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Water and Sanitation in Municipalities in the Selenge River Basin of Mongolia

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This report presents a review of access to water and sanitation in municipalities located in the Selenge River Basin of Mongolia, including a review of the upgrade needs to improve water and sanitation services and the identification of ongoing and planned programmes and projects on water and sanitation.

The study was conducted in the framework of UNESCO-executed activities under the UNDP-GEF Project on "Integrated Natural Resources Management in the Baikal Basin Transboundary Ecosystem" (Mongolia and Russia). The project objective is to spearhead integrated natural resources management of Lake Baikal Basin, ensuring ecosystem resilience and reduced water quality threats in the context of sustainable economic development. The project is executed by UNOPS. UNESCO's International Hydrological Programme (IHP) is an international executing partner for the project.

The study and report preparation was coordinated by Dr Sarantuyaa Zandaryaa, Programme Specialist at the International Hydrological Programme of UNESCO in Paris. The review was prepared by Prof Davaa Basandorj, Mongolian University of Science and Technology who served as the national expert for the study. The report was prepared in collaboration with experts from the Ministry of Construction and Urban Development and National Water Committee of Mongolia. Data of a previous study on access to improved water and sanitation carried out by a team coordinated by Dr P. Batimaa under the project on "Improving Access to Water and Sanitation" (MON/08/302), implemented by the Mongolian Government and funded by UNDP, were used and re-evaluated for the purpose of this study, where relevant.

Findings and recommendations of the study were discussed with relevant stakeholders at the National Workshop "Selenge – A River without Borders", organized by UNESCO in collaboration with the National Water Committee and Ministry of Environment and Green Development of Mongolia, which took place in the State Palace in Ulaanbaatar on 04 June 2013. The workshop participants included representatives of the Ministry of Environment and Green Development, Ministry of Health, Ministry of Industry and Agriculture, River Basin Authorities, research institutions, universities, NGOs and the private sector. The key outcomes of the workshop discussions were incorporated in this final report. The report also benefited from discussions at the scoping meetings and workshops, organized by UNESCO in the framework of this study.

This report was published with the support of the Project Management Unit of the GEF project "Integrated Natural Resource Management in the Baikal Basin Transboundary Ecosystem", in particular, Sergey Kudelya, Project Manager, and Tumurchudur Sodnom, Technical Director for Mongolia.

Foreword

H.E. Ts. Bayarsaikhan
Minister for Construction and Urban Development of Mongolia

Mongolia has a vast territory, abundant natural resources and a rich historical and cultural heritage. However, the country is striving towards providing universal access to water and sanitation for its entire population.

The Government of Mongolia recognizes that access to clean drinking water and adequate sanitation is essential for health, well-being, livelihoods and a better quality of life of people. Urban development, including the construction of new housing, infrastructure and public services, is one of the key action priorities of the current "Government of Change". As part of the Government Action Plan for 2012-2016, the Government of Mongolia has launched a number of programmes aimed at achieving national targets under the Millennium Development Goals in order to provide better living conditions and a healthy environment for the people of Mongolia.

Hence, the Ministry of Construction and Urban Development is actively pursuing efforts to improve housing conditions and the provision of water and sanitation services in urban areas throughout Mongolia. Over the past years, access to water and sanitation has improved significantly as a result of various programmes and projects, some of which were implemented with the support of international donors. The Government's efforts to improve water and sanitation will continue with the implementation of new programmes such as "100,000 New Apartments", "1,000 New Housing" in each province town and "Re-planning and Re-designing of Ger Areas of Ulaanbaatar".

The review of water and sanitation in municipalities in the Tuul-Orkhon-Selenge River Basin, presented in this report, is an important contribution to assessing the current state of water and sanitation services in Mongolia because the basin is the centre of Mongolia's urban, economic and agricultural development. Also, a vast majority of Mongolia's population live in large and small urban communities located in the basin, including the three biggest cities of the country. Data and information presented in this report are very valuable because it is the

first review of access to improved water and sanitation based on the Government-approved methodology and official national statistical data based on the 2010 Population and Housing Census. I commend the recommendations deriving from this study, which are important to be included in policies to improve water and sanitation not only in the municipalities in the basin, but are also relevant to water and sanitation in the whole country. These recommendations will be taken into account in our Government's efforts to improve water and sanitation for urban and rural populations of Mongolia.

Finally, I would like to express my appreciation to UNESCO International Hydrological Programme for conducting, in cooperation with the National Water Committee of Mongolia, this important study on water and sanitation in Mongolia. I am also very satisfied with the fruitful cooperation of UNESCO with the Government of Mongolia on the implementation of these project studies and the publication of this report. I trust that this report will become an useful information source for national policy-makers of all levels, researchers and international development donors.

TS. BAYARSAIKHAN

Member of Parliament

Minister of Construction and Urban development

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Acronyms

ADB	Asian Development Bank
ASM	Artisanal and small-scale mining
LBB	Lake Baikal Basin
IHP	International Hydrological Programme (of UNESCO)
MDG	Millennium Development Goals
MEAS	Ministry of Education and Science (of Mongolia)
MIA	Ministry of Industry and Agriculture (of Mongolia)
MEGD	Ministry of Environment and Green Development and (of Mongolia)
MOF	Ministry of Finance (of Mongolia)
MOH	Ministry of Health (of Mongolia)
MCUD	Ministry of Construction and Urban Development (of Mongolia)
NGO	Non-governmental organization
NWC	National Water Committee (of Mongolia)
O&M	Operations and Maintenance
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNJPWSS	United Nations Joint Programme on Water and Sanitation (for Mongolia)
USD	US Dollars
USUG	Water Supply and Sewerage Authority of Ulaanbaatar
WSS	Water Supply and Sanitation
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

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Executive Summary

Mongolia does not possess abundant water resources. Mongolia's water resources are unevenly distributed throughout the country's territory. In recent years, water consumption in Mongolia has increased due to population growth, rapid urbanization, economic development and changes in lifestyle. Mongolia's water resources are not only under increasing pressures to meet growing water demands, but also face a critical challenge of ensuring water supplies for current and future uses in the face of climate change impacts. For example, with the increasing trend in water demand in Ulaanbaatar, the current available water supply will not be adequate to meet growing water needs and support the projected population growth in the near future. Water flows in major rivers such as the Tuul River, Kharaa River and Kherlen River are decreasing, while there is a tendency of increasing pollution of water resources near urban areas (Basandorj et al, 2006). The impacts of climate change on Mongolia's water resources are expected to be severe. Due to climate change, Mongolia is facing increasingly severe water problems such as accelerated melting of glaciers and permafrost, drying out of springs and river beds, shrinking and breakdown of runoff to rivers.

The Selenge River Basin is the most developed region in Mongolia and is the centre of the country's political, economic and cultural life. Approximately 1.8 million people (67% of Mongolia's total population) live in the Selenge River Basin. In 2007, economic activities in the Selenge River Basin produced 81% of the national GDP of Mongolia. Out of Mongolia's 21 *aimags*[1], territories of nine *aimags,* entirely or partially, are located within the Selenge River Basin. Ulaanbaatar, the country's capital city, is located on Tuul River, which is one of the main tributaries of the Selenge River Basin. Urban settlements located in the Selenge River Basin include three large cities (Ulaanbaatar, Darkhan and Erdenet), six aimag-level towns, and 84 soum-level municipalities.

In Mongolia, water consumption per person is 3 to 4 times lower than the world average. Per capita water consumption of inhabitants of 'ger' districts of large cities, small towns and municipalities is from 8 to 10 liters per person per day, which is 4 to 5 times lower than the acceptable sanitary norms. On the other hand, the water consumption of inhabitants of apartment buildings and modern houses in Ulaanbaatar exceeds the average per capita water consumption in developed countries. There is also significant leakage of water from household faucets and toilets or from pipelines of the water supply network. This is due to lack of maintenance of the municipal water supply system and inefficient, outdated household sanitary appliances.

As of 2013, access to improved drinking water sources at the national level is 78.40%. Access to water and sanitation is higher in urban areas compared to in rural areas. The average *per capita* water consumption varies drastically for different types of housing. Inhabitants of apartment buildings are connected to centralized water supply systems and consume 270-340 liters of water per day, whereas residents of *'ger'* districts are served by water kiosks, or water trucks, and use only about 8-10 liters of water per day (Government of Mongolia, 2009). Lack of access to safe drinking water remains a concern for many rural communities in Mongolia. Inhabitants of 115 *soums* of 17 aimags consume water, which does not meet the National Drinking Water Quality Standard.

Access to safe drinking water in the Selenge River Basin ranges between 42.47% and 99.52% at the province (*aimag*) level. The drinking water coverage is the highest in large cities and their administrative territories, including Ulaanbaatar (99%), Darkhan-Uul (95%) and Orkhon (95%). The *aimags* presenting the lowest coverage of safe drinking water are Arkhangai (42%) and Khuvsgul (49%). The percentage of the population connected to centralized water supply is higher in urban areas: 49.81% in Darkhan-Uul *aimag* (the highest); 39.87% in Orkhon *aimag*, including the Erdenet City; and 36.87% in Ulaanbaatar. The proportion of the population connected to piped water supply is very low in rural areas.

In general, access to sanitation is low at the country level, with a very small portion of

the total population connected to centralized sewerage systems. At the national level, only 22.5% of the country's total population is connected to centralized sewerage systems. According to the 2013 estimation based on data of the 2010 National Population and Housing Census, about 37.3% of Mongolia's total population has access to improved sanitation, whereas about 62.7% use unimproved sanitation facilities. In general, about 64% of urban inhabitants have access to sanitation facilities, which meet hygiene standards, and this rate is 31% of rural settlements (Government of Mongolia, 2011). According to 2007-2008 Household Socio-Economic Survey conducted by the National Statistics Office (NSO) of Mongolia, four in nine persons had access to sanitation, which mets hygiene requirements, three in four persons had access to electricity and one third of the population had access to both of these services. Three quarters of urban population and one third of rural population had access to sanitation, which met hygiene standards.

Access to improved sanitation in municipalities in the Selenge River Basin is relatively low. Improved sanitation coverage is higher in large cities such as Ulaanbaatar, Darkhan and Erdenet and ranges from 49.73% to 60.4%. In most *aimags* in Mongolia, access to improved sanitation in province-level towns and soum-level municipalities is very low.

In most soum-level municipalities, the proportion of population with access to improved sanitation is lower than 20%. The percentage of the population connected to sewerage systems is the lowest in Arkhangai *aimag* (2.01%), Bulgan *aimag* (2.38%) and Khuvsgul *aimag* (1.32%). In small municipalities in rural areas, most people use pit latrines. The use of septic tanks is low, with about 0.02-1.0% of the population using septic tanks.

With the increase of the expansion of individual housing areas with modern water systems in recent years, the use of septic tanks and small-size decentralized biological wastewater treatment plants is becoming more common for such new housing developments.

Centralized systems of water supply and sanitation exist in large cities and in province-level towns. A majority of population with no access to improved water supply, sanitation and electricity lives in rural areas and represents the poor segment of the population. As of 2012, about 69% of the country's total population resides in urban areas (World Bank, 2013). Large disparities exist in the coverage of water and sanitation services in large urban areas versus small municipalities in rural areas, the latter always being lower. The low rate of access to water and sanitation in rural municipalities is due to lack of investment in rural development and the strong dependency of rural municipalities on the central Government's financing because local governments lack financial resources to deal with water and sanitation needs of the communities. On the other hand, large cities have always been a priority for large-scale state investment

and financing for the fact that issues of large cities have a high profile on the political agenda. Furthermore, there is lack of public awareness on water, sanitation and hygiene, especially in rural communities. There is a critical need to raise public awareness and education of the rural population on water, sanitation and hygiene.

There is also a significant difference between access to water and access to sanitation services. The coverage of improved sanitation both in large cities and small municipalities is much lower than the water supply coverage. The low sanitation coverage rate results in the discharge of large quantities of wastewater to rivers and the soil, causing water and environmental pollution. The low sanitation coverage in both large cities and rural municipalities is mainly due to the low priority on sanitation by central and local governments. The difference between access to drinking water and access to sanitation is because drinking water issues have always been a high priority topic on both political and public agendas.

Over the recent years, public investment in improving water and sanitation has grown significantly as a result of the Government's effort to achieve the national MDG target on water and sanitation to increase, by 2015, access to safe drinking water to 70% from the 1990 baseline of 30.8% and improved sanitation coverage to 50% from the 1990 baseline of 22%. Although water supply and sanitation services have improved in the recent years as a result of the country's rapid economic growth and rising living conditions, the current status of the implementation of the MDG target on water and sanitation in Mongolia shows slow progress in general (Government of Mongolia and UNDP, 2011). The expansion of water supply and sanitation services does not keep up with the urbanization rate. In addition, the capacity of water treatment facilities is insufficient and their performance and effectiveness is low.

As a result of the Government's efforts and growing national and international financing for the water and sanitation sector, significant improvements in water and sanitation services have been made over the recent year, which have contributed to the enhancement of the quality of life of approximately of 400 thousand people (Government of Mongolia, 2011). However, there are pressing needs to improve access to safe drinking water and sanitation for the remaining population without access to these services.

Towards this end, the following recommendations are proposed.

- *Reduce disparities in access to water and sanitation*

  There is a critical need to reduce large disparities in access to water and sanitation services between large urban areas and small rural municipalities. Programmes and projects specifically targeting province-level towns and small rural munici-

palities need to be developed and implemented, with strong emphasis on providing safe water supplies and adequate sanitation services in 'ger' districts. The potential effectiveness of decentralized water and sanitation services, as well as enabling conditions for community participation and community management of these services, need to be explored.

- *Improve the institutional capacity and legal framework for the water and sanitation sector*

  There is a need to improve the institutional capacity and legal framework for the water sector. With the revision of the relevant existing laws into the new Law on Water (2012) and Law on the Use of Water Supply and Sewerage Systems in Urban Areas and Human Settlements (2011), the legal framework for the water and sanitation sector has improved significantly. However, regulations on tariff setting for water supply and sanitation services and on fees for different types of water uses need to be improved.

- *Promote innovative, low-cost technological solutions*

  Innovative, low-cost technologies for water and sanitation that offer practical solutions in providing small-scale, decentralized water and sanitation services in rural municipalities and 'ger' districts need to be identified and promoted, along with relevant capacity building support. Such technologies should be deployed with special emphasis on areas, where centralized water and sanitation systems are not available. The choice of these technologies should also take into account local and climatic conditions, such as the robustness and adaptability of the technologies in cold climate zones. Water saving technologies should be introduced and water meters need to be provided in areas connected to centralized water and sanitation systems. Raising public awareness and educating the public about the importance of efficient water use in households is needed.

- *Increasing financing for water and sanitation*

  Innovative financing mechanisms for water and sanitation sector need to be explored, by examining other countries' experiences and international mechanisms for financing both improvement of water and sanitation services and expansion of water and sanitation infrastructure. In addition, the government budget for water and sanitation programmes need to be increased. Increased investment in water and sanitation will bring about multiple socio-economic and environmental benefits resulting from access to improved water supply and adequate sanitation such as health improvements, poverty reduction, enhanced environmental quality, reduction in water pollution, etc..

- *Promote public and private partnerships in the water and sanitation sector*

  Collaboration with the private sector in the water and sanitation sector should be strengthened. The private sector has great potential to contribute to expanding the coverage of water and sanitation services. Community and private sector participation should be mobilized to improve access to water supply and sanitation in areas where central government investment is lacking. The ongoing Government efforts on water and sanitation include large urban development projects, which have great potential for public-private partnerships to attract additional private sector investment in water and sanitation.

- *Raising education and awareness on water, sanitation and hygiene*

  National programmes on improving water education and raising public awareness on water, sanitation and hygiene need to be developed. Advocacy activities for educating the public on the importance of good quality water and adequate sanitation for human health and the environment need to be promoted.

- *Improving water resources management*

  In general, national strategies for sustainable use and management of water resources need to be clearly defined, to ensure the sustainability of resources and current and future needs of water supplies for different uses such as drinking water, agricultural irrigation and water for mining and industrial activities. Water resources management strategies should also take into account expected climate change impacts, including reduced precipitation rates, low water levels, prolonged and more frequent droughts, and high evaporation rates.

In addition, measures to prevent, control and reduce water pollution need to be implemented and strengthened. Special emphasis need to be given on improving access to sanitation to prevent water-borne diseases and reduce soil and groundwater pollution. Existing wastewater treatment plants in large cities and small towns need to be urgently rehabilitated and upgraded with modern technologies and equipment. New wastewater treatment plants need to be built in towns and municipalities where wastewater treatment facilities do not exist.

Water supply services should be improved and secured to provide access to safe drinking water in sufficient quantities for the entire population of the country. The provision of safe drinking water to herder families needs to be the priority of rural development and water resources management strategies. Drinking water treatment at the household level should be considered as an alternative way to provide clean water for

rural population and in areas where access to improved water sources and centralized water purification systems is unavailable or inadequate.

Water demands should be assessed based on mid- and long-term perspectives, taking into account climate change impacts as well. To meet growing water demands and to face climate change challenges, effective ways to ensure water security and to meet current and future water needs should be implemented by augmenting the water storage capacity in various forms as a mitigation strategy and by increasing water use efficiency in all water use sectors.

Integrated water resources management plans need to be developed. Water resources management at the basin level should be practiced by establishing basin commissions for all major river basins and systems.

People need clean water and sanitation to sustain their health and maintain their dignity. Safe water, proper sanitation and good hygiene have a direct bearing on people's health and development.

1. Introduction

1.1. Background

Mongolia is a landlocked country, located in the heart of Asia. It has a total area of 1,566,500 sq. km. and borders with Russia to the north and China to the south. Mongolia has a population of 2,911,800 as of September 2013 (NSO, 2013). The capital of Mongolia is Ulaanbaatar, which is home to almost half of the country's total population. Mongolia is one of the most sparsely populated countries on the world, with an average population density of 1.8 inhabitants per sq. km.

Mongolia is divided administratively into 21 *aimags* (provinces) and the capital city Ulaanbaatar, which is an administrative and territorial unit on its own. Each of the *aimags* is further divided into smaller administrative units, known as *soums* (equivalent to counties), and the *soums* are divided into *baghs*, which are the smallest administrative and territorial units in Mongolia. Ulaanbaatar has nine districts and 121 *khoroo* (sub-districts).

Mongolia is located in the extreme continental climate zone, characterized by cold winters, dry climatic conditions, high temperature fluctuations, a low precipitation level, and a huge number of sunny days throughout the year. The annual mean air temperature for Mongolia is 0.7°C. The country is characterized by arid and semi–arid ecosystems for most parts, with precipitation ranging between 50-400 mm. Approximately 90% of the precipitation evaporates and only 10% forms surface runoff, partially recharging the groundwater aquifers. Mongolia is a water scarce country.

Mongolia does not possess abundant water resources. Mongolia's water resources are unevenly distributed throughout the country's territory. The total amount of water resources is estimated at 599 km³, composed mainly of water stored in lakes (500 km³), glaciers (62.9 km³) and surface and groundwater resources (34.6 km³) (MNET, 2010). The country largely depends on groundwater resources. Only less than 10% of Mongolia's water consumption is provided from surface water resources. The total water consumption by different types of water uses is estimated as: 18.1% for drinking and domestic use; 39.3% for industry; 24.0% for livestock, 17.4% for irrigation; and 1.2% for other purposes. In recent years, water consumption has increased in Mongolia, due to a rise in the urban population and social-economic development. In Mongolia, agricultural water use is comparatively low and crop farming is mainly non-irrigated. The vast majority of livestock husbandry is based on nomadic pastoralism practices. The agricultural sector is totally dependent on the ecosystem's ability to provide water retention, quantity and quality regulation and reticulation services. This makes the maintenance of ecosystem functions and water provisioning services absolutely critical for the survival of communities, and there is an urgent need to improve the capacity of natural ecosystems to regulate water baseflows in critical water catchments, including storage of water falling in heavy rainfall episodes in wetlands and aquifers (MNET, 2010).

The impacts of climate change on Mongolia's water resources are expected to be severe. Due to climate change, Mongolia is facing increasingly severe water problems such as accelerated melting of glaciers and permafrost, drying out of springs and river beds, shrinking and breakdown of runoff to rivers. Changes in precipitation patterns and am-

bient air temperatures and humidity, coupled with melting of glaciers and permafrost, are likely to severely affect the hydrological regime. Average annual precipitation has decreased by 7% between 1940 and 2007 (MNET, 2010). In particular, the amount of precipitation has decreased during the summer months. It is projected that precipitation will decrease in the short term by 4% between 2010 and 2039 (MNET, 2010). There have already been noticeable changes in river flow patterns. An increase in the frequency of extreme weather and climatic events is expected. These include flash floods, heavy snowfalls and snow storms, spring sandstorms, droughts and *dzud*[4]. The incidence and severity of drought has increased significantly in Mongolia over the last 60 years. Mongolia experienced extreme droughts in consecutive summers during 1999-2002, which were followed by severe *dzud* in winter.

The impacts of climate change on Mongolian communities are likely to be exacerbated by a number of other human-induced threats to the environment. During the last 50 years, human activities have significantly affected the environment and the ecosystem functions that underpin their water supplies. The impact of climate change and human activities have resulted in increased water scarcity, increased pollution levels of surface waters and groundwater resources, and water regime change. This will continue in the future if no appropriate actions are taken, especially because Mongolia has limited and water resources, which are unevenly distributed throughout the country.

As of 2012, about 69% of the country's total population resides in urban areas (World Bank, 2013). The urban population has grown over the past decade as a result of population growth and migration. Rural to urban migration has increased significantly in recent years, especially after the severe *dzud* of 2000-2003, during which 15% of livestock was lost, and more recently, after the 2009-2010 *dzud* which affected 50-70% of the total territory of Mongolia and caused a loss of 8 million livestock, leaving 8,710 herder households without any livestock (MNET, 2010). This is expected to further accelerate migration to cities.

In Mongolia, centralized piped systems of water supply and sanitation exist in only large cities—namely, Ulaanbaatar, Darkhan and Erdenet—and province-level towns of 18 *aimags*. Access to water and sanitation is higher in urban areas compared to in rural areas. Furthermore, a majority of population with no access to improved water supply, sanitation and electricity is poor, compared with the population with access to all these services. This trend is observed in both urban and rural areas, however with little discrepancy in the latter.

4 Dzud is a Mongolian term for a harsh winter with heavy, long lasting or frequent snowfall combined with extreme low temperatures. With climate change, occurrence of dzud is becoming more frequent and its intensity greater. The dzud impact on livestock has been devastating in recent years.

Baikal Lake Basin

Although Lake Baikal is located in Russia, its watershed is a transboundary ecosystem encompassing over 500,000 sq. km. shared between Russia and Mongolia, with over 400 rivers and streams (see Figure 1).

Lake Baikal is the ancient and largest (by volume) freshwater lake in the world. The Selenge River is the biggest tributary to Lake Baikal and a major transboundary water system of the Lake Baikal Basin. On average it brings 30 cub. km. of water annually to the Baikal, which is about 60% of the total inflow to the lake. The Selenge River originates in Mongolia and about half of its annual runoff is generated in Mongolia. The catchment area of the Selenge River is 447,060 km^2, of which 33% is in Russia and 67% in Mongolia. The Selenge River Basin comprises over 80% of the Lake Baikal Basin.

Note: The part of the Selenge River Basin on the Mongolian territory is shown in yellow.

Figure 1. The Selenge River Basin as part of the Lake Baikal Basin

(Courtesy of Baikal Institute of Nature Management, Siberian Branch of the Russian Academy of Sciences - BINM SB RAS)

Lake Khuvsgul (on the Mongolian northern border, as shown in Figure 1) is located in the Selenge River Basin and also one of the large ancient lakes of Asia. It is estimated to be at least five million years old. Khuvsgul and Baikal are sister lakes, both formed from the same rift in the Earth's crust. Lake Khuvsgul, which is located in northern Mongolia, is the largest freshwater lake in Mongolia by volume and the 16th largest naturally formed lake in the world by water volume. It contains 60% of the surface freshwater resources of Mongolia and is a constant source of clean freshwater flowing to the Selenge River through its sole outlet—the *Egiin Gol* (Eg River). The Lake Khuvsgul ecosystem has a unique flora and fauna, some of which are endemic. In 1992, Lake Khuvsgul was designated as a national park, comprising an area of 900,000 ha at the southern limit of the Siberian taiga forest. As an oligotrophic lake, Lake Khuvsgul is characterized by high levels of dissolved oxygen, high transparency and low levels of nutrients and organic carbon.

1.2. Objective of the study

The study on "Review and ranking of upgrade needs for water and sanitation in Mongolian municipalities in the Selenge River Basin, including the identification of ongoing and planned water and sanitation projects" was conducted in the framework of UNESCO-executed activities under the UNDP-GEF Project on "Integrated Natural Resources Management in the Baikal Basin Transboundary Ecosystem" (Mongolia and Russia). The project objective is to spearhead integrated natural resources management of Lake Baikal Basin, ensuring ecosystem resilience and reduced water quality threats in the context of sustainable economic development.

The study focused on:

- The review of water, sanitation and wastewater in main cities and municipalities in the Selenge River Basin of Mongolia;
- The review of upgrade needs to improve water and sanitation;
- Identifying ongoing and planned water and sanitation projects;
- Developing recommendations on improving water and sanitation in municipalities in the Selenge River Basin with the aim to prevent, control and reduce pollution of basin's water resources from urban areas.

The scope of the study was to:

- Compile background information on water resources of the Selenge River Basin and the socio-economic situation of the basin
- Review the current situation of water and sanitation in main cities and municipalities in the basin;

- Review the upgrade needs to improve water, sanitation and wastewater management in municipalities in the basin;
- Compile an inventory of ongoing and planned programmes and projects on water and sanitation covering the municipalities in the Selenge River Basin;
- Develop recommendations to improve access to water and sanitation and wastewater management in municipalities in the Selenge River Basin with the aim to prevent, control and reduce pollution of basin's water resources from urban areas.

1.3. Data and methodologies

1.3.1. Methodologies

The study is based on the classification by the WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation of 'improved' and 'unimproved' drinking-water sources and sanitation facilities. The JMP definitions of improved drinking water sources and sanitation facilities are described below (http://www.wssinfo.org):

- **Improved drinking-water source:** For MDG monitoring, an improved drinking-water source is defined as one that, by nature of its construction or through active intervention, is protected from outside contamination, in particular from contamination with feacal matter.
- **Improved sanitation facilities:** For MDG monitoring, an improved sanitation facility is defined as one that hygienically separates human excreta from human contact.

Improved drinking-water sources encompass three dimensions of water security: quality, proximity and quantity.

According to the classification of the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (2013), the different categories of 'improved' and 'unimproved' drinking-water sources and sanitation facilities include:

Drinking-water source categories

'Improved' sources of drinking-water:

Piped water into dwelling
Piped water to yard/plot

Public tap or standpipe
Tubewell or borehole
Protected dug well
Protected spring
Rainwater

'Unimproved' sources of drinking-water:

Unprotected spring
Unprotected dug well
Cart with small tank/drum
Tanker-truck
Surface water
Bottled water

Sanitation categories

'Improved' sanitation:

Flush toilet
Piped sewer system
Septic tank
Flush/pour flush to pit latrine
Ventilated improved pit latrine (VIP)
Pit latrine with slab
Composting toilet
Special case

'Unimproved' sanitation:

Flush/pour flush to elsewhere
Pit latrine without slab
Bucket
Hanging toilet or hanging latrine
No facilities or bush or field

In 2012, the National Statistical Office and Ministry of Construction and Urban Development of Mongolia adapted the JMP classification of drinking-water sources and sanitation facilities into a new national classification with the aim align the assessment of water and sanitation coverage in Mongolia with the global MDG monitoring data. This new national classification of 'improved' and 'unimproved' water and sanitation facilities was adopted by Decision 1/4 of the Chairperson of the National Statistical Office of Mongolia on 03 January 2013.

1.3.2. Data

The study is based on existing information and data that are available at national institutions and government organizations.

Data on water and sanitation coverage in all municipalities are based on the 2010 National Population and Housing Census. People who use water from private hand wells and other open water sources non included in the census were excluded from this data analysis as their number is negligible.

Data of a previous study on access to improved water and sanitation carried out by a team coordinated by Dr P. Batimaa under the project on "Improving Access to Water and Sanitation" (MON/08/302), implemented by the Mongolian Government and funded by UNDP, were used and re-evaluated for the purpose of this study, where relevant. The methodology for the re-evaluation of these data was based on the national classification of 'improved' and 'unimproved' water and sanitation facilities, adopted by the Decision 1/4 of the Chairperson of the National Statistical Office of Mongolia on 03 January 2013.

All data used in this report are based on official government and UN data, which have been consolidated and defined using methodologies agreed by government institutions and UN agencies.

