



ECONOMIC COMMISSION FOR THE UNITED NATIONS

COMMITTEE ON ENVIRONMENTAL POLICY CONFERENCE OF EUROPEAN STATISTICIANS

A joint inter-sectoral working group on environmental indicators

The seventh session

Geneva, 5 - 7 November 2013

Item 3 of the provisional agenda

REVIEW OF THE GUIDELINES ON THE APPLICATION OF ENVIRONMENTAL INDICATORS

Informal Note by the Secretariat¹

Introduction

As part of activities of the Joint Task Force on Environmental Indicators, the Group continues to review its Guidelines on the Application of Environmental Indicators. At its seventh session the Group will be reviewing the following indicators from the Guidelines:

- Total water use;
- Public water supply;
- Connection of population to public water supply;
- Concentrations of pollutants in coastal seawater and sediments (except nutrients);
- Population connected to wastewater treatment;
- Wastewater treatment facilities; and
- Waste reuse and recycling.

This report analyses the replies to the questionnaire of the following countries:

- Armenia,
- Azerbaijan,

¹ Prepared by Mr. Alexander Shehovtsova at the request of the secretariat; The document has not been formally edited.

- Belarus,
- Bosnia and Herzegovina,
- Kazakhstan,
- Kyrgyzstan,
- Montenegro,
- Republic of Moldova,
- -Serbia,
- Russian Federation,
- Tajikistan,
- The former Yugoslav Republic of Macedonia,
- Ukraine.

The review and basic analysis of the data reported by countries for each of the indicators are presented below.

I. I. SUMMARY OF COUNTRY RESPONSES TO THE QUESTIONNAIRE ON SEVEN INDICATORS FROM THE GUIDLINES

1. Total water use

| Country | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |

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|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Republic of Moldova | | | | | | | | | | | | | | | | |
| The Russian Federation | | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some of the data relating to this indicator

Thirteen countries to varying degree of detail completed the questionnaire on this indicator.

All countries except Montenegro and The Former Yugoslav Republic of Macedonia have data on total water use for different periods of time. Belarus and Ukraine have presented the most complete data on the indicator providing all the data of water use for the period of 1990-2012.

Kazakhstan and Kyrgyzstan have provided the data since 1995, except for data on import/export of water in Kazakhstan and desalinated water and reused water in Kyrgyzstan.

The Republic of Moldova and the Russian Federation have not provided the data on water use by households.

Montenegro and The former Yugoslav Republic of Macedonia have not provided the data on the use of water in agriculture, forestry and fishing, they however provided the data on the use of water for irrigation, which is an integral part of this dataset.

Bosnia and Herzegovina on the contrary, showed the data on the water use in agriculture, forestry and fishing, but does not provide data on use of water for irrigation.

All countries provided data on total water use by economic activity (Bosnia and Herzegovina, and Kyrgyzstan without data on use of water in the energy sector, and Montenegro without data on water use in other economic activities). Serbia, Montenegro and Tajikistan provided such data since 2000, and Bosnia and Herzegovina and the Russian Federation since 2005 (in the Russian Federation statistical surveys are changed from sectors of economy to economic activities). At the same time, the Russian Federation has referred to other activities than those listed in the questionnaire.

Belarus and Ukraine completed all rows for calculation of the total fresh water available. They informed that they are not using desalination processes, and they do not import/export waters. These data were not made available by other countries.

Montenegro did not provide the data for the calculation of the total water use, except for the total freshwater abstraction in 2002, 2005, 2008 and 2011.

The Russian Federation stated that the data on: waters returned without use, net freshwater abstracted, water desalinated, imports/exports of water and total fresh water available are not collected through the federal statistical surveys.

The other reporting countries include in the calculation of the total water use from two (the former Yugoslav Republic of Macedonia) to seven datasets (Kazakhstan, Kyrgyzstan) of the nine requested.

Analysis of the data showed a decline in the total amount of water use in most of the countries:

- In Azerbaijan by 1.5 times between 1990 - 2012 due to the decrease in water use by all economic activities (especially in manufacturing sector);
- Belarus by 2 times between 1990 - 2012 due to the decrease in water use in all types of economic activities (particularly in the energy sector);
- In Bosnia and Herzegovina by 1.1 times over the period 2005 - 2012 due to the decrease in water use in the manufacturing sector;
- Kyrgyzstan by 1.6 times from 2000 to 2011 in all economic activities (especially in agriculture, forestry, fishing);
- In Serbia by 1.1 times for the period of 2000 -2012 by reducing the use of water in agriculture, forestry, fishing, manufacturing and other economic activities (but an increase in water use in the energy sector);
- In the Republic of Moldova by 4.4 times between 1990 -2012 due to a significant reduction in water use in all types of economic activities;
- In the Russian Federation by 1.6 times over the period 1990 - 2012 (recording of water use by economic activities is carried out since 2005 and since that time, water use decreased by 1.1 times, with decrease in fishing and aquaculture, in manufacturing industries and in other economic activities;
- Tajikistan by 1.5 times over the period 2000 - 2012 due to the decrease in water use in agriculture, forestry, fishing, manufacturing sector (irrigation);
- Ukraine by 3 times in the period of 2000 -2012 due to a significant reduction in water use in all economic activities.

Kazakhstan has also achieved a reduction by 1,2 times in the total amount of water use for the period of 1995 - 2012, with a substantial reduction in water use in agriculture, forestry, fishing, manufacturing sector. However, there was a 26 times increase of water use in other types of economic activities.

Only in Armenia total water use for the period 1990 -2012 increased by 1.5 times due to the growing water use in agriculture, forestry and fishing.

In 2012, the absolute volume of the water in these countries ranged from 150 million m³ in Bosnia and Herzegovina, to 72,053 million m³ in the Russian Federation.

Water losses during delivery to users have been reduced for the reporting periods in the Republic of Moldova, the Russian Federation and Ukraine. The increase in water losses have occurred in Armenia, Azerbaijan, Bosnia and Herzegovina, Kyrgyzstan, Serbia. In Belarus, the losses of water in 2012 were at the level of 1990.

