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Designing and Implementing Green Public Investment Programmes – experience on water supply and wastewater treatment in rural and remote areas

Market Study for Green Public Investment Programme in the Republic of Azerbaijan

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Green Public Investment Programme (GPIP)

- **Programme/GPIP** – a series of (investment) measures designed to achieve certain public **objectives** in a specified timeline with a clearly allocated **budget** for their implementation
- **Public expenditure programme** – mechanism to allocate resources to priority areas in need of public funding, without which the priority measures would not be achieved. Aim to promote **greener** model of development
- **Market study** is part of the analytical component of the GPIP provides the data for programme design and costing

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GPIP in Azerbaijan

- Need to adapt to **decline in supply of quality water** and increased water demand
- **Objective:** diversify water supply sources (surface and groundwater) to meet future water demand (considering climate change impacts on water resources).
- Four main objectives (activity areas):
 - Increase water extraction/catchment volumes
 - Increase available water storage capacities
 - Ensure groundwater level recovery/increase
 - Ensure efficient water supply

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Water sector challenges in Azerbaijan

- **Uneven distribution of and access to water resources**
- **Surface water:** mainly from transboundary rivers that arrive already polluted. Some rural area residents lack a reliable supply due to a lack of water supply infrastructure.
- **Groundwater resources** (one-fifth of water consumed): mainly concentrated in foothills. Generally of high quality and mainly used in agriculture and industry.
- **Lowlands:** groundwater is often poorly drained and may exhibit high salinity. In some areas, groundwater is close to the surface and poorly protected.

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Water sector challenges in Azerbaijan

- **Outdated water resource inventories**
- Water resource inventories cited in both academic studies and strategic documents date from the 1970s and 1980s and require revision. This urgent need has been recognised in current sectoral strategies.
- Groundwater with usability (up to 1.0 g / l) and low mineralization (1-3 g / l) is unevenly distributed in mountainous and foothill areas.
- Regional exploitable groundwater reserves in the foothills were estimated in the 1970s and 1980s, during which it was estimated that regional groundwater reserves were about 24 million m³ / day (or 8.67 billion m³ per year).

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Forecasted changes in temperature



Forecasted change in temperature,
2011-2040



Forecasted change in temperature,
2041 and 2070

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Forecasted changes in annual precipitation



Forecasted change in precipitation,
2011-2040



Forecasted change in precipitation,
2041 and 2070

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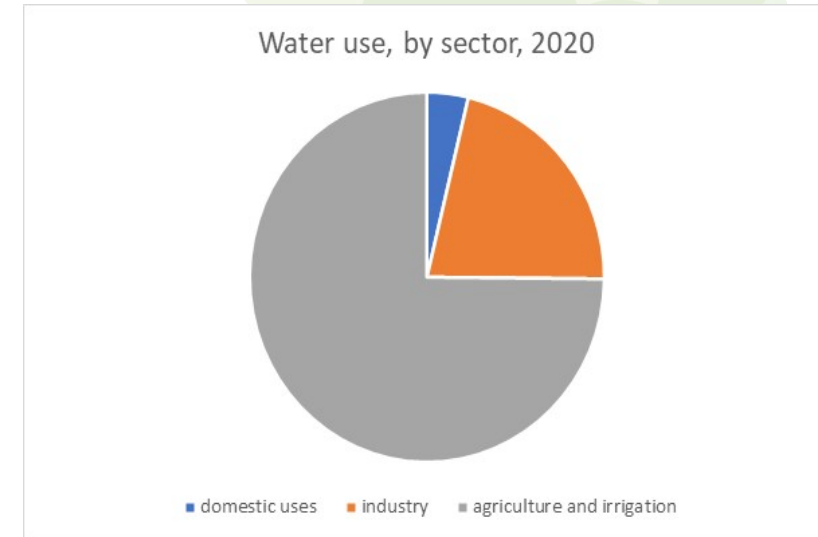
Water sector challenges in Azerbaijan

- **Agriculture is main water resource consumer**
- Water balance 2019: water resource use (excluding energy sector) - 8.3 billion m³.
 - Agriculture and irrigation: 7.3 billion m³ (87.9%)
 - Domestic: 840 million m³ (10.2%)
 - Other: 160 million m³ (1.9%)
- Surface water resources: 140 reservoirs and 53,000 km of irrigation canals.
- Dry climate requires irrigation water. Current irrigation methods are ineffective and work needs to be done to apply drip irrigation and other modern approaches to irrigation.

