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**Republic of Moldova's Water Supply &  
Sanitation Strategy  
(Revised Version 2012) – 2<sup>nd</sup> Draft  
October 2012**



# REPUBLIC OF MOLDOVA'S WATER SUPPLY AND SANITATION STRATEGY (Revised Version 2012)

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## Acronyms

AC	Apa Canals
AAM	Agency Apele Moldovei
AGMR	Agency for Geology and Mineral Resources
AMAC	Association of Moldovan Apa Canals
ANRE	National Regulator for the Energy Sector
ATU	Administrative Territorial Unit
BoQ	Bill of Quantity
CBA	Cost Benefit Analysis
DEU	Delegation of European Union in Moldova
DSS	Decision Support System
DW	Drinking Water
DWSP	Drinking Water Safety Plan
DWD	Drinking Water Directive
DWM	Department of Water Management (MoEn)
EBRD	European Bank for Reconstruction & Development
EEA	European Environmental Agency
EEC	European Economic Community
EIA	Environmental Impact Assessment
EU	European Union
EUWI	European Water Initiative
FAD	Finance and Accounting Division
FIDIC	International Federation of Consulting Engineers
FP7	Seventh Framework Program
FR	Final Report
GD	Governmental Decision
GEO	Government Emergency Ordinance
GIS	Geographic Information System
GoM	Government of Moldova
HC	House Connection
HRD	Human Resources Development
IBRD	International Bank For Reconstruction & Development
ICPDR	International Convention for Protection of Danube River
IEG	Institute of Ecology and Geography
IFI	International Financial Institution
INSPIRE	Directive for Infrastructure for Spatial Information in the European Community
IPR	Interim Progress Report
ISO	International Standards Organization
KE	Key Expert
KPI	Key Performance Indicator
LGU	Local Government Unit
LTSO	Long Term Strategic Objectives
MAC	Maximum Admissible Concentration
MDGs	Millennium Development Goals
MIS	Management Information System
MoEn	Ministry of Environment
MoF	Ministry of Finance
MoH	Ministry of Health
MoRDC	Ministry of Regional Development & Construction
MTBF	Medium Term Budget Framework
MTEF	Medium Term Economic Framework
MTSO	Medium Term Strategic Objectives
NAS	National Acceptance Scheme
NCPH	National Centre for Public Health

NDS	National Development Strategy
NEF	National Ecological Fund
NGO	Non Governmental Organization
NKE	Non Key Expert
NRDF	National Regional Development Fund
OECD	Organization for Economic Cooperation & Development
O&M	Operation & Management
OSS	Operational Support System
PCA	Partnership and Cooperation Agreement
PD	Project Director – Program Manager of Eptisa Romania.
PIU	Project Implementation Unit
PE	Population Equivalent
PMU	Project Management Unit
PPP	Public Private Partnership
PPWMD	Pollution Prevention and Waste Management Division
PRIS	Public Relations and Information Service
PSP	Private Sector Participation
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Procedures
QAR	Quality Assurance Responsible
RDA	Regional Development Agency
R&D	Research & Development
RIA	Regulatory Impact Assessment
ROC	Regional Operating Company
NBS	National Bureau of Statistics
NGO	Non - Governmental Organization
NRBD	Natural Resources and Biodiversity Division
SC	Steering Committee (Water – SPSP)
SCADA	Supervisory Control and Data Acquisition
SCC	Sector Coordination Council
SDC	Swiss Agency for Development and Cooperation (Swiss Development Aid)
SEI	State Ecological Inspectorate
SEIS	Shared Environmental Information System
SHS	State Hydro-meteorological Service
SPSP	Sector Policy Support Program
SoE	State of Environment
TA	Technical Assistance
TDS	Total Dissolved Solids
TF	Task Force
TOR	Terms of Reference
TL	Team Leader
UNECE	United Nations Economic Commission for Europe
USD	United States Dollar
UWWT	Urban Waste Water Treatment (EU Directive)
WFD	Water Framework Directive
WMD	Water Management Division
WOC	Water Operating Company
W&S	Water & Sanitation
WSP	Water Safety Plan
WSS	Water Supply & Sanitation (Sector)
WUA	Water Users Association
WWTP	Waste Water Treatment Plant
YC	Yard Connection



## **1. Description of the present situation**

The revision of WSS Strategy of Moldova (ed. 2007) is driven by the recent economic and political development of the country that requires an update of the strategic planning of the water supply and sanitation (WSS) sector.

The revision is based on key strategic documents adopted by the country such as UN MDGs (Millennium Development Goals 2005, revised in 2007), the National Development Strategy (NDS) for 2008-2011, the National Regional Development Strategy 2010-2012, the OECD Draft Action Plan 2010-2015 for the implementation of the WSS Sector strategy as well as the Targets and Targets Dates under the Protocol Water & Health approved by the 2010 joint order of MoH and MoEn.

Moldova aspires to have closer links with the European Union, and is finalizing an Association Agreement that creates a new framework for EU-Moldova relations, going beyond the Partnership and Co-operation Agreement of 1998. Its principal objective is to draw Moldova closer to the EU through a commitment to approximate EU laws and standards in a number of areas. Good and efficient water supply and sanitation infrastructure is an important domain of the “EU Acquis” that Moldova will want to approximate under this new Association Agreement.

