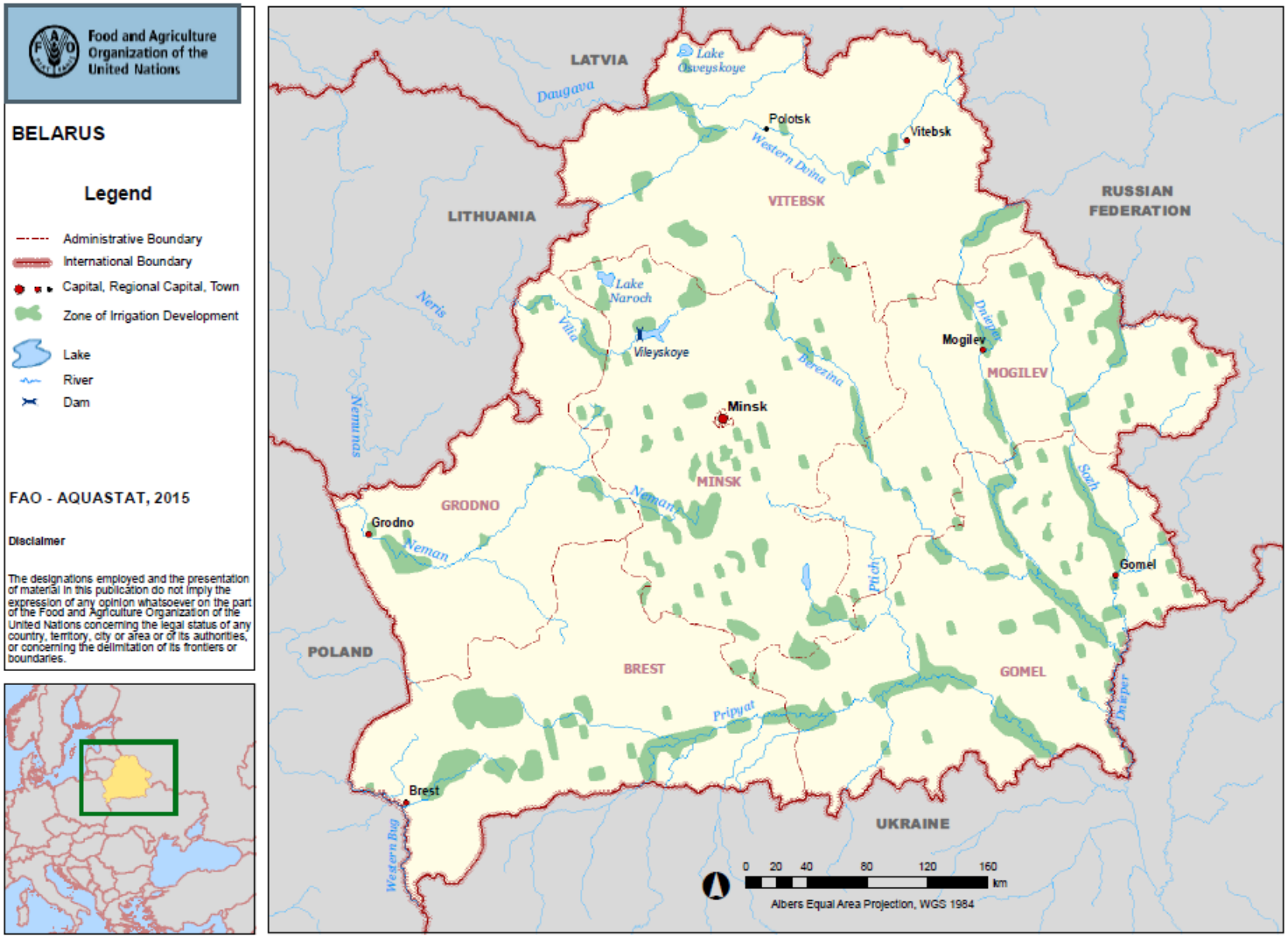
Belarus is part of the east European lowland, covered with young glacial formations, mainly gravel and sand. From the southwest to the northeast the moraine Belarus rampart, where several larger rivers originate, crosses the country. In the south is the vast, marshy land of Polesye. The peak of the highest hill is at 345 m above sea level.

The agricultural area, which is the sum of arable land, permanent crops and permanent meadows and pasture, is estimated at 8.7 million ha, which is 42 percent of the total area of the country. In 2013, the total physical cultivated area was estimated at 5.7 million ha, of which 98 percent (5.6 million ha) consisted of temporary crops and 2 percent (0.1 million ha) of permanent crops (Table 1).

