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ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE
TASK FORCE FOR THE IMPLEMENTATION OF THE ENVIRONMENTAL ACTION PROGRAMME FOR CENTRAL AND EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

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Water Supply and Sanitation Sector Reform

Meeting the Millennium Development Goal
Drinking Water and Sanitation Target
in the EECCA region: a goal within reach ?

5-6 June 2005

English - Or. English

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ABBREVIATIONS:

CIS	Commonwealth of Independent States of the Former Soviet Union
DFID	Department for International Development of the British Government
DHS	Demographic and Health Survey (USAid)
EAP	Environmental Action Programme
ECA	Europe and Central Asia (Central and Eastern Europe, i.e. Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia FYR, Poland, Romania, Slovak Republic, Slovenia, Serbia and Montenegro + EECCA countries + Turkey)
EECCA:	Eastern Europe, Caucasus and Central Asia, i.e.: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan
FAO	Food and Agriculture Organisation
GWP	Global Water Partnership
HBS	Household Budget Survey
IDA	International Development Association
IFI	International Financing Institution
JMP	Joint Monitoring Programme
LSS	Living Standards Measurement Survey
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey (UNICEF)
OECD	Organisation for Economic Co-operation and Development
O&M	Operation an Maintenance
PRS	Poverty Reduction Strategy
RLMS	Russia Longitudinal Monitoring Survey
SLC	Survey of Living Conditions (World Bank)
SPPRED	State Programme on Poverty Reduction and Economic Development
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNICEF	United Nations Children's Fund
WB	World Bank
WEHAB	Water, Energy, Health, Agriculture and Biodiversity
WHO	Wold Health Organisation
WSS	Water Supply and Sanitation
WSSCC	Water Supply & Sanitation Collaborative Council
WSSD	World Summit on Sustainable Development
WWC	World Water Council

EXECUTIVE SUMMARY

"Today, one person in six will drink unclear water. One person in three will not have access to proper sanitation. And around 10,000 people will die today as a result of this preventable situation. That is unacceptable...That's why commitments were made in the Millennium Declaration in 2000 and at Johannesburg in 2002. The commitments were to halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation..."[1]

The Millennium Development Goal target for water and sanitation (Target 10) aims to reduce by half the numbers of people without sustainable access to safe drinking water and basic sanitation by 2015, using 1990 as the baseline year.This report assesses the effort that is required in the remaining period of time as well as the amount of financing needed to fund the necessary investments in the EECCA region.

There are no simple answers to these questions:

1. the proportion of the EECCA population currently having sustainable access to safe and affordable water and adequate sanitation remains to be determined. The official MDG Target 10 progress monitoring system - JMP - provides a reassuring picture of the water supply and sanitation sector in the EECCA region that is misleading:
   - the indicators officially used to monitor MDG Target 10 progress are technology-based and do not capture issues such as quality, reliability and sustainability. These issues are particularly relevant in the EECCA region where connection rates have traditionally been high, but quality has been low and deteriorating. In the JMP monitoring system, a household connection to a centralised water supply system providing contaminated water would be characterised as " sustainable access to safe drinking water" ;
   - there is no baseline against which progress can be measured since population data are missing in most countries for the year 1990, the baseline year for the monitoring of Target 10;
   - limited data collection, mainly based on household surveys, raise serious questions about the reliability of JMP's coverage estimates on which progress monitoring relies;
   - Evidence from other sources (for example see "Progress Report on Implementing the Almaty Guiding Principles" prepared for this meeting) suggests that the water supply and sanitation sector in the EECCA region is actually in crisis.

   One important policy conclusion from this analysis is that donors and IFIs should be very cautious in using JMP-based monitoring progress reports when setting priorities and designing assistance programmes and projects, and they should draw on other analyses for these purposes.

2. In view of these uncertainties, attempts to calculate the costs and amount of financing needed to reach MDG Target 10 in the EECCA region are also very uncertain.

   Two studies have addressed these issues: a 2003 World Bank study and a 2004 COWI draft report[2].
   - the two cost estimates are of a similar order of magnitude for the EECCA region as a whole:

[1] Statement of the United Nations Secretary General Kofi Annan to the United Nations Advisory Board on Water and Sanitation in July 2004

[2] COWI 2004 draft report "Financial needs of achieving the Millennium Development Goals for water and sanitation in the EECCA region" commissioned by the Danish Ministry of Environment, and World Bank 2003 "Meeting the Environment Millennium Development Goal in Europe and Central Asia"

- the World Bank estimates the cost of achieving Target 10 in all CIS countries between 2000 and 2015 at USD 1.1 billion annually[3], of which 55% for water supply. This is equivalent to roughly € 15.3 billion for the period 2002-2015;
- COWI' estimates the "MDG cost" at € 14.6 billion for the period 2002-2015, two thirds of which relate to water supply, and close to 90% to rehabilitation (as opposed to service extension) costs;

➢ However, the detailed estimates for specific countries (Kazakhstan, Moldova and Ukraine[4]) show significant discrepancies which can be attributed to a different understanding of the types of costs to be included under "MDG costs" and to different calculation methods;

➢ With all the uncertainties related to these studies, their similarity may be a coincidence rather than a convergence of comparable estimates.

COWI's estimate of an annual EECCA "Total costs", an "all-in cost" which includes not only "MDG cost" but also operation and maintenance and re-investments costs, amounts to € 6.9 billion per year over the period 2000-2020. The magnitude of this estimate underlines one of the main challenges for the EECCA region: maintaining and improving existing infrastructure rather than extending it. In addition the study suggests that even raising the finance to operate and maintain the infrastructure in its present poor state – a much less ambitious challenge than achieving the water-related MDGs - would pose major problems for a number of EECCA countries. So despite uncertainties about the estimates, there can be little doubt that the scale of investments needed to meet Target 10 by 2015 will require a massive and unprecedented mobilisation of financial resources from donors and IFIs in a context a scarce domestic financial resources.

Resolving the methodological issues related to measuring progress in achieving the MDG water and sanitation target would remove an important obstacle to the development of MDG-focused development strategies in EECCA countries. A possible sequence of measures that could be taken in this regard include:

➢ new indicators could be defined to account for the functionality, reliability and quality of the water supply and sanitation sector;

➢ the establishment of sound and sustainable national statistical capacities and systems in each country would enable the collection of more data of better quality. Donors could provide useful assistance in this respect;

➢ a common definition and methodology for measuring "MDG costs" should be developed; failing this, confusion will persist and comparison between various studies will remain difficult;

➢ unless more realistic coverage estimates can me made for 1990, a different baseline year should be used for EECCA countries from which to calculate the required level of Target 10 by 2015;;

➢ on that basis, MDG-focused development strategies would enable countries to translate the value set for Target 10 in 2015 into an investment programme at the sub-national level with intermediary targets. This would also help to better define the role that national and local governments could play in EECCA countries and the support that donors and IFIs could most usefully provide.

3 presumably in 1995 USD

4 The World Bank did precise calculations of the cost of reaching Target 10 only for three countries

INTRODUCTION

Nearly five years have elapsed since the Millennium Declaration[5], and fifteen years out of the twenty-five year period within which the water supply and sanitation[6] target (Target 10) is to be met[7]. Time has now come for an assessment of the progress made to-date, since "*if the goals are to be reached, these developments need to happen very soon*", as stated by the UN Secretary General to the UN General Assembly in September last year.

In this context of urgency for immediate action, the EAP Task Force was asked to (i) analyse progress made towards the achievement of the Drinking Water and Sanitation MDG target (the so-called MDG "Target 10") in the EECCA region, and (ii) review existing studies made on the cost of achieving Target 10, with a view to informing Ministers at the Conference of EECCA Ministers of Finance, Water and Environment to be held in November 2005, and initiating a discussion on this issue.

This background paper first demonstrates that the few official MDG progress reports issued so far fail to convey a true picture both of the EECCA water supply and sanitation sector and of progress made towards the achievement of MDG Target 10[8], and identifies the methodology used to monitor progress as one of the major reasons for such a misleading reporting.

Then, the latest region-focused studies on the cost of achieving Target 10[9] are thoroughly analysed, evidencing significant disparities in terms of methods used and results, raising the issue of the comparability of such cost estimates and of the feasibility to calculate - with a reasonable degree of accuracy - the level of investments, costs and amount of financing necessary for the region to achieve Target 10. However both studies point to a very significant cost of reaching Target 10 in the EECCA region, which will only be financed through a major mobilisation of donors and IFIs.

Finally, a few tangible measures are proposed that could contribute to a better monitoring of the pace and magnitude of progress towards the reaching of this ambitious Target 10, pave the way for more meaningful estimates of the costs and amount of financing needed to achieve it and possibly contribute to a sustainable mobilisation of funds from donors and IFIs.

[5] Declaration adopted at the United Nations Millennium Summit in September 2000 from which emerged the MDGs and related targets – www.un.org/millenniumgoals/ - see Annexes I and II

[6] The term *water supply and sanitation* refers to *domestic water supply and sanitation* and does not encompass *water resource management*

[7] The period considered for the reaching of Target 10 is 1990-2015.

[8] In the latest UN MDG Progress Report, Target 10 is already assumed to be met in urban areas of the former CIS countries as of September 2004

[9] COWI 2004 draft report "Financial needs of achieving the Millennium Development Goals for water and sanitation in the EECCA region" commissioned by the Danish Ministry of Environment, and World Bank 2003 "Meeting the Environment Millennium Development Goal in Europe and Central Asia"

I – Why the monitoring of progress towards the MDGs fails to provide a true picture of the water supply and sanitation sector in the EECCA region

1.1) The Millennium Declaration and the World Summit on Sustainable Development

Monitoring progress on the Millennium Development target for water supply and sanitation first of all requires a clear and common understanding of the terminology used. Different wordings have been used in various instances before an official definition of the water supply and sanitation MDG target (Target 10) was adopted in the Millennium Declaration:

- in the Millennium Report[10], UN Secretary-General specifically urged the World Summit on Sustainable Development ("WSSD") *"to adopt the target of reducing by half, between now and 2015, the proportion of people who lack sustainable access to adequate sources of affordable and safe water"*.
- The water supply-related objective set in the Millennium Declaration adopted by the UN General Assembly in September 2000 was "…, *by the same date* [2015], *to halve the proportion of people who are unable to reach or to afford safe drinking water*"[11].
- In 2002, in the context of appalling statistics[12] published by the WEHAB Working Group in charge of water and sanitation issues[13], the Johannesburg World Summit on Sustainable Development (WSSD) reaffirmed the commitment to achieving the MDGs. The WSSD Plan of Implementation subsequently adopted by the UN stipulated that "*In this respect, we agree to halve, by the year 2015, the proportion of people who are unable to reach or afford safe drinking water, as outlined in the Millennium Declaration, and the proportion of people without access to basic sanitation*…"

The existence of similar but different wordings around the same concept contributed to create confusion when it comes to the water supply and sanitation MDG target. Therefore, it is important to bear in mind the official Millennium Declaration definition of Target 10, on which the monitoring of progress in the water supply and sanitation sector is based.

