EAP Task Force

EUWI
EU WATER INITIATIVE

JOINT MEETING OF

THE EAP TASK FORCE'S GROUP OF SENIOR OFFICIALS ON THE REFORMS OF THE WATER SUPPLY AND SANITATION SECTOR IN EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

THE EU WATER INITIATIVE'S EECCA WORKING GROUP

MONITORING OF THE SYSTEM OF WATER SUPPLY AND WASTEWATER IN TAJIKISTAN

DOCUMENT 3

PARIS 2007

TABLE OF CONTENTS

FIGURES

1. INTRODUCTION

This report is prepared by the outcomes of the project "Monitoring the Water Supply and Sanitation Utilities in the Russian Federation and Tajikistan", implemented by the Foundation "Institute for Urban Economics" from October 2006 though February 2007 on request of the Organization for Economic Cooperation and Development.

The goal of the project was to improve the system of monitoring of the project in countries by making a comparative analysis of water supply and wastewater organizations and dissemination of the methods using a set of indicators developed by the World Bank.

The main task of the project was monitoring and comparative analysis of performance efficiency of water organizations in the Russian Federation and Tajikistan through:

- collection and processing of technical and financial data on the performance of water supply and wastewater organizations; and
- building the capacity for collection of technical and financial data and ensuring their reliability within companies, operating in the water supply and wastewater sector in the specific country of this project by transferring to them the methods developed by the World Bank based on a set of indicators.

Monitoring covered 9 water supply and wastewater enterprises of the Republic of Tajikistan, including:

- 4 enterprises, providing services to population centres with up to 50,000 population, including:
  - town of Vakhdat (44,700 population at the beginning of 2006)
  - town of Tursunzade (48,100 population)
  - town of Khorog (29,100 population)
  - town of Rasht (15,000 population)
- 4 enterprises, providing services to towns with 50,000 to 150,000 population, including:
  - town of Kurgan-Tube (68,500 population)
  - town of Khudzhand (142,500 population)
  - town of Istarashvan (58, 600 population)

- town of Kulyab (87,516 population)
- and the enterprise, providing water supply and wastewater collection services in the city of Dushanbe, capital of the Republic of Tajikistan (683,000 population)

The enterprises, which took part in the monitoring, provide water supply and wastewater collection services for 65% population of the Republic of Tajikistan. By the results of 2004, these enterprises provided 65.6% of the total water supply in the country and sold 53.3% of water to all categories of users, including 52.2% of water sold to population, as well as 40.2% of the total wastewater treatment in the country.

Given the fact that the monitoring included only the enterprises providing services to the towns, the authors of this report thought it expedient to use additional sources of information, which allowed making a more correct conclusion about the supply of water supply and wastewater collection services to rural population. These sources were used by the Foundation "Institute for Urban Economics" for preparing, in 2005, the report "Tailoring Global MDG7 Targets 10 and Indicators to Local Conditions in ECA (Georgia, Tajikistan, Albania)" on request of the World Bank.

2. GENERAL INFORMATION ABOUT THE WATER SUPPLY AND WASTEWATER SECTOR IN THE REPUBLIC OF TAJIKISTAN

The Republic of Tajikistan is located in the south-eastern part of Central Asia. The area of the country is 143,100 km2. According to national statistical data, the country population is 6,710,200 people, with 1,774,800 urban population (26.4%) (including 640,000 population of Dushanbe). Tajikistan is a mountainous country: 93% of its area is mountains. Over 85% of its population lives in the plain areas.

The Republic of Tajikistan is one of the poorest countries of Central Asia. According to data of the International Foundation for Aral safety, 82.8% of population live below the poverty level1. In Tajikistan, the issues of water supply and wastewater collection are tackled by the Ministry of Housing and Communal Economy, administration of large towns, the state unitary enterprise (SUE) "Housing and Communal Facilities", the organization "Tajikselkhozvodoprovodstroy", as well as by large industrial enterprises. The country has 52 water supply and wastewater management offices, of which 40 offices are subordinated to the SUE "Housing and Communal Facilities". The design and construction organization "Tajikselkhozvodoprovodstroy" provides water for over 2 million rural population.

[1] The programme of specific actions for improvement of environmental and socio-economic situation in the Aral Sea basin for 2003-2010, Dushanbe 2004.

The quality of potable water is very low. According to information of the Ministry of Health, "Most of water pipelines are operated with serious violations of operational rules, unsatisfactory condition of water supply structures and systems … Lack of coagulants and chlorinated preparations result in supply of bad-quality and unsafe water to population"2. Quality of potable water is affected by faeces-contaminated water entering the water supply system through damaged pipelines. The average depreciation of water supply systems is 70%. This rate of depreciation is taken from accountancy documents, whereas the actual wear rate is higher. According to information of the Ministry of Health, today the condition of most water pipelines is very unsatisfactory. "Out of 254 water pipelines in Khatlon Oblast, 122 are out of order, i.e., 48%. As regards quality of water supplied to population, it does not meet the State Standard "Potable Water"3. Over 80% of wastewater treatment plants are out of operation, because of moral and physical wear, while the operating wastewater treatment plants are inefficient. The design capacity of WWTP in the town of Kulyab is 9,000 m3/day; at present, the actual amount of wastewater fed to WWTP is 15,000 m3 per day, and 6,000 m3 of wastewater is discharged to channels and rivers without pre-treatment and decontamination. Wastewater treatment plants in the town of Kurgan-Tube are in the same condition. Over the last decade, the number of accidents in the water supply and wastewater collection networks has significantly increased.

The most serious epidemiological situation is in rural areas, which mostly use water from rivers and ponds as drinking water. The main source of pollution of open water reservoirs is the discharge of untreated household and faecal wastewater, as well as wastewater from the fields contaminated with pesticides and mineral fertilizers. For example, epidemiological investigations of the outbreak of typhoid fever in Khatlon Oblast showed that 180 toilets, more than 180 cowsheds, 70 garbage dumpsites are located within 0.6 to 5 m from the channel used the people to take water for drinking and household needs.

Low quality of water, used for drinking and household needs, is the cause of the high level of intestinal infection diseases among population, including typhoid fever.

At the 54th session of the UN General Assembly, the President of Tajikistan declared the year of 2003 "The International Year of Fresh Water"; the period 2005-2015 is declared in Tajikistan the "Water for Life" decade. In the recent years, a number of new laws concerning water supply in the country have been adopted, including: Law on Nature Protection, Water Code and Law on Subterranean Resources.

Information on water supply and wastewater collection is collected in the country by state statistic authorities, and different governmental and nongovernmental organizations. Statistical information on water supply and wastewater collection is collected, stored and disseminated by the State Committee of Statistics of the Republic of Tajikistan. Activities of the State Committee are regulated by the Law of the Republic of Tajikistan "On State Statistics". Data are collected using different mandatory state reporting forms and selective surveys.

---

[2] Water and Sanitation, K.S. Alimov, Proceedings of the National Scientific-Practical Conference "Pure Water for Human Beings", Dushanbe, 2003.

[3] Water and Sanitation, K.S. Alimov, Proceedings of the National Scientific-Practical Conference "Pure Water for Human Beings", Dushanbe, 25 September 2003.

Information on water supply and wastewater collection is collected using forms of state reporting called: 1-water supply and 1-wastewater, which were approved by Ordinance No. 14 of the State Committee of Statistics of the Republic of Tajikistan on 30 August 2001. Before 2002, they used the form 2-tp (water sector), which is not filled today because of lack of funds. Information for these forms is collected once a year. Statistical information is collected by the State Committee of Statistics of the Republic of Tajikistan through statistical annual books, special newsletters and data provided on request.

Besides the State Committee of Statistics, information on water supply and wastewater collection is collected by the Ministry of Land Reclamation and Water Economy, the Ministry of Environmental Protection and Forestry, the Ministry of Health, the Chief Geological Service of the Republic of Tajikistan, and the state unitary enterprise “Housing and Communal Facilities”.

Besides governmental organizations, water supply and wastewater collection services are monitored by information. Over the last decade, the Chair of Epidemiology of the Medical University has monitored quality of water in water reservoirs used by population as the main source of water supply. Monitoring is made using state statistical data, annual reports of the centres of state sanitation and epidemiological surveillance, maps of surveys of epidemiological disease spots, and the results of physical, chemical, bacteriological and virologic surveys.

Selective collection of information on water supply and wastewater collection in rural areas of the country is made by the International Fund for Saving the Aral Sea.

Before 1991, all organizations of Tajikistan, which supplied water and/or received wastewater, had their laboratories which controlled quality of water supplied to users, as well as quality of wastewater. Currently, no control is exercised, as a rule, over quality of water and wastewater in rural areas.

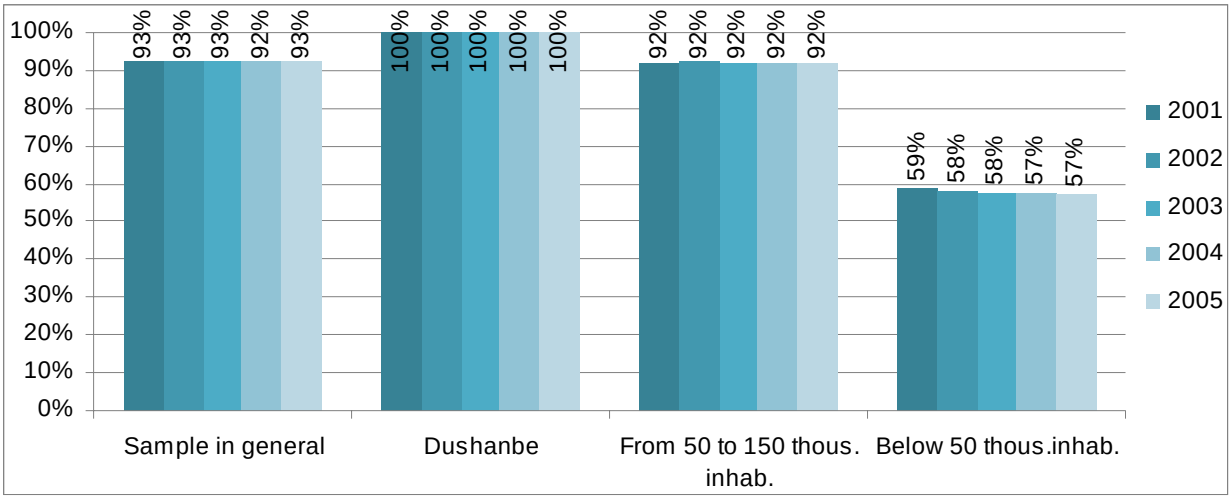
In the Republic of Tajikistan, there are many population centres, where people take potable water from sources located up to 5 km away from the place of residence. Children have their duty to provide potable water for their households. However, nobody collected information about the distance between the households and the water sources.

3. CHARACTERIZATION OF INDICATORS OF ECONOMIC ACTIVITIES OF THE REPUBLIC OF TAJIKISTAN WATER SUPPLY AND WASTEWATER ENTERPRISES

3.1 COVERAGE OF POPULATION BY SERVICES

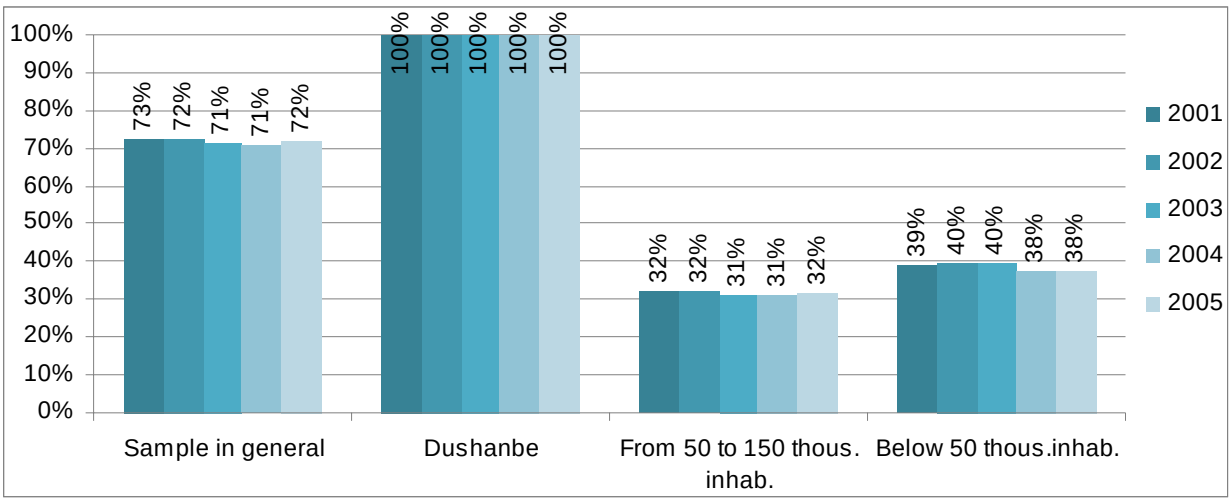
According to data, provided by the managers of the water supply and wastewater enterprises of the Republic of Tajikistan, covered by monitoring, the coverage of population by water supply services (**indicator 1.1**) provided by all enterprises, included into the sample, is rather high, if we consider the total number of the country population, i.e., at the level of 92%-93%. Population of Dushanbe is fully covered by water supply services; in 2001-2005, in towns with 50,000–150,000 population water supply services were provided to 92% of the residents; however, in towns with population less than 50,000 people the coverage by water supply services was very low. While by the results of 2001 the water supply services were provided to 59% of enterprises living in these towns, then by the end of the period of analysis this percent went down to 57%.

Figure 1: Indicator 1.1. Coverage by water supply services



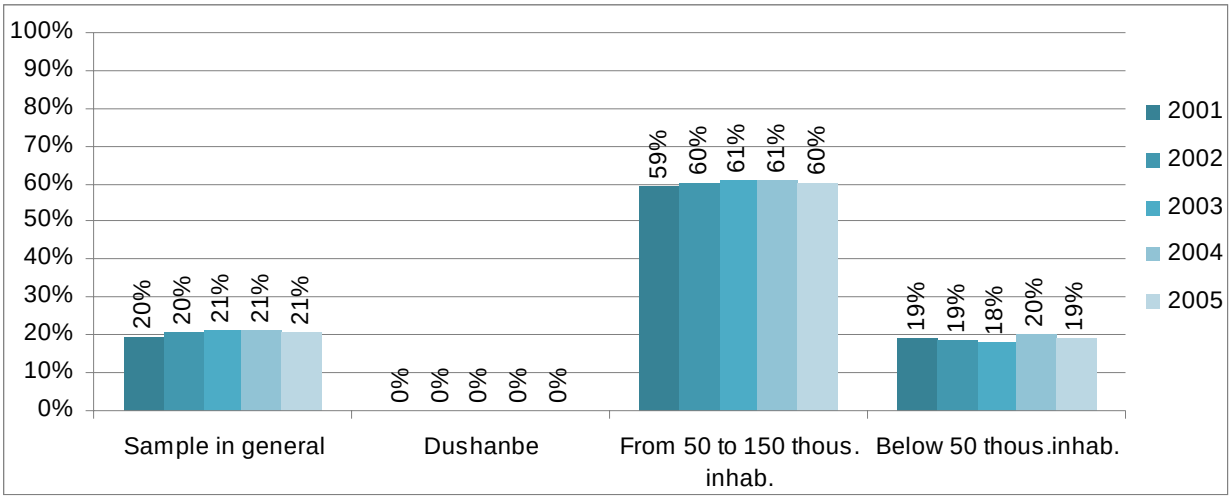
(Выборка в целом = Sample in general; г.Душанбе = Dushanbe; От 50 до 150 тыс. чел. = 50,000 – 150,000 people; Менее 50 тыс. чел. = < 50,000 people)

Figure 2: Indicator 1.2. Coverage by water supply services (connected population)



The main part of the population, receiving water supply services, has access through points of connection to the centralized water supply network, located in their living facilities. By the results of 2005, out of 93% of population, receiving water supply services, 82% had access to these services through points of connection to water supply network in their houses, and only 11% used water through common water supply points.

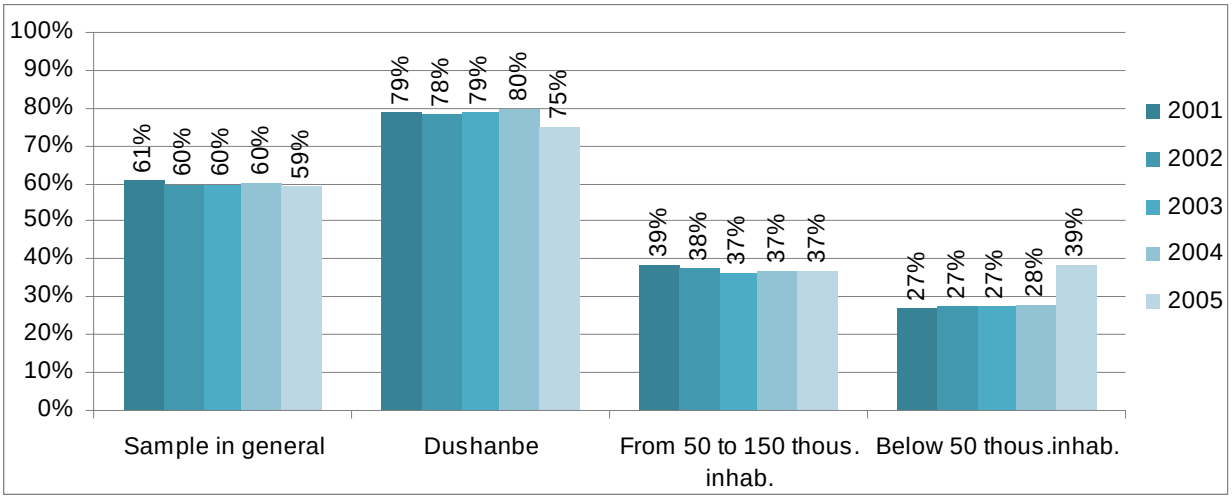
Figure 3: Indicator 1.3. Coverage by water supply services (common water supply points)



During the entire period of analysis, the coverage by sewerage services was at a much lower level. While in Dushanbe wastewater collection services were provided, on the average to 8 out of 10 citizens, then in towns with 50,000–150,000 population just over one-third of residents had access to sewerage services (39% in 2001 and 37% by the results of 2005). In towns with less than 50,000 population, the coverage by sewerage services in 2001-2004 was even lower, at the level of 27%-28%, however, by the results of 2005 the value of this indicator went up to 39%, thus surpassing the value of the indicator in larger towns. A rapid growth of the indicator for this group is related to a growth of population which has access to sewerage services in the town of Tursunzade, where, according to information provided by managers of the local water supply and

wastewater enterprise, over one year the number of people who received water supply services increased from 8 580 to 23 325 people.

Figure 4: Indicator 2.1. Coverage of sewerage services



Given the fact that monitoring included only those enterprises which provided services to towns, it is expedient to use, for analysis of the coverage of population by water supply and wastewater collection services, additional information sources, which allows making a conclusion about the level of coverage by the water supply and wastewater collection services in rural population centres. These sources were used by the Foundation "Institute for Urban Economics" for preparing, in 2005, the report "Tailoring Global MDG7 Targets 10 and Indicators to Local Conditions in ECA (Georgia, Tajikistan, Albania)" on request of the World Bank. Below, we provide parts from the above report related to characterization of the population coverage by water supply and wastewater collection services (quotations from the report are given in italics).

"Today, information about the population of the Republic of Tajikistan, which had access to centralized water supply and wastewater collection services, is not included into statistical data, provided by the water supply and wastewater enterprises using the approved state statistical forms (form 1-water supply and 1-sewerage).

Nevertheless, the coverage of population by centralized water supply and wastewater collection services can be tentatively estimated using information obtained form the following sources:

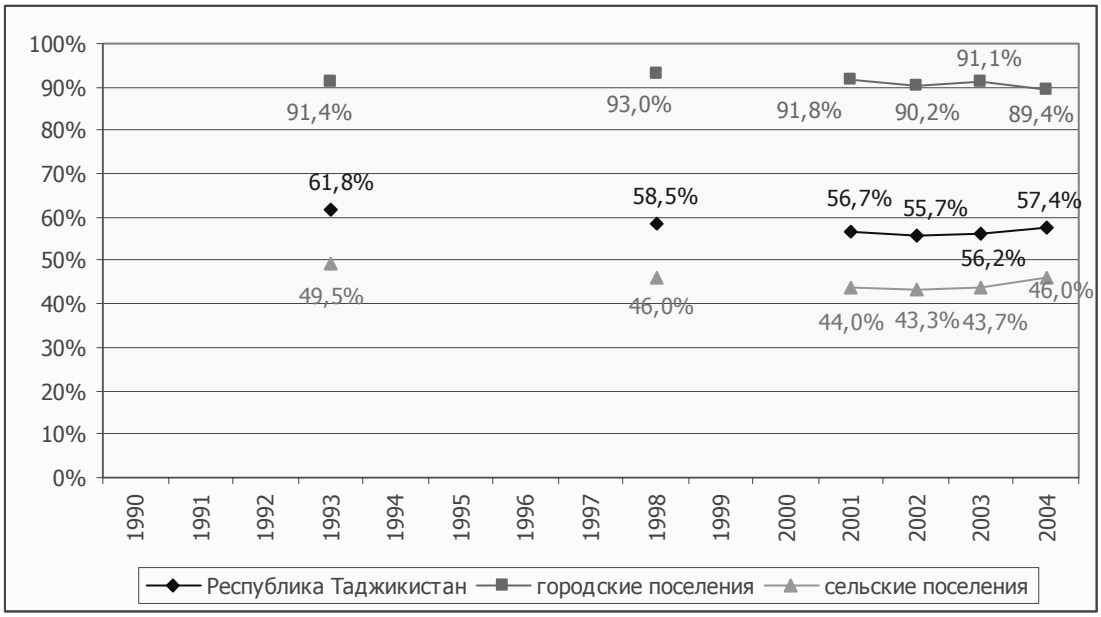
- reports of international organizations about the state of the water supply and wastewater sector of the Republic of Tajikistan and its regions;
- results of selective surveys made for estimating the status of the national water supply and wastewater collection sector (1993, 1998, 2002) by the Republic of Tajikistan State Committee of Environmental Protection and Forestry;
- information of the National Centre of State Sanitation and Epidemiological Surveillance of the Republic of Tajikistan Ministry of Health about the provision of tap water to population and laboratory indicators of drinking water analysis;

- information about the area of housing facilities equipped with access to centralized.

Results of selective surveys for estimating the state of the national water supply sector

According to the results of selective surveys for estimating the state of the national water supply sector, provided by representatives of the Republic of Tajikistan State Committee of Environmental Protection and Forestry, at the beginning of 1990's the level of population coverage by centralized water supply services was about 62% for the whole of the Republic of Tajikistan; more than 90% of the urban population was covered such services, while in the rural areas only half of the population had access to centralized water supply services. By 1998, the value of this indicator for the entire Republic of Tajikistan decreased to 60%, due to total wear of some parts of urban and rural water supply networks. The coverage of urban population by centralized water supply services increased to 93%, while rural population had the level of coverage by these services less than half (46%). By 2002, there was an additional decrease of this indicator, and, as a result, coverage of population by water supply services in the country as a whole decreased to 56%: urban population was covered by 91% and rural by 43%. By the results of 2004, 57.4% of population of the Republic of Tajikistan as a whole was covered by centralized water supply services, including 89.4% of the urban population and 46% or the rural population.