TABLE 1
Basic statistics and population

Physical areas:			
Area of the country	2013	20 760 000	ha
Agricultural land (permanent meadows and pasture + cultivated land)	2013	8 726 000	ha
• As % of the total area of the country	2013	42	%
• Permanent meadows and pasture	2013	3 033 000	ha
• Cultivated area (arable land + area under permanent crops)	2013	5 693 000	ha
- As % of the total area of the country	2013	27	%
- Arable land (temp. crops + temp. fallow + temp. meadows)	2013	5 573 000	ha
- Area under permanent crops	2013	120 000	ha
Population:			
Total population	2015	9 496 000	inhabitants
- Of which rural	2015	25	%
Population density	2015	46	inhabitants/km^2
Economy and development:			
Gross Domestic Product (GDP) (current US$)	2014	76 139	million US$/year
• Value added in agriculture (% of GDP)	2014	9	%
• GDP per capita	2014	8 014	US$/year
Human Development Index (highest = 1)	2014	0.798	-
Gender Inequality Index (equality = 0, inequality = 1)	2014	0.151	-
Access to improved drinking water sources:			
Total population	2015	100	%
Urban population	2015	100	%
Rural population	2015	99	%

FIGURE 1
Map of Belarus



Climate

Belarus has a moderate continental climate, with cool humid winters and warm summers. The west of the country is characterized by the transitional climate between maritime and continental, the climate in the central and eastern parts is continental. Average temperatures vary across Belarus. The average annual midday temperature is 6°C, varying from -4.5°C to -8°C in January to 17°C to 18.5°C in July. Some parts of Belarus experience sub-zero temperatures for more than a third of the year. Belarus has an average annual rainfall of 600-700 mm, ranging from 550 mm in the southeast to 800 mm on the highest areas in the centre of the country. About 70 percent of the precipitation falls from April to October. The east of the country is covered with snow for up to 120 days per year, the west for fewer than 80 days.

Population

In 2015, the total population was about 9.5 million, of which around 25 percent was rural (Table 1). Population density is 46 inhabitants/km^2, rather evenly distributed over the country. The average annual population growth rate in the 2005-2015 period has been estimated at minus 0.2 percent.
In 2014, the Human Development Index (HDI) ranks Belarus 50 among 188 countries, while the Gender Inequality Index (GII) ranks it 31 among 155 countries, for which information was available. Life expectancy is 72 years and the under-five mortality is 5 per 1000 births, both progressing from 70 years and 17 per 1000 in the 1990s. With no significant distinction between boys and girls, around 93 percent of the children in 2013 are enrolled in primary education, and 97 percent for secondary education (World Bank, 2015).
Adult literacy is 100 percent in 2012 (UNDP, 2015). In 2015, almost the entire population had access to improved water sources (100 and 99 percent in urban and rural areas respectively) and 94 percent of the total population had access to improved sanitation (94 and 95 percent in urban and rural areas respectively) (JMP, 2015).

ECONOMY, AGRICULTURE AND FOOD SECURITY

In 2014, the gross domestic product (GDP) was US$ 76 139 million and agriculture accounted for 9 percent of GDP, while in 1994 it accounted for 10 percent.

Belarus was heavily affected by the accident at the nuclear power plant at Chernobyl, which is located just over the border in the southeast in neighbouring Ukraine close to the Pripyat river. The nuclear accident occurred in April 1986 and 70 percent of the radiation is estimated to have fallen on Belarus, as prevailing winds carried the heaviest radioactive releases into Belarus. About 1.8 million ha or 20 percent of the agricultural land in Belarus is estimated to be contaminated, including almost the entire drained area in the southern and southeastern Polesye. More than 2 million ha of forest areas were also subject to radioactive contamination. However, in spite of this contamination, cropping has not been totally suspended. As of January 2008 only 248 700 ha were reported to have been taken out of the agricultural use. The largest part of contaminated areas is in Gomel and Mogilev provinces in the southeast of the country (MNREP, 2009).

Traditionally, the farms in Belarus were state-run. In 1995, agriculture was almost exclusively in the hands of the *sovkhoz* (state farms) and *kolkhoz* (collective farms) and there were only 3 000 private farms in Belarus, owning a total of 62 100 ha of land. Many of the state-run farms have now been privatized and sold to foreign investors, greatly increasing their productivity. Several of the remaining state-owned farms are seeking foreign investment.

The country's main agricultural products are potatoes (being the world's eighth biggest producer) and cereals. Other agricultural products include vegetables, fruits, meat, diary products. Much is exported to neighbouring states, with the Russian Federation being a major market (Belarus.by, 2015).

Most of the Trans-European railway main lines and highways, oil and gas pipelines, air routes and waterways between West Europe and Asia, converge in Belarus. The shortest routes from Central and Eastern Russian regions to Western Europe, as well as between the Baltic and Black seas, go through Belarus. Belarus is rich in natural resources (MNREP, 2009).

WATER RESOURCES

Surface water and groundwater resources

There are around 20 800 rivers in Belarus with an overall length of 90 600 km. Seven major rivers have a total length of more than 500 km each: Western Dvina, Neman, Vilia (or Viliya), Dnieper, Berezina, Sozh and Pripyat. All of them, except Berezina, are transboundary rivers.