1.2) MDG 7 and Target 10 Indicators 30 & 31

The various statements mentioned above eventually led - within the Millennium Declaration Goal 7 "Ensure environmental sustainability" - to the official definition of Target 10, which specifically covers Water Supply and Sanitation:

> "***Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation***".

[10] UN Secretary-General 2000 "We the Peoples - The role of the United Nations in the 21st century"

[11] Resolution 55/2 "United Nations Millennium Declaration" adopted by the UN General Assembly on 18/09/2000

[12] WEHAB Working Group 2002 "A Framework for Action on Water and sanitation": *"about 1.2 billion people still have no access to safe drinking water, and 2.4 billion do not have adequate sanitation services. Some 2 million children die every year from water-related diseases. In the poorest countries, one in five children dies before the age of five mainly from water-related infectious diseases arising from insufficient water availability, in both quantity and quality. Thus provision of safe drinking water and sanitation services to more than 1 billion people over the next decade remains one of the most critical challenges humanity is facing today"*

[13] The WEHAB initiative was proposed by UN Secretary-General Kofi Annan as a contribution to the preparations for the WSSD, providing focus on the five key thematic areas of water, energy, health, agriculture and biodiversity

Out of the 48 MDG indicators, two indicators were designed to monitor progress towards Target 10 and are used by the Joint Monitoring Programme (JMP), the official mechanism within the United Nations in charge of monitoring international goals on access to drinking-water and sanitation:

- Indicator 30: Proportion of population with sustainable access to improved water source, urban and rural

Improved	Not Improved
Household connection	Vendor-provided water
Public standpipe	Bottled water (1)
Borehole	Tanker-truck provided water
Protected dug well	Unprotected well
Protected spring	Unprotected spring
Rainwater collection	

(1) Based on concerns about the quantity of supplied water, not concerns over the quality

Access to safe drinking-water is the percentage of the population using "improved" water sources. "Reasonable access" to water-supply services is broadly defined as the availability of at least 20 litres per person per day from an "improved" source within 1 kilometre of the user's dwelling. An "improved" source is one that is likely to provide "safe" water[14].

"Household connections" consist in "piped supplies into the household, plot or yard".

- Indicator 31: Proportion of population with access to improved sanitation, urban and rural

Improved	Not Improved
Public sewer	Service or bucket latrine (1)
Connection to septic system	Public latrines
Pour-flush latrine	Latrines with an open pit
Simple pit latrine	
Ventilated improved latrine	

(1) where excreta are manually removed

Access to adequate sanitation facilities is the percentage of the population using "improved" sanitation. Excreta disposal systems are considered adequate if they are private and if they separate human excreta from human contact [12].

A "Household connection" in the sanitation context is understood as "connection to a public sewer".

Target 10 should be viewed as a step on the path to full global service coverage by 2025, the perspective of Global Water Partnership ("GWP") [15] in its "Framework for Action". Contrary to Target 10 focused on household water and sanitation, the 2025 targets include irrigation, industrial effluent, wastewater treatment, water resource and environmental management.

[14] www.wssinfo.org (JMP's website)

[15] GWP is a working partnership among all those involved in water management: government agencies, public institutions, private companies, professional organizations, multilateral development agencies and others committed to the Dublin-Rio principles

1.3) The WHO/UNICEF Joint Monitoring Programme

Since 1990, WHO and UNICEF have been collaborating in the Joint Monitoring Programme. In particular, they were mandated by the UN Secretary General to provide - through JMP - coverage estimates on water supply and sanitation that feed into the reporting system of the MDGs.

JMP's main purpose is to (i) build national capacity for the water and sanitation sector, (ii) monitor and (iii) inform policy makers globally on the status of the sector. In addition, JMP must ensure that the different organisations that report on water supply and sanitation development adopt a common set of definitions and criteria to describe access to water supply and sanitation services. JMP assessments were made in 1991, 1993, 1996 and 2000. In 2004 for the first time, a "Mid-Term Assessment of Progress" was produced which measured progress towards the MDG drinking-water and sanitation target[16].

Since 1997, the method for calculating trends in access to safe drinking-water and sanitation has been changed, due to the limitations of provider-based data reported by national governments and service providers[17]: household surveys provide an important step forward in obtaining a more accurate picture of access and use of facilities, collecting data from consumers on the facilities which they actually use, including those they have installed themselves, such as private wells or pit latrines etc.

Household surveys commonly used by JMP in its coverage estimates include Demographic and Health Surveys (DHS) conducted by Macro International and funded by USAID, UNICEF's Multiple Indicator Cluster Surveys (MICS), national census reports and Living Standards Measurement Surveys. Both DHS and MICS are national cluster sample surveys, covering thousand households in each country. The samples are stratified to ensure that they are representative of urban and rural areas of each country. Provider-based data are used only when no survey data are available.

JMP assembles, reviews and assesses these survey and census data. A set of rules was drawn up to make the interpretation of collected data and their graphical conversion into data points a systematic and objective exercise. In JMP's "Mid-Term Assessment of Progress" report, survey and census data are plotted on a time scale from 1980 to the present. A linear trend line based on the least-squares method[18] is then drawn through these data points to estimate coverage both for 1990 and 2002. These estimates form the basis for the assessment of progress towards Target 10.

1.4) Problems of interpretation and methodological issues

The interpretation of Target 10 and of its related indicators, as well as the methodology currently used to monitor progress raises a number of issues, which have to be kept in mind when analysing MDG progress reports:

a) Terminology

No official definition of "sustainable access", "safe drinking water" and "basic sanitation" is provided by JMP. Through indicators 30 and 31, JMP reports on access to "improved" water supply sources and "improved" sanitation facilities, the assumption being that those technologies

[16] JMP 2004 "Meeting the MDG drinking water and sanitation target – a Mid-Term Assessment of Progress"

[17] Varying definitions of "access" according to the country, difficulty in assessing access to improved services other than household connections, no consideration given to whether or not facilities are functioning or used, no reporting on self-built facilities, or systems installed by small local communities

[18] The method of least squares assumes that the best-fit curve of a given type is the curve that has the minimal sum of the deviations squared (*least square error*) from a given set of data.

identified as "improved" are most likely to provide access to safe water and adequate sanitation. However, there is no evidence that the so called "improved" technologies do provide safe water nor adequate sanitation. Moreover, the concept of safety and reliability of water sources and of adequacy of sanitation facilities from a user's point of view, key to any analysis of the status of the water supply and sanitation sector, have until now been overlooked in the monitoring process. In some locations for instance, an unprotected household well may provide a better supply of water, both in terms of quantity and quality of water, than a household connection which may be subject to intermittence and poor water quality. The concept of sustainability (both in terms of service and environment), present in the Target 10 definition, is not addressed by indicators 30 and 31. Finally, affordability is only implied, but not clearly stated.

b) Baseline date

The definition of Target 10 does not explicitly provide for a baseline date against which progress should be monitored. Although the MDGs were formulated in 2000, and in spite of the initial statement of UN Secretary General ("…*between now and 2015*…" - see above § 1.2)), the baseline for the MDG target on water and sanitation, and for most MDG targets in general, has been set as 1990[19].

According to the French Water Academy, who kept 2000 as baseline year in its March 2004 report [20], selecting 1990 as baseline year is not neutral and less demanding: it results in a decrease of the target for access to water at global level from 91% to 89.5% in 2015 and of the target for access to sanitation from 81% to 77.5%.

c) Household surveys

Although providing the best and most reliable data sources available to understand the status of the water supply and sanitation sector, particularly when compared to information supplied by governments or service providers, household surveys also entail certain drawbacks:

- they are not conducted recurrently in many countries;
- the lack of standard indicators and methodologies makes it difficult to compare information obtained from different surveys. JMP has already started working on the harmonisation of survey instruments (MICS, DHS etc.) in order to increase comparability of household surveys;
- they do not include questions as to the reliability of the water supply, the quality or affordability of the water, the distance between the household and the water or sanitation facility, the availability of separate sanitary facilities for women and men or how hygienic a sanitary facility actually is.

d) Lack of data leading to unreliable projections

The quality of the results obtained when using a linear regression line to find the best fit to available data depends *inter alia* on the number of such points. When it comes to the EECCA region, unfortunately few such points exist[21]. In JMP's mid-term assessment report, the first attempt to establish progress made towards Target 10 from 1990 to 2002, none of the 1990 or 2002 estimates produced for the EECCA region, be it for water supply or sanitation, corresponds to data obtained from surveys conducted those years: they result from the linear regression method using data collected in other years. But for 7 out of the 12 EECCA countries, only one year of actual data

[19] JMP report - "Meeting the MDG drinking water and sanitation target – a Mid-Term Assessment of Progress" – 2004

[20] Water Academy 2004 "The cost of meeting the Johannesburg targets for drinking water" by Henri Smets

[21] See Annex III

is used by JMP for the period 1990-2002. This heavily undermines an assessment of progress limited to an analysis of such coverage estimates. In addition, the progression being linear as opposed to curve, all EECCA country coverage estimates evidence - if not a progress - at least an absence of deterioration between 1990 and 2002. This contradicts the widespread and well known phenomenon of severe deterioration - and at times even collapse - of the water supply and sanitation infrastructure in most of the EECCA countries since 1990, corroborated, when available, by the Poverty Reduction Strategies prepared by the EECCA countries themselves ("PRSs")[22].

