



**Financing Water Supply and Sanitation in Moldova**

**Executive Report**

**JOINT MEETING OF**  
**THE EU WATER INITIATIVE'S EECCA WORKING GROUP**  
**THE OECD EAP TASK FORCE'S GROUP OF SENIOR OFFICIALS FOR WATER SECTOR REFORM IN**  
**EECCA**

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**February 2008**

## List of acronyms and abbreviations

ACTD	Agency for Construction and Territorial Development
BOD	Biochemical oxygen demand
BNS	Bureau of National Statistics
EAP TF	Environmental Action Programme Task Force
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EGPRSP	Economic Growth and Poverty Reduction Strategy Paper
EU	European Union
EUR	Euro (currency of the European Monetary Union)
GDP	Gross Domestic Product
GoM	Government of Moldova
IBNET	International Benchmarking Network
IFI	International Finance Institutions
ISFM	Investment Social Fund of Moldova
KFAED	Kuwait Fund for Arab Economic Development
Lcd	Litres per capita per day
MAC	Maximum Allowable Concentration
MACA	Moldova Apa Canal Association
MDGs	Millennium Development Goals
MDL	Moldova Lei
MEC	Ministry of Economy and Commerce
MERN	Ministry of Environment and Natural Resources
MoF	Ministry of Finance
MoLPA	Ministry of Local Public Administration
M3/s	Cubic metres per second
NEAP	National Environmental Action Plan
NEF	National Environmental Fund
NIS	Newly Independent States
O&M	Operation and maintenance

OECD	Organisation for Economic Co-operation and Development
PRSP	Poverty Reduction Strategy Paper
PS	Pumping Station
TA	Technical Assistance
TDS	Total Dissolved Solids
UfW	Unaccounted for water
USD	United States Dollars
WHO	World Health Organisation
WS	Water Supply
WSS	Water Supply and Sanitation
WW	Wastewater
WWPS	Wastewater Pumping Station
WWTP	Wastewater Treatment Plant

#### **Currency equivalents**

Currency Unit = Lei  
 EUR 1 = 16.5 Lei

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## MAIN FINDINGS AND RECOMMENDATIONS

### Introduction

The study “Facilitating Policy Dialogue, and Developing a National Financing Strategy for Urban and Rural Water Supply and Sanitation in Moldova” (Financing Strategy) was initiated in support of Government prioritisation of the water supply and sanitation (WSS) sectors, and implemented by a steering group led by the Ministry for Local Public Administration and bringing together all major water sector stakeholders in Moldova. The project received the technical assistance of the OECD/EAP Task Force and the EU Water Initiative and financial support from the EU Water Initiative Finance Working Group, the EC, Germany and the UK.

Different Government sector policy targets have been identified and assessed in the study:

**Table 1 Alternative WSS sector targets and beneficiaries**

<b>Policy targets</b>	<b>Urban</b>	<b>Rural</b>	<b>Total 20 year expenditure EUR Million</b>
1) Baseline: To halt deterioration of existing WSS infrastructure and provide modest improvements	Improved O&M Reinvestment in old infrastructure Very modest improvements	Very modest capital investment improvements	1320
2) Baseline + Meeting the MDGs on WSS*	As baseline	Investment in non-piped supplies Modest investment in simple piped water supplies Investment in on-site sanitation	1820
3) Baseline + EC Directives**	As baseline, plus: Water supply extensions to reach 95% of population in urban settlements. Wastewater extensions to reach 90% connections to urban towns. Water and wastewater treatment	As baseline	1840
4) Baseline + MDGs + critical WWTPs	As Scenario 2 plus full rehabilitation of 7 WWTPs	As Scenario 2	1910
5) Baseline + MDGs + EC Directives	As Scenario 3	As Scenario 2	2340
6) Draft Government Strategy (1)	All targets	MDGs	3240
7) Government Strategy (2, Revised***)	As (6) but re-scheduled	As (6) but re-scheduled	2845

\* it is assumed that in Moldova MDGs on WSS will be met by year 2022

\*\* the following EC Directives were taken into consideration: Urban WWTPs; Drinking Water, and Water Framework Directives

\*\*\* Following a draft of this paper, the Government revised their strategy to re-schedule the bulk of investments to after 2012, and slightly lowering the total level of investments up to the planning horizon of 2025

The alternative targets have been simulated to reveal their financial consequences; their financial feasibility and affordability have been assessed.

The main findings and recommendations of this study, as agreed by the final meeting of the Steering Group, held on 8<sup>th</sup> November 2007, comprise the following.

### **Main findings and conclusions**

- The current level of financing for the water supply and sanitation sector from key sources (user charges, international loans and grants and government budgetary support to the sector) is not sufficient to maintain assets at their current low operational levels, nor to provide adequate levels of service (a willingness and ability to pay survey in two towns has revealed that some 40% of the households that have access to piped water supply face daily shortages and a large proportion of households consider the water quality to be poor).
- As a result of inadequacies of the existing piped water supplies around 50% of the total household expenditure on water supplies goes on purchasing bottled water and maintaining supplementary water supply sources. Furthermore, the results of the limited willingness and ability to pay survey undertaken in the framework of this study, show that the lowest income groups would be willing to spend around 5% to 7% of their monthly income on adequate water supply services.
- The main constraints to the sector development include:
  - Poor condition of assets
  - Under financed O&M
  - Low management and implementation capacity
  - Inadequate metering
- The baseline scenario aimed at halting deterioration and providing modest improvements resulted in challenging increases in user charges (from 3% to 5% of household disposable income - that is to the affordability limit), government budgetary support (from 0.5% to 2.3% of total public expenditure) and international financing (from €5 million to €17 million per annum). A higher level of expenditure would hardly be realistic at the current time.
- Meeting the more ambitious government targets in the timeframe of the approved Government Strategy for water supply and sanitation (WSS) sector development (sector policy target 7 in table 1) will require about 160% the level of funding identified for the less ambitious target 2 (in table 1), which is designed to achieve the water-related MDGs. This suggests the need for careful prioritisation and phasing in order to make the best use of scarce financial resources.

### **Recommendations**

#### ***Policy***

- Due to limited financial resources, existing Government policy targets in the WSS sector need to be prioritised. A suggested order of priority is:
  1. Halt deterioration of existing infrastructure and improve cost recovery performance of the WSS sector
  2. Meeting the Millennium Development Goals (MDGs) for WSS



3. Pollution reduction to critical discharges to international waters
  4. Implementation of EC Directives on WSS and the Water Framework Directive.
- The Government's priority for the WSS sector needs to be reflected by increased budget allocations to the sector in the Government's Medium Term Expenditure Framework (MTEF) and annual budgets.

### *Prioritisation of investments*

- Prioritisation of investment projects in the WSS sector must be transparent and follow Government policy objectives, such as those recommended by the Economic Growth and Poverty Reduction Strategy Paper (EGPRSP) and reflected in this Financing Strategy.
- The overriding objective of Government Policies is to improve the living conditions of the people of Moldova. *Inter alia* by reducing substantially the health risks associated with water and wastewater. To achieve this wider objective, a number of secondary objectives are required. They are presented below, in a suggested order of prioritisation:
  1. **Reduce water related morbidity:** this is the Government's stated first priority, and is fully supported.
  2. **Halt deterioration of existing infrastructure:** ensuring the viability of existing systems through improved maintenance and replacement of defective infrastructure, is also seen as more important than investing in extensions and new schemes.
  3. **Improvements in efficiency and reliability of existing systems:** these initiatives will have priority over extensions to existing systems.
  4. **Increase availability of safe water and sanitation to meet MDGs:** This would be mainly achieved in rural areas. In urban areas, extensions to existing systems should have a lower priority, as improvements to reliability and efficiency are needed to reduce health risks and also operational costs, and are considered mandatory before extensions are considered in urban areas.
  5. **Reduction in pollution:** reduction of pollution to international waters is seen as having priority over reduction of pollution to internal waters.
  6. **WSS sector priority:** water supplies are generally given priority over sewerage schemes, *inter alia* because the health benefits of water supply schemes are generally more readily demonstrated.
- Public awareness of WSS sector issues needs to be improved and local communities involved at project inception stage, including an assessment of their willingness and ability to pay for water.
- Donor coordination meetings should provide an open forum for exchange of views and help link transparently prioritised investment projects with donor objectives.

### *Institutional*

- Clearly define responsibilities for regulation, planning, implementation and management between National and Regional bodies. Once defined, improve their capacities through Technical Assistance (short-term), recruitment and training (long-term).

- Establish an independent WSS Sector Regulator, with the clear objective of protecting the interests of both consumers and service providers by establishing tariffs to recover the full O&M and replacement costs, whilst ensuring that tariffs are affordable for the consumers.
- Establish regional water utilities to improve management capability and also allow closer coordination with local communities for planning. A uniform tariff in each region will also provide a level of equity between rural and urban communities, and a degree of poverty alleviation.
- Strengthen current metering policy to reduce unaccounted for water.
- Adopt international standards and procedures for procurement and implementation (to attract external financing and improve implementation capacity)
- Create incentives for operational efficiency by considering the use of performance based contracts between municipal owners of WSS infrastructure and WSS services providers, including the use of management contracts awarded to the private sector through competitive bidding. Improve operational efficiency focusing on water and energy savings.
- Improve monitoring arrangements for the sector, particularly in the rural areas.