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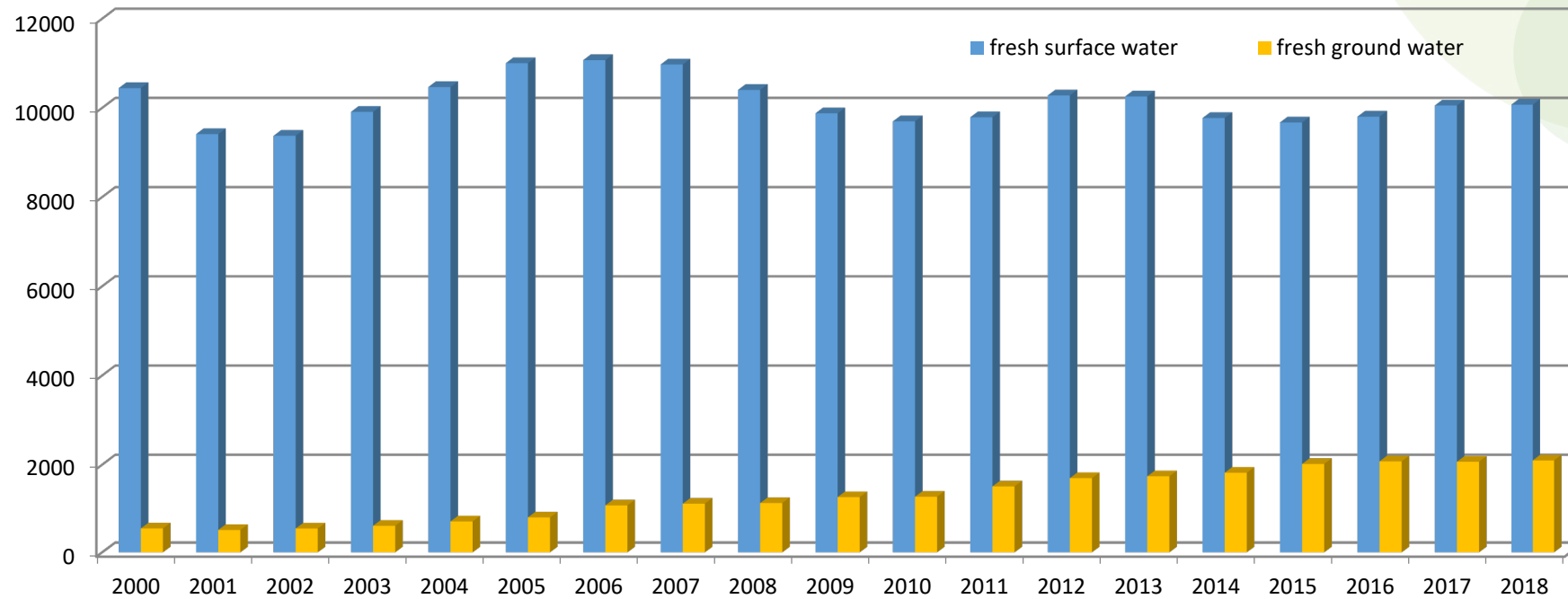


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Total freshwater abstraction