Finally, the overall monitoring process lacks national - and even in the case of large countries sub-national - level targets, as well as intermediary targets between 2005 and 2015.

e) Urban versus rural

Whereas indicators 30 and 31 both distinguish between urban and rural populations, it is unclear whether Target 10 should be reached globally or separately for each category of population. In its latest report, the UN Task Force for Water and Sanitation points at four components of Target 10[23], which seems to imply that Target 10 is actually made of four separate sub-targets. This interpretation is supported by the mention of the same four sub-targets in the latest UN MDG progress report[24]. This point needs to be clearly stated as it has major strategic and financial implications.

f) Poverty reduction

The spirit of the Millennium Declaration, i.e. poverty reduction, should be kept in mind while focusing on the water and sanitation MDG target. This means that Target 10 should not merely consist of an extension of coverage, but that it should also concentrate on the very poorest, often located in rural areas. Unfortunately, indicators used to monitor Target 10 progress are not designed to specifically track progress in the struggle against poverty.

1.5) Assessment of progress towards Target 10 in the EECCA region based on the UN monitoring system

Based on the above, monitoring the progress made towards Target 10 in the EECCA region cannot but result in a distorted view of the actual status of the WSS sector. Both the global MDG progress report published by the UN in the second half of 2004 and JMP's "Mid-Term Assessment of Progress" issued in 2004 and based on 2002 estimates, unfortunately provide the best illustration for this:

a) The UN MDG global progress report (up to September 2004)

The latest UN MDG progress report, providing information worldwide at a regional level, was issued based on statistics available in September 2004. The information related to the CIS (Europe and Asia)[25] is described below:

[22] PRSs are a prerequisite for low income countries to receive concessional assistance from the World Bank through the International Development Association ("IDA") and the IMF through the Poverty Reduction and Growth Facility PRGF. Within the World Bank, IDA is specifically in charge of providing help in the form of long-term interest-free loans (credits) and grants to the earth's poorest countries to reduce poverty and deal with MDG challenges. Seven EECCA countries are IDA borrowers: Armenia, Azerbaijan, Georgia, the Kyrgyz Republic, Moldova, Tajikistan and Uzbekistan

[23] UN Task Force on Water and Sanitation 2005 "Health, dignity, and development: what will it take?"

[24] UN 2004 "Millennium Development Goals: Progress Report"

[25] Same region as the EECCA one: CIS in Europe = Belarus, Republic of Moldova, Russian Federation, Ukraine - CIS in Asia = Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan

Water supply	Status
Halve the proportion without improved drinking water in urban areas:	MDG met
Halve the proportion without improved drinking water in rural areas:	high access but limited change (progress but at a rate which is so far insufficient to meet the target)

Sanitation	Status
Halve the proportion without sanitation in urban areas:	high access but limited change (progress but at a rate which is so far insufficient to meet the target)
Halve the proportion without sanitation in rural areas:	no significant change (no change or negative change relative to the target since 1990, or current levels unsatisfactory compared to global standards)

Source: UN 2004 "Millennium Development Goals: Progress Report"

The gap in coverage described in this report appears significantly understated and contradicts the findings of reputable water supply and sanitation experts working in the region[26]: according to this report, Target 10 is deemed already met in urban areas as far as water supply is concerned, and the only potentially negative change having occurred in the sector since 1990 is limited to sanitation in rural areas. This information is reproduced as such in the 2005 report issued by the UN Millennium Project "Investing in Development – A Practical Plan to Achieve the Millennium Development Goals".

b) Coverage estimates produced by JMP at the national level

If the quality of estimates produced by JMP in its 2004 "Mid-Term Assessment of Progress" has obviously improved compared to the estimates issued in its "Global Water Supply and Sanitation Assessment 2000" Report, thanks *inter alia* to a finer interpretation given to "improved" technologies[27], the outcome of the report is still misleading:

Water Supply % of population with access to improved drinking water sources	1990			2002		
	Urban	Rural	Total	Urban	Rural	Total
Armenia	99	-	-	99	80	92
Azerbaijan	80	49	66	95	59	77
Belarus	100	100	100	100	100	100
Georgia	-	-	-	90	61	76
Kazakhstan	96	72	86	96	72	86
Kyrgyz Republic	98	-	-	98	66	76

[26] See § 2.1) below

[27] For example, according to JMP, 100% of the population of the Kyrgyz Republic (urban and rural) had access to adequate sanitation in 2000; the proportion fell to 75% in 2002 (51% urban, 60% rural)

Republic of Moldova	97	-	-	97	88	92
Russian Federation	97	86	94	99	88	96
Tajikistan	-	-	-	93	47	58
Turkmenistan	-	-	-	93	54	71
Ukraine	100	-	-	100	94	98
Uzbekistan	97	84	89	97	84	89

Sanitation % of population with access to improved sanitation	1990			2002		
	Urban	Rural	Total	Urban	Rural	Total
Armenia	96	-	-	96	61	84
Azerbaijan	-	-	-	73	36	55
Belarus	-	-	-	-	-	-
Georgia	96	-	-	96	69	83
Kazakhstan	87	52	72	87	52	72
Kyrgyz Republic	-	-	-	75	51	60
Republic of Moldova	-	-	-	86	52	68
Russian Federation	93	70	87	93	70	87
Tajikistan	-	-	-	71	47	53
Turkmenistan	-	-	-	77	50	62
Ukraine	100	97	99	100	97	99
Uzbekistan	73	48	58	73	48	57

These figures do reflect a well known feature of the EECCA countries' water supply and sanitation sector, i.e. well developed infrastructure inherited from the Soviet Union times. They remain, however, puzzling for anyone having some experience of the region:

- in no EECCA country did the WSS sector deteriorate between 1990 and 2002 (in other words the proportion of population having access to improved drinking water sources or sanitation did not decrease in any of the EECCA countries). In most of the region, the situation remained stable, with improvements registered in the water supply sector in Azerbaijan and the Russian Federation[28];
- these estimates might represent the proportion of the population benefiting from "improved" technologies, but it is doubtful whether the same proportion actually enjoys safe drinking water and basic/adequate sanitation at any time and all year round, especially in rural areas;
- these estimates are not consistent with coverage estimates provided, if and when available, in Poverty Reduction Strategy papers.

The absence of 1990 coverage estimates - out of a total of twelve countries in the EECCA region estimates are missing for (i) three countries in urban areas and seven in rural areas in the case of water supply, and (ii) six countries in urban areas and eight countries in rural areas in the case of sanitation – also contributes to making a prospective trend difficult to establish[29]. In other words, how can Target 10 be quantified if the proportion of people without improved drinking water and sanitation is unknown in the baseline year?

[28] This does seem consistent with the fact that people in the EECCA region ended the 1990s less healthy and with lower average incomes than people in Latin America and the Caribbean : 7 countries out of 12 (Armenia, Azerbaijan, Georgia, Kyrgyz Republic, Republic of Tajikistan and Uzbekistan) ended the 1990s with income close to those of the least developed countries (source: UNDP Human Development Report 2003)

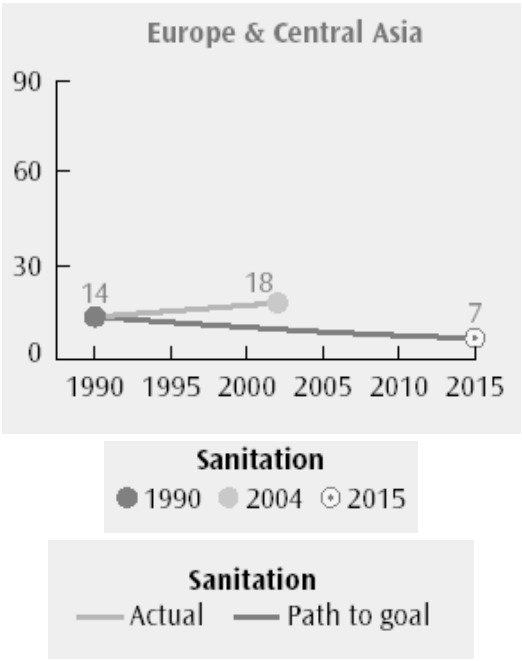
[29] However, the countries for which JMP 1990 coverage estimates (resulting from the linear trend line method) are provided represent 72% and 83 % of the total EECCA population respectively for water supply and sanitation, the Russian Federation alone representing more than half of the population of the EECCA region

Finally, as already mentioned earlier, when looking at the user-based surveys from which data were collected and then used by JMP to produce estimates[30], it appears that:

- in the period from 1990 to 2002, 7 out of 12 countries have been subjected to only one survey, the data of which have been used by JMP;
- no surveys were conducted precisely for the years 1990 and 2002; the coverage estimates for those two years are all derived from the linear trend line method.

c) Progress reported by the WB in its "Global Monitoring Report 2005"[31]

In its recently issued "Global Monitoring Report 2005", the WB comments on progress made towards Target 10 on a regional basis. While the "Europe and Central Asia" region, which includes the EECCA region, is deemed off track when it comes to sanitation, no mention is made of the situation of water supply in the region. The chart below, based on JMP data, shows the percentage of population in the "Europe and Central Asia" region without access to improved sanitation in 1990, 2004, and the 2015 MDG projected target level:



Source: WB / JMP

Interestingly, for all regions, charts similar to this one exist for both water supply and sanitation, except for the "Europe and Central Asia" region for which "*only sanitation estimates are available*", thereby pointing at the unavailability of equivalent water supply estimates. No further explanation for the missing chart is provided in the report.

As for sanitation, "Europe and Central Asia" appears - not surprisingly - off track in terms of reaching Target 10 by 2015. No details are available however to substantiate the percentages shown or the method used to determine the level of Target 10 in 2015.

[30] See Annex III

[31] The International Bank for Reconstruction and Development / The World Bank 2005 "Global Monitoring Report 2005 – Millennium Development Goals: from Consensus to Momentum"

In the three above-mentioned publications covering the monitoring of progress achieved by the water supply and sanitation sector in the EECCA region, JMP coverage estimates lie at the heart of the reporting exercise. However, while user-based data used by JMP appear as probably the best and most reliable data sources currently available to monitor progress towards the reaching of Target 10, a proper assessment of progress made towards Target 10 in the EECCA region cannot be derived from JMP's monitoring system as it stands at present. Technology-focused indicators ignoring quality, reliability and sustainability issues, combined with poor data collection, invalidate JMP's MDG progress monitoring of the water supply and sanitation in the EECCA region. This brings about two major implications:

- donors and IFIs should not base their fund allocation strategies in the EECCA WSS sector on official MDG progress reports;
- the feasibility of assessing (i) the amount of funds necessary to reach Target 10, let alone (ii) the amount of external financing that should be raised for that purpose, already a daunting challenge in itself, becomes a real issue.