## INTRODUCTION

This report is organised into four parts to reflect the four stages of the study, as follows:

- Part I: “Existing situation and Baseline Scenario”
- Part II; “The social dimension of the Financing Strategy”
- Part III: “A realistic financing strategy for WSS”:
- Part IV: “Integrating the financing strategy into the policy framework”.

### PART I: EXISTING SITUATION AND BASELINE SCENARIO

This part of the report describes the status of the water and wastewater infrastructure in Moldova, and presents a baseline scenario reflecting the minimum level of funding required to halt further deterioration of the country’s infrastructure.

#### Water Resources

The availability and quality of water resources plays an important role in influencing the type of water and sanitation infrastructure most appropriate to the conditions in Moldova, and to the economics of supply as follows:

- The use of surface water as a source of drinking water is largely restricted to the use of the Dniester and Prut Rivers, due to reliability and water quality constraints of internal watercourses and impoundments.
- The yield of shallow wells is generally suitable for manual abstraction, but is unlikely to be sufficient for pumped supplies. Higher yields can be obtained from deeper aquifers, but the investment and running costs can be deterrents to low income communities.
- Groundwater quality problems in Moldova include high levels of Hardness, Total Dissolved Solids, Selenium, Nitrates, Sulphates, Fluoride and Chloride.
- Water quality in shallow wells is impacted by its location with respect to housing rather than agriculture. High levels of Fluoride are related to geological factors rather than land use.

#### Existing situation

Some key indicators for the existing infrastructure for both urban and rural settlements for different sized towns and villages are summarised below:

**Table 1.1. Key Indicators (2005 figures)**

Size of town	Nr	% of population	% WS connections	% sewer connections	Per capita consumption lcd
> 200,000 (Chisinau)	1	17%	93%	81%	193
50,000-200,000 (Balti)	1	4%	80%	64%	77
20,000-50,000	6	4%	72%	55%	78
5,000 – 20,000	35	12%	61%	36%	44
0-5,000	11	1%	68%	33%	35
Rural settlements(1)	1472	61%	12%	5%	33

Source: MACA data base for year 2005

(1) Consultants estimates, based on 2002 survey results

The consumption levels indicate a dramatic reduction from the pre-independence (Soviet) design norms, resulting in the infrastructure being significantly under-utilised. This reduction resulted mostly from the introduction of billing based on individual water-meter reading, and tariff increases associated with this process. But due to the low quality of the meters in use, with meters not reacting to low flow and also allowing manipulations, the water consumption is likely to be substantially under-reported.

The poor condition of the infrastructure is evident from the irregularity of supplies, high levels of pipe bursts (40 times higher than Western Europe), high sewer blockage rates, and high levels of unaccounted water (UfW).

Apart from Chisinau and Balti, which appear reasonable, the urban wastewater treatment plants fail to meet the required effluent standards for about 70% of the time, while **several hundred** piped sewerage systems and treatment plants built in rural areas before 1992 do not operate at all.

The infrastructure for many of the smaller towns have been built relatively recently (around 30 years ago), but the poor quality of materials and workmanship, and insufficient funds for maintenance and reinvestment has resulted in serious deterioration, with many systems on the point of collapse. Each town is different, and the specific needs of each town need to be examined in detail. Nevertheless, in all cases financing policies need to be urgently put into place to start replacing those components of the systems, which are in worst condition, and which lead to inefficient operations and poor service standards.

Existing expenditure for the sector approximately covers operating and maintenance costs, which are around 60% of required levels. They do not cover the reinvestment costs required to halt further deterioration of the assets, nor do they cover the rehabilitation works necessary to bring service levels back to design levels or any investments to extend service coverage.

### **Baseline Scenario**

In the context of the existing unsatisfactory situation, and the Government's policy to improve water and wastewater infrastructure, it was considered that a baseline scenario projecting the current unsatisfactory situation would not be appropriate. The baseline therefore assumes investments to halt further deterioration of the infrastructure (re-investment or replacement), to provide some modest improvements to serviceability (renovation of rehabilitation), and extensions to reduce some of the more acute inequalities, as summarised below:

- The base year is 2006 while the start year for scenario implementation is 2007
- Planning period to be to 2026
- Population to remain at current (2006) levels
- Full cost recovery of operation and maintenance costs
- Annual investment in replacement of assets based on 1/nth of replacement value, where n = average life of assets (in years).
- Rehabilitation of 25% of water and wastewater networks (12.5% for Chisinau, which has recently undergone significant rehabilitation) (2008 – 2022)
- Rehabilitation of 50% of pumping equipment (2008 – 2022)
- Rehabilitation of 25% of treatment plants (2008 – 2022)
- Service extensions to bring connection levels of towns to certain minimum levels (2008 – 2022)<sup>1</sup>
- Modest improvements to rural water supplies by upgrading approximately 11.5 % of hand dug wells with poor water quality to deeper groundwater or surface water sources, as appropriate.
- Upgrading “on-site” sanitation to approximately 20% of the rural population<sup>2</sup>

It should be emphasised that the costs of rehabilitation have been estimated using the actually required capacity rather than the existing capacity, which is generally far in excess of the requirements.

The purpose of setting these targets was to provide a baseline from which other development options can be compared. It should be stressed that this does not imply any Government or official approval or obligation to this scenario.

### **Projected Baseline Expenditure (EUR 1 = 16.5 Lei)**

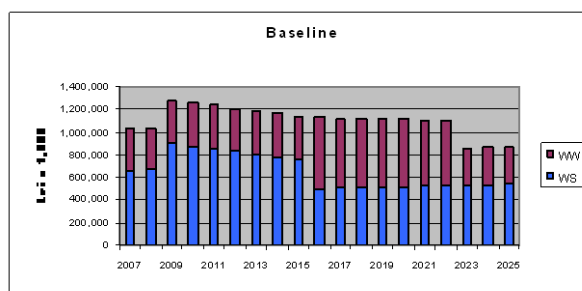
The annual projected expenditure of the baseline scenario is shown in Figure 1.1, which averages at around Lei 1,000 million per annum.

<sup>1</sup> Minimum connection levels:

Population	Percent connections to WS	Percent connections to WW
> 200,000	93%	91%
50,000 – 200,000	80%	65%
20,000 – 50,000	70%	50%
5,000 – 20,000	60%	40%
< 5,000	50%	30%

<sup>2</sup> The majority of Moldova’s rural population use simple pit latrines for defecation and urination. These latrines are often associated with flies, smells and accompanied health risks. However, these facilities can be a suitable solution, (where population densities are not high) by simple measures such as fitting a cover to the defecating hole, by making the facility easily maintained and cleaned, and by the use of appropriate hygienic practices.

**Figure 1: Total annual expenditure of baseline scenario.**



The expenditure split between the water and wastewater sectors was:

- Water: 60%
- Wastewater: 40%.

Baseline expenditure by type of expenditure, and the impact on the average tariff level, (assumed at an index level of 1.0) that would be required to meet cost recovery are shown below:

**Table 1.2: Baseline expenditure: impact on tariffs, by type of expenditure**

Component	% of total expenditure	Impact on existing average tariff level (1.0)
a) O&M	39%	a) = 1.3 x current tariff level
b) Reinvestment	45%	a) + b) = 2.8 x current tariff level
c) Renovation	12%	a) + b) + c) = 3.2 x current tariff level
d) Extensions	4%	a) + b) + c) + d) = 3.4 x current tariff level

Approximately three times this level of expenditure for extensions would be required to meet the millennium development goals for WSS (assuming low cost, non-piped water supply and sanitation solutions for rural areas).

The distribution of baseline expenditure between the different sizes of towns, can be compared with the percent of total population served as follows

**Table 1.3: The distribution of baseline expenditure between the different sizes of towns**

Size of settlement	Percent of baseline expenditure	Percent of population served
> 200,000 (Chisnau)	57%	60%
50,000 – 200,000 (Balti)	8%	9%
20,000 – 50,000	10%	11%
5,000 – 20,000	22%	19%
< 5,000	2%	1%

## Financing for Baseline Scenario

Ultimately, there are three basic mechanisms at the disposal of the Government to finance the proposed investments. These include:

- User charges for supply of water and wastewater services
- National public budget support for capital investments and operations
- External donor contributions for capital investments

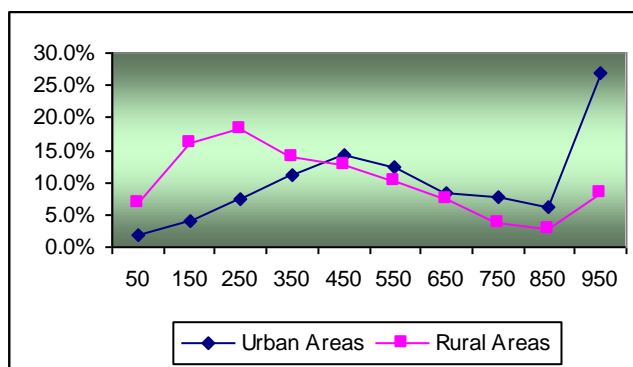
### *User Charges*

In an ideal situation, the tariffs levied on consumers should fully recover the economic cost of services generating sufficient revenues for service providers to undertake all necessary maintenance and capital investments. However, this has rarely been achieved in the economies in transition as a result of financial constraints to undertake critically needed investments and low household incomes to realise cost recovery tariffs.