In the Russian Federation the total amount of recycled and reused water (including sea water) was twice the amount of water abstracted from various fresh water sources for 2012.

Of the total freshwater abstraction, the losses at delivery in 2012 were as follows: in Armenia 25.6 %, in Belarus 5.1%, in Bosnia and Herzegovina 54.3 %, in Kazakhstan 14.5%; Kyrgyzstan 19.7 %, in Serbia 6.1% in the Republic of Moldova 7.5% in the Russian Federation 13.6%, in Tajikistan 28.0 %, and in Ukraine 13.9%.

For the reporting periods the total water use per unit of GDP decreased in all the countries: in Armenia 2 times, in Azerbaijan and Belarus 3.8 times, and in Bosnia and Herzegovina 1.3 times, in Kazakhstan 3.5 times, in Kyrgyzstan 1.6 times, in Serbia 1.6 times, in the Republic of Moldova 2.8 times, in the Russian Federation 1.9 times, in Tajikistan 2.5 times, in Ukraine 2.1 times. At the same time, in all countries, except the Republic of Moldova and Ukraine, GDP has increased (the largest growth in GDP, more than 5 times in the period from 1995 to 2012 was in Bosnia and Herzegovina).

The former Yugoslav Republic of Macedonia has not provided data on total water use per unit of GDP.

In Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Republic of Moldova, the Russian Federation, Ukraine, the data for the indicator "Total water use", are collected with the state statistical surveys.

In Armenia, Azerbaijan, Tajikistan and Ukraine the production of the data lies with water authorities, in Belarus, Kazakhstan, the Russian Federation with ministries of environment, in Bosnia and Herzegovina, Serbia, Montenegro, The Former Yugoslav Republic of Macedonia with the statistical agencies, in the Republic of Moldova this is a joint responsibility of environmental and statistical agencies, and in Kyrgyzstan a shared responsibility of water security and statistical agencies. Exactly the same authorities are also responsible for quality data control.

Tajikistan reported that due to the increase of water users the completeness of the data for "Total water use" cannot be ensured.

Belarus evaluates the accuracy of the data in the range between 3-5%, Serbia reported that it carries out the quality control in accordance with international instruments such as: Water Framework Directive, WFD - 2000/60/EC; JQ OECD / Eurostat - Inland water; Questionnaire REQ12 - Regional Environmental Data Collection - Inland water; JQ UNSD / UNEP - Environmental Statistics. Also Bosnia and Herzegovina uses recommendations of international organizations in carrying out the data quality control.

All the countries reporting on "Total water use", informed about publishing data in the publications of environmental and statistical agencies. At the same time, Armenia, Bosnia and Herzegovina, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia did not provide links to websites with these publications.

Conclusions:

1. Most countries have the data available to produce the indicator "Total water use". Belarus and Ukraine have provided the most complete data on the indicator, with providing all the required datasets of water use for the period 1990-2012.

2. The Republic of Moldova and the Russian Federation do not provide data on water use by households.
3. Bosnia and Herzegovina, Montenegro and The former Yugoslav Republic of Macedonia did not show information on the water use in some economic activities, and the Russian Federation referred to activities, different from those contained in the questionnaire.
4. All countries, except Armenia achieved a reduction in the total water use for the reporting period. The biggest decrease was achieved by the Republic of Moldova (4.4 times for the period 1990 - 2012).
5. In Armenia, the total water use for the period 1990 -2012 increased by 1.5 times due to the growing use of water in agriculture, forestry and fishing.
6. In the Republic of Moldova, the Russian Federation, Ukraine, there was a reduction of water losses during supply to users, whereas in Armenia, Azerbaijan, Bosnia and Herzegovina, Kyrgyzstan and Serbia the losses increased.
7. The largest water losses for the last reporting year were in Bosnia and Herzegovina 54.3 %, the lowest in Belarus 5.1 %.
8. The total water consumption per unit of GDP decreased in all countries ranging from 1.3 times in Bosnia and Herzegovina to 3.8 times in Belarus.
9. All reporting countries informed about publications with water use data, at the same time Armenia, Tajikistan and The former Yugoslav Republic of Macedonia did not provide the links to websites with these publications.

Recommendations:

1. Belarus and Ukraine should use the available data for the production of the indicator "Total Water Use".
2. Kazakhstan and Kyrgyzstan should work to complete the questionnaire on the missing datasets.
3. Montenegro and The former Yugoslav Republic of Macedonia should use accounting of the total water use in their countries, as the basis for the production of this indicator.
4. The Republic of Moldova and the Russian Federation should introduce the collection of data on water use by households.

2. Public water supply

| Страна | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |

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|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Montenegro | | | | | | | | | | | | | | | |
| Republic of Moldova | | | | | | | | | | | | | | | |
| Russian Federation | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some of the data relating to this indicator.

Twelve countries completed the questionnaire on this indicator. It was completed for all the datasets for the period 1990 – 2012 by Armenia, Azerbaijan, Belarus, Ukraine, for the period 1992 - 2012 by Tajikistan for the period 2000 - 2012 by Bosnia and Herzegovina, Kazakhstan, Serbia, for the period 2003 - 2012 by Republic Moldova, and for the period 2010 - 2012 by Kyrgyzstan. Montenegro presented data on a public water supply for 2002, 2005, 2008 and 2011. The former Yugoslav Republic of Macedonia provided only the net volume of water supplied by the public water supply industry for the period 1990 - 2012.

The Russian Federation did not report any data on public water supply and provided no explanation for it.

Analysis of the data shows the following trends with regard to the public water supply in the countries for the reporting periods:

- Armenia's gross volume of fresh water delivered by public water supply industry remained at the same level with a slight increase in the period 2000 - 2009. However, the net volume of fresh water supplied to users, decreased more than twice due to increasing losses during transportation;

- In Azerbaijan, Belarus and Serbia, there is a tendency to reduce both the gross and net volumes of fresh water for the public supply, with some increasing volume of losses during transportation;

- In Tajikistan the gross volume of fresh water delivered by public water supply industry decreased significantly (more than twice), and water losses during transportation decreased even more drastically (by more than four times). At the same time, the net volume of fresh water supplied by the industry decreased more than twice.