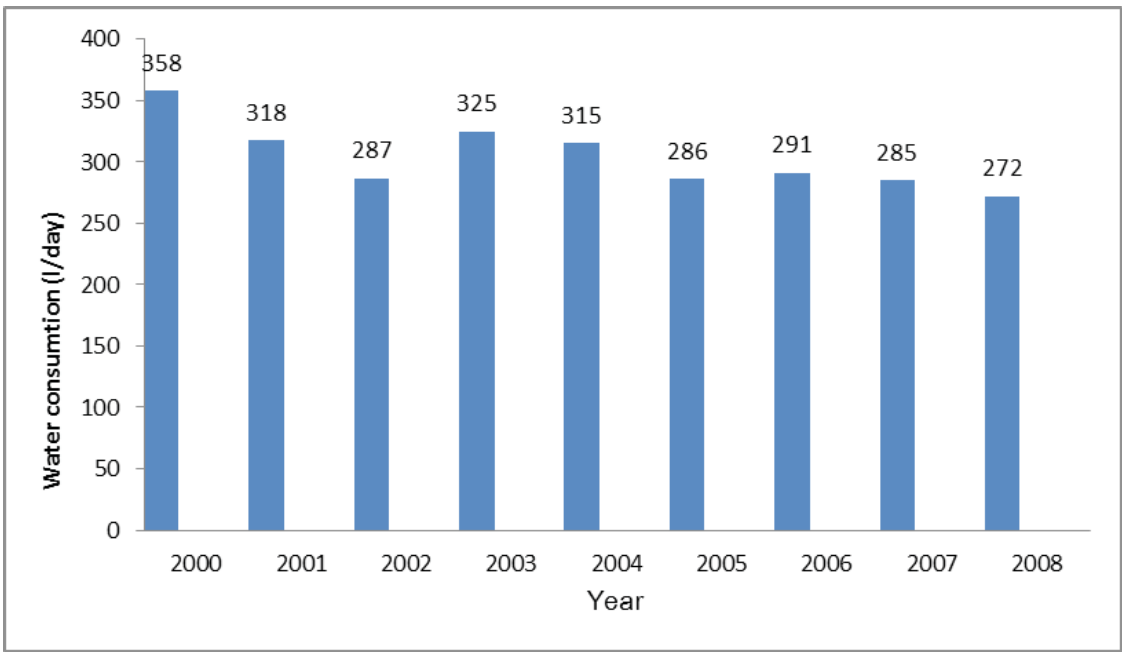
2. Water and Sanitation Coverage in Mongolia

2.1. Access to drinking water at the national level

In Mongolia, centralized engineered systems of water supply and sanitation exist only in large urban settlements, including the country's three biggest cities (Ulaanbaatar, Darkhan and Erdenet), province-level towns (centers of *aimags*) and a few smaller *soum*-level towns.

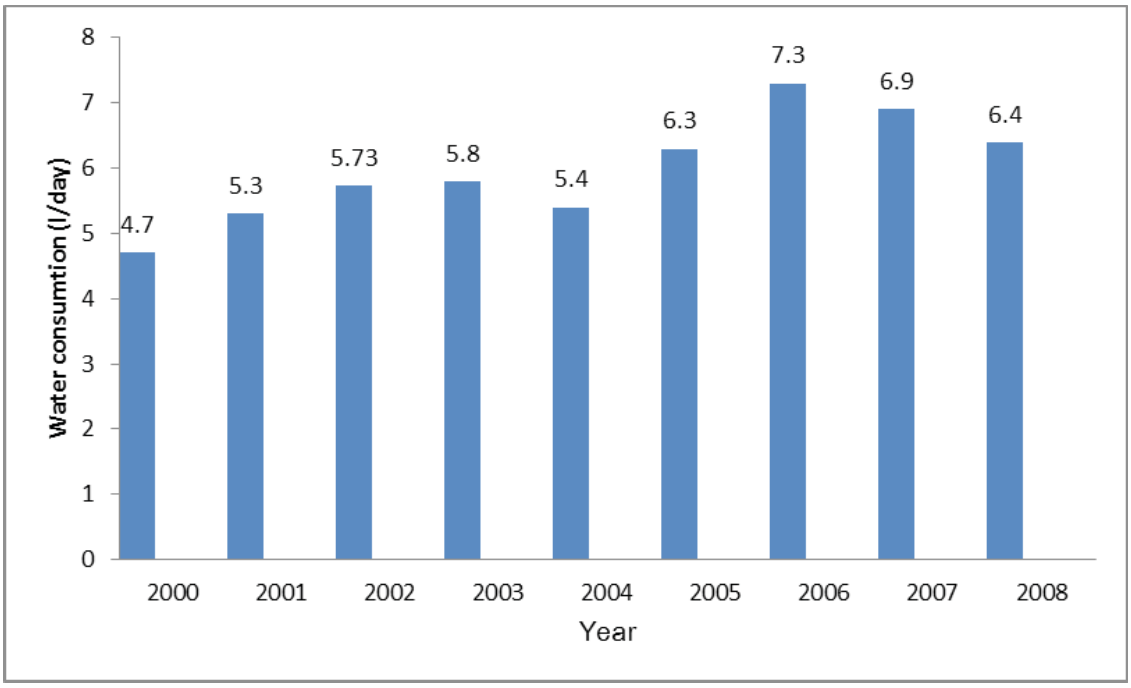
Access to water supply is a relatively good in the capital city Ulaanbaatar, other large cities and *aimag* centers of Mongolia. Per capita water consumption varies drastically

for different types of housing. Inhabitants of apartment buildings connected to centralized water supply systems consume 270-340 liters of water per day (Figure 2), whereas inhabitants of '*ger*' districts use only about 4.7-8.4 liters of water per day (Figure 3).



Source: Basandorj, 2010.

Figure 2. Water consumption (*per capita*) by apartment users in Ulaanbaatar



Source: Basandorj, 2010.

Figure 3. Water consumption (*per capita*) by inhabitants of '*Ger*' areas in Ulaanbaatar

At a water borehole in the Gobi desert, Mongolia

Access to safe drinking water services has improved significantly over the past decade in Mongolia from 39.2% in 2005 to 47.8% in 2010 and to 78.4% in 2013 of the country's total population in the respective years. In 2005, 39.2% of country's 2.5 million population had access to improved water supply services, of which: around 22% had access to centralized water supply engineered systems; 8.5% used water from kiosks connected to centralized water supply networks; 8.6% used water from protected groundwater wells; and 0.1% consumed water from protected springs (Government of Mongolia, 2011). In 2010, access to safe drinking water improved to 47.8% of the total 2.8 million population, of which: 22.5% had access to centralized water supply engineered systems; 15.3% used water from kiosks connected to centralized water supply networks; 9.9% used water from protected wells; and 0.1% consumed water from protected springs (Government of Mongolia, 2011).

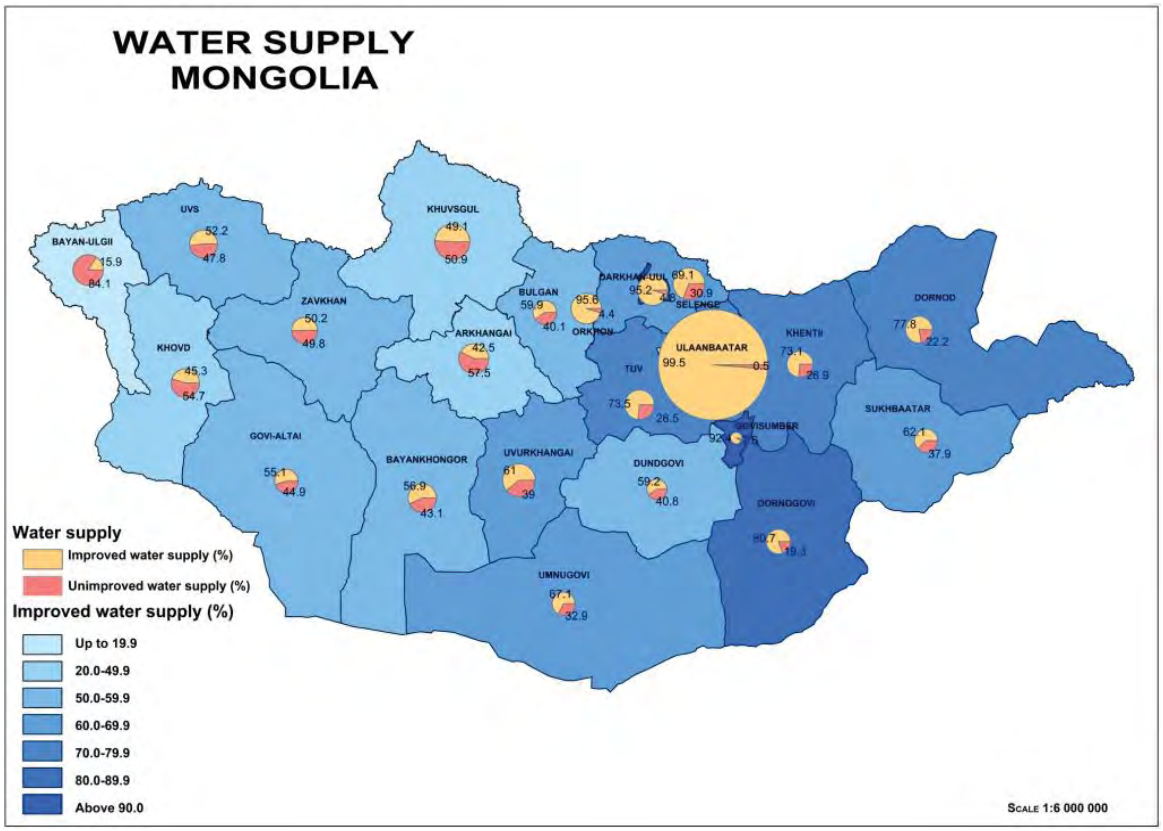
As of 2013, access to improved drinking water sources at the national level is 78.40%, as shown in Table 1 below. This comprises the following major types of improved drinking water sources:

- centralized water supply systems and networks - 22.59%
- water kiosks connected to centralized water supply networks - 12.56%
- water kiosks with storage tanks (water transported by tankers from centralized water supply systems to water tanks) - 20.56%

- protected groundwater wells - 15.84%
- water trucks - 6.13%
- protected springs - 0.72%

Lack of access to safe drinking water remains a concern for many rural communities in Mongolia. Inhabitants of 115 *soums* of 17 *aimags* consume water which does not meet the National Water Quality Standard. Among them, inhabitants in 94 *soums* use water rich in magnesium, whereas drinking water in 102 *soums* is hard and in 64 *soums* is mineralized (Government of Mongolia, 2009).

The percentage of the population with access to improved drinking water supply at the national level is illustrated in Figure 4.



Data source: Data based on 2010 National Population and Housing Census

Figure 4. Access to improved water supply in Mongolia (as of 2013)

Access to safe drinking water in the Selenge River Basin ranges between 42.47% and 99.52% at the *aimag* (province) level. The *aimags* presenting the lowest coverage of safe drinking water are Arkhangai (42%) and Khuvsgul (49%). The drinking water coverage is the highest in large cities and their administrative territories, including Ulaanbaatar (99%), Darkhan of Darkhan-Uul *aimag* (95%) and Erdenet of Orkhon *aimag* (95%).

Regarding sources of improved water supply, the percentage of the population connected to centralized water supply networks is higher in urban areas: 49.81% in Darkhan-Uul *aimag* (the highest); 39.87% in Orkhon *aimag*, including the Erdenet City; and 36.87% in Ulaanbaatar, the capital city of Mongolia. It is very low in rural areas: 2.03% in Arkhangai *aimag*; 2.37% in Bulgan *aimag*; 2.93% in Zavkhan *aimag*; 2.11% in Uvurkhangai; 14.39% in Selenge *aimag*; and 1.31% in Khuvsgul *aimag*.

Table 1. Access to improved drinking water supply at the national level in Mongolia (as of 2013)

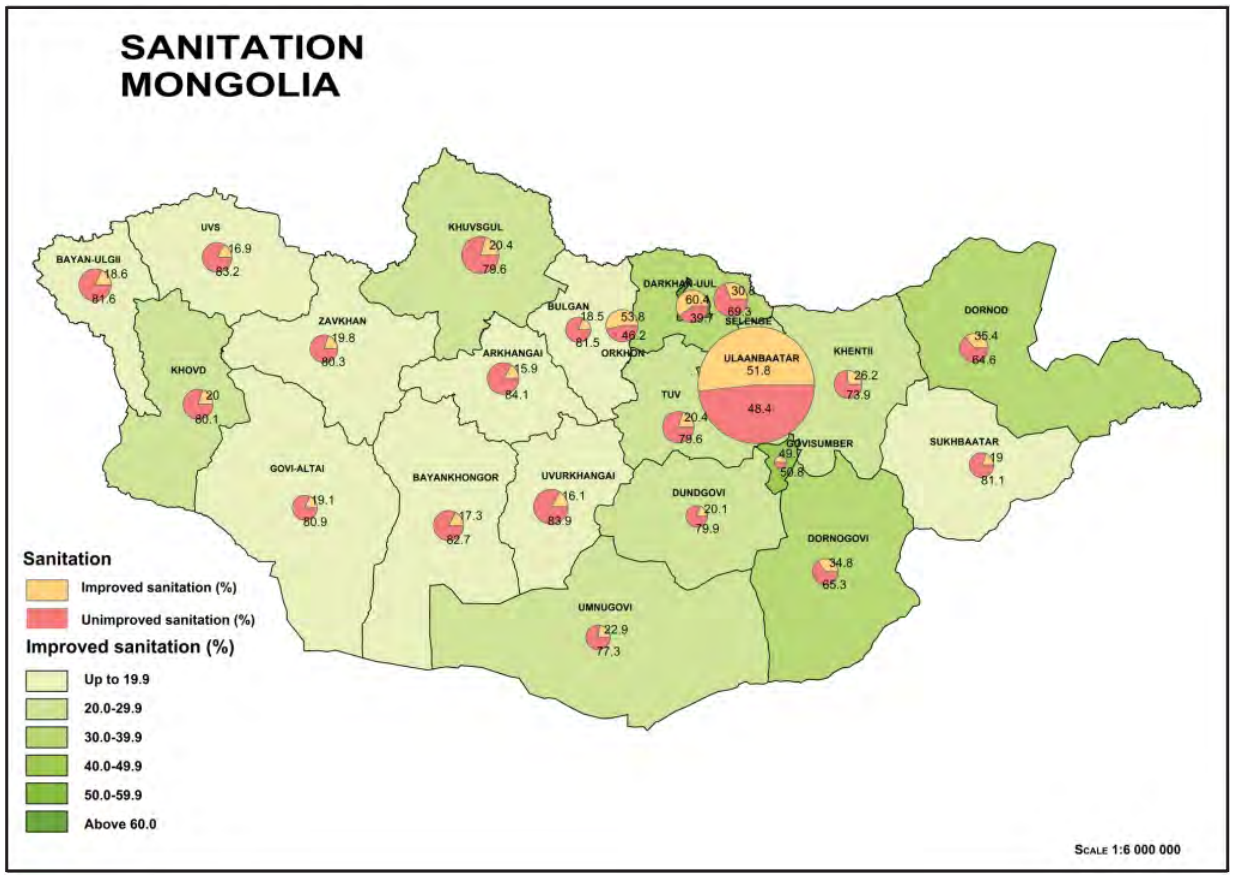
Name of *aimag* and city	**Population served by improved water supply, %**	**Of which**					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to the water supply network	Transported to water tanks			
National average	78.40	22.59	12.56	20.56	6.13	15.84	0.72
Arkhangai	**42.47**	**2.03**	**0.28**	**13.73**	**5.25**	**19.01**	**2.18**
Bayan-Ulgii	15.93	2.61	0.11	0.06	2.73	9.91	0.50
Bayankhongor	56.88	3.96	0.28	4.31	26.88	19.14	2.30
Bulgan	**59.86**	**2.37**	**0.80**	**7.73**	**13.43**	**33.38**	**2.15**
Gobi-Altai	55.14	6.41	0.30	1.81	19.31	25.54	1.78
Dornogobi	80.69	21.87	17.03	8.78	15.59	17.18	0.24
Dornod	77.79	22.31	20.66	7.68	8.70	17.78	0.66
Dundgobi	59.16	5.21	20.00	0.90	3.07	29.85	0.14
Zavkhan	**50.15**	**2.93**	**0.19**	**7.55**	**14.13**	**24.99**	**0.35**
Uvurkhangai	**61.05**	**2.11**	**0.45**	**25.53**	**4.50**	**27.01**	**1.45**
Umnugobi	67.07	6.24	29.41	0.85	3.00	25.46	2.11
Sukhbaatar	62.07	6.84	18.36	3.21	5.36	25.03	3.27
Selenge	**69.10**	**14.39**	**7.95**	**9.57**	**17.66**	**19.33**	**0.20**
Tuv	**73.46**	**6.60**	**2.14**	**11.70**	**8.06**	**43.94**	**1.02**
Uvs	52.24	3.35	0.59	0.64	2.49	44.41	0.76
Khovd	45.34	5.69	2.98	0.17	2.41	32.99	1.09
Khuvsgul	**49.07**	**1.31**	**0.25**	**13.03**	**7.53**	**24.61**	**2.34**
Khentii	73.09	11.51	10.75	4.49	5.89	38.77	1.68
Darkhan-Uul	**95.18**	**49.81**	**0.58**	**17.23**	**5.88**	**21.51**	**0.17**
Orkhon	**95.56**	**39.87**	**0.30**	**49.00**	**1.05**	**5.19**	**0.15**
Gobi-Sumber	92.40	37.60	0.68	4.26	27.82	21.91	0.13
Ulaanbaatar (the capital city)	99.52	36.87	22.00	33.20	2.90	4.43	0.11

Data source: Data based on 2010 National Population and Housing Census

2.2. Sanitation coverage at the national level

According to 2007-2008 Household Socio-Economic Survey conducted by the National Statistics Office (NSO) of Mongolia, four in nine persons had access to sanitation, which meets hygiene requirements, three in four persons had access to electricity and one third of the population had access to both of these services. Three quarters of urban population in urban areas and one third of rural population had access to sanitation, which met hygiene standards.

The 2013 estimation based on data of the 2010 National Population and Housing Census indicates that about 37.3% of Mongolia's total population has access to improved sanitation, whereas about 62.7% use unimproved sanitation facilities. Figure 5 shows the level of sanitation coverage in Mongolia. In general, about 64% of urban inhabitants have access to sanitation facilities, which meet hygiene standards, and this rate is 31% in rural settlements (Government of Mongolia, 2011).



Data source: Data based on 2010 National Population and Housing Census

Figure 5. Sanitation coverage in Mongolia (as of 2013)

Access to improved sanitation is higher in urban areas and ranges from 49.73% to 60.4% in cities, particularly in: Ulaanbaatar, the Darkhan City, the Erdenet City and Gobi-Sumber town. In most *aimags* in Mongolia, access to improved sanitation is lower than 20%. The rate of access to improved sanitation is shown in Table 2 for all *aimags*, along with detailed data by major types of sanitation facilities.

A simple sanitation facility in 'ger' residential areas

Table 2. Access to improved sanitation at the national level in Mongolia (as of 2013)

Name of *aimag* and city	Access to improved sanitation, %	Of which				
		Connected to sewage networks	Septic tanks	Decentralized sanitation (with sewage transportation)		Ventilated improved pit latrines
				Pumped sewage tanks	Ventilated improved pit latrines	
National average	37.30	22.45	0.21	6.56	8.08	0.00
Arkhangai	**15.94**	**2.01**	**0.02**	**4.52**	**9.38**	**0.00**
Bayan-Ulgii	18.63	2.21	0.41	7.28	8.73	0.00
Bayankhongor	17.29	3.95	0.02	6.48	6.84	0.00
Bulgan	**18.48**	**2.38**	**0.03**	**6.45**	**9.62**	**0.00**
Gobi-Altai	19.10	5.79	0.03	6.46	6.82	0.00
Dornogobi	34.81	21.84	0.21	5.41	7.34	0.00
Dornod	35.42	21.65	0.08	5.01	8.69	0.00
Dundgobi	20.15	5.24	0.05	7.06	7.79	0.00
Zavkhan	**19.75**	**2.83**	**0.07**	**8.12**	**8.74**	**0.00**
Uvurkhangai	**16.10**	**2.14**	**0.08**	**6.43**	**7.46**	**0.00**
Umnugobi	22.85	5.22	0.33	8.25	9.06	0.00
Sukhbaatar	18.96	6.69	0.04	5.26	6.97	0.00
Selenge	**30.78**	**14.00**	**0.20**	**6.65**	**9.92**	**0.00**
Tuv	**20.44**	**6.23**	**0.10**	**5.40**	**8.72**	**0.00**
Uvs	16.86	3.28	0.07	5.66	7.84	0.00
Khovd	19.99	5.56	0.10	6.58	7.76	0.00
Khuvsgul	**20.37**	**1.32**	**0.01**	**8.02**	**11.02**	**0.00**
Khentii	26.17	11.39	0.13	5.84	8.81	0.00
Darkhan-Uul	**60.40**	**49.33**	**0.27**	**4.70**	**6.10**	**0.00**
Orkhon	**53.82**	**39.63**	**0.02**	**6.89**	**7.28**	**0.00**
Gobisumber	49.73	37.97	1.03	4.46	6.26	0.00
Ulaanbaatar (capital city)	**51.80**	**36.84**	**0.32**	**6.88**	**7.77**	**0.00**

Data source: Data based on 2010 National Population and Housing Census

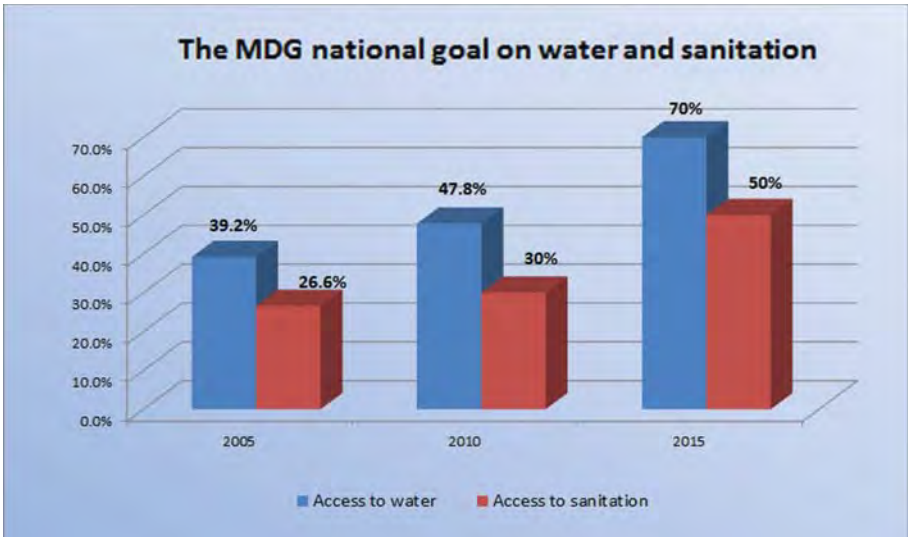
In general, access to sanitation is low at the country level, with a very small portion of the total population connected to centralized sewerage systems. At the national level, only 22.5% of the country's total population is connected to centralized sewerage systems. The percentage of the population connected to sewerage systems is the lowest in Arkhangai *aimag* (2.01%), Bulgan *aimag* (2.38%) and Khuvsgul *aimag* (1.32%). The use of septic tanks is low, with only 0.02-1.0% of the population using septic tanks. With the expansion of individual housing areas with modern water systems in recent years, the use of septic tanks and small-size decentralized biological wastewater treatment plants is becoming more common for such new housing developments.

In rural areas, most people use unimproved pit latrines. About 43.94% of the total population of Mongolia uses non-ventilated pit latrines, which is an unimproved type of sanitation and one of the main sources of pollution of the soil and shallow groundwater resources and causes water-related diseases such as hepatitis, jaundice and dysentery. Incidents of outbreaks of jaundice and dysentery have increased over the last few years due to the growing environmental pollution, lack of access to safe drinking water, and a low level of hygiene education. A number of multi-stage measures have been implemented over the last 20 years with the purpose to improve and expand the access to water supply and sanitation services as part of urban planning and development in cities and *aimag* centres.

2.3. The Millennium Development Goal target on water and sanitation in Mongolia

The Millennium Development Goals (MDG) target on water and sanitation calls to "halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation." As this was against the 1990 baseline data, the MDG target on water and sanitation in Mongolia is to increase, by 2015, access to safe drinking water to 70% from the 1990 baseline of 30.8% and improved sanitation coverage to 50% from the 1990 baseline of 22% (Figure 6).

Although water supply and sanitation services are improving over the recent years as a result of the rapid economic growth and rising living conditions, the current status of the implementation of the MDG target on water and sanitation in Mongolia shows slow progress in general. The implementation of the drinking water target shows better results than the sanitation target. Given this slow progress in the MDG implementation and the population growth, it is likely that Mongolia will not meet the MDG targets on both water and sanitation 2015.



Source: MCUD, 2012

Figure 6. The Millennium Development Goals target on water and sanitation in Mongolia

The progress in the implementation of the MDG target on water and sanitation has been assessed by the Ministry of Construction and Urban Development (MCUD) of Mongolia for the period from 2005 to 2010 and is shown in Table 3.

Over recent years, a number of activities were implemented to improve access to clean water in '*ger*' districts. The Fourth National Report on the MDG implementation (Government of Mongolia, 2011) notes that these activities aimed at expanding access to safe drinking water, connecting the existing water supply points to central systems, increasing the number of water supply points, and creating conditions for connecting some public facilities (such as schools and health centers) in '*ger*' districts to access to the central water supply and sewage pipeline system and providing access to individual house connections.

According to data provided by the Ministry of Construction and Urban Development, in addition to these urban development-based activities, the Government allocated 14.7 billion MNT in the period from 2006 to 2009 to improve access to safe drinking water to the rural population. In particular, the drilling of 1899 new wells resulted in an increase of 1.3% over the 2005 level, bringing the total portion of water supply from protected wells to 9.9%. Under the "40,000 Apartments" project and "National Programme on Developing '*Ger*' Districts into Apartment Districts", 33.2 thousand families were connected to centralized water supply and sewage facilities.

Table 3. Implementation of the MDG target on water and sanitation in Mongolia (2005-2010)

MDG target	2005	2010	Outcome
Access to safe drinking water	39.2 %	47.8 %	During the period from 2005 to 2010, approximately 400 km drinking water, wastewater and heating pipelines were rehabilitated or newly constructed by the state budget financing of over 50 billion MNT (*Mongolian tugrugs*). In addition, about 350 km drinking water, wastewater and heating pipelines, 10 wastewater treatment facilities and 100 water kiosks were constructed and another 60 water kiosks were connected to the central water supply system within the implementation of projects financed by the Asian Development Bank and World Bank loans. As a result of these efforts,, the drinking water coverage increased to 47.8% of the total population (of 2.8 million) in 2010. From this, about 22.5% used water from centralized water supply systems, 15.3% from water kiosks connected to central pipeline systems, 9.9% from protected wells, and 0.1% from protected springs. The sanitation coverage increased to 30% of the total population in 2010 from 26.6% in 2005.
Access to improved sanitation	26.6 %	30.0 %	

Source: MCUD, 2012

To achieve the MDG targets on and water, sanitation and housing, several national programmes were adopted by the Parliament of Mongolia (*The State Great Khural*), including: the "New Construction" mid-term strategy (*The State Great Khural* of Mongolia, Resolution No.36/2010); "National Programme on Water" (The Government of Mongolia, Resolution No. 303/2008) and "National Programme on Developing '*Ger*' Districts into Apartment Districts". Activities under these programmes have been incorporated into the Government Annual Socio-Economic Development Guidelines and other development and policy papers, and the required financial resources have been provided from the state and local budgets and foreign aid and assistances.

In recent years, public investment in water supply and sanitation facilities has been increased. For example, the public investment of 3.5 billion MNT in 2006 escalated to 13.02 billion MNT and grew by 4 times. 2005-2010, the public investment of 70 billion MNT was allocated for the construction of water supply, sewerage and heating networks, water reservoirs and tanks, wastewater treatment facilities, groundwater wells, and flood protection dams.

These works were implemented major cities such as Ulaanbaatar, Erdenet, and Darkhan, Ulaangom city of Uvs *aimag*, Uliastai city of Zavkhan *aimag*, Mandalgovi city of Dundgovi *aimag*, Esonbulag *soum* of Govi-Altai *aimag*, Sukhbaatar city of Selenge *aimag*, Orkhon-Khutul, Dornogovi *aimag*, Govi-Altai *aimag*, Dornod *aimag*, Sharyn-Gol *soum* in Darkhan-Uul *aimag*, Uvurkhangai *aimag*.

During 2005-2010, additional 426,800 people were provided with sustainable access to safe drinking water as a result of the Project on "Improvement of Ulaanbaatar Utilities - 2nd Phase" (103 water supply stations in 7 '*ger*' districts built and connected to central systems) under the World Bank concession loans of 736,000 USD and the Project on "Improvement of Utilities in Rural Cities" (40 water supply stations in '*ger*' districts of 8 *aimags* built and connected to central systems) under the Asian Development Bank concession loans of 300,000 USD. In addition, water supply, sanitation and wastewater facilities were constructed and rehabilitated within the framework of the 'ADB-funded', project. Under the UNDP project "Improvement of Water and Sanitation" (MON/08/302), an integrated system of water and sanitation and a small-scale wastewater treatment facility are being constructed in Bayan- Uul, Biger, Tonkhil, Tugrug *soums* of Govi-Altai *aimag* and Durgun, Mankhan, Myangad and Zereg *soums* of Khovd *aimag*. Within the framework of "Urban Development Support" executed with GIZ assistance, technologically and environmentally-friendly toilets (ECOSAN) have been introduced and provided in several districts in Ulaanbaatar. The two-phase project on "Rehabilitation of the Central Sewerage System in Ulaanbaatar" has been implemented under the long-term loan of the Government of Spain. Other project on water and sanitation include: the project on "Improvement of Drinking Water Quality in *Soum*/Urban Settlements" implemented with technical assistance of the Government of the Czech Republic; the project on "Improvement of Water Supply of Darkhan City", implemented with Japanese grant; the project on "Urban Development Sector", implemented on ADB soft loans ; the project on "Improvement of the Sewage Removal System in Erdenet City", developed with concession loans of the Government of France.