Consequently, a more realistic short to medium term objective could be to achieve full recovery of operation and maintenance and re-investment costs. With the expected growth of the national economy and increases in real incomes of households, the tariffs should be increased to levels based on internationally acceptable criteria for affordability while widespread metering would enable households to manage demand more effectively to reflect their own priorities and affordable consumption patterns

### *Income Levels*

The distribution of average monthly disposable household income per capita for both rural and urban areas of Moldova in 2005 in Lei is shown in the Figure

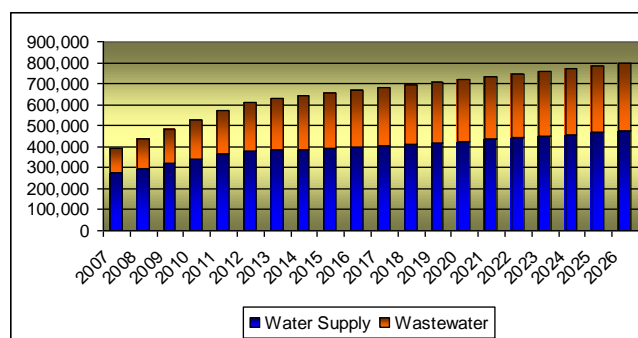


The distribution of rural income is skewed by a relatively large proportion of households in the low income brackets.

### *Tariff Levels and Consumer Affordability*

Majority of international financing institutions and EU agencies adopt affordability criteria which recommend that household expenditure on water and wastewater services should not exceed 5% to 6% of its monthly income. An analysis was undertaken to determine the present consumer affordability levels for the urban water supply and wastewater systems in the country. The results highlight that the current levels

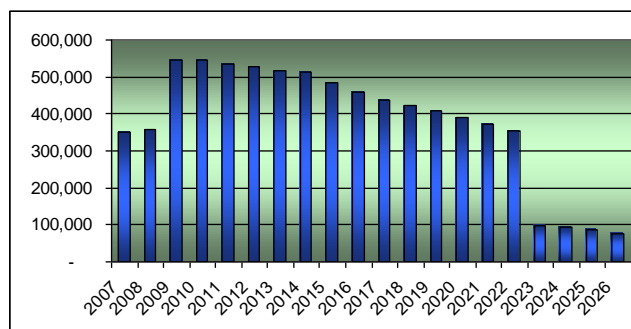
of expenditures on water and waste services are well below the affordability thresholds. The household expenditures for WSS services account for less than 3% of household income in most cases. However, this estimate excludes the additional expenditure incurred by households in maintaining supplementary sources of supply, such as shallow wells and purchase of bottled water as a result of inadequate piped water supplies and poor water quality. A household survey undertaken for the study for two small to medium size towns also revealed that on average households spend around 3.8% to 5.4% of their income on water supplies, while those in the low quintile up to 6-7% of their income on water.



*Projected Revenues from User Charges – Lei ('000)*

The projected revenues increase until the user charges reach the 5% affordability threshold in 2015 and increase gradually thereafter in line with projected income increases. The contribution of user charges is estimated to generate revenues of Lei 7.9 billion from water supplies and Lei 5.1 billion from wastewater services in constant 2006 prices over the 20 year period. However, the total revenues of Lei 13.0 billion are far short of the total expenditure of Lei 21.8 billion over the period.

*Projected National Budget Support (Lei '000)*

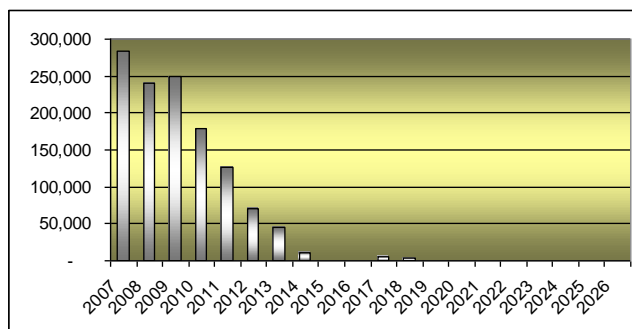


The projected national public budget support totals Lei 7.6 billion for water supply and wastewater over the 20 year period. In 2007 and 2008 it accounts for 1.7% of forecast overall public expenditure compared with the planned expenditure of just 0.5% in 2006. In 2009 it would increase to around 2.2% and gradually decline as a proportion of total overall expenditure between 2010 and 2022. This is not over optimistic in comparison with the allocations for the water sector from national budgets at the levels of around of 4% to 5% of total government expenditure in some other Former Soviet Republics such as in Armenia.



### **Projected External Financing Needs (Lei '000)**

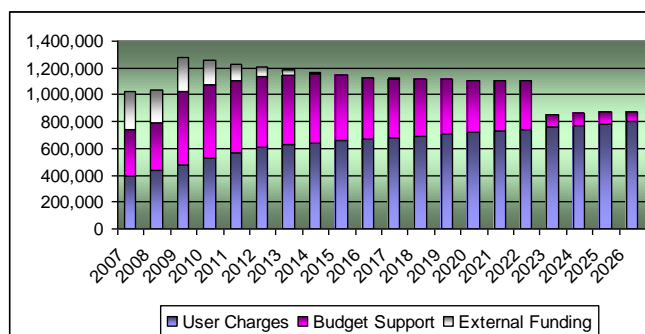
The involvement of external bilateral donors and IFIs, who could provide much needed grant and loan funds for the sectors, has been fairly insignificant.



The projections show relatively large contributions needed from external donors and IFI’s to meet the needs of the water and wastewater sectors and bridge the financing gap left after the revenues from user charges and support from the national public budgets are taken into account. While the projections show large contributions in earlier years and none after about 2014, the reality may be that external donor involvement continues over the long term. This has been the case in most of the new EU member states and in fast growing “tiger” economies of the Far East where external donors involvement in water and sanitation sectors has lasted over 50 years. In such an event, the contribution from national budget support would be reduced but significantly increased external financial support in the short or over the longer term would need to be matched by very substantial improvements in implementation and absorptive capacity of the national and local institutions in Moldova involved the water and sanitation sector. International donors are usually reluctant to provide support in the absence of these development and prevailing conditions of transparency, integrity and accountability at all levels. Nevertheless, on the basis of above projections, a total of Lei 1.2 billion of external financing is needed over the period. This would take up almost half of the Government’s forecast for overall external financial assistance to Moldova between 2007 and 2009 and a significant proportion until about 2016 to fulfil the expenditure needs of the Baseline Scenario.

### **Concluding Remarks**

Projected revenues from user charges cover 59% of the total requirements over the 20 year period.



National public budget support to the WSS sector is projected to contribute 35% of the total financing.

The projected financing from external donors would contribute to 6% of the total financing requirements.

It should be emphasised that the baseline scenario in essence represents a fairly minimum level of intervention needed to address the requirements of the water and wastewater sectors. Nevertheless, it needs challenging initiatives to finance the requirements. The projections shown here for increases in user charge revenues, public budget support, and external financing are substantially greater than the levels of financing ever achieved before.

## PART II: THE SOCIAL DIMENSION OF THE FINANCING STRATEGY

### Introduction

Sustainable access to improved sources of water supply and improved sanitation are priorities stipulated by the Economic Growth and Poverty Reduction Strategy Paper (EGPRSP) for Moldova, UN Millennium Development Goals (MDGs), as well as the National Program for Water and Sewerage (NPWS) in the Republic of Moldova.

The focus of this part of the report is to present the findings of the case study on ability-to-pay (ATP) and willingness-to-pay (WTP) assessments of households in two small to medium size towns in Moldova.

### *Household Survey*

To assess the household's willingness and ability to pay for improved water and sanitation services it is necessary to collect data to determine the availability of alternative water supply sources, the modality of their usage for different purposes, water quality and the level of population satisfaction with water supply services. In this context, one of the most appropriate tools for data collection is the household sampling survey, as the water utility sources offer information only about the general status of infrastructure and operating data, but little about the usage and reliability of water and sanitation services and almost nothing about consumer satisfaction with the status of existing services.

As part of the present study, a household survey was undertaken in 2007 in Moldova for two small and medium size towns to assess the prevailing situation with regard to consumer perceptions about reliability and quality of existing water supply services and the willingness and ability of households to pay for piped water supplies of acceptable quality. The survey is the source of all data, tables and charts presented in this section and in Part II of the main report.

This section presents key findings of the survey. The existing water supply characteristics of the households surveyed in the two towns are summarised in Table 2.1 below.