- In Bosnia and Herzegovina, Kazakhstan and the Republic of Moldova there was an increase in gross and net volumes of fresh water for the public supply. At the same time, in Bosnia and Herzegovina, the increase of water losses for the period 2000-2012 was more than 1.6 times, some increase in Kazakhstan, and the Republic of Moldova remained at the level of 2003;

- In Ukraine, there is a significant decline in both gross (almost 2 times) and net (more than 2.6 times) volume of fresh water for the public supply, thus with significant increase in the volume of losses during transportation.

The data provided by The former Yugoslav Republic of Macedonia as reported by public water supply industry on volume of net water supplied undergoes significant fluctuations from year to year, for which reason the trends cannot be evaluated.

The absolute volume of water losses during transportation increased in all countries, except for Belarus and the Republic of Moldova.

Water losses in the countries as a percentage by country changed in the following ranges:

- Armenia: 1990 - 54.2% 2012 - 80.4% (the largest losses of water - 84.6% in 2008);
- Azerbaijan: 1990 - 24.0% 2012 - 35.4% (the largest water losses -36.2% in 2001);
- Belarus: 1990 - 8.3%, 2012 - 10.8% (the largest water losses -15.5% in 2008);
- Bosnia and Herzegovina: 2000 - 49.8% 2012 - 54.1% (the largest losses of water - 54.2% in 2011);
- Kazakhstan: 2000 - 18.5% 2012 - 13.8% (the largest losses of water - 19.9% in 2001);
- Serbia: 2000 - 38.5% 2012 - 51.9% (the largest water losses for all years);
- Montenegro: 2002 - 30.9% 2011 - 54.6% (the largest water losses for all years);
- Republic of Moldova - 2003 - 62.6% 2012 - 55.5% (the largest losses of water - 64.2% in 2004);
- Tajikistan: 1992 - 88.3% (the largest water losses for all years), in 2012 - 46.7%;
- Ukraine: 1990 - 6.4%, 2012 - 30.2% (the largest water losses for all years).

The analysis made shows that in the reporting periods only in Kazakhstan, Tajikistan and the Republic of Moldova the percentage of water losses decreased in the public supply during transportation from the source to the users, however for the Republic of Moldova this percentage was still high and exceeded 50%.

To date, more than 50% of water is lost during transport in Bosnia and Herzegovina, Serbia, Montenegro, the Republic of Moldova and in Armenia such losses exceeded 80 %.

The smallest percentage of water losses was in 1990 in Ukraine (6.4 %), though it increased almost fivefold until 2012.

Looking at the ratio of the gross to net volumes of fresh water supplied to users by the public water supply, Belarus and Kazakhstan were supplying the water most effectively.

In Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, the Republic of Moldova, Tajikistan, Ukraine, the data for the indicator "Public water supply" are collected with the state statistical surveys.

Water authorities are responsible for the production of the data in Armenia, Azerbaijan and Tajikistan, ministries of environment in Belarus and the Republic of Moldova, statistical agencies in Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Serbia, Montenegro, The former Yugoslav Republic of Macedonia, ministry of regional development in Ukraine. Exactly the same authorities in all the countries, except Ukraine, control the data quality. In Ukraine, the data quality control is done by the statistical authorities.

Belarus evaluates the accuracy of the data in the range of 3-5%. Serbia reported that its quality control is guided by international instruments such as: Water Framework Directive,

WFD - 2000/60/EC; JQ OECD / Eurostat - Inland water; Questionnaire REQ12 - Regional Environmental Data Collection - Inland water; JQ UNSD / UNEP - Environmental Statistics.

All the countries reporting on "Public water supply" informed about publishing the data in the publications of environmental and statistical agencies. At the same time, Armenia, Bosnia and Herzegovina, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia did not provide links to websites with the publication.

Conclusions:

1. Most countries have complete data for the production of the indicator "Public water supply."
2. The Russian Federation did not fill out the questionnaire on this indicator and did not provide any explanation for it.
3. The former Yugoslav Republic of Macedonia presented data only on net volume of water supplied by public water supply industry.
4. The volumes of fresh water supply increased in Bosnia and Herzegovina, Kazakhstan and the Republic of Moldova in the reporting period.
5. In Azerbaijan, Belarus, Serbia and Ukraine there is a tendency to reduce both the gross and net volumes of fresh water supplied by public water supply industry.
6. In Tajikistan, while there was a decrease in the gross volume of fresh water supply, the net volume increased due to reduction of water losses during transport, which may indicate the effectiveness of measures taken in the country in this field.
7. More than 50 % of the water was lost during its transportation from the source to the users in Bosnia and Herzegovina, Serbia, Montenegro, Republic of Moldova, and in Armenia such losses exceeded 80 %.
8. In Ukraine, for the period 1990 - 2012, the percentage of water losses during transport increased almost fivefold.
9. In Tajikistan, for the period 1992 - 2012, the percentage of water losses during transport decreased by more than fourfold.
10. The most effective public water supply was in Belarus and Kazakhstan.
11. Most countries publish data on public water supply, however, Armenia, Bosnia and Herzegovina, Serbia and The former Yugoslav Republic of Macedonia did not specify the web addresses for the publications.

Recommendations:

1. Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Moldova, Serbia, Tajikistan, Ukraine should use the available data for the production of the indicator "Public water supply"
2. Montenegro should collect annual data for the production of the indicator "Public water supply."
3. The former Yugoslav Republic of Macedonia should include in the calculation of the indicator the gross volume of fresh supplied by the public water supply industry and the transportation losses.
4. The Russian Federation should complete the questionnaire on "Public water supply".

3. Connection of population to public water supply

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|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Country | | | | | | | | | | | | | | | |

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|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |
| Republic of Moldova | | | | | | | | | | | | | | | |
| The Russian Federation | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some of the data relating to this indicator.

