

# Initial Environmental Examination

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## ARM: Water Supply and Sanitation Sector Project – Subproject Kapan Town

Prepared by Armenian Water and Sewerage Company for the Republic of Armenia and the Asian Development Bank.

**ASIAN DEVELOPMENT BANK FUNDED  
WATER SUPPLY AND SANITATION SECTOR PROJECT**

**WATER SUPPLY AND SANITATION SYSTEM IMPROVEMENT  
IN THE SETTLEMENTS OF THE REPUBLIC OF ARMENIA**

**INITIAL ENVIRONMENTAL EXAMINATION**

**Subproject KAPAN TOWN**



## **1.1 Scope of work**

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The purpose of this sub-project is improvement of drinking water supply to Kapan town of the RA Syuniq marz.

Taking into account the disagreement between the funds needed for full improvement of Kapan town's W&W systems and the funds provided by ADB, the Consultant selected improvement of distribution networks in private districts that provide tangible results and will promote increasing water supply efficiency in Kapan town.

Thus, under the priority measures it is planned reconstruction of distribution networks of the IV, VI, VII, and VIII zones fully, those of private houses' districts in the II and V zones, the works to be implemented in which are provided below:

- Construction of de50-de110 mm L= 27.1 km long PE water lines,
- Construction of valve nodes - 3 pcs.,
- Construction of pressure regulation nodes - 15 pcs.,
- Construction of buried valve nodes DN40- DN100 - 65 pcs.,
- Construction of 955 private houses' water metering nodes and inlet lines.

Population number in Kapan as of January 1, 2010 is 46750. The housing stock in the town is 258 multi-apartment blocks and 1894 private houses. The town has 13067 customers.

As a result of the project implementation, it is planned to supply the town population with drinking quality water.

## **1.2 Description of the present water supply systems of Kapan town**

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Water supply to Kapan town is implemented by the following 4 systems:

1. Geghi WTP - Gyard-Kapan water main.
2. Geghi spring intake - Kapan water main.
3. Surin-kap and Jrakhor spring intakes – Kapan water main.
4. Chanakhchi WTP –Kapan water main.

The town relief allows water supply to Kapan to be fully implemented by gravity, without pumping stations.

The water supply system of the town is fed from 28 groups of DRRs of various capacity in different parts of the town, at different altitudes.

The internal network is fully constructed with steel pipes, which are in emergency condition. Total length of the internal network is about 150-160km. During recent years about 8-9km pipelines were replaced with polyethylene pipelines. Distribution network of private house sector is about 35.0km long and is fully subject to replacement. In that district the pipelines mainly pass through private land areas and gardens that makes their operation difficult.

Water meter chambers are installed on emergency steel inlet lines for about half of the private houses. There are houses, inlet lines of which pass through one or several private land areas.

According to the data obtained from Kapan branch, because of deteriorated distribution network in private house sector, daily water amount supplied per capita is about 7.0m<sup>3</sup>. The DRRs are mainly in normal condition, however in some of them there are leaks from walls and floors.

The whole town has sewerage network. Wastewater treatment plant, which is located at 11.0km distance south-east from the town has not operated for about 20years.

The internal sewerage network, which was constructed in 1958 is fully deteriorated. Because of deteriorated collectors the town wastewater is discharged into river Voghji from 7 places.

The Ø700mm 11.0km long general collector from the town to the wastewater treatment plant is entirely deteriorated. 7.5km sewerage lines of Ø 300 - Ø 500mm diameter and 800m of Ø200 - Ø 250mm diameter are subject to replacement in different parts of the town.

### **1.3 The geographical location and climate of the residential area**

Kapan town is the center of Syunig marz. It is located in south-eastern part of Syunig marz, at 320.0km distance from Yerevan. The region has dry, continental climate.

Absolute maximum air temperature is +42°C. Absolute minimum air temperature is -22°C.

Annual precipitation is 585mm, eastern and south-eastern winds are predominant. Once in 20 years winds with 21m/sec velocity are possible. Wind pressure – 27kg/m<sup>2</sup>. Snow cover pressure – 50kg-f/m<sup>2</sup>.

Maximum soil frost depth is 20cm.

From landscape point of view the area is located in mid-mountainous and foot parts of Zangezour ridge south-eastern ranges. From the relief origination point of view the area is ranked to the type of mountains composed of volcanogenic-fragmental and land carbonate rocks and is a high mountainous region with indented relief.