The country can be divided into four main river basins (Table 2):

- *The Dnieper basin:* This basin covers about 81.5 percent of the country. The Dnieper river rises in the Russian Federation and enters Belarus in the northeast. Within the country it flows to the south and, after forming the border with Ukraine over some 100 km, it flows into Ukraine and finally the Black Sea. The largest tributary of the Dnieper in Belarus is the Pripyat, which rises in Ukraine, enters the country in the south, flows east and leaves the country again in the southeast to flow into the Dnieper within Ukraine just north of Chernobyl. Other main tributaries of the Dnieper are the Berezina river, originating within Belarus, and the Sozh river, originating in the Russian Federation. A major tributary of the Pripyat river is the Ptich river, originating within Belarus south of the capital Minsk.
- *The Western Dvina basin:* This basin covers about 10 percent of the country. The Western Dvina river rises in the Russian Federation and flows into Belarus in the northeast. It then flows to the west and leaves the country in the northwest to flow into Latvia, where it is called the Daugava, flowing to the Baltic Sea.
- *The Neman basin:* This basin covers about 6 percent of the country. Its main source is in the centre of the country south of the capital Minsk. It flows to the west and enters Lithuania, where it is called the Nemunas river, which flows to the Baltic Sea. The Vilia river, also rising in Belarus to the north of the Neman river, flows west into Lithuania, where it becomes the Neris river that flows into the Nemunas river. Some smaller tributaries rise in Poland and flow east into Belarus into the Neman river.
- *The Western Bug basin:* This basin covers about 2.5 percent of the country in the southwest. The main Bug river rises in Ukraine, and forms the border, first between Ukraine and Poland and then between Belarus and Poland, before entering Poland.

TABLE 2
Renewable surface water resources (RSWR) by river basin (million m3/year)
(Source: Adapted from MNREP, 2010)

Name of river basin	Internal RSWR	Inflow		Total RSWR	Outflow
	million m³/year	million m³/year	from:	million m³/year	to:
Dnieper	16 900	15 000		31 900	Ukraine
Berezina	*4 500*	*0*		*4 500*	
Dnieper main + Sozh	*6 800*	*7 600*	*Russian Federation*	*14 400*	
Pripyat + Ptich	*5 600*	*7 400*	*Ukraine*	*13 000*	
Western Dvina	6 800	7 100	Russian Federation	13 900	Latvia
Neman	8 900	100		9 000	Lithuania
Neman	*6 600*	*100*	*Poland*	*6 700*	
Vilia	*2 300*	*0*		*2 300*	
Western Bug (incl. Narew) *	1 400	1 700	Ukraine	3 100	Poland
Total	**34 000**	**23 900**		**57 900**	

* *Western Bug is a border river between Belarus and Poland. The 1 400 million m³ refers to the part generated within Belarus.*

Long-term total renewable water resources are estimated at 57 900 million m^3/year, but can vary from 92 400 million m^3/year in wet years to 37 200 million m^3/year in dry years.

The renewable groundwater resources are estimated at about 15 900 million m^3/year (Table 3), which are considered to be drained entirely by the surface water network (overlap). The total annual renewable water resources in the country are thus estimated at 57 900 million m^3/year (Table 4).

In 2012, total municipal wastewater produced and treated was 1 078 million m^3 and 666 million m^3 respectively.

TABLE 3
Renewable groundwater resources (RGWR) by river basin (million m^3/year)
(Source: MNREP, 2010)

Name of river basin	Internal RGWR	
	million m^3/year	
Dnieper	7 769	
Pripyat		*2 569*
Other		*5 200*
Western Dvina	2 690	
Neman	4 931	
Neman		*3 601*
Vilia		*1 330*
Western Bug (incl. Narew)	510	
Total	**15 900**	

TABLE 4
Renewable water resources

Renewable freshwater resources:			
Precipitation (long-term average)	-	618	mm/year
	-	128 300	million m^3/year
Internal renewable water resources (long-term average)	-	34 000	million m^3/year
Total renewable water resources	-	57 900	million m^3/year
Dependency ratio	-	41	%
Total renewable water resources per inhabitant	2015	6 097	m^3/year
Total dam capacity	2009	3 100	million m^3

Lakes and dams

There are about 10 800 freshwater lakes with a total area of 1 600 km^2, or 0.8 percent of the total area of the country, and a total capacity of 6 000-7 000 million m^3. 75 percent of the lakes are classified as small, having a surface area up to 0.1 km^2. The largest lake is Lake Naroch, with an area of 80 km^2 and an average depth of 9 m, following the Lake Osveyskoye, with an area of 53 km^2 and an average depth of 2 m. There are also about 1 500 small and shallow natural ponds in the country with a total area of 350 km^2 and a total capacity of 0.5 km^3.

There are 153 reservoirs constructed in Belarus with an overall volume of 3 100 million m^3 and an effective storage of about 1 240 million m^3 (MNREP, 2009).

The most important dam is the Vileyka (or Vileyskoye) reservoir, with a total area of 64 km^2 and a total capacity of 1 336 million m^3, that gives birth to the Vileyka-Minsk system of canals along which water from the Vilia river is directed to Minsk (Export.by, 2015; NSC, 2013).

At present, 26 hydroelectric power plants, including mini hydroelectric power stations, are operational in Belarus. Their gross installed capacity is about 11 MW or 0.15 percent of the gross installed capacity of operating power plants of all types (MNREP, 2009).

INTERNATIONAL WATER ISSUES

Belarus is party to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes and under this convention has undertaken substantial activities on the shared transboundary water resources with other countries.