billion m3

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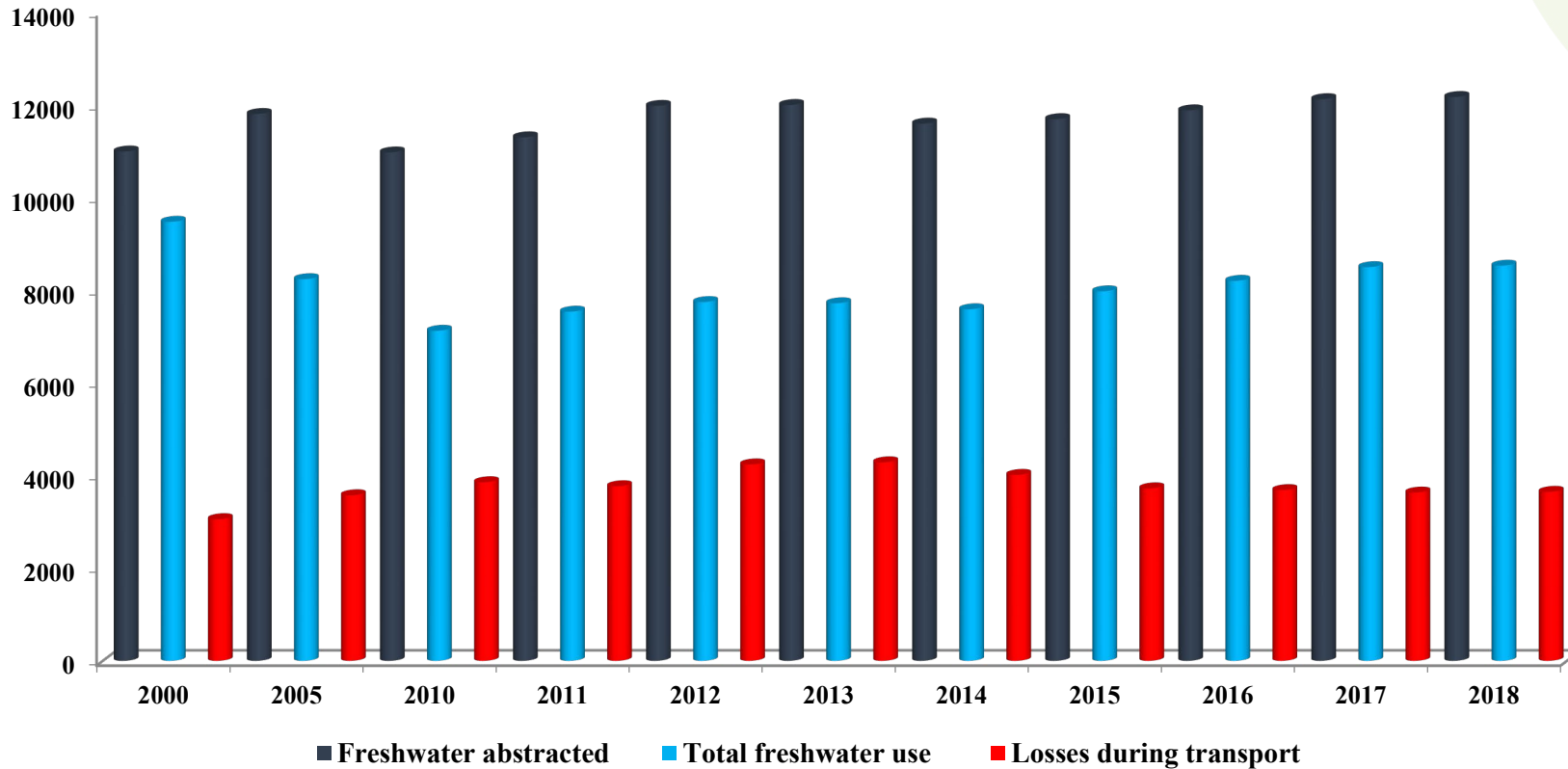


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Total freshwater use



billion m3



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Water abstraction

	2010	2015	2016	2017	2018	2019	2020
Water abstraction from natural water resources – total	11566	12285	12504	12781	12847	13227	12961
- per capita, m ³	1295	1289	1297	1313	1308	1335	1300
Water consumption – total, of which for:	7715	8567	8824	9154	9205	9472	9693
Domestic	405	323	308	291	306	312	319
Industry	1742	2117	2108	2224	2111	2070	2073
Agriculture	5497	6057	6342	6570	6722	7038	7252
Water losses during transmission	3851	3718	3680	3627	3642	3755	3268

million m³

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Irrigation and water supply to agriculture

	2016	2017	2018	2019	2020
	mln.m3	mln.m3	mln.m3	mln.m3	mln.m3
Country, total	6342,3	6570,2	6721,5	7038,3	7251,6
<i>Absheron - Khizi economic region - total</i>	<i>99,1</i>	<i>104,2</i>	<i>117,9</i>	<i>118,9</i>	<i>125,0</i>
<i>Daghlig Shirvan economic region - total</i>	<i>120,2</i>	<i>130</i>	<i>127,8</i>	<i>139,8</i>	<i>149,5</i>
<i>Ganja-Dashkasan economic region - total</i>	<i>465,8</i>	<i>503,3</i>	<i>530,2</i>	<i>595,6</i>	<i>603,02</i>
<i>Kazakh-Tovuz economic region - total</i>	<i>485,3</i>	<i>460,3</i>	<i>457,1</i>	<i>532,08</i>	<i>638,1</i>
<i>Guba-Khachmaz economic region - total</i>	<i>310,8</i>	<i>320,4</i>	<i>321,6</i>	<i>345</i>	<i>295,2</i>
<i>Lankaran-Astara economic region - total</i>	<i>109,8</i>	<i>116,4</i>	<i>115,7</i>	<i>139,96</i>	<i>143,5</i>
<i>Central Aran economic region - total</i>	<i>1052,7</i>	<i>1113,6</i>	<i>1135,51</i>	<i>1171,13</i>	<i>1191,3</i>
<i>Mil-Mugan economic region - total</i>	<i>1030,9</i>	<i>1046,7</i>	<i>1069,1</i>	<i>1092,29</i>	<i>1111,2</i>
<i>Shaki-Zagatala economic region - total</i>	<i>276</i>	<i>293</i>	<i>287,4</i>	<i>309,6</i>	<i>332,4</i>
<i>Shirvan-Salyan economic region - total</i>	<i>633,8</i>	<i>663,7</i>	<i>711,3</i>	<i>731,12</i>	<i>752,5</i>