Thirteen countries completed the questionnaire for different time periods. The most complete series of data (1990 to 2012) come from Armenia, Azerbaijan, Belarus and The former Yugoslav Republic of Macedonia. Bosnia and Herzegovina, Serbia, Tajikistan and Ukraine provide data on connection of population to public water supply since 2000, and Kazakhstan since 2001. The Russian Federation provided data for the last four years, Montenegro for the last three years, Kyrgyzstan for 1999 and 2009, and the Republic of Moldova only for 2012.

While analysing the number of population connected to the public water supply, it is necessary to take into account the dynamics in change of the total number of population in the country.

For the countries having provided data for more than ten years, in Azerbaijan, Kazakhstan and Tajikistan the overall growth of population corresponded with the growth in the number of population connected to the public water supply.

In Belarus, Serbia and Ukraine, the total population decreased during the reporting period, while the number of population connected to public water supply increased.

Armenian population also declined from 1990 to 2012, while the number of population with access to public water supply changed only a little. In this way the percentage of population connected to the public water supply increased significantly, amounted to 97.6% in 2102 (the highest percentage of all the countries).

In Bosnia and Herzegovina and The former Yugoslav Republic of Macedonia, the total number of population in the reporting periods did not change, and the number of the users of the public water supply has increased by 800 thousand and 133 thousand, respectively, which shows the development of the countries in this area.

In all of the countries, the percentage of the population connected to public water supply, relative to the total population in the countries, increased over time. In 2012, it amounted to:

- Armenia - 97.6%;
- Azerbaijan - 63.6%;
- Belarus - 85.3%;
- Bosnia and Herzegovina - 58.5%;
- Kazakhstan - 66.8;
- Serbia - 85.8%;
- Republic of Moldova - 41.7%
- The Russian Federation - 59.8%;
- Tajikistan - 22.4%;
- The former Yugoslav Republic of Macedonia - 95.0%;
- Ukraine - 66.1%.

Montenegro did not provide the percentage of the population connected to the public water supply but the number of urban population of the country, which does not comply with the methodology of the indicator.

Ukraine, in addition to the data requested in the questionnaire, also provided additional data on the number of households equipped with running water and the average size of households.

In Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Moldova, Ukraine, the data for the production of the indicator "Public Water Supply" are collected with the state statistical surveys.

Water authorities are responsible for the preparation of data in Armenia and Azerbaijan, ministries of environment in Belarus and the Republic of Moldova, statistics agencies in Bosnia and Herzegovina , Kazakhstan, Montenegro, Serbia, Tajikistan , The former Yugoslav Republic of Macedonia, health authorities in the Russian Federation, ministry of regional development in Ukraine. Exactly the same authorities in all countries, except for Ukraine, control data quality. In Ukraine, the data quality control is done by the statistical authorities.

Belarus evaluates the accuracy of the data in the range of 3-5%, Serbia reported that its quality control is guided by international instruments such as: Water Framework Directive,

WFD - 2000/60/EC; JQ OECD / Eurostat - Inland water; Questionnaire REQ12 - Regional Environmental Data Collection - Inland water; JQ UNSD / UNEP - Environmental Statistics.

All countries except Kyrgyzstan, reporting on "Population connected to Public Water Supply," informed about publishing data in the publications of the environmental authorities and / or bodies of statistics and housing and communal services. At the same time, Armenia, Bosnia and Herzegovina, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia did not provide links to websites with the publications.

In Kyrgyzstan there is no organization responsible for the collection of data on this indicator. Also no information was provided on websites where the data was published.

Conclusions:

1. Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia and Ukraine provided data for more than a decade to produce the indicator "Public water Supply."
2. Dynamics in growth of population connected to the public water supply is observed in most countries with a long series of data on this indicator.
3. The highest percentage of population connected to public water supply (80%) is in Armenia, Belarus, Serbia and the former Yugoslav Republic of Macedonia.
4. Despite the positive growth in the absolute number of population connected to public water supply, Tajikistan is a country with the lowest percentage value of the indicator (22.4%).

Recommendations:

1. Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia and Ukraine should use the available data for the production of the indicator "Connection of Population to Public Water Supply".
2. Kyrgyzstan, Montenegro, Republic of Moldova and the Russian Federation should continue to work to collect data for the production of the indicator "Connection of Population to Public Water Supply".
3. Montenegro, in the calculation of population connected to public water supply, should follow the methodology contained in the description of the indicator.

4. Concentrations of pollutants in coastal seawater and sediments (except nutrients)

| Country | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Albania | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |
| The Russian | | | | | | | | | | | | | | | |

Analysis of water quality of coastal areas provided shows that the largest pollution due to the contamination:

- by petroleum hydrocarbons the waters of Baku Bay (Azerbaijan), Golden Horn Bay (Russian Federation) and the Dnieper- Bug estuary (Ukraine);
- by hexavalent chromium the coastal waters of Kazakhstan and Montenegro and Delta of the Danube River (Ukraine);
- by nickel, magnesium and zinc in the coastal waters of Kazakhstan;
- by chlorinated pesticides the waters of Golden Horn Bay (Russian Federation);

A large volume of faecal coliforms is found in the coastal waters of Montenegro.

None of the countries that provided data on the indicator has accompanied them with schematic maps of the coastal seawater areas with the indication of the location of sampling points. Neither the measurement methods used were specified.

The environmental authorities are responsible for the collection of the data for this indicator in Azerbaijan and Montenegro, and hydrometeorological services in the Russian Federation and Ukraine.

Competent research organizations control the quality of data in Montenegro, the Russian Federation and Ukraine, and Ministry of Ecology and Natural Resources in Azerbaijan.

In Azerbaijan, the data on the pollution of seawaters and sediments are published for official use only. In Montenegro, the Russian Federation and Ukraine the data are published in specialized hydrometeorological journals. At the same time, Ukraine has not provided links to websites with these publications.

It seems bizarre that Kazakhstan having presented the data informs that there is no information on the organization responsible for their collection, control and publications.