**Table 2.1. Water Supply Characteristics of the Survey Households**

	Causeni	Nisporini
Population	17,685	12,041
Access to piped water supplies	72.3%	32.5%
No access to piped water supplies	27.7%	67.5%

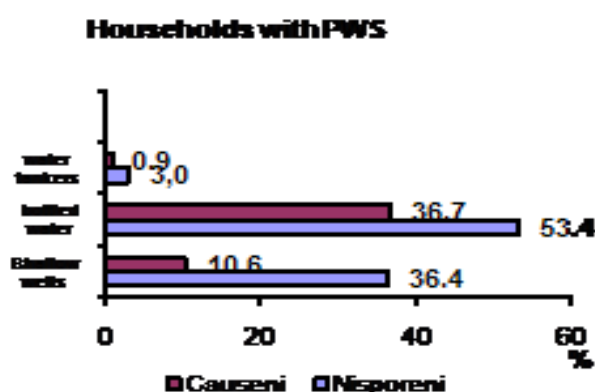
The water supply characteristics are considered to be fairly representative of the small to medium size towns in the country with either relatively large proportion of population with access to piped water supplies (PWS) in some areas, or those towns which have very limited access PWS and large proportion of the households have to rely on alternative sources of supply to satisfy their basic water consumption requirements.

The pattern of household's water usage is largely dependent on the water supply source and implicitly on its availability, quantity and quality. In many instances households use multiple water supply sources to satisfy their different needs.

### Water Supply Sources

The main alternative water supply sources for the households without PWS in both towns are shallow wells. Thus, in Căușeni, the share of households without PWS which obtain water from shallow wells is 68.6%, and in Nisporeni the use of this source increases to 88.1%. In addition, 54.4% of the households in Căușeni purchase water in bulk from water tankers, including 40.7% of households that have shallow wells as well.

**Figure 2.1 Water sources used by households with and without PWS (% households)**



In the case of households with access to PWS, it was found that 36.4% of such households in Nisporeni also use water from shallow wells; while the share of such households for Căușeni is 10.6%.

Bottled water is used widely, by 45.1% of households from Nisporeni and 29.4% of households in Căușeni. Bottled water is used by both categories of households with PWS and without PWS. The share of households with PWS buying bottled water in Nisporeni accounts for 53.4% while those without PWS is 41.1%. An explanation for this situation would be the poor quality of water from PWS, a fact emphasized by the households as discussed below.

On the question of water quality in the two towns, the survey results show that in Nisporeni 75.1% of the total households with PWS have assessed the water quality as poor and buy bottled water. In Căușeni, about one third of the households with PWS – those who perceive water quality to be poor from PWS - buy bottled water.

### Water Shortages / Rationing

Water shortages / rationing remains a problem for 63% of the households, out of which 39% face this difficulty on daily basis, 4% weekly, and for 19% of the households in the two towns this is a seasonal problem.

Out of the total number of households that have access to PWS, only 32.4% do not have problems with water shortages / rationing compared with 43.4% of the households that do not have access to PWS. However, 39.5% of households with access to PWS and 38,0% of households with no access to PWS face the water shortages on daily basis.

## Household Expenditure for Water Supplies

In discussing the household expenditure for water supplies and other essential goods and services the following should be noted:

- The expenditure for dwelling maintenance includes the expenditures for PWS, expenditure for well maintenance and for water supplied by tankers;
- The expenditure for purchase of bottled water are included in the expenses for food;`
- The category “expenditures for water supply” covers all the costs associated with household’s supply of water including PWS, bottled water, costs of supply from water tankers and expenses incurred in well maintenance.

Household’s average monthly expenditures total 1420 Lei in Nisporeni and 1,339 Lei in Căușeni.

**Table 2.2 Household’s average monthly expenditures for dwelling maintenance, food and water, by locality**

	Nisporeni	Căușeni	Nisporeni	Căușeni
	Lei		%	
Household’s average monthly expenditures, including:	1420.6	1339.2	100.0	100.0
Expenditures for dwelling maintenance	315.1	336.3	22.2	25.1
Expenditures for food procurement	720.0	651.3	50.7	48.6
<b>Total expenditures for water supply</b>	<b>76.7</b>	<b>51.2</b>	<b>5.4</b>	<b>3.8</b>

### *Expenditure on Water Supplies*

The average values of the total household expenditures related to water supply vary depending on the locality: from 76.6 Lei in Nisporeni to 51.2 Lei in Căușeni. The distribution of total expenditures also differs according to type of water usage. This is summarized below in Table 2.3

One of the key findings is that in Nisporeni both types of households, with and without access to PWS, incur the largest proportion on bottled water accounting for 47% and 52% of the total expenditure on water supplies respectively.

In Căușeni, those households with access to PWS incur about 50% of the total water expenses on bottled water. Expenditure on bottled water accounts for only about 10% for households without access to PWS.

**Table 2.3 Breakdown of Total Average Expenditure on Water Supplies for Households With and Without Access to PWS**

	Nisporeni		Căușeni		Nisporeni		Căușeni	
	PWS	No PWS	PWS	No PWS	PWS	No PWS	PWS	No PWS
	Lei				%			
<b>Water supply expenditures, total, including:</b>	99.1	65.9	50.9	52.0	100.0	100.0	100.0	100.0
<b>Bottled water</b>	47.0	34.3	25.7	5.4	47.4	52.1	50.5	10.4
<b>Well maintenance</b>	11.4	31.5	0.1	6.4	11.5	47.9	0.2	12.4
<b>PWS water</b>	37.5	0.0	25.1	0.0	37.9	0.0	49.3	0.0
<b>Water tankers</b>	3.2	0.0	0.0	40.2	3.3	0.0	0.0	77.2

### **Willingness to Pay for Improved Water Supplies**

The household survey assessed the willingness to pay for piped water supplies – given that the quality of the service is improved and complies with a minimal standard. It was not the objective of the survey to assess the consumer perception concerning improvements to all alternative water supply sources which are only used because piped supplies are either inadequate or households do not have access to them.

Willingness to pay for improved piped water supply is greatly influenced by the difficulties encountered by those households connected to PWS as well as those households without access to PWS. The results of the survey show that overall the willingness to pay for improvements is substantially higher in Nisporeni where households face more difficulties with water supply and poorer quality of water obtained from shallow wells as well as from PWS systems:

While in Causeni almost half (42.5%) of the households are not willing to pay more or are willing to pay only current amounts for future improvements in piped water supplies, the share of such households in Nisporeni is four times smaller (10.5%).

While in Căușeni the share of households that are willing to pay Lei 40 or more monthly for improved piped water supply amounts to 35%, in Nisporeni the share of such households is almost twice as high (74.7%).

It is also evident from the responses that the consumer behaviour is governed by a combination of complex factors that are not necessarily consistent. On the one hand, the consumers would like to see improvements to their water supply services but at the same time many of them are reluctant to pay any more than at present, and in fact, would prefer to pay significantly less for improved piped water supply than they pay at present for all water supplies. Such responses are usually associated with households that do not perceive serious problems with the existing service levels and are able to cope more easily with inconvenience.

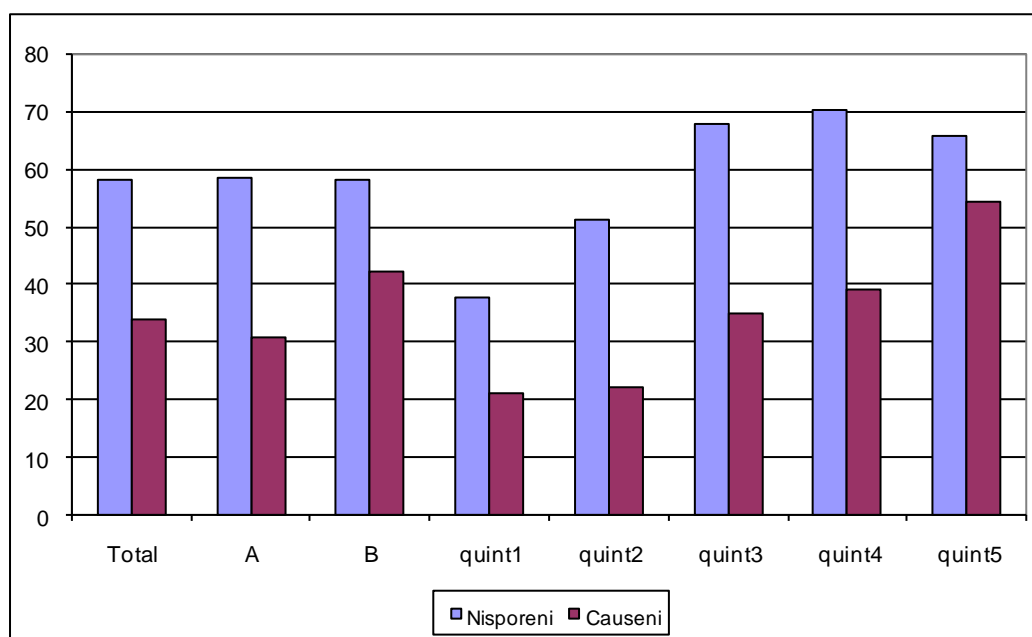
The willingness to pay over and above the current levels generally goes up more significantly in the situation where households perceive or face more difficulties with existing service levels and would value the convenience of having access to adequate water supply services. This fact is verified by the responses

of the households from Nisporeni, which face much greater problems with their existing services levels. Nevertheless, survey results based on difficult parameters such as “human nature” where responses may not truly reveal real preferences, should be treated with caution. For example, the respondents may think that if they state higher willingness to pay they may be faced with higher water charges in the future and by stating their desire to pay less than they pay at present they perceive this may shield them from any further increases in water charges in the future.