Figure 5: Coverage of population by water supply services by different types of population centres, in general for the Republic of Tajikistan



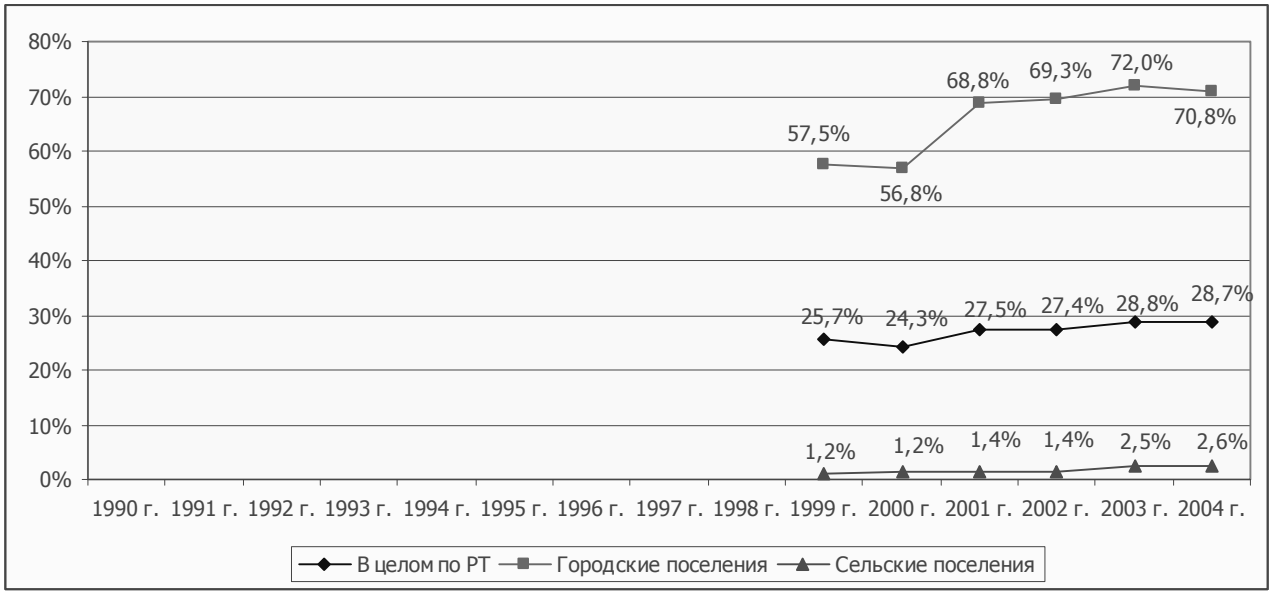
(Республика Таджикистан = Republic of Tajikistan; городские поселения = urban population centres; сельские поселения = rural population centres)

Provision of housing facilities with centralized water supply and wastewater collection services

Information about provision of housing facilities with water supply and wastewater collection services is provided in the statistical books "Main indicators of the housing and communal facilities in the Republic of Tajikistan", issued every year by the Chief Information Centre of the

State Committee of Statistics of the Republic of Tajikistan. The currently available information about provision of housing facilities with centralized water supply and wastewater collection services for the period of 1999-2004 inclusive is presented in the figure below.

Figure 6: Provision of housing facilities with water supply and wastewater collection services



(В целом по РТ = In general for the Republic of Tajikistan; городские поселения = urban population centres; сельские поселения = rural population centres)

As seen from the diagram, over the last 6 years provision of housing facilities of all forms of property with water supply and wastewater collection services increased in the Republic of Tajikistan. In urban population centres, the share of houses equipped with centralized water supply systems increased by 13.3%, and in rural areas it went up 2.2 times. Special attention should be paid to a very low level of provision of housing facilities with centralized water supply and wastewater collection services in rural areas, where the value of the relevant indicator does not exceed 3%.

By the results of selective surveys, the level of population coverage by wastewater collection services was much lower, compared to the water supply services: generally for the Republic of Tajikistan, centralized water supply services were provided to not more than 16% of population; while in urban population centres almost half of the population had access to centralized water supply services , then only 2% of rural population had access to centralized water supply services.

Figure 7: Coverage of population by centralized water supply services

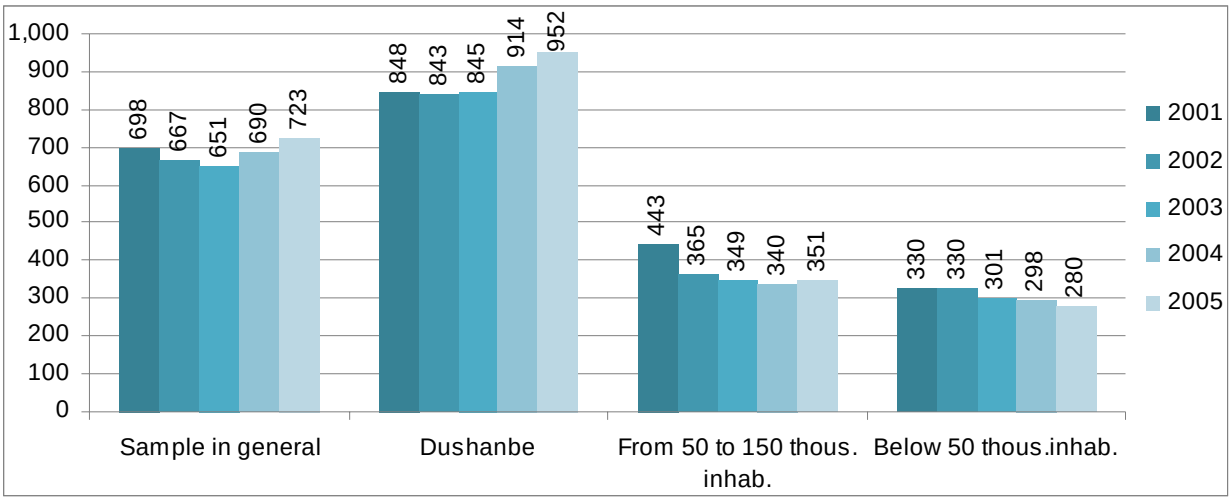
(Республика Таджикистан = Republic of Tajikistan; городские поселения = urban population centres; сельские поселения = rural population centres)

Thus, the earlier discussed indicators 1.1-1.3 and 2.1 do not fully characterize the real status as regards coverage of the Republic of Tajikistan population by water supply and wastewater collection services. To be more precise, these indicators correctly characterize the situation related to the coverage by water supply and wastewater collection services of urban population, whereas the chief problem in the water supply and wastewater collection sector of the Republic of Tajikistan is a very low coverage by water supply and wastewater collection services of population living in remote rural population centres.

3.2 WATER USE AND PRODUCTION

The volume of water production (**indicator 3.1**), in general for all enterprises, included into the sample, after some period of decrease in 2001–2003 from 698 to 651 litres per day per capita, increased by the results of 2005 to 723 litres per day per capita. It should be noted that such high level of this indicator is preconditioned by a very high level of the indicator for the enterprise providing services in the city of Dushanbe, where the volume of water production over this period increased from 848 to 952 litres per day per capita. As regards other enterprises, included into the sample, the level of the indicator was much lower and more correspondent to the value of such indicator for enterprises in EECCA countries. It should be noted that during the entire period of analysis the value of the indicator 3.1 for enterprises, providing services in small and medium population towns, was obviously decreasing: in the group of enterprises, providing services to towns with population from 50,000 to 150,000 people the volume of water production decreased from 443 to 351 litres per day per capita. As regards enterprises, providing services to towns with up to 50,000 population, the volume of water production decreased less significantly; however, initially this indicator was at a much lower level: in 2001 its value was 330 litres per day per capita, while by the results of 2005 this indicator decreased to 280 litres per day per capita.

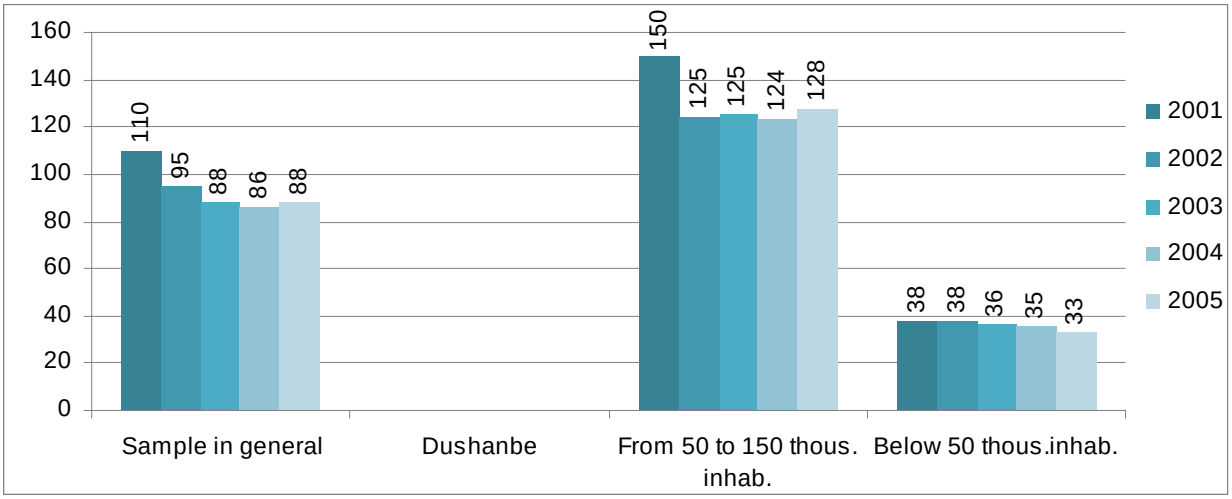
Figure 8: Indicator 3.1. Water production (litres per day per capita)



The value of the **indicator 3.2**, characterizing the volume of water production per connection point per month, as it is presented for the entire sample, does not fully characterize the situation for the whole of the Republic of Tajikistan; this is related to the fact that the water supply and wastewater enterprise of Dushanbe did not present correct information about the number of connection points to the water supply networks of this enterprise. Nevertheless, it should be noted that the value of the indicator for the enterprises, providing services to small and medium towns, decreased over this period. Changes of this indicator for enterprises, providing services to towns with population up to 50,000, were not so prominent; however, they decreased stably and over the period of analysis the volume of water production per connection point decreased from 38 to 33 cubic metres of water per month. For enterprises, providing services to towns with population from 50,000 to 150,000 people, this indicator in 2002 went down by one-sixth, from 150 to 125 cubic metres of water per connection point per month; however, in the following years this

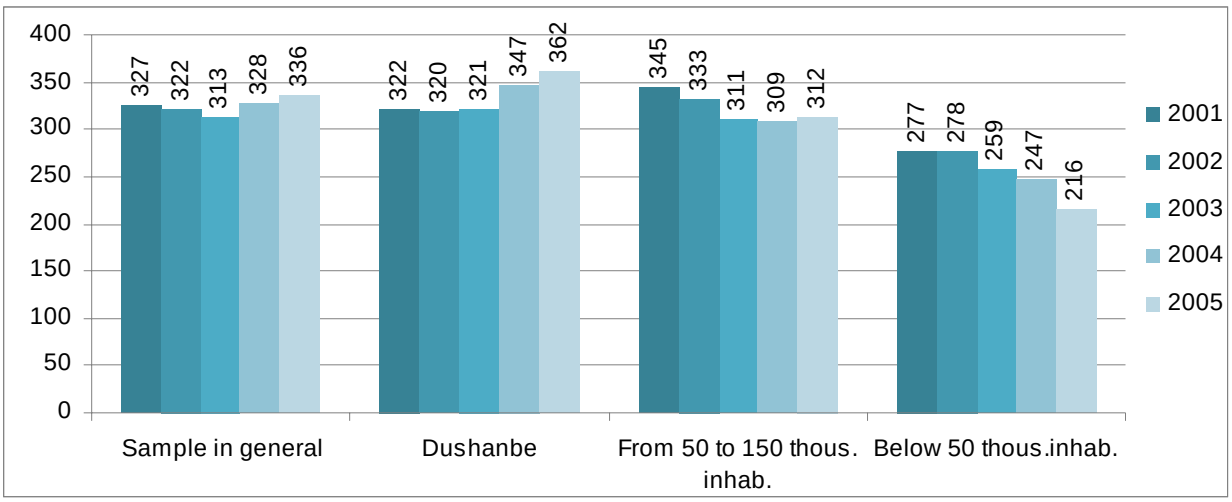
indicator practically did not change, and only by the results of 2005 it increased a little to 128 cubic metres of water per connection point per month.

Figure 9: Indicator 3.2. Water production (m3 per connection per month)



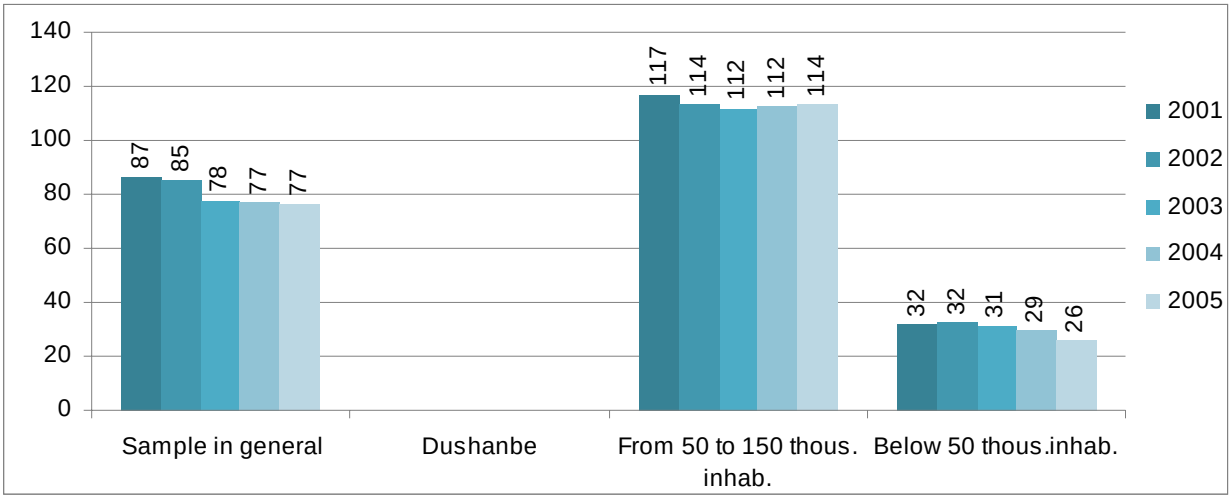
The dynamics of the **indicator 4.1**, characterizing the volume of water use by all categories of users per capita, in general corresponded to the dynamics of the indicator 3.1, discussed above. The growth of the indicators in general for the sample from 327 to 336 litres per day per capita over the period of analysis was preconditioned by the growth of the volume of water use in the city of Dushanbe, from 322 to 362 litres per day per capita. For other water supply and wastewater enterprises of the Republic of Tajikistan, included into the sample, the volume of water use persistently reduced. For the group of enterprises, providing services to town with population from 50,000 to 150,000 people, the value of the indicator 4.1 decreased by 10% and reached, by the results of 2005, the level of 312 litres per day per capita. For enterprises, providing services to towns with population less than 50,000 people, the level of this indicator was lower from the very beginning; nevertheless, its reduction was rather substantial, and by the results of 2005 the volume of water use decreased to 216 litres per day per capita (78% of the 2001 level).

Figure 10: Indicator 4.1. Water use (litres per day per capita)



The value of the **indicator 4.2**, characterizing the volume of water use per connection point per month, in general for all enterprises taking part in the monitoring, expect for the water supply and wastewater enterprise in Dushanbe, decreased from 87 to 77 m^3; for the water supply and wastewater enterprises, providing services to towns with population up to 50,000 people, the value of the indicator 4.2 was 4 times smaller than the value of the similar indicator for the group of enterprises, providing services to towns with population from 50,000 to 150,000 people (26 m^3 and 114 m^3, respectively, by the results of 2005).

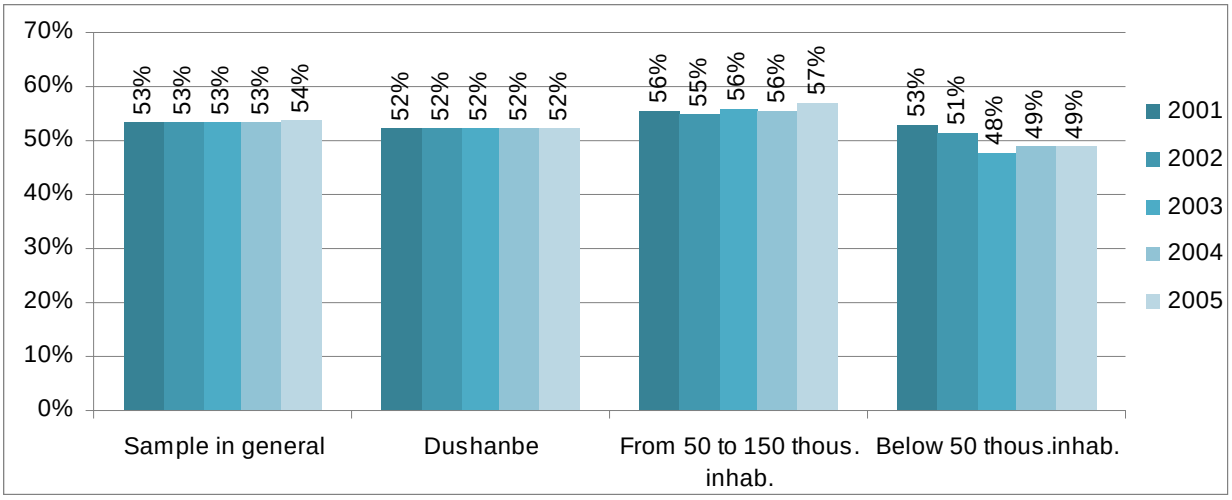
Figure 11: Indicator 4.2. Water use (m^3 per connection per month)



The main water use in the Republic of Tajikistan is the Republic of Tajikistan. During the entire period of analysis, the value of the **indicator 4.3**, characterizing the share of population in the total water use, was 53%-54%. The share of population in the total water use for Dushanbe stably remained at the level of 52%; for enterprises, providing services to towns with population from 50,000 to 150,000 people there was a slight increase of the population share from 56% to 57%.

A situation is different for enterprises, providing services to towns with population up to 50,000 people: the share of population in the total water use over the period of analysis decreased by 4%; it is important that during the last three years it was always below 50%. This was related to the fact that enterprises, providing services to towns with small population, over the entire period of analysis, was stably high for such category of water users as budgetary organizations. By the results of 2001, 2004 and 2005, the share of these users (**indicator 4.5**) was close to 38%, and in 2002–2003 it exceeded 40% of the totals amount of water used by all categories of users.

Figure 12: Indicator 4.3. The share in the total water use: population



The share of commercial users (**indicator 4.4**), in general for the sample, was stably at the level of 17%; a high level of this indicator was in the group of enterprises, providing services to towns with medium population (28% in 2001–2005).

Figure 13: Indicator 4.4. The share in the total water use: commercial enterprises

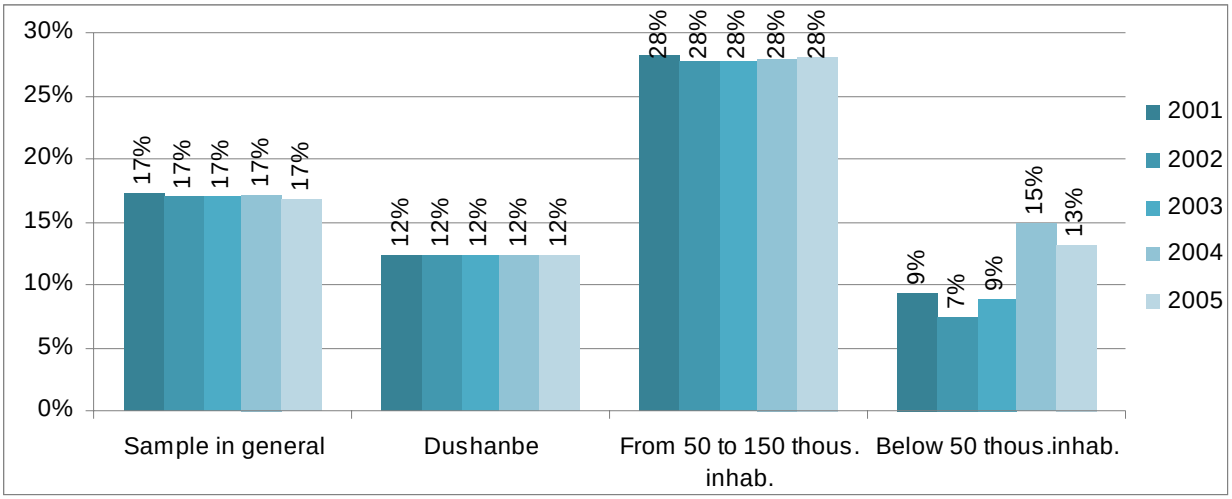


Figure 14: Indicator 4.5. The share in the total water use: budgetary organizations

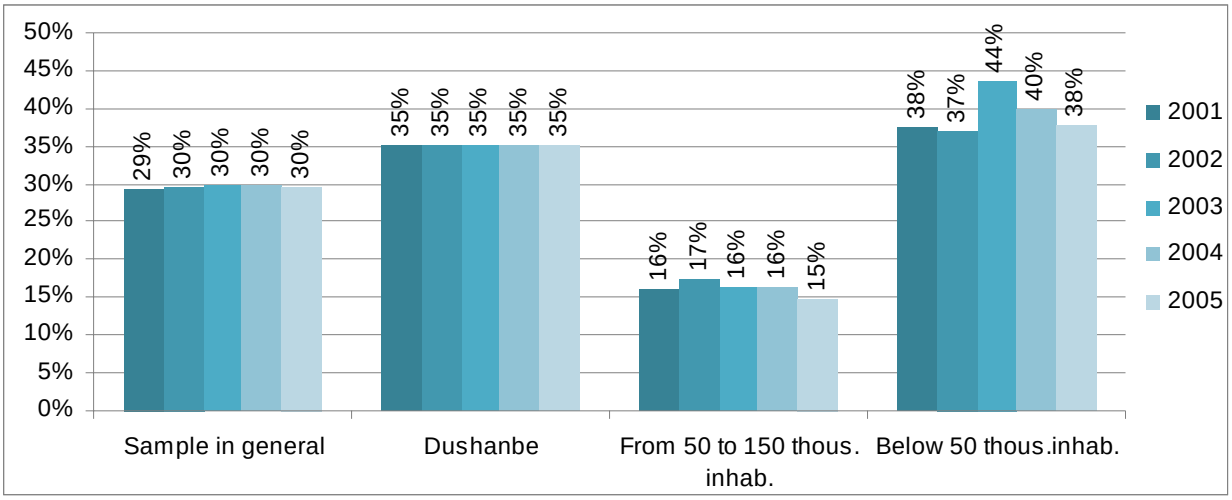
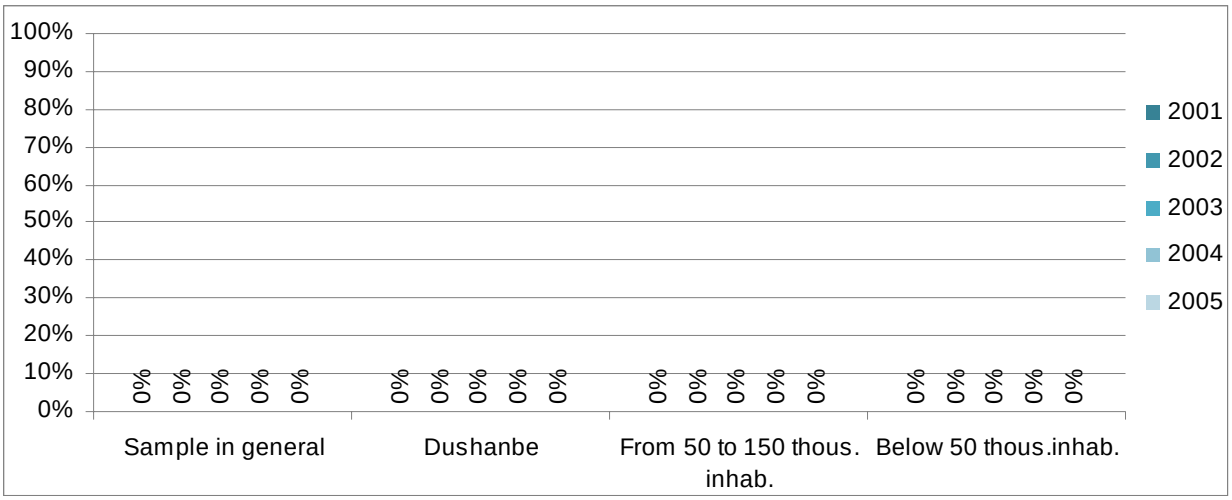


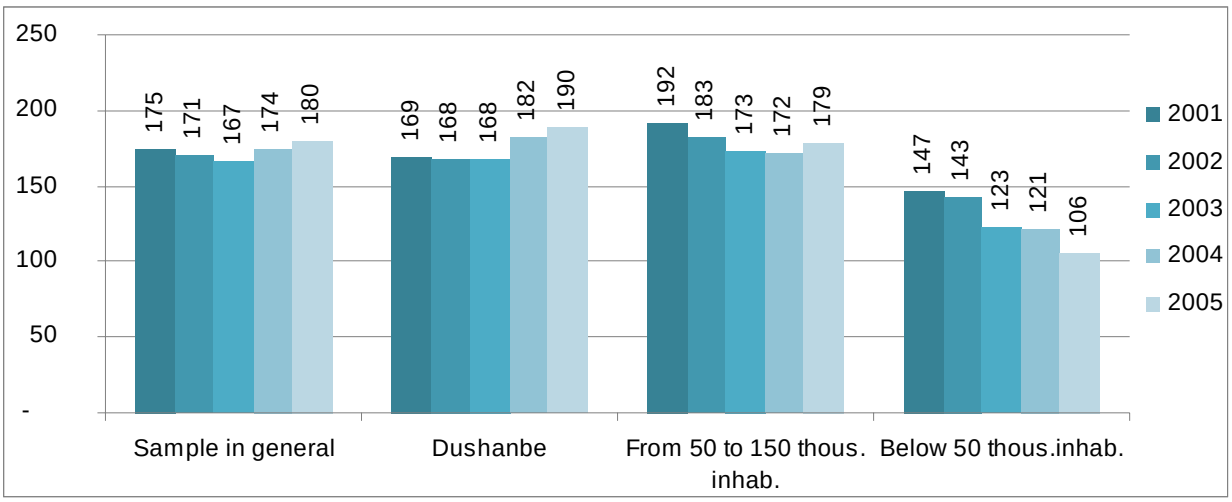
Figure 15: Indicator 4.6. The share in the total water use: supply to outside organizations



None of the enterprises, included into the monitoring, supplied water to outside organizations, as a consequence, the value of the **indicator 4.6** over the entire period of analysis was invariably equal to 0%.