As a result of the above-mentioned projects, water supply (about 300 km), sewage (about 200 km) and heating (about 70 km) pipelines were renewed, 15 wastewater treatment facilities and 150 water supply points were constructed and water softening systems were provided in of 110 *soums* of 17 *aimags*. These projects resulted in the enhancement of the quality of life of approximately 400 thousand people.

In April 2013, the Ministry Economic Development conducted an evaluation of progress in the implementation of MDG targets on water and sanitation in Mongolia. The preliminary results are shown below.

National MDG Target 16: Reduce, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

Proportion of population without access to safe drinking water sources:

	1990	2000	2010	2015	Evaluation
National average	45.0	33.8	27.4	**40.0**	**Achieved**

Source: Population and Housing Census of Mongolia - 1989, 2000, 2010 (NSO/UNFPA, 1989, 2000, 2010), Ministry of Economic Development of Mongolia, 2013

Proportion of population without access to improved sanitation facilities:

	1990	2000	2010	2015	Evaluation
National average	77.4	77.0	76.8	**60.0**	**On-track**[5]

Source: Population and Housing Census of Mongolia - 1989, 2000, 2010 (NSO/UNFPA, 1989, 2000, 2010), Ministry of Economic Development of Mongolia,[4] 2013

The National MDG Target 16 aims to increase access to improved water sources to 60% and improved sanitation to 40% by 2015. The target to reduce the proportion of population without access to safe drinking water sources to 40% by 2015 has not only been completely achieved, but has exceeded significantly the target baseline. The proportion of population without access to safe drinking water has declined from 45% in 1990 to 27.4% in 2010 at the national level. However, the implementation of the target to reduce the proportion of population without access to improved sanitation to 60% by 2015 is rather very slow.

National MDG Target 17: Improve, by 2015, the housing condition of population

Proportion of population living in houses and apartments with connections to engineering service networks (electricity, water, sewage and heating):

	1990	2000	2010	2015	Evaluation
National average	-	22.7	21.2	**30.0**	**On-track**[1]

Source: Population and Housing Census of Mongolia - 1989, 2000, 2010 (NSO/UNFPA, 1989, 2000, 2010), Ministry of Economic Development of Mongolia, 2013

[5] According to the evaluation of the implementation national MDGs conducted by the Ministry Economic Development of Mongolia in April 2013, the national MDG Targets 16 and 17 are evaluated as '*on-track*'. The proportion of the population not living in houses and apartments with connections to centralized water supply and sewerage services has been reduced, whereas the proportion of the population in such housing is increasing. But progress in achieving the 2015 target is lagging behind. However, considering the attention paid to reach this target and the specific policy measures planned to be taken until 2015, the targets are evaluated as '*on-track*'.

The National MDG Target 17 aims to increase the proportion of population living in comfortable housing with connection to engineering facilities to 30% by 2015. The implementation of this target is slow.

The proportion of the population living in houses and apartments with no connections to engineering service networks has been reduced and the proportion of the population living in accommodation with modern water and sanitation facilities is increasing. The implementation of this target is slow and may be difficult to achieve by 2015. However, considering the attention paid to reach this target and the specific policy measures planned to be taken until 2015 and therefore, the target is as "*on-track*".

According to this recent evaluation by the Ministry of Construction and Urban Development of Mongolia, the national MDG Targets 16 and 17 are evaluated as on-track.

However, there are pressing needs to increase international and national investments in sanitation and housing and ensure and monitor the quality of construction works completed under different projects.

Bringing water on a camel © Ellen Warren

3. Water and Sanitation in Mongolian Municipalities in the Selenge River Basin

3.1. Administrative divisions and socioeconomic development in the Selenge River Basin

The Selenge River Basin is the most developed region in Mongolia and is the centre of the country's political, economic and cultural life. Approximately 67% of Mongolia's total population (1.8 million people) lives in the Selenge River Basin (Figure 7). The economy in northern Mongolia is based on agriculture, livestock breeding, and mining. In 2007, economic activities in the Selenge River Basin produced 81% of the

national GDP of Mongolia (3,702.9 billion MNT, or 2.9 billion USD). The mining sector is Mongolia's single largest industry and a major contributor to the Mongolian economy, accounting for 65% of industrial value added, and 58% of export earnings. Mongolia's mining sector is in the midst of a major expansion.

The mining industry output is largely based on copper and gold. The Erdenet Copper and Molybdenum Mine, located in the basin, accounts for almost half of the foreign exchange earnings and provides almost 25% of government revenues. Gold production comes mainly from placer operations (mining of alluvial deposits of gold). In recent years, gold mining has emerged as one of the most dynamic and potentially destructive sectors of Mongolia's economy. There are 42 licensed mines in the Zaamar gold field alone, located in the sub-watershed of the Selenge River Basin. As of 1998, at least 25 other placer gold mines were active in the same watershed. This figure has certainly increased in the past 10 years due in large part to the rapid growth of artisanal and small-scale mining (ASM). Traditionally, the artisanal and small-scale mining is not a conventional economic activity in Mongolia. During the past decade, it has grown from non-existence to becoming the main livelihood for tens of thousands of people, with estimates ranging from 30,000-100,000 people involved throughout the country (IBRD/World Bank, 2006). The agriculture sector is expanding.

The Selenge River Basin covers an area of 300,788 km^2 in Mongolia. The administrable map of the Selenge River Basin is shown Figure 7.

Source: Institute of Hydrology and Meteorology of Mongolia

Figure 7. Administrative map of the Selenge River Basin in Mongolia

Out of Mongolia's 21 *aimags* (provinces), territories of nine *aimags* entirely or partially and Ulaanbaatar, the country's capital city, are located wholly or partly within the Selenge River Basin (Figure 7). The administrative territory of the country's capital city Ulaanbaatar is also located in the Tuul River sub-basin in the upper Selenge Basin area. Urban settlements located in the Selenge River Basin include: three large cities (Ulaanbaatar, Darkhan-Uul and Erdenet); six province-level towns (*aimag* centres); and 84 *soum*-level municipalities.

The municipalities located in the Selenge River Basin are listed below for their respective *aimags*.

- **Arkhangai** *aimag (*18 *soums*): Tsakhir, Tariat, Khangai, Chuluut, Ondor-Ulaan, Jargalant, Erdenemandal, Khairkhan, Ulziit, Tsetserleg, Battsengel, Ugiinuur, Khashaat, Khotont , Bulgan Tsenker, Tuvshruulekh and Erdenebulgan.
- **Bulgan** *aimag (*16 *soums*): Teshig, Khutag-Under, Selenge, Bayan-Agt, Khangal, Bugat, Bulgan Saikhan, Mogod, Orkhon, Buregkhangai, Khishig-Undur, Dashinchilen, Baynnuur, Rashaant and Gurbanbulag.
- **Uvurkhangai** *aimag* (6 *soums*): Bat-Ulzii, Khujirt, Ulziit, Zuil, Burd and Kharkhorin.
- **Zavkhan** *aimag* (4 *soums*): Ider, Telmen, Tosontsengel and Ikh-Uul.
- **Khuvsgul** *aimag* (19 *soums*): Murun, Bayanzurkh, Arbulag,Tsagaan-Uul, Burentogtokh, Jargalant, Galt, Shine-Ider, Tomorbulag, Tosontsengel, Ikh-Uul, Rashaant, Tarialan, Tunel, Khankh, Chandmani-Ondor, Erdenebulgan, Alag-Erdene and Tsagaan-Uur.
- **Tuv** *aimag (*15 *soums*): Erdenesant, Undershireet, Lun, Bayankhangai, Bayabgol, Gergelen, Zuunmod, Argalant, Zaamar, Ugtaaltsaidam, Bayanchandmani, Tseel, Jargalant, Bornuur and Batsumber.
- **Selenge** *aimag* (18 *soums*): Orkhontuul, Sumber, Mandal, Bayangol, Baruunburen, Orkhon, Sant, Khotol, Khushaat, Javkhlant, Yuruu, Khuder, Zuunburen, Tsagaannuur, Shaamar, Teshig, Altanbulag and Sukhbaatar.
- **Orkhon** *aimag (*2 *soums*): Bayan-Under and Jargalant.
- **Darkhan-Uul** *aimag (*4 *soums*): the city of Darkhan, and Orkhon, Khongor and Shariingol *soums.*
- **Ulaanbaatar** (the capital city and an independent administrative territorial unit): All six districts of Ulaanbaatar are located in the Selenge River Basin—which are, Bayangol, Khan-Uul, Bayanzurkh, Nalaikh, Sukhbaatar and Shingeltei.

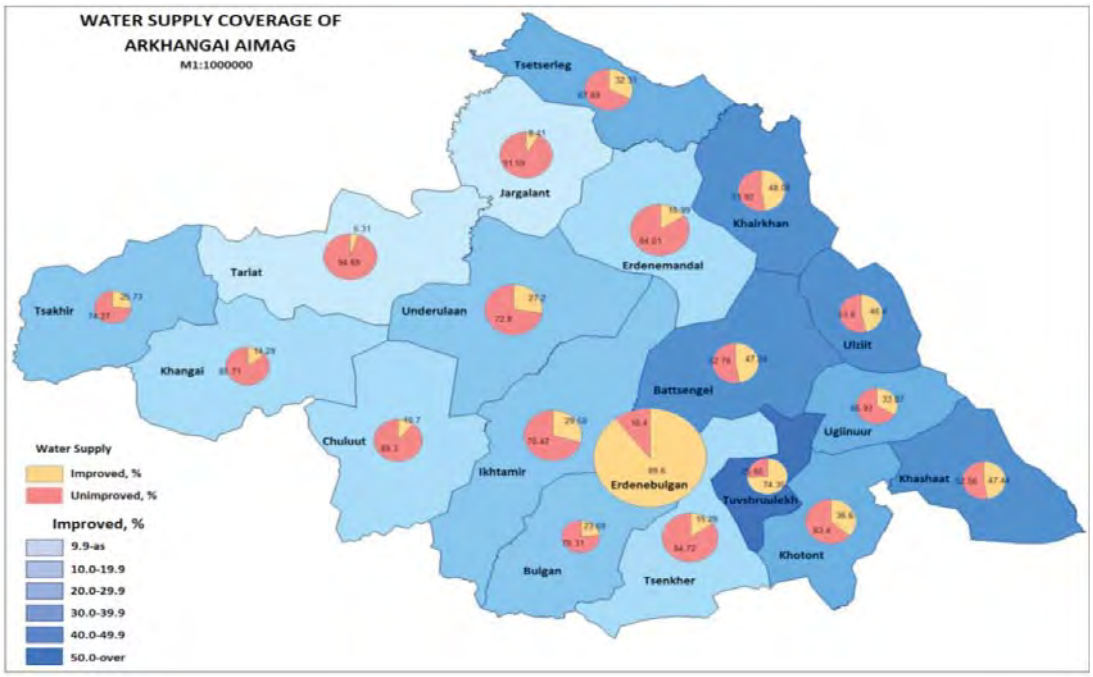
The assessment of the water supply and sanitation in municipalities in the Selenge River Basin was made for each of these administrative divisions at the *aimag* level and at the *soum* level of each *aimag.*

3.2. Arkhangai aimag

In 2010, the total population of Arkhangai *aimag* was 92,500 in 25,700 households. The proportion of urban and rural populations was 19.9% and 80.1%, respectively. The population is mostly rural, with a majority of people living in rural areas. The largest town in Arkhangai *aimag* is Erdenebulgan (which is the capital of the province).

3.2.1. Access to safe drinking water

The coverage of drinking water supply from improved water sources is 42.5% (Figure 8). The proportion of the population with access to improved water supply is shown in Table 4. The centralized water supply service is provided only in Erdenebulgan, where about 8.68% of the town's population is served by tap water and 1.2% is served by water kiosks connected to the centralized water supply network. In all other *soums* (municipalities) of Arkhangai *aimag*, the main source of drinking water is protected wells. In most municipalities, about 40% of the population has access to a water source within 200 meters from their homes, 40.6% from 200 meters to 1 kilometer and 19.4% over 1 kilometer.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 8. Drinking water coverage in Arkhangai *aimag* (as of 2013)

Table 4. Access to improved drinking water supply in Arkhangai *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Arkhangai (*at the aimag level*)	42.47	2.03	0.28	13.73	5.25	19.01	2.18
Erdenebulgan (*capital of the province*)	89.60	8.68	1.20	56.36	4.31	12.89	6.16
Battsengel	47.24	0.00	0.00	0.50	17.28	28.84	0.62
Bulgan	23.69	0.00	0.00	1.56	10.71	11.23	0.19
Jargalant	8.41	0.00	0.00	0.00	1.32	4.62	2.48
Ikh Tamir	29.58	0.00	0.00	0.29	3.22	25.25	0.82
Ugii-Nuur	33.07	0.00	0.00	0.55	0.90	31.35	0.27
Ulziit	46.40	0.00	0.00	0.50	13.09	31.05	1.76
Under-UIaan	27.20	0.00	0.00	0.18	1.49	22.90	2.63
Tariat	5.31	0.00	0.00	0.45	0.22	4.45	0.19
Tuvshruulekh	74.35	0.00	0.00	0.04	13.69	57.75	2.86
Khairkhan	48.08	0.00	0.00	3.97	10.00	33.20	0.91
Khangai	14.29	0.00	0.00	0.00	2.19	11.71	0.39
Khashaat	47.44	0.00	0.00	0.18	4.93	41.58	0.76
Khotont	36.60	0.00	0.00	0.24	3.47	32.86	0.03
Tsakhir	25.73	0.00	0.00	7.96	17.27	0.50	0.00
Tsenkher	15.28	0.00	0.00	0.26	3.17	10.71	1.14
Tsetserleg	32.31	0.00	0.00	0.00	1.15	30.22	0.94
Chuluut	10.70	0.00	0.00	0.06	5.22	5.19	0.23
Erdenemandal	15.99	0.00	0.00	0.43	5.57	9.72	0.27

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Access to improved water supply sources is low in following municipalities: Tariat (5.31%, the lowest); Jargalant (8.41%); Chuluut (10.7%); Khangai (14.29%); Tsenkher (15.28%); and Erdenemandal (15.99%). The low level of access to improved water sources is linked with the fact that these municipalities are located close to large rivers and their inhabitants mainly use surface water sources for drinking water, which does not always meet drinking water quality standards and has a high risk of pollution.

In Arkhangai, about 57.5% of the population still uses drinking water from unimproved water sources (Table 5). The proportion of the population using unimproved water sources in each town and municipality of Arkhangai *aimag* is shown in Figure 9.

Table 5. Proportion of the population using unimproved water sources in Arkhangai *aimag*, by source types (as of 2013)

Municipalities	Proportion of the population using unimproved water supply, %	Of which, %					
		Transported water	Un-protected wells	Unprotected springs	Cart with small tanks	Rain water	Surface water
Arkhangai (at the *aimag* level)	57.53	0.00	0.00	0.00	0.00	0.00	57.53
Erdenebulgan *(capital of the province)*	10.40	0.00	0.00	0.00	0.00	0.00	10.40
Battsengel	52.76	0.00	0.00	0.00	0.00	0.00	52.76
Bulgan	76.31	0.00	0.00	0.00	0.00	0.00	76.31
Jargalant	91.59	0.00	0.00	0.00	0.00	0.00	91.59
Ikh Tamir	70.42	0.00	0.00	0.00	0.00	0.00	70.42
Ugii-Nuur	66.93	0.00	0.00	0.00	0.00	0.00	66.93
Ulziit	53.60	0.00	0.00	0.00	0.00	0.00	53.60
Under-Ulaan	72.80	0.00	0.00	0.00	0.00	0.00	72.80
Tariat	94.69	0.00	0.00	0.00	0.00	0.00	94.69
Tuvshruulekh	25.65	0.00	0.00	0.00	0.00	0.00	25.65
Khairkhan	51.92	0.00	0.00	0.00	0.00	0.00	51.92
Khangai	85.71	0.00	0.00	0.00	0.00	0.00	85.71
Khotont	63.40	0.00	0.00	0.00	0.00	0.00	63.40
Tsakhir	74.27	0.00	0.00	0.00	0.00	0.00	74.27
Tsenkher	84.72	0.00	0.00	0.00	0.00	0.00	84.72
Tsetserleg	67.69	0.00	0.00	0.00	0.00	0.00	67.69
Chuluut	89.30	0.00	0.00	0.00	0.00	0.00	89.30
Erdenemandal	84.01	0.00	0.00	0.00	0.00	0.00	84.01

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 9. Proportion of the population using unimproved water sources in *soums* of Arkhangai *aimag* (as of 2013)

3.2.2. Access to sanitation

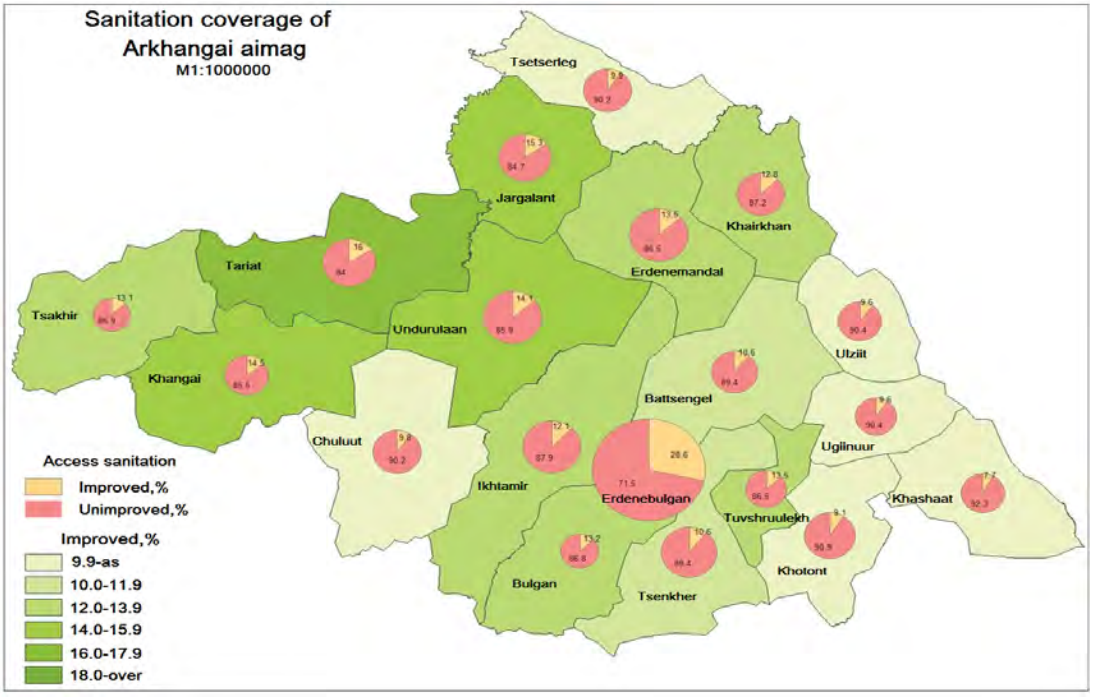
Arkhangai has the lowest sanitation coverage compared to other *aimags*. Only about 15.94% of the total population of Arkhangai *aimag* has access to improved sanitation facilities. The proportion of the population with access to different types of improved sanitation is shown in Table 6. Around 84.06% of the population still use unimproved sanitation facilities. The sanitation coverage is the highest in Erdenebulgan, the largest town and capital of Arkhangai, with about 28.56% of its inhabitants having access to improved sanitation. The access to improved sanitation ranges from 7% to 16% in other municipalities (Figure 10).

Most municipalities do not have centralized water and sewerage systems. Very small areas of *soum* centers are connected to local sewerage networks. Septic tanks are used only in some new residential areas. In *'ger'* districts, ventilated improved pit latrine is the most common sanitation facility.

Table 6. Access to improved sanitation in Arkhangai *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Arkhangai (at the *aimag* level)	15.94	2.01	0.02	4.52	9.38
Erdenebulgan *(capital of the province)*	28.56	8.59	0.09	8.69	11.19
Battsengel	10.58	0.03	0.00	2.68	7.87
Bulgan	13.21	0.00	0.00	2.96	10.245
Jargalant	15.29	0.00	0.00	4.04	11.25
Ikh Tamir	12.08	0.00	0.00	2.52	9.56
Ugii-Nuur	9.59	0.00	0.00	2.84	6.75
Ulziit	9.62	0.00	0.00	3.73	5.89
Underulaan	14.13	0.00	0.00	2.61	11.52
Tariat	16.04	0.00	0.00	4.81	11.23
Tuvshruulekh	13.52	0.08	0.00	4.45	8.99
Khairkhan	12.84	0.00	0.00	3.22	9.62
Khangai	14.52	0.00	0.00	4.17	10.36
Khotont	7.70	0.00	0.00	2.39	5.32
Tsakhir	9.13	0.00	0.00	3.05	6.08
Tsenkher	13.05	0.00	0.00	5.33	7.72
Tsetserleg	10.60	0.02	0.00	3.12	7.46
Chuluut	9.85	0.00	0.00	2.63	7.22
Erdenemandal	9.82	0.00	0.00	1.27	8.55

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 10. Sanitation coverage in Arkhangai *aimag* (as of 2013)

3.3. Uvurkhangai aimag

Uvurkhangai is one of the biggest *aimags* in Mongolia by population. In 2010, the total population of Uvurkhangai *aimag* was 120,000 in 32,400 households. The population of Uvurkhangai *aimag* is bigger compared to all other *aimags*. The proportion of urban and rural populations is 22.3% and 77.7%, respectively. Arvaikheer is the capital and biggest town of Uvurkhangai.

3.3.1. Access to safe drinking water

Access to improved drinking water supply is 61.05% at the *aimag* level (Table 7). The coverage of improved drinking water supply is the highest in Arvaikheer, with 98.07% of the population having access to improved drinking water sources. Around 7.79% of the population of Arvaikheer is served by tap water and 86.44% uses purified water from water kiosks connected to the centralized water supply system. In most municipalities, the majority of inhabitants use protected wells as the main source of drinking water (Figure 11).

Table 7. Access to improved drinking water supply in Uvurkhangai *aimag* (as of 2013)

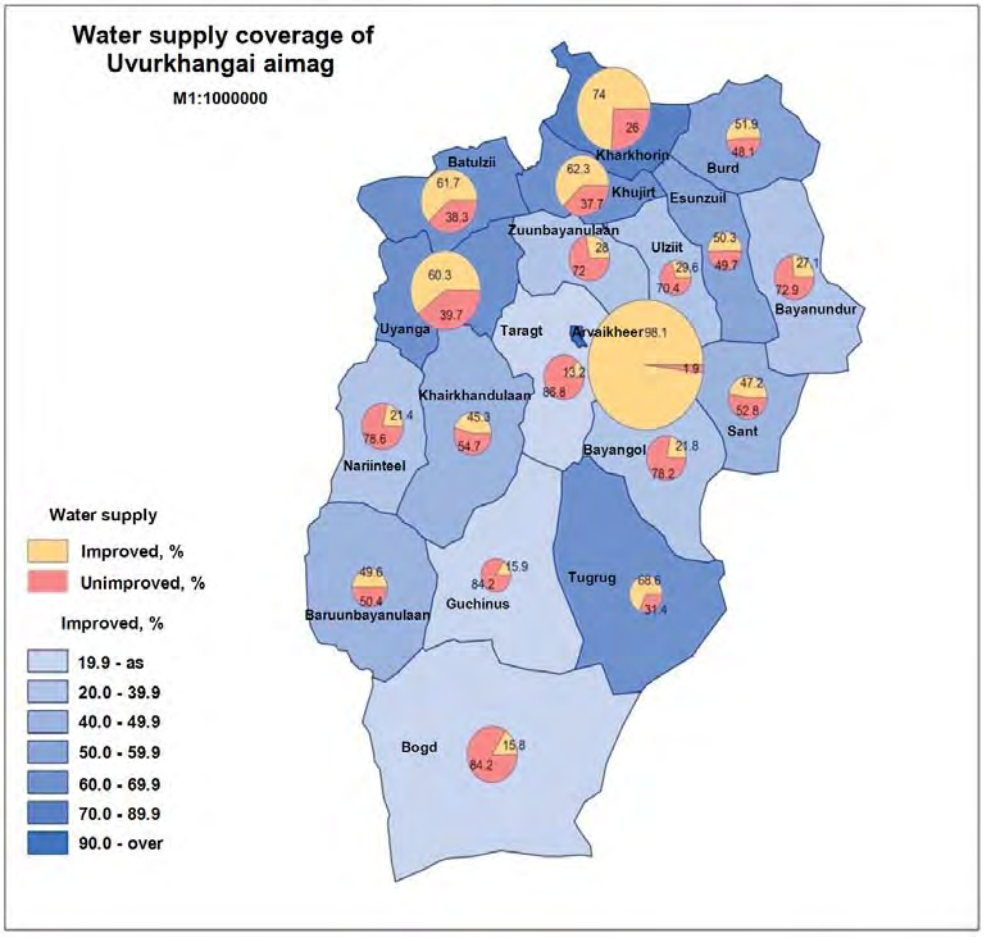
Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Uvurkhangai *(at the aimag level)*	61.05	2.11	0.45	25.53	4.50	27.01	1.45
Arvaikheer *(capital of the province)*	98.07	7.79	1.51	84.93	2.44	1.35	0.05
Baruun Bayan-Ulaan	49.56	0.00	0.00	0.00	1.00	48.14	0.42
Batulzii	61.71	0.00	0.00	0.11	1.18	53.50	6.91
Bayangol	21.82	0.00	0.00	0.03	5.89	15.89	0.00
Bayanunder	27.06	0.00	0.00	0.00	1.72	25.33	0.00
Bogd	15.77	0.00	0.00	3.59	5.48	5.78	0.92
Burd	51.94	0.00	0.00	0.00	5.47	40.87	5.60
Guchin-Us	15.85	0.00	0.00	0.00	6.36	9.49	0.00
Esunzuil	50.29	0.00	0.00	0.00	6.60	42.98	0.71
Zuun Bayan-Ulaan	27.97	0.00	0.00	0.03	3.79	23.75	0.40
Nariin-Teel	21.38	0.00	0.00	0.03	0.03	21.32	0.00
Ulziit	29.64	0.00	0.00	0.00	0.00	10.13	19.51
Sant	47.16	0.00	0.00	0.00	1.00	46.15	0.00
Taragt	13.23	0.00	0.00	0.00	0.03	12.52	0.68
Tugrug	68.63	0.00	0.00	0.00	2.07	65.87	0.69
Uyanga	60.32	0.00	0.00	0.29	7.09	52.26	0.68
Khairkhandulaan	45.30	0.00	0.00	0.00	2.98	40.78	1.54
Kharkhorin	73.98	0.22	0.43	23.91	16.37	32.53	0.52
Khujirt	62.29	0.00	0.00	0.00	1.13	57.92	3.24

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

The coverage of improved drinking water supply in Uvurkhangai *aimag* is relatively higher compared to other *aimags*. Most of the population use drinking water from protected wells, or served by water trucks.

The accessibility of water sources, in terms of the average distance from households to the nearest water source, is as follows: 36.68% of the population is served by an improved water source within 200 meters; 41.37% from 200 meters to 1 kilometer; and 21.91% over 1 kilometer.