Conclusions:

1. Of the five countries that responded to the questionnaire, four of them showed the concentration of pollutants in coastal seawater and sediments. Ukraine did not provide data on the concentration of pollutants in sediments.
2. None of the countries, except for the Russian Federation provided data to determine the full range of concentrations that are included in the questionnaire.
3. The Russian Federation has shown the concentrations of all pollutants of seawater and sediments (except for other chemical compounds in sediments) for the three-year time period, though this period is not sufficient to assess the dynamics of changes in the seawater environment. This conclusion also applies to data submitted by Montenegro.
4. Without the support of the data on the concentrations of pollution of coastal waters and sediment with maps or marine charts indicating of the location of sampling points and information of the analysis methods, the development of the indicator cannot be considered complete.

Recommendations:

1. Montenegro and the Russian Federation should use a long time series of observations on the level of concentrations of pollutants in coastal seawater and sediments (if available).
2. Ukraine should include in the monitoring of the marine environment the measuring of contamination in sediments.

3. Azerbaijan, Kazakhstan, Montenegro and Ukraine should expand the list of pollutants measured for seawater and sediments.
4. All the reporting countries on the indicator "The concentrations of pollutants in coastal seawater and sediments" should accompany their data with maps of marine areas with the indication of the location of sampling points, as well as with information on the methods of measurement used.
5. Kazakhstan should complete the sheet "7ind" of the questionnaire with information about the organization responsible for the production of data, quality control as well as data publication.

5. Population connected to wastewater treatment

| Country | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |
| Republic of Moldova | | | | | | | | | | | | | | | |
| The Russian Federation | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some data related to this indicator

Twelve countries completed the questionnaire, in varying degrees of detail, for various time periods.

The Russian Federation did not report data on the population connected to wastewater treatment in the country and did not provide any explanation for it.

The former Yugoslav Republic of Macedonia completed the questionnaire only with data on the number of population connected to public water supply. These data are not sufficient for the calculation of the indicator "Population connected to wastewater treatment."

Bosnia and Herzegovina and Serbia provided full data on this indicator and for the thirteen-year period. Also, good information, since 2004, is provided by Azerbaijan. Other countries have either long series data but only for some datasets (Armenia and Tajikistan since 1990, Belarus and Ukraine since 2000), or the data is for short periods of time for only some datasets (Kazakhstan, Kyrgyzstan, Montenegro and the Republic of Moldova).

All reporting countries showed the number of population connected to public sewer for different periods of time (from one year: the Republic of Moldova, to more than twenty years: Armenia, Tajikistan).

Belarus, Kazakhstan, Montenegro, Tajikistan and Ukraine do not provide data on all kind of treatments, and Armenia on the secondary and tertiary treatment.

In all countries that have long time series data, except for Armenia, the population with access to wastewater treatment is growing:

- In Azerbaijan almost 500 thousand people in the nine-year period, from 27.5% to 29.8%;
- In Belarus more than 1.1 million people in 13 years, from 63.2% to 78.5%;
- In Bosnia and Herzegovina 330 thousand people in 13 years, from 18.6% to 26%;
- In Kazakhstan by 1.6 million over seven years, from 45.6% to 51.8%;
- In Serbia, almost 1 million people in 13 years, from 43.8 % to 59.2%;
- In Tajikistan 300 thousand people over more than twenty years. However, the percentage of the population connected to wastewater treatment, decreased from 26.9% to 21.8%, due to the rapid growth of the total population in the country;
- In Ukraine 2.1 million people in 13 years, from 55.1% to 63.8%.

In Armenia, in 2012 the number of population connected to wastewater treatment, as compared with 1990, has almost not changed, but due to decrease in the country's total population, the percentage increased from 62.4% to 68.9%.

In Belarus, all the population is connected to sewer, with runoffs which are treated; in Azerbaijan this is 15% to 16%, in Bosnia and Herzegovina from 17.1% to 26.9% and in Serbia from 38.2% to 48.1%. Other countries did not provide data on this dataset.

The information from the previous section shows that in Bosnia and Herzegovina and Serbia the input capacity for connection of population to wastewater treatment cannot ensure the subsequent wastewater treatment.

Bosnia and Herzegovina, when calculating the percentage is not always multiplying by 100 the division of one dataset by another.

Ukraine provided, in addition to the datasets of the questionnaire, also data on the number of households supplied with public water supply, and the average size of households.

In Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Republic of Moldova, Ukraine, the data collection for the indicator "Population connected to wastewater treatment" is done on the basis of the state statistical surveys.

Water agencies are responsible for the collection of data for this indicator in Armenia and Tajikistan, ministry of environment in Azerbaijan, statistical agencies in Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Serbia, the Republic of Moldova and The former Yugoslav Republic of Macedonia, ministry of tourism in Montenegro, and ministry of regional development in Ukraine. Exactly the same authorities in all the countries, except for Ukraine, control data quality. In Ukraine, the quality control is done by the statistical authorities.

Serbia reported that its quality control is guided by international instruments such as: Water Framework Directive, WFD - 2000/60/EC; JQ OECD / Eurostat - Inland water; Questionnaire REQ12 - Regional Environmental Data Collection - Inland water; JQ UNSD / UNEP - Environmental Statistics.

In Azerbaijan, data on connection of population to wastewater treatment are published for official use only. Belarus provides such data on request. The Republic of Moldova reported that it plans to publish data on the indicator starting from 2013. Montenegro and The former Yugoslav Republic of Macedonia did not inform whether they publish information on this indicator.

Other countries reported on publishing this indicator in various publications, but only Kazakhstan and Ukraine informed about links to websites with the publications.

Conclusions:

1. Bosnia and Herzegovina and Serbia have complete data for more than a decade to produce the indicator "Population connected to wastewater treatment".
2. With adding the data by Azerbaijan on population connected to wastewater tertiary treatment (or informing of lack of such data), this information could be used for the production of the indicator.
3. Most countries have not provided information about the mechanical, biological, and advanced wastewater treatment.
4. In almost all reporting countries providing good data on this indicator the absolute number of the population connected to wastewater treatment increased. In Armenia, the number of such population in 2012 compared with 1990 did not change much.
5. The largest percentage of the population connected to wastewater treatment of total population is in Belarus and amounts to 78.5 %, while all the population is connected to public sewer, runoffs of which are processed.
6. In Tajikistan, only 21.8 % of the population is connected to wastewater treatment, which is the lowest percentage of all the countries that provided data.
7. In Bosnia and Herzegovina and Serbia the input capacity to wastewater treatment cannot always assure consecutive wastewater treatment.
8. Of all the countries that publish data on the population connect to wastewater treatment, Armenia, Bosnia and Herzegovina, Serbia and Tajikistan did not provide the web addresses with such publications.