The volume of water use by population (**indicator 4.7**), in general for all enterprises, included into the sample, following its decrease in 2001– 2003 from 175 to 167 litres per day per capita, in the following 2 years increased to 180 litres per day per capita. This growth was related to increased volume of water use by population in the city of Dushanbe, where, the period of stabilization of this indicator in 2001–2003 at the level of 168-169 litres per day per capita, was followed by a 13% growth to 190 litres per day per capita. In its turn, the growth of water use in Dushanbe was preconditioned by the increased period of uninterruptible water supply, which increased from 16 hours per day by the results of 2003 to 23.9 hours per day (see **indicator 15.1**).

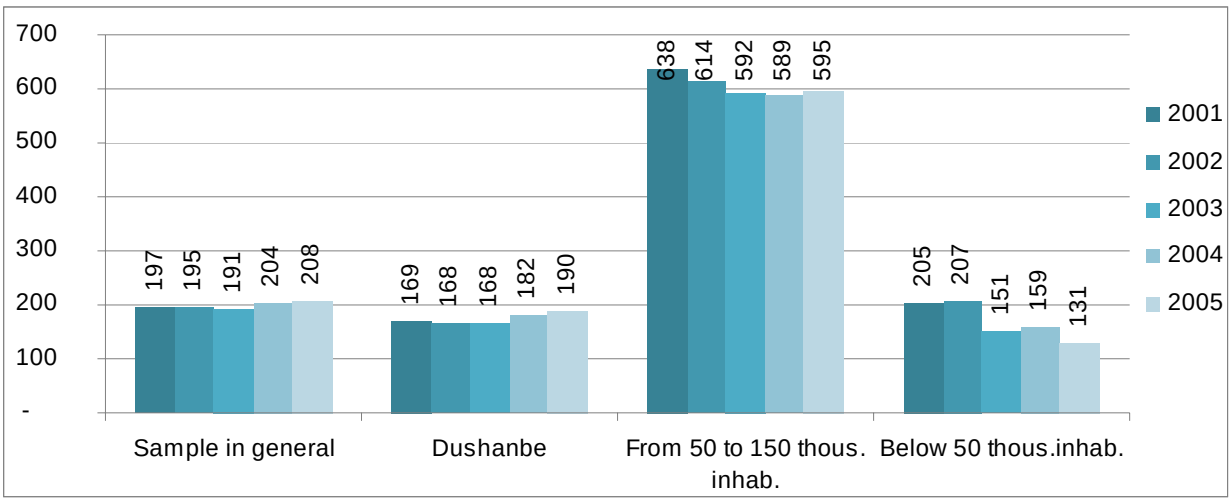
Figure 16: Indicator 4.7. Water use by population (litres per day per capita)



The direct dependence between the period of uninterruptible water supply and the volume of water use by the population was revealed in respect of other enterprises of the Republic of Tajikistan, included into the sample. Thus, the reduction of water use by population in the towns with up to 50,000 people from 147 to 106 litres per day per capita was related to the decreased period of uninterruptible water supply from 24 to 18.8 hours a day. As regards enterprises, providing services to towns with population from 50,000 to 150,000 people, the period of uninterruptible water supply decreased less significantly (from 24 to 21.9 hours per day); hence, the drop of water use by population was less substantial (192 litres per day by the results of 2001 and 179 litres per day in 2005).

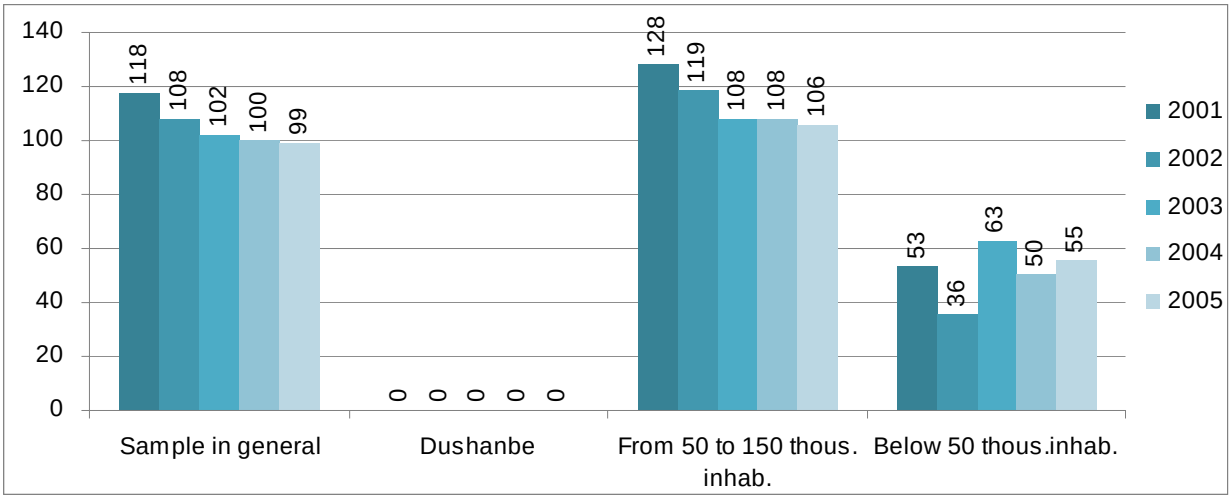
The dynamics of the volumes of water use by population, living in houses connected to the centralized water supply services (**indicator 4.8**), is similar to the dynamics of the **indicator 4.7**: over the period of analysis, the indicator for the entire sample, after reduction in 2001–2003 from 170 to 165 litres per day per capita, increased in the next 2 years to 181 litres per day per capita. In the city of Dushanbe, the value of indicator 4.8 increased over the period of analysis to 190 litres per day; for enterprises, providing services to towns with population from 50,000 to 150,000 people, the value of indicator 4.8 decreased from 183 to 158 litres per day per capita; for enterprises, providing services to towns with population up to 50,000 people, its reduction of the indicator was more significant (205 litres per day in 2001 and 131 litres per day by the results of 2005).

Figure 17: Indicator 4.8. Water use by population: connected population (litres per day per capita)



The volume of water use by population through common water supply points (**indicator 4.9**), generally for the sample, decreased from 309 to 267 litres per day per capita; however, analyzing this indicator it should be kept in mind that when this indicator was calculated in general for the sample the city of Dushanbe was not included, because the managers of the enterprise did not provide information about the number of people using water through common water supply points.

Figure 18: Indicator 4.9. Water use by population: common water supply points (litres per day per capita)



3.3 WATER GIVING NO INCOMES

The volume of water that gives no income, calculated for the water supply and wastewater enterprises of the Republic of Tajikistan, included into the sample, was stably at a very high level: 52%-53% of the total amount of water supplied to the network (**indicator 6.1**). This high level of water losses was preconditioned by water loss at the enterprises, providing services for Dushanbe, where the share of water, giving no incomes, over the entire period of analysis remained at the level of 62%. For other water supply and wastewater enterprises of the Republic of Tajikistan, included into the sample, the value of the **indicator 6.**1 was at a much more acceptable level. For the enterprises, providing services to towns with population from 50,000 to 150,000 people, the loss of water, reported by the results of 2001 at the level of 22% of the total amount of water supplied to the network, in the following years decreased to the level of 9%-11%. For enterprises, providing services to towns with population up to 50,000 people, the share of water giving no income remained at a higher level: while in 2001-2004 the value of the indicator 6.1 was 14%-16%, then by the results of 2005 it went up to 23% of the total amount of water supplied to the network.

Figure 19: Indicator 6.1. Water giving no incomes: the share of the total amount of water supplied to the network

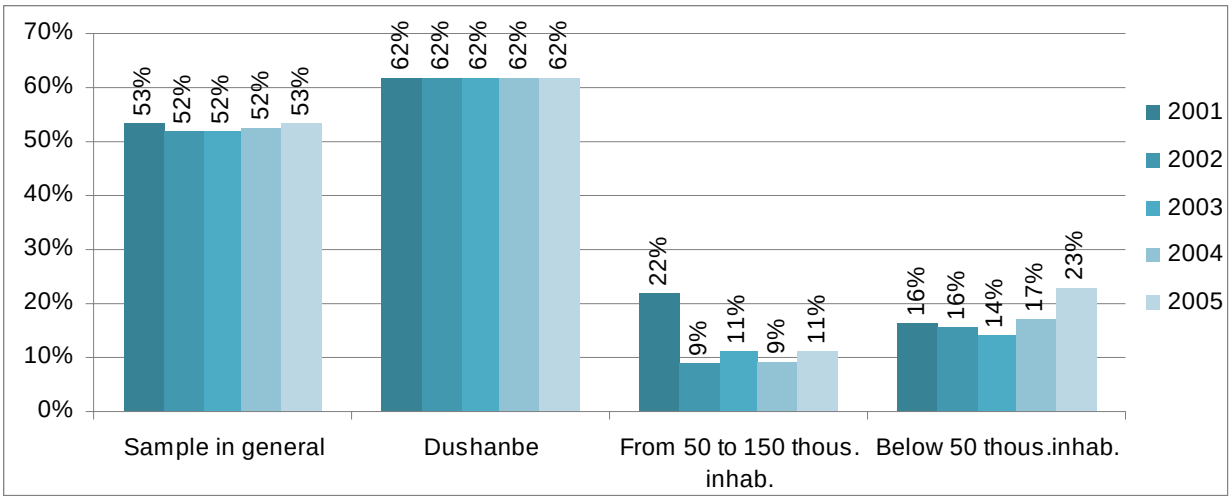
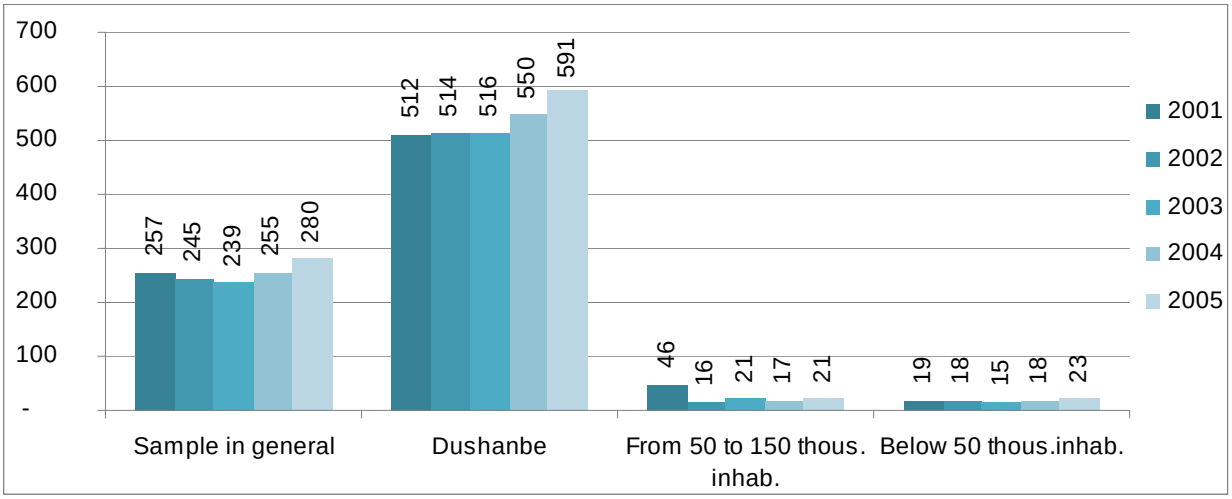
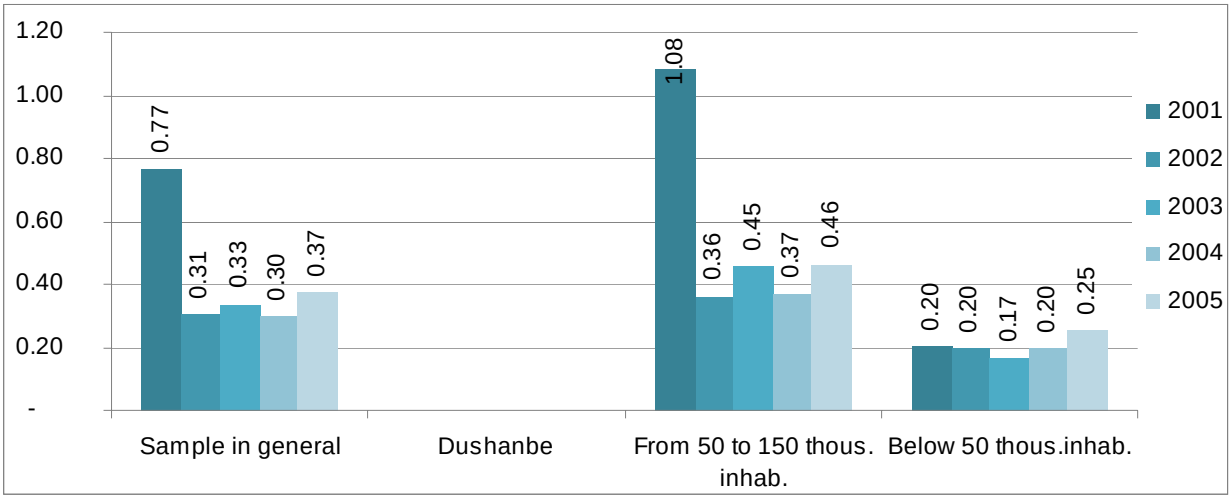


Figure 20: Indicator 6.2. Water giving no incomes: per km of the network per day (m^3 of water per day per km of the water supply network)



The volume of water that gives no income, calculated per km of the water supply network, by the results of 2005 made 280 m3 per day for the entire sample of enterprises, thus, going up by 17% compared to the results of 2003. The maximal value of the indicator 6.2, over the entire period of analysis, was reported for the enterprise, providing services for Dushanbe (512 m3 of water per day per km of the water supply network in 2001, while by the results of 2005 this indicator increased by 15% to the level of 591 m3 of water per day per km of the water supply network).

Figure 21: Indicator 6.3. Water giving no incomes: per connection point per day (m^3 of water per day per connection point to the network)

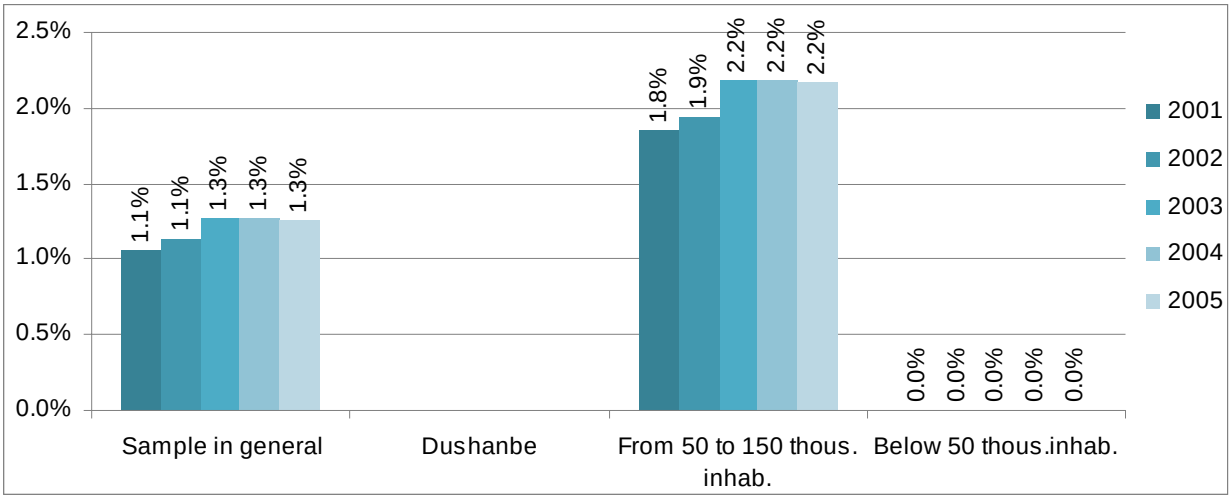


3.4 USING THE WATER METERS

The use of water meters in the water supply and wastewater facilities of the Republic of Tajikistan is at an unacceptable low level. In towns with medium size of population, water meters

are used at only 2.2% of connections to the water supply network, while in small population towns water metres are not used at all (**indicator 7.1.**).

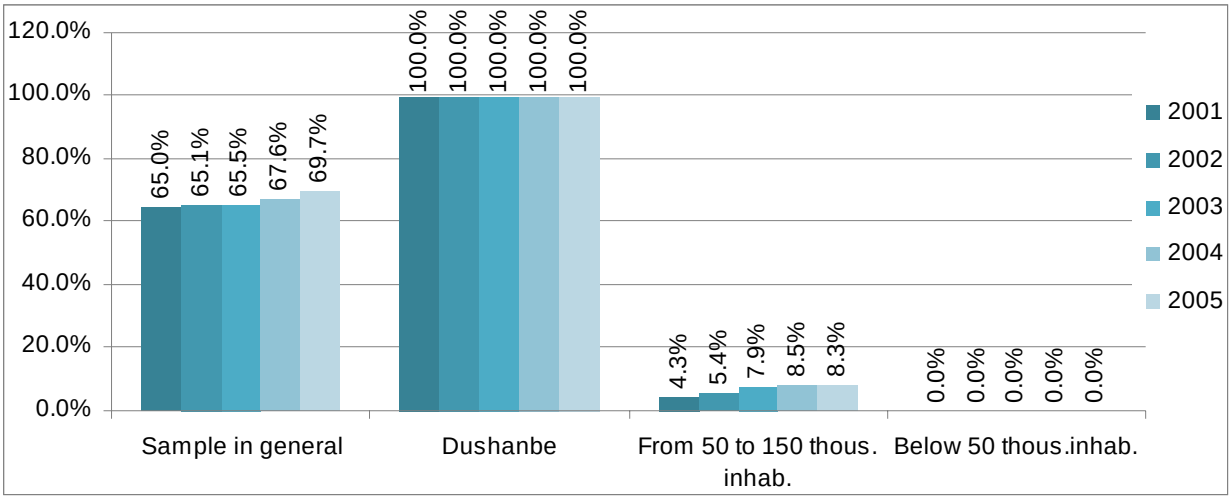
Figure 22: Indicator 7.1. Level of measurement



As a result, the share of water billed by the water metres (**Indicator 8.1**) is also low. In towns with medium size of population, the value of the indicator 8.1, by the results of 2005, reached the level of 8.3%, while in small towns are not used at all, because they are not available.

The exception is the city of Dushanbe, where, according to data provided by managers of the local water supply and wastewater enterprise, water metres ware used for billing the entire amount of water supplied to its users. This high level of the use of water metres in Dushanbe affected the level of the indicator 8.1 for the entire sample, which went up during the period of analysis from 65% to 69.7%.

Figure 23: Indicator 8.1. The share of measured sold water



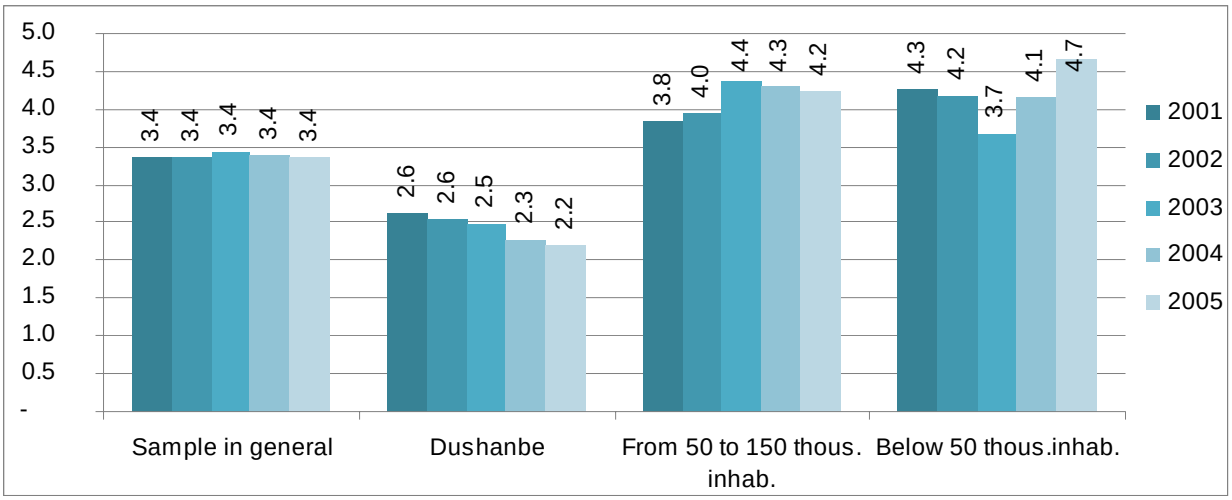
3.5 THE CONDITION OF NETWORKS

The consequence of a very high depreciation of fixed assets of the water supply and wastewater enterprises is the unacceptably high level of accident rates in water supply and sewerage networks.