At the *aimag* level, around 38.95% of the population still uses drinking water from unimproved water sources (Figure 12). In small municipalities, more than the half of the populations uses drinking water from surface water sources and unprotected springs and ponds.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 11. Drinking water coverage in Uvurkhangai *aimag* (as of 2013)

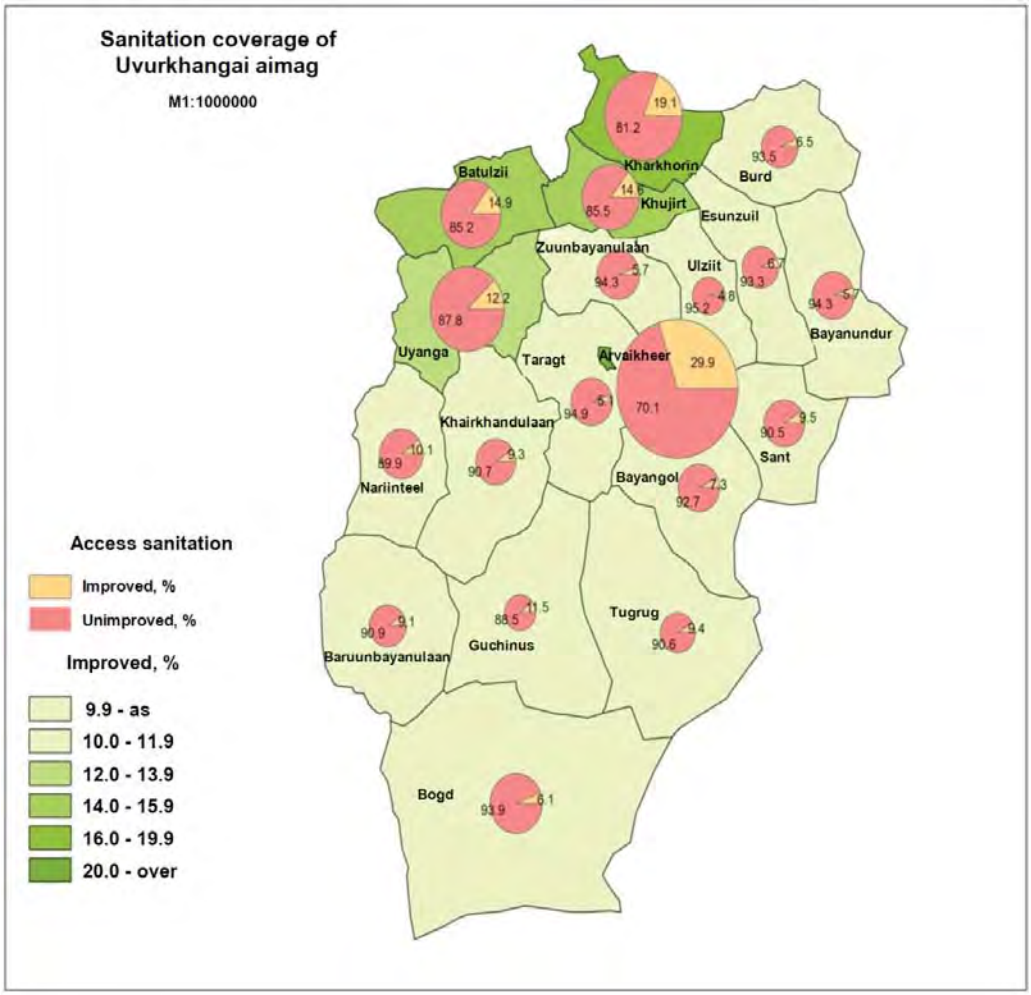
Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 12. Proportion of the population using unimproved water sources in municipalities in Uvurkhangai *aimag* (as of 2013)

3.3.2. Access to sanitation

Sanitation coverage in municipalities of Uvurkhangai *aimag* is shown in Figure 13. At the *aimag* level, access to improved sanitation is 16.10% of the total population of the *aimag*. Around 83.90% of the *aimag*'s population uses unimproved sanitation facilities.

Arvaikheer—the largest town in the *aimag*—has the highest level of access to improved sanitation, where about 29.94% of its inhabitants use improved sanitation facilities. In all small municipalities of Uvurkhangai, the sanitation coverage remains very low, ranging around 6-15%.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 13. Sanitation coverage in Uvurkhangai *aimag* (as of 2013)

As shown in Table 8, in 12 out of the total 19 *soums* of Uvurkhangai *aimag*, the level of access to improved sanitation is less than 10%. These municipalities are: Ulziit (4.83%, the lowest); Taragt (5.12%); Bayan-Under (5.71%); Bogd (6.13%); Burd (6.5%);

Esunzuil (6.71%), Zuun Bayan-Ulaan (5.67%); Bayangol (7.33%); Baruun Bayan-Ulaan (9.06%); Tugrug (9.36%); Khairkhandulaan (9.27%); and Sant (9.54%). The level of access to improved sanitation in other *soums* is less than 20%.

Compared to other *aimags*, Uvurkhangai has the second lowest sanitation coverage, which indicates the need to increase investment to improve access to sanitation in municipalities of the province.

Table 8. Access to improved sanitation in Uvurkhangai *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Uvurkhangai (at the *aimag* level)	16.10	2.14	0.08	6.43	7.46
Arvaikheer *(capital of the province)*	29.94	7.79	0.04	10.86	11.24
Baruun Bayan-Ulaan	9.06	0.00	0.00	4.55	4.50
Batulzii	14.88	0.11	0.22	6.33	8.21
Bayangol	7.33	0.00	0.00	3.64	3.68
Bayanunder	5.71	0.00	0.00	2.61	3.09
Bogd	6.13	0.00	0.00	2.56	3.56
Burd	6.50	0.00	0.00	2.65	3.84
Guchin-Us	11.47	0.00	0.00	5.66	5.80
Esunzuil	6.71	0.00	0.00	1.39	5.30
Zuun Bayan-Ulaan	5.67	0.00	0.00	2.30	3.36
Nariin-Teel	10.06	0.00	0.00	5.02	5.04
Ulziit	4.83	0.00	0.00	2.35	2.47
Sant	9.54	0.00	0.00	3.37	6.17
Taragt	5.12	0.03	0.00	1.69	3.39
Tugrug	9.36	0.37	0.00	4.22	4.76
Yaunga	12.19	0.03	0.00	5.27	6.87
Khairkhandulaan	9.27	0.00	0.00	4.24	5.02
Kharkhorin	19.06	0.27	0.42	8.25	10.12
Khujirt	14.56	0.09	0.07	6.80	7.59

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.4. Zavkhan aimag

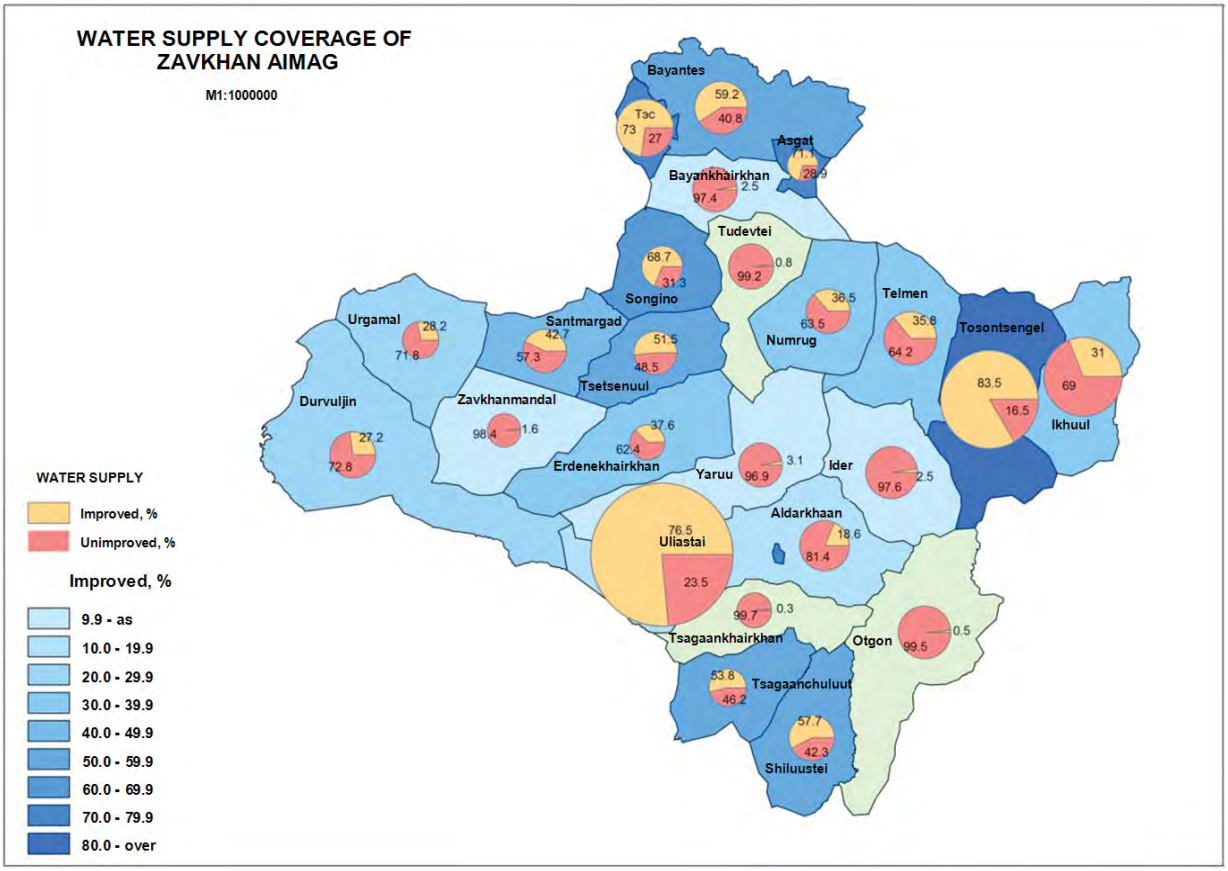
In 2010, the total population of Zavkhan *aimag* was 79,800 in 20,890 households. The proportion of urban and rural population is 21.2% and 78.8%, respectively. The capital town of Zavkhan *aimag* is Uliastai, which is also the largest town in the *aimag*.

3.4.1. Access to safe drinking water supply

Access to improved drinking water supply is 50.15% at the *aimag* level, whereas the remaining 49.85% of the *aimag's* population uses unimproved water sources (Figure 14). At the town and municipal level (Table 9), the level of access to improved drinking water sources varies greatly, ranging from less than 1% up to over 80%.

A centralized water supply system is available only in Uliastai. About 11.16% of inhabitants of Uliastai is served by tap water. Inhabitants of small municipalities are served by water trucks or use protected wells.

The accessibility of water sources, in terms of the average distance from households to the nearest water source, is better than in other *aimags*: 47.93% of the population is served by an improved water source within 200 meters; 41.19% from 200 meters to 1 kilometer; and 10.88% over 1 kilometer.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

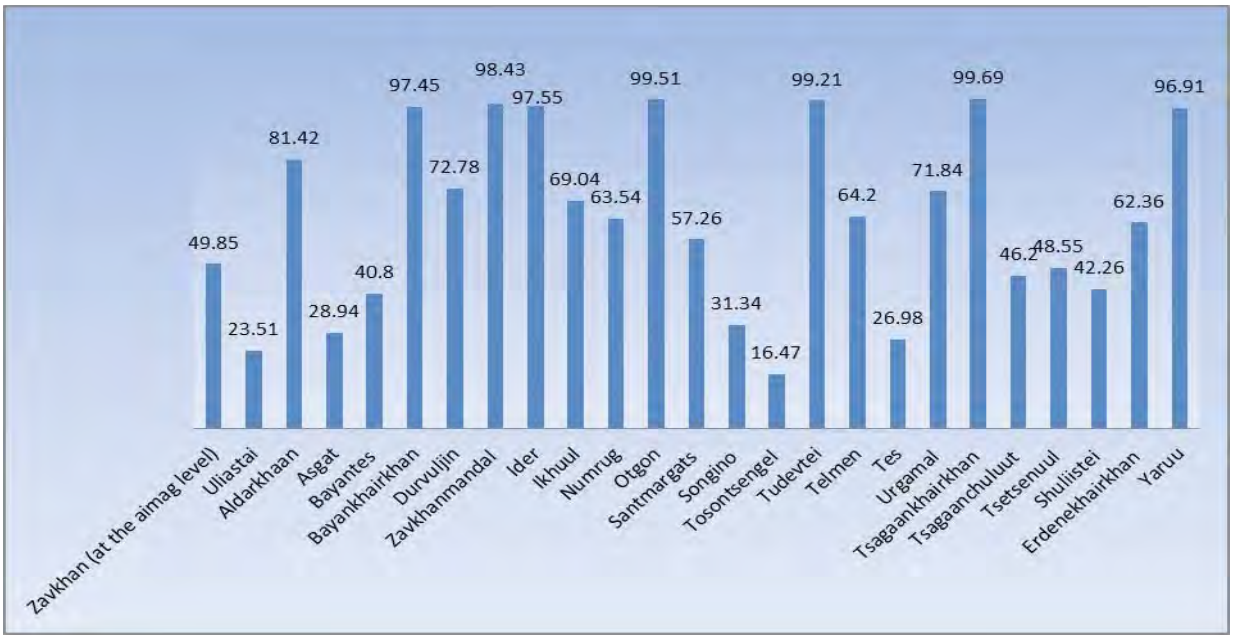
Figure 14. Drinking water coverage in Zavkhan *aimag* (as of 2013)

Table 9. Access to improved drinking water supply in Zavkhan *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Zavkhan (at the *aimag* level)	50.15	2.93	0.19	7.55	14.13	24.99	0.35
Uliastai *(capital of the province)*	76.49	11.16	0.74	26.28	30.44	7.83	0.05
Aldarkhaan	18.58	0.00	0.00	0.00	0.50	17.69	0.40
Asgat	71.06	0.00	0.00	0.13	70.29	0.64	0.00
Bayantes	59.20	0.00	0.00	5.62	4.29	49.12	0.18
Bayankhairkhan	2.55	0.00	0.00	0.00	1.49	0.31	0.75
Durvuljin	27.22	0.00	0.00	0.00	18.11	9.11	0.00
Zavkhanmandal	1.57	0.00	0.00	0.00	0.00	1.57	0.00
Ider	2.45	0.00	0.00	0.00	1.25	1.20	0.00
Ikh-Uul	30.96	0.00	0.00	0.02	0.72	29.27	0.94
Numrug	36.46	0.00	0.00	0.82	17.56	17.56	0.51
Otgon	0.49	0.00	0.00	0.00	0.49	0.00	0.00
Santmargats	42.74	0.00	0.00	0.52	33.94	8.27	0.00
Songino	68.66	0.00	0.00	0.22	2.60	65.70	0.14
Tosontsengel	83.53	0.00	0.00	0.33	15.34	67.39	0.48
Tudevtei	0.79	0.00	0.00	0.18	0.00	0.61	0.00

Telmen	35.80	0.00	0.00	0.00	0.93	34.82	0.04
Tes	73.02	0.00	0.00	4.81	19.65	48.29	0.26
Urgamal	28.16	0.00	0.00	0.00	0.37	27.79	0.00
Tsagaanxairkhan	0.31	0.00	0.00	0.31	0.00	0.00	0.00
Tsagaanchuluut	53.80	0.00	0.00	0.00	0.35	53.01	0.44
Tsetsenuul	51.45	0.00	0.00	6.54	14.40	30.52	0.00
Shuliistei	57.74	0.00	0.00	0.00	0.18	55.25	2.31
Erdenexairkhan	37.64	0.00	0.00	0.00	0.80	36.84	0.00
Yaruu	3.09	0.00	0.00	0.00	0.00	0.26	2.84

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 15. Proportion of the population using unimproved water sources in municipalities in Zavkhan *aimag* (as of 2013)

Around 49.85% of the *aimag's* total population still uses unimproved water sources. As shown in Table 9 and Figure 15, in some municipalities over 90% of population uses unprotected water sources. The use of unimproved water sources is most prevalent in *soums* that are located on large rivers such as Bayankhairkhan, Zavkhanmandal, Ider, Otgon, Tudevtei, Tsagaankhairkhan and Yaruu. Inhabitants of these communities almost entirely use on surface waters as their drinking water source. The rate of access to improved water sources in these municipalities is particularly low: Tsagaankhairkhan (0.31%); Otgon (0.49%); Tudevtei (0.79%); Zavkhanmandal (1.57%); Ider (2.45%); Bayankhairkhan (2.55%); and Yaruu (3.09%).

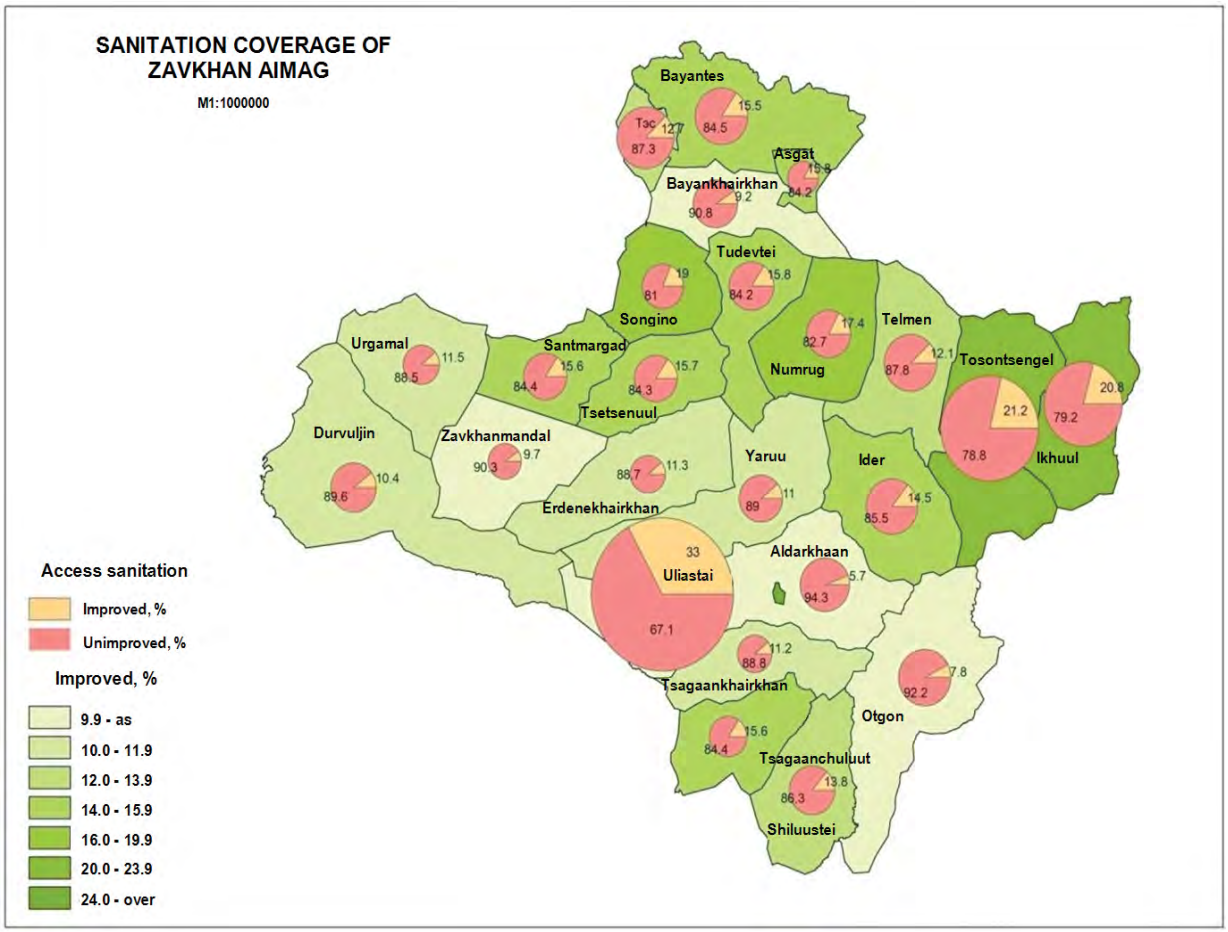
3.4.2. Access to sanitation

Only 19.75% of the total population of Zavkhan *aimag* has access to improved sanitation and 80.25% use unimproved sanitation facilities.

The improved sanitation coverage is the highest in Uliastai, where 33.0% of inhabitants use improved sanitation forms, of which 10.72% are connected to the centralized sewerage network. In *soum* municipalities, the access to improved sanitation is between 6% and 21% (Figure 16 and Table 10). Most municipalities do not have sewerage networks, with the exception of only few which have small sewerage networks that serve very small areas. The use of septic tanks is not common. The most widely-used form of sanitation is ventilated improved latrine, especially in *'ger'* districts. The level of access to improved sanitation is over 20% in only three municipalities, namely: Uliastai (33%); Tosontsengel (21.21%); and Ikh-Uul (20.78%).

At the *aimag* level, access to improved sanitation is less than 20% in 21 municipalities, which is 87.5% of all *soum* centres. This may be linked with several factors, including lack of investment, remote location from country's economic centres, and predominantly rural population with about 80% of the population living in rural areas.

Access to water and sanitation is higher in Tosontsengel and Ider *soums*, which are located in the Ider Gol Basin—a tributary of the Selenge River Basin.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 16. Sanitation coverage in Zavkhan *aimag* (as of 2013)

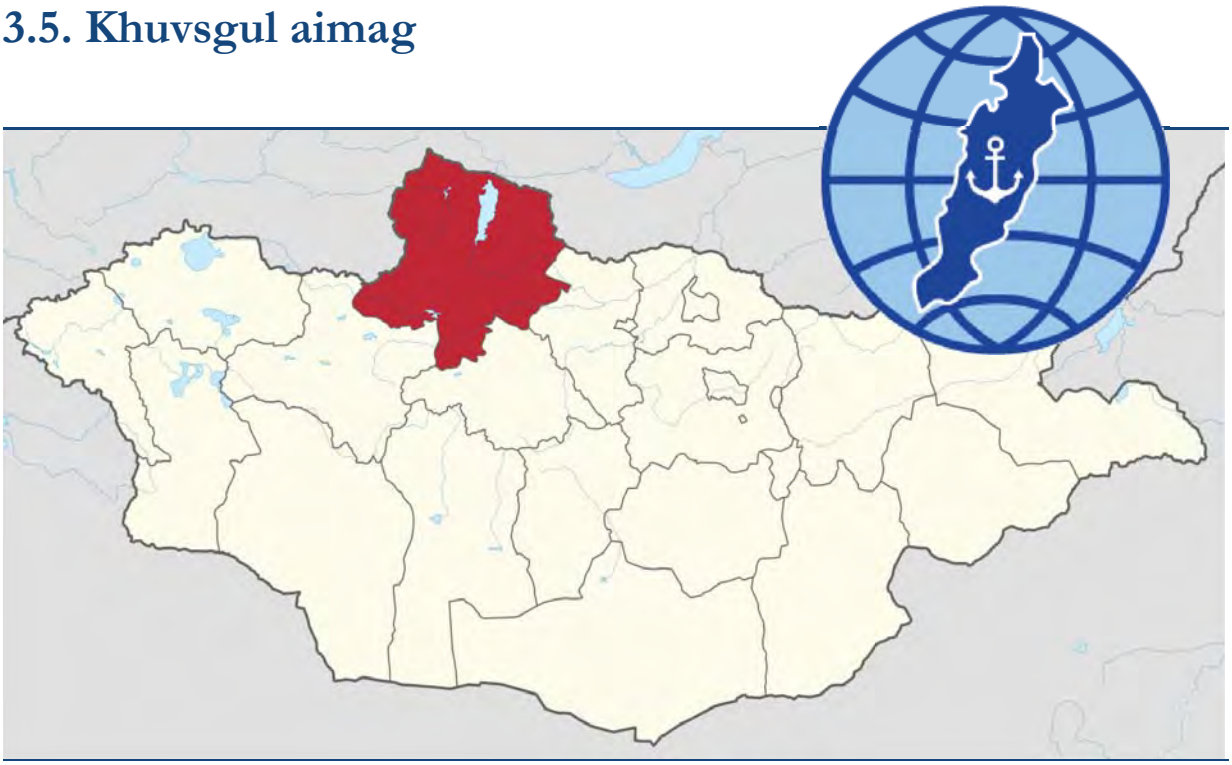
Table 10. Access to sanitation in Zavkhan *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Zavkhan (at the *aimag* level)	19.75	2.83	0.07	8.12	8.73
Uliastai *(capital of the province)*	33.00	10.72	0.26	10.94	11.96
Aldarkhaan	5.66	0.00	0.00	2.88	2.78
Asgat	15.80	0.00	0.00	7.78	8.02
Bayantes	15.54	0.00	0.00	7.32	8.22
Bayankhairkhan	9.24	0.00	0.00	3.97	5.27
Durvuljin	10.43	0.00	0.00	5.03	5.40
Zavkhanmandal	9.71	0.56	0.00	4.77	4.38
Ider	14.49	0.00	0.00	6.70	7.79
Ikh-Uul	20.78	0.00	0.00	8.98	11.8
Numrug	17.35	0.00	0.00	8.49	8.86
Otgon	7.76	0.00	0.00	3.81	3.79
Santmargats	15.55	0.00	0.00	7.32	8.23
Songino	18.96	0.07	0.00	9.16	9.73
Tosontsengel	21.21	0.04	0.00	10.32	10.85
Tudevtei	15.81	0.00	0.00	7.56	8.23
Telmen	12.15	0.00	0.00	5.46	6.69
Tes	12.72	0.00	0.00	6.01	6.71
Urgamal	11.47	0.00	0.00	5.96	5.51
Tsagaanxairkhan	11.22	0.00	0.00	5.32	5.90
Tsagaanchuluut	15.62	0.00	0.00	7.62	8.00
Tsetsenuul	15.66	0.00	0.00	7.74	7.92
Shuliistei	13.75	0.00	0.00	6.30	7.45
Erdenexairkhan	11.32	0.10	0.00	5.58	5.64
Yaruu	10.96	0.00	0.00	5.52	5.44

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

A horse drinking water from a stream

3.5. Khuvsgul aimag

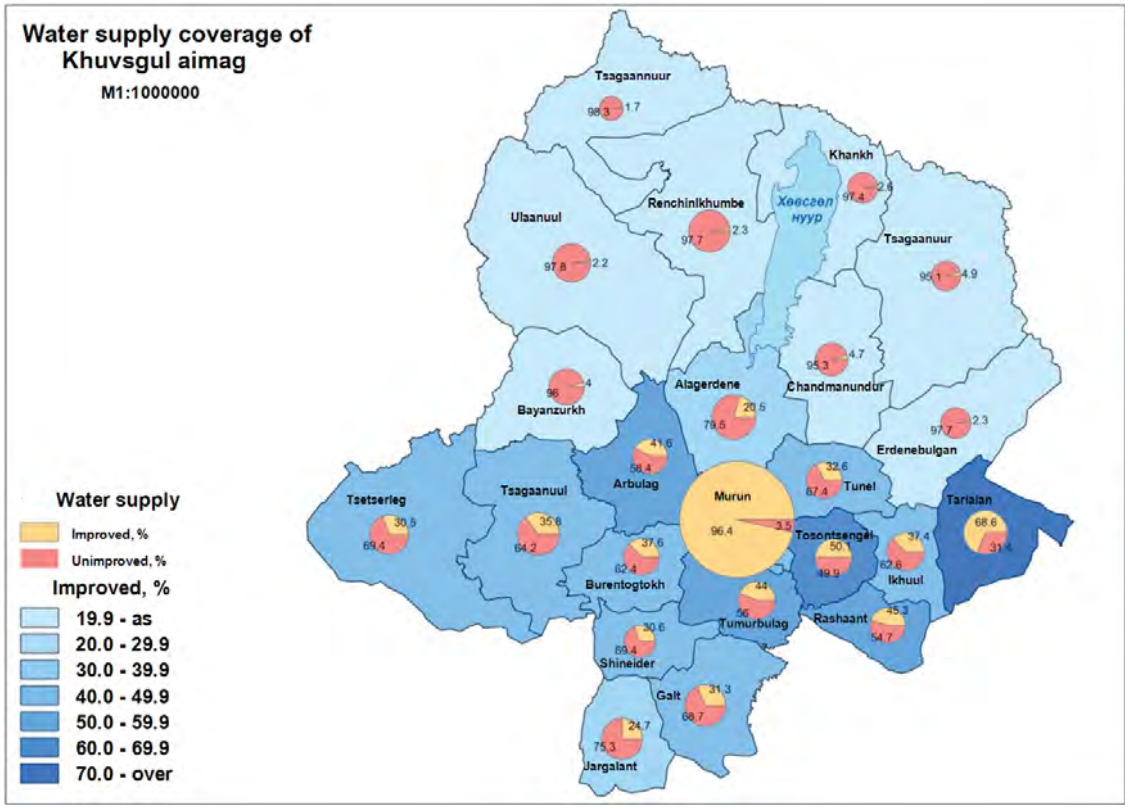


Khuvsgul is the northernmost province of Mongolia on the border with Russia and one of the largest *aimags* by population. In 2010, the total population of Khuvsgul *aimag* was over 126,000 in 35,000 households. The proportion of urban and rural population is 31.6% and 68.4%, respectively. Infrastructure development is low in Khuvsgul *aimag*. Most of inhabitants of municipalities live *'ger'* districts. Tourism is one of the main local economic activities. Increasing investment in infrastructure and expanding tourism activities over the recent years will possibly result in better water and sanitation services in the province in the future. Murun is the capital and largest town of Khuvsgul *aimag*.

3.5.1. Access to safe drinking water

Around 49.07% of the *aimag*'s population has access to improved drinking water supply, whereas 50.93% still uses drinking water from unimproved water sources. The level of access to improved drinking water supply is shown in Figure 17 for all municipalities in Khuvsgul.