According to the initial data the total number of population as of 01/01/2010 was 46750. According to the data of “Demographic catalogue of Armenia, 2007” the annual growth rate of the population is 0.8% (see Table 2-3).

The residential areas are located at 730-1155m altitudes.

#### **1.4 Biodiversity and sensitive nature areas**

From geomorphologic point of view it is located in Voghji river area.

In the geological structure of the area the groups of volcanic rocks of Middle Eocene Oligocene age take part: andesite-basalts, which are covered by layers of Quaternary age alluvial, eluvial, deluvial-proluvial, deluvial formations - clay, sand, fragmental soils.

From hydro-geological point of view the area is included in the region of fracture waters of various eruptive rocks.

From hydro-geological point of view the area is scarce of water. Underground waters are related to volcanic rocks and alluvial rocks, belong to fractural cavity, porous-cavity, partially terrain water types.

From seismotectonic point of view the area is located within the folded zone of Armenia. The area is considered one of the most seismically active zones of Armenia.

Among dangerous physical-geological processes are surface flooding, landslides, erosion volcanic weathering and destruction.

Syuniq marz Kapan region is characterized with brown carbonate stepped earth, there are also valley-terrace pebble lands here.

Kapan area flora includes exclusively the elements of Meghri floristic region

Along Vorotan river bed riparian woodlands are spread, consisting of populus, willow, Ulmus, Acer, Sorbus, Tamarix, Juniperus, Rubus, Rosa zangezura, Numulus. Near reservoirs elements of wetland plants are mixed with the riparian woodlands, creating families of wetland plants in some places.

On the river canyon rocks there are Silene, Centaurea, Cotoneaster, Sempervivum, Sedum, Astragalus kirpicznikovii, Botriochitoea, Rosa zangezura, Amygdalus, Prunus, Acer, Juniperus, etc.

The woodland zone is followed by mountain-steppe zone, with plants characteristic for it - Ziziphora, Netepa, Salvia, Teucrium, Eryngium, Scutellaria.

The forest zone is presented by mixed forests where there are wild fruit and berry crops.

Among endangered species there are Punica granatum, Ficus carica, Adiantum capillus - veneris, Periplosa graeca, Iris lineolata, Orchis schelkovnikovii. Osimia, Ophrys caucasica, Platanthera chlorantha, Zelkova carpinifolia.

Among endemic species are Symphyandra zangezura, Thlaspi zangezorum, Pyrus zangezura, Amygdalus nairica, Astragalus kirpicznikovii, Rosa zangezura.

The fauna is also rich here. Among mammals there are several types of night bats and field mice, rabbit, wild pig, wolf, jackal, forest cat, among birds – Sittidae, Woodpecker, Gallinaceae, Tetrao mlokosiewiczzi, Alectoris chucar, birds of prey, magpie, also waterfowl – ducks, Fulica atra, Bubulcus ibis, Podiceps, various reptiles and amphibia, among fish – river trout, koghak, beghlou. etc.

In the sub-project implementation area there are not specially protected zones. The covered community does not have also sites of cultural, archaeological or historical importance. These data were obtained as a result of interviews with the administration heads. The information was gathered on the basis of the following survey form.

**B1. Are any of the following areas located inside or around the village or project site?**

		Yes	No	Not identified
<b>B1.1</b>	National park, protected area designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or protected areas	1	2	3
<b>B1.2</b>	Virgin forests, tropical forests	1	2	3
<b>B1.3</b>	Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)	1	2	3
<b>B 1.4</b>	Habitat of valuable species protected by domestic laws or international treaties	1	2	3
<b>B 1.5</b>	Likely salts cumulus or soil erosion areas on a massive scale	1	2	3
<b>B 1.6</b>	Remarkable desertification trend areas	1	2	3
<b>B 1.7</b>	Archaeological, historical or cultural valuable areas	1	2	3
<b>B 1.8</b>	Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	1	2	3

## **1.5 Environmental Impact**

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The Initial environmental examination (IEE) identified that negative impact on landscapes, flora and fauna of the residential areas where improvement of water supply system will be done is not expected.

The detailed environmental examination is planned to be implemented in the course of the detailed design when all the construction or reconstruction sites will be approved.

Based on the detailed environmental examination, the sub component will be estimated by category and if needed, environmental management plan, as well as monitoring plan will be prepared.