Cooperation in the field of protection and use of transboundary rivers between Belarus, Lithuania, Poland, the Russian Federation and Ukraine has been regulated basing on the following documents:

- Agreement on the Environmental Protection Cooperation (1992) between the Ministry of the Environmental Protection, Natural Resources and Forestry of Poland and the State Committee for Ecology of Belarus
- Agreement between Belarus and Ukraine on the Cooperation on Environmental Protection (1994)
- Agreement between Belarus and Lithuania on Cooperation in Environmental Protection (1995).
- Agreement between Belarus and Ukraine on the Joint Use and Protection of Transboundary Waters (2001)
- Agreement between Belarus and the Russian Federation concerning Cooperation in Protection and Rational Use of Transboundary Waters (2002)
- Agreement on inter-institutional cooperation between the Kaliningrad region of the Russian Federation, Lithuania and Belarus in the field of monitoring and exchange of data on the status of transboundary surface water bodies (2003).
- Draft agreement between Belarus, Latvia and the Russian Federation on the Western Dvina/Daugava river basin, establishing a joint commission (2003). The Latvian government approved the draft but it was not signed in 2003 as the Russian Federation and Belarus postponed the final decision several times due to various reasons. After Latvia joined the European Union (EU) in 2004, any international agreement on water management between an EU Member State and a non-Member State requires the EU as a Contracting Party. Cooperation agreements were on the list of topics to be discussed during high-level meetings of the EU and the Russian Federation; however, this has not led to renewal of the negotiations concerning this agreement.
- Technical Protocol signed between the Ministry of Natural Resources and Environmental Protection of Belarus and the Ministry of Environment of Lithuania on cooperation in the field of monitoring and exchange of data on the status of transboundary surface water bodies (2008).

In the past decades, several international projects concerning protection and rational management of waters have been implemented in the Bug river basin which is shared between Belarus, Poland and Ukraine. The most important ones including Belarus are:

- The Bug river pilot project on monitoring and assessment of transboundary rivers, established under the UNECE Water Convention (1998-2003)
- Creation of the Polish-Belarusian-Ukrainian Water Policy in the Bug basin – the Neighbourhood Programme Poland-Belarus-Ukraine INTERREG III A – TACIS CBC (2007-2009).

The Science for Peace and Security NATO pilot study project “Sustainable Use and Protection of Groundwater Resources – Transboundary Water Management”, launched in 2006, focuses on development of international cooperation on implementation of water quality monitoring and assessment. It is also a scientific platform for experts from Belarus, Poland and Ukraine as well as from other countries to exchange ideas about water management, with special emphasis on groundwater and its protection. The Bug river basin is one of the main interests of the project (Nalecz, 2010).

The Nemunas River Basin District (RBD) is shared between three EU Member States, Latvia, Lithuania and Poland, and two non-EU countries, Belarus and the Russian Federation (Kaliningrad oblast). The governments of Lithuania, the Russian Federation, Belarus, and the European Commission have

initiated the preparation of an agreement on cooperation in the use and protection of water bodies within the Nemunas RBD. A draft agreement has been drawn up but has not been signed yet. No measures have been foreseen for Poland and Latvia, because the part of the Nemunas RBD in Poland constitutes only 287 km^2 (the upstream reaches of the rivers with no significant pressures), and the part of the RBD in Latvia constitutes only 100 km^2 (the upstream reaches of the rivers with no significant pressures), and the results of water quality monitoring showed that the ecological status of the rivers along the Polish and Latvian border were good.

WATER USE

In 2013 total water withdrawal was estimated at 1 514 million m^3 (NSC, 2014). This includes water loss during transport of 141 million m^3, which has been estimated to be equally distributed over industrial and municipal water withdrawal. Of these 1 514 million m^3, 117 million m^3 (8 percent) was for irrigated agriculture, 372 million m^3 (25 percent) for aquaculture, 547 million m^3 (36 percent) for municipalities (including 70 million m^3 of water loss during transport) and 478 million m^3 (31 percent) for industries (including 71 million m^3 of water loss during transport) (Table 5 and Figure 2). Approximately 851 million m^3, or 56 percent of the total withdrawal, comes from groundwater sources and 663 million m^3, or 44 percent, from surface water sources (Figure 3) (NSC, 2014). Water withdrawal decreased steadily over the last decennia, from 1 980 million m^3 in 1995 and 1 706 million m^3 in 2005 (NSC, 2014).