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Domestic water use

	2016		2017		2018		2019		2020	
	Total, mln.m3	Per resident, m3	Total, mln.m3	Per resident, m3	Total, mln.m3	Per resident, m3	Total, mln.m3	Per resident, m3	Total, mln.m3	Per resident, m3
Country, total	308,0	32,0	291,1	29,9	305,8	30,8	312,3	31,2	318,9	31,6
<i>Absheron - Khizi economic region - total</i>	37,5	66,9	36,4	60,1	35,2	61,7	46,1	80,2	45,4	78,6
<i>Daghlig Shirvan economic region - total</i>	2,4	7,6	2,5	8,0	3,4	10,7	3,1	9,5	3,6	11,1
<i>Ganja-Dashkasan economic region - total</i>	14,8	-	12,7	-	12,9	-	13,0	21,2	12,4	20,3
<i>Kazakh-Tovuz economic region - total</i>	4,7	-	5,2	-	5,7	-	6,1	9,0	5,9	8,6
<i>Guba-Khachmaz economic region - total</i>	6,0	11,3	5,7	10,5	6,5	11,9	6,8	12,2	7,5	13,5
<i>Lankaran-Astara economic region - total</i>	3,6	4,0	4,1	4,4	4,7	5,0	5,1	5,4	5,7	6,0
<i>Central Aran economic region - total</i>	15,6	-	11,5	-	13,3	-	12,0	16,5	12,9	17,5
<i>Mil-Mugan economic region - total</i>	4,6	-	4,6	-	4,6	-	4,5	8,5	4,7	9,0
<i>Shaki-Zagatala economic region - total</i>	6,7	11,0	7,9	12,9	5,8	9,4	6,7	10,5	7,5	11,9
<i>Shirvan-Salyan economic region - total</i>	12,3	-	11,1	-	9,2	-	10,8	21,8	10,8	21,6



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Water sector challenges in Azerbaijan

- **Poor technical condition of pipelines and canals**
- Due to technical failures of pipelines and canals during water transmission, the level of water losses is high and leads to increased water withdrawals to meet demand. Excessive withdrawal of water from springs can lead to rivers falling below the required for environmental flow, and sometimes even to dry up.
- **Awareness raising needed on rational use of water resources**
- Need to raise awareness on efficient use of water. Wastewater should be treated and used as industrial water for industrial, irrigation and other purposes

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Capital repair of fixed assets on environmental protection

	2010	2015	2016	2017	2018	2019	2020
Total	2697,1	1605,0	1043,4	5123,6	3395,1	971,6	1920,1
of which:							
- treatment of wastewater and rational use of water resources	1 944,0	1115,4	624,5	4281,2	1315,4	548,2	1802,7
% of total	72%	69%	60%	84%	39%	56%	94%

Thousand
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Capital investments on environmental protection

	2010	2015	2016	2017	2018	2019	2020
Total	84864,4	109546,0	133387,0	247912,2	309855,6	170208,7	84864,4
of which:							
- capital investments for protection of water resources and their rational use	84474,4	108996,0	117387,0	233348,1	294922,5	170208,7	84474,4
% of total	99,5%	99,5%	88,0%	94,1%	95,2%	100,0%	99,5%

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Main stakeholders

- **Ministry of Ecology and Natural Resources** – prepares water balances, fomulates and implements state environmental policy. Ecological Policy Division
- **Ministry of Energy**
- **Ministry of Emergency Situations**
- **Ministry of Health**
- **Azersu JSC** – implements state policy and strategy in water supply and sanitation serices
- **Amelioration JSC** – bulk water supplies and irrigation systems
- **Water User Associations** – voluntary community farmer associations responsible for management of on-farm irrigation systems. Can set irrigation service fee

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Main stakeholders

- **National Water Policy Dialogue (NRPD)** – established in 2010 as an interagency platform to support water sector reform. Prepare sector strategy based on integrated water resources management in Azerbaijan (IWRM), the European Union (EU) Water Framework Directive, the UN Economic Commission for Europe (UNECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes and its Water and the Health Protocol.
- **Commission on Water Resources** – established by the Order of the President of the Republic of Azerbaijan dated April 15, 2020 "On measures to ensure the efficient use of water resources" in order to ensure the efficient use of water resources in the country, improve water management and coordinate activities in this area.