Recommendations:

1. Bosnia and Herzegovina and Serbia should use the available data for the production of the indicator "Population connected to wastewater treatment".
2. Azerbaijan should also use the data to produce the indicator and add to the data the information on tertiary treatment (or on its absence).
3. Armenia, Belarus, Kazakhstan, Montenegro, Republic of Moldova and Ukraine, should supplement the questionnaire with data, which are needed for production of this indicator.
4. Bosnia and Herzegovina should recalculate the percentages of the indicator to bringing them in line with the questionnaire prescription.
5. The former Yugoslav Republic of Macedonia should report not only on number of population connected to public water supply, but also on the outstanding datasets of the indicator.
6. The Russian Federation should complete the questionnaire on the "Population connected to wastewater treatment".

6. Wastewater treatment facilities

| Country | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |
| Republic of Moldova | | | | | | | | | | | | | | | |
| The Russian Federation | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some of the data relating to this indicator.

The most complete information on this indicator has been received from the Republic of Moldova as well as from Bosnia and Herzegovina.

The former Yugoslav Republic of Macedonia reported that the data on the characteristics of wastewater treatment facilities are not available currently in the country.

The Russian Federation provided data only on the designed capacity of mechanical treatment of urban wastewater facilities for the ten year period.

Kyrgyzstan sent only information about the installed capacity of sewage pumping stations and volume of wastewater entering the primary, secondary and tertiary treatment.

Most countries associate capacity of treatment facilities with urban wastewater treatment. Independent wastewater treatment is done only in the Republic of Moldova.

Currently, all three types of urban waste water treatment (primary, secondary and tertiary) are used in Belarus, Bosnia and Herzegovina, Kyrgyzstan, Serbia and the Republic of Moldova. At the same time, Bosnia and Herzegovina and the Republic of Moldova have provided all the requested information, including the designed capacity volumes and the actual occupation volumes as well as for both on the biochemical oxygen demand for the whole reporting period, and Serbia for the last two years. Kyrgyzstan reported only the volume of wastewater flowing through these facilities.

Belarus provided the explanation that since 2009, there is a separate accounting of municipal sewage treatment facilities of 1-3 level of treatment, which treat wastewater from population and primary treatment of storm water from urban areas (level 1), and replaced the general accounting used until 2009 of mechanical treatment - level 1, and secondary treatment (referred to as level 2), which treated urban wastewater, including wastewater treatment of industry providing wastewater treatment services to population.

Two types of urban wastewater treatment facilities (primary and secondary) are used in Montenegro (on all parameters) and Azerbaijan, Kazakhstan, Tajikistan (only on design capacity of treatment facilities and actual occupation volumes).

Armenia and Ukraine provide data on primary treatment facilities only of municipal wastewater on the designed and actual volumes received by treatment facilities.

Serbia is the only country that provided generalized data on treatment facilities not linked with urban wastewater treatment. At the same time, the design capacity of the facilities and actual occupation volumes of wastewater, significantly (in some cases an order of magnitude) exceed the characteristics of urban wastewater treatment facilities.

In Armenia, Azerbaijan, Bosnia and Herzegovina, Kazakhstan, Serbia, Moldova, Tajikistan, the design capacity of the urban treatment facilities exceeds the actual occupation volumes, that is, treatment facilities are working with a capacity reserve.

In Montenegro, the treatment facilities are working at their full capacity, in some years, exceeding the designed treatment volume.

Ukraine showed the designed capacity of treatment facilities and the actual volumes of treated wastewater in different dimensions (million m³ per day and million m³ per year, respectively). At the same time, taking into account that the treatment facilities in the country are working every day in a year, then the design capacity of treatment facilities is also larger than the volume of actual wastewater treated.

The efficiency of wastewater treatment can be judged on the data obtained from Bosnia and Herzegovina, the Republic of Moldova, and partly Serbia on the total amount of contaminants removed from the effluent BOD5 per year:

- In Bosnia and Herzegovina for a period of twelve years the efficiency in primary treatment increased by 2.3 times, in the secondary by 1.4 times and in the tertiary by 1.1;
- In the Republic of Moldova for a period of twenty three years the efficiency in primary treatment increased more than 40 times, in secondary decreased by 3.6 times and in tertiary also decreased by 1.6 times;
- In Serbia, the data become available starting from 2012.

The Republic of Moldova also provided data on the total number of pollutants discharged BOD removed by the wastewater treatment facilities. Their volume decreased over the period by 2.3 times.

In Belarus, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Ukraine the data for the indicator "Wastewater Treatment Facilities" are collected on the basis of the state statistical surveys.

The water authorities are responsible for the collection of data in Armenia, Montenegro and Tajikistan, statistical agencies in Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Serbia and the former Yugoslav Republic of Macedonia, environmental authorities in Belarus and the Russian Federation, a joint stock company in Azerbaijan, ministry of regional development in Ukraine. Exactly the same authorities in all the countries, except for Ukraine, control the data quality. In Ukraine, the data quality control is done by the statistical authorities.

In the Republic of Moldova the primary data is collected by five laboratories accredited under the State Environmental Inspectorate and the joint-stock company, which creates some problems. The laboratories are responsible for data quality.

Belarus evaluates the accuracy of the data in the range of 3-5%. Serbia reported that its quality control is guided by international instruments such as: Water Framework Directive, WFD - 2000/60/EC; JQ OECD / Eurostat - Inland water; Questionnaire REQ12 - Regional Environmental Data Collection - Inland water; JQ UNSD / UNEP - Environmental Statistics.