**In Nisporeni:**

- The average value of the maximum amount that the households would be willing to pay for improved PWS is **58.2** Lei per month with no significant differences between the households with and without access to PWS. The median value of this indicator does not differ significantly from the average value and comes to 60 Lei. This needs to be compared with **37.5** Lei per month the households with access to PWS pay at present for the poor quality piped water supply service (see Table 2.3);
- The average value increases significantly for households in higher income quintiles (see Figure 2.2).

**Figure 2.2 – Average Amount Households are Willing to Pay for Improved Piped Water Supply Services, by Income Quintiles (Lei per month)**



Note: A (with access to PWS)

B (without access to PWS)

**In Căușeni**

- The average value of the maximum amount that the households are willing to pay for improved service is **34.1** Lei monthly, with differences depending on whether the households have access to PWS (31 lei) or not (42.2 lei). This needs to be compared with **25.1** Lei per month the households with access to PWS pay at present for the poor quality piped water supply service (see Table 2.3);

- As would be expected the average value increases to 54.3 Lei per month for the highest income quintile category.

In general, it is noted that the households in Nisporeni are willing to pay for improved pipes water supply service amounts that are 1.2 to 2.3 times higher than in Causeni reflecting the persistent problems of water supply shortages faced in Nisporeni.

### Ability and Willingness to Pay for Improved Service

Based on the results of the willingness to pay assessment the statistics summarized in Table 2.4 below show the ability to pay and the willingness to pay for improvements:

**Table 2.4 Ability and Willingness to Pay for Improved PWS service**

Income	Mean (Lei per month) Per Household		Percentage of Income Households are Willing to Pay for Improved PWS Service	
	Nisporeni	Causeni	Nisporeni	Causeni
1	532	622	7.1%	5.0%
2	989	1,260	5.2%	1.8%
3	1,602	1,736	4.2%	2.1%
4	2,517	2,367	2.8%	1.6%
5	3,773	3,737	1.8%	1.4%
<b>Total</b>	<b>1,843</b>	<b>1,915</b>	<b>3.2%</b>	<b>1.7%</b>

#### Nisporeni

- Lower income households are willing to pay between 5% and 7% of their income for improved PWS;
- The households are willing to pay for improved PWS on average **55.2% more** than the households with access to PWS pay at present for the poor quality piped water supply service.

#### Causeni

- Lowest income group are willing to pay up to 5% of their income for improved PWS;
- The households are willing to pay on average **35.6% more** for improved PWS than the households with access to PWS pay at present for the poor quality piped water supply service.

It should be noted that if the improvements materialise in both towns and all households get access to good quality PWS services and pay for it the respective maximum amounts indicated above, then the households would be better off by making savings in the amount they spend at present on all sources of water supplies while water utilities would collect substantially larger amounts in user charges (see Table



2.5). However, such improvements would also involve additional costs in capital investments and in operation and maintenance for the water utilities.

**Table 2.5 Potential for increasing the user charge revenues of water utilities (Lei per household per month, average values)**

	<b>Nisporeni</b>	<b>Causeni</b>
Total expenditures for water supply at present	76.6	51.2
Present expenditure for piped water supply (by households with access to PWS)	37.5	25.1
The average value of the maximum amount that the surveyed households would be willing to pay for improved PWS	58.2	34.1
Potential for increasing the user charge revenues of water utilities	20.7	9.0

### **Concluding Remarks**

- 40% of the households that have access to PWS face daily shortages and a large proportion of households consider the water quality to be poor.
- Due to daily or weekly water shortages / rationing and in general poor quality of the PWS service, significant proportion of households that have access to PWS have to rely on supplementary water sources such as shallow wells to satisfy their consumption needs. This has direct implication for future policy for improvements for water supply infrastructure. It is not only necessary to expand the coverage but it is equally important to improve the supply conditions to maximise the benefits for the recipients of these services.
- As a result of inadequacies of the existing water supplies around 50% of the total household expenditure on water supplies goes on purchasing bottled water and maintaining supplementary water supply sources. On average households spend between 3.8% to 5.4% of their monthly income on water supplies, while those in the low quintiles spend up to 6-7% of their income, depending on the settlement.
- The policy implication is that while improving water quality has a relatively high marginal cost, increasing the quantity and reliability of supplies can be usually achieved by modest increases in marginal costs, which can help to substantially increase the welfare of the population. Proposed investments in reliability and larger quantities would improve the service levels and reduce the need for the consumers to rely on supplementary water supply sources, thus contributing to savings in overall household expenditure on water supplies whilst generating additional user charge revenues for water utilities.
- The results of the willingness and ability to pay survey demonstrate the inadequacies of water supply services in fairly representative towns in the country and show that the lowest income groups would be willing to spend around 5% to 7% of their monthly income on adequate water supply services.
- One of the greatest benefits of improved water supply services perceived by the households in the two towns that already have access to PWS is not having to carry water from supplementary

sources and not having to use less water than they need to satisfy their basic households requirements.

- The observations above on present level of expenditure for water and on the willingness to pay in the lowest quintile are also consistent with the proposed increases of the water bill to 5% of average household disposable income, discussed in Part I of the report.

The limited scope of the ATP & WTP survey undertaken in the context of the present study should not be taken to represent the prevailing conditions for all urban areas, not to mention the rural areas where some 60% of the total population lives. However, it provides a strong justification for including social dimension components in project planning and preparation whenever decisions are taken to invest in rehabilitation or extension of water and sanitation services in both urban and rural areas.

## PART III: A REALISTIC FINANCING STRATEGY FOR WSS

### Alternative policy targets and financial implications

The different policy targets identified and assessed are shown in Table III.1 below, which also shows which sector and which beneficiaries are targeted by the different scenarios.

**Table III.1 Alternative sector policy targets and beneficiaries**

Policy targets	Urban	Rural
1) Baseline: To halt deterioration of existing infrastructure and provide very modest improvements	Improved O&M Reinvestment in old infrastructure Very modest improvements	Very modest capital investment improvements
2) Baseline + Meeting the MDGs*	As baseline	Investment in non-piped supplies. Modest investment in simple piped water supplies Investment in on-site sanitation.
3) Baseline + EC Directives**	As baseline, plus: Water supply extensions to reach 95% of population in urban settlements. Wastewater extensions to reach 90% connections to urban towns. Water and wastewater treatment	As baseline
4) Baseline + MDGs + critical WWTPs	As Scenario 2 plus full rehabilitation of 7 WWTPs	As Scenario 2
5) Baseline + MDGs + EC Directives	As Scenario 3	As Scenario 2
6) Draft Government Strategy (1)	All targets	MDGs
7) Government Strategy (2, Revised***)	As (6) but re-scheduled	As (6) but re-scheduled

\* it is assumed that in Moldova MDGs on WSS will be met by year 2022

\*\* the following EC Directives were taken into consideration: Urban WWTPs; Drinking Water, and Water Framework Directives

\*\*\* Following a draft of this paper, the Government revised their strategy to re-schedule the bulk of investments to after 2012, and slightly lowering the total level of investments up to the planning horizon of 2025

The financial consequences of adopting the different targets are shown in Table III.2.

**Table III.2. Financial consequences of sector targets**

<b>Target</b>	<b>User charges needed above existing level, by the factor of</b>	<b>Government contribution (% of budget) per annum</b>	<b>External assistance, EUR million per annum</b>	<b>Total 20 year expenditure EUR Million</b>
Existing situation	1	0.5%	5 million	
1) Baseline	2.3*	2.3%	17 million	1320
		Either from 2.3% up to**	Or from 17 million up to**:	
2) 1 + MDGs	2.3	4.8%	42 million	1820
3) 1 + EC Directives	2.3	4.9%	43 million	1840
4) 2+ critical WWTPs	2.3	5.3%	46.5 million	1910
5) 1+MDGs+ EC Directives	2.3	7.4%	68 million	2340
6) Draft Government Strategy (1)	2.3	11.9%	113 million	3240
7) Government Strategy (2, Revised)	2.3	9.9%	93.25 million	2845

\* Affordability limit

\*\* Scenarios 2 to 7 include baseline financing conditions and show incremental requirements for government budget contributions or external assistance (alternatively a combination of government budget or external assistance).

As shown by the baseline scenario, major increases in sector expenditure are required to fund adequate levels of operation and maintenance and to commence a programme to replace old, unserviceable infrastructure. Increase in user charges up to affordability threshold (increased gradually over time up to 5% of the average household disposable income), of over twice the existing average tariff levels will fund most of the baseline expenditure. However, increases in Government contributions (by over 400%) and external assistance (by over 300%) will also be required. These increases rise to unrealistic levels as the policy targets increase as shown in Table III.2.