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National Strategy on Rational Use of Water Resources

- improve water legislation to ensure the application of IWRM and Electronic Water Economy Information System (EWEIS)
- achieve sustainable water resources management based on the river basin management
- develop river basin management planning
- strengthen organizational and regulatory framework in the water sector
- strengthen monitoring system to determine the ecological status of water bodies, creating a database for surface and groundwater
- improve drinking water supply and wastewater treatment systems
- organise water use in energy production
- enact resolutions and regulations addressing existing challenges related to transboundary rivers
- support investment in water protection and new technologies (especially in irrigation)
- Expand capacity of water bodies at the national and basin levels.

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National Strategy on Rational Use of Water Resources

- Short-term (six years)
 - secure water supply to meet demand in key sectors in terms of quality and quantity
 - improve institutional capacity and legal framework to facilitate inter-agency cooperation and stakeholder participation in water management
 - Implement Action Plan "on ensuring the efficient use of water resources for 2020-2022" approved by the Decree of the President of the Republic of Azerbaijan No. 2178 dated July 27, 2020.
- Medium and long-term objectives also identified
- National Strategy identifies some priority areas for capital investments. No cost estimates are provided.
- Among others, both Azersu JSC and Amerlioration JSC have developed action plans and priority investment lists based on the Action Plan of this Strategy.

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Action Plan for 2020-2022

- Presidential Decree No. 2178 (2020) on the “Action Plan for 2020-2022 to ensure the efficient use of water resources”
 - „setting the stage” for water sector reforms, with priority toward feasibility studies, but also of ongoing water supply projects
 - Prioritises some types of capital investments to be undertaken and lists some on-going, priority projects by name. No cost estimates are provided.

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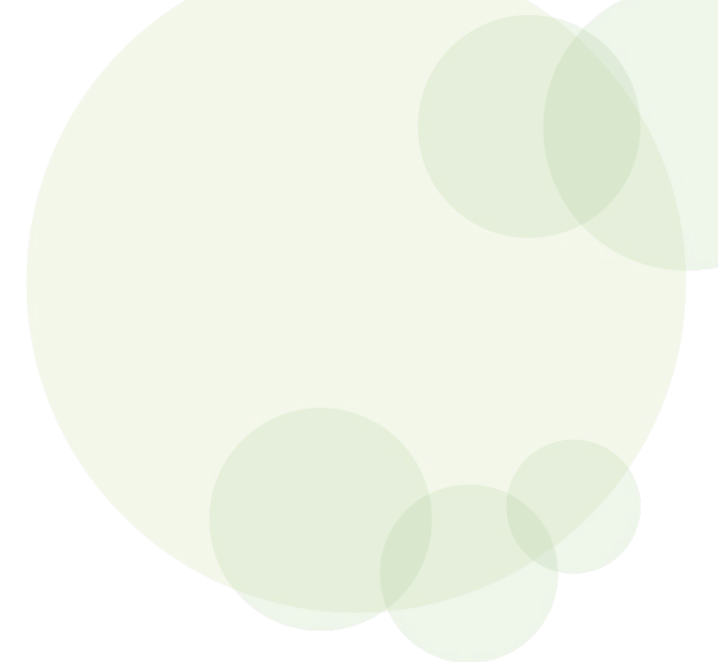
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Data sources

- Existing feasibility studies, cost adjusted to the present
- On-going investments under completion
- Priority investment lists from Azersu JSC, Amelioration JSC, the Action Plan, and Water Strategy
- Application of average unit cost method

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Project pipelines

- Water supply infrastructure – shallow wells / deep wells, pumping station, automation, electric connection, etc.
- Water storage infrastructure – surface water catchments from small water bodies; new water storage facilities (water towers, ponds, cisterns, small dams)
- Water treatment infrastructure – small water treatment facilities
- Wastewater treatment infrastructure – small, decentralised wastewater facilities

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Thank you for you attention

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