Throughout the entire period of analysis, **indicator 9.1**, characterizing the number of accidents per km of the water supply network, was persistently at the level of 3.4 accident/km for the entire sample of enterprises. For comparison, it should be noted that in the Russian Federation the value of this indicator was almost 10-fold lower (0.38 accident/km by the results of 2005).

The highest level of **indicator 9.1** is in the group of enterprises, providing services to towns with population up to 50,000 people: already in 2001 its value was 4.3 accident/km of the network, and after its decrease in 2002-2003 to 3.7 accident/km, in the next 2 years this indicator for this group of enterprises rapidly increased to 4.7 accident/km of the network.

Figure 24: Indicator 9.1. Accidents in the water supply networks



In the group of enterprises, providing services to towns with population from 50,000 to 150,000 people, the situation with the accident rates was not much better: in 2001, on the average 3.8 accident/km of the network was reported in water supply networks, while by the end of the analyzed period the accident rate reached 4.2 accident/km of the network.

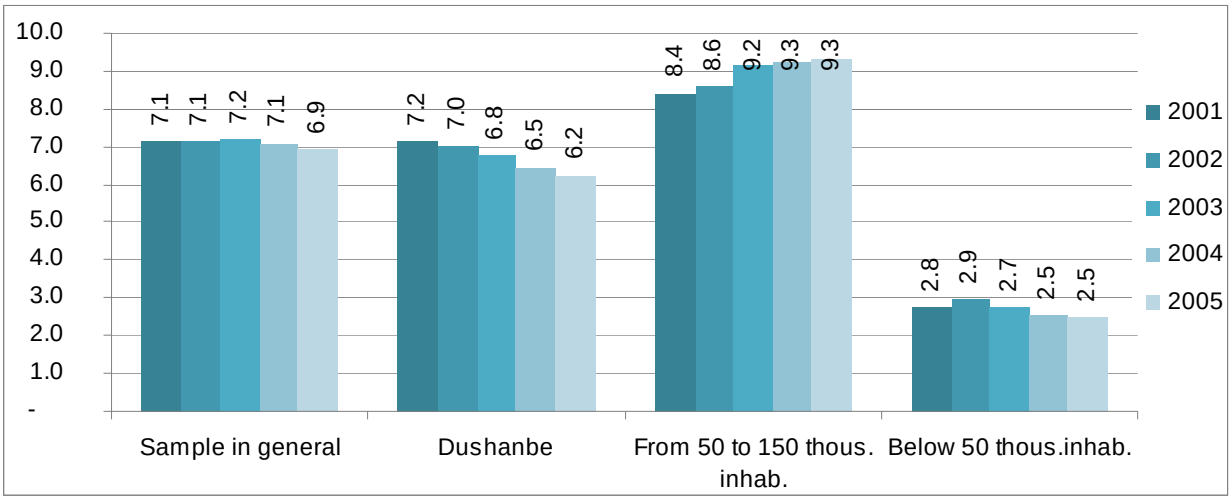
The level of accidents at the water supply and wastewater enterprise operating in Dushanbe, compared to other water supply and wastewater enterprises of the Republic of Tajikistan, included into the sample, is minimal; however, it cannot be considered in any way acceptable: in 2001, the average accident rate in water supply networks in Dushanbe was 2.6 accident/km of the network, while in the following years this accident rate went down to 2.2 accident/km of the network.

The situation is even more critical in the sewerage networks of the Republic of Tajikistan. While enterprises, providing services to towns with population up to 50,000 people, had the accident rate 10 times higher than the accident rate in the Russian Federation (2.50 and 0.22 accident/km of the network, respectively), then the enterprises, providing services in Dushanbe and in towns with medium size of population, the accident rates are 30-40 times higher than in the

Russian Federation. For the entire ample, the value of **indicator 10.1** during 2001–2004 remained at the level of 7.1-7.2 accident/km of the network, and only by the end of 2005 it decreased to 6.9 accident/km of the network because the accident rate was reduced in the sewerage networks of Dushanbe.

In general for the Republic of Tajikistan, according to the results of state statistical data using form 1-sewerage, the absolute number of accidents in the sewerage networks was stably growing: while in 2001 the number of accidents was 2784, then by the results of 2004 the accident rate increased more than 1.5 times, reaching the level of 4751 accidents.

Figure 25: Indicator 10.1. Accidents in sewerage networks



3.6 OPERATIONAL COSTS AND STAFF

3.6.1 Operational costs litres per day per capita

Over the period of analysis the expenditures of the enterprises, included into the monitoring, increased from 0.9 cents to 3.1 cents per m^3 of water; the highest level of operational costs was always for the enterprises, providing services to towns with population up to 50,000 people (3.7–5.6 cents per cubic metre of supplied).

Figure 26: Indicator 11.1. Operational costs per unit: for supply (USD/m^3 of water)

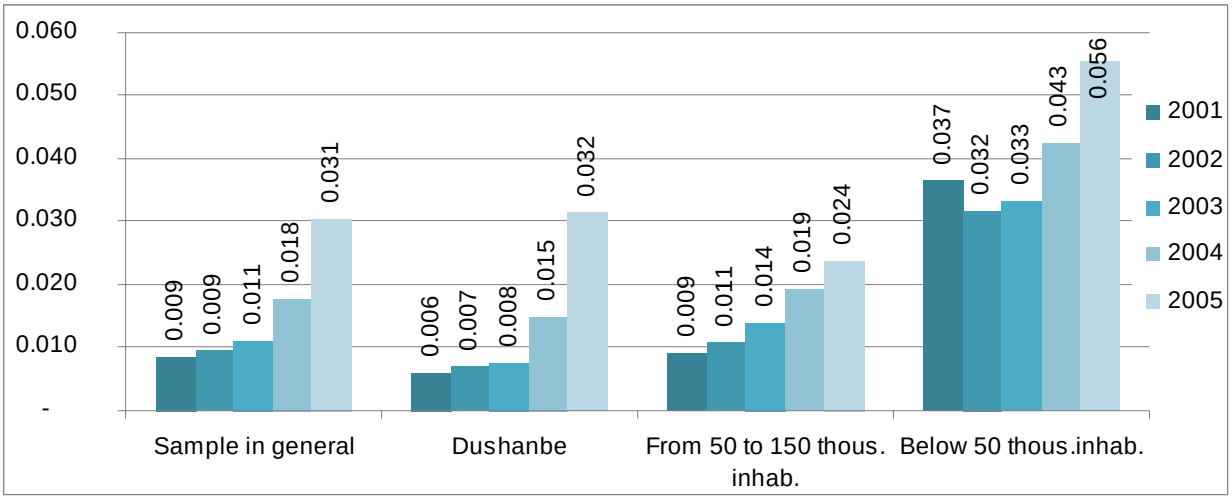
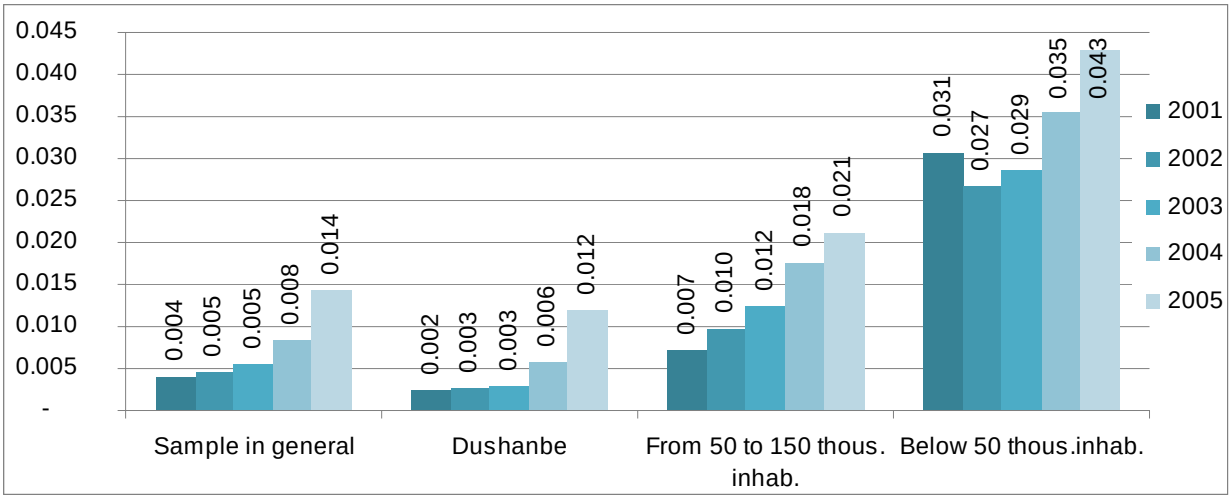


Figure 27: Indicator 11.2. Operational costs per unit: for production (USD/m3 of water)



3.6.2 Structure of expenses

In general, for all water supply and wastewater enterprises of the Republic of Tajikistan, covered by the monitoring, the structure of operational costs changed insignificantly. The salary share (**indicator 13.1**) increased from c 32% to 36.9%, the electricity share (**indicator 13.2**) increased

from 12.5% to 14.6%, and the share of operational costs related to subcontracts (**indicator 14.1**) increased from 19.5% to 23.0%.

Figure 28: Indicator 13.1. Share of salary expenses

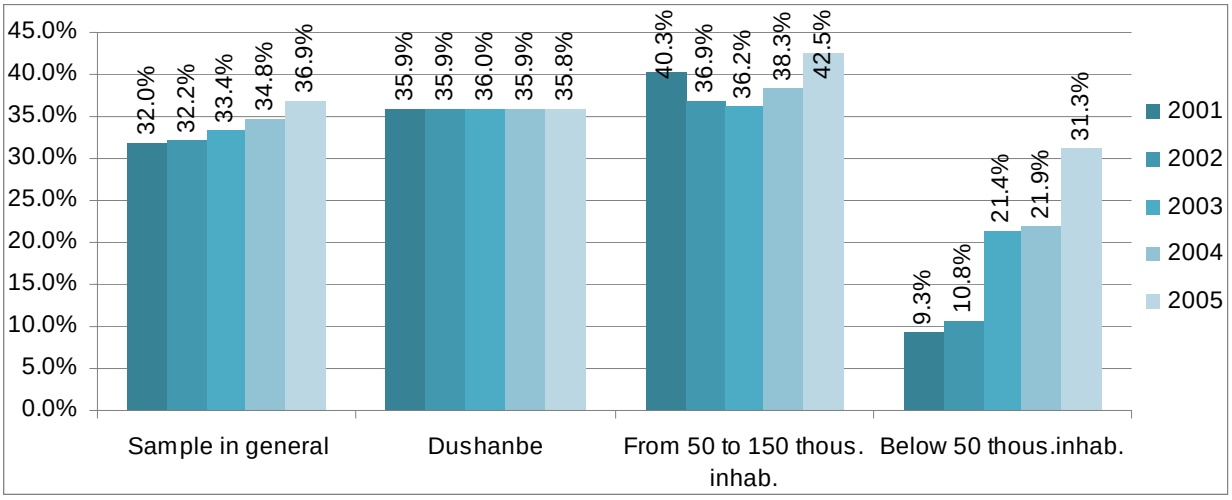


Figure 29: Indicator 13.2. Share of electricity expenses

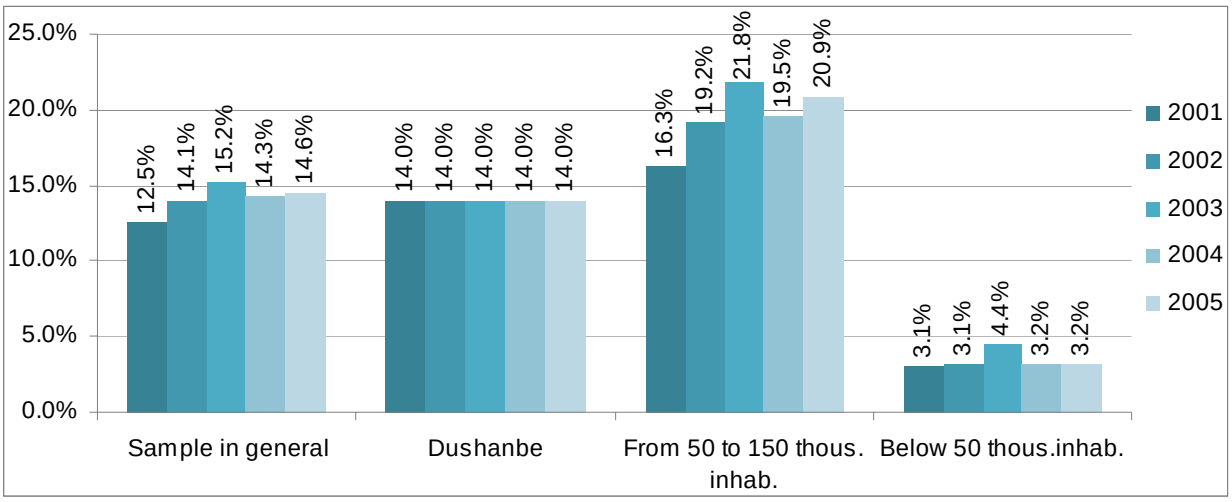
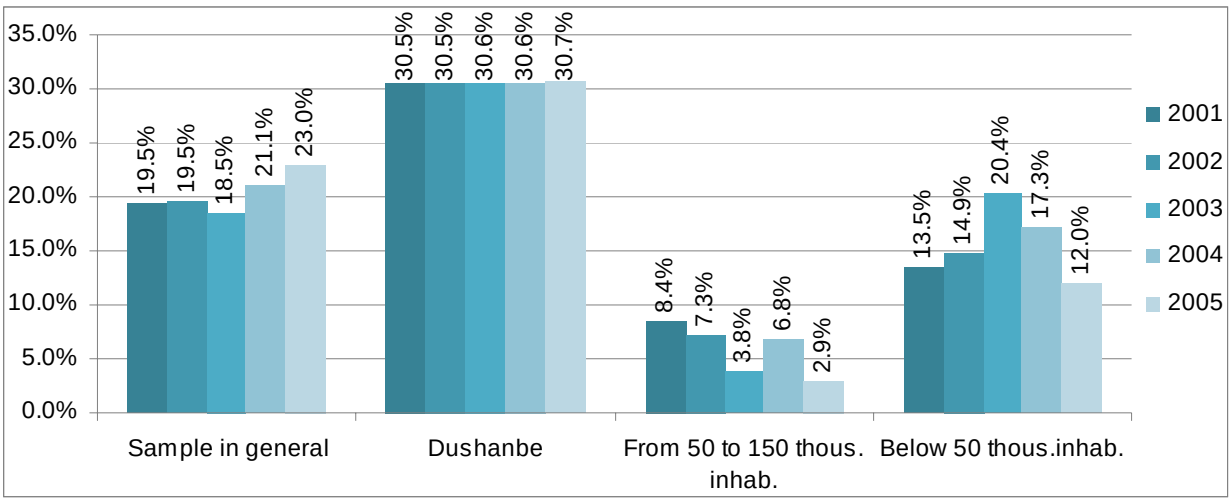


Figure 30: Indicator 14.1. Share of expenses related to subcontracts



3.6.3 Staff

Over the period of analysis, the number of staff employed by the water supply and wastewater enterprises, calculated per 1000 persons receiving services (**Indicator 12.3**), persistently remained at the level of 1.6 employees, which is one-third below the similar indicator for the Russian Federation. The minimal number of staff was at the enterprise in the city of Dushanbe (1.1 employees per 1000 persons receiving water supply services); for other enterprises, included into the monitoring, this indicator was 2.2-2.7 employees per 1000 persons receiving services, on the average.

In general, in 2001-2005, the number of employees at the water supply and wastewater enterprises remained at the level of 1.2-1.3 employees per 1000 persons receiving water supply and wastewater collection services; the value of i**ndicator 12.4** at the enterprise operating in Dushanbe was almost 3 times lower than the same indicator for other enterprises, included into the monitoring (0.7 and 2.2 employees per 1000 persons receiving services by the results of 2005).

In the total number of employees, over three-fourths included employees of the water supply sector; this ratio is typical of all water supply and wastewater enterprises, taking part in the monitoring (**indicator 12.7** and **indicator 12.8**).

Figure 31: Indicator 12.1. Water supply employees per 1000 connection points to water supply networks (employees/1000 connection points)

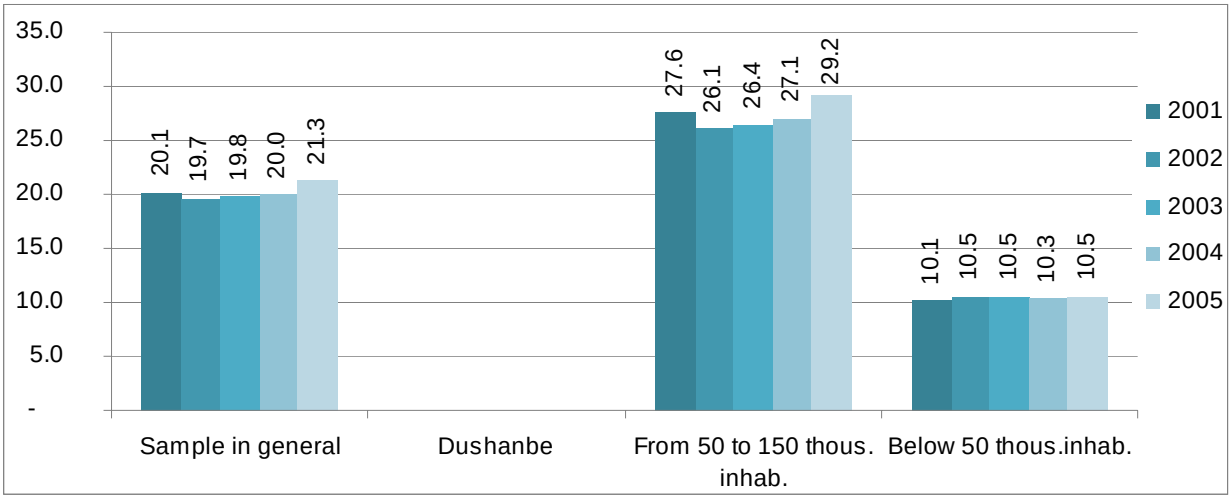


Figure 32: Indicator 12.2. Water supply and wastewater employees: per 1000 connection points to water supply and sewerage systems (employees/1000 connection points)

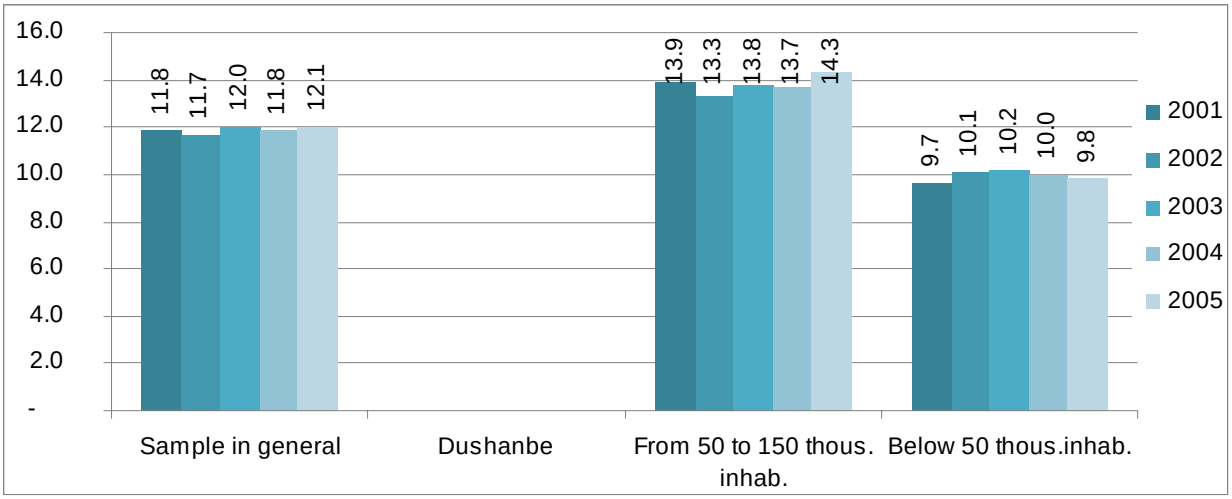


Figure 33: Indicator 12.3. Water supply employees per 1000 serviced persons (employees /1000 serviced persons)

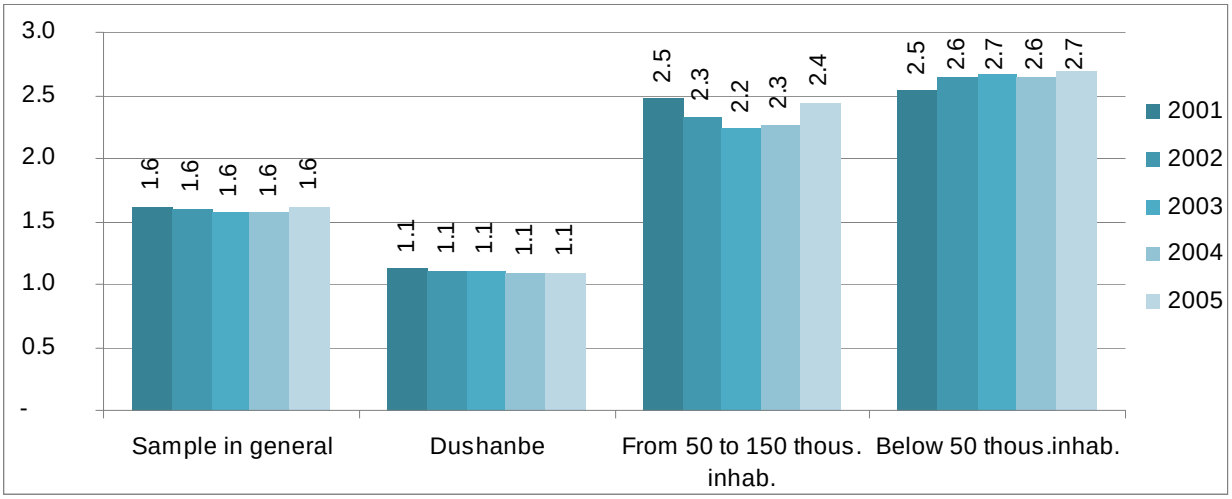


Figure 34: Indicator 12.4. Water supply and wastewater employees: per 1000 persons serviced by water supply and wastewater enterprises (employees /1000 serviced persons)

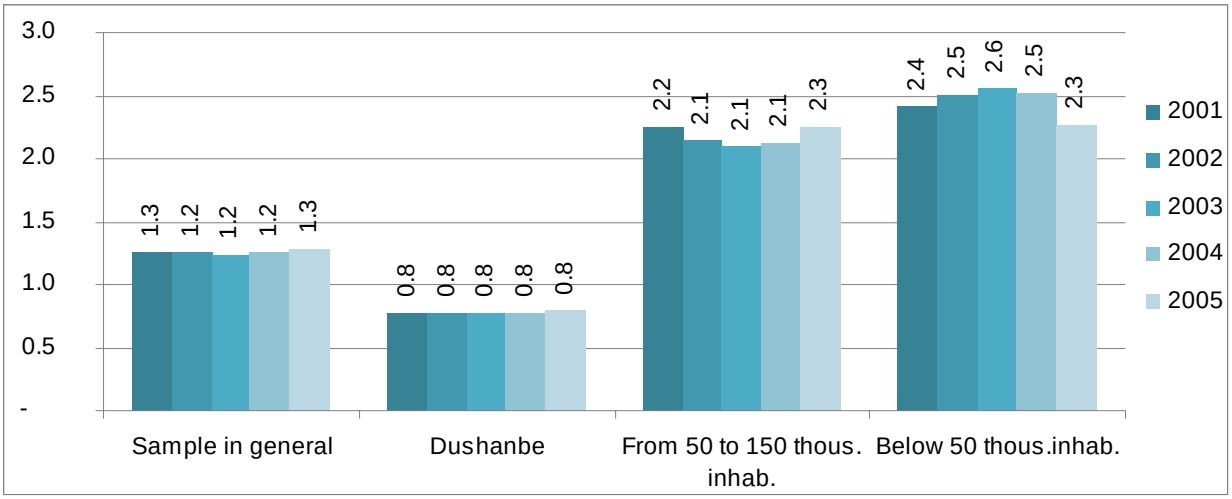


Figure 35: Indicator 12.5. Wastewater employees: per 1000 connection points to sewerage systems (employees/1000 connection points)