Murun has the highest level of access to improved water supply in the *aimag*, with 96% of inhabitants using improved water sources. However, only 4.2% of its inhabitants is connected to the centralized water supply system. As shown in Table 11, in *soum* municipalities the majority of inhabitants with access to improved water sources are served by water trucks or use protected wells.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

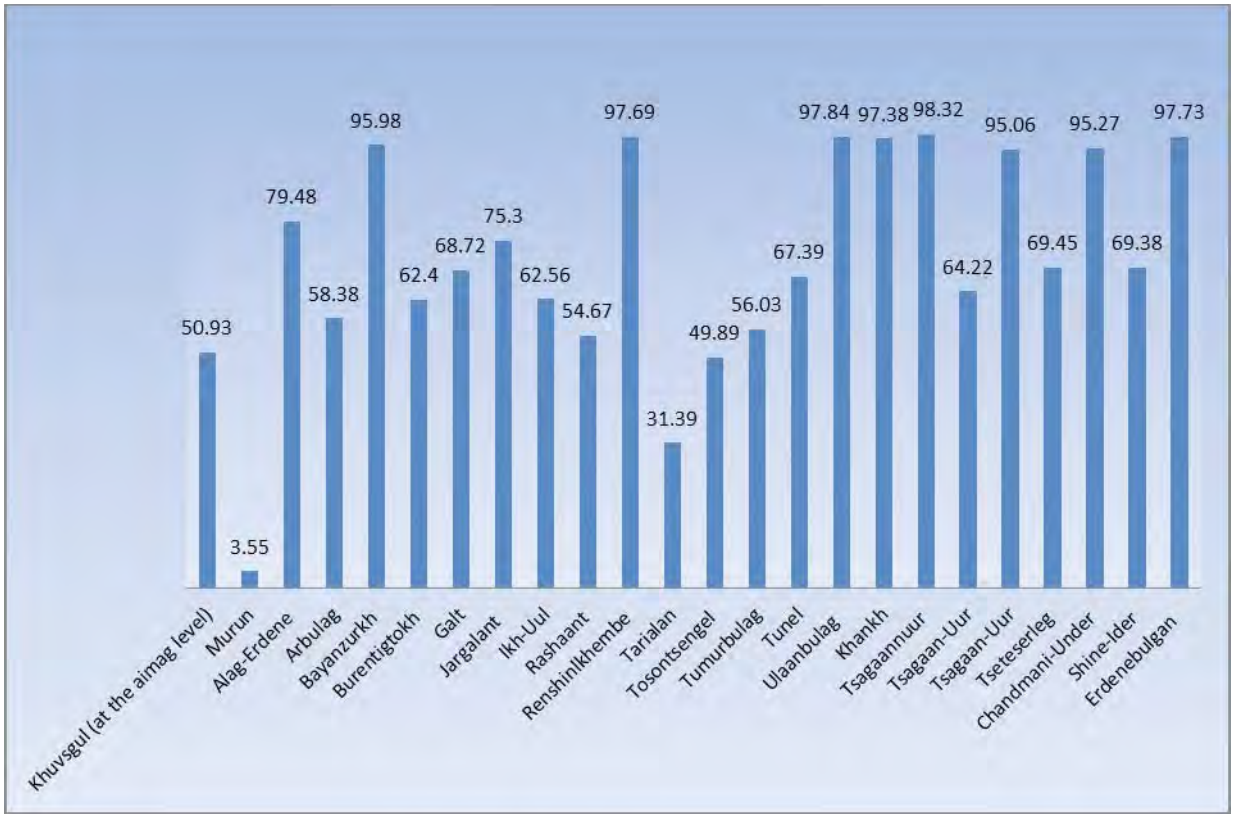
Figure 17. Drinking water coverage in Khuvsgul *aimag* (as of 2013)

Table 11. Access to improved drinking water supply in Khuvsgul *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Khuvsgul (at the *aimag* level)	49.07	1.31	0.25	13.03	7.53	24.61	2.34
Murun *(capital of the province)*	96.45	4.20	0.81	36.30	8.88	46.05	0.21
Alag-Erdene	20.52	0.02	0.00	0.18	3.02	13.12	4.18
Arbulag	41.62	0.00	0.00	3.99	2.67	31.74	3.21
Bayanzurkh	4.02	0.00	0.00	0.03	3.35	0.63	0.00
Burentigtokh	37.60	0.00	0.00	0.00	4.15	32.87	0.58
Galt	31.28	0.00	0.00	0.29	15.02	9.50	6.47
Jargalant	24.70	0.00	0.00	0.45	4.47	7.88	11.90
Ikh-Uul	37.44	0.00	0.00	1.90	16.17	13.41	5.96
Rashaant	45.33	0.00	0.00	0.15	1.85	29.08	14.25
Renshinlkhembe	2.31	0.00	0.00	0.00	2.02	0.27	0.02

Tarialan	68.61	0.00	0.00	2.87	34.38	30.12	1.25
Tosontsengel	50.11	0.00	0.00	0.20	3.63	43.44	2.85
Tumurbulag	43.97	0.00	0.00	0.69	1.92	31.50	9.87
Tunel	32.61	0.00	0.00	0.00	0.56	27.86	4.19
Ulaanbulag	2.16	0.00	0.00	0.00	0.05	1.92	0.18
Khankh	2.62	0.00	0.00	0.13	2.37	0.13	0.00
Tsagaannuur	1.68	0.00	0.00	0.40	0.07	1.21	0.00
Tsagaan-Uul	35.78	0.00	0.00	30.33	3.28	2.09	0.09
Tsagaan-Uur	4.94	0.00	0.00	0.00	4.55	0.40	0.00
Tseteserleg	30.55	0.00	0.00	1.57	8.00	20.30	0.68
Chandmani-Under	4.73	0.00	0.00	0.11	0.00	4.62	0.00
Shine-Ider	30.62	0.00	0.00	0.31	25.16	4.88	0.27
Erdenebulgan	2.27	0.00	0.00	0.42	0.42	1.43	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 18. Proportion of the population using unimproved water sources in *soums* of Khuvsul *aimag* (as of 2013)

The rate of access to improved water sources is less than 5% in seven municipalities, namely: Bayanzurkh (4.02%); Renchinlkhembe (2.31%); Ulaan-Uul (2.16%); Khankh (2.62%); Tsagaannuur (1.68%); Tsagaan-Uur (4.94%); Chandmani-Under (4.73%); and Erdenebulgan (2.27%).

About 50.93% of the total population of Khuvsgul *aimag* still uses unimproved water sources. At the municipality level, up to 60-97% of inhabitants of small municipalities uses surface water sources such as springs, rivers and lakes (Figure 18). Throughout Khuvsgul, which is a mountainous region with high snow coverage, frozen surface water sources, ice and snow are commonly used as drinking water.

As regards the accessibility of water sources, the average distance from households to the nearest water source is as follows: 57.82% of the *aimag*'s population is served by an improved water source within 200 meters; 39.89% from 200 meters to 1 kilometer; and 3.30% over 1 kilometer (Table 12).

Table 12. Accessibility of drinking water sources (the distance) in Khuvsgul *aimag*

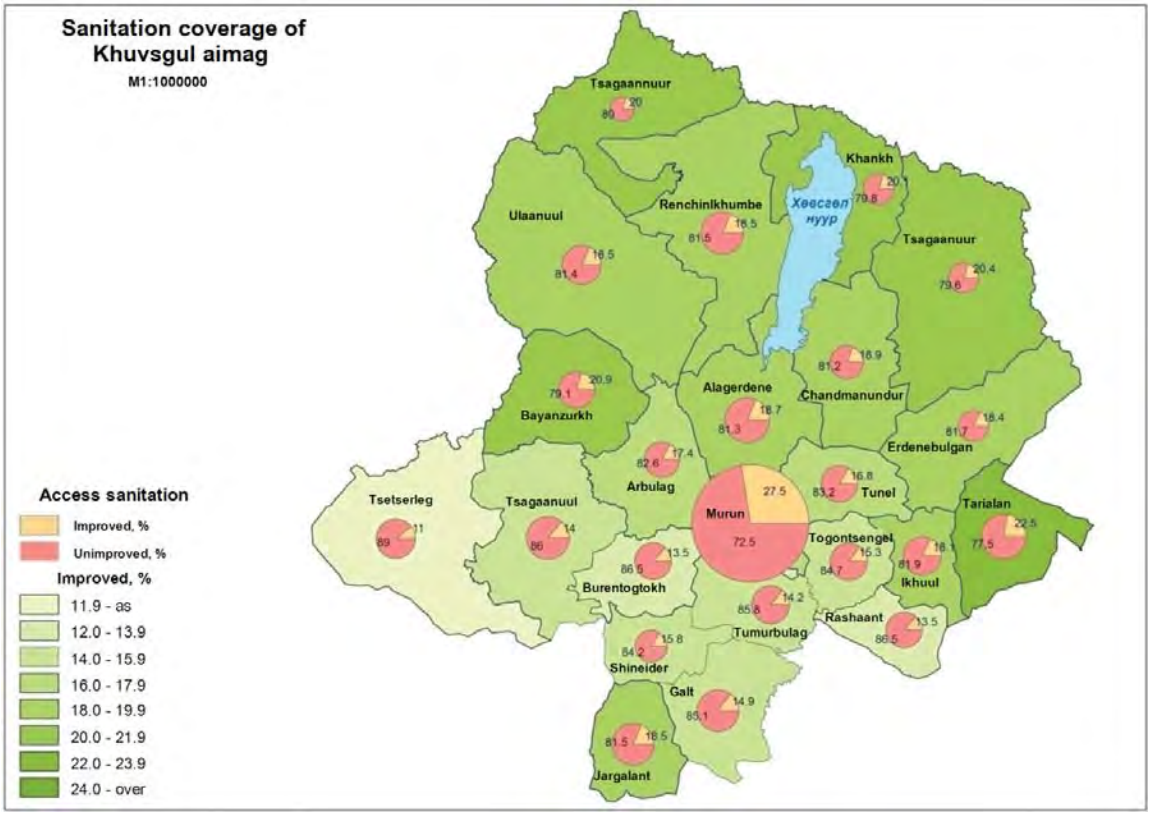
Municipalities	Up to 200 meters, %	From 200 meters to 1 kilometer, %	Over 1 kilometer, %
Khuvsgul (at the *aimag* level)	57.82	38.89	3.30
Murun *(capital of the province)*	57.82	38.89	3.30
Alag-Erdene	29.27	40.29	30.45
Arbulag	29.76	39.70	30.54
Bayanzurkh	77.95	20.18	1.87
Burentigtokh	38.96	40.79	20.25
Galt	44.00	40.32	15.68
Jargalant	56.77	38.90	4.34
Ikh-Uul	33.03	41.32	25.66
Rashaant	30.23	46.99	22.78
Renshinlkhembe	55.95	34.50	9.55
Tarialan	41.28	40.19	18.52
Tosontsengel	52.01	31.96	16.03
Tumurbulag	45.15	40.76	14.09
Tunel	29.72	54.13	16.16
Ulaanbulag	51.03	35.52	13.45
Khankh	27.74	49.26	23.00
Tsagaannuur	56.67	33.63	9.70
Tsagaan-Uul	34.27	56.76	8.97
Tsagaan-Uur	68.84	29.61	1.54
Tseteserleg	77.03	22.34	0.63
Chandmani-Under	38.56	54.80	6.64
Shine-Ider	39.38	38.02	22.60
Erdenebulgan	57.67	27.03	15.30

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.5.2. Access to sanitation

Khuvsgul *aimag* has a low rate of access to improved sanitation. About 20.37% of the *aimag's* total population has access to improved sanitation, while 79.63% uses unimproved sanitation facilities.

Murun has the highest coverage of improved sanitation in the *aimag*, where 27.52% of its inhabitants has access to improved sanitation. Improved sanitation coverage is very low in *soum*-level municipalities ranging between 10% and 23% (Figure 19 and Table 13).



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 19. Sanitation coverage in Khuvsgul *aimag* (as of 2013)

Table 13. Access to improved sanitation in Khuvsgul *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Khuvsgul (at the *aimag* level)	20.37	1.32	0.01	8.02	11.01
Murun *(capital of the province)*	27.52	4.21	0.04	11.47	11.78
Alag-Erdene	18.66	0.01	0.00	6.95	11.69
Arbulag	17.39	0.00	0.00	6.55	10.84
Bayanzurkh	20.90	0.00	0.00	8.77	12.12
Burentigtokh	13.46	0.00	0.00	4.35	9.09
Galt	14.93	0.00	0.02	4.47	10.42
Jargalant	18.52	0.05	0.00	7.88	10.59
Ikh-Uul	18.06	0.00	0.00	6.43	11.62
Rashaant	13.54	0.00	0.03	5.76	7.74
Renshinlkhembe	18.54	0.00	0.00	6.57	11.96
Tarialan	22.47	0.04	0.00	10.16	12.27

Tosontsengel	15.27	0.00	0.00	4.57	10.69
Tumurbulag	14.18	0.00	0.00	4.81	9.36
Tunel	16.83	0.00	0.00	5.64	11.18
Ulaanbulag	18.55	0.08	0.00	6.40	12.06
Khankh	20.15	0.00	0.00	7.98	12.16
Tsagaannuur	20.01	0.00	0.00	8.78	11.22
Tsagaan-Uul	14.04	0.04	0.00	5.53	8.46
Tsagaan-Uur	20.36	0.00	0.00	8.09	12.25
Tseteserleg	10.96	0.05	0.00	4.54	6.36
Chandmani-Under	18.85	0.00	0.00	7.04	11.80
Shine-Ider	15.78	0.00	0.00	5.69	10.07
Erdenebulgan	18.35	0.00	0.00	6.21	12.13

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Khuvsgul Lake, Mongolia

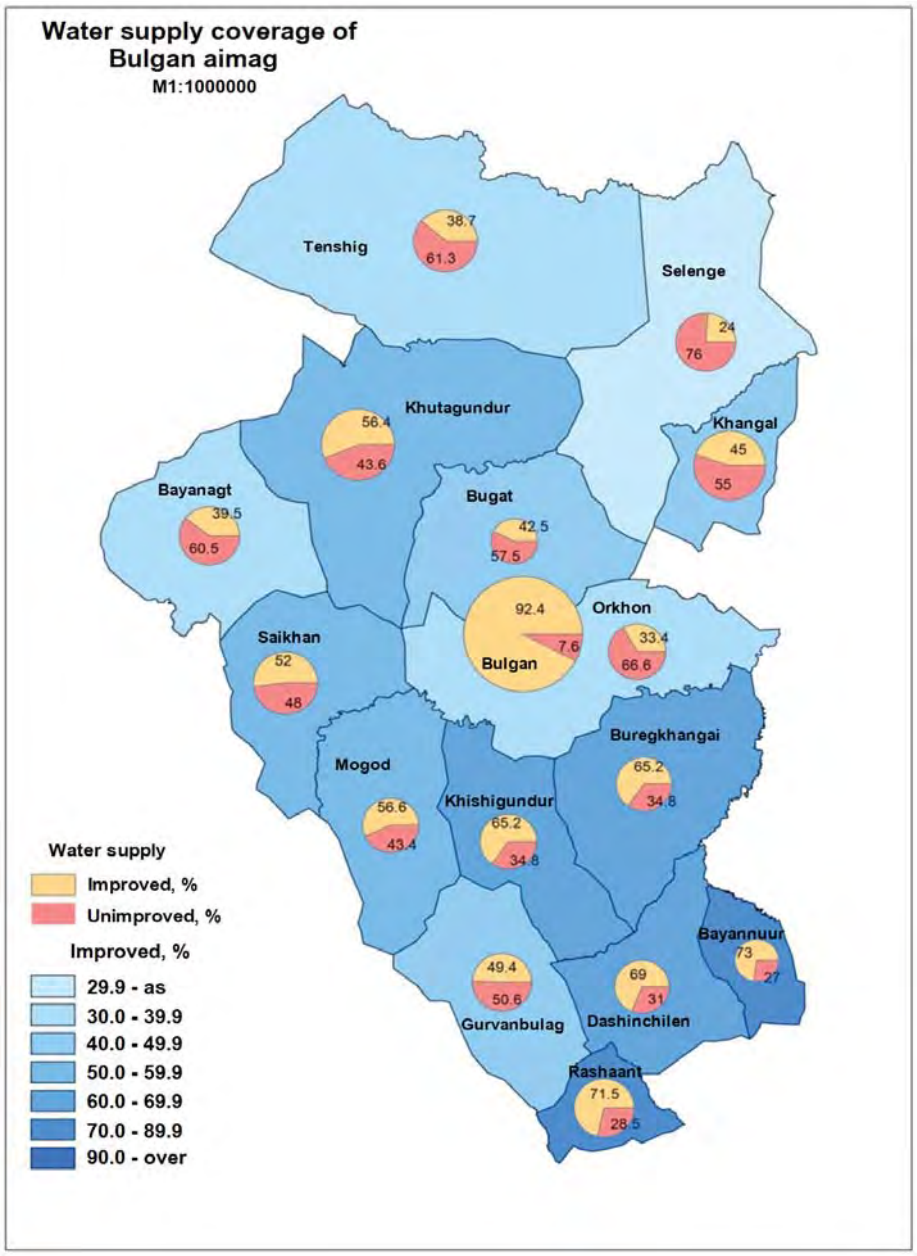
3.6. Bulgan aimag

Bulgan is one of the smallest *aimags* in Mongolia by population size. In 2010, the total population of Bulgan *aimag* was 62,800 in 16,900 households. The proportion of urban and rural population is 25.5% and 74.5%, respectively. The Bulgan City is the capital and largest town of Bulgan *aimag*.

3.6.1. Access to safe drinking water

Access to improved water supply is 59.86% at the *aimag* level, with 40.14% of the population lacking access to safe drinking water. At the town and municipal level, the level of access to improved water supply is relatively higher compared to other *aimags* and ranges between 24% to 93% (Figure 20 and Table 14).

The Bulgan City has the highest coverage of drinking water supply, where 92.37% of inhabitants have access to improved water sources. Around 9.56% of inhabitants of Bulgan City is served by tap water and 3.39% by water kiosks connected to the city's central water supply system. In *soum*-level municipalities, the most commonly-used source of improved water supply is protected wells.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 20. Drinking water coverage in Bulgan *aimag* (as of 2013)

About 40% of the population of Bulgan *aimag* is served by an improved water source within 200 meters, 40.6% from 200 meters to 1 kilometer and 19.4% over 1 kilometer.

Accessibility of water sources in the Bulgan City is higher than in *soum*-level municipalities, with 57.59% of the city's population served by an improved water source within 200 meters, 37.40% from 200 meters to 1 kilometer and 5.01% over 1 kilometer.

Table 14. Access to improved drinking water supply in Bulgan *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Bulgan aimag (*at the aimag level*)	59.86	2.37	0.80	7.73	13.43	33.38	2.15
Bulgan city (*capital of the province*)	92.37	9.56	3.39	28.95	24.44	25.56	0.47
Bayan-Agt	39.48	0.00	0.00	0.04	0.36	36.55	2.54
Bayannuur	73.01	0.00	0.00	0.00	0.00	69.26	3.75
Bugat	42.46	0.00	0.00	1.26	9.21	31.16	0.84
Buregkhangai	65.16	0.00	0.00	0.00	3.86	48.78	12.51
Gurbanbulag	49.41	0.00	0.00	0.29	7.84	40.06	1.22
Dashinchilen	69.00	0.00	0.00	0.17	47.38	21.18	0.26
Mogod	56.58	0.00	0.00	9.93	14.74	25.17	6.75
Orkhon	33.41	0.00	0.00	1.46	0.87	29.94	1.15
Rashaant	71.51	0.00	0.00	0.68	5.20	64.84	0.79
Saikhan	52.04	0.00	0.00	0.38	14.72	29.10	7.85
Selenge	23.99	0.00	0.00	0.18	12.70	10.43	0.69
Teshig	38.74	0.00	0.00	0.00	0.51	38.00	0.22
Khangal	44.98	4.69	1.12	2.94	14.98	21.15	0.10
Khishigundur	65.18	0.00	0.00	0.52	3.10	60.57	0.99
Khutag-Undur	56.43	0.00	0.00	8.78	16.62	29.46	1.57

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

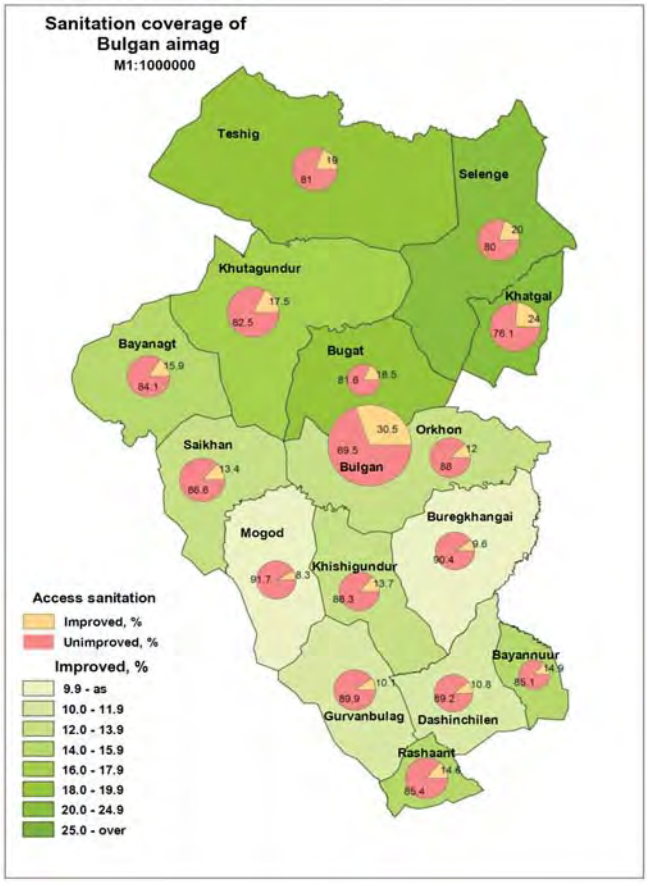
Figure 21. Proportion of the population using unimproved water sources in municipalities in Bulgan *aimag* (as of 2013)

As shown in Figure 21, about 40.14% of the total population of Bulgan *aimag* lacks access to improved water supply. Inhabitants of most small municipalities use surface water sources such as rivers, streams and lakes, which often do not meet drinking water quality standards and are susceptible to anthropogenic pollution. In winter like in any other part of Mongolia, it is common to use ice from frozen rivers and lakes and snow for cooking, household and livestock uses, especially in rural areas.

3.6.2. Access to sanitation

About 18.48% of the *aimag*'s population has access to improved sanitation, whereas 81.53% uses unimproved sanitation facilities. Figure 22 illustrates the level of access to improved sanitation at the town and municipality level in Bulgan *aimag*.

The Bulgan City has the highest coverage of improved sanitation in the *aimag*, with 30.38% of its inhabitants using improved sanitation facilities. In all other *soums*, the level of access to improved sanitation is only between 8% and 24% (Table 15) and the majority of inhabitants uses ventilated improved pit latrines.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 22. Sanitation coverage in Bulgan *aimag* (as of 2013)

Table 15. Access to improved sanitation in Bulgan *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Bulgan aimag (at the *aimag* level)	18.48	2.38	0.03	6.45	9.61
Bulgan city *(capital of the province)*	30.48	9.27	0.00	10.22	10.98
Bayan-Agt	15.87	0.00	0.00	4.6	11.27
Bayannuur	14.95	0.00	0.00	6.53	8.41
Bugat	18.47	0.36	0.12	6.16	11.83
Buregkhangai	9.61	0.13	0.00	3.13	6.345
Gurbanbulag	10.05	0.00	0.00	4.81	5.23
Dashinchilen	10.77	0.00	0.00	4.21	6.55
Mogod	8.29	0.21	0.00	3.06	5.02
Orkhon	12.02	0.00	0.00	3.82	8.2
Rashaant	14.57	0.43	0.00	6.48	7.65
Saikhan	13.43	0.00	0.00	4.27	9.15
Selenge	19.97	0.00	0.00	7.82	12.14
Teshig	18.97	0.00	0.00	7.11	11.85
Khangal	23.99	4.87	0.20	7.14	11.78
Khishigundur	13.74	0.12	0.00	6.17	7.44
Khutag-Undur	17.54	0.00	0.12	5.42	11.99

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.7. Tuv aimag

In 2010, the total population of Tuv *aimag* was 88,800 in 26,800 households. The proportion of urban and rural population is 20% and 80%, respectively. Zuunmod is the capital and largest town of Tuv *aimag* and also the closest town to Ulaanbaatar, the capital city of Mongolia. Tuv *aimag* is one of the predominant agricultural areas in the country. Agriculture is the main economic activity of the *aimag*.

Geographically, Ulaanbaatar is located within the territory of Tuv *aimag*, but the city is administrated as an independent administrative and territorial unit itself. Ulaanbaatar's new (bigger) international airport is planned to be built on the territory of Tuv *aimag*, which will undoubtedly lead to the expansion of economic activities, urban development and improvement of infrastructure in the province.

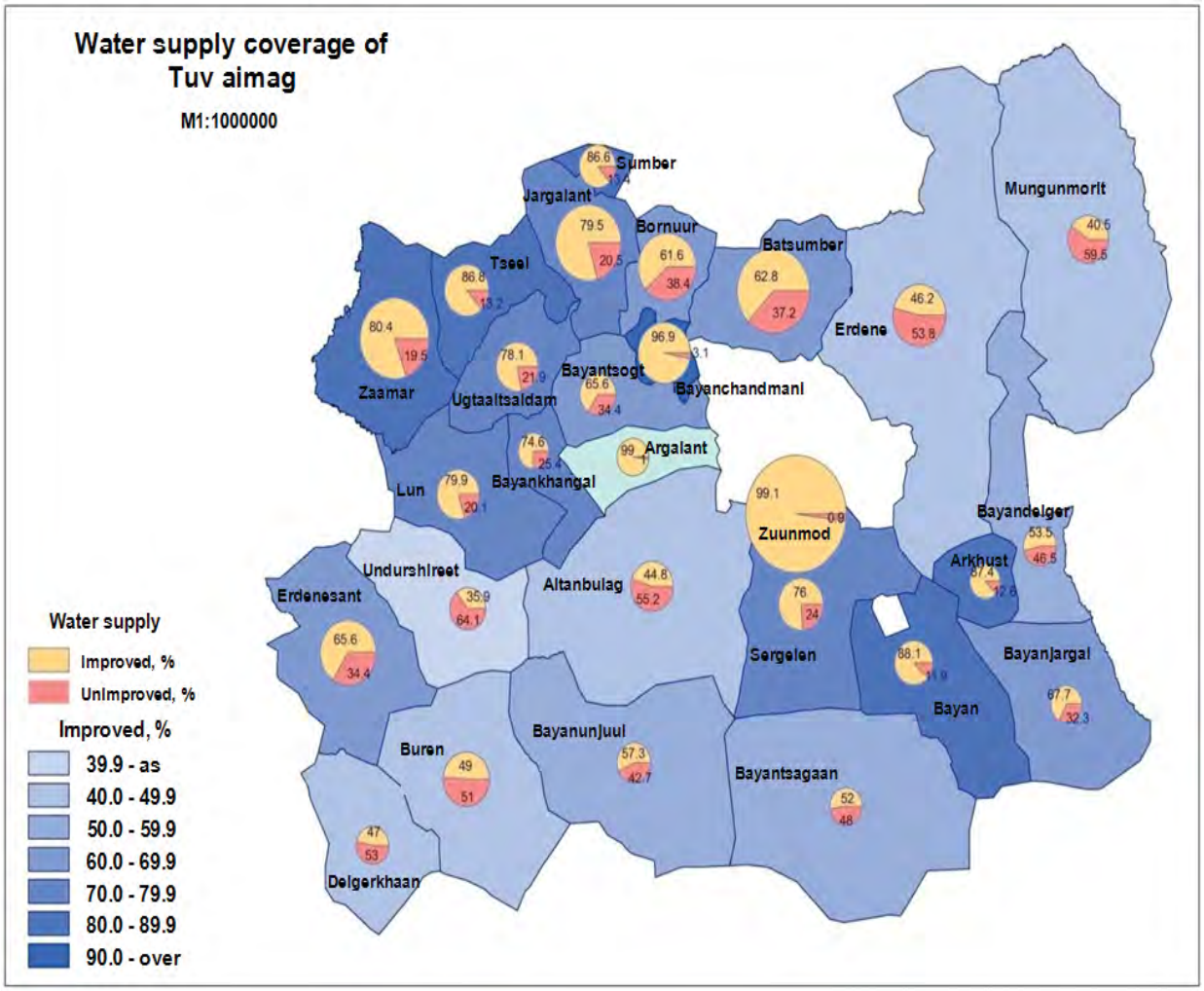
3.7.1. Access to safe drinking water

Tuv *aimag* has the highest coverage of improved water supply at the national level compared to other *aimags*—if not considering Darkhan-Uul and Orkhon *aimags*, which are administrative territories of Darkhan and Erdenet, the second and third largest cities of Mongolia. Improved water supply coverage in Tuv *aimag* is 73.46% of the total population. Over 99% of inhabitants of Zuunmod—the capital and larg-

est town of Tuv *aimag*—has access to improved water supply and about one third (32.84%) is served by tap water from the town's centralized water supply network.

At the *soum* level, the level of access to improved water sources ranges between 35% to 99% and is above 70% in most *soums* (Figure 23). In addition to Zuunmod (the capital town of the *aimag*), several *soums* have centralized water supply systems. As shown in Table 16, around 13.13% of inhabitants of Arkhust *soum* and 6.65% of inhabitants of Zaamar *soum* are supplied with tap water from centralized water distribution networks. Furthermore, an additional 10.6% of inhabitants of Zaamar *soum* is served by water kiosks connected to the water supply network. In other *soums,* protected wells are the main source of drinking water supply.