II - Estimating the costs and amount of financing needed to reach Target 10 in the EECCA region: comparison of the methods used and of their outcome

In the 2003 "Financing Water for All" report of the World Panel on Financing Water Infrastructure[32], known as the "Camdessus report", the amount of funds needed to achieve Target 10 - using the most basic standards of service and technology - was estimated at an extra annual investment cost of about USD 10 billion[33]. Should full water and sewerage connections and primary wastewater treatment be provided to the urban population, the total amount required per year was estimated at USD 17 billion for water and USD 32 billion for sanitation and sewerage.

Estimates such as these from reputable experts and international organisation have been ranging over the past few years between $ 6.5 billion per year (UN MDG Task Force on Water and Sanitation - 2004) to USD 75 billion per year (World Water Vision - 2000)[34] . The width of this range is *inter alia* due to the difference in the assumptions used, such as the level of service to be provided and their unit costs, the baseline year, the population growth estimates, as well as the initial purpose of the calculation (for instance, maintenance and rehabilitation costs of existing infrastructure are sometimes taken into account). This of course makes comparison between various estimates extremely difficult and underlines the need to precisely understand the assumptions used to produce estimates.

Few studies were carried out however when it comes to assessing the amount of funds needed to reach Target 10 in the EECCA region. This chapter concentrates on the most recent and comprehensive ones, i.e.:

- a study, still in a draft form although at a very advanced stage, undertaken in May 2004 by the consultancy firm COWI at the request of the Danish Ministry of Environment and entitled "Financial needs of achieving the Millennium Development Goals for water and sanitation in the EECCA region". This study is based on information from various sources (official statistics, relevant international databases, reports and studies from major international organisations combined with COWI's own data base and Environmental Financing Strategies); and

[32] This panel of financial experts was formed as a joint initiative of GWP, WWC and the 3rd World Water Forum in Kyoto to address the ways and means of attracting new financial resources to the water and sanitation field

[33] Unofficial estimates by the WSSCC, one of the first international networks of concerned professionals and activists created in 1990 and committed to improving the quality of life of billions of people who lack access to safe water, sanitation and hygiene

[34] WELL 2004 "Analysis of cost estimates and funding available for achieving the Millennium Development Goals targets for water and sanitation" (WELL is a resource centre network providing access to information and support in water, sanitation and environmental health for DFID)

- the World Bank "Meeting the Environment Millennium Development Goal in Europe and Central Asia" report dated June 2003, which covers ECA countries and includes a detailed "MDG costing exercise" for Kazakhstan, Moldova and Ukraine.

But before analysing various attempts made to calculate the cost of reaching Target 10 in the region and the associated amount of financing needed, it is useful to better understand the magnitude of the crisis prevailing in the WSS sector in the EECCA region.

2.1) Brief overview of the current status of the Water Supply and Sanitation sector in the EECCA region[35]

The water supply and sanitation sector in the EECCA region lies in the midst of an extremely severe crisis. Central Asia and Caucasus countries in particular have to engage in a fight against the collapse of existing infrastructure. This situation does not stem from limited water resources, even though the high annual internal renewable water resources[36] per inhabitant (IRWR) in the EECCA countries [37] hides large disparities within the region, and sometimes even within the same country[38]. The roots of the crisis rather originate from the following:

- an overall continuous deterioration of the WSS infrastructure since the collapse of the Soviet Union in the 1990s, due to the lack of resources for proper operation and maintenance[39], particularly severe in the rural areas which used to have some form of centralised WSS system and where entire networks have collapsed;
- soaring charges compared to household incomes, due to:
  - over-designed systems inherited from the Soviet Union times frequently breaking down or leaking (see above);
  - tariffs that remain disconnected from the economic costs of supplying water and sanitation;
  - the absence of incentive mechanisms to encourage cost reduction and service optimisation;
  - high electricity charges (one of the main cost items for WSS utilities);
- a still excessive water consumption due to the limited development of metering practises.

As a result, WSS services are inadequate, and drinking water safety often a serious issue;

- irregular and unreliable water supply[40] is frequent, often due to insufficient water pressure (and/or interruption of power supply). Discontinuity in water supply brings about (i) a further deterioration of the infrastructure and (ii) an increased risk of drinking water contamination and water-related health problems[41];

[35] For more information on the status of the water supply and sanitation sector in the EECCA region, see the background paper entitled "Progress on implementing the Almaty Guiding Principles"

[36] Average annual flow of rivers and recharge of groundwater generated from endogenous precipitation (in km^3/year)

[37] 16,000 m3, more than twice the world's average

[38] The region actually encompasses a wide variety of situations in terms of water resources: the average IRWR in the Russian Federation amounts to 29,000 m3 per year per inhabitant, compared to an average IRWR in Caucasus of 4,517 m3, and even less in Central Asia.

[39] According to COWI, 20 to 50% of WSS infrastructure assets are physically exhausted

[40] In many cities water is supplied based on a schedule

[41] Waterborne diseases are often linked to secondary contamination of water in urban distribution systems: infiltration of sewage water into empty water supply systems is often the reason for contamination of drinking water when both water supply and sewage networks leak in the same place.

- water quality does not meet basic chemical and microbiological standards in most of the region, constituting a real health threat in the form not only of contaminated drinking water but also of vector of diseases such as trachoma, cholera, typhoid and hepatitis.

The situation of the WSS sector in the EECCA region is now such that polluted drinking water has become one of the most important environmental and public health problems currently facing most of the EECCA countries. In this appalling context, reaching MDG Target 10 by 2015 - provided a target level is set for each country - appears as even more of a challenge for the whole region.

2.2) The WB "per capita" approach to estimating the amount of funds needed to reach Target 10

In its June 2003 report, the WB underlines the difficulty of estimating the amount of funds needed to reach Target 10 in the ECA region, related *inter alia* to the issues of base year, data reliability and data gaps, and inadequacy of Indicators 30 and 31 when it comes to this region. In particular, the WB is well aware of the fact that "*there are serious water quality problems for many consumers of water that, by the MDG definition, would be regarded as an "improved source*", and therefore concludes for the need of a different water target "*focusing on quality as well as delivery*", which should be monitored and the value of which should be established. A similar observation is made on sanitation.

In this context, the cost of reaching Target 10 - taking into account the need to improve quality - is estimated for only three countries: Kazakhstan, Moldova and Ukraine.

a) Cost of water supply programs in Kazakhstan, Moldova and Ukraine

In urban areas, the MDG WS target is interpreted as the percentage of population having access to piped water. Starting from the level of access to piped water in percentage of the population in 2000[42], an MDG target is derived for each of the three countries, translated into a number of inhabitants. FAO population forecasts are used.

An estimation of the per-capita cost of different options for rehabilitating and increasing the access to water in urban areas, such as the per-capita cost of digging wells, is then made for each country. A combination of these options is assumed based *inter alia* on the proportion of the infrastructure which needs rehabilitating. Among costs estimated are for instance treatment costs of ground and surface water (the highest per-capita costs, ranging between USD 42 and USD 573 per person), surface water storage costs and costs of rehabilitating the treatment system. Different per-capita costs are sometimes used to account for the size of the cities in terms of population.

In rural areas, an alternative solution to exclusive water provision by way of piped water, which would be very costly, is to combine it with other methods such as safe wells. An MDG target is similarly derived for rural areas, with initial 2000 coverage estimates provided by the WB[43].

The total water supply program cost is then defined as the sum of:

1. *Cost of improving water quality* (i.e. cost of rehabilitating the existing system); plus
2. *Cost of improving population access to safe water* (i.e. infrastructure cost of building additional piped water system in urban areas and cost of a combination of piped water and well in rural areas); plus
3. *Cost of Operation and Maintenance* (i.e. cost of sustaining water access) estimated at 15% of the sum of the above two costs of (i) improving water quality and (ii) improving population access to safe water.

[42] see water supply table below

[43] see sanitation table below

As a result, the following amounts of funds are assumed to be necessary for the reaching of Target 10 in the water supply sector of Kazakhstan, Moldova and Ukraine:

(in million 1995 US$)

Country	Access to Improved Water (%)				Costs for period 2000-2015				Annual cost	
	Situation in 2000		MDG 2015		TOTAL	A Rehab.	B Extension	C O&M	As % of 2002 GDP	Total Annual Cost
	Urban	Rural	Urban	Rural						
Kazakhstan	96.9 *96*	82 *72*	97.8	87.4	**650**	268	297	85	0.2	43
Moldova	79.6 *97*	88 *88*	85.7	91.6	**106**	54	38	14	0.2	7
Ukraine	95.6 *100*	94 *94*	96.9	95.8	**1,001**	871	-	131	0.1	67

Source: WB 2003 report
Percentage figures shown in small italics are JMP 2002 coverage estimates

b) Cost of sanitation programs in Kazakhstan, Moldova and Ukraine

A similar method is used to estimate the cost of sanitation programs. In urban areas, priority is given to access to sewage systems with centralised pipelines, while other and cheaper technologies are favoured in rural areas (combination of public sewer, septic system and pit latrines for instance). The resulting estimates are the following:

(in million 1995 US$)

Country	Access to Sewage System (%)				Costs for period 2000-2015				Annual cost	
	Situation in 2000		MDG 2015		TOTAL	A Rehab.	B Extension	C O&M	As % of 2002 GDP	Total Annual Cost
	Urban	Rural	Urban	Rural						
Kazakhstan	73.1 *87*	98 *52*	81.2	98.6	**553**	112	369	72	0.1	37
Moldova	67.6 *86*	98 *52*	77.3	98.6	**106**	31	62	14	0.2	7
Ukraine	79.8 *100*	98 *97*	85.9	98.6	**508**	402	-	66	0.1	34

Source: WB 2003 report
Percentage figures shown in small italics are JMP 2002 coverage estimates

While the origin of certain assumptions and the details of some calculations are not provided in the WB report, making any further analysis impossible, the following observations can be made:

- The MDG principles used by JMP are not fully complied with:
  - the base year is 2000, due to lack of available data in 1990;
  - in urban areas, the water supply indicator is interpreted as the percentage of population having access to piped water;
  - 2000 coverage estimates are in some cases higher than official JMP 2002 estimates, and surprisingly high when it comes to sanitation in rural areas (98 % in all three countries);
  - the costs of establishing new sewerage treatment systems[44] are taken into account.
- The standards of rehabilitation of the WSS systems are not defined;
- The costs of meeting Target 10 include the costs of establishing new sewerage treatment systems ;

[44] The per capita unit cost table related to sewerage systems includes the cost of "*establishing new treatment system*"

- They do not seem to include operations and maintenance costs related to the part of the existing infrastructure which is not deemed in need of rehabilitation. Such costs could also be construed as part of the global cost of reaching Target 10, as if they are not incurred, access to "improved" water supply and sanitation will be lost by part of the population.