TABLE 5
Water use

Water withdrawal:			
Total water withdrawal	2013	1 514	million m^3/year
- Agriculture	2013	117	million m^3/year
- Aquaculture	2013	372	million m^3/year
- Municipalities	2013	547	million m^3/year
- Industry	2013	478	million m^3/year
• Per inhabitant	2013	159	m^3/year
Surface water and groundwater withdrawal (primary and secondary)	2013	1 514	million m^3/year
• As % of total renewable water resources	2013	3	%
Non-conventional sources of water:			
Produced municipal wastewater	2012	1 078	million m^3/year
Treated municipal wastewater	2012	666	million m^3/year
Direct use of treated municipal wastewater	-	-	million m^3/year
Direct use of agricultural drainage water	-	-	million m^3/year
Desalinated water produced	-	-	million m^3/year

FIGURE 2
Water withdrawal by sector
Total 1 514 million m^3 in 2013

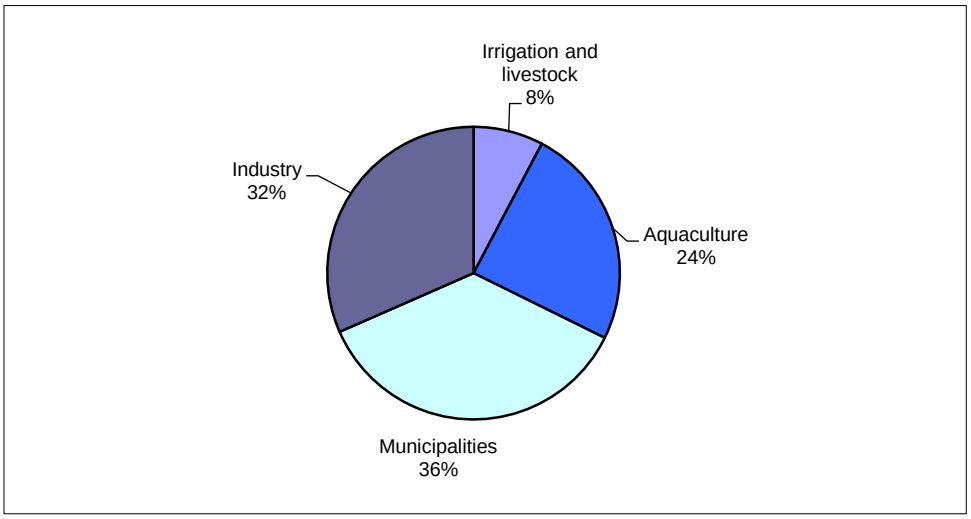
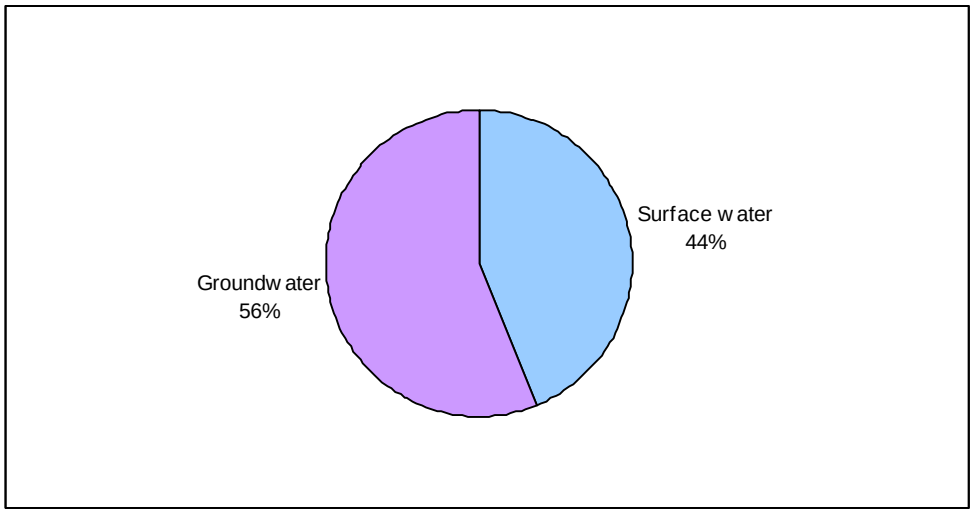


FIGURE 3
Water withdrawal by source
Total 1 514 million m3 in 2013



Groundwater is the main source of water supply for drinking purposes. However, residents of Polotsk and partly of Minsk and Gomel cities receive their drinking water from surface sources (NATO, 2005).

Minsk and Minsk Oblast remain Belarus' largest of water users, with 35 percent of total water withdrawal, 42 percent and 33 percent of surface water and groundwater respectively (MNREP, 2015b).

IRRIGATION AND DRAINAGE

Evolution of irrigation development

All irrigation takes place on land that has been excessively drained. In fact, there is no real need for irrigation, except in areas where the groundwater has been lowered too much by excessive drainage. For this reason, no figure on irrigation potential is available.