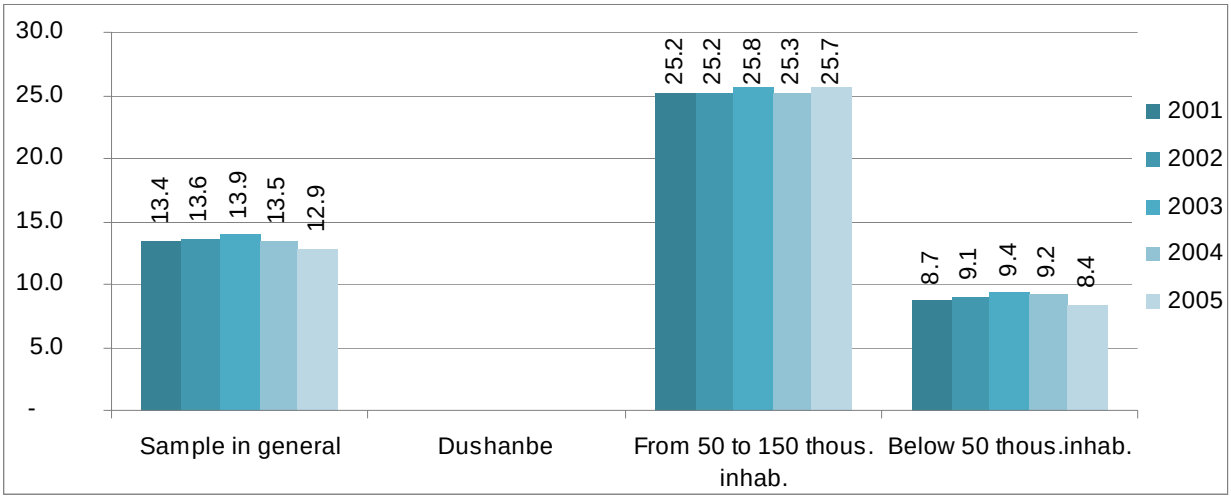


Figure 36: Indicator 12.6. Wastewater employees: per 1000 serviced persons (employees /1000 serviced persons)

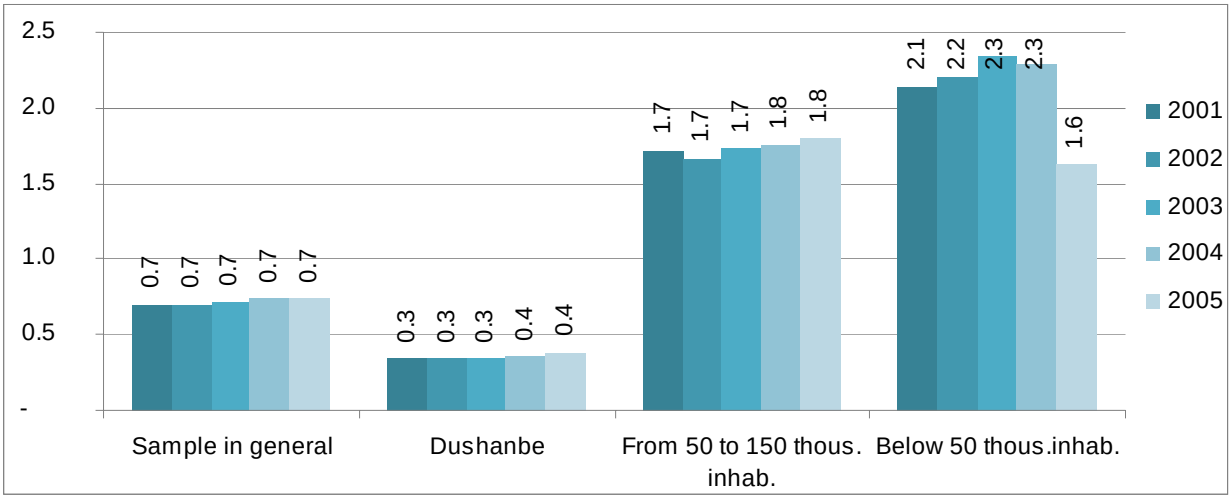


Figure 37: Indicator 12.7. Water supply employees: % of the total number of employees of the water supply and wastewater facilities

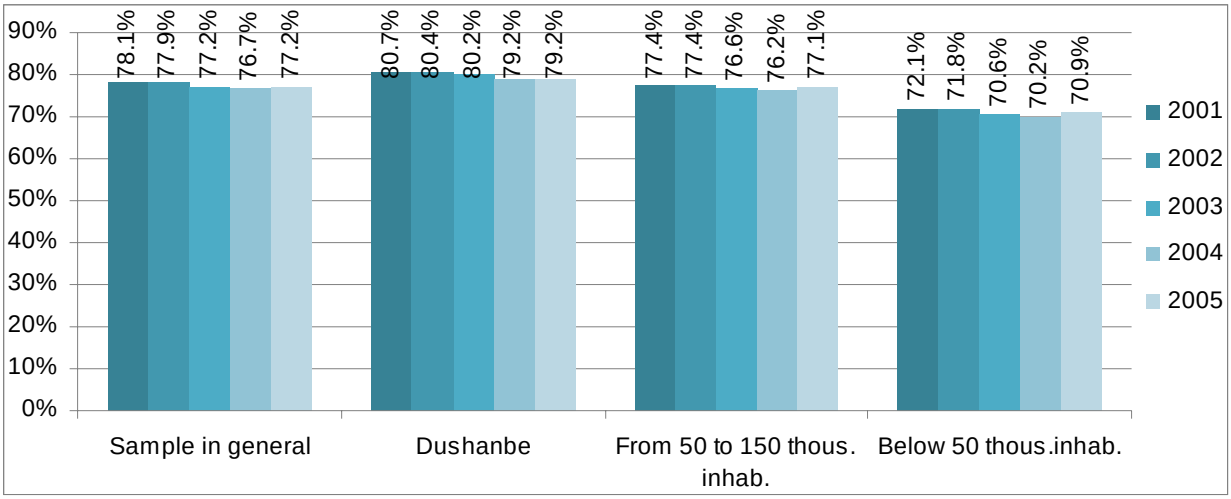
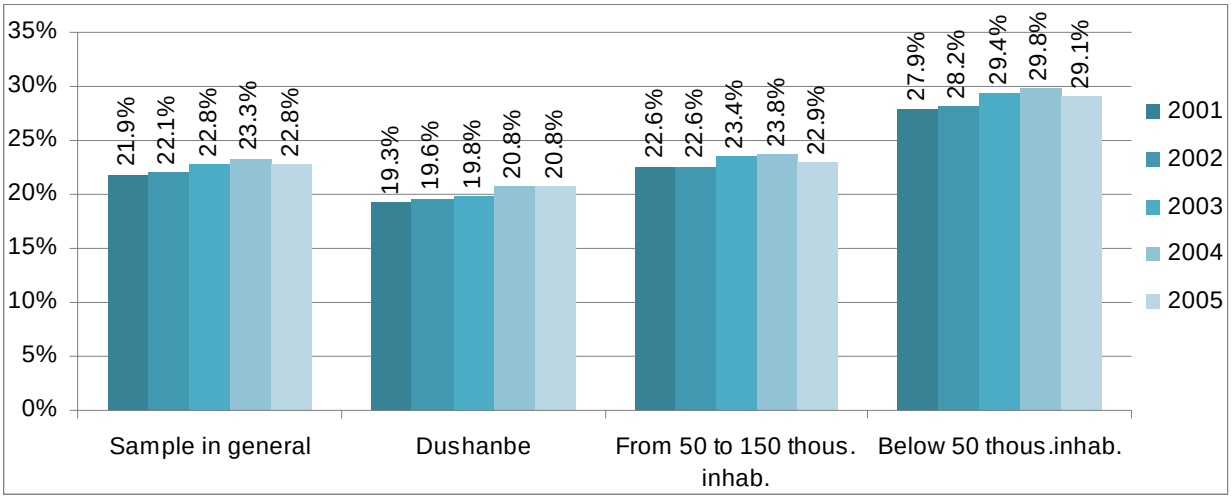


Figure 38: Indicator 12.8. Wastewater employees: % of the total number of employees of the water supply and wastewater facilities



3.7 QUALITY OF SERVICES

3.7.1 Uninterruptible services

In general, for all water supply and wastewater enterprises of the Republic of Tajikistan, taking part in the monitoring, the period of uninterruptible water supply (**indicator 15.1**) over the period of analysis increased from 18.4 hours per day in 2001 to a relatively acceptable level of 23.3 hours per day by the results of 2005. However, it should be noted that the increased period of uninterruptible water supply for all enterprises, included into the sample, was preconditioned by the growth of **indicator 15.1** for the city of Dushanbe, where it value increased from 16 hours per day by the results of 2002 to 23.9 hours per day in 2005. At other enterprises, taking part in the monitoring, the trend of changes of **indicator 15.1** was opposite: enterprises, providing services to towns with population from 50,000 to 150,000 people the period of uninterruptible water supply decreased from 24 hours per day to 21.9 hours per day, while at enterprises, providing services to towns with population up to 50,000 people the decrease of the period of uninterruptible water supply was even more significant: while in 2001-2002 these enterprises provided water supply 24 hours, then in 2005 the value of **indicator 15.1** went down to 18.8 hours per day.

Figure 39: Indicator 15.1. Uninterruptible services

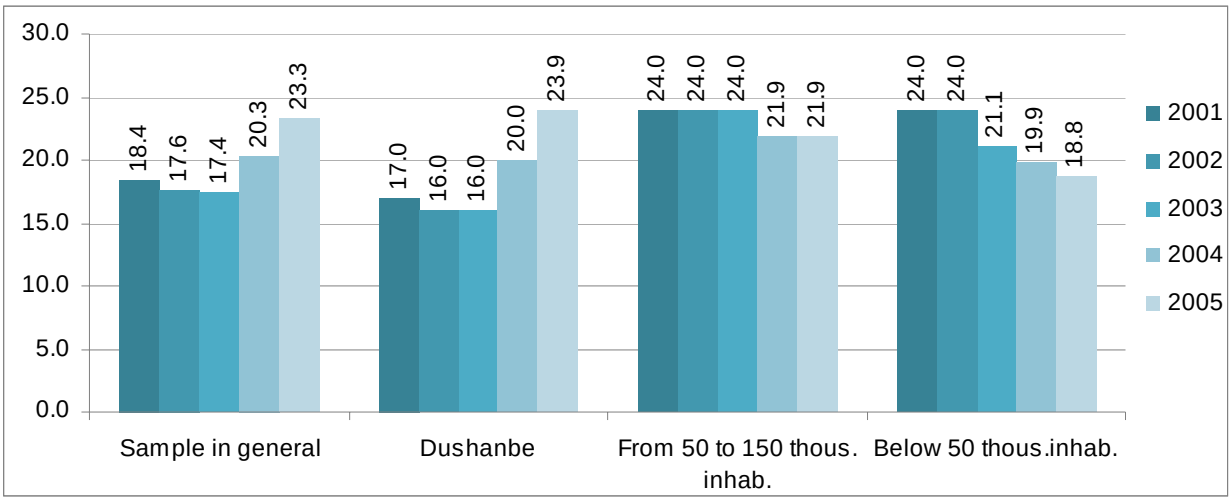
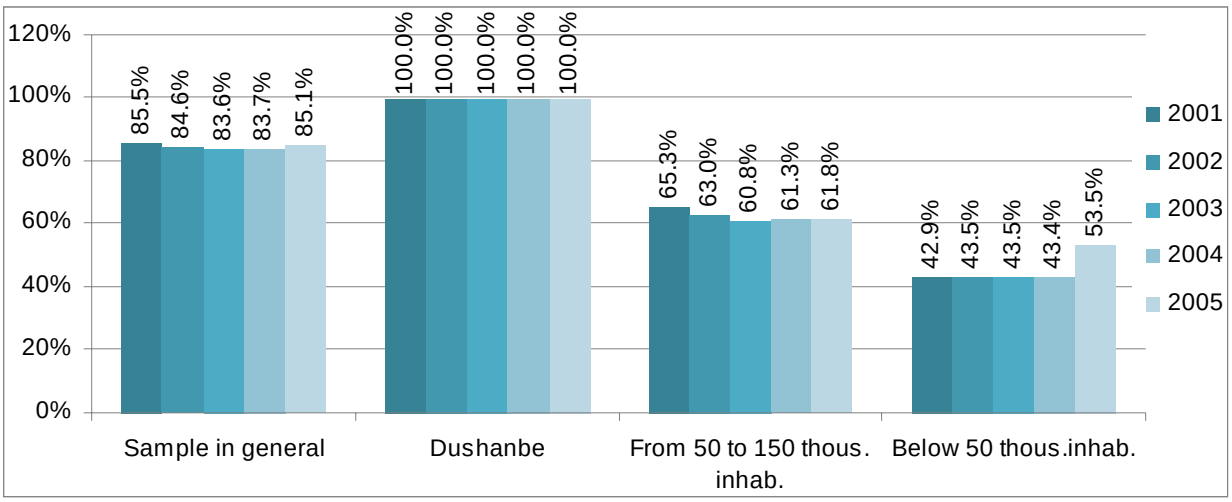


Figure 40: Indicator 15.2. % of users with interrupted water supply



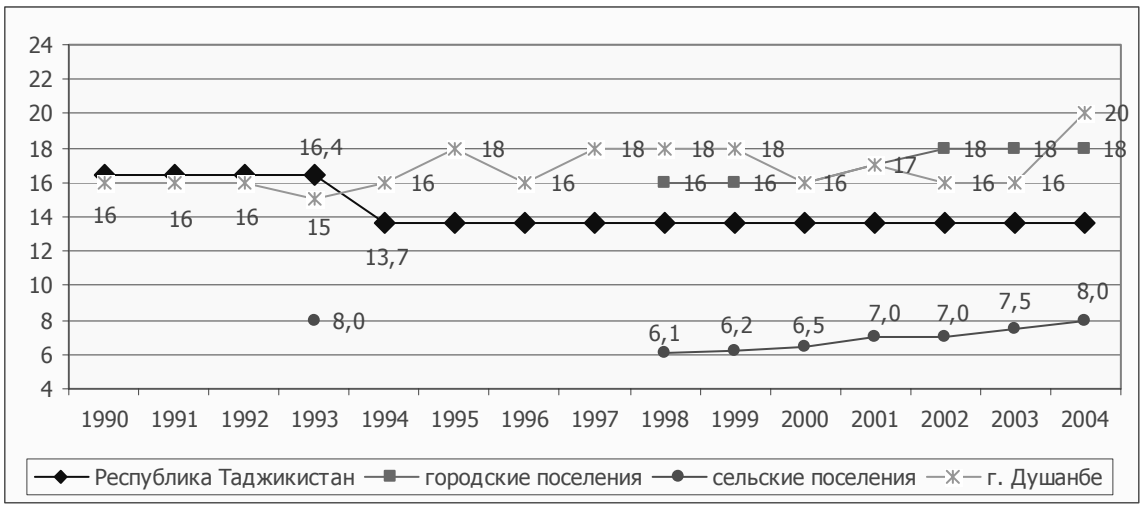
Information about the share of population receiving water supply services with constant interruptions is used for **indicator 15.2**. Despite the fact that enterprises, providing services to towns with population from 50,000 to 150,000 people provided 24 hours water supply for population in 2001–2003, about two-thirds of the population in these towns received water with interruptions. As regards enterprises, providing services to towns with population up to 50,000 people, constant interruptions in water supply in 2001–2004 affected 43%-44% of the population, while by the results of 2005, when the period of water supply services reduced to 18.8 hours per day, the share of population receiving water with interruptions increased to 53.5%.

In general for all enterprises, included into the monitoring, the share of population receiving water with interruptions, during the entire period of analysis, was at a very high level of 84%-85%.

To have a correct idea about the period of uninterruptible water supply for the entire Republic of Tajikistan, we shall once again use data included into the report of the Foundation “Institute for Urban Economics”, prepared in 2005 on request of the World Bank (as shown in italics).

Information required for calculating this indicator is not in the list of information, officially provided by the water supply and wastewater enterprises to the state statistical authorities. As a result, the period of uninterruptible water supply was defined by local consultants of the Foundation “Institute for Urban Economics” for this project, based on the data obtained from communal enterprises, different ministries and departments.

Figure 41: Period of uninterruptible water services



(Республика Таджикистан = Republic of Tajikistan; городские поселения = urban population centres; сельские поселения = rural population centres); г. Душанбе = Dushanbe)

The period of uninterruptible water supply services in general for the Republic of Tajikistan was estimated by the local experts at the level of 13.7 hours per day, from 1994 till now, and at the level of 16.4 hours per day in the previous period, from 1990 to 1993 inclusive. The period of uninterruptible water supply in rural areas was estimated at the level of 8 hours per day by the results of 2003, while during 1998-2004 the value of this indicator was estimated at the level from 6.1 to 8 hours per day. The period of uninterruptible water supply for all urban population centres was estimated at the level of 16 hours per day for 1998-2000, and in the following years it increased, making 18 hours per day from 2002 till now.

Thus, generally for the Republic of Tajikistan, the situation with uninterruptible water supply is far from what can be called optimal. Despite the fact that for enterprises, taking part in the monitoring and providing services to urban population centres, the period of uninterruptible water supply in the last 2 years was above 18 hours per day, enterprises, providing services rural population centres over the last 8 years could provide water supply services to population not more than 8 hours per day.

3.7.2 Quality of supplied water

In general for all enterprises, taking part in the monitoring, the number of tests for residual chlorine, meeting the established standards (**indicator 15.4**), over the entire period of analysis, was at a rather acceptable level: as regards enterprises, providing services to towns with population from 50,000 to 150,000 people, the share of tests, meeting the respective standards, did not decrease during the entire period of analysis below 98.4%, while for enterprises, providing services to towns with population up to 50,000 people the value of the analyzed indicator in 2003–2005 was always above 99%.

Figure 42: Indicator 15.3. Quality of supplied water: number of tests for the residual chlorine

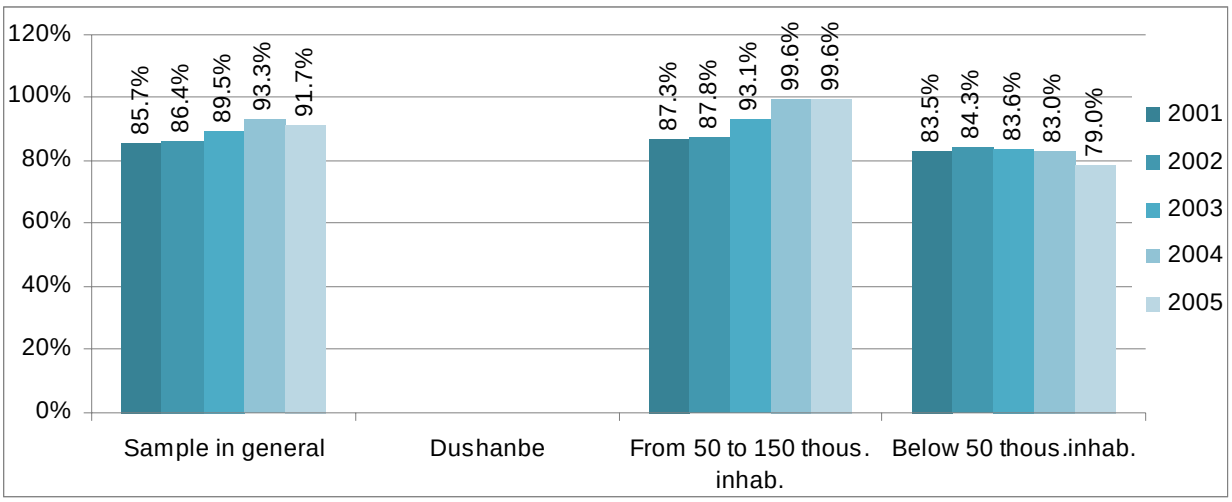
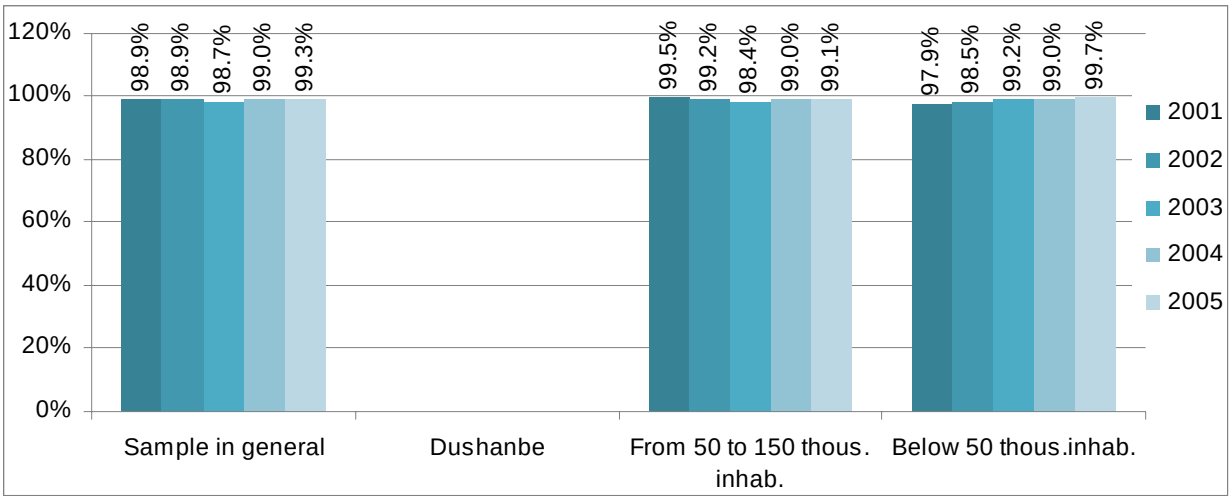


Figure 43: Indicator 15.4. Quality of supplied water: tests corresponding to the residual chlorine standard



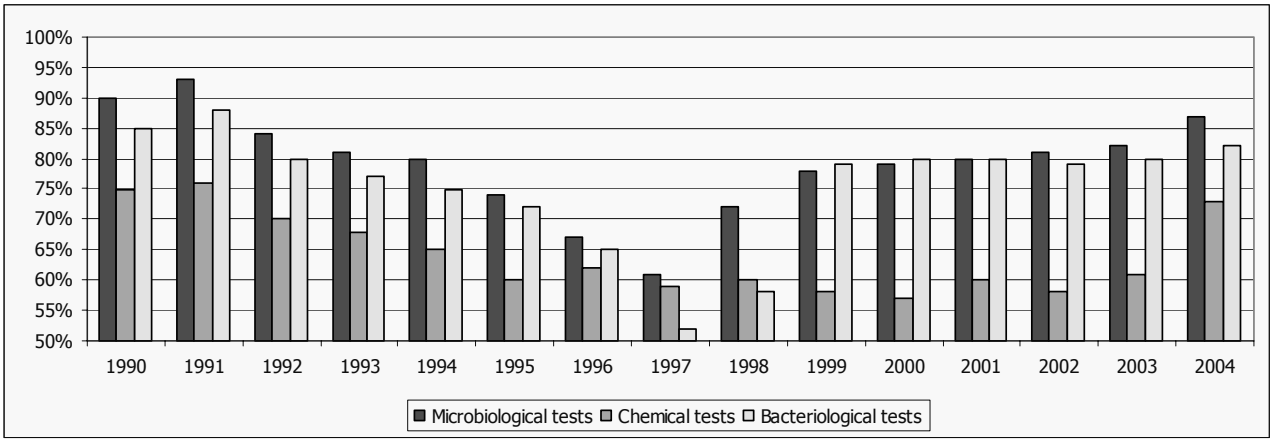
Given the absence of information about the quality of water supply services in the monitoring results in the city of Dushanbe, as well as the fact that the situation related to maintenance of high quality of water supply services is less acceptable as regards enterprises, providing services to rural population centres, we shall once again look at the report of the Foundation “Institute for Urban Economics” “Tailoring Global MDG7 Targets 10 and Indicators to Local Conditions in ECA (Georgia, Tajikistan, Albania)”, which includes the results for 2005 (the quotation is given in italics).