For comparison purposes, it should be noted that costs are expressed in absolute terms in 1995 USD and then as a percentage of the 2002 GDP.

c) Cost of reaching Target 10 in the CIS countries over the period 2000-2015

Finally, **the cost of achieving Target 10 in all CIS countries between 2000 and 2015 is estimated at USD 1.1 billion annually**[45], of which 55% for water supply, based on the following assumptions:

- the average cost of rehabilitating the existing WSS infrastructure is estimated to be USD 60 per capita;
- the cost of building a new water supply system is USD 200 per capita;
- the cost of building a new sewage system in urban areas is USD 250 per capita;
- the cost of providing pit latrines in rural areas is USD 25 per capita;
- 35% of existing WSS systems need rehabilitating;
- in urban areas, the MDG target is assumed to imply access to a piped water system and a public sewage system; in rural areas, it is assumed to imply access to improved WSS as per the UN MDG definitions.

No further explanation is provided as to how this aggregated estimate is obtained. It is unclear whether it includes the cost of establishing new sewerage treatment systems or operations and maintenance costs.

2.3) The COWI approach to estimating the amount of funds needed to reach Target 10: an inventory combined with the use of the FEASIBLE[46] financial modelling tool

In its draft report, COWI not only aims, at estimating the cost of achieving Target 10 in the EECCA region using the FEASIBLE tool, but also at analysing how this cost can be financed.

COWI first points out the issues raised by the costing of the achievement of Target 10, of which:

- the absence of precise information as to the level of services that should be targeted;
- the lack of definition for "safe water" (COWI assumes that "safe water" is water that, if drunk, does not immediately threatens human health);
- the fact that the MDG definition should be interpreted on a country-by-country basis (for instance, to achieve the same health impact in different countries, various levels of service might have to be achieved);
- the need to take rehabilitation costs into account in the calculation, keeping in mind the underlying health objectives of Target 10, and the difficulty to assess the extent of the necessary rehabilitation to provide minimum levels of quality and service;
- the lack of consistency and adequacy of existing data and indicators to properly reflect the real situation with respect to WSS (the "*wide discrepancy between the reality…and existing official information*" is underlined).

[45] presumably in 1995 USD

[46] FEASIBLE is a computerised decision support tool, the development of which was funded by Denmark and carried out by COWI with the assistance of OECD, and the purpose of which is to help address financial issues related to the achievement of environmental goals

a) Input data

COWI's uses the following input data:

- population broken down into urban and rural categories (based *inter alia* on official country statistics) and into five different sizes of settlements, from above one million inhabitants to less than five thousand inhabitants, unit costs varying with the average size of towns;
- water supply and sanitation coverage estimates distinguishing between "Improved" & "Not Improved", "Urban Centralised", "Urban Other" & "Rural", mostly coming from the household surveys' estimates published by JMP[47].

b) Main assumptions and rehabilitation needs of the WSS systems [48]

c) Cost functions and unit costs

(Euro per capita)

	WATER SUPPLY	**SANITATION**
URBAN AREAS	• 20% to 50% of network infrastructure and equipment of centralised water systems should be substantially rehabilitated. 30% has been estimated for the majority of countries, though 20% for the Russian Federation and Belarus; • for the share of population not having access to safe water supply, a connection to the existing system is considered as the "improved" technology in the MDG sense.	• 10% to 50% of centralised sewerage collection and treatment systems should be rehabilitated. 10% is assumed for calculation purposes; • a connection to the existing centralised system is considered as the adequate technology for the share of population not having access to sanitation.
RURAL AREAS	• 20% to 50% of existing water supply systems and 20% to 40% of other sources such as wells and springs need rehabilitation; • stand posts with a minor system of supplied water for relatively large urban settlements and hand pumps for smaller villages are assumed to provide safe water to the population without access.	• 10% to 40% of existing rural water technologies need rehabilitation. 40% is assumed for the purpose of calculations; • simple ventilated pit latrine is assumed to provide adequate sanitation.

[47] See however Annex IV where some discrepancies are evidenced, especially as far as sanitation is concerned

[48] the percentages mentioned in this paragraph are based on the substantial amount of data collected from surveys and public sources, and from COWI's own projects carried out in the region over the last ten years – it should be noted that different values appear throughout COWI's draft report for the same data (20%-50% instead of 10%-50%, 20%-50% instead of 30%-50%, 10%-50% instead of 20%-50%)

CATEGORY	Rural village	Small town	Town	Large city
POPULATION	1,000	10,000	100,000	1,000,000
WATER				
Hand pump/protected well	45	45	45	45
New connection treatment	80	45	20	10
New connection distribution	100	100	100	120
Renovation treatment	25	15	7	4
Renovation distribution	30	30	30	40
SANITATION				
Pit latrine ("improved")	40	40	40	40
New connection – wastewater treatment (mechanical)	60	40	20	20
New connection sewer	180	160	150	100

Unit costs are determined using several cost functions, such as the length of the distribution network as a function of the total population and its density, or the pipe density as a function of the total population. Due to their complexity and the fact that they are not fully elaborated upon in COWI's draft report, only the outcome of these calculations is shown below:

These costs are then "calibrated" to price and cost levels in the various EECCA countries.

d) "MDG costs" estimate of reaching of Target 10 over the period 2002-2015

The total cost of reaching Target 10 (the so-called "MDG costs") is defined over the period 2002-2015 (14 years) as the sum of:

- *Cost of service extension*; plus
- *Cost of rehabilitating the existing system* to such a level that it can provide safe and adequate WSS services.

The "MDG costs" are assessed using - for each country - the best estimate for all key input data:

(in million €)

Country	Water supply				Sanitation				WSS			
	Rehab.	Serv. Ext	**Total**	Per capita	Rehab.	Serv. ext	**Total**	Per capita	Rehab.	Serv. Ext	**Total**	Per capita
Armenia	140	0	**140**	44	50	10	**60**	16	190	10	**200**	59
Azerbaijan	260	30	**290**	35	140	200	**340**	43	400	230	**630**	78
Belarus	430	0	**430**	43	190	0	**190**	19	620	0	**620**	62
Georgia	170	10	**180**	42	40	10	**50**	11	210	20	**230**	53
Kazakhstan	520	20	**540**	37	140	20	**160**	12	660	40	**700**	49
Kyrgyz Rep.	170	40	**210**	42	30	140	**170**	34	200	180	**380**	76
Moldova	100	10	**110**	26	40	10	**50**	12	140	20	**160**	37
Russian Fed.	3,850	0	**3,850**	27	2,370	0	**2,370**	16	6,220	0	**6,220**	43
Tajikistan	200	70	**270**	41	20	170	**190**	29	220	240	**460**	71
Turkmenistan	260	10	**270**	51	40	40	**80**	17	300	50	**350**	68
Ukraine	2.050	120	**2,170**	45	660	110	**770**	16	2,710	230	**2,940**	61
Uzbekistan	910	240	**1,150**	46	190	370	**560**	22	1,100	610	**1,710**	69
TOTAL	**9,060**	**550**	**9,610**	**34**	**3,910**	**1,080**	**4,990**	**18**	**12,970**	**1,630**	**14,600**	**52**

The "MDG cost" estimate of € 14.6 billion for the period 2002-2015 is the central estimate out of a wide range of values from € 7 billion to € 21 billion. Approximately two thirds of this estimate relate to water supply, and close to 90% of it to rehabilitation costs (as opposed to service extension costs). The importance of extension service costs in the sanitation sector in Central Asia should be noted.

The average per-capita cost estimate amounts to € 52, varying from € 37 in Moldova to € 78 in Azerbaijan.

e) "Total costs" estimate of reaching of Target 10

COWI goes beyond the mere calculation of "MDG costs" and attempts to calculate an all-in cost (the so-called "Total costs") which also includes O&M and re-investment costs. "Total costs" are the sum of:

- "*MDG costs*" over the period 2002-2015 (14 years); plus
- *O&M costs of the existing system*; over the period 2000-2020 (21 years) ; plus
- *O&M costs of new extensions and additional facilities* to be built over the period 2000-2020; plus
- *Re-investment costs* over the period 2000-2020, i.e. investment costs needed to maintain the same level of quality/service of the existing infrastructure (COWI does not include such costs under the "MDG costs", where the level of quality/service is assumed to be improved above the current level).

This second cost estimate corresponds to an aggregate of costs over two different periods, i.e. 14 years on the one hand and 21 years on the other. It is this estimate that COWI uses to explore the feasibility of financing the cost of reaching of Target 10.