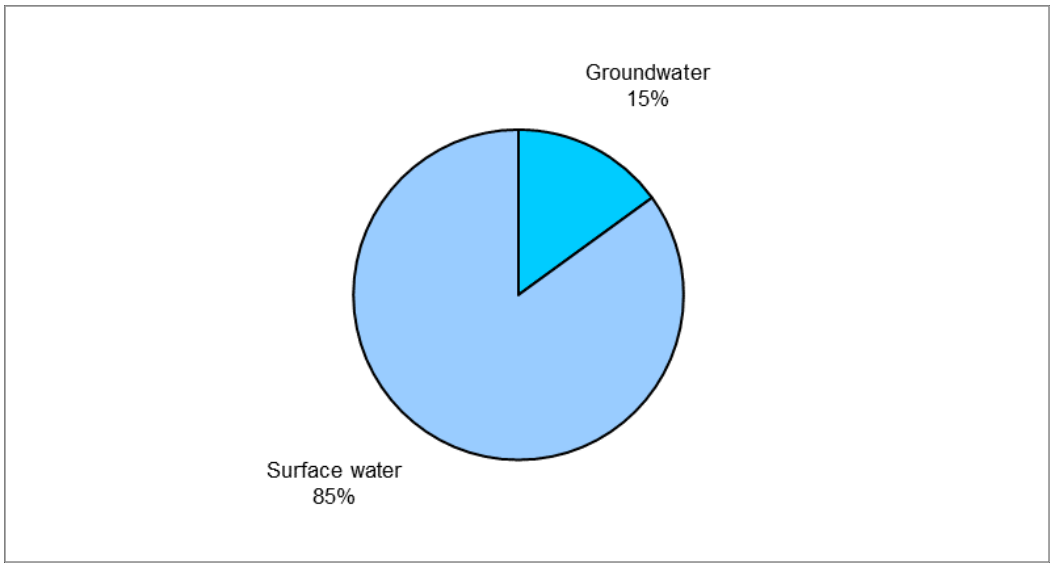
Irrigated areas first appeared in the statistics in 1974. In 1993, the area equipped for irrigation was equal to 131 000 ha. It was largest in 1980 when it still was part of the Soviet Union, with 163 000 ha, but the Chernobyl nuclear accident in 1986, combined with the difficult economic situation, resulted in a deterioration of the drainage and irrigation systems, and cultivation on part of these lands was abandoned. In 1993, the whole area was reported to be sprinkler irrigated, using moving sprinkler irrigation systems. With this type of irrigation, the area equipped for irrigation may vary from year to year and is in fact equal to actually irrigated area. The variation depends mainly on whether precipitation is sufficient or not, but has decreased considerably during the last 5 years. While it was still 114 100 ha in 2006, it went down to 52 900 ha in 2009, 56 900 ha in 2010 and 30 600 ha in 2011 (NSC, 2011). Of the 114 100 ha in 2006, 85 percent was irrigated by surface water and the remaining 15 percent by groundwater (Table 6 and Figure 4).

TABLE 6

Irrigation and drainage

Irrigation potential	-		ha
Irrigation:			
1. Full control irrigation: equipped area	2011	30 600	ha
- Surface irrigation	-	-	ha
- Sprinkler irrigation	-	-	ha
- Localized irrigation	-	-	ha
• Area equipped for full control irrigation actually irrigated	2011	30 600	ha
- As % of area equipped for full control irrigation	2011	100	%
2. Equipped lowlands (wetland, ivb, flood plains, mangroves)	-	-	ha
3. Spate irrigation	-	-	ha
Total area equipped for irrigation (1+2+3)	**2011**	**30 600**	**ha**
• As % of cultivated area	2011	0.5	%
• % of area irrigated from surface water	2006	85	%
• % of area irrigated from groundwater	2006	15	%
• % of area irrigated from mixed surface water and groundwater	-	-	%
• % of area irrigated from non-conventional sources of water	-	-	%
• Area equipped for irrigation actually irrigated	2011	30 600	ha
- As % of total area equipped for irrigation	2011	100	%
• Average increase per year	2003-2011	-14	%
• Power irrigated area as % of total area equipped for irrigation	-	-	%
4. Non-equipped cultivated wetlands and inland valley bottoms	-	-	ha
5. Non-equipped flood recession cropping area	-	-	ha
Total agricultural water managed area (1+2+3+4+5)	2011	30 600	**ha**
• As % of cultivated area	2011	0	%
Size of full control irrigation schemes: **Criteria**:			
Small schemes < - ha			ha
Medium schemes > - ha and < - ha			ha
large schemes > - ha			ha
Total number of households in irrigation			
Irrigated crops in full control irrigation schemes:			
Total irrigated grain production			metric tons
• As % of total grain production			%
Harvested crops:			
Total harvested irrigated cropped area	2011	30 600	ha
• Temporary crops: total	2011	8 200	ha
- Vegetables	2011	3 000	ha
- Potatoes	2011	2 900	ha
- Leguminous crops	2011	2 300	ha
• Permanent crops: total	2011	2 300	ha
- Fruits	2011	2 300	ha
• Permanent meadows and pastures irrigated: total	2011	20 100	ha
Irrigated cropping intensity (on full control area actually irrigated)	2011	100	%
Drainage - Environment:			
Total cultivated area drained	2011	2 952 900	ha
• Non-irrigated cultivated area drained	2011	2 922 300	ha
• Area equipped for irrigation drained	2011	30 600	ha
- As % of total area equipped for irrigation	2011	100	%
Area salinized by irrigation	-	-	ha
Area waterlogged by irrigation	-	-	ha