Currently, only some information is available that makes it possible to estimate the compliance of the laboratory tests of water with the national standards on water supply service quality. In particular, such information for the entire country and for its administrative areas was provided by the centres of state sanitation and epidemiological surveillance. This information covers the period of 1996–2004. According to this centre, the results of microbiological surveys in 1996 and 2004 showed that about 30% of samples did not meet the national standard. In 2000, this indicator was over 40%. In 1996, in Kurgan-Tube, Kulyab and Khatlon regions, the number

of samples not compliant with the national standard, exceeded 57%. As regards sanitary and chemical indicators, 42.6% of taken samples in 1996 and 30.2% in 2004 did not comply with the national standard. In Kulyab area, in 86.5% of samples taken in 1996 did not comply with the national standard by their sanitary and chemical indicators.

The most complete information on the compliance with the national standard of water supplied to population was provided by the Dushanbe Water Supply PCU.

Figure 44: Compliance of laboratory water samples with national standards for water supply networks in Dushanbe



As can be seen from the diagram below, even in 1990, during the Soviet Union, laboratory samples did not comply with the national standards in a rather big number of cases. The most significant discrepancy between the water analysis results and water quality standards over the entire period of analysis was reported for chemical samples: even in 1990-s, only 75% of water samples complied with the standard, while in 1997 only half of the samples complied with the standard. The same significant drop in water quality was reported for microbiological and bacteriological results. Despite the fact that after 1997 the quality of water in Dushanbe was significantly improved, by the results of 2004 less than 90% of microbiological samples, less than 85% of bacteriological samples and less than 75% of chemical samples complied with the national standards.

Diseases related to quality of potable water

Information about the number of diseases, related to bad quality of water, was obtained from several independent sources:

- reports of international organizations, devoted, inter alia, to issues of quality of water supply and wastewater collection services provided in the country;
- results of monitoring of diseases conducted by the National sanitary and epidemiological stations of the Republic of Tajikistan Ministry of Health;
- results of monitoring of diseases conducted teachers and students of the Tajik State Medical University named after Abuali ibn Sina, under the guidance of the Head of the Epidemiology Chair, Professor H. Rafiev.

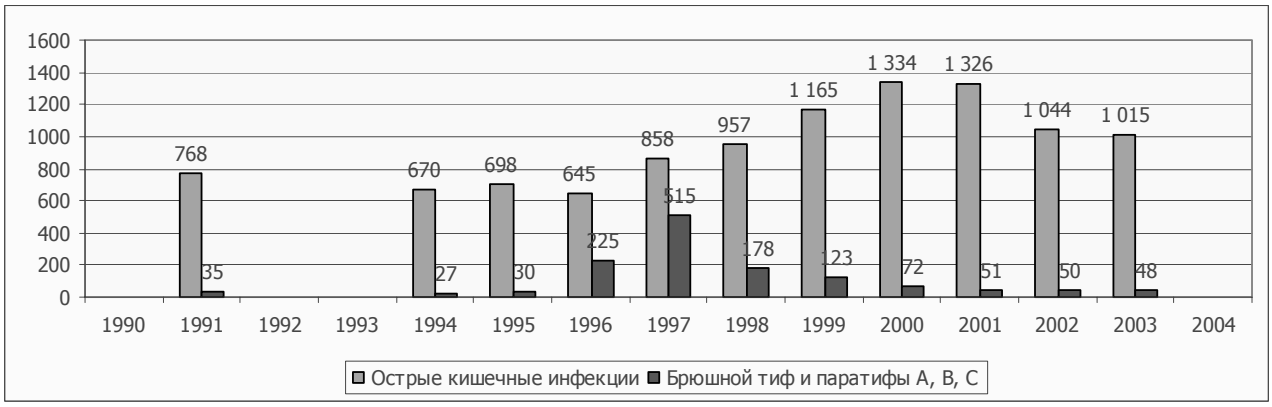
Practically every report of international organizations pays attention to a very high level of diseases, directly related to low quality of water used by population.

In particular, as noted bin the report of the Office for the Coordination of Humanitarian Affairs, in 2001 only in one region, Khatlon Oblast of the Republic of Tajikistan, recorded 1,331 cases of typhoid fever and 26,284 cases of diarrhoea; it is specially stressed that there is a direct relation between the number of the above cases and the level of people's access to good potable water.

Figure 45: Total number of acute intestinal infections (per 100,000 people)4

(Экспертная оценка = Expert evaluation; Официальная информация = Official information)

Figure 46: Number of cases of typhoid fever and acute intestinal infections (per 100,000 people)5



(Острые кишечные заболевания = Acute intestinal diseases; Брюшной тиф и паратифы А, Б, С = Typhoid fever and paratyphoid A, B, C)

As can be seen from above diagrams, the level of diseases, directly related to bad quality of water, was always at an unacceptably high level during all post-Soviet period. Despite some improvement of the situation, compared to the most critical year of 2000, in the following years, the number of diseases related to quality of water still exceeded, by the results of 2003, the level

[4] Source of information: Results of disease monitoring, conducted by the group headed by Professor H. Rafiev.

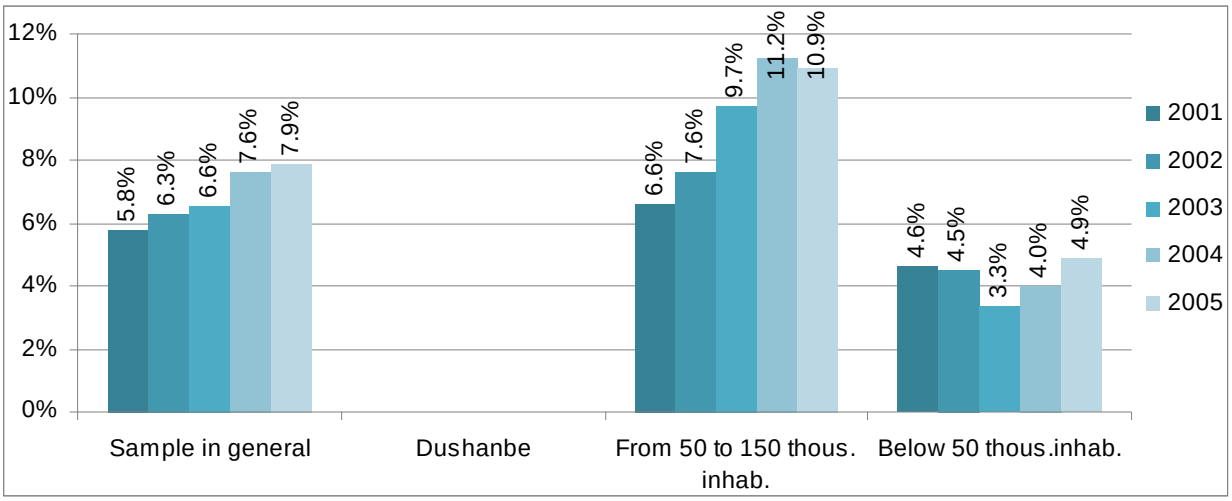
[5] Source of information: Results of monitoring, conducted by the National Sanitary and Epidemiology Station of the Republic of Tajikistan Ministry of Health.

of diseases observed in 1990, i.e., during the period of existence of Tajikistan as one of the USSR republics.

3.7.3 Complaints against the services provided by water supply and wastewater enterprises

Given a short period of uninterruptible water supply, as well as a high share of population who receive water with constant interruptions, it is easy to understand the high level of **indicator 16.1**, characterizing the number of complaints against water supply and wastewater collection services. The water supply and wastewater enterprise in the city of Dushanbe did not provide information about the number of complains against the services received by population; as regards other enterprises, taking part in the monitoring, the number of complains per connection point over the period of analysis increased from 5.8% to 7.9%.

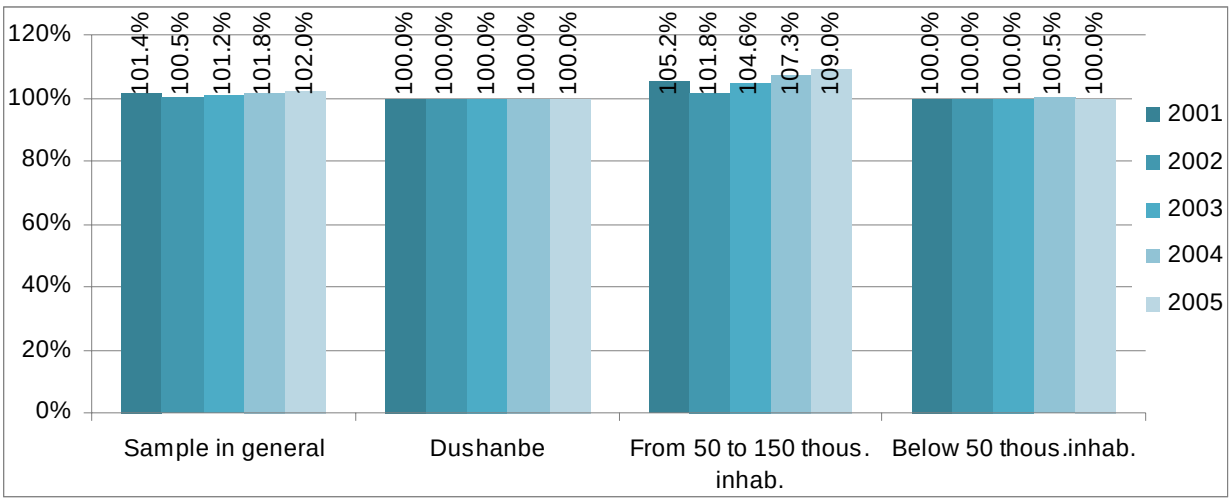
Figure 47: Indicator 16.1. Complaints against the services of water supply and wastewater enterprises



3.7.4 Quality of wastewater treatment

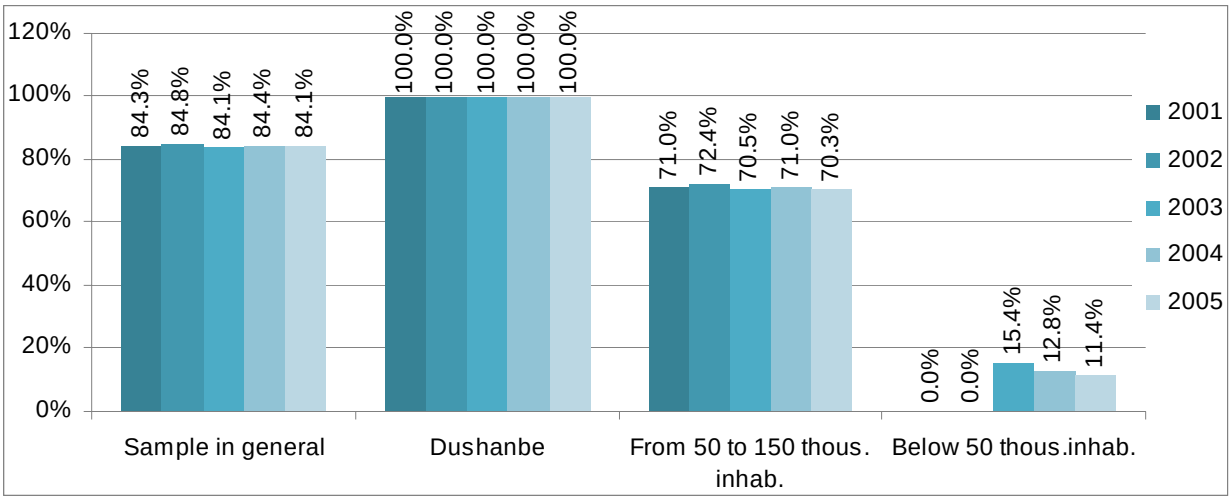
Over the entire period of analysis, all received wastewater was sent for treatment (**indicator 17.1**). Primary treatment was made for 84% of received wastewater (**indicator 17.2**), however, it is necessary to pay attention to the fact the level of the indicator for all enterprises, taking part in the monitoring, was ensured, basically, by the water supply and wastewater enterprise in the city of Dushanbe, where all received wastewater was treated.

Figure 48: Indicator 17.1. The share of treated wastewater



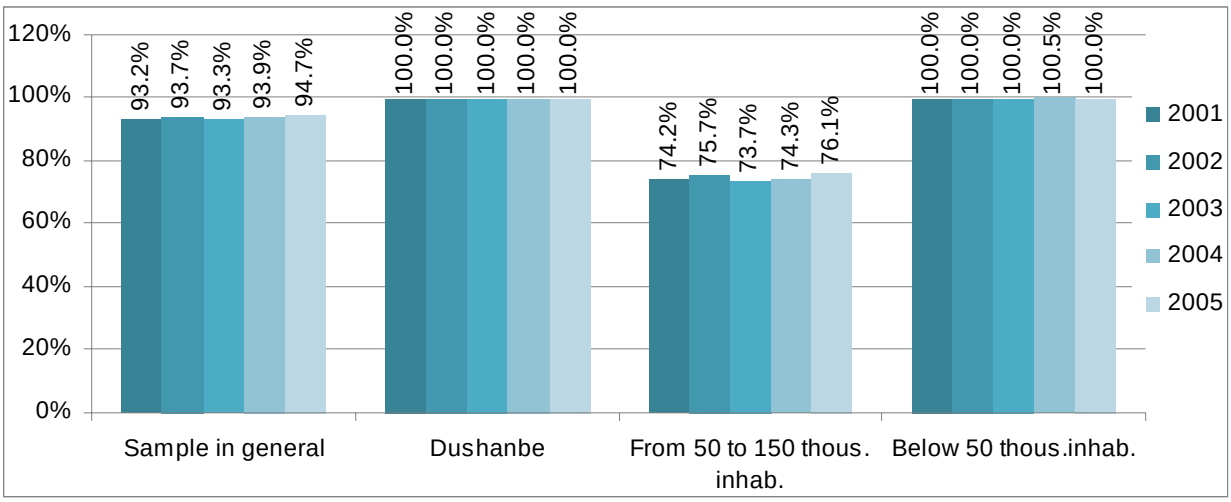
Enterprises, providing services to towns with population from 50,000 to 150,000 people, made primary treatment (**indicator 17.2**) of three-fourth of all received wastewater. The situation is more acceptable at enterprises, providing services to towns with population up to 50,000 people: by the results of 2001–2002, all received wastewater was not treated by primary treatment systems, and only in the following years the level of primary treatment of received wastewater made 11%-15%.

Figure 49: Indicator 17.2. Wastewater: primary treatment



Secondary and in-depth treatment (**indicator 17.3**), in general for all enterprises, taking part in the monitoring, was applied to over 93% of received wastewater; at enterprises, providing services in Dushanbe and in towns with population up to 50,000 people, all received wastewater was subjected to biological treatment, while at enterprises, providing services to towns with population from 50,000 to 150,000 people, three-fourth of received wastewater was treated by secondary treatment systems.

Figure 50: Indicator 17.3. Wastewater: secondary and in-depth treatment



3.8 BILLING AND COLLECTION OF FEES

3.8.1 Incomes of enterprises

Over the period of analysis, incomes of water supply and wastewater enterprises of the Republic of Tajikistan, taking part in the monitoring, increased from 1.2 to 4.3 US cents per m^3 of water (**indicator 18.1**). the most significant growth was reported for the enterprise in Dushanbe, where incomes went up more than 4 timers, from 0.9 to 4.7 US cents per m^3 of water; the maximum level of incomes throughout the period of analysis was reported among enterprises, providing services to towns with population up to 50,000 people (4.3 US cents in 2001 and 6.1 US cents by the results of 2005).

Figure 51: Indicator 18.1. Average incomes of water supply and wastewater enterprises per cubic metre of water (USD/m^3)

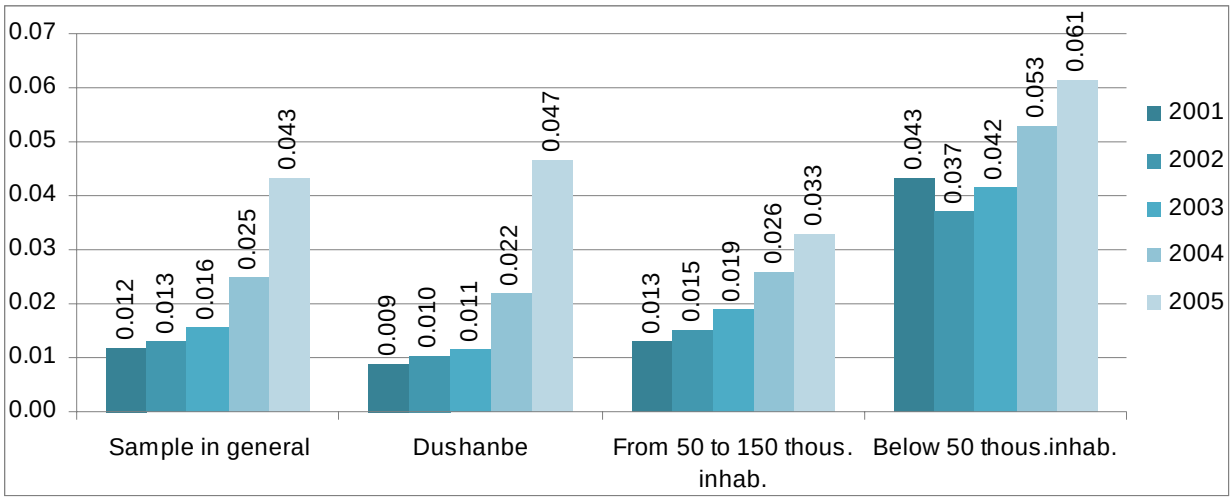


Figure 52: Indicator 18.2. Average incomes of water supply and wastewater enterprises per connection to the water supply network (USD/m^3)

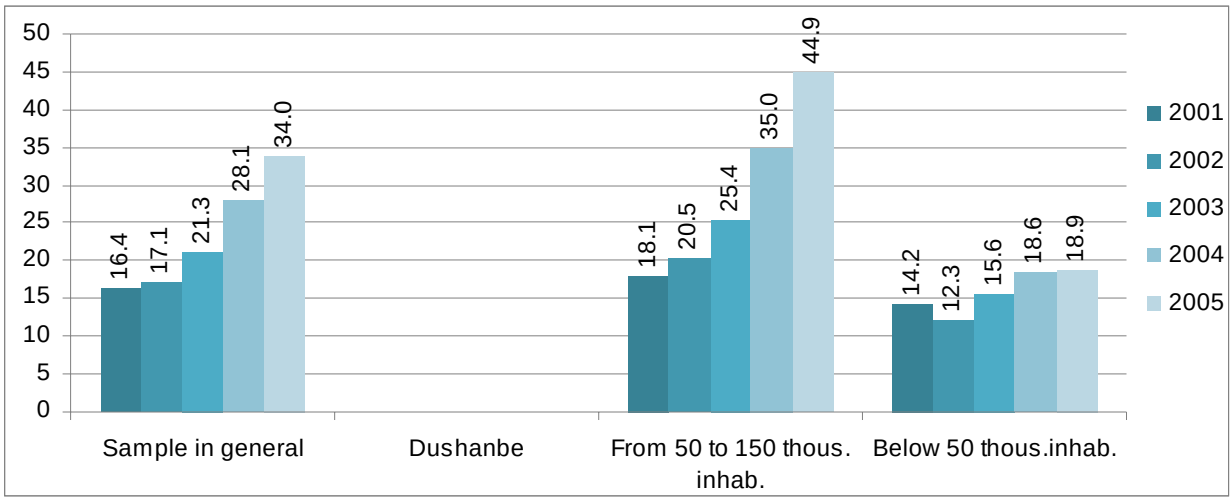
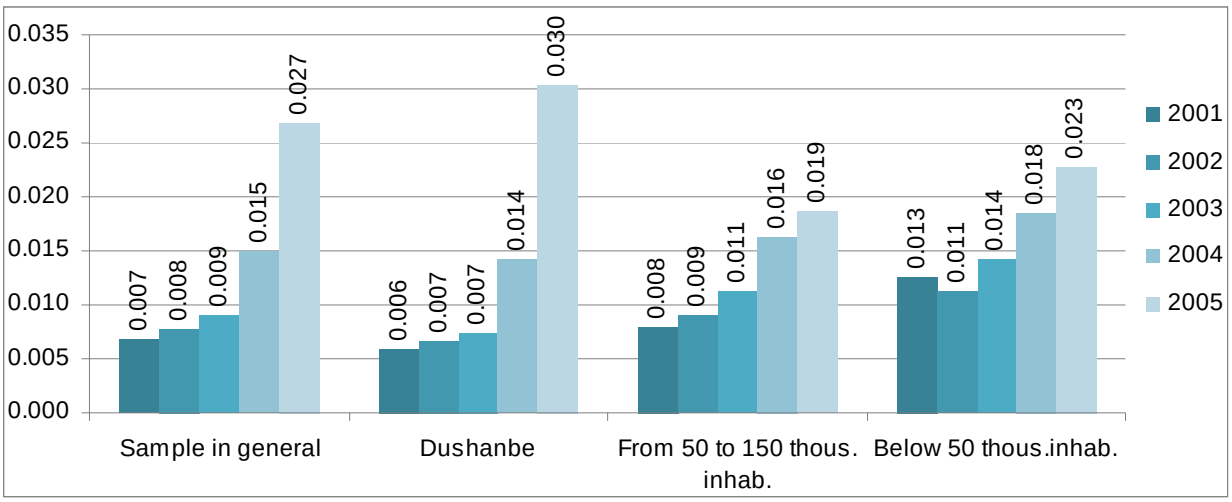


Figure 53: Indicator 18.3. Average incomes from water supply per cubic metre of water (USD/m^3)



The basic part of incomes for all enterprises, taking part in the monitoring, was obtained through provision of water supply services (57.5%-61.7% over the period of analysis); the main part of incomes of enterprises, providing services to towns with population up to 50,000 people, was obtained by provision of wastewater collection services (**indicator 18.4** and **indicator 18.5**).