The annual "Total costs" estimates per country are obtained by dividing the "Total costs" estimate by 20:

(in million Euro)

	Water Supply		**Sanitation**		**WSS**	
Country	Total	Per capita	Total	Per capita	Total	Per capita
Armenia	58	18.1	26	7.9	84	26.0
Azerbaijan	102	12.8	87	10.9	189	24.0
Belarus	211	20.9	91	9.0	302	30.0
Georgia	69	15.3	29	6.3	98	22.0
Kazakhstan	233	16.1	100	6.9	333	23.0
Kyrgyz Rep.	80	16.0	30	6.0	110	22.0
Moldova	44	10.2	26	6.1	70	16.0
Russian Fed.	2,408	16.6	1,254	8.6	3,662	25.0
Tajikistan	85	13.1	32	4.9	117	18.0
Turkmenistan	120	22.7	32	6.1	152	29.0
Ukraine	868	18.0	384	8.0	1,252	26.0
Uzbekistan	411	16.5	142	5.7	553	22.0
TOTAL	**4,689**	**16.3**	**2,233**	**7.2**	**6,922**	**23.6**

The **annual "Total costs" estimate of € 6.9 billion per year** appears out of proportion with the so-called "MDG costs": over a 14-year period, it amounts to nearly € 97 billion, more than six times the "MDG costs". In other words, based on COWI's draft report, the real challenge for the EECCA regions in the years to come lies much more with the O&M of the WSS systems and the maintaining of the existing infrastructure at its current level of quality/service than with extension costs or costs incurred to improve the current level of quality/service and bring it at an "MDG Target 10 compliant" level.

A number of points should be clarified or kept in mind in order to have a better understanding of both the "MDG costs" and the "Total costs" estimate calculated by COWI:

- it is unclear whether the population assumption varies in time;
- when it comes to sanitation, COWI's coverage estimates are quite systematically and significantly higher than household surveys' estimates published by JMP[49];
- the calculation method used for the "Total costs" estimate, involving two different periods, needs clarifying. The same applies to the way the annual "Total costs" estimate is calculated.

f) Financing sources and financing gaps

In its draft report, COWI then studies the feasibility of financing the "Total costs" estimate. The three sources of financing available to the WSS sector are assessed and various scenarios designed in order to carry out sensitivity analysis using the FEASIBLE tool:

- User charges, which include the amount of private expenditures used to sustain all forms of non-centralised water supply systems and sanitation facilities and methods (assumed to be equal to the total estimated cost of individual systems, i.e. € 500 million) and represent approximately € 3.7 billion or close to € 143.5 per capita per year.

  The possibility of tariff increases in most EECCA countries is also explored (only Moldova has already reached the affordability limit, with a ratio "household water bill/household consumption expenditures" amounting to 4%, other countries ranking from 0.7% (Belarus) to 2.76% (Ukraine) in this respect). Such affordability reserves can be enhanced by relatively high levels of real income growth prospects in the region.

  Two scenarios are derived from the user charges data:
  - the share of household payments for water services is gradually increased every year and reaches the maximum level of 4% by the end of 2007;
  - the share of household payments for water services is gradually increased every year and reaches the maximum level of 4% by the end of 2007 while consumer expenditures rise by 4% annually in real terms, reflecting the increase in income.
- Public subsidies, for which data collected is said to be subject to some uncertainty. Furthermore, the distinction between investment and current expenditures is often difficult to make. COWI estimates that an amount of € 660 million is available for the WSS sector from public budgets each year, 60% to 80% of which being allocated to cover current expenditures, i.e. € 2.4 per capita. This financing source is by far the largest provider of funds to the sector.

  One scenario provides for the possibility of an increase in the amount of public budget funds, even if it appears unlikely.
- International donors, defined as IFIs and individual country funds provided through national or international development assistance agencies, covering only a small fraction of the WSS financing needs in the region. € 800 million were provided to the EECCA countries in the form of IFI loans between 1995 and 2003, i.e. € 0.36 per capita per year, which, projected to the entire EECCA population would represent € 100 million per year. There is no clear pattern in terms of trend. Bilateral donor assistance stands at about 25% of IFI funds provided (€ 192 million between 1997 and 2001). COWI's assumptions regarding the level of international donor finance during the implementation of the MDG Target 10 programme are not clearly stated, except for bilateral finance which is maintained at its level over the period 1997-2001.

For each country, the following scenarios are run covering the period from 2000 to 2020 using the FEASIBLE tool, evidencing the amount of finance available and the gap between the uses and the sources of funds:

[49] See Annex IV

1. the current state of affairs remains unchanged;
2. the share of household payments for water services is gradually increased every year and reaches the maximum level of 4% by the end of 2007;
3. Same as Scenario 2 and household income rising by 4% annually in real terms;
4. Same as Scenario 3 and moderate growth of public budget expenditures over the whole period.

The situation is obviously contrasted from one country to the other, but the overall picture appears alarming in terms of reaching Target 10 in the EECCA region:

- Scenario 2 only enables **Armenia** to cover O&M costs, and Scenario 3 to fully cover re-investment costs from 2008. The WSS sector should therefore continue to deteriorate until 2008. The total cumulative gap including the "MDG costs" can only be fully covered in 2020 under scenario 4.
- **Azerbaijan** covers its O&M costs as well as 30% of re-investment costs under Scenario 1. Only 50% of re-investment costs are covered under Scenario 2, and 100% under Scenario 3 but only in 2020. No scenario enables to fill in the total cumulative gap.
- No scenario enables **Belarus** to cover its O&M costs. At best, the total cumulative gap reaches € 3 billion by 2020.
- **Georgia** does not cover its O&M costs and re-investment costs under Scenario 4. Its cumulative gap is never closed.
- Scenario 2 enables the full cover of O&M and re-investment costs by 2007 in **Kazakhstan**. "MDG costs" are covered under Scenario 4. Scenario 4 enables the closure of the cumulative gap by 2007.
- In the **Kyrgyz Republic**, not even 50% of the O&M costs are covered under Scenario 1, and hardly 100% of them are covered under Scenario 4 in 2020. Just operating existing WSS infrastructure should present a substantial challenge in the Kyrgyz Republic. The financial deficit should continue to accumulate.
- Under the best scenario, **Moldova** will hardly cover its O&M costs and re-investment costs by 2020.
- Under Scenario 1, **Russia** almost covers its O&M and re-investment costs, i.e. the deterioration process is stopped. "MDG costs" can be covered under Scenario 2. At best the cumulative gap will be closed in 2005.
- **Tajikistan** never covers its O&M costs and the cumulative gap reaches € 1.5 billion by 2020 under the best scenario.
- As WSS services are free of charge in **Turkmenistan**, Scenarios 2 and 3 are not applicable. Scenario 1 is close to full coverage of O&M costs, and Scenario 4 does not enable to fully cover re-investment costs.
- Meeting Target 10 in **Ukraine** will also be very difficult: O&M and re-investment are only fully covered in 2020 under Scenario 4. The cumulative gap is never closed over the considered period.
- In **Uzbekistan**, O&M costs can be covered under Scenario 1, but even under the best scenario re-investment costs are not fully covered.

2.4) Comparing MDG estimates

It is interesting to try and compare the MDG cost estimates calculated in both reports. This exercise can only be carried out for the three countries for which the WB undertook a detailed calculation. Operations and maintenance costs have been deducted from the WB MDG cost estimate, as they are not taken into account by COWI in its "MDG costs' aggregate. Similarly, the cost of establishing new sewerage treatment systems should also have been deducted from the WB MDG cost estimate, but it could not be done as this cost has not been isolated in the WB report:

MDG Cost Estimates	COWI 2002-2015 (14 years) (in million €)			World Bank 2000-2015 (in million 1995 US$)		
	WS	S.	Total	WS	S.	Total
Kazakhstan	565	481	1.046	539	166	705
Moldova	54	93	147	112	48	160
Ukraine	871	402	1.273	2.179	776	2.955

The difference in the periods covered and the currencies used cannot alone explain such a wide discrepancy in the country estimates, both in terms of absolute values and split between cost categories (Water Supply versus Sanitation). The cost of establishing new sewerage treatment systems does not seem to justify the difference between the two MDG Cost estimates either, as in this case the WB estimates should systematically be equal or superior to COWI's ones.

When considering the whole EECCA region however, it should be noted that MDG cost estimates provided by COWI and the World Bank *a priori* appear of a more similar order of magnitude than country estimates. The WB provides a global annual MDG cost estimate of USD 1.1 billion from 2000 to 2015 (presumably in 1995 USD), without including much detail on the calculations however. Over a 14-year period, this would approximately represents € 15.3 million[50] compared to COWI's € 14.6 billion over the period 2002-2015. However, the comparability of these two estimates remain questionable as the assumptions used by the WB in its calculation are not clearly defined: are included O&M costs and the cost of establishing new sewerage treatment systems included in the global CIS MDG cost estimate of the World Bank ? Do both estimates point to a common order of magnitude or is this a mere coincidence? There is no obvious answer to this question as things stand at present.

[50] 1995 USD 1.1 billion = 2004 USD 1.36 billion = € 1.09 billion incl. O&M costs ⇒ € 15.3 billion over the period 2002-2015

CONCLUSION

The recent WB "Global Monitoring Report 2005 – Millennium Development Goals: from Consensus to Momentum" points to the inadequacy of progress made to ensure the reaching of MDGs five years after the Millennium Declaration. This is especially true of the reaching of Target 10 in the EECCA region. Most information sources, be it from the countries themselves through PRS papers, or from consultants or IFIs working in the field, point to the disastrous condition of the WSS sector. The only comprehensive and quantitative study available on the feasibility of reaching Target 10 in the EECCA region, i.e. the COWI report, indicates that this goal will remain out of reach of the region as a whole[51] over the next twenty years, on the basis of "MDG costs" estimated at € 14.6 billion over the period 2002-2015 and "Total costs" estimated at € 138 billion over the period 2000-2020. This valuable finding, as interesting as it might be, can only be considered as indicative in the face of considerable uncertainties still involved in the costing exercise.

However, COWI's conclusions appear logical in the particular context of the region, where (i) public financing is scarce or non existing, (ii) user charges cannot be significantly increased due to affordability constraints, (iii) domestic capital markets generally cannot provide the necessary long term funding, (iv) international private sector, negligible anyway in terms of financial flows to the WSS sector, is no more willing to invest in WSS infrastructure, while domestic private sector, if it exists, suffers from a lack of access to domestic or foreign long term funding, and (v) aid from international donors continues to play a limited role. As clearly stated by the WB in its 2005 Global Monitoring Report, "*the bulk of the increase in infrastructure investment…will have to come from the public sector. Infrastructure spending (investment plus operation and maintenance) will need to rise in all regions to support stronger growth and service delivery consistent with MDG targets*". And the mobilisation of domestic public funds alone will not enable the EECCA region to reach Target 10.