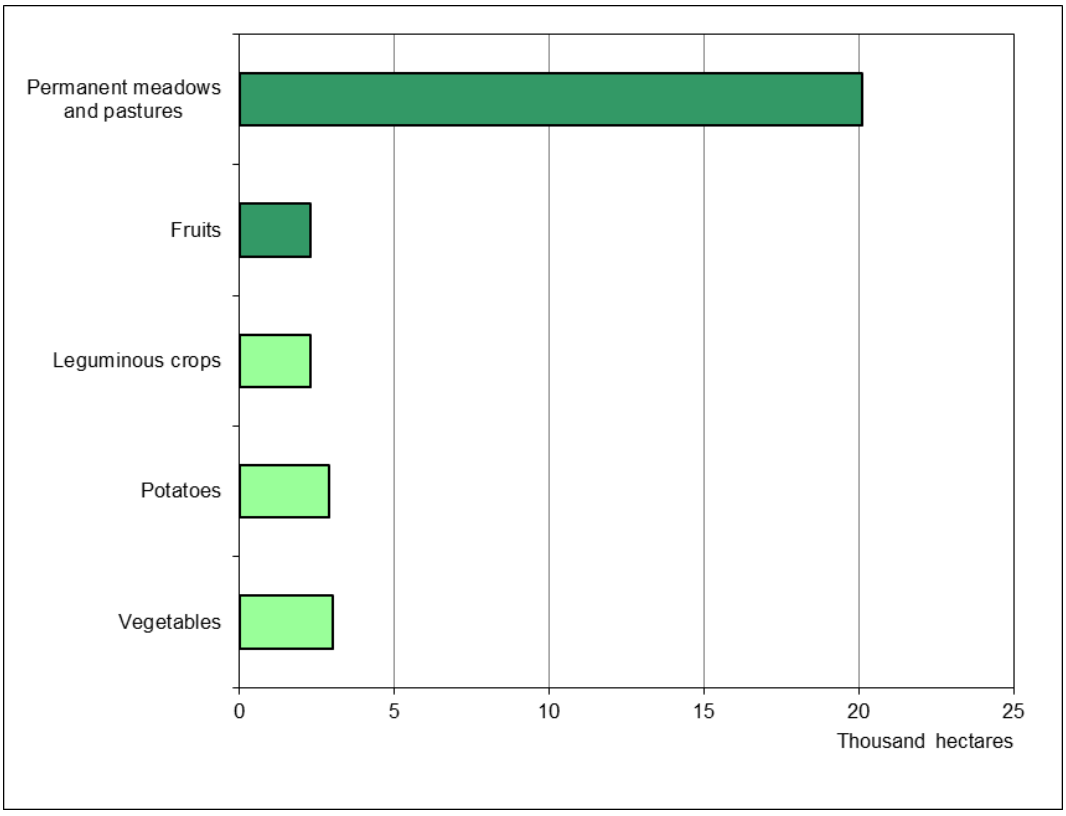
FIGURE 4
Source of irrigation water on area equipped for irrigation
Total 114 100 ha in 2006



Role of irrigation in agricultural production, economy and society

In 2011, total harvested irrigated crop area was estimated at 30 600 ha, of which around 66 percent permanent meadows and pasture, 17 percent fruits and vegetables, 10 percent potatoes and 7 percent leguminous crops (Table 6 and Figure 5).

FIGURE 5
Irrigated crops on area equipped for full control irrigation
Total harvested area 30 600 ha in 2011 (cropping intensity on actually irrigated area: 100%)



Status and evolution of drainage systems

Due to the climatic conditions, there is a need for drainage rather than irrigation in the country, except in areas where the groundwater level has fallen too much due to excessive drainage.

The history of drainage in Belarus dates back to the second half of the 18th Century in the then Polish state. On huge private estates marshes were drained, mainly by open canals, to turn them into meadows. In the final quarter of the 19th Century, large-scale drainage works were carried out in the Polesye region, where about 4 700 km of canals were built with an average depth of 1.1 m. These works were also intended to facilitate wood exploitation and the floating of timber down to Ukraine. Drainage work stopped at the beginning of the 20th Century but restarted in the 1920s, independently in the western part (Poland) and the eastern part (the Soviet Union). During the Second World War, work was suspended and when it restarted after the war it was initially on a small scale. Following the "Land Draining and Sovkhoz Building Act" of 1966, large-scale drainage work started again. Most of the drainage work was concentrated in the Polesye region, where 85 000 ha had been drained by 1939, and this drained area amounted to 560 000 and 1 400 000 ha in 1966 and 1986 respectively. In the period 1966-1986, mainly subsurface drainage systems were built. Most of this drained land in the Polesye region was contaminated after the accident at the Chernobyl nuclear power plant which, combined with the difficult economic situation, resulted in a deterioration of the drainage systems and cultivation on part of these lands was abandoned.

In 1993, about 3 million ha had been drained for agricultural purposes. In addition, land had also been drained for non-agricultural purposes, such as construction. On average, in 1993, there were 250 m of drains per ha of drained land. Subsurface drains existed on more than 75 percent of the drained area, the remaining 25 percent being drained by open canals. The total length of the irrigation and drainage network exceeds 800 000 km, which is almost nine times the total length of the natural rivers in the country. The total area where drainage infrastructure could be developed has been estimated at 7.9 million ha.