The distribution of expenditure between Urban and Rural areas, and between water and wastewater can be seen from figure III.1

**Figure III.1 Distribution of costs between Urban & Rural, and Water Supply and Wastewater for the different scenarios**

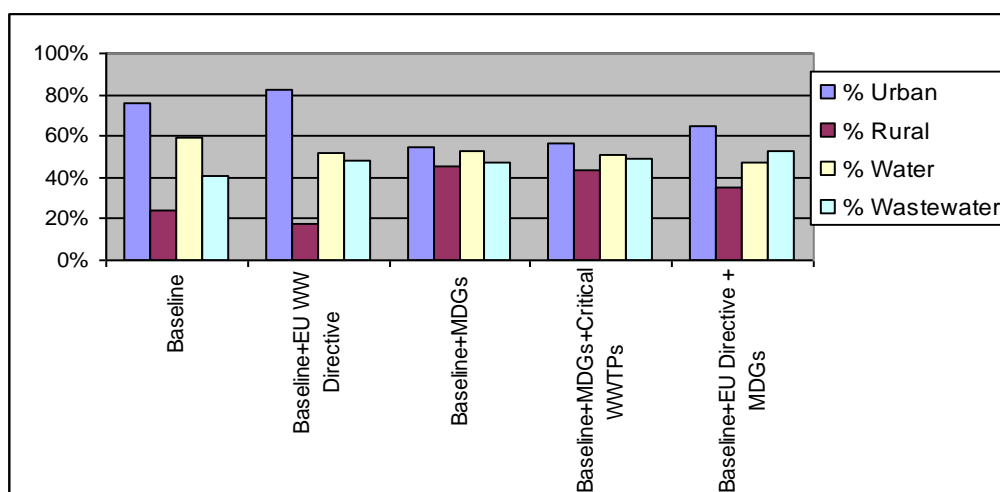


Figure III.1 shows that the Baseline scenario, by concentrating on the maintenance of existing assets, is predominantly financing urban water supply infrastructure. The EU Directives also are directed to urban infrastructure, whereas the MDGs support rural infrastructure as well.

**Discussion**

The baseline scenario was designed to provide the lowest level of expenditure to halt further deterioration of existing infrastructure, and to make some modest rehabilitation to reduce operating costs. This scenario was discussed during the Steering Group’s meeting in March, where the consensus was that the resulting financing requirements were already challenging. Major barriers include the present low implementing capacity of the government agencies, as well as little absorptive capacity of Moldova, meaning the maximum level of resources per annum the country can utilise cost-effectively on the WSS sector priorities.

Nevertheless, given serious Government backing and reform to sector management and administration to increase its implementation capacity, this could be attainable.

The implementation of the baseline scenario is seen as the essential first step to improving the water and wastewater sectors, and these costs are therefore essential to all other alternatives considered.

The difficulties expressed in mobilising the financial resources and in implementing even the baseline objectives imply that achieving more costly objectives such as meeting the MDGs and EC Directives may not be possible in the foreseeable future.

To make these alternative scenarios more affordable, and more possible from the point of view of the implementation and absorptive capacity of Moldova, the cost estimates for the above assessments assumed least cost solutions and longer periods for implementation.

Nevertheless, as shown in Table 2, it is very doubtful that the higher levels of financing could be realistically assumed in the short to medium term.

The approved Government Strategy (revised compared to the first draft) has gone some way to recognising the financial constraints, by rescheduling the bulk of expenditure to after 2012, but this is still significantly more ambitious than the baseline scenario.

## **Conclusions**

a) The baseline scenario (or something close to this in financial terms) would appear to be the only realistic level of expenditure at the current time. The option assumes substantial increase in tariffs, as well as over 400% increase in Government budgetary support and over 300% increase in external support. It also assumes reform to sector management and administration. However, this scenario does not address rural requirements, and does not meet Government sector targets such as the MDGs, EU Directives and pollution reduction to international waters.

This conclusion does not mean that the Government should abandon these targets, but rather adopt a flexible approach to the proposed deadlines for achieving them.

b) Assuming the Government actively pursues the recommendations of the Poverty Reduction Strategy Paper, and an efficient, transparent, market economy evolves, then, as the economy improves, the Government targets could be raised, to meet the following objectives in order of priority:

- MDGs
- Improvements to key wastewater treatment plants discharging to international waters
- EC Directives

## **PART IV: INTEGRATING THE FINANCING STRATEGY INTO THE POLICY FRAMEWORK**

### **Integration of the Financing Strategy into the MTEF**

The three basic sources of finance at the disposal of the Government to finance the sector comprise:

#### ***User charges for supply of water and wastewater services***

The affordability threshold for water supply and wastewater services is assumed to be at 5% of the average disposable household income. It is proposed that average water bill should be gradually increased to 5% of average disposable household income by 2015 and kept constant at that level as share of the income. Results of the limited ATP and WTP assessment presented in Part III of the report justify the proposed threshold for the increases. Note that proposed investments in improved reliability and greater quantity of water supply would improve the service levels and reduce the need for consumers to rely on, and pay additional amounts for supplementary water supply sources.

Projected increases in user charges up to 5% of the average disposable household income should be taken into account in MTEF projections in determining the government budgetary support and donor funding for the WSS sector. MTEF is an appropriate instrument for integrating such projections into the budgetary process.

The newly established water agency - Apele Moldovei, responsible for planning and implementation of capital investments in the water supply and wastewater sectors should work closely with the Ministry of Finance in rolling out this message to the water and wastewater companies in the localities.

#### ***National public budget support for capital investments and operations***

In comparison with actual sector support in 2006 at 0.5% of overall public expenditure, the projected national budget support in 2007 and 2008 at 1.8% is very substantial. However, to meet the financing needs of even the baseline scenario it would need to increase to around 2.3% in 2009. The annual amounts that the Apele Moldovei needs to integrate into the MTEF planning process is shown in Table 4.1.

**Table 4.1 Projected National Budget Support for Integration into MTEF (Lei million)**

<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
349	358	544	547	534	528	517	512	484	461
<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>
438	423	409	391	374	356	98	92	85	77

It is difficult to envisage any other alternative available to Government but to commit an increasing proportion of national public budget if it wishes to comply with its policy to address the problems of water and wastewater sectors.

The recently approved (revised) Government Strategy for Water and Sanitation Sector envisages substantial increases in expenditure over the next 20 years of 47 Lei billion (€ 2.85 billion) compared to the

baseline total expenditure of 21.8 Lei billion (€ 1.32 billion). There is no denying that this level of expenditure is required, however, a more realistic view on both availability of finance and capacity to implement suggests that this expenditure should be spread over a longer term. The fact that so far there has been no attempt to integrate the expenditure for the WSS sector suggested in the Government Strategy into the MTEF would support this view.

### *External donor contributions for capital investments*

It is estimated that external financing for the sector has averaged only around € 5 million per annum in recent years. The MTEF for 2006-2009 forecasts that the Government would benefit from total external grants and loans of **Lei 2,418 million** (€ 147 million) during the period 2006–09.

On the basis of the baseline projections, Apele Moldovei requires an assistance of **Lei 1.2 billion** of external financing over the period to be integrated into MTEF. This would take up a significant proportion of the MTEF’s forecast for total external financing assistance between 2007 and 2009 to fulfil the expenditure requirements of the baseline scenario as shown in Table 4.2

**Table 4.2 Projected External Financing Support for Integration into MTEF (Lei million)**

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
283	240	249	179	126	71	44	11		

### *Concluding Remarks*

Apele Moldovei, the newly created central government agency is expected to become the driving force for rehabilitation and development of water and wastewater sectors in the future. However, it is difficult to judge whether it can develop this capacity in a relatively short time to achieve this objective. The implementation of the baseline scenario and “internalisation” of the financing strategy will be largely hinged on the success of Apele Moldovei.

In assessing the contribution of each source of funding and its effective integration into the planning process of MTEF, the following should be noted:

- Projected revenues from user charges levied on the consumers for water supply and wastewater services cover 60% of the total requirements over the 20 year period.
- National public budget support is projected to increase significantly over the first few years from about 0.5% of the overall budget expenditure at present to around 2.3% by 2009 and gradually decline as a proportion of total overall expenditure between 2010 and 2022. It would account for 35% of the total financing requirements over the period.
- The projected financing from external sources would take up almost half of the MTEF forecast for overall external financing assistance to Moldova between 2007 and 2009 and a significant proportion until about 2010 to fulfil the expenditure needs of the baseline scenario.

It should be emphasised that the baseline scenario in essence represents a fairly minimum intervention needed to address the requirements of the water and wastewater sectors. Nevertheless, the projections shown here for integration into the MTEF planning process such as increases in user charge revenues, greater public budget support, and higher external financing are substantially greater than ever achieved before.



## Prioritisation of WSS sector policy targets and projects

The two logical principal components of the prioritisation methodology are:

1. Government sector policy objectives set in the EGPRSP and other policy documents have to be used as a primary means of priority.
2. Investment costs have to be contained within the financing envelope indicated by the Financing Strategy as being realistic.