The challenge is all the more daunting that ODA[52] flows in the WSS sector have decreased in the recent years: in its 2004 "Aid for water supply and sanitation" report, OECD notes a "*drastic decrease in average donor commitments for WSS between 1990-2000 and 2001-2002*[53]*…In real terms, bilateral commitments were in 2002 at their lowest level since 1985*". Moreover, ODA flows into the sector have traditionally been concentrated in a relatively few recipient countries (half of the total bilateral and multilateral commitments in 2001-2002 were allocated to just ten recipient countries, none of them being from the EECCA region[54]). The poverty focus of donors' aid also needs changing if Target 10 is to be reached: only 16% of total aid to the water sector in 2001-2002 went to countries where less than 60% of population had access to improved drinking water sources[53]. Hopefully with the Monterrey Consensus, the decline in ODA will be reversed. According to UN secretary General[55], on the basis of recent commitments to future increases by several donors, global annual ODA flows to all sectors should nearly double the levels they

[51] Obviously some countries, such as the Russian Federation, appear in a better position to reach Target 10 than others

[52] Official Development Aid (ODA) consists of financial transfers with a minimum grant element of 25% from government-to-government transfers from OECD member states ("bilateral aid") and from the World Bank's International Development Association (IDA), concessional funds operated by regional development banks and various aid funds of the European Union and several UN agencies including UNDP.

[53] The total annual average aid commitment in the WSS sector worldwide amounted to USD 3.1 in 1999-2000 compared to USD 2.7 billion 2000-2001

[54] Source: OECD 2004 "Aid for water supply and sanitation"

[55] UN Secretary General 2005 "In larger freedom: towards development, security and human rights for all"

had at the time of the Monterrey conference, even though a significant proportion of this amount reflects debt write-offs and dollar depreciation rather than net long-term finance.

With only ten years remaining to reach Target 10, a massive and unprecedented mobilisation of donors and IFIs is more than ever needed to complement efforts at increasing capacity at the national level. Drastic and urgent progress needs to take place, because not pursuing the WSS MDG Target also bears a heavy cost in the form of lost lives, particularly children, increased public health expenditures, and economic loss to the country. But such mobilisation, if achieved, will be short-lived unless an effective progress monitoring system capable to properly assess progress made towards the reaching of MDG Target 10 is put in place. Donors and IFIs increasingly need to be able to demonstrate to tax payers the effective impact of aid funds, failing which they will not be able to sustain their financial efforts. Therefore the first challenge on the way to reaching Target 10 appears to be a methodological one. Below are a few suggestions and issues which, if addressed, could contribute to a significant improvement in the monitoring of progress towards the reaching of Target 10:

1. *Sequencing of tasks*

   It is useful to underline the various steps that should be taken to establish a solid basis for the monitoring of MDG Target 10:

   a) Determination of the proportion of the EECCA population currently having sustainable access to safe and affordable water and adequate sanitation; given the difficulty involved, this could take the form of an iterative process as data collection improves;
   b) Determination of a 2015 WSS access coverage target and intermediary targets between now and 2015;
   c) Assessment of the investment needs related to the reaching of MDG Target 10 and translation of the global target into a development strategy over the next 10 years;
   d) Determination of the amount of external financing needed to achieve Target 10.

2. Indicators

   The weaknesses of the concept of "improved technologies" could be addressed through the determination of new monitoring indicators to account for the functionality, reliability, and quality of WSS services, such as the percentage of drinking water meeting quality standards to be defined, or the percentage of time with uninterrupted water supply. Such indicators could be fed through additional WSS-related questions added to the already existing household surveys. In this respect, the interesting initiative of the WB in the ECA region, currently studying the possibility of improving Indicators 30 and 31 so that they account of quality, reliability and sustainability of services is worth mentioning. Another interesting development is the entering into force this year of the world's first legally binding international instrument in the fight against water related diseases, i.e. the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. This Protocol[56] obliges the signatories to set targets for access to drinking-water for everyone and for the provision of sanitation for everyone, which requires the establishment and the publication of national and/or local targets for the standards and levels of performance that need to be achieved or maintained for a high level of protection against water-related diseases. The coming into force of this Protocol represents an ideal opportunity to revise or complement Target 10 indicators.

3. Baseline year

   The choice of 1990 as baseline year for monitoring MDG Target 10 progress proves irrelevant in the case of the EECCA region. Various options are available:

   - estimate somehow the value of Target 10 indicators in 1990 for all EECCA countries;
   - choose another baseline year common to all EECCA countries;

[56] Among the EECCA countries, Armenia, Georgia, the Republic of Moldova, the Russian Federation and Ukraine have signed the Protocol, and Azerbaijan, the Russian Federation and Ukraine have ratified it

- accept to work with several baseline years corresponding to the earliest years for which countries deem the coverage data reasonably reliable.

The first option is not without risk as the baseline year is key in the whole MDG target setting exercise: a poor 1990 estimate will unavoidably lead to an irrelevant Target 10 level in 2015. The second and third options appear preferable in terms of reliability of coverage estimates in the baseline year, but raise another issue: should Target 10 definition be adapted when the period during which progress should take place is less than twenty five years and if so how? As the status of the WSS sector has deteriorated in the EECCA region since the early 1990s, halving the proportion of the population without sustainable access to safe drinking water and basic sanitation on the basis of a more recent baseline year means making the reaching of Target 10 even more of a challenge for the EECCA region. An option needs to be selected and a methodology determined in order to overcome this difficulty.

4. *Quality, quantity and consistency of data collected*

The availability of quality data consistent overtime is instrumental in MDG progress monitoring. This implies the building of sound and sustainable national statistical capacity and systems in each country. Donors and IFIs are playing a useful role here through funds and technical assistance aid. Progress has already been achieved in the carrying out of Household Budgets Surveys thanks to the combined efforts of international organisations and the countries themselves. Some technical assistance schemes have been implemented to improve the statistical capacity of national entities. The involvement of international organisations in the form of support to Household Budget Surveys and to national data collection and analysis needs to be sustained in order to improve the quality of MDG progress monitoring.

5. *MDG focused national development strategies and MDG needs assessments*

The translation of Target 10 coverage levels in 2015 into a ten-year MDG focused development strategy is no easy exercise but is crucial if MDG Target 10 is to be achieved. Starting from the global 2015 objectives, such strategy should result from an assessment of challenges and needs at the local level, involving local authorities and communities. It should also set intermediary medium-term targets and include a finance strategy evidencing financial gaps in order for donors and IFIs to understand the magnitude of the efforts needed overtime to reach MDG targets by 2015 and induce them to provide financial support. Obviously such strategies need to be "owned" and therefore developed by the countries themselves. The first PRSs issued so far, although far from being comprehensive, constitute an encouraging move in the right direction. In this area too IFIs and donors can provide valuable assistance. For instance, FEASIBLE-based WSS nationwide finance strategies already developed in a few countries with the assistance of the EAP Task Force can prove particularly useful.

6. *A common approach of MDGs and the way they should be monitored*

In order for all stakeholders to co-operate in the field of MDGs, a common language and approach is needed. For instance, although widely used in the specialised literature, MDG costs have no definition. This is illustrated by the difference in interpretation between COWI and the WB. Should wastewater treatment be taken into account for the calculation of the costs to achieve Target 10, although it is not directly implied in the definition of Target 10? Should part of the rehabilitation costs be taken out of the MDG bill?

Another area which needs clarifying is whether the MDG monitoring system allows for the introduction of flexibility to account for country specificities or preferences. For instance, should collected data remain comparable from one country to the other, allowing for a monitoring at the regional or global level, or can it be envisaged that each country adapts the MDGs, thereby making comparison between countries difficult if not impossible?

ANNEX I

Historical background to the Water Supply and Sanitation MDG Target

The water supply and sanitation target outlined in the UN Millennium Declaration and the MDGs is the outcome of several decades of deliberations:

- in 1981, the International Drinking Water Supply and Sanitation Decade was being launched with the objective of providing safe drinking water and sanitation to underserved urban and rural areas by 1990, on the ground that "*all people, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs*";
- in 1990, at the World Summit for Children, heads of state or government called for both universal access to safe water and sanitation by 2000. That same year, the New Delhi Statement adopted at the Global Consultation on safe Water and Sanitation for the 1990s formalised the need to provide, on a sustainable basis, access to safe water in sufficient quantities and proper sanitation for all, emphasizing the "some for all rather than more for some" approach;
- in 1992, Agenda 21 was adopted at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro, which consisted in a comprehensive plan of action to be taken globally and locally by organisations of the UN system, governments and major groups in every area in which human impacts on the environment. The water and sanitation related objectives focused on (i) the promotion of human health and the meeting of primary health care needs for all by 2000 - implying *inter alia* the provision of safe water supply and sanitation -, (ii) the control of communicable diseases through environmental control measures, and (iii) the protection of the quality and supply of freshwater resources[57]. That same year, the International Conference on Water and the Environment in Dublin issued four guiding principles, one of which was that "water has an economic value in all its competing uses and should be recognised as an economic good";
- in 1998, consensus was reached at the intergovernmental level on key water issues at the sixth session of the Commission for Sustainable Development;
- in 2000 and 2001, another two major conferences took place: the second World Water Forum in the Hague and the Bonn International Conference on Freshwater respectively, enabling stakeholders to exchange views and issue new recommendations as to how to address the increasingly challenging problems experienced in the water sector;
- in late 2002, the UN affirmed the Right to Water, noting that such a right is "*indispensable for leading a life in human dignity*" and "a *prerequisite for the realization of other human rights*";
- in 2003, the Third World Water Forum in Kyoto further stimulated global awareness of water problems, encouraging dialogue between different stakeholders and building on the commitments made in Johannesburg.

Although in many cases, considerable progress has been made even though numerical targets have not been reached, the setting of global goals drew attention to the water supply and sanitation needs.

[57] At that time, the cost to develop lower cost but adequate drinking water supply and sanitation services that could be implemented and sustained at the community level was estimated at USD 20 billion/year from 1993 to 2000.