Most of the countries that responded to the questionnaire on "Wastewater treatment facilities," informed about publishing data in the publications of environmental, statistical, and water authorities. At the same time, Armenia, Azerbaijan, Bosnia and Herzegovina, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia and Ukraine did not provide links to web sites with the publication.

Montenegro did not provide information about publishing of data on the indicator, and the Republic of Moldova does not publish the data, but provides information at official request.

Belarus accompanied the completed questionnaire with illustrative material (histograms), showing the number of available treatment facilities in the country and the type of treatment.

Conclusions:

1. Despite the fact that most countries have submitted some data, in most cases, these data are not sufficient for the production of the indicator "Wastewater treatment facilities."

2. The most complete data for the development of indicator "Wastewater treatment facilities" have Bosnia and Herzegovina and the Republic of Moldova. These countries have shown the use of all three types of treatment facilities for long periods of time. In this regard, it is appropriate to consider this section as a sub- component of the indicator "Wastewater Treatment Facilities"

3. Serbia is the only country that generalized data on treatment facilities not linked with urban wastewater treatment. For this, the design capacity volume and actual volumes at these facilities are significantly higher than for similar urban wastewater treatment plants.

4. In Montenegro, the treatment plants are working at full capacity, in some years, exceeding the designed treatment volume. In the other countries the design capacity of wastewater treatment facilities is significantly bigger than the volume of actually treated wastewater.

5. The effectiveness of urban wastewater treatment facilities for long periods of time can only be assessed in Bosnia and Herzegovina (it doubled in the twelve years) and in the Republic of Moldova (increased more than 40 times over the period of twenty three years).

6. Only the Republic of Moldova has shown how data on the number of pollutants BOD5 removed by wastewater treatment facilities, and the total amount of pollutants discharged by wastewater treatment facilities.

7. Most countries publish data on the characteristics of the design capacity of urban wastewater treatment facilities and the actual wastewater volumes received by them. At the same time Azerbaijan, Armenia, Bosnia and Herzegovina, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia and Ukraine, did not provide the web addresses with such publication.

Recommendations:

1. Bosnia and Herzegovina and the Republic of Moldova should use the available data to produce the indicator "Wastewater treatment facilities".

2. Kyrgyzstan and The former Yugoslav Republic of Macedonia should start annual collection of data to produce the indicator "Wastewater treatment facilities".

3. The Russian Federation should complete the questionnaire on the indicator "Wastewater Treatment Facilities", given the fact that the country is publishing such data.

4. Armenia, Azerbaijan, Kazakhstan, Montenegro, Tajikistan, Ukraine, should provide information about the use of the different types of wastewater treatment facilities, which they have not presented, and on the effectiveness of the treatment facilities.

5. The Republic of Moldova should centralize the responsibility for collection of primary data for the indicator, in order to avoid the data collection difficulties.

7. Waste reuse and recycling

| Country | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Albania | | | | | | | | | | | | | | | |
| Armenia | | | | | | | | | | | | | | | |
| Azerbaijan | | | | | | | | | | | | | | | |
| Belarus | | | | | | | | | | | | | | | |
| Bosnia and Herzegovina | | | | | | | | | | | | | | | |
| Georgia | | | | | | | | | | | | | | | |
| Kazakhstan | | | | | | | | | | | | | | | |
| Kyrgyzstan | | | | | | | | | | | | | | | |
| Serbia | | | | | | | | | | | | | | | |
| Montenegro | | | | | | | | | | | | | | | |
| Republic of Moldova | | | | | | | | | | | | | | | |
| The Russian Federation | | | | | | | | | | | | | | | |
| Tajikistan | | | | | | | | | | | | | | | |
| The former Yugoslav Republic of Macedonia | | | | | | | | | | | | | | | |
| Ukraine | | | | | | | | | | | | | | | |
| Uzbekistan | | | | | | | | | | | | | | | |

Note: The green colour indicates that the country has reported at least some of the data relating to this indicator.

Twelve countries provided some data on the indicator "Waste reuse and recycling."

Bosnia and Herzegovina did not report data on the reuse and recycling of waste. At the same time the country informed to be carrying out pilot studies in this field.

Montenegro provided data only on the volume of reuse of municipal waste in the last seven years, and Tajikistan in the last four years, which is not sufficient for the production of this indicator.

Kyrgyzstan provided data on the amount of reuse and recycling of municipal waste for the periods 1995 - 2005 and the years of 2010 - 2012, in the first case in cubic meters per year, in the second case, in tons per year. However, this information needs to be corrected.

Armenia, Azerbaijan and the Republic of Moldova do not have data on the reuse and recycling of municipal waste. They completed, however, the data on all other datasets of the questionnaire for more than 10 year period.

The questionnaire of the Republic of Moldova does not provide the calculation of the percentages of re-use and recycling of all types of waste, and for a number of years, the quantity of reused and recycled waste is much higher than the quantity of managed waste in categories "non-hazardous industrial waste", "hazardous waste", "Total Waste". The explanation for it is that reuse and recycling of waste is not contained in waste managed.

Belarus provided information on all the requested datasets (including the treatment and disposal of municipal waste over the past two years), with the caveat that since 2009, the country has changed waste classification, and thus some of waste previously identified as non-hazardous (plastic and wood waste), according to indicators on explosion or fire hazard were classified as hazardous waste, for which reason there is discrepancy between data series.

Serbia has no information on the reuse and recycling of municipal waste and on hazardous waste managed.

The Russian Federation has shown the quantity of municipal waste managed of solid municipal waste in 2012 in units of 1000 tons per year, taken from the category "Waste from production and consumption" instead of the proposed category of the questionnaire "Non-hazardous industrial waste".

Ukraine in their data, instead of waste managed under the different categories, provided the quantity of collected and generated waste, and the reuse and recycling replaced with waste utilization. The country provided then an explanation that the data on municipal waste since 2010 include only waste from household and services.