Around 36.44% of the *aimag*'s population is served by a water source within 200 meters, 40.2% from 200 meters to 1 kilometer and 23.35% over 1 kilometer.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

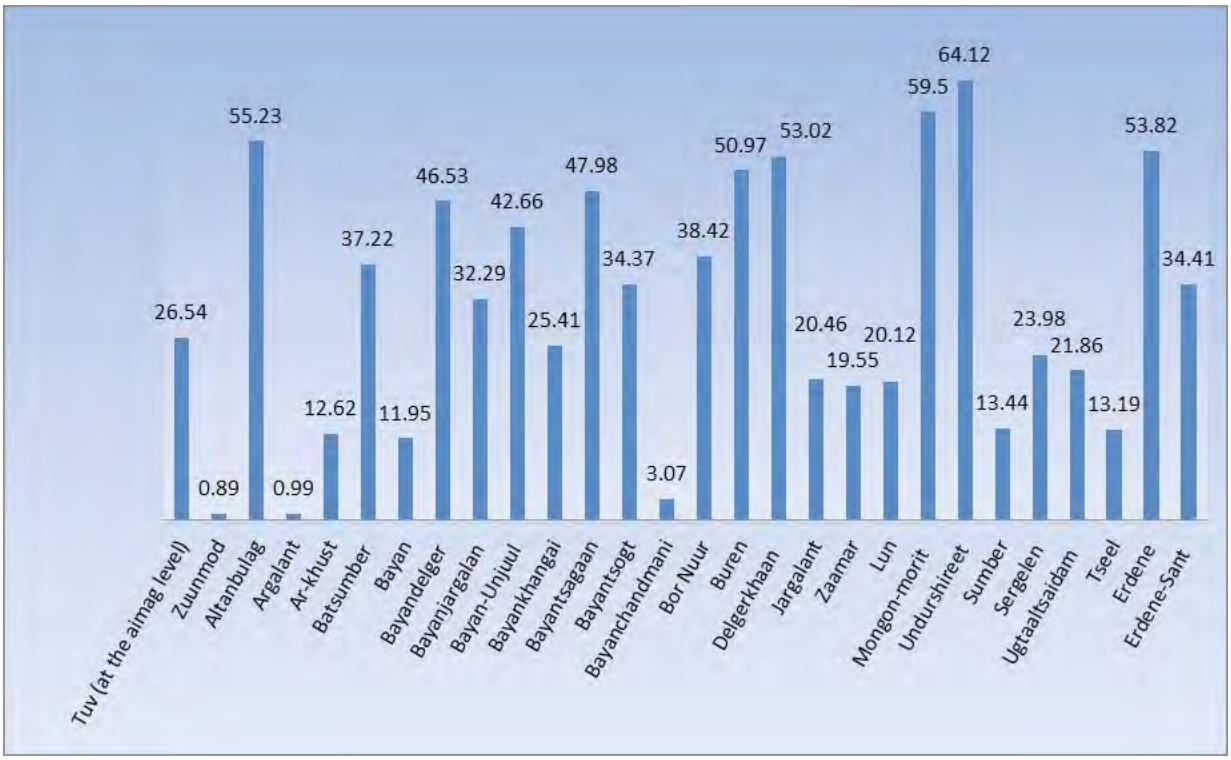
Figure 23. Drinking water coverage in Tuv *aimag* (as of 2013)

Table 16. Access to improved drinking water supply in Tuv *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	**Transported to water tanks**			
Tuv (at the *aimag* level)	73.46	6.60	2.14	11.70	8.06	43.94	1.02
Zuunmod *(capital of the province)*	99.11	32.84	3.76	36.39	10.04	15.98	0.11
Altanbulag	44.77	3.02	0.00	0.22	4.83	36.49	0.22
Argalant	99.01	0.00	0.38	0.00	9.56	87.78	1.29
Ar-Khust	87.38	13.13	0.26	8.07	9.36	52.62	3.95
Batsumber	62.78	2.29	0.70	0.07	1.13	57.98	0.61
Bayan	88.05	0.27	0.38	0.00	3.88	82.28	1.24
Bayandelger	53.47	0.14	0.07	0.56	5.47	46.18	1.05
Bayanjargalan	67.71	0.00	0.00	0.39	4.48	61.67	1.18
Bayan-Unjuul	57.34	0.07	0.34	29.42	2.39	24.23	0.89
Bayankhangai	74.59	0.00	0.00	1.73	0.25	69.80	2.81
Bayantsagaan	52.02	0.00	0.00	1.35	0.37	49.25	1.05
Bayantsogt	65.63	0.00	1.49	28.17	26.09	9.47	0.42
Bayanchandmani	96.93	4.65	0.34	0.00	0.98	90.12	0.83
Bor Nuur	61.58	0.12	0.56	7.51	2.36	50.71	0.33
Buren	49.03	0.00	1.28	5.64	0.26	40.49	1.36
Delgerkhaan	46.98	0.00	0.23	26.40	13.50	6.33	0.53
Jargalant	79.54	0.02	0.18	0.06	4.79	72.64	1.85
Zaamar	80.45	6.65	10.60	33.32	17.23	10.92	1.72
Lun	79.88	0.34	0.26	0.26	0.21	78.17	0.64
Mungun-Morit	40.50	0.00	0.05	36.02	2.81	1.33	0.29
Undurshireet	35.88	0.12	0.00	0.31	0.00	34.05	1.40
Sumber	86.56	0.00	0.23	0.29	4.17	81.10	0.76
Sergelen	76.02	0.89	0.19	1.40	14.05	57.16	2.33
Ugtaal-Tsaidam	78.14	0.00	0.13	0.04	38.21	38.96	0.79
Tseel	86.81	0.04	7.58	0.00	6.49	71.70	1.00
Erdene	46.18	1.48	0.20	1.06	0.45	40.73	2.26
Erdene-Sant	65.59	1.62	5.25	0.15	23.24	34.16	1.17

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Despite the high water supply coverage in most *soums*, about 26.54% of the *aimag*'s total population still uses unimproved water sources (Figure 24). But the proportion of the population lacking access to improved water supply is relatively small compared to other *aimags*. In most *soums*, about 20-50% of the population uses unprotected springs and rivers.



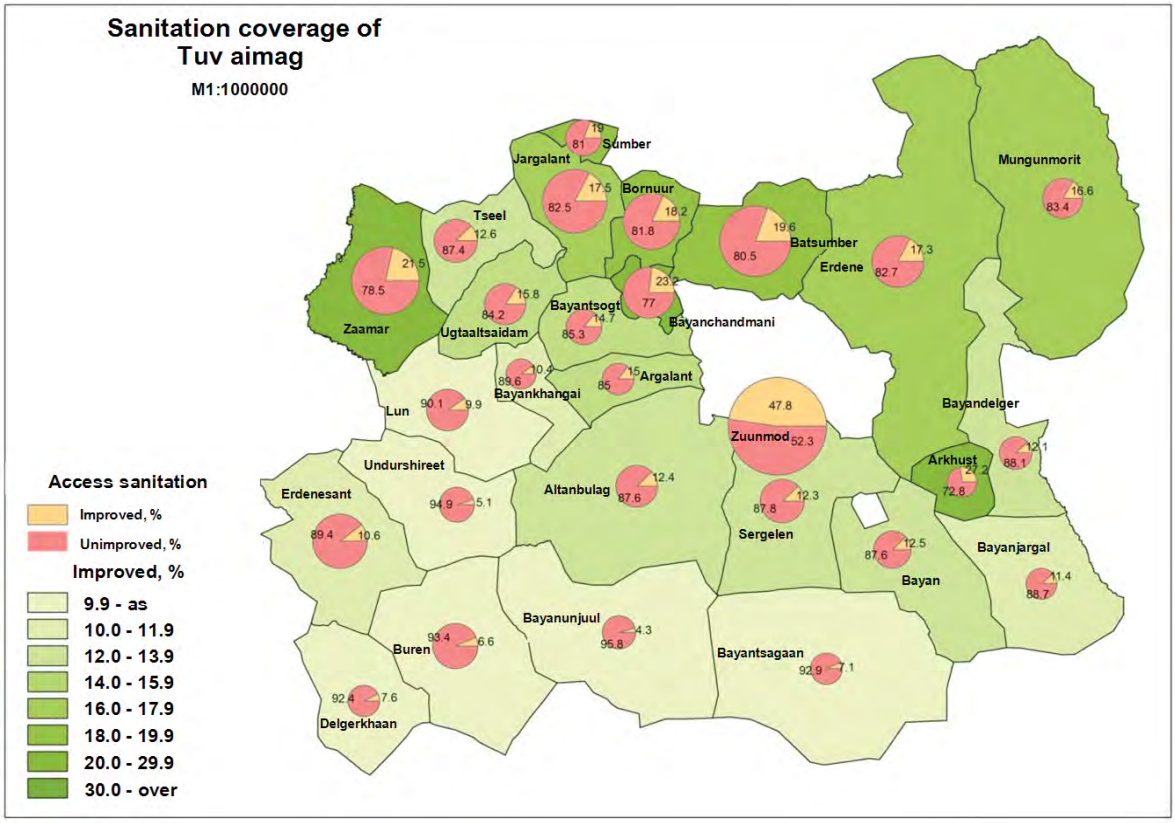
Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 24. Proportion of the population using unimproved water sources in municipalities in Tuv *aimag* (as of 2013)

3.7.2. Access to sanitation

Although access to drinking water is comparatively high in Tuv *aimag*, only about 20% of its total population has access to improved sanitation, whereas the remaining 80% still uses unimproved sanitation facilities. The level of access to improved sanitation in Zuunmod is the highest in the *aimag*, where almost half of inhabitants (or 47.81%) use improved sanitation facilities. At the *soum* level, the coverage of improved sanitation ranges from 5% to 27% (Figure 25 and Table 17).

Improved sanitation coverage is less than 20% in most *soums*. In only six *soums* out of total 27, the level of access to improved sanitation is above 20%. Despite the fact that Tuv *aimag* is the closest province to Ulaanbatar—the country's political, economic and cultural center—its infrastructure and social development is very low and at a comparable level to other *aimags*.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 25. Sanitation coverage in Tuv *aimag* (as of 2013)

Table 17. Access to improved sanitation in Tuv *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Tuv (at the *aimag* level)	20.44	6.23	0.10	5.39	8.71
Zuunmod *(capital of the province)*	47.81	31.71	0.26	7.45	8.38
Altanbulag	12.45	3.02	0.00	3.52	5.90
Argalant	15.01	0.00	0.08	5.28	9.65
Àr-Khust	27.21	13.13	0.00	4.94	9.13
Batsumber	19.56	1.46	0.04	6.70	11.34
Bayan	12.49	0.27	0.11	4.30	7.81
Bayandelger	12.05	0.14	0.21	4.17	7.53
Bayanjargalan	11.40	0.00	0.24	3.60	7.56
Bayan-Unjuul	4.28	0.07	0.14	1.305	2.77
Bayankhangai	10.39	0.00	0.00	3.52	6.85
Bayantsagaan	7.14	0.00	0.00	1.89	5.24
Bayantsogt	14.73	0.00	0.00	5.59	9.12

Bayanchandmani	23.19	4.35	0.43	7.10	11.30
Bor Nuur	18.21	0.12	0.07	6.69	11.33
Buren	6.56	0.00	0.00	2.27	4.28
Delgerkhaan	7.60	0.00	0.00	3.08	4.51
Jargalant	17.53	0.02	0.00	6.11	11.40
Zaamar	21.52	5.22	0.00	6.83	9.46
Lun	9.92	0.34	0.04	3.35	6.18
Mungun-Morit	16.63	0.00	0.00	5.02	11.60
Undurshireet	5.13	0.12	0.00	1.67	3.34
Sumber	19.04	0.00	0.12	7.54	11.37
Sergelen	12.32	0.89	0.27	3.69	7.46
Ugtaal-Tsaidam	15.79	0.00	0.00	6.93	8.85
Tseel	12.64	0.04	0.00	3.97	8.62
Erdene	17.32	1.65	0.06	4.88	10.73
Erdene-Sant	10.61	1.62	0.00	2.91	6.07

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.8. Selenge aimag

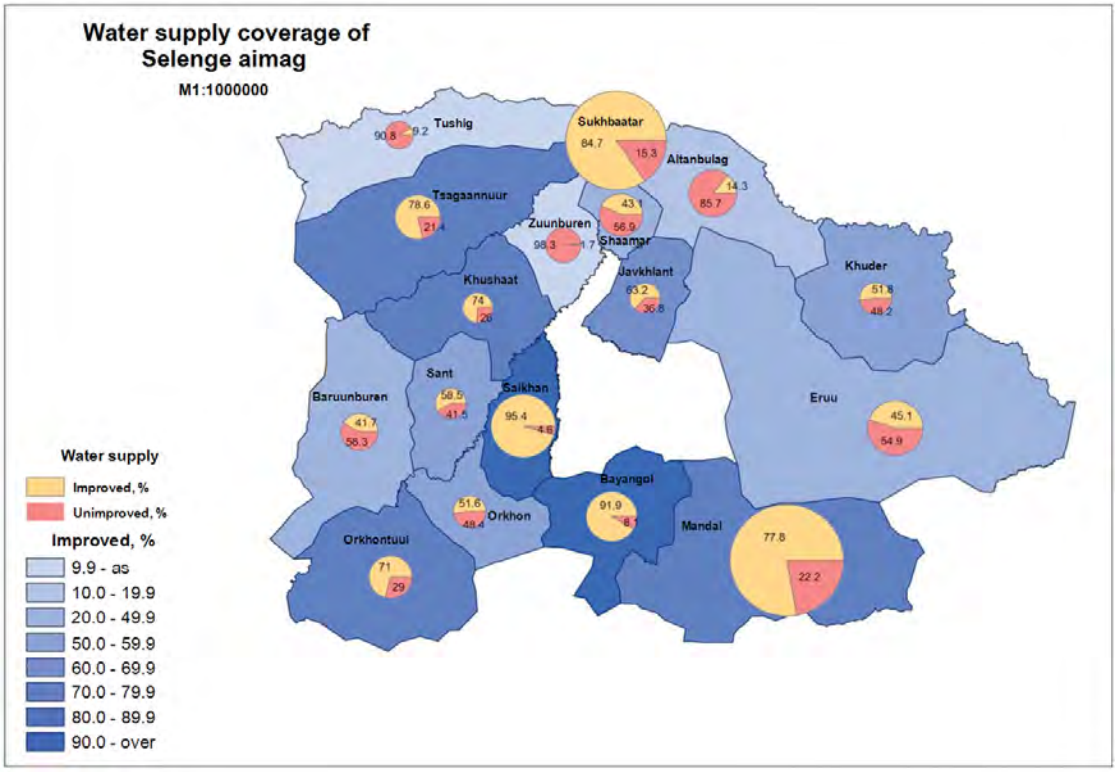
Selenge is one of the largest *aimags* in Mongolia by population size. In 2010, the total population of Selenge *aimag* was 105,000 in 28,400 households. The proportion of urban and rural population is 32.4% and 67.6%, respectively. The capital of Selenge *aimag* is Sukhbaatar, which is the largest town in the *aimag*. The border town Altanbulag, which is the location of the Altanbulag Free Trade Zone, is located on the border with Russia opposite to the Russian town of Kyakhta. Several larger human settlements are located in Selenge *aimag* such as Zuunkharaa, Baruunkharaa and Khutul towns. Poverty is low compared to other *aimags*.

Selenge *aimag* is the most intensive agricultural region of Mongolia. Agriculture is the principal economic activity in the *aimag* and a major source of livelihoods of the majority of the inhabitants. Selenge *aimag* produces most of the domestically-grown grains and agricultural products of Mongolia. Over recent years, agricultural activities have expanded considerably and the market share of the domestically-grown agricultural products has increased. Mining is also one of the main economic activities in Selenge *aimag*. It is expected that intensive agricultural and mining activities in the region will provide good incentives for better infrastructure development and water and sanitation services.

3.8.1. Access to safe drinking water

Access to improved water supply is 69.10% of the total population of Selenge *aimag*, whereas 30.90% of the population uses unimproved water sources. Several *soums* of Selenge *aimag* have centralized water supply systems, where the level of access to improved water sources is comparatively high, in particular in: Sukhbaatar, the capital and largest town of Selenge *aimag* (84.67%); Bayangol (91.94); Saikhan (95.41%); Mandal (77.82%); Orkhontuul (71.02%); Yuruu (45.11%); and Altanbulag (14.30%). A significant part of inhabitants of these *soums* is served by tap water from municipal water distribution networks; for example, 26.94% in Sukhbaatar town; 52.56% in Saikhan *soum*; and Orkhontuul (15.00%). Furthermore, substantial portions of inhabitants of these *soums* are served by water kiosks connected to water supply networks, such as: Sukhbaatar town (18.48%) and Saikhan *soum* (14.82%). A significant part of inhabitants use protected wells or are served by water trucks. Access to improved water supply is low in Zuunburen (1.73%) and Tushig (9.21%). Figure 26 and Table 18 show the level of access to improved water supply for all towns and *soums* of Selenge *aimag*.

The accessibility of improved water sources is higher in Selenge *aimag* compared to in other *aimags*, with 69.33% of its total population served by a water source within 200 meters, 22.6% from 200 meters to 1 kilometer and 8.07% over 1 kilometer.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

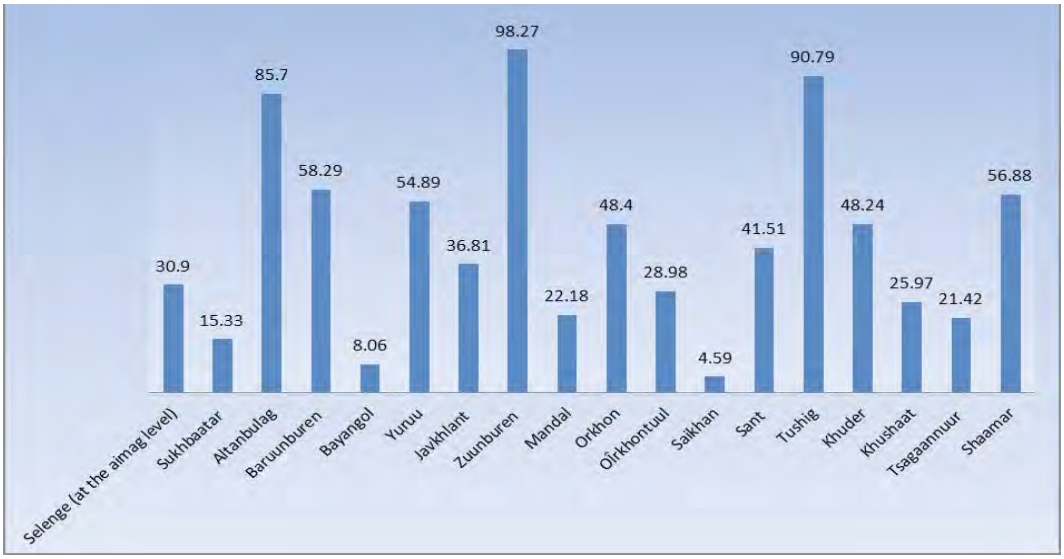
Figure 26. Drinking water coverage in Selenge *aimag* (as of 2013)

Table 18. Access to improved drinking water supply in Selenge *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Selenge (at the *aimag* level)	69.10	14.39	7.95	9.57	17.66	19.33	0.20
Sukhbaatar *(capital of the province)*	84.67	26.94	18.48	26.21	5.22	7.76	0.05
Altanbulag	14.30	5.08	1.79	0.35	1.72	4.04	1.32
Baruunburen	41.71	0.11	0.15	20.36	1.83	19.14	0.11
Bayangol	91.94	4.41	6.20	6.08	18.00	56.83	0.41
Yuruu	45.11	6.32	5.92	5.78	9.52	17.44	0.14
Javkhlant	63.19	0.00	0.00	0.00	3.69	57.91	1.59
Zuunburen	1.73	0.65	0.13	0.00	0.61	0.35	0.00
Mandal	77.82	11.24	3.39	5.02	41.84	16.24	0.08
Orkhon	51.60	0.30	0.00	1.09	32.30	17.63	0.30
Orkhontuul	71.02	15.00	0.42	3.51	7.25	44.69	0.14
Saikhan	95.41	52.56	14.82	16.38	9.95	1.61	0.09
Sant	58.49	0.39	20.70	0.44	1.72	35.07	0.17
Tushig	9.21	0.00	0.00	0.20	1.34	7.66	0.00
Khuder	51.76	0.00	0.00	0.00	7.20	44.46	0.10
Khushaat	74.03	0.00	0.00	0.86	28.03	44.91	0.23
Tsagaan-Nuur	78.58	0.13	16.47	0.03	28.55	33.09	0.31
Shaamar	43.12	0.00	3.24	0.65	3.22	35.89	0.11

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

At the *aimag* level, about 30% of the population still uses unimproved water sources. The portion of people lacking access to improved water supply is shown in Figure 27 for all towns and *soums* of Selenge *aimag*.



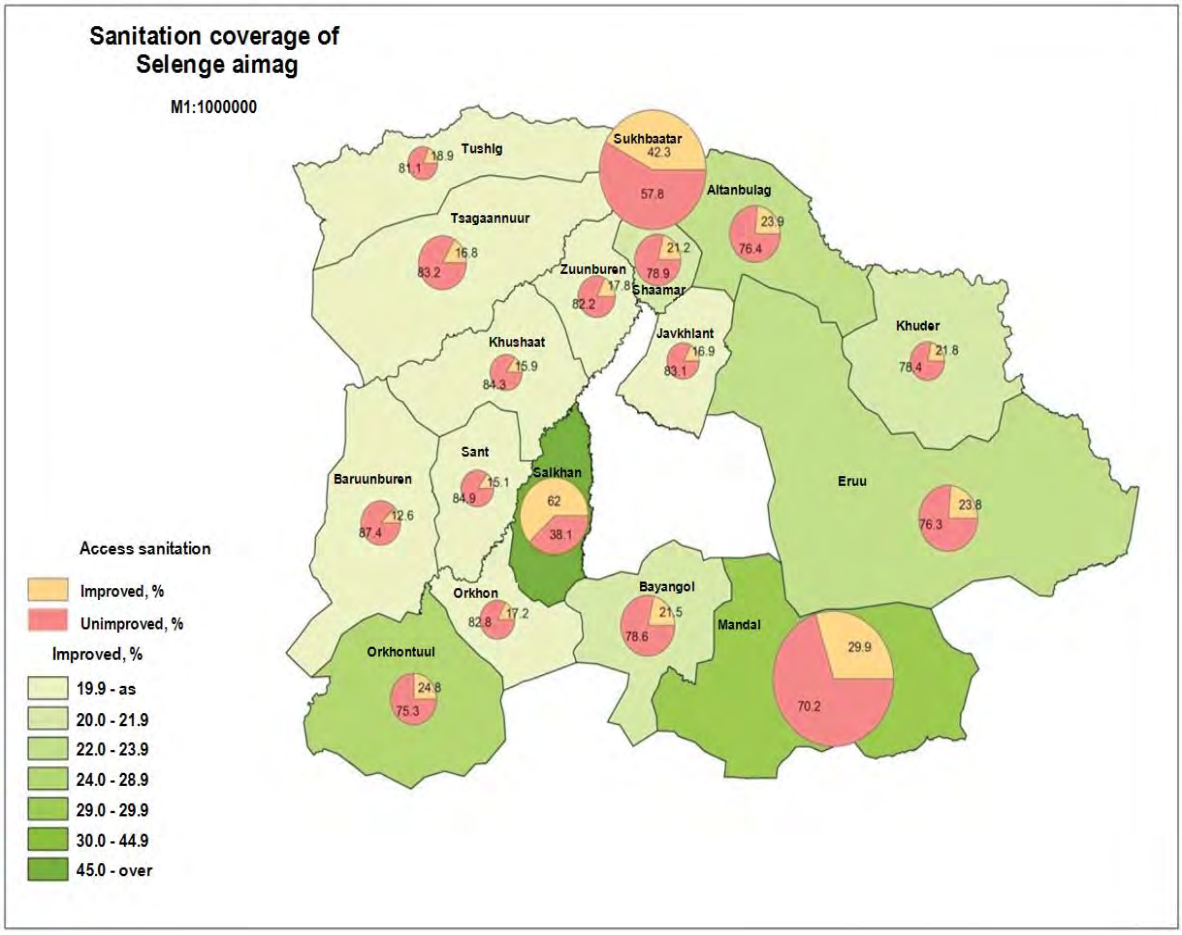
Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 27. Proportion of the population using unimproved water sources in municipalities in Selenge *aimag* (as of 2013)

3.8.2. Access to sanitation

Improved sanitation coverage in Selenge *aimag* is 30.78% of the total population, whereas 69.22% still uses unimproved sanitation facilities. The level of access to improved sanitation is relatively higher in small towns such as Saikhan *soum* (62%), which is the location of Khutul town, and Sukhbaatar town (42.3%). In all other *soums* of Selenge *aimag*, access to improved sanitation ranges from 13% to 30% (Figure 28 and Table 19).

The coverage of public sewerage systems is very low in Selenge *aimag*, like in all other *aimags*. In most *soums*, only about 0.11-11.1% of inhabitants is connected to sewerage networks, except for larger towns such as the province capital Sukhbaatar City (25.44%) and Saikhan *soum*/Khutul town (52.56%). In 40% of the *aimag*'s *soums*, the level of access to improved sanitation is less than 20%. The use of septic tanks is limited to only few municipalities. The most widespread form of sanitation is ventilated improved pit latrine.



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 28. Sanitation coverage in Selenge *aimag* (as of 2013)

Table 19. Access to improved sanitation in Selenge *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Selenge (at the *aimag* level)	30.78	14.00	0.20	6.65	9.93
Sukhbaatar *(capital of the province)*	42.3	25.44	0.26	7.43	9.17
Àltanbulag	23.9	4.36	0.53	7.33	11.68
Baruunburen	12.6	0.11	0.11	3.51	8.87
Bayangol	21.5	4.45	0.20	5.41	11.44
Eruu	23.8	6.40	0.19	6.70	10.51
Javkhlant	16.9	0.00	0.00	5.91	10.99
Zuunburen	17.8	0.65	0.04	5.81	11.30
Mandal	29.9	11.10	0.24	7.75	10.81
Orkhon	17.2	0.30	0.00	6.68	10.22
Orkhontuul	24.8	14.38	0.14	3.73	6.55
Saikhan	62.0	52.56	0.14	3.60	5.70
Sant	15.1	0.22	0.00	4.95	9.93
Tushig	18.9	0.00	0.00	7.38	11.52
Khuder	21.8	0.08	0.30	9.14	12.28
Khushaat	15.9	0.11	0.23	5.29	10.27
Tsagaan-Nuur	16.8	0.13	0.00	6.26	10.41
Shaamar	21.2	0.13	0.00	6.26	14.81

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.9. Orkhon aimag

In 2010, the total population in Orkhon *aimag* was 85,000 in 24,600 households. The proportion of urban and rural population is 95.5% and 4.5%, respectively. With more than 95% of the population living in urban areas, Orkhon *aimag* is one of the most urbanized provinces of Mongolia. By territory, Orkhon *aimag* is one of the smallest of *aimags* of Mongolia.

The Erdenet City—a large industrial town and the third largest city of Mongolia by population size—is located in Orkhon *aimag* (Figure 29). Administratively, the Erdenet City is located on the territory of Bayan-Undur *soum* and therefore officially called "*Bayan-Undur soum*". Erdenet is home to the "Erdenet Mining Corporation" (Erdenet Copper-Molybdenum Mine), which is a joint Mongolian-Russian venture and the fourth largest copper mine in the world.

Figure 29. A view of the Erdenet City

3.9.1. Access to safe drinking water

Over 95% of the population of Orkhon *aimag* has access to improved drinking water supply. The proportion of the population served by tap water from the centralized water supply system is higher compared to other provinces. At the province level, 39.87% the total population is connected to the centralized water distribution networks. In the Erdenet City (called also as, Bayan-Undur *soum*), 40.63% of inhabitants uses tap water and 17.1% of inhabitants of Jargalant *soum* is connected to central water distribution network. The rest of the population mostly uses water from water kiosks and protected wells (Table 20). Being an industrial city, the Erdenet City has a very high level of access to centralized drinking water supply and sanitation services.

Table 20. Access to improved drinking water supply in Orkhon *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Orkhon(at the *aimag* level)	95.56	39.87	0.30	49.00	1.05	5.19	0.15
Erdenet City (Bayan-Undur)	96.25	40.63	0.31	49.95	1.08	4.23	0.05
Jargalant	75.05	17.10	0.00	20.68	0.04	34.05	3.19

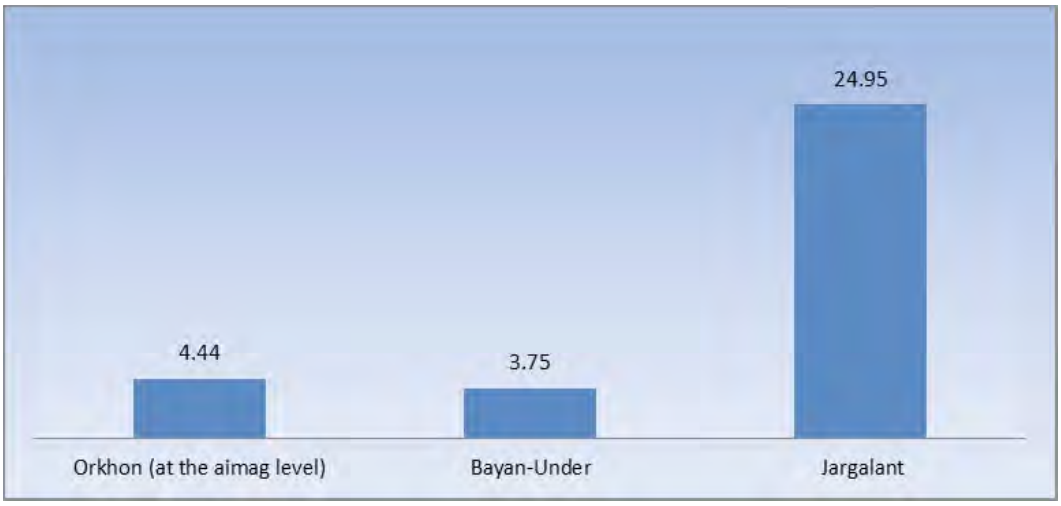
Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Only around 5% of the population lacks access to improved water sources and use water from surface water resources such as unprotected springs and streams (Table 21, Figure 30).