Government sector policy targets include:

- Meeting the Millennium Development Goals (MDGs) for WSS
- The EGPRSP also gave priority to water supply and sanitation sectors: water supplies are generally given priority over sewerage schemes these sectors
- Reduction of pollution to international waters
- Implementation of EC Directives on WSS and the Water Framework Directive

### *Prioritisation of investments*

The overriding objective of Government Policies is to improve the living conditions of the people of Moldova. *Inter alia* by reducing substantially the health risks associated with water and wastewater. To achieve this wider objective, a number of secondary objectives are required, as discussed below, in a suggested order of prioritisation:

- a) **Reduce water related morbidity:** This is the Government's stated first priority, and is fully supported.
- b) **Halt deterioration of existing infrastructure:** Ensuring the viability of existing systems through improved maintenance and replacement of defective infrastructure, is also seen as more important than investing in extensions and new schemes.
- c) **Improvements in efficiency and reliability of existing systems:** Significant improvements can generally be achieved, at low cost, through simple modernisation and equipment replacement, which will also provide health benefits. In addition, as discussed above (b), these initiatives will have priority over extensions to existing systems.
- d) **Increase availability of safe water and sanitation to meet MDGs.** Availability of services to meet the MDGs is the next major Government objective, which also supports (a) above. Nevertheless, this would be mainly achieved in rural areas. In urban areas, extensions to existing systems should have a lower priority, as improvements to reliability and efficiency are needed to reduce health risks and also operational costs, and are considered mandatory before extensions are considered in urban areas.
- e) & f) **Reduction in pollution:** Although important on environmental grounds, health benefits are less direct than by providing improved water supplies, and public awareness of health risks and hygienic practices are seen as having a better cost/benefit ratio. However, reduction of pollution to international waters (e) is seen as having priority over reduction of pollution to internal waters (f).

**WSS Sector prioritisation:** Water supplies are generally given priority over sewerage schemes, firstly, logically because sewerage schemes cannot operate without water, but also because the health benefits of water supply schemes are generally more readily demonstrated. An ideal solution would be to improve water and wastewater services at the same time. However, there are rarely sufficient funds to invest in both water and wastewater simultaneously. And, as highlighted by this report, Moldova is no exception to this rule.

Table 4.3 identifies methods of achieving the above objectives, and indicates potential funding arrangements for the resulting projects

**Table 4.3 Sector objectives**

Objective	Means of achieving objective	Suggested means of financing
a) Reduce water related morbidity	Improved water quality in towns prioritised on health criteria	External funding for highest priorities (Packages 1 2 below)
b) Increase availability of safe drinking water and sanitation to meet the MDGs	National promotional campaigns to improve awareness of health risks and means of reducing them by improving “on site” facilities.	External funding for campaign. Investment costs for improving facilities at household expense. (Package 3 below)
c) Improve efficiency and reliability of services	Upgrading electrical and mechanical works	Increase in user charges and internal funding, with initial external funding for highest priorities, linked to (a) above and (f) below.
d) Halt deterioration of existing infrastructure	Improved maintenance & re-investment	Increase in user charges to affordability limits
e) Reduction in pollution of international waters	Upgrading existing and provision of new critical wastewater treatment plants	External funding (Package 4 below)
f) Reduction in environmental pollution through meeting EC Directives	Upgrading existing and provision of new wastewater treatment plants	Priority projects to be met from external funding (package 5 below)

***Prioritisation by type of investment project***

Prioritisation of projects is complicated by the fact that each project will contribute to more than one objective. Table 4.4 therefore indicates a method for prioritising the different type of projects using the degree to which each project contributes to meeting the above objectives, and combines this with a weighting following the above suggested prioritisation of objectives.

**Table 4.4 Prioritisation of type of projects**

Government policy objectives	Objectives of policies					Weighted Score	Rank
	Halt deterioration of infrastructure	Reduce water related morbidity	Improve efficiency and reliability	Increase availability of WSS	Reduction in pollution		
Weighting given to objectives	2	5	3	4	1		
Type of Investment Project	Degree to which projects meet objectives						
Prioritised piped water supply projects	100%	100%	100%	100%	0%	14.00	1
Improvements to rural water supplies	0%	100%	0%	100%	0%	9.00	2
Prioritised WWTPs	100%	25%	100%	10%	100%	7.65	3
Improvements to rural sanitation	0%	50%	0%	100%	50%	7.00	4
Improvements to WWTPs on international waters	50%	50%	50%	10%	100%	6.40	5

It should be added that, although this exercise should result in an emphasis on early investments towards the highest ranked type of project, it should not result in complete neglect of the lowest ranked projects.

#### ***Ranking within type of project***

In addition to the above high level prioritisation, each category of investment also needs to be prioritised within itself, as summarised below, and described in more detail in Part III Section 4 of the main report.

#### **Prioritisation of piped water supply projects**

Criteria developed through a number of workshops involving sector stakeholders in Moldova<sup>3</sup> gave a weighting as follows:

Health 45% (consideration of 25 health related constituents)

Social considerations: 20% (population size, and density)

Sustainability: 10% (population un-served, % with piped water supplies)

Technical: 25% (source, distance, treatability).

This exercise resulted in the prioritisation of 156 towns throughout Moldova, as given in Appendix E of the main report attached to this report. The EGPRSP also referred to this prioritisation, and this methodology is therefore recommended for piped water supply projects.

#### ***Prioritisation of rural water supplies***

Financial constraints dictate that piped water supplies can not be provided to the majority of rural settlements, which will have to continue to rely on low-cost groundwater sources in the foreseeable future. However, groundwater quality is a concern over large parts of Moldova. The EGPRSP proposed as a

<sup>3</sup> "Improvement of Water Supply and Sewerage System Planning in priority regions of the Republic of Moldova" ; 2000, Government of Moldova, Jacobs/KCIC.

priority, to research appropriate low-cost methods of water treatment, and this recommendation is endorsed before any major investment is made into this area.

#### *Prioritisation for improvements to WWTPs*

There will be exceptions due to local sensitive issues, but in general, prioritisation should be in accordance with the concentration of BOD in the recipient water during low flows.

#### *Improvements to rural sanitation*

Following the recommendations of the EGPRSP, it is recommended to first conduct research into appropriate low-cost methods of wastewater treatment for individual housing and small communities, before entering a major investment programme in this sector.

#### *Prioritisation for reduction of pollution to international waters*

In exactly the same way as (iii) above, prioritisation should be in accordance with the concentration of BOD in the recipient water during low flows

#### ***Prioritised investment packages***

Using this methodology, the following investment packages have been identified. Most of these packages can be adjusted to meet the financing available. It is therefore suggested that potential donors are invited to express interest and possible financing proposals for the following packages, which are summarised in the table below and described in more detail in Part III, section 4.

It should be noted that:

- Package 1, 2, 6 and 7 are all identified within the EGPRSP, and are inline with stated government policies.
- Package 3 is in direct support of the Government policy to meet the MDGs
- Package 4 is in direct support of the Policy to reduce pollution to international waters
- Package 5 is in direct support of Government Policy to reduce environmental pollution and to achieve compliance with EC Directives.

**Table 4.5 Prioritised packages**

<b>Package</b>	<b>Title</b>	<b>EUR million</b>
1	Prioritised water supply projects – Phase 1	18
2	Prioritised water supply projects – Phase 2	18
3	Environmental Health Project	1
4	Pollution reduction to International Waters	18
5	Prioritised environmental investments	12.5
6	Pilot project to find a low-cost solution to reduce Nitrates and Sulphates to acceptable levels in rural water supplies	1
7	Pilot project for low-cost wastewater treatment	1.5
<b>Total</b>		<b>70</b>

It should also be noted that IFI's normally require pre-conditions to their loans with the objective of ensuring the sustainability of the infrastructure, its management, and hence the security of their financing. These pre-conditions could be expected to include the following:

- Increase in user charges
- Local contributions
- Institutional strengthening
- Technical assistance

### **Integrating the Financial Strategy with the EGPRSP**

The recommendations of the Financial Strategy and those of the EGPRSP with respect to the Water and Wastewater sectors are already very close, as indicated in the table below:

**Table 4.6 Comparison of recommendations of the EGPRSP and the Financial Strategy**

<b>EGPRSP recommendation</b>	<b>Financial Strategy recommendation</b>
<b>Access to water and water quality</b>	
Develop and modernise WS & WW systems in 156 localities	Prioritises the first 30 localities for the 1 <sup>st</sup> and 2 <sup>nd</sup> priority investments
Construction of 93,300 rural wells	Encouraged through the proposed environmental health project
Pilot project to remove nitrates and sulphates from water	Priority project nr 6
Pilot project for biological wastewater treatment	Priority project nr 7
<b>Tariff Policy</b>	
Completion of water metering	Completion of water metering recommended plus recommendations to regulate quality of meters, their periodic maintenance and reading

Methodology for tariff calculation and review	Recommendation for the formation of an independent sector regulator to avoid political interference.  Methodologies for tariff calculation are well known. However, a local capacity needs to be built with regard to meeting specific objectives.
Public campaign for setting tariffs	Recommends a public campaign to increase public awareness of the need to increase tariffs to ensure better quality and reliability of supplies
Enforcement of penalties for non payment of water bills	Recommendations for institutional and management strengthening include this aspect as only one of many other factors.
<b>Improvement of legislation and regulation</b>	
Technical audit of WS and WW systems	Included in management strengthening
Bring legislation, standards and regulations inline with European and International standards	Recommended as one of the major issues to enhance implementation capacity
Improve legal & regulatory framework to attract private capital	Not recommended at this stage in development (except private sector engagement in management and service contracts, and eventual leases)
<b>Regional Development</b>	
Support to Regional Development	This is seen as a critical aspect for the water and wastewater sectors, particularly with poverty alleviation as a priority

Whilst the Financial Strategy supports the use of private sector involvement in management support to the sector, the only significant area where the Financial Strategy does not support (or strengthen) the EGPRSP, at least in the near future, is in the area of attracting private capital into the sector. The reasons behind this are:

- Firstly, only Chisinau and possibly Balti could attract private capital in the foreseeable future. And, if allowed to privatise as separate entities, this would oppose the EGPRSP recommendation of regionalisation, which is strongly supported by the Financial Strategy.
- The Financing Strategy sees regionalisation as a basic tool for poverty alleviation in rural communities, with uniform regional tariffs providing a level of equity between urban and rural populations.
- Regional management will also support and improve infrastructure management at the smaller localities. It will also be better able to participate in the consultation process with individual settlements, which is currently missing, and in the identification and implementation of appropriate measures to meet the MDGs.
- Regional water companies will become more attractive for private operators, who could bring their management and operational skills and know-how.