ANNEX II

Water: A Cross-cutting Tool for the Millennium Development Goals[58]

Improved water resources management and access to water supply and sanitation has benefits for each of the eight MDGs:

MDGs AND ASSORTED TARGETS		
GOAL 1: ERADICATE EXTREME POVERTY AND HUNGER		
Target 1:	To halve the proportion of the world's people whose income is less than $ 1 /day	➢ Water is a factor of production in agriculture, industry and economic activities ➢ Investments in water infrastructure/services act as a catalyst for local/regional development ➢ Reduced vulnerability to water-related hazards reduces risks in investments and production ➢ Reduced ecosystems degradation makes livelihood systems more secure ➢ Improved health increases productive capacities, reduces burden on those who care for the sick
Target 2:	Halve the proportion of the world's people who suffer from hunger	➢ Water is a direct input to irrigation for expanded grain production ➢ Reliable water for subsistence agriculture, home gardens, livestock, tree crops ➢ Sustainable production of fish, tree crops and other foods gathered in common property resources (also affects poverty when such goods are sold for income) ➢ Reduced urban hunger due to cheaper food prices ➢ Healthy people are better able to absorb the nutrients in food than those suffering from water-related diseases, particularly worms
GOAL 2: ACHIEVE UNIVERSAL PRIMARY EDUCATION		
Target 3:	To ensure that children everywhere complete a full course of primary schooling	➢ Improved school attendance from improved health and reduced water-carrying burdens, especially for girls ➢ Having separate sanitation facilities for girls and boys in schools increases girls' school attendance
GOAL 3: PROMOTE GENDER EQUALITY AND EMPOWER WOMEN		
Target 4:	To ensure girls and boys have equal access to primary and secondary education	➢ Community-based organisations for water management improve social capital of women ➢ Reduced health, and care-giving burdens from improved water services give women time for productive endeavours, education, empowerment activities ➢ Water and sanitation facilities closer to home put women and girls at less risk for sexual harassment while gathering water and searching for privacy ➢ Higher rates of child survival are a precursor to the demographic transition toward lower fertility rates;

[58] Source: Interim Report of the Millennium Project Task Force on Water and Sanitation and Global Water Partnership

		having fewer children reduces women's reproductive responsibilities
GOAL 4: REDUCE CHILD MORTALITY		
Target 5:	To reduce by two-thirds the death rate for children under five	➢ Improved quantities and quality of domestic water and sanitation reduce main morbidity and mortality factors for young children ➢ Improved nutrition and food security reduces susceptibility to diseases
GOAL 5: IMPROVE MATERNAL HEALTH		
Target 6:	To reduce by three-fourths the rate of maternal mortality	➢ Improved health and reduced burdens from water portage reduce risks ➢ Improved health and nutrition reduce susceptibility to anaemia and other conditions that affect maternal mortality ➢ Sufficient quantities of clean water for washing pre-and-post birth cut down on life-threatening infections ➢ Higher rates of child survival are a precursor toward lower fertility rates, and fewer pregnancies per woman reduce maternal mortality
GOAL 6: COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES		
Targets 7 & 8:	To halve, halt and begin to reverse the spread of HIV, malaria, other major diseases	➢ Better water management reduces mosquito habitats ➢ Better water management reduces risk for a range of water-borne diseases ➢ Improved health and nutrition reduce susceptibility to/severity of HIV/AIDS and other major diseases
GOAL 7 : ENSURE ENVIRONMENTAL SUSTAINABILITY		
Targets 9 & 10:	To stop the unsustainable exploitation of natural resources and to halve the proportion of people who are unable to reach or afford safe drinking water	➢ Improved water management, including pollution control and water conservation, is a key factor in maintaining ecosystems integrity ➢ Development of integrated management within river basins creates situation where sustainable ecosystems management is possible and upstream-downstream conflicts are reconciled ➢ Biodiversity conservation, combating desertification furthered by sound water management
Target 11:	To have achieved a significant improvement in the lives of at least 100 million slum dwellers	➢ Improved domestic water supply and sanitation and better water management reduce the biological pathogens and chemical hazards to which slum dwellers are exposed
GOAL 8 : DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT		

JMP-produced national coverage estimates

The data presented in this Annex result from the processing by JMP of data collected mostly in the framework of user-based surveys (for instance, some of the data collected have been revised by JMP who considered that only 50% of the number of protected wells and springs and 50 % of the number of traditional pit toilet established could be considered as "improved" technology).

Most of these data were subsequently used to derive 1990 and 2002 estimates. Stricken through figures, though collected, were not used by JMP to derive the linear trend line.

"Household connections" are defined by JMP as "piped supplies into the household, plot or yard" in the case of water supply and "connection to a public sewer" when it comes to sanitation.

ARMENIA	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1998 – Health and Nutrition						
- Total population	99	77		~~100~~	~~91~~	
- Household Connections	*97*	*58*		*95*	*33*	
2000 – DHS						
- Total population	99	87		95	60	
- Household Connections	*97*	*72*		*90*	*20*	
2001 – Census						
- Total population	99	75		98	61	
- Household Connections	*96*	*62*		*93*	*20*	

AZERBAIJAN	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1995 – SLC						
- Total population	85	53				
- Household Connections	*68*	*17*				
2000 – MICS						
- Total population	93	58	76	73	36	56
- Household Connections	*74*	*18*	*48*			

BELARUS	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1999 - JMP F6 questionnaire						
- Total population	100	100				
- Household Connections	*78*	*22*				

GEORGIA	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1999 – MICS						
- Total population	90	61		96	69	
- Household Connections	*83*	*30*				

KAZAKHSTAN	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1995 – DHS						
- Total population	98	82		86	50	
- Household Connections	*91*	*33*		*71*	*4*	
1996 – LSS						
- Total population	~~103~~	76		85	54	
- Household Connections	*88*	*25*		*71*	*4*	
1999 – DHS						
- Total population	95	63		90	52	
- Household Connections	*87*	*23*		*75*	*4*	

KYRGYZ REPUBLIC	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1997 - DHS						
- Total population	98	66		75	51	
- Household Connections	*87*	*28*				

REPUBLIC OF MOLDOVA	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1980 - National baseline data						
- Total population	~~85~~					
- Household Connections	*~~59~~*					
1999 – JMP F6 questionnaire						
- Total population	~~100~~	~~100~~		~~100~~		
- Household Connections	*~~97~~*			*~~90~~*		
2000 – MICS						
- Total population	97	88	92	86	52	66
- Household Connections	*78*	*9*	*37*			

RUSSIAN FEDERATION	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1992 – RLMS						
- Total population	98	87		94	70	
- Household Connections	*87*	*49*		*85*	31	
1996 – RLMS						
- Total population	98	86		93	69	
- Household Connections	*89*	*51*		84	30	
1996 – RLMS						
- Total population	98	87		93	69	
- Household Connections	*90*	*51*		84	30	
1997 – RLMS						
- Total population	98	87		93	69	
- Household Connections	*90*	*51*		84	30	
1999 – RLMS						
- Total population	98	87		93	69	
- Household Connections	*90*	*51*		84	30	
1999 – JMP F6 questionnaire						
- Total population	~~100~~	~~96~~				
- Household Connections	~~*98*~~	~~*68*~~				
2000 – RLMS						
- Total population	98	87		91	68	
- Household Connections	*90*	*51*		83	30	
2001 – RLMS						
- Total population	100	89		94	71	
- Household Connections	*92*	*52*		86	31	
2002 – RLMS						
- Total population	100	89		95	71	
- Household Connections	*92*	*52*		86	31	

TAJIKISTAN	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
2000 – MICS						
- Total population	93	47		71	47	
- Household Connections	*82*	*26*				

TURKMENISTAN	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1980 – National base line data						
- Total population	~~85~~					
- Household Connections						
2000 – DHS						
- Total population	93	54		77	50	
- Household Connections	*81*	*29*				

UKRAINE	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
2000 - MICS						
- Total population	100	94	98	100	97	99
- Household Connections	*93*	*49*	*79*			

UZBEKISTAN	% of access to improved drinking water sources			% of access to improved sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1996 – DHS						
- Total population	99	88	93	71	43	55
- Household Connections	*87*	*38*	*60*			
2000 – MICS						
- Total population	94	79	84	76	54	60
- Household Connections	*83*	*29*	*47*			

ANNEX IV

Comparison between coverage estimates published by COWI and latest coverage estimates from household surveys published by JMP

Water Supply % of population with access to improved drinking water sources	Urban	Rural
ARMENIA		
- Census 2001	99	75
- COWI	98	83
AZERBAIJAN		
- MICS 2000	93	58
- COWI	93	58
BELARUS		
- F6 quest. 1999	100	100
- COWI	100	100
GEORGIA		
- MICS 1999	90	61
- COWI	94	61
KAZAKHSTAN		
- DHS 1999	95	63
- COWI	98	91
KYRGYZ REPUBLIC		
- DHS 1997	98	66
- COWI	90	48
REP. OF MOLDOVA		
- MICS 2000	97	88
- COWI	97	87
RUSSIAN FEDER.		
- RLMS 2002	100	89
- COWI	100	100
TAJIKISTAN		
- MICS 2000	93	47
- COWI	78	46
TURKMENISTAN		
- DHS 2000	93	54
- COWI	97	73
UKRAINE		
- MICS 2000	100	94
- COWI	100	92
UZBEKISTAN		
- MICS 2000	94	79
- COWI	90	68

Sanitation % of population with access to improved sanitation	Urban	Rural
ARMENIA		
- 2001 Census	98	61
- COWI	100	100
AZERBAIJAN		
- MICS 2000	73	36
- COWI	90	70
BELARUS		
- COWI	100	100
GEORGIA		
- MICS 1999	96	69
- COWI	100	99
KAZAKHSTAN		
- DHS 1999	90	52
- COWI	100	99
KYRGYZ REPUBLIC		
- DHS 1997	75	51
- COWI	87	64
REP. OF MOLDOVA		
- MICS 2000	86	52
- COWI	99	96
RUSSIAN FEDER.		
- RMLS 2002	95	71
- COWI	100	100
TAJIKISTAN		
- MICS 2000	71	47
- COWI	88	66
TURKMENISTAN		
- DHS 2000	77	50
- COWI	98	84
UKRAINE		
- MICS 2000	100	97
- COWI Ukraine	100	96
UZBEKISTAN		
- MICS 2000	76	54
- COWI	88	68

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