Table 21. Proportion of the population using unimproved water sources in Orkhon *aimag* (as of 2013)

Municipalities	Proportion of the population using unimproved water supply, %	Of which, %						Bottled water, %
		Transported water	Unprotected wells	Unprotected springs	Cart with small tanks	Rain water	Surface water	
Orkhon (at the *aimag* level)	4.44	0.00	0.00	0.00	0.00	0.00	4.44	0.00
Erdenet City (Bayan-Undur)	3.75	0.00	0.00	0.00	0.00	0.00	3.75	0.00
Jargalant	24.95	0.00	0.00	0.00	0.00	0.00	24.95	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 30. Proportion of the population using unimproved water sources in municipalities in Arkhangai *aimag* (as of 2013)

Regarding the accessibility of water sources, the inhabitants, who are not connected the centralized water supply system, but provided with purified water from water kiosks connected to the centralized water distribution network are served by a water kiosk in an average distance of: 200 meters for 44.99% of these inhabitants; from 200 meters to 1 kilometer for 48.56%; and over 1 kilometer for 6.44% (Table 22).

Table 22. Accessibility of drinking water sources (the distance) in Orkhon *aimag*

Municipalities	Up to 200 meters, %	From 200 meters to 1 kilometer, %	Over 1 kilometer, %
Orkhon (at the *aimag* level)	44.99	48.56	6.44
Erdenet City (Bayan-Undur soum**)**	45.17	48.68	6.15
Jargalant	41.24	46.09	12.67

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.9.2. Access to sanitation

Orkhon *aimag* has improved sanitation coverage of 53.82% of its total population. Access to improved sanitation is relatively high in the Erdenet City (54.50%) and Jargalant *soum* (33.62%), which are the only two municipalities in Orkhon *aimag* (Table 23). Both municipalities have centralized sewerage network systems. Consequently, a significant part of the inhabitants of these municipalities are connected to the public

sewerage systems: 40.39% in the Erdenet City and 17.10% in Jargalant *soum*. At the *aimag* level, 39.63% of the population is served by centralized sewerage systems.

Table 23. Access to improved sanitation in Orkhon *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Orkhon (at the *aimag* level)	53.82	39.63	0.02	14.17	0.00
Erdenet City (Bayan-Undur soum)	54.50	40.39	0.03	14.09	0.00
Jargalant	33.62	17.10	0.00	16.53	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

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3.10. Darkhan-Uul aimag

In 2010, the population of Darkhan-Uul *aimag* was over 90,000 in around 28,000 households. The proportion urban and rural population is 81.1% and 18.9%, respectively. By territory, Darkhan-Uul *aimag* is one of the smallest of *aimags* of Mongolia.

The Darkhan City, which is an industrial city and the second biggest city in Mongolia by population size, is located in Darkhan-Uul *aimag*. The city is also home to the Darkhan Metallirugical Plant. There are three other smaller municipalities in Darkhan-Uul *aimag*, which are Orkhon, Khongor, and Shariin-Gol (Figure 31). The *aimag* has good infrastructure, with a direct paved road to Ulaanbaatar and access to the international railway.

Figure 31. Administrative map of Darkhan-Uul *aimag*

3.10.1. Access to safe drinking water

Access to improved water supply in Darkhan-Uul *aimag* is amongs the highest in Mongolia, with 95.18% of the *aimag*'s total population having access to improved water sources. As shown in Table 24, water supply coverage in the Darkhan City is 96.91%, whereas it is slightly lower in smaller municipalities: Shariin-Gol (91.90%); Khongor (84.05%); and Orkhon (80.28%). Nearly half of the *aimag*'s population is connected to centralized water supply systems, with the proportion of the population served by tap water being 55.06% in the Darkhan City, 20.91% in Khongor *soum*, and 38.41% in Shariin-Gol. Furthermore, a significant part of the population is served by purified water from centralized water distribution networks through water kiosks and water trucks. The rest of the population uses protected wells and springs.

Table 24. Access to improved drinking water supply in Darkhan-Uul *aimag* (as of 2013)

Municipalities	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Darkhan (at the *aimag* level)	95.18	49.81	0.58	17.23	5.88	21.51	0.17
Darkhan City	96.91	55.06	0.70	18.11	5.25	17.61	0.17
Orkhon	80.28	0.00	0.00	0.63	13.91	65.46	0.28
Khongor	84.05	20.91	0.00	0.27	4.35	58.25	0.27
Shariin-Gol	91.90	38.41	0.00	26.10	9.56	17.72	0.11

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

The accessibility of improved water sources is relatively high. The average distance from households to the nearest improved decentralized water source (such as a water kiosk or protected well) is: within 200 meters for 61.6% of the total population; from 200 meters to 1 kilometer for 32.16%; and over 1 kilometer for only 6.24% (Table 25).

Table 25. Accessibility of drinking water sources (the distance) in Darkhan-Uul *aimag*

Municipalities	Up to 200 meters, %	From 200 meters to 1 kilometer, %	Over 1 kilometer, %
Darkhan (at the *aimag* level)	61.60	32.16	6.24
Darkhan City	62.02	33.97	4.01
Orkhon	88.10	7.41	4.49
Khongor	47.00	29.30	23.70
Shariin-Gol	54.38	37.45	8.17

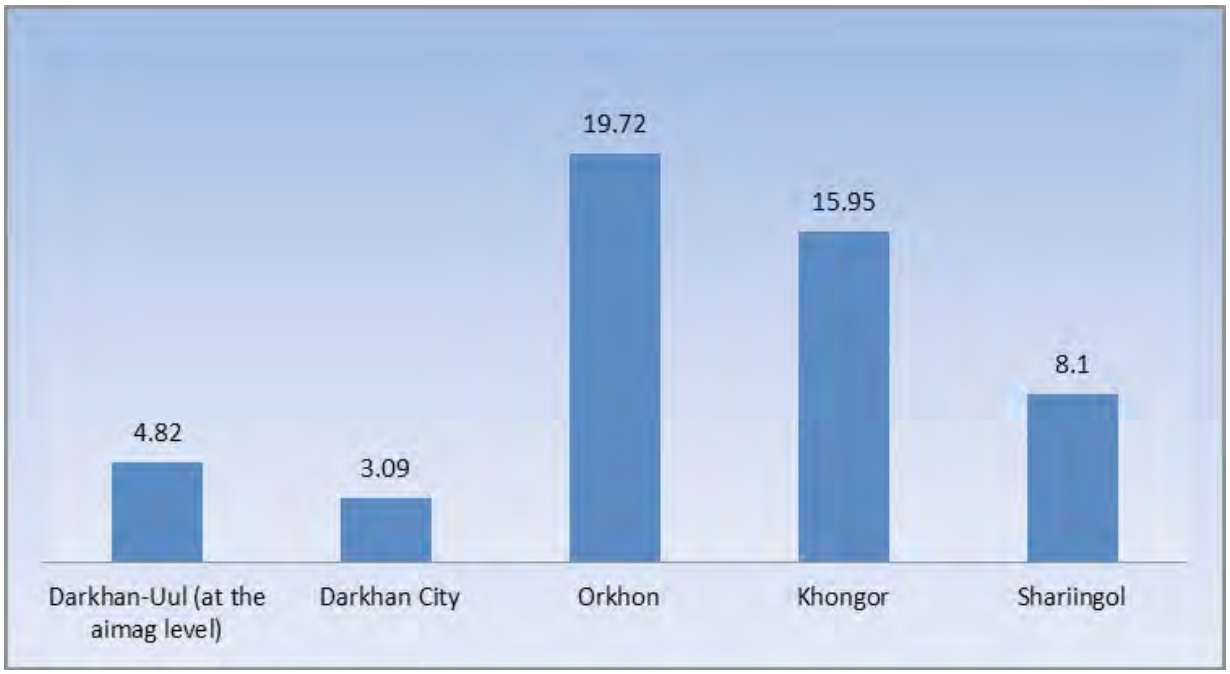
Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

About 4.82% of the total population of Darkhan-Uul *aimag* lacks access to improved water supply. The proportion of the population using unimproved water sources is higher in small towns such as Orkhon (19.72%) and Khongor (15.95%), as shown in Table 26 and Figure 32. Their main source of drinking water is surface waters, with the majority of the inhabitants using water directly from the Kharaa River, which flows by the Darkhan City and Orkhon and Khongor towns.

Table 26. Proportion of the population using unimproved water sources in Darkhan-Uul *aimag* (as of 2013)

Municipalities	Proportion of the population using unimproved water supply	Of which, %						Bottled water, %
		Transported water	Unprotected wells	Unprotected springs	Cart with small tanks	Rain water	Surface water	
Darkhan (at the *aimag* level)	4.82	0.00	0.00	0.00	0.00	0.00	4.82	0.00
Darkhan City	3.09	0.00	0.00	0.00	0.00	0.00	3.09	0.00
Orkhon	19.72	0.00	0.00	0.00	0.00	0.00	19.72	0.00
Khongor	15.95	0.00	0.00	0.00	0.00	0.00	15.95	0.00
Shariin-Gol	8.10	0.00	0.00	0.00	0.00	0.00	8.10	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 32. Proportion of the population using unimproved water sources in municipalities in Darkhan-Uul *aimag* (as of 2013)

3.10.2. Access to sanitation

Santiation coverage in Darkhan-Uul *aimag* is amongst the highest in Mongolia. Over 60% of the total population has access to improved sanitation (Table 27), whereas 39.6% uses unimproved sanitation facilities (Table 28). Most municipalities have centralized sewerage systems. About 49.33% of the *aimag*'s total population and 54.27% of inhabitants of the Darkhan City are connected to centralized sewerage networks.

Table 27. Access to improved sanitation in Darkhan-Uul *aimag* (as of 2013)

Municipalities	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Darkhan-Uul (at the *aimag* level)	60.40	49.33	0.27	10.80	0.00
Darkhan City	64.64	54.27	0.30	10.06	0.00
Orkhon	18.99	0.10	0.28	18.60	0.00
Khongor	35.73	20.89	0.00	14.85	0.00
Shariin-Gol	60.40	49.33	0.27	10.80	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Table 28. The proportion of the population using unimproved sanitation in Darkhan-Uul *aimag* (as of 2013)

Municipalities	Proportion of the population using unimproved sanitation, %
Darkhan-Uul (at the *aimag* level)	39.60
Darkhan City	35.52
Orkhon	81.15
Khongor	64.27
Shariin-Gol	39.94

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

3.11. Ulaanbaatar- the capital city of Mongolia

Ulaanbaatar—the capital city of Mongolia—is an independent administrative territorial unit under the revised *Law of Mongolia on Administrative and Territorial Units and their Governance* of 2006. According to data from the National Statistics Office of Mongolia (2010), the territory under the administration of the capital city of Ulaanbaatar is an entirely urban area with 100% urban population. Ulaanbaatar is home to nearly half of the country's population. In 2010, the population of Ulaanbaatar was 1.2 million in 280,000 households. About half of the city's inhabitants live in apartments and modern houses and the other half live in *'ger'* districts.

Ulaanbaatar has nine administrative districts, six of which are located within the city itself and three are satellite districts (towns). The inner districts include: Bayangol; Bayanzurkh; Chingeltei; Khan-Uul; Songino-Khairkhan and Sukhbaatar. The satellite districts of Ulaanbaatar are: Baga-Nuur; Baga-Khangai; and Nalaikh.

3.11.1. Access to safe drinking water

Ulaanbaatar has achieved almost universal access to improved water supply, with 99.52% of its inhabitants having access to improved water sources. About 36.87% Ulaanbaatar's total population is served by tap water from the city's centralized water supply system and 55.20% of users is served by water kiosks connected to the water distribution network and water trucks delivering purified water to water tanks (Table 29). The rest of the inhabitants uses purified water from water tanks or delivered by water truck services. The proportion of the population connected to the centralized water supply network is higher in the inner districts of Ulaanbaatar, where a majority of the inhabitants lives in modern partments. The water supply and sewerage network of Ulaanbaatar is shown in Figure 33.

Source: USUG, 2011.

Figure 33. Water supply and sewerage network of Ulaanbaatar

Table 29. Access to improved drinking water supply in Ulaanbaatar (as of 2013)

Municipal districts	Population served by improved water supply, %	Of which, %					
		Served by tap water	Water kiosks		Served by water trucks	Protected wells	Protected springs
			Connected to water supply network	Transported to water tanks			
Ulaanbaatar (total)	99.52	36.87	22.00	33.20	2.90	4.43	0.11
Districts:							
Baga-Nuur	97.62	45.71	15.63	31.37	2.26	2.23	0.43
Baga-Khangai	99.54	51.97	0.82	37.31	5.86	3.57	0.00
Bayangol	99.99	73.36	4.62	19.84	1.57	0.61	0.00
Bayanzurkh	99.39	34.51	3.25	54.02	3.39	4.11	0.12
Nalaikh	96.60	21.20	0.40	68.89	2.67	3.36	0.08
Songino-Khairkhan	99.57	23.79	32.00	34.02	3.63	6.01	0.13
Sukhbaatar	99.70	39.30	16.53	38.43	1.63	3.50	0.31
Khan-Uul	99.46	40.14	38.87	5.15	2.53	12.72	0.05
Chingeltei	99.85	17.51	58.09	18.42	3.74	2.07	0.03

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Only about 0.48% of the total inhabitants use unprotected springs and rivers (Table 30 and Figure 34). There are 22 springs around Ulaanbaatar, which are used for drinking water purposes. However, these springs have become polluted from inadequate waste disposal and are no longer safe for drinking purposes. The use of bottled water is increasingly becoming an alternative option for people who do not have access to improved drinking water sources.

The accessibility of drinking water sources is very high and is as follows: up to 200 meters for 57.84% of the total population of Ulaanbaatar; from 200 meters to 1 kilometer for 38.73%; and over 1 kilometer for 3.43%.

Table 30. Proportion of the population using unimproved water sources in Ulaanbaatar (as of 2013)

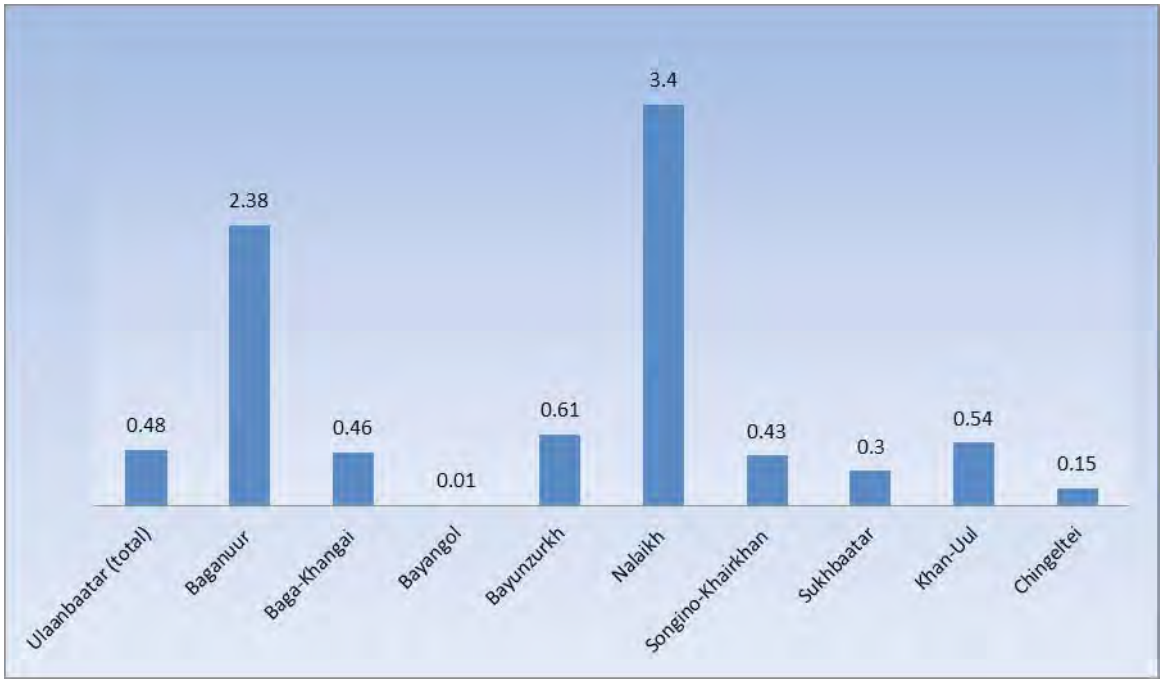
Municipal districts	Proportion of the population using unimproved water supply	Of which, %						Bottled water, %
		Transported water	Unprotected wells	Unprotected springs	Cart with small tanks	Rain water	Surface water	
Ulaanbaatar (total)	**0.48**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.48**	**0.00**
Districts:								
Baga-Nuur	2.38	0.00	0.00	0.00	0.00	0.00	2.38	0.00
Baga-Khangai	0.46	0.00	0.00	0.00	0.00	0.00	0.46	0.00
Bayangol	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Bayanzurkh	0.61	0.00	0.00	0.00	0.00	0.00	0.61	0.00
Nalaikh	3.40	0.00	0.00	0.00	0.00	0.00	3.38	0.02
Songino-Khairkhan	0.43	0.00	0.00	0.00	0.00	0.00	0.42	0.01
Sukhbaatar	0.30	0.00	0.00	0.00	0.00	0.00	0.30	0.00
Khan-Uul	0.54	0.00	0.00	0.00	0.00	0.00	0.53	0.01
Chingeltei	0.15	0.00	0.00	0.00	0.00	0.00	0.15	0.00

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

In 2005-2010, 426,800 people were provided with sustainable access to safe drinking water as a result of the following projects (Government of Mongolia, 2011):

- 103 water distribution kiosks were built in seven 'ger' districts of Ulaanbaatar and were connected to the central water distribution network of Ulaanbaatar under the Project on "Improvement of Ulaanbaatar Water Utilities: Second Phase" financed by the World Bank loan of 736,000 USD; and
- 40 water distribution kiosks were built in 'ger' districts of eight aimag-level towns and were connected to centralized water supply systems under the Project on "Improvement of Water Utilities in Rural Cities" financed by the Asian Development Bank loan of 300,000 USD.

In addition, the construction and rehabilitation works of water supply, sanitation and sewerage systems in other cities and towns are being carried out within the framework of the ADB "Urban Development Project".



Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Figure 34. Proportion of the population using unimproved water sources in Ulaanbaatar, by districts (as of 2013)

3.11.2. Access to sanitation

Despite nearly universal coverage of access to improved water supply, Ulaanbaatar still lags behind in providing access to improved sanitation to its inhabitants. Around 51.80% of the total population of Ulaanbaatar has access to improved sanitation facilities and 36.84% is connected to the centralized sewerage system. At the district level, the level of access to improved sanitation ranges from 37.34% to 79.49% for various districts (Table 31). The Bayangol district has the highest proportion of population with access to improved sanitation, where over 73% of its residents are connected to the centralized sewerage network.

The proportion of population with no access to improved sanitation is 48.2% of the city's total population. At the district level, it varies between 20% to 60%, depending on the extent and size of *'ger'* areas, in each of the districts as shown in Table 32. Inhabitants of the *'ger'* areas use pit latrines because the *'ger'* areas are usually located outside the boundaries of the centralized sewerage collection network, and therefore are not connected to sewerage network of the city. In the *'ger'* areas, wastewater from

cooking and washing is often disposed of directly to simple soak pits or seeps directly into the soil, causing pollution of soil and shallow groundwater.

Table 31. Access to improved sanitation in Ulaanbaatar (as of 2013)

Municipal districts	Proportion of the population with access to improved sanitation, %	Flush toilets connected to sewerage network, %	Septic tanks, %	Decentralized sanitation, %	
				Transported sewage systems	Ventilated improved pit latrines
Ulaanbaatar (total)	51.80	36.84	0.32	6.88	7.76
Districts:					
Baga-Nuur	58.01	45.74	0.00	5.75	6.51
Baga-Khangai	61.27	51.82	0.00	3.75	5.70
Bayangol	79.49	73.15	0.11	2.94	3.28
Bayanzurkh	50.31	34.53	0.45	7.27	8.06
Nalaikh	38.58	21.26	0.12	7.69	9.50
Songino-Khairkhan	41.43	23.76	0.32	7.99	9.35
Sukhbaatar	53.76	39.35	0.49	6.41	7.50
Khan-Uul	54.67	39.97	0.33	6.98	7.38
Chingeltei	37.34	17.56	0.29	9.30	10.18

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Table 32. Proportion of the population using unimproved sanitation in Ulaanbaatar (as of 2013)

Municipal districts	Proportion of the population using unimproved sanitation, %	Non standard pit latrines, %	Open pit latrines, %	Public toilets, %	Soak-pit latrines, %
Ulaanbaatar (total)	48.20	23.29	4.42	0.00	20.49
Districts:					
Baga-Nuur	41.99	19.54	5.18	0.00	17.27
Baga-Khangai	38.73	17.11	10.35	0.00	11.26
Bayangol	20.56	9.85	1.86	0.00	8.84
Bayanzurkh	49.91	24.18	3.91	0.00	21.82
Nalaikh	61.48	28.51	9.90	0.00	23.06
Songino-Khairkhan	58.73	28.06	6.67	0.00	23.99
Sukhbaatar	46.49	22.51	4.74	0.00	19.23
Khan-Uul	45.49	22.14	2.39	0.00	20.95
Chingeltei	62.81	30.55	4.34	0.00	27.92

Data source: Unpublished data based on 2010 National Population and Housing Census, 2013

Within the programme on "Integrated Urban Development, Construction Sector & TVET Promotion", implemented by the Mongolian Government with support from GIZ of Germany, approximately 40 ecological sanitation (ECOSAN) toilets were

installed in 'ger' area residents of Ulaanbaatar and institutions in Mongolia. However, the experiences and results of this study were limited and could not reach a broader acceptance among the target-groups of the project (ger-area inhabitants, tourist-camps, public institutions) in Mongolia.

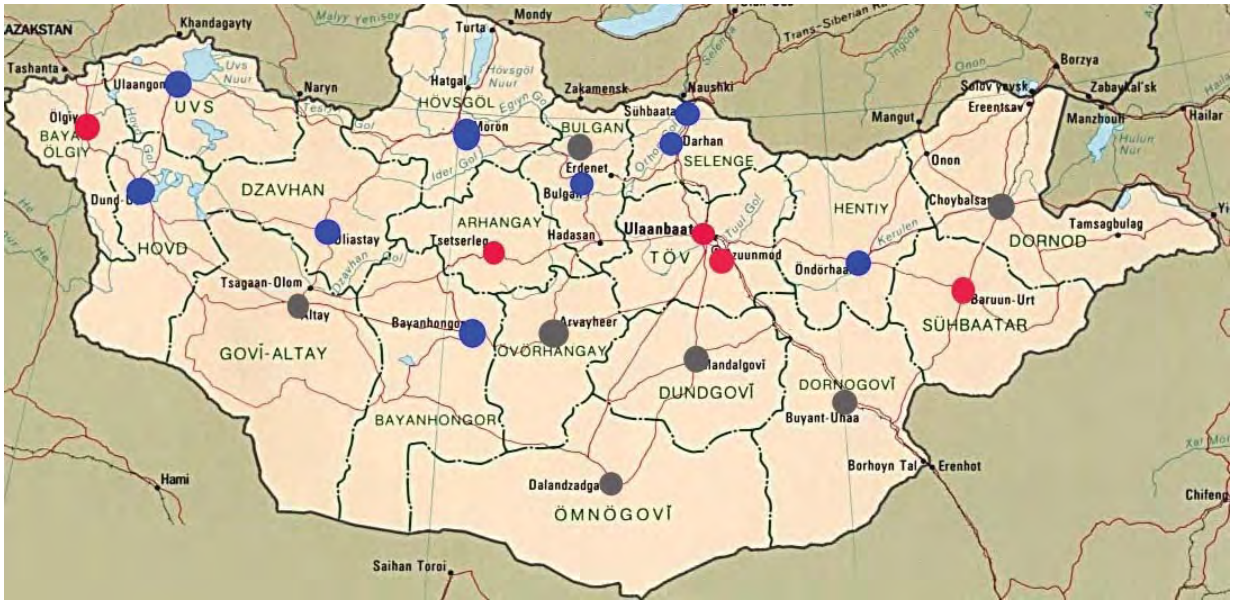
In 2009-2012, the Action Contre la Faim (ACF, or Action Against Hunger) implemented a pilot programme on Ecological Sanitation in Ulaanbaatar, funded by the French Water Agencies for Artois Picardie and Seine Normandie and the Swiss Development Corporation. The programme included: the installation of 370 ECOSAN latrines in household compounds in the 'ger' areas of Bayanzurkh and Songino-Kharikhan districts of Ulaanbaatar; setting up a faeces collection and transportation service for these ECOSAN latrines; and also the demonstration of a small-scale pilot composting facility of a capacity to produce 14 tons of compost per year from human biological waste. This pilot composting was aimed at demonstrating that human faeces composting can work in Mongolian climatic conditions in both winter and summer. Currently ACF is working with the Mongolian Government to develop a legal framework for ecological sanitation.

4. Wastewater Management in the Selenge River Basin

There are over 120 municipal wastewater treatment plants in Mongolia. Among them, there are only 21 large capacity wastewater treatment plants, which are located in country's three big cities and 18 province capitals (called also as *aimag* centres). As of 2012, out of these 21 large wastewater treatment plants, nine plants are operating normally, five plants are partially-operational and seven are out of operation due to technological breakdown and maintenance requirements (Figure 35). Wastewater treatment plants only in large cities (Ulaanbaatar, the Darkhan City, and the Erdenet City), province-level towns (*aimag* centres) and a few *soum*-level smaller towns have secondary biological treatment. Most of these plants use outdated technology and some are out of operation because of technological and physical deterioration. The

wastewater treatment plants that are in operation require rehabilitation, technology upgrade and maintenance investments. Many of the operating plants have poor performance and inefficient. Those that are partially-functioning provide only mechanical treatment for a limited amount of the wastewater received. Small-scale wastewater treatment plants in most soum-level towns are designed to provide only primary treatment. Almost all wastewater treatment plants in Mongolia were constructed before 1990 during the socialist period.

In 2007, a total of about 82.9 million cubic meters of domestic and industrial wastewater was treated at the operating wastewater treatment plants, which was approximately 65% of the estimated total volume of wastewater generated nationwide. The remaining 35%, or 43.5 million cubic meters of wastewater, was discharged to rivers without any treatment.



• *operating normally;* ☐ *out of operation;* ☐ *partially-operating*

Source: Ministry of Construction and Urban Development (Mongolia), 2013

Figure 35. Municipal wastewater plants in large cities and *aimag* centers of Mongolia

There are 10 large-scale wastewater treatment plants in the Selenge River Basin. These plants are found in big cities and *aimag*-level towns. The following Table 33 describes the main parameters of the wastewater treatment plants that are located in the Selenge River Basin.

Most of the wastewater treatment plants in the Selenge River Basin are working normally. In recent years, rehabilitation and reconstruction works have been carried out, or have been initiated, in some of these plants. The wastewater treatment plant in Zuunmod town of Tuv *aimag* was reconstructed in 2010-2011. The rehabilitation and reconstruction of the wastewater treatment plant of the Sukhbaatar town, which is

the administrative center of Selenge *aimag*, was also carried out and completed in 2012. The reconstruction and rehabilitation of the wastewater treatment plant of the Erdenet City has been completed recently and its technical capacity has been expanded to 24,000 m^3/day. Currently, a further technological upgrade of the Erdenet plant is being carried out with the support of the French Government.

Table 33. Wastewater treatment plants in the Selenge River Basin, Mongolia

Location (Name of *aimag centre* or city)	Date of exp.	Technical capacity		Date of construction, or rehabilitation	Type of wastewater treatment	Main treatment units	Effluent discharge method
		Design capacity	Current operation capacity				
Tsetserleg/ Erdenebulgan (Arkhangai *aimag*)	1987	2,700	850	2008	Secondary biological	Septic tank	Soil
Bulgan (Bulgan *aimag*)	1984	1,200	800	2008	Secondary biological	Sand sedimentation sludge sedimentation tank disinfection	Soil
Darkhan City (Darkhan-Uul *aimag*)	1997	50,000	16,000	First commissioned in 1968; rehabilitation planned	Secondary biological	Sand sedimentation, sedimentation land filtration	Kharaa River
Uliastai (Zavkhan *aimag*)	2001	2,700	1,900	2001	Secondary biological	Sand sedimentation, sedimentation Aeration tank	Uliastai River
Erdenet City, (Orkhon *aimag*)	1978	24,000	24,000-28,000	2013	Secondary biological	Mechanical and biological and microfiltration	Khangal River
Arvaikheer (Uvurkhangai *aimag*)	1997	2,700	800		Secondary biological	Land filtration	Soil
Sukhbaatar (Selenge *aimag*)	1991	6,900	1,800	2012	Secondary biological	Mechanical and biological	Orkhon River
Zuunmod, (Tuv *aimag*)	1972	2,700	1,200	rehabilitation in 2011	Secondary biological	Mechanical and biological	Soil
Murun (Khuvsgul *aimag*)	2001	2,700	1,800	2001	Secondary biological	Bio-filtration	Soil
Ulaanbaatar	1984	230,000	180,000	2008	Full biological	Mechanical and biological and sludge treatment	Tuul River

Source: MCUD, 2012.