## Performance indicators

Performance indicators need to be established for both piped systems and for rural “on-site” facilities. The nature of these different systems are very different, requiring completely different sets of indicators, that need to be put together by an appropriate regional or national body to arrive at a complete picture of the sector.

### *Performance indicators for utilities*

Performance indicators for utilities are required to monitor and assess the status of the infrastructure, operating efficiency and financial performance of utilities, they should also help to assess the degree to which operating and financial targets are being met. For the indicators to be effective and useful, they should firstly be based on data that is readily available, and secondly expressed as percentages or as a unit value, so that performance can be directly compared with other utilities and to established sector targets. A number of these indicators have been used in Part I of this report, where the status and performance of existing systems has been described. Recommended indicators are suggested in Table 4.7 below:

**Table 4.7 Recommended indicators**

Indicator	Purpose	Target
<b>1. Service levels</b>		
1.1 Percent of population served (WS & WW)	Indication of coverage	Local target
1.2 Per capita consumption	Level of service & efficiency of metering	Around 100 lcd for urban areas
1.3 Percent of connections metered	Operating efficiency	100%
1.4 Hours of service	Reliability	24 hrs
1.5 Domestic consumption as % of total consumption	Planning	NA
1.6 Number of Water quality tests, and percentage failing to meet desired standards	Health	None per month.
1.7 Nr of treated wastewater tests, and percentage failing to meet desired standards	Environment & health	None per month
<b>2. Operating performance</b>		
2.1 Specific power consumption by volume of abstracted water	Efficiency	0.2 to 0.5 kWh/m <sup>3</sup> (WS)
2.2 Pipe bursts	Status of infrastructure	0.2 bursts/km/year
2.3 Losses	Efficiency and status	20% of water abstracted, or 7m <sup>3</sup> /km/d, or 0.15 m <sup>3</sup> per connection per day
2.4 Staffing	Efficiency	1 per 1000 population served
2.5 Specific power consumption for wastewater collected	Efficiency	0.5 kWh/m <sup>3</sup>
2.6 Sewer blockages	Status of infrastructure	1 blockage/km/year
2.7 Complaints	Performance	<1 complaint per 1000 connections per month

<b>3. Financial performance</b>		
3.1 Tariff	Performance	To cover all costs
3.2 Total costs divided by total volume of water billed	To detect trends and Performance	<0.5 US\$/m3 (guideline)
3.3 Cost of wastewater collected and treated	Ditto	<0.5 US\$/m3 (guideline)
3.4 % of costs attributed to main categories of expenditure of: Staff, energy, chemicals and other costs	Structure of expenditure	Local targets to be set
3.5 Revenue	Ditto	To exceed all costs
3.6 Collection rate	Efficiency	>95%
3.7 Operating cost recovery ratio	Viability	>110%

All these indicators can be readily determined from data that is normally available from monthly operational reports, and it is recommended that a standard reporting format is designed in Excel format, so that these indicators are automatically calculated.

Additional indicators can be added for larger utilities to suit their needs and characteristics.

Some of the target values need to be revised to suit the characteristics of individual systems, but it is suggested that these should not vary significantly from the above suggestions.

These indicators can be used to assess:

- Monthly and annual trends (all indicators)
- Compare performance with other utilities (all indicators, but particularly 3.2, 3.3 and 3.5)
- Assess compliance with Regulations (indicators 1.6 & 1.7)
- Assess progress in achieving Government targets (indicators 1.1, 1.3 and 3.7)

### *Regional indicators*

As mentioned, the above indicators for utilities exclude areas not covered by the serviced areas, and additional Regional indicators need to be compiled by regional bodies to add to the utility data to provide a more complete regional assessment of the sector. These indicators would include:

<b>Indicator</b>	<b>Purpose</b>	<b>Target</b>
<b>Water Supplies</b>		
4.1) % of population using non-piped water	Monitoring	Set locally
4.2) % of population using different non-piped sources for water supply	To determine structure of supplies	
4.3) % of different sources that are of acceptable quality	Monitoring MDGs	100%
4.4) Average population per well	Assess development needs	
<b>Sanitation</b>		
5.1) % of population using non-sewer systems	Monitoring	Set locally
5.2) % of population using different types of sanitation	Determination of structure of sector	



5.2) % of different types of sanitation that are of acceptable quality	Monitoring MDGs	100%
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Medical data on water related diseases could be added to the above, if such data is readily available and reliable. It will also be useful to conduct occasional supplementary surveys to determine consumer satisfaction and investigate any problematic issues in the region.

All the data for each region should be compiled into an annual report on the status and performance of the sector in the region. This should then be forwarded to the appropriate national body to compile a similar national status report on the sector.

### **Complementary measures for sector development**

As discussed in Part III, there are a number of key complementary measures to improve the operating and implementing environment within the water and wastewater sectors in Moldova. Unless these issues are addressed, even the modest objectives of the baseline scenario will not be achieved. Some of these factors are discussed briefly below, together with possible solutions:

1. **Cost recovery from user charges:** In the short to medium term user charges should recover all operating, maintenance and annual replacement costs of existing schemes. In the longer term, a clear policy needs to be established for financing investments, preferably linked to the “user pays” principle.
2. **Metering:** Strengthen the current policy of metering policy by the introduction of tighter controls on quality of meters and their reading. This will reduce UfW and commercial risks for water utilities.
3. **Financial sustainability:** It is proposed that the authority to approve tariffs should be shifted to an independent professional regulator for the sector. This will act to ensure that minimum tariffs are applied that are consistent with the utility being able to supply a cost-effective service.
4. **Management:** Regional operating companies could help solve the resultant human resource and financial constraints and improve operating efficiencies. Larger scale of operations will also make the WSS sector more attractive for private operators.
5. **Equality of user charges:** The creation of regional operating companies, as suggested in (4) above, with uniform tariffs across their service areas, would provide a level of equity between urban and rural communities. This will soften affordability constraints especially by the rural population, thus reducing the risk of arrears / commercial risks of water utilities.
6. **Organization and capacity building:** Clear responsibilities need to be defined for:
  - Regulation (new regulator)
  - Planning (Regional and National Development Councils, the Ministry of Local Public Administration, Apele Moldovei, Ministries of Economy and Finance)
  - Implementation (Apele Moldovei)
  - Management (new Regional Operators)

Once this framework has been established, an intensive capacity building programme is required. *Inter alia* this concerns the capacity of the government agencies and local public jurisdictions to utilise available resources in a cost-effective manner, thus increasing the absorptive capacity of the country (i.e. the level of resources per annum Moldova can cost-effectively utilise for WSS sector priorities).

1. International finance: To attract higher level of international financing, Moldova will need to implement projects in accordance with internationally accepted practices and procedures, as well as substantially increase its implementation and absorptive capacity in line with (6) above.
2. Institutional measures: Current regulation and legislation needs to be reviewed and reformed in accordance with (7) above, together with significant capacity building at the central and regional levels.
3. Included in (8) above would also be a capability aimed at improving and developing rural water supplies and sanitation through which local initiatives by the private sector and civil society, including NGOs, can be channelled.

### **Water demand management and losses**

Issues regarding water demand management and reduction of losses are discussed in Part 1, section 4, and are summarised below:

To provide effective demand management through metering it is first necessary to introduce regulation to standardise water meter manufacture and quality, and to improve procedures for meter reading, billing, checking and repair, accompanied with a public awareness programme.

An unaccounted-for water reduction strategy can then be designed to suit the individual requirements of each network. Such a strategy typically includes some 13 measures to improve the:

- Evaluation of unmeasured legitimate use of water
- Reduction in non-legitimate water use and
- Reduction in (physical) losses

The package will help improve the financial position of water utilities by reducing commercial losses (measures 1 and 2) and through savings (measure 3).

### **Procedures for improved investment planning**

The total value of investments required in the sector, as indicated by the Government's Strategy for WSS, far exceeds the realistic volume of work that could be financed and implemented on an annual basis. It is clear that a prioritisation process is needed to reduce the annual volume of work down to a realistic level.

The methodology used in Part 3, section 4 of this report, using Government policy objectives as a means of providing this prioritisation seems to be a logical approach. The methodology suggests a degree of priority between the different Government Sector Policies, and the Agency (Apele Moldovei) and MoLPA will need to make their own judgment on this in close liaison with other Government Ministries.