In 2011, the area of drained lands of the republic was 3.41 million ha, of which 2.95 million ha was drained agricultural land: 43.1 percent croplands, 56.8 percent meadows and pastures, 0.1 percent permanent crops (MNREP, 2009; NSC, 2011).

WATER MANAGEMENT, POLICIES AND LEGISLATION RELATED TO WATER USE IN AGRICULTURE

Institutions

During the Soviet period, all water investments were the responsibility of the Ministry of Water Administration (Minvodkhoz). At present, several institutions are involved in water resources management:

- The Natural Resources and Environmental Protection Ministry of the Republic of Belarus (MNREP) is, since 1994, in charge of exploitation of natural resources and environmental protection, pursuing the state ecology policy.
- The Republican Center of Analytical Control in the Sphere of Environmental Protection, subordinated of the MNREP, is responsible for analytical control of water.
- The Republican Unitary Enterprise "Central Research Institute for Complex Use of Water Resources" (CRICUWR) is a specialized scientific institution of the MNREP for research in the fields of water resources management and engineering.
- The State Hydrometeorological Service is a system of organizationally and functionally united entities involved in hydrometeorological activities.
- The Ministry of Agriculture and Food is responsible for all issues relating to drainage and irrigation.

Water management

The government is making it a priority to bring safe drinking water to people, and to build good wastewater treatment and sanitation facilities (World Bank, 2013).

The Ministry of Natural Resources has adopted a Water Strategy of the Republic of Belarus by 2020 outlining the main issues and setting the goals in the area of water management and protection which have to be addressed taking into consideration the next stage of the socioeconomic development of Belarus. This strategy aims to achieve the goals of the International Decade for Action Water for Life 2005-2015 and UN Millennium Declaration, Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (MNREP, 2015b).

There are two types of water supply systems in Belarus: centralized and non-centralized. At the end of 2008, centralized water supply systems reached 100 percent of urban and 23 percent of rural settlements, and provided water to 85 percent of the population (96 percent of urban population and 56 percent of rural population). The management and development of the centralized system is within the competence of local authorities while the requirements to the quality of water are established by the Ministry of Public Health at the state level and supervised by public health services. The quality of sewage treatment and its conformity to the standards is supervised by the Ministry of environmental protection and its territorial bodies (Alena, 2011).

Policies and legislation

The main legislation related to water resources is (Alena, 2011):

- The Water Code (1998), amended in 2010
- The Law about environmental protection (1992), amended in 2010
- The Law about sanitary-and-epidemic well-being of the population (1993), amended in 2009
- The Law about drinking water supply (1999), amended in 2009

ENVIRONMENT AND HEALTH

The radioactive contamination after the Chernobyl nuclear accident affected a large part of the country, especially the southeast. Although these lands should have been completely excluded from agricultural production on health grounds, this was not the case. In those areas farming never stopped entirely. During the first few years after the accident, the levels of radioactive materials in agricultural plants and animals decreased quickly because of factors such as weather and decay. In the past decade, the radioactivity levels have still gone down, but much more slowly. At present, the levels of caesium-137 in agricultural food products from Chernobyl-affected areas are generally below national and international action levels. However, problems persist in some rural areas with small private farms where dairy cows are grazing in pastures that are neither ploughed nor fertilized. The state's farms adopted measures to minimize contamination of crops, including the use of certain fertilizers. Some crops absorb less radiation and those that absorb more have been grown only for fodder (GreenFacts, 2015; Myers, 2005).

The quality of centralized and non-centralized water supply sources is controlled by laboratories. In 2004, it was revealed that in major cities drinking water did not meet hygienic standards: 30-78 percent of water samples of centralized sources failed to meet sanitary-chemical standards. The main reason for failure was high concentration of iron. Some investigations suggested that it is dangerous to locate sources of water supply on city territories (NATO, 2005).

Due to the rehabilitation, upgrading and construction of sewage treatment plants water pollution has reduced considerably. In the last five years 49 sewage treatment facilities were put into operation in line with the Clear Water Program and with the assistance from local and national funds of environmental protection. Over the last two years the general state of rivers such as the Dnieper, Western Dvina, Neman

and Pripyat has been greatly improved. There are signs of stabilization of the Western Bug (MNREP, 2015b).

Groundwater quality is much higher than surface water quality (Ysoveev *et al*., 2011).

The Strategic Plan for Conservation and Sustainable Use of Biodiversity for 2011-2020 stipulates that by 2020 at least 17 percent of land and inland waters and, in particular, of the areas having particular importance for biodiversity conservation and performance of ecosystem services, will be preserved through efficient and fair management and operation of ecologically representative and well-linked systems of protected areas (Republic of Belarus, 2014).

PROSPECTS FOR AGRICULTURAL WATER MANAGEMENT

In terms of water management, possible future low-water years would bring the following negative effects (Climate adaptation, 2015):

- Reduction of water supply to economic sectors that use surface waters
- A drop in minimum water levels in rivers and resultant complications for the operations of river intake, water transport and recreation
- Groundwater level lowering, especially in near-river areas
- Worsened quality of river water, caused by low dilution of wastewater and other pollution sources
- Transformation of the hydro-biological regime of rivers caused by a change of rivers' level and speed patterns.

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