Figure 54: Indicator 18.4. Share of incomes from water supply

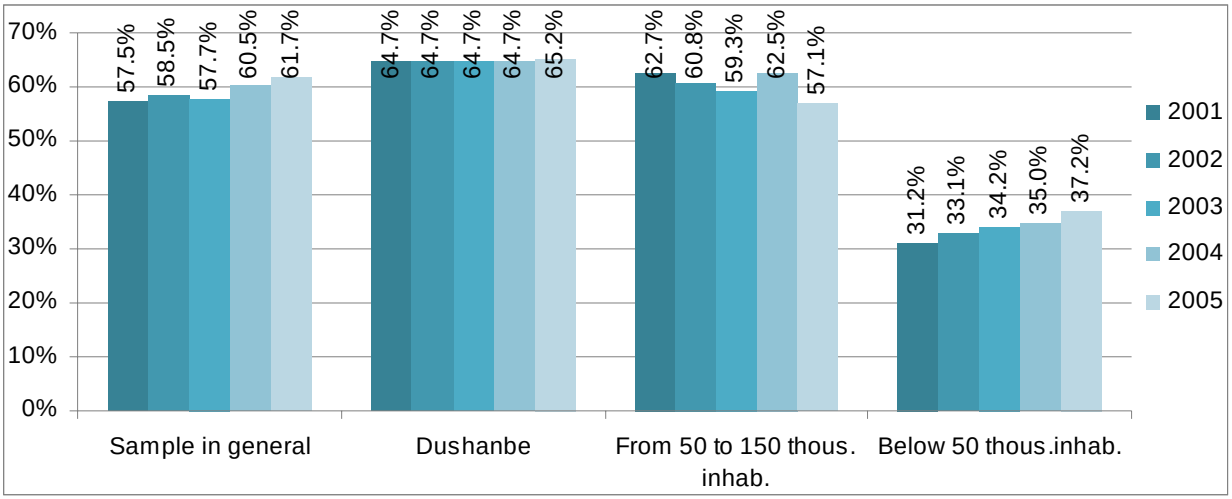
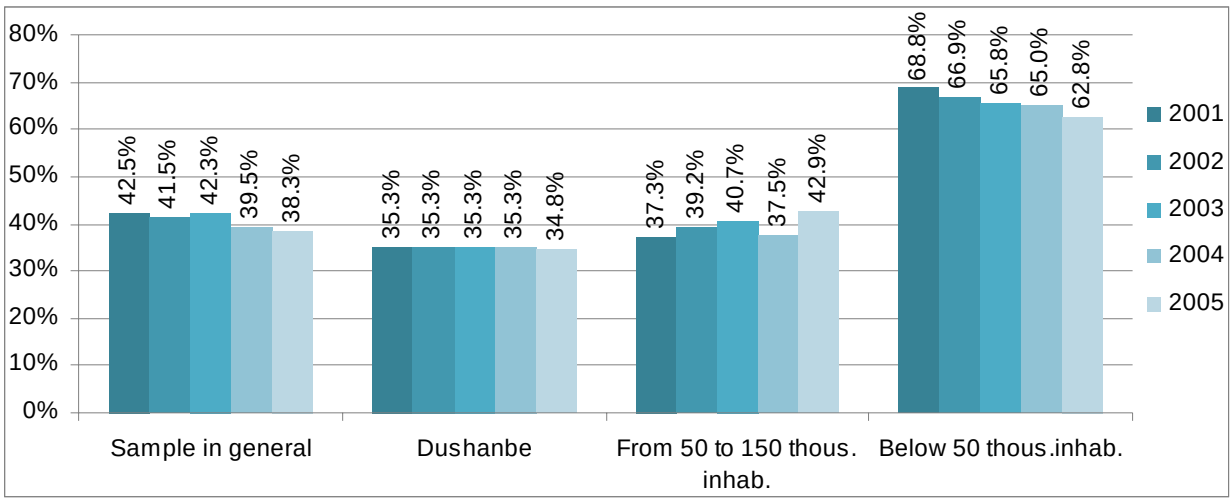


Figure 55: Indicator 18.5. Share of incomes from sewerage



The main part of incomes from water supply services, received by enterprises, taking part in the monitoring, was obtained from provision of water to budgetary organizations (indicator 18.8.). The share of population in the incomes from water supply over the period of analysis decreased from 31% in 2003 to 23.3% by the results of 2005, whereas the share of commercial users as a whole for all enterprises, taking part in the monitoring, increased to 38.1%.

As regards the water supply and wastewater enterprise in the city of Dushanbe, the main part of incomes form water supply services was obtained from commercial users (43%-44%), while the share of population was stably at the level of 17.4%-17.5%.

Figure 56: Indicator 18.6. Share of incomes from population in the total incomes from water supply

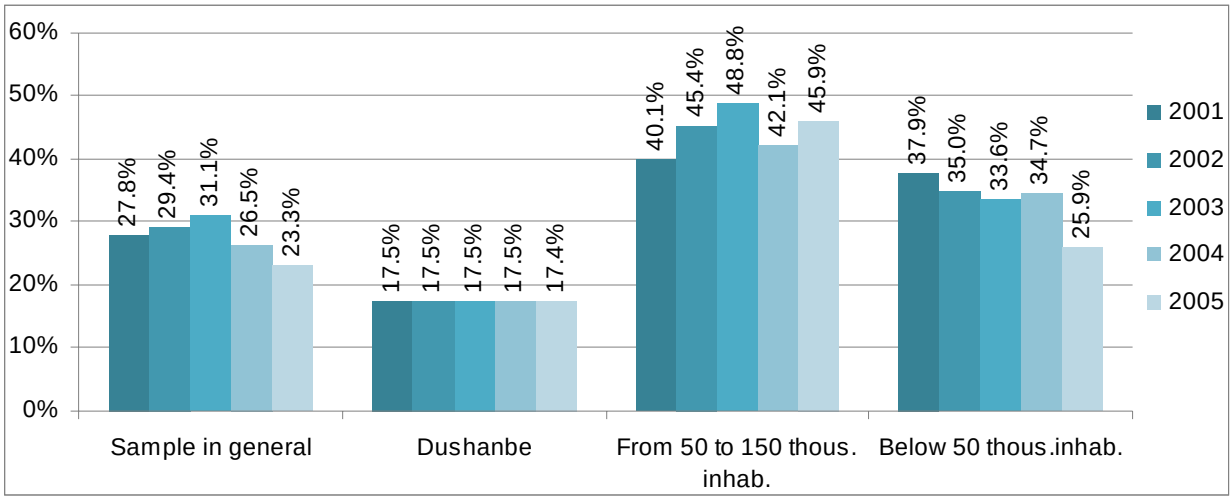


Figure 57: Indicator 18.7. Share of incomes from commercial users in the total incomes from water supply

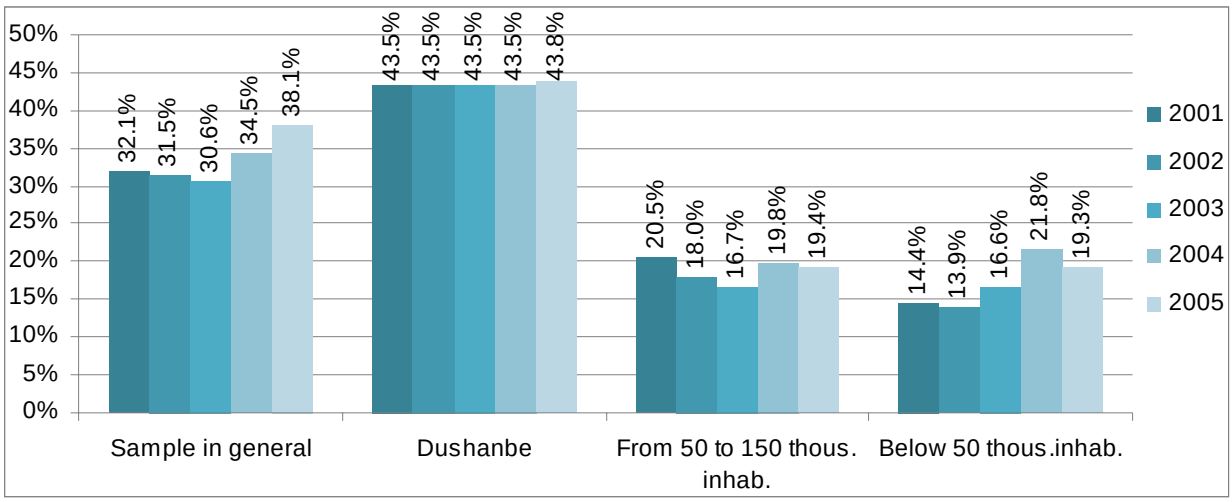


Figure 58: Indicator 18.8. Share of incomes from budgetary organizations in the total incomes from water supply

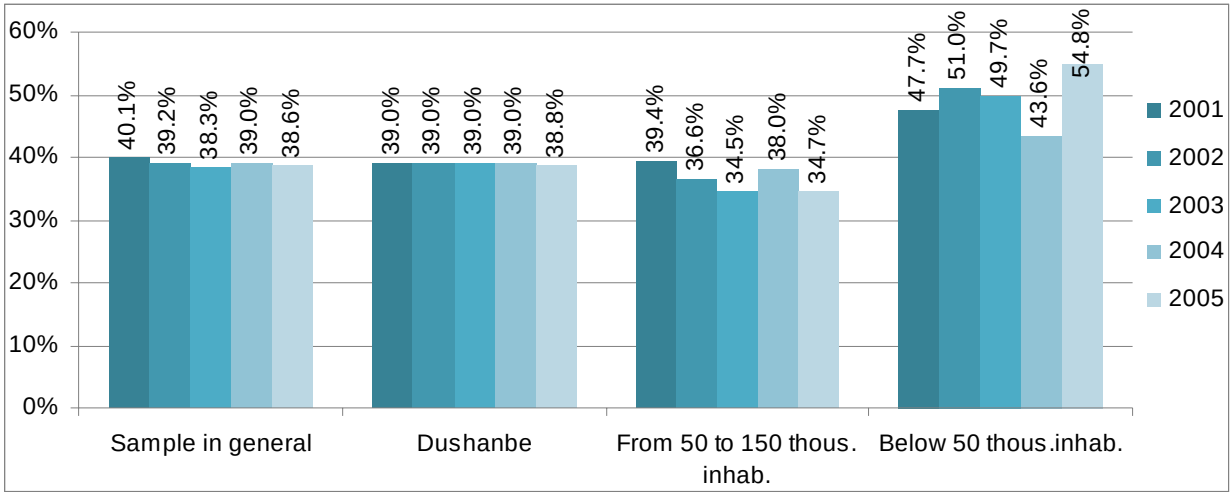


Figure 59: Indicator 18.9. Share of incomes from water sales to outside organizations

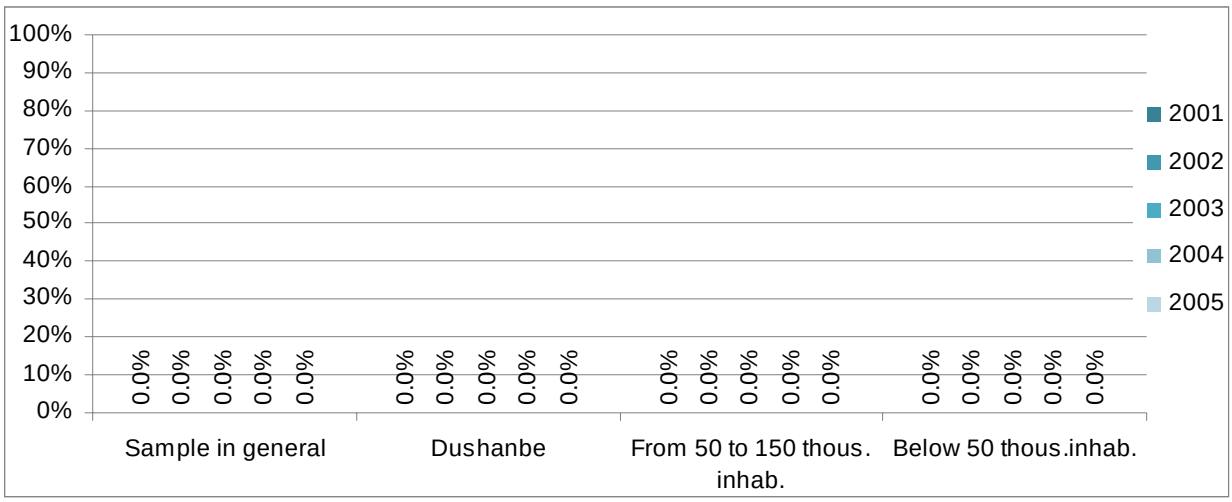
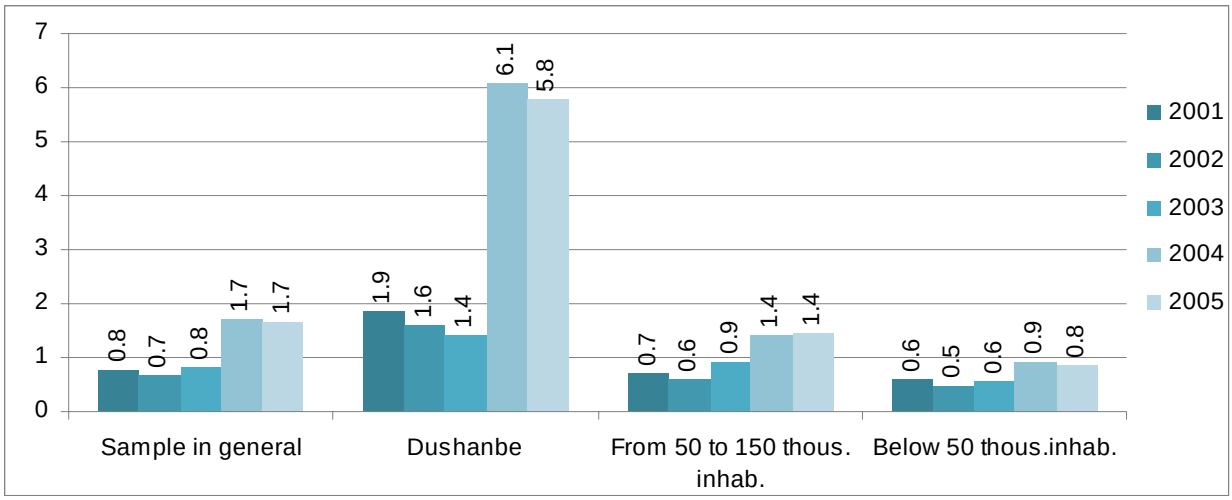


Figure 60: Indicator 19.2. Water bills



3.8.2 Comparison of tariffs for individual categories of users

In general over the period of analysis, the ratio between tariffs for commercial enterprises and population, reflected by **indicator 21.1**, had an obvious trend towards increase. While in 2001 the tariffs for commercial users exceeded tariffs for population 3.3 times, then by the results of 2005 this ratio increased to 4.2. The highest indicator was among enterprises, providing services in Dushanbe, where **indicator 21.1** over the entire period of analysis was 6.2 times. The minimal level of this indicator was reported for enterprises, providing services to towns with population from 50,000 to 150,000 people: in 2001–2002 and in 2005 this indicator made 1.6-1.7, and only in 2003–2004 it increased to 2.0-2.1. As regards enterprises, providing services to towns with population up to 50,000 people, the value of this indicator decreased from 5.0 by the results of 2001 to 3.2 in 2004; however by the results of 2005 it again increased to the level of 3.4.

Figure 61: Indicator 21.1. The ratio between tariffs for industrial users and population

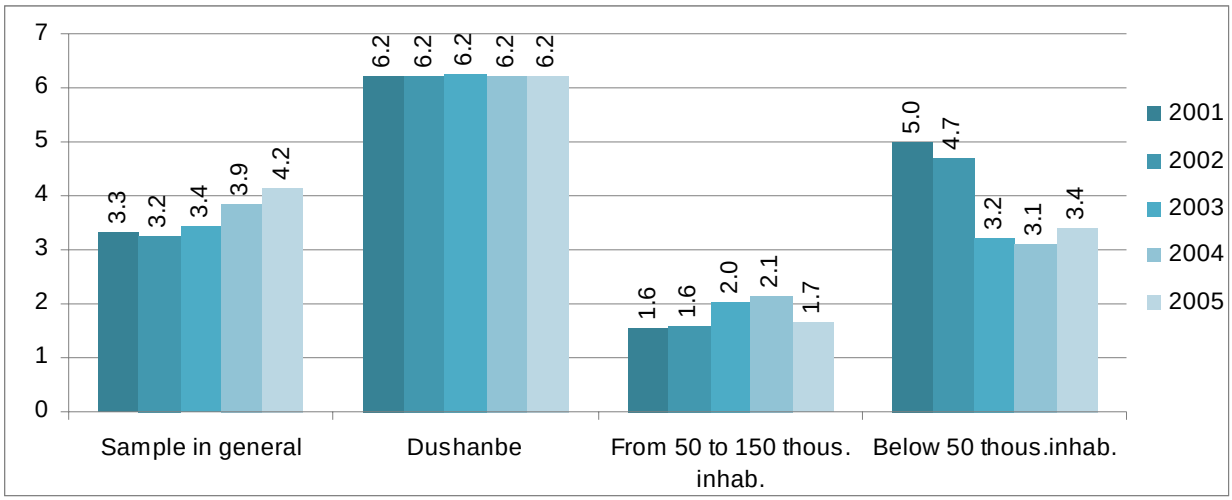


Figure 62: Indicator 21.2. The ratio between tariffs for industrial users and population: water supply

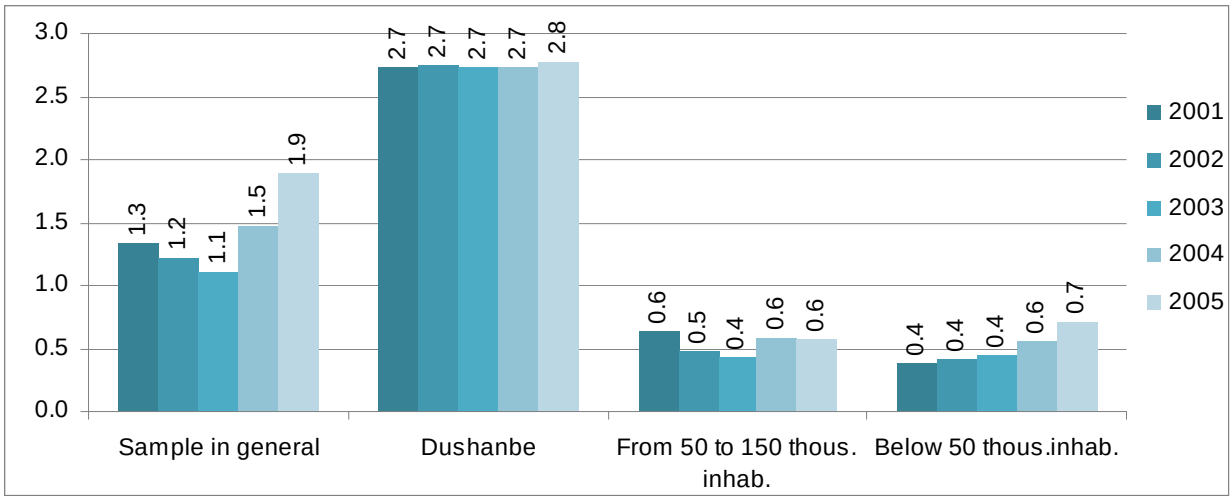
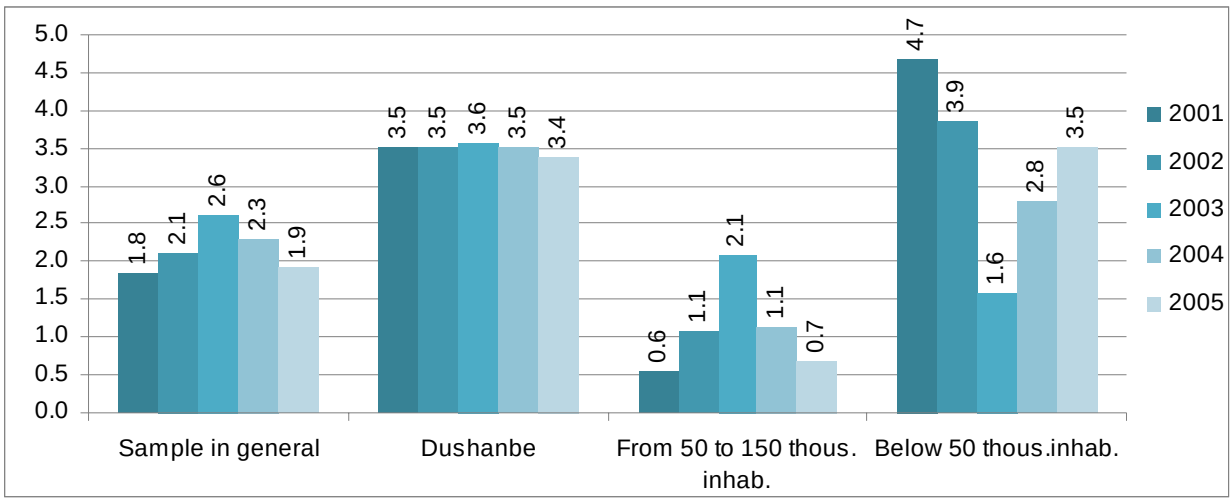


Figure 63: Indicator 21.3. The ratio between tariffs for industrial users and population: sewerage



3.8.3 Period and level of collection of fees

The period of fees collection (**indicator 23.1**) over the entire period of analysis remained at a very high level for all enterprises, included into the sample. In 2001–2002 as well as in 2004–2005, the period of fees collection was 260–280 days on the average, while by the results of 2003 its value increased to 326 days; thus, for all enterprises, included into the sample, on the average the users paid for communal services and resources bills 9-11 months later.

However, in 2001–2004, even this long period of fees collection was hardly possibly for enterprises, providing services to towns with population from 50,000 to 150,000 people. by the results of 2001, the average period of fees collection for enterprises of this group was 536 days, i.e., almost 18 months; for enterprises, providing services in towns of Kurgan-Tube and Kulyab the value of **indicator 23.1** made 938 and 921 days, respectively (31 moths). The lowest indicator among enterprises of this group was reported for the enterprise in the town of Khudzhand, where the period of fees collection was 353 days, i.e., almost 1 year.

In the following years, the value of this indicator, on the average for enterprises, providing services to towns with population from 50,000 to 150,000 people, decreased to 477 days (16 months (in 2002–2003) and only in 2005 the period of fees collection decreased to the average national level of 284 days (9 months).

As regards the enterprise working in Dushanbe, there was an opposite trend in the variation of **indicator 23.1,** throughout the entire period of analysis. While by the results of 2001 the period of fees collection for this enterprise was 111 days (4 months), then by the results of 2005 it increased more than 2 times, i.e., to 281 days (9 months).

As regards enterprises, providing services to towns with population up to 50,000 people,, the situation with payment of fees for the services, compared to other enterprises, taking part in the monitoring, can be considered as quite satisfactory (of course, it is possible at all to call satisfactory the period of fees collection making 5-6 months). It should be noted that from 2003 to

2005 the value of **indicator 23.1** for this group of enterprises decreased almost by 20%, making 151 days by the results of 2005.