The re-design and rehabilitation of wastewater treatment plants in the towns of Murun (Khuvsgul *aimag*), Bulgan (Bulgan *aimag*) and Ulaistai (Zavkhan *aimag*) are planned to begin in 2013.

The central wastewater treatment plant of Ulaanbaatar city is the biggest in Mongolia. The Ulaanbaatar Wastewater Treatment Plant is undergoing a technological upgrade by building a new secondary treatment unit and a new biological filter under the two-phase Project on "Renovation of the Central Wastewater Treatment Plant in Ulaanbaatar", implemented with the long-term loan from the Government of Spain.

The Government of Mongolia is planning to carry out rehabilitation and technological upgrade of wastewater treatment plants in all province-level towns (all *aimag* centres). This work is part of the measures in order to be able to comply with the "polluter pays" principles adopted in the new Law of Mongolia on Water Pollution Fees (adopted by the Mongolian Parliament on 17 May 2012), which introduces fees payable for pollution of water resources and sets effluent standards for treated wastewater.

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5. Improving Water and Sanitation in the Selenge River Basin

5.1. Upgrade needs for improving water and sanitation in the Selenge River Basin

Providing access to safe drinking water and improved sanitation brings multiple benefits such as improvements in human health, living standards, environmental quality and social development. Access to water and sanitation also reduces poverty, contributes to income generation and leads to other socio-economic benefits. The benefits resulting from access to water and sanitation, therefore make an important contribution to the sustainable development of the country.

5.1.1. Improving access to safe drinking water

Access to drinking water is high in large cities and province-level towns, with over 90% of population having access to improved water sources. However, drinking water coverage is relatively low in some *soum*-level municipalities.

There is a need to increase drinking water coverage and provide better access to drinking water supply in rural *soum*-level municipalities. Usually, there are one or two drinking water wells in a *soum*-level town (*soum* center), which supply drinking water to around 100 to 300 households of the town. In some places, the same water sources are used for multiple uses such as for both drinking water and livestock water. Most of rural municipalities in Mongolia depend on borewells and dug-wells for drinking water, many of which are not protected. Building a zone of protection around these borewells and dug-wells, which are currently used for drinking water purposes, will improve access to improved water sources in many rural municipalities. There has been little study on access to water supply and sanitation in rural areas. Hence, more focus needs to be put on improving water and sanitation conditions in rural communities within the implementation of ongoing and planned projects on water and satiation.

5.1.2. Improving access to sanitation

Access to improved sanitation is very low throughout the country in large cities, province-level towns and *soum*-level municipalities alike. Centralized sewerage networks exist only in small areas in large cities, province-level towns and few *soum*-level municipalities. In most municipalities, the connection to sewerage networks falls below 50%. The low sanitation coverage in municipalities throughout the country poses a serious concern for human health and environmental quality.

There, is a critical need to improve sanitation by expanding the connection to sewerage networks in large cities and towns and by providing sustainable and adequate sanitation facilities in *soum*-level municipalities. Decentralized sanitation solutions in *'ger'* districts located outside the coverage of centralized sewerage networks and in small municipalities will significantly increase access to improved centralized sanitation because most of the population lacking access to improved sanitation lives in *'ger'* districts and small municipalities. Mongolia, being a country located in a cold continental climate zone, it is essential to find sanitation solutions suitable to the cold climate, which generally requires the use of particular technologies that can work in extremely low temperatures. However, such sanitation facilities are restricted to only a few technological choices, which are often more costly.

In addition to technological and infrastructure investments, it is important to provide opportunities for community-based interventions to improve access to sanitation in small communities and municipalities. Enabling community participation and encouraging community management of water and sanitation services not only will be an important impetus for improving water and sanitation in local communities, but also will lead to an effective and more-sustainable means to increase sanitation coverage in *soum*-level municipalities, significantly improving water governance in at the local level (UNDP, 2009).

5.1.3. Wastewater management

Lack of effective wastewater management is a serious concern in Mongolia due to increasing pressure from population growth and urbanization in addition to the current needs for wastewater infrastructure development and expansion. Improving wastewater management in Mongolia requires large investments both for technological upgrade and rehabilitation of existing wastewater treatment plants and for the construction of new infrastructure and wastewater collection and treatment facilities.

Over the past years, significant efforts have been made to improve wastewater treatment in major cities and *aimag*-level large towns. The Government of Mongolia is planning to rehabilitate existing wastewater management plants in all *aimag*-level towns, including the reconstruction and rehabilitation of five wastewater treatment plants in 2013 and of the remaining 15 in 2014. In 2012, the Wastewater Treatment Plant of the Sukhbaatar town (Selenge *aimag*) was reconstructed with the investment from the central government budget, by increasing the wastewater treatment efficiency and upgrading existing technologies of the plant. The reconstruction and rehabilitation works of the Wastewater Treatment Plant of the Erdenet City (Orkhon *aimag*) begun in 2013 to increase the technical capacity of the plant to 24,000 m^3/day and upgrade with modern technologies and equipment of Degrémont Technologies of France. The central Wastewater Treatment Plant of Ulaanbaatar is currently being expanded by constructing two more sedimentation tanks and a sludge treatment facility. Upon completion of the construction of these new treatment units, the wastewater treatment efficiency of the Ulaanbaatar plant will be improved significantly. The existing Wastewater Treatment Plant of Darkhan will be reconstructed to a new design capacity 50,000 m3/day. During 2011-2013, several research studies were conducted on the feasibility of advanced wastewater treatment technologies such as nanotechnology, membrane technology and biotechnology. A research project in cooperation with German universities has developed and tested on a pilot basis a new small-scale wastewater treatment facility in the Darkhan City.

The new Law of Mongolia on Water Pollution Fees (2012), which includes the "polluter

pays" principles, requires more stringent effluent standards for treated wastewater to prevent pollution of water resources. The implementation of this law will require greater investment in the wastewater sector. All existing wastewater treatment plants need to be rehabilitated and technologically upgraded in order to be able to comply with the new standards and the new Law on Water Pollution Fees.

In the framework of the implementation of this law, the Government of Mongolia is planning to reconstruct and rehabilitate all existing wastewater treatment plants in all province-level towns (in all *aimag* centres) by 2016. The Government is also promoting greywater use and the 3R approach to 'reuse, reduce and recycle' wastewater.

Despite these recent Government's increasing efforts and investment to improve wastewater management, the problem of inadequate wastewater management remains serious, especially in small municipalities. A significant part of domestic and industrial wastewater is discharged with little or no treatment. Therefore, special attention should be placed on improving wastewater infrastructure and treatment facilities in small towns and municipalities such as *soum*-level towns.

In addition to improving wastewater treatment, alternative sustainable solutions to wastewater management need to be promoted. Promoting water saving technologies and increasing wastewater reuse will reduce wastewater generation and thereby the volume of wastewater to be treated and discharged to water resources. Moreover, creating economic incentives to adopt less-water intensive production processes and to reuse and recycle wastewater in water-intensive industries such as mining and energy sectors will be an effective mechanism to reduce pollution from wastewater.

5.2. Ongoing and planned programs on water and sanitation

In recent years, the government investment to improve water supply, sanitation and wastewater at the national level has increased significantly through several programmes and projects funded by the state budget and international donors, including UN agencies.

5.2.1. Ongoing programmes and projects

Improved water supply and sanitation is one of the main priority areas for the Mongolian Government, as well as for international donor agencies working in Mongolia. In 2010, the Parliament of Mongolia adopted the National Water Program. Within the

framework of this program, the Government of Mongolia has developed two six-year Action Plans for the Implementation of the National Water Programme for 2010-2015 and 2016-2021. These policy documents have a strong focus on improving water, sanitation and living conditions for all Mongolians.

In recent years, a number of projects on water and sanitation have been planned and launched. Table 34 provides brief descriptions of ongoing programmes and projects that aim to improve urban development, access to water and sanitation, and living conditions in urban and rural areas in Mongolia.

All these projects aim at raising living standards of the people of Mongolia. Of these, the two largest and most important projects are the urban development projects of Ulaanbaatar and province-level towns in rural areas. The Ulaanbaatar Urban Development Project, funded with a World Bank loan, focuses on the infrastructure development in *'ger'* areas of Ulaanbaatar. As a result of the project, inhabitants of *'ger'* areas in six districts of Ulaanbaatar have been provided with access to safe drinking water and high quality purified drinking water from water kiosks connected to the centralized water distribution network.

Table 34. Ongoing projects on urban development, water supply and sanitation

Project	Location	Implementation agency	Timeframe
Urban sector development project (MON-2301) (funded by an ADB loan)	Erdenet Uvurkhangai Bayankhangor Gobi-Altai	MCUD	2008-2013
Ulaanbaatar urban development project (funded by a World Bank loan)	*Ger* districts of Ulaanbaatar (Chingeltei, Dambadarjaa, Bayankhoshuu, Dari-Ekh, Naran and Uliastai)	Municipality of Ulaanbaatar, MCUD	2002-2010
Improvement of water supply in the Darkhan City (funded by the Japanese grant)	Darkhan City	MCUD	2009-2011
Improvement of drinking water quality in *soum*-level towns and small settlements	45 *soum*-level towns	MCUD	2006-2010
UN Joint Programme on Improving Water and Sanitation in Mongolia (UNDP MON/08/302)	4 *soums* in Khovd *aimag* and 4 *soums* in Gobi-Altai *aimag*	MCUD, MGDE, MOH	2008-2013
Community driven development of *ger* areas (JFPR MON-9106)	Erdenet City, Bayankhongor *aimag*, Choir town	MCUD	2007-2011
Rehabilitation and upgrade of the wastewater treatment plant of the Erdenet city (financed by a soft loan from the French Government)	Erdenet city	MOF, MCUD	2009-2013

MoMo project "IWRM-Central Asia" (research project funded by the German Ministry of Research)	Darkhan City, Kharaa River Basin	MEAS, MGDE, MCUD	2006-2009 2010-2015
UNDP Project "Energy- efficient buildings" (MON/09/301)	Ulaanbaatar	MCUD	2009-2013
Educational project for urban development and construction specialists	Ulaanbaatar city and all *aimags*	MCUD, MEAS, Municipality of Ulaanbaatar	2006-2009
Southeast Gobi urban and border town development project (G0204-MON, funded by the Mongolian Government and ADB grant)	5 *soums* of Umnugobi *aimag*, 5 *soums* of Dornogobi *aimag*	MCUD	2015
Infrastructure development in Zamiin-Uud *soum*	Zamiin-Uud town	MCUD	2013
Development of sub-districts of Ulaanbaatar	Ulaanbaatar (7th and 14th sub-districts)	MCUD	2013
Project "Water supply of the Yarmag new residential district of Ulaanbaatar" (funded by the South Korean grant)	Ulaanbaatar	MCUD	2011-2013

Source: Based on information provided by MCUD, 2012.

The Urban Sector Development Project, funded by a loan from Asian Development Bank, aims to improve water supply, sanitation, wastewater management, solid waste management and infrastructure development in rural municipalities. The project is implemented in two phases: the first phase covers western *aimags*; and the second phase covers eastern and southern (Gobi) *aimags*. The project aims at improving water supply and wastewater management through infrastructure investments for in the extension of water supply networks and the reconstruction and rehabilitation of existing wastewater treatment plants.

Most of these projects listed in Table 34 focus on the development and expansion of water and sanitation infrastructure in *'ger'* areas in large cities and province-level towns. With the exception of only few few projects covering a small number of *soum*-level towns, there are no other ongoing projects specifically addressing water and sanitation in rural municipalities.

Improving water and sanitation is a priority area for international donors in Mongolia. Several of these water and sanitation projects are being implemented with the support of international donors. Table 35 below describes funding sources and main focus areas of major projects on water and sanitation, funded by international donors.

Table 35. Water and sanitation projects with international funding (2008-2013)

Project	Funding agency and budget	Purpose of the project
Urban sector development project MON-2301	ADB loan (*46.1 million USD*)	• Part A: extension of centralized water supply and sewerage networks, rehabilitation of wastewater treatment plants, improvement of solid waste management • Part B: road investment • Part C: improvement of local water supply, installation of water metering devices • Part D: capacity building and institutional capacity development
Ulaanbaatar urban development project	World Bank loan (*22.98 million USD*)	• Part1: improvement of water supply in *'ger'* areas in Ulaanbaatar • Part 2: improvement and extension of the centralized water supply network of Ulaanabatar • Part 3: improvement of energy efficiency • Part 4: improvement of water governance
Improvement of water supply in the Darkhan City	Japanese grant (*940 million Yen*)	• Rehabilitation and renovation of the centralized water supply system • Connection of *'ger'* areas to the centralized water supply system by building water kiosks connected to the systems water supply network • Technology and equipment upgrade
Improvement of drinking water quality in *soum*-level towns and small settlements	Check Republic aid (*24.44 million krons*)	• Improvement of water quality in *soums* • Supply of filters for drinking water
UN Joint Programme on Improving Water and Sanitation in Mongolia (UNDP Mon/08/302)	UNDP Grant (*1.315 million USD*)	• Improvement of drinking water governance in the WASH sector • Improvement of water supply and sanitation in schools and hospitals in *soum*-level towns • Education and public awareness on WASH
Community driven development of *ger* areas (JFPR MON-9106)	Japanese grant (*1.950 million USD*)	• Part A: Institutional and human capacity development • Part B: Public-oriented project development
Rehabilitation and upgrade of the wastewater treatment plant of the Erdenet city	French Government loan (*9.535 million Euros*)	• Technology and equipment upgrade/supply for the new Wastewater Treatment Plant in the Erdenet city
Project "Energy-efficient buildings" (MON/09/301)	UNDP Mongolia (*2.1 million USD*)	• Revising energy regulations and standards for buildings • Promoting energy efficiency technology for apartment buildings and households • Development of a market oriented financial mechanism for energy-efficient buildings
Educational project for urban development and construction specialists	GIZ *Ger*many (*4.5 million Euros*)	• Part 1: Support for low-cost houses • Part 2: Promoting energy efficient low-cost buildings • Part 3: Capacity building • Part 4: Public participation in the development of *'ger'* areas

Source: Based on information provided by MCUD, 2012.

There are seven major international donors active in the field of water and sanitation in Mongolia. The donor with the lead role is UNDP. Other major donors that provided over 1 million USD in aid include: Japan, Germany, IDA of the World Bank, Republic of Korea, France and the Netherlands (WHO, 2012).

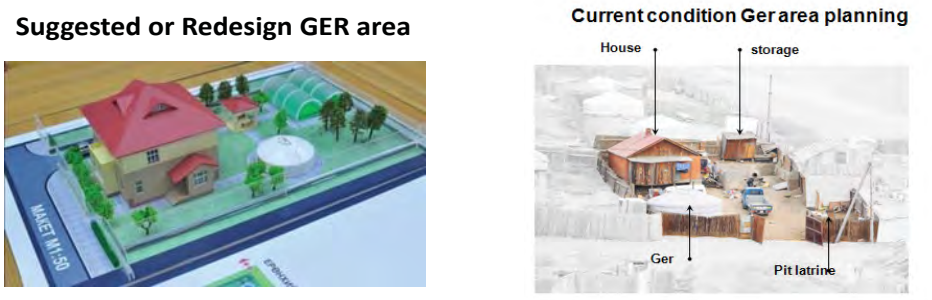
5.2.2. Planned programs

The Mongolian Government has planned to continue its efforts to improve water, sanitation and wastewater beyond the above-described ongoing projects. The Action Plan for the Implementation of the National Water Programme for 2016-2021 includes a number of programmes and projects focusing on water and sanitation.

The planned projects on water and sanitation include:

- "100,000 apartments" project: Construction of 100,000 apartments and houses with modern water and sanitation facilities, including 1,000 modern houses in each *aimag*-level town;
- "Model *soum* towns" project: Development of "model *soum*-level towns", focusing infrastructure development in rural municipalities;
- "*Gudamj*" (street) project: A sub-project (component) on the development of new streets and construction of engineering infrastructure (including water and sanitation facilities) in 'ger' areas of Ulaanbaatar;
- "G" ('*ger*' area development) project in Ulaanbaatar: Housing upgrading in *'ger'* areas (districts) of Ulaanbaatar, focusing on re-designing and reconstruction of existing housing in seven *'ger'* districts, covering 280,000 people.

In 2013, the capital Ulaanbaatar city adopted a new urban development plan for 2020. Under this new urban development plan, the "G" ('*ger*' area development) project will be implemented with the aim to upgrade housing and improve infrastructure and water and sanitation conditions in *'ger'* areas. The housing upgrade in *'ger'* areas includes the re-designing and reconstruction of existing housing, construction of piped connections to water supply and sewage networks; and improvement of infrastructure services. The following figure illustrates a model of housing upgrade in *'ger'* areas.



Source: MCUD, 2012.

Figure 36. Suggested housing upgrade in *'ger'* districts: current typical housing in *'ger'* areas (left) and a model of housing upgrade (right)

The project will cover 12 areas in Ulaanbaatar's seven *'ger'* districts, where existing housing will be upgraded and modernized to the suggested re-design of model housing. It is expected that the housing upgrading in *'ger'* areas will be expanded to more areas in the coming years.

6. Conclusions and Recommendations

6.1. Conclusions

Mongolia does not possess abundant water resources. Mongolia's water resources are unevenly distributed throughout the country's territory. The total water consumption by different types of water uses is estimated as: 18.1% for drinking and domestic use; 39.3% for industry; 24.0% for livestock, 17.4% for irrigation; and 1.2% for other purposes. In recent years, water consumption in Mongolia has increased, due to a rise

in the urban population, rapid economic growth and social development. The impacts of climate change on Mongolia's water resources are expected to be severe. Due to climate change, Mongolia is facing increasingly severe water problems such as accelerated melting of glaciers and permafrost, drying out of springs and river beds, shrinking and breakdown of runoff to rivers.

The Selenge River Basin is the most developed region in Mongolia and is the centre of the country's political, economic and cultural life. Approximately 67% of Mongolia's total population (1.8 million people) lives in the Selenge River Basin. In 2007, economic activities in the Selenge River Basin produced 81% of the national GDP of Mongolia. Out of Mongolia's 21 *aimags*, territories of nine *aimags* are located wholly or partly within the Selenge River Basin. Urban settlements located in the Selenge River Basin include: three large cities (Ulaanbaatar, Darkhan and Erdenet); six *aimag*-level towns; and 84 *soum*-level municipalities.

As of 2013, access to improved drinking water sources is 78.40% at the national level. Access to water and sanitation is higher in urban areas compared to in rural areas. Per capita water consumption varies drastically for different types of housing. Inhabitants of apartment buildings are connected to centralized water supply systems and consume 270-340 liters of water per day, Residents of *'Ger'* districts are served by water kiosks, or water trucks, and use only about 8-10 liters of water per day (Government of Mongolia, 2009). Lack of access to safe drinking water remains a concern for many rural communities in Mongolia. Inhabitants of 115 *soums* of 17 *aimags* consume water, which does not meet national drinking water quality standards.

Access to safe drinking water in the Selenge River Basin ranges between 42.47% and 99.52% at the *aimag* (province) level. The drinking water coverage is the highest in large cities and their administrative territories, such as Ulaanbaatar (99%), Darkhan-Uul (95%) and Orkhon (95%). The *aimags* with the lowest coverage of safe drinking water are Arkhangai (42%) and Khuvsgul (49%). Regarding sources of improved water supply, the percentage of the population connected to centralized piped water supply networks is higher in urban areas: 49.81% in Darkhan-Uul *aimag* (the highest); 39.87% in Orkhon aimag, including the Erdenet City; and 36.87% in Ulaanbaatar. The proportion of the population connected to piped water supply is very low in rural municipalities.

In general, access to sanitation is very low at the country level, with a very small portion of the country's total population connected to centralized sewerage systems. At the national level, only 22.5% of the total population is connected to centralized sewerage systems. According to the 2013 estimation based on data of the 2010 National Population and Housing Census, about 37.3% of Mongolia's total population has ac-

cess to improved sanitation, whereas about 62.7% of use unimproved sanitation facilities. In urban areas, about 64% of urban inhabitants have access to sanitation facilities, which meet hygiene standards, and this rate is 31% of rural settlements (Government of Mongolia, 2011). According to 2007-2008 Household Socio-Economic Survey conducted by the National Statistics Office (NSO) of Mongolia, four in nine persons had access to sanitation, which met hygiene requirements, three in four persons had access to electricity and one third of the population had access to both of these services. Three quarters of urban population in urban areas and one third of rural population had access to sanitation, which met hygiene standards.

Access to improved sanitation in municipalities in the Selenge River Basin is relatively low. Improved sanitation coverage is higher in large cities such as Ulaanbaatar, Darkhan and Erdenet and ranges from 49.73% to 60.4%. In most *aimags* in Mongolia, access to improved sanitation is very low in both province-level towns and *soum*-level municipalities. In most *soum*-level municipalities, the proportion of the population with access to improved sanitation is lower than 20%. The percentage of the population connected to sewerage systems is the lowest in Arkhangai *aimag* (2.01%), Bulgan *aimag* (2.38%) and Khuvsgul *aimag* (1.32%). In small municipalities in rural areas, most people use pit latrines. The use of septic tanks is low, with only about 0.02-1.0% of the population using septic tanks. With the expansion of individual housing areas with modern water and sanitation systems, the use of septic tanks and small-sized decentralized biological wastewater treatment plants is becoming more common for such new housing developments.

Centralized systems of water supply and sanitation exist only in large cities and in province-level towns. A majority of the population with no access to improved water supply, sanitation and electricity live in rural areas and represent the poor segment of the population. As of 2012, about 69% of the country's total population resides in urban areas (World Bank, 2013). Large disparities exist in the coverage of water and sanitation services in large urban areas versus small municipalities in rural areas, the latter always being lower. The low level of access to water and sanitation in rural municipalities is due to lack of investment in rural development and the strong dependency of rural municipalities on the central Government's financing because local governments lack financial resources to deal with water and sanitation needs of the communities. On the other hand, large cities have always been a priority for large-scale state investment and financing because issues of large cities have a high profile on the political agenda. Furthermore, there is lack of public awareness on water, sanitation and hygiene, especially in rural communities. Therefore, there is a critical need to raise public awareness and education of the rural population on water, sanitation and hygiene.

There is also a significant difference between access to water and access to sanitation services. The coverage of improved sanitation both in large cities and small municipalities is much lower than the water supply coverage. The low sanitation coverage level results in the discharge of large quantities of wastewater to rivers, lakes and the soil, causing water and environmental pollution. The low sanitation coverage in both large cities and rural municipalities is mainly due to the low priority on sanitation by central and local governments. The difference between access to drinking water and access to sanitation is also because drinking water issues have always been a high priority topic on both the political and public agendas.

Over the recent years, public investment in improving water and sanitation has grown significantly as a result of the Government's effort to achieve the national MDG target on water and sanitation to increase, by 2015, access to safe drinking water to 70% from the 1990 baseline of 30.8% and access to improved sanitation to 50% from the 1990 baseline of 22%. Although significant improvements in water supply and sanitation services have been made in the recent years as a result of the rapid economic growth and rising living conditions, the current status of the implementation of the MDG target on water and sanitation in Mongolia shows slow progress in general. The expansion of water supply and sanitation services does not keep up with the urbanization rate. In addition, the capacity of water and wastewater treatment facilities is insufficient and their performance and effectiveness is low.

6.2. Recommendations

People need access to clean water and adequate sanitation to sustain their health and maintain their dignity. Safe water, proper sanitation and good hygiene have a direct bearing on people's health, well-being and development.

As a result of the Government's efforts and growing national and international financing for the water and sanitation sector, significant improvements in water and sanitation services have been made over the recent year, which have contributed to the enhancement of the quality of life of approximately of 400 thousand people (Government of Mongolia, 2011). However, there are pressing needs to improve access to safe drinking water and sanitation for the population without access to these services.

Towards this end, the following recommendations are proposed.

- *Reduce disparities in access to water and sanitation*

  There is a critical need to reduce disparities in access to water and sanitation services between large urban areas and small rural municipalities. In order to improve the equity in access to water and sanitation services between urban and rural areas, investments in water and sanitation need to be consistent across different levels of municipalities, including large cities, province-level towns (capitals of *aimags*) and small municipalities (*soum*-level towns). Programmes and projects specifically targeting province-level towns and small rural municipalities need to be developed and implemented, with strong emphasis on providing safe water supplies and adequate sanitation services in *'Ger'* districts. The potential effectiveness of decentralized water and sanitation services, as well as enabling conditions for community participation and community management of these services, need to be explored. Decentralization and local-level management of water and sanitation services delivery not only can work, but is an effective and more-sustainable means to increase coverage and will significantly improve water governance in a variety of areas.

- *Improve the institutional capacity and legal framework for the water and sanitation sector*

  There is a need to improve the institutional capacity and legal framework for the water sector. With the revision of the relevant existing laws into the new Law on Water (2012) and Law on the Use of Water Supply and Sewerage Systems in Urban Areas and Human Settlements (2011), the legal framework for the water and sanitation sector has improved significantly. However, regulations on tariff setting for water supply and sanitation services and on fees for different types of water uses need to be improved. For example, tariffs for groundwater use should take into account the sustainability and depletion of the resource. The legal basis for establishing a licensing regime for private water and sanitation service providers also needs to be developed.

- *Promote innovative, low-cost technological solutions*

  Innovative, low-cost technologies for water and sanitation that offer practical solutions in providing small-scale, decentralized water and sanitation services in rural municipalities and 'Ger' districts need to be identified and promoted, along with relevant capacity building support. Such technologies should be deployed with special emphasis on areas, where centralized water

and sanitation systems are not available. The choice of these technologies should also take into account local and climatic conditions, such as the robustness and adaptability of the technologies in cold climate zones.

Water saving technologies should be introduced and water meters need to be provided in areas connected to centralized water and sanitation systems. This will contribute to reducing water demand, improving water use efficiency and reducing wastewater generation. Raising public awareness and educating the public about the importance of efficient water use in households is needed.

- *Increasing financing for water and sanitation*

Innovative financing mechanisms for the water and sanitation sector need to be explored, by examining other countries' experiences and international mechanisms for financing both improvement of water and sanitation services and expansion of water and sanitation infrastructure.

In addition, the government budget for water and sanitation programmes need to be increased, by allocating at least 0.5% of the total state budget to the water sector. Currently, the central government budget for investment in the water and sanitation sector is very small. Increased investment in water and sanitation will bring about multiple socio-economic and environmental benefits resulting from access to improved water supply and adequate sanitation such as health improvements, poverty reduction, enhanced environmental quality, reduction in water resources pollution, etc..

- *Promote public and private partnerships in the water and sanitation sector*

Collaboration with the private sector in the water and sanitation sector should be strengthened. The private sector has great potential to contribute to expanding the coverage of water and sanitation services. Community and private sector participation therefore should be mobilized to improve access to water supply and sanitation in areas where central government investment is lacking.

The ongoing Government efforts on water and sanitation include large urban development projects such as "100,000 apartments" project and "Model *soum* towns" project, which comprise the provision of improved water supply and

sanitation facilities. These projects have potential for public-private partnerships to attract additional private sector investment in water and sanitation.

- *Raising education and awareness on water, sanitation and hygiene*

  National programmes on improving water education and raising public awareness on water, sanitation and hygiene need to be developed. Advocacy activities need to be promoted for educating the public on the importance of good quality water and adequate sanitation for human health and the environment.

- *Improving water resources management*

  In general, national strategies for sustainable use and management of water resources need to be clearly defined, taking into account to ensure the sustainability of resources and current and future needs of water supplies for different uses such as drinking water for the growing population, agricultural irrigation, and water for mining and industrial activities. Water resources management strategies should also take into account expected climate change impacts, including reduced precipitation rates, low water levels, prolonged and more frequent droughts, and high evaporation rates.

In addition, measures to prevent, control and reduce water pollution need to be implemented and strengthened. Special emphasis need to be given on improving access to sanitation to prevent water-borne diseases and reduce soil and groundwater pollution. Existing wastewater treatment plants in large cities and small towns need to be urgently rehabilitated and upgraded with modern technologies and equipment. New wastewater treatment plants need to be built in towns and municipalities where wastewater treatment facilities do not exist.

Water supply services should be improved and to secured to provide access to safe drinking water in sufficient quantities for the entire population of the country. Drinking water supply for rural population and water supply for livestock should be treated and provided separately. The provision of safe drinking water to herder families need to be ensured by providing access to a minimum quantity of potable water of 20 liters per person per day. Improving access to safe drinking water for the rural population should be the priority of rural development and water resources management strategies of the country. Drinking water treatment at the household level should be considered as an alternative way to pro-

vide clean water for rural population and in areas where access to improved water sources and centralized water purification systems is unavailable or inadequate.

Water demands should be assessed based on mid- and long-term perspectives, taking into account climate change impacts as well. In the face of growing water demands and climate change challenges, effective ways to ensure water security and to meet current and future water needs should be implemented by augmenting the water storage capacity in various forms as a mitigation strategy and by increasing water use efficiency in all water use sectors.

Integrated water resources management plans need to be developed. Water resources management at the basin level should be practicised by establishing basin commissions for all major river basins and systems.

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Note: These data were re-evaluated and re-analyzed for the purpose of this study.