Based on an analysis of data provided by the countries:

- In Armenia, there is a tendency to increase the total quantity of waste managed (since 2000 more than 20 times), what is also true for the waste categories;
- In Azerbaijan, there is also this tendency to increase the total quantity of waste managed (since 1995, more than 5 times) and waste by categories (with the exception of 1990 for non-hazardous industrial waste);
- In Belarus, total waste managed from 2000 increased by almost 1.8 times, due to a significant increase in the quantity of managed hazardous waste. At the same time there was a reduction of almost 2.5 times in the non-hazardous industrial waste managed for the reasons mentioned above;
- In Kazakhstan, the total number of waste managed decreased almost by 1.5 times in the period 2006 - 2012, due to reduction in hazardous waste managed that the country accounted for more than 97% of all waste managed;
- In Serbia, the total amount of waste managed increased by 2.7 times over the past five years. Most of the waste is non-hazardous industrial waste;
- Montenegro has shown only a reduction by 1.2 times of waste managed in the period 2006 - 2012 years;
- In the Republic of Moldova, the total amount of waste managed from 1995 fell by almost 1.8 times, though the data is difficult to assess due to the fact that the reuse and recycling of waste is not included in the waste managed;

- In the Russian Federation, the total quantity of waste managed (the category of "waste from production and consumption") doubled between 2002 and 2012, due to the significant increase in the non-hazardous industrial waste managed;

- Tajikistan has shown only a slight increase of municipal waste managed in the last four years;

- The data of The former Yugoslav Republic of Macedonia cannot be analysed because they are presented in different measurements units by two different organizations.

- Ukraine has shown an increase of 3.5 times in the total quantity of waste managed in 2012 as compared with 1995 (for the period 2005 - 2009, the data are not given).

However, taking into account the Ukraine's note that, instead of waste managed in the relevant rows of the questionnaire it provided collected and generated waste, these data cannot be analysed for this indicator.

The largest percentage of reused and recycled waste from the total quantity of managed waste (100.4 % in 2008) is in Azerbaijan. It needs to be explained why this figure is greater than 100 %.

In Armenia percentage of reused and recycled waste of the total managed waste in different years ranges from 0.3% to 3.8%, Belarus from 12.2% to 37.8 %, in Kazakhstan from 0.5% to 3.1% in Serbia from 1.0% to 3.8% and in the Russian Federation from 68.5% to 78.3%.

In Kazakhstan, the Republic of Moldova, the Russian Federation, Tajikistan, Ukraine, the data for the indicator "Waste reuse and recycling" are collected based on the state statistical surveys.

Statistical agencies are responsible for preparation of data in Azerbaijan, Kazakhstan, Kyrgyzstan, Montenegro, several bodies in Armenia and two bodies in Belarus, Serbia, Moldova, Tajikistan and Ukraine, and ministry of environment in the Russian Federation.

For the most cases, the organizations responsible for the preparation of the data are also responsible for controlling their quality.

In Belarus, the data quality control takes into consideration the methodology of calculation of recyclable and reusable waste contained in the UNSD / UNEP Questionnaire on Environment Statistics.

Serbia uses a data quality control procedures of Regulation (EC) No. 2150/2002 of the European Parliament on Waste Statistics, on statistical reporting on waste, adopted by the European Parliament, and the Commission Regulation on waste statistics No 849/2010, on statistical reporting on waste, amending Regulation (EC) No 2150/2002; JQ OECD / Eurostat - Waste statistics; JQ UNSD / UNEP - Environmental statistics.

Most of the countries that responded to the questionnaire on "Waste reuse and recycling," informed about publishing the data in the publications of environmental, statistical, and other organizations. At the same time, Armenia, Serbia and Tajikistan did not provide links to websites with the publications.

The former Yugoslav Republic of Macedonia did not provide the information about the organizations responsible for the preparation of the data and their publication.

Belarus accompanied the completed questionnaire with illustrative material (histogram), showing the quantities and types of waste disposed.

Conclusions:

1. None of the reporting countries has complete data for the production of the indicator.
2. There is no information on the reuse and recycling of municipal waste in questionnaires from Armenia, Azerbaijan, Serbia, Montenegro, Republic of Moldova, Tajikistan and The former Yugoslav Republic of Macedonia.
3. Kazakhstan provided data on the reuse and recycling of municipal waste for the past eight years, Belarus for the last two years and the Russian Federation for 2012.
4. In the Republic of Moldova, the reuse and recycling of waste is not included in the managed waste, and therefore, in some cases the quantity of reused and recycled waste is higher than the quantity of managed waste.
5. Ukraine in their data, instead of providing waste managed under the different categories, showed the amount of waste collected and generated, and the reuse and recycling of waste replaced with waste utilization.
6. In Armenia, Azerbaijan, Belarus, Serbia and the Russian Federation increased the total amount of waste managed over time, and in Kazakhstan and Montenegro there is a reduction of waste managed.
7. The largest percentage of reused and recycled waste from the total quantity of managed waste is in Azerbaijan. In this case, this figure exceeds 100%.
8. In other countries with the data available, the percentage of reused and recycled waste from the total quantity of managed waste ranges from 0.3% (Armenia 2012) to 78.8% (Russian Federation 2003).
9. Belarus and Serbia use the recommendations of relevant international organizations for ensuring the quality of data and control procedures for the preparation of this indicator.
10. Most of the reporting countries publish data on managed waste, including their reuse and recycling, however, Armenia, Serbia and Tajikistan did not provide the web addresses for the publication.

Recommendations:

1. Countries should work to develop the procedure for the production of the indicator "Waste reuse and recycling" on the basis of the requirements included the description of the indicator and using the developed questionnaire.
2. The Republic of Moldova should consider reuse and recycling of waste as part of the waste managed for this indicator.
3. Ukraine should use for this indicator the data on managed waste instead of the data on the quantities of generated waste and waste recycled and reused as this is required for the production of the indicator.
4. Countries are recommended to use the experience of Belarus and Serbia in applying the recommendations of the relevant international organisations for ensuring data quality and control procedures when producing this indicator.
5. Bosnia and Herzegovina should complete the questionnaire on "Waste reuse and recycling" in course of the pilot studies in this field.
6. Kyrgyzstan, Montenegro, Tajikistan should complete the questionnaire not only with data on the quantity of the municipal waste managed, but also on other datasets for this indicator.