Figure 64: Indicator 23.1. Period of fee collection

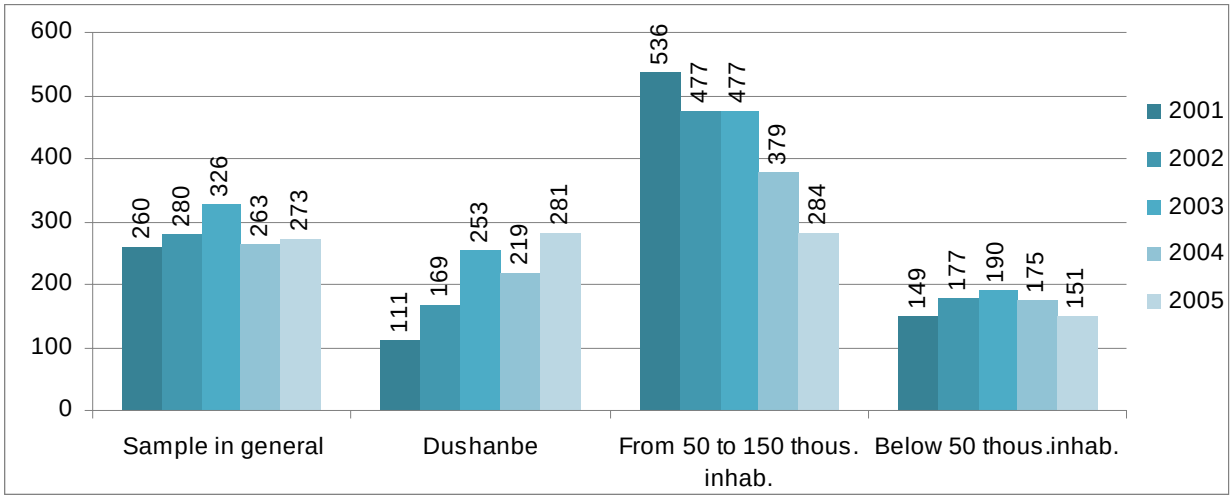
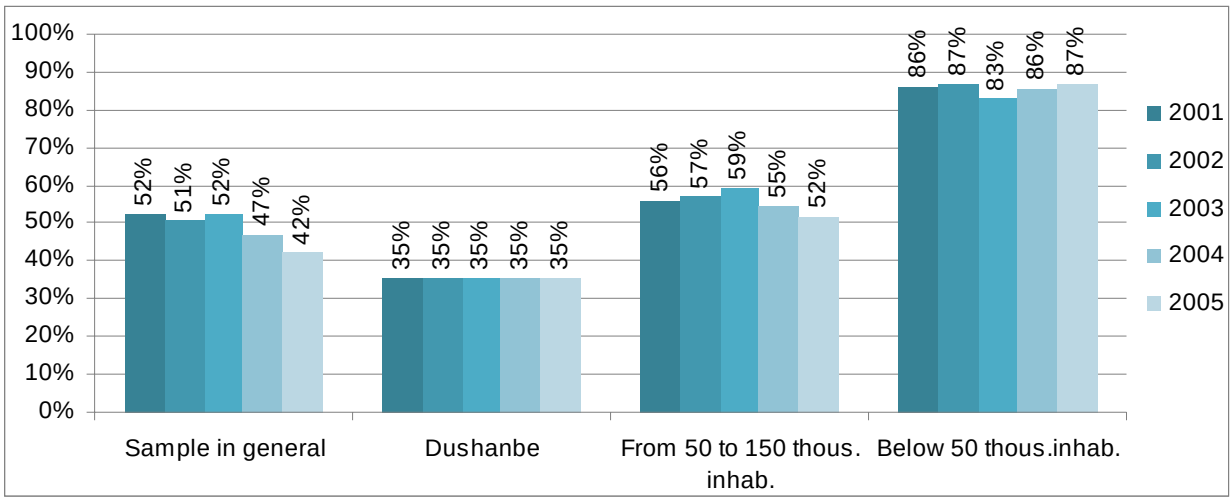


Figure 65: Indicator 23.2. Collection of fees

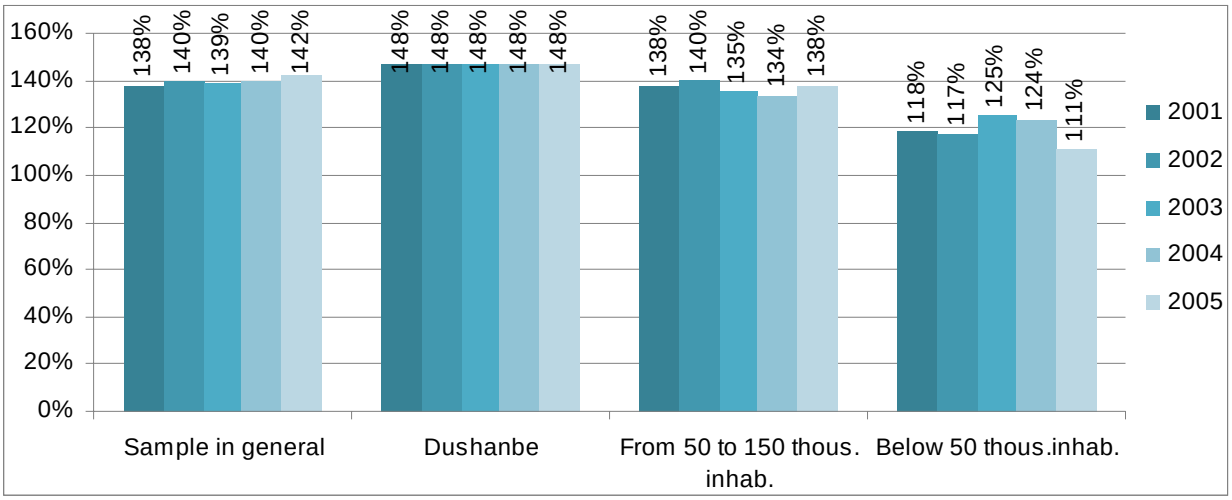


It is quite clear that such long period of fees collection, reported for all water supply and wastewater enterprises in the Republic of Tajikistan, included into the sample, points to a very low level of fees collection. Indeed, for all enterprises, included into the sample, the value of **indicator 23.2** over the period of analysis decreased from 52% in 2001 to 42% by the results of 2005; as regards the city of Dushanbe, the volume of incomes actually received over the entire period of analysis made one-third of the volume billed. As regards enterprises, providing services to towns with population up to 50,000 people, the fees collection can be called relatively satisfactory: the value of **indicator 23.2** always exceeded 80% and by the results of 2005 it reached 87%.

3.9 FINANCIAL OUTCOMES

Indicator 24.1 "Compensation of operational costs", characterizing the ratio between billed amounts and operational costs related to production and provision of water supply and wastewater collection services, both for all enterprises, included into the sample, and by different groups of enterprises, providing services to towns with different numbers of population, was persistently above 100% during the entire period of analysis. The maximal level of this indicator was for the enterprise, providing services in Dushanbe (148%), while the average indicator for the sample was 138%-142%.

Figure 66: Indicator 24.1. Compensation of operational costs



However, it does not follow from the above that water supply and wastewater enterprises of the Republic of Tajikistan were able to fully cover their operational costs. As stated above in this report, the collection of fees from water supply and wastewater enterprises of the Republic of Tajikistan was at an unacceptably low level; as a result, on the average, these enterprises received only half of the amount which they should have received from users of communal resources and services according to the bills.

Indeed, if we determine the value of the additional indicator, characterizing the ratio between the actually received incomes and the operational costs, then on the average for all enterprises, taking part in the monitoring, the value of this indicator over the period of analysis decreased from 71% in 2001 to 60% by the results of 2005. It should be noted that by the results of 2005 the enterprise, working in the town of Kulyab had this indicator at a low level of 16%, while the enterprise working in Dushanbe the actually received incomes made only 52% of its operational costs.

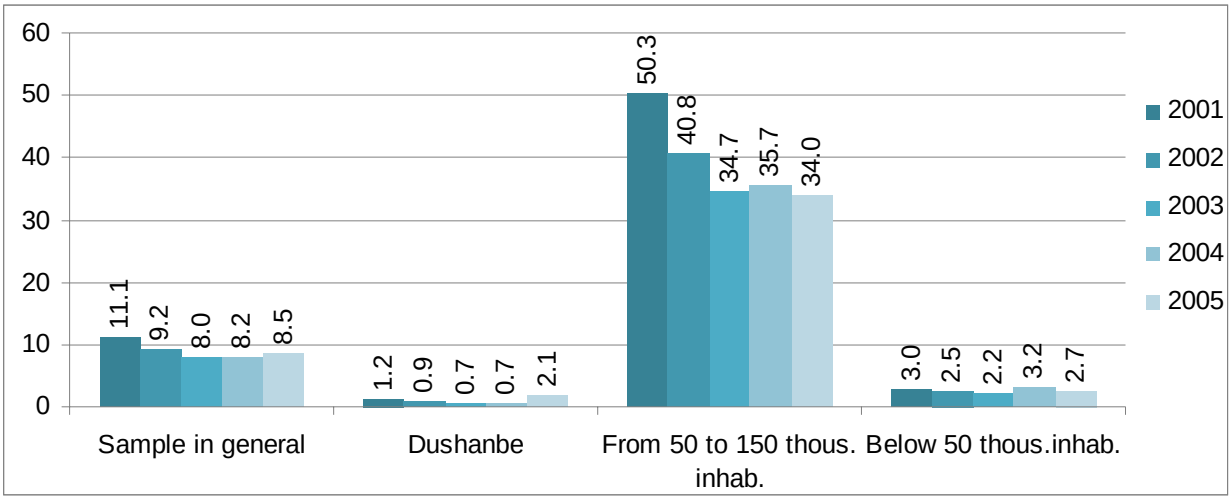
3.10 ASSETS OF THE ENTERPRISES

The gross value of the fixes assets of water supply and wastewater enterprises (**indicator 27.1**) in the Republic of Tajikistan, included into the sample, decreased over the period of analysis from $11.1 to $8.5 per employee. For the enterprise working in Dushanbe the value of **indicator 27.1**, following its decreases in 2001-2004 from $1.2 to $0.7, increased in 2005 to $2.1 per

employee; as regards enterprises, providing services to towns with population up to 50,000 people, the value of fixed assets decreased from $3 to $2.7 per employee. As regards enterprises, providing services to towns with population from 50,000 to 150,000 people, the value of **indicator 27.1** was 4-5 times higher than the average national level, making from $50.3 in 2001 to $34 by the results of 2005. This high level of the indicator for this group was preconditioned by the high level of the indicator for the enterprise operating in the town of Khudzhand, where the value of fixed assets per employee during the period of analysis stably exceeded $70.

The total cost of fixed assets at the Republic of Tajikistan water supply and wastewater enterprises, taking part in the monitoring, in 2005 was 14.3 million somonis, going down by 15% compared to 2001.

Figure 67: Indicator 27.1. Gross value of fixed assets: water supply and sewerage



The decreased value of fixed assets was reported also by different types of services: the cost of fixed assets pertaining to water supply (**indicator 27.2**) over the period of analysis decreased from $9.1 to $7.7, while the cost of fixed assets pertaining to sewerage services (**indicator 27.3**) decreased from $13.3 to $9.0.

Figure 68: Indicator 27.2. Gross value of fixed assets: water supply

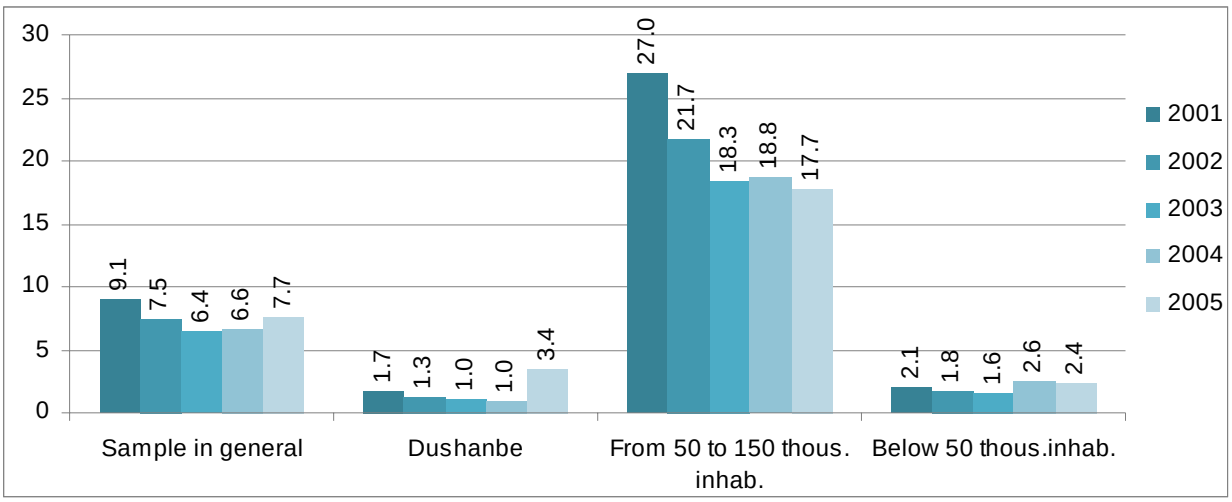
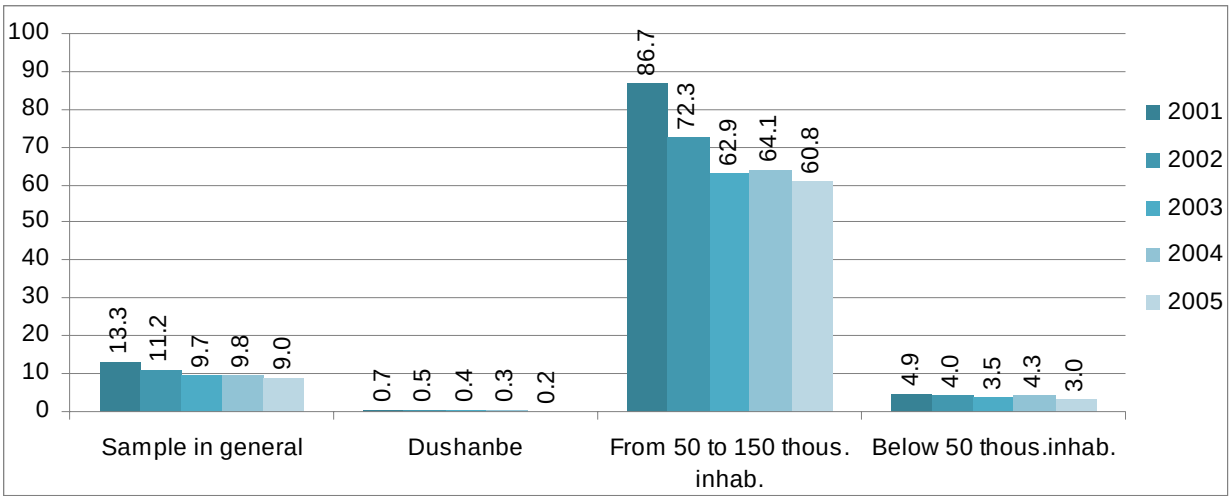


Figure 69: Indicator 27.3. Gross value of fixed assets: sewerage



3.11 FINANCIAL ACCEPTABILITY

Given the fact that provision of access to water supply and wastewater collection services for population is a problem, above all, for water supply and wastewater enterprises operating in rural areas, which were not included into the monitoring in 2006, we shall once again go back to the report prepared by the Foundation "Institute for Urban Economics" on request of the World Bank in 2005; this report characterizes the situation for the Republic of Tajikistan in general and for different urban and rural population centres (the quotations are given in italics).

The Republic of Tajikistan is one of the poorest countries of the world; incomes of the majority of its population are below the standard of living. Even in the Soviet period, 51% of the country population had the average income per capita below 75 roubles per months; for comparison, this percentage was 33% in Kirgizia, 16% in Kazakhstan and 5% in Russia. As a result of the civil in mid 1990's and the following collapse of its economy, in 1999 the UNDP included the Republic of Tajikistan into the group of the poorest countries of the world, with the GDP per capita at 215 US dollars. By the results of TLSS, two-thirds of the country population live below the poverty level specified by the World Bank (2.15 US dollars per day as regards purchasing power parity. One-third of the population lives below the "extreme poverty" level, specified by the Republic of Tajikistan State Committee of Statistics at the level of 50% of the minimal consumer basket.

As stated in the report of the Office for the Coordination of Humanitarian Affairs (OCHA), in April 2002 the average monthly wages in the country were equivalent to 9 US dollars, with the highest wages reported in some industrial sectors (17.5 US dollars) and the lowest among health workers (about 3.4 US dollars).

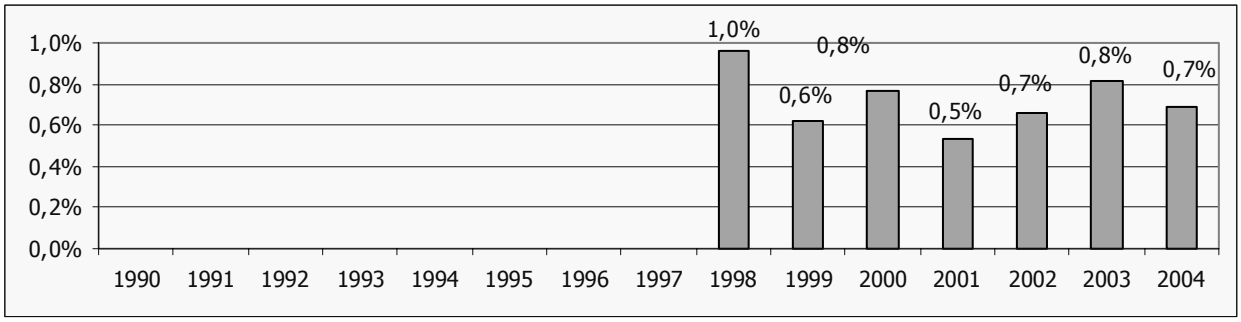
Given this very low level of incomes of population, it is clear why the water supply and wastewater collection services cost very low for the population: according to official statistics this cost makes 0.5%–1% of average incomes per capita[6]. Attention should be paid to the fact that during numerous meetings with the leading specialists of the water supply and wastewater collection sector and with ordinary people of the country nobody among the respondents could give at least tentative cost of what they pay for the water supply and wastewater collection services. This once again points to a very low level of such fees for the households.

Meanwhile, it should be noted that the above value of this indicator characterizes only the country average costs paid for water supply and wastewater collection services, but it does not give any idea about the share of costs paid for water supply and wastewater collection services by the poorest households. In this view, the most informative indicator would be the "share of households, whose fees paid for water supply and wastewater collection services exceed 5% of their incomes"; however, the current official statistics does not include data that allow making a correct estimation of this indicator. By the results of selective household surveys, organized by the state statistics authorities, they identify quintile distribution of households by incomes; however, the correlation of the country average fees for the water supply and wastewater collection services with the incomes of the lowest quintile of households cannot be correct. The reasons for this is that in the overwhelming majority of cases people with the lowest incomers live in rural areas

[6] Prices in Tajikistan: Statistical Book / State Committee of Statistics, Republic of Tajikistan, Dushanbe, 2004.

and, most often, receive potable water from open water sources; hence, these households do not pay for water supply and wastewater collection services as such.

Figure 70 The share of fees paid for water supply and wastewater collection services from the total incomes per capita in the Republic of Tajikistan



Characterizing access to water supply services, it is necessary to point to such factor of service accessibility as the distance to the water supply source. The official statistics for this indicator is not available; however, as follows from the information provided in the report Progress toward the Millennium Development Goals in Tajikistan – Dushanbe 2003, by the results of the project "Water Quality and Household Hygiene Survey in Khatlon and Direct Rule Districts", implemented by Action Against Hunger in April-May 2000, 43% of the households have their own water sources located at home, 5% of the people live less than 5 km away from the water source, 18% of population live at the distance of 5 to 100 meters from the water sources, and one-third of the population live at the distance of more than 100 metres from the water source.

4. DESCRIPTION OF IDENTIFIED DRAWBACKS OF THE COLLECTED DATA

The outcomes of the water supply and wastewater enterprises, taking part in the monitoring, are not devoid of drawbacks, which are predefined both by the conditions of the monitoring and the methods used for calculation of the indicators.

According to conditions of the monitoring, all water supply and wastewater enterprises took part on voluntary principles. As a result, the authors of the report could not collect all data required from such enterprises. Employees of the participating enterprises filled the proposed survey form using only those indicators which either make part of the official statistical reports or are regularly used by the enterprises themselves. Some of the enterprises decided that it was not necessary to present data that could, to some extent, characterize their financial status, in particular, data on debt repay, receivables, etc.

Besides, even when they filled the survey forms in full, it was possible that these data were not correct due to their intentional distortion or due to errors made when entering data. A separate category included errors related to incorrect understanding of the terminology used in the survey

form. In this connection, we should mention indicators characterizing the number of connections to the water supply and sewerage networks, which presented most of the difficulties when the survey form was filled. In particular, this information was provided by the water supply and wastewater enterprise operating in the city of Dushanbe; hence, all indicators, which use the number of connection points as baseline data, characterize only the situation related to the enterprises, taking part in the monitoring.

In addition, it should be noted that part of the requested indicators should have been defined by way of calculation made at the enterprises; however, in most cases the enterprises did not possess baseline data required for such calculations. This refers, first of all, to the indicator, characterizing the number of population which has permanent interruptions in water supply. It can only be assumed that in filling the survey form with data on this indicator the employees of the enterprises indicated the number of people living in the areas (in particular, in the residential quarters of the towns) who faced problems with water supply, since it was not possible to correctly determine the real value of this indicator for the previous years.

It should be noted specifically that, despite the fact that the enterprises, taking part in the monitoring, provide, in general, from one half to two-thirds of the total national water supply and wastewater collection services, the monitoring results do not characterize the water supply and wastewater collection situation in rural areas, thus giving the idea only about the performance of enterprises, providing services in urban population centres of the Republic of Tajikistan.

Keeping in mind the above, the authors considered it necessary to ensure quality of the report, characterizing the condition and outcomes of operation of water supply and wastewater enterprises in the Republic of Tajikistan, by including information taken from the reports, prepared by the Foundation “Institute for Urban Economics” during previous period for other projects. This allowed including into this report more accurate characteristics of the water supply and wastewater sector of the Republic of Tajikistan.

5. RECOMMENDATIONS FOR ENSURING STABLE MONITORING

5.1 CHARACTERIZATION OF THE EXISTING SITUATION

Today, the Republic of Tajikistan uses approved forms of state statistics: 1-water supply and 1-sewerage. The statistical reporting form 1-water supply includes information about water pipelines (the number of street water abstraction points, the capacity of the structures), the performance of water supply enterprises in the previous year (the amount of uplifted water, water supplied to networks and passed through treatment plants, supplied to population and other users, the number of accidents, leakages), as well as financial information on water supply enterprises. The reports for 1-sewerage includes information about sewerage systems (the length of networks, their capacity), information on performance over the year (passed wastewater amount, including

treated wastewater, amount of treated wastewater according to standard, and the number of accidents), as well as information about the financial status of the enterprises.

The above reporting forms do not contain information about the number of people having access to centralized water supply services, number of people taking water from stand pipes and living not more than 200 m from the stand pipes, and people having access to centralized wastewater collection systems.

Information about the quality of water supplied to population and quality of wastewater treatment is collected by the National Centre of State Sanitary and Epidemiological Surveillance of the Republic of Tajikistan Ministry of Health. The main problem is the lack of sufficient laboratories making analysis of taken samples, as well as the lack of specialists who can do required operations.

5.2 POSSIBLE WAYS FOR ORGANIZATION OF MONITORING OF THE WATER SUPPLY AND WASTEWATER COLLECTION SECTOR

Organization of the national system for monitoring the water supply and wastewater collection sector can be made using the already existing organizations or by setting a new organization. Given the fact that both nongovernmental monitoring organization and any existing monitoring organization will use the same official statistical data, the creation of an independent structure for monitoring will not allow a higher adequacy of the used data; however, it will entail higher costs related to funding of such unit.

As a consequence, it is expedient to create a unit on monitoring the water supply and wastewater collection sector based on the existing organizations. The following organizations can be proposed as such basis:

- the State Committee of Statistics of the Republic of Tajikistan;
- the Tajikistan office of the Executive Committee of the International Fund for Saving the Aral Sea; and
- the State Committee of Environmental Protection and Forestry.

The last of the organizations in this list can be considered as the most prepared for exercise of monitoring of the water supply and wastewater collection sector. The following arguments can be used to prove its eligibility:

- today, this Committee already makes selective monitoring of the water supply and wastewater collection sector; and
- members of the Committee have positive experience of cooperation with international organizations in issues of assessment of the water supply and wastewater collection sector in the Republic of Tajikistan.