### **1.1 The Shortcoming of the Strategy 2007**

The OECD/EUWI Project Report (2011) made a thorough diagnosis of the difficulties in the WSS sector in Moldova. Important conclusions complemented by most recent experience in the sector include:

- The Water Strategy (2007) is not realistic financially and needs to be revised;
- The Government of Moldova (GoM) water sector policy documents lack coherence, are not coordinated, and water institutions do not share adequately information;
- The water sector institutions have overlapping responsibilities and there is no organization to provide clear direction for action;
- The water sector lacks a database on sector assets and performance;
- The present financing mechanisms for the water sector do not follow either the requirements of effective sector programming and budgeting, or clear prioritization of investment needs that should be grounded into Master Plans and Feasibility Studies;
- The financing means allocated to the WSS Strategy are insufficient to implement the Strategy;
- The GoM is relying too heavily on Donor funded projects to advance WSS investment needs;
- The GoM is insufficiently allocating resources from the EU budget support theoretically earmarked for the water sector (52 million EUR) into the sector itself, starving it from urgently needed resources for sector oversight, project preparation studies and physical infrastructure development and deployment;
- The MoEn is relying too heavily on the resources of the EU-funded Technical Assistance project for capacity substitution of the limited resources available at the DWM;

- The mobilization of domestic resources for WSS investment is excessively low and constrained further by the limited absorption capacity for financial resources in the sector.

The Water Strategy (2007) did not identify clearly the issues to be addressed nor did it present recommendations regarding the necessary legal, institutional, managerial and technical tools that needed to be established to program, track, monitor and steer its implementation in the face of scarce available resources.

## **1.2 The Need for Action**

The identified critical issues, the shortcomings of the WSS Strategy 2007 and the opportunity cost of inaction in the face of potential large economic benefits of good WSS infrastructure, lead to the necessity for action in a number of fields. These include essentially the following needs:

- The strengthening of the legal framework and institutional capacity to provide the enabling tools for well coordinated and orchestrated WSS infrastructure development and sustainable operation;
- The development of WSS infrastructure planning instruments like Master Plans (MPs) and Feasibility Studies (FSs) and Environmental Impact Assessment (EIA) in order to identify least cost optimal solution and provide the documentation required to mobilize international donor funding;
- The revision and/or development of technical standards and guidelines for WSS infrastructure design, construction and operation to lower their investment and operational and maintenance costs;
- The elaboration of periodically updated and refined 3-5 years Investment/ Action Plan which provide a pipeline of WSS projects aligned with the socio-economic policies and strategies defined at the national, regional or local level;
- The set up of yearly revised performance indicators and targets associated with the implementation of the Investment/ Action Plan, to be attributed to relevant organizations based on their respective responsibilities for programming, prioritizing, planning, financing, implementation, and monitoring the WSS sector to ensure achievement at milestone years (2017- 2027);
- The elaboration of a communication and information dissemination plan for awareness building and capacity building development of the stakeholders needed to implement the Strategy.

## **1.3 The purpose of the Strategy & Revision process**

Water is central to development. The contribution of water and sanitation services to socio-economic development is far wider than their impact on households' well being. Water is a key factor of production in manufacturing industry, power generation, and agriculture. It also sustains the natural and ecological environment

This revised WSS Strategy is intended to present an updated and deepened roadmap for the development of the WSS sector on the shorter term (3-5 years, target year 2017), and the longer term (6-15 years, target year 2027). To enable a swift start of the implementation of the strategy, an action plan for the next 2-3 years is attached as Annex 12 to the Strategy document.

A further objective of the Strategy is to make the issues and necessary actions and solutions understandable to the widest possible group of stakeholders. The policy recommendations reflected in the document is the result of wide consultation with a multiplicity of stakeholders at the central, regional and local level. To achieve its objectives, the deployment and implementation of the Strategy will require the coordinated involvement of many concerned parties well beyond the Ministry of Environment (MoEn) which is in charge of WSS policy and monitoring.

The revision of the existing WSS Strategy underwent a participatory process through functional networking. It started at a launching event on February 15, 2012 organized in working groups on (i) Legal frame, (ii) Institutional development, (iii) Financial sources, and (iv) Action Plan, that prefigured the structure and the content of the main chapters of the new version of the document.

Consultation held helped (i) project a vision of what should be the best content of the revised WSS strategy, (ii) identified institutional partners and professionals who supported the revision of the WSS Strategy, (iii) discussed the establishment of a WSS-SCC Sub Group structure, operating mechanisms and scope of work to coordinate the revision of the WSS strategy, and (iv) produced an outline logical frame of the revised WSS strategy and the action plan for developing it.

The “Functional Network” also dovetailed into a WSS Sub-Group of the Sector Coordination Council (SCC). The functional network was approached at periodic interval to review the development of the revision of the Strategy and provided the advisory panel necessary to drive the revision of the document to make it coherent with other development in the sector and other sectors, as well as aligned with a broad range of stakeholders’ interests.

## 2. Definition of the problems that require the involvement of the Government

### 2.1 Critical WSS issues Since the Strategy 2007

The document is a revision of the strategy 2007. While a new strategy requires according to Moldovan regulations a comprehensive and in depth overview of the current situation and trends, a “revised” Strategy needs only to focus on changes and emerging issues since the issuance of the original WSS Strategy in 2007.

The list of critical WSS shortcomings and issues is large. Based on an assessment of the current WSS situation across the country, they can be summarized as follows:

- ✓ **Political and legal environment** - although Moldova has the political will to approximate the “EU Acquis” in the WSS sector, it has not been so far translated into the necessary institutional reform needed to improve the management of the public WSS services. The legal base for the functioning of the WSS sector has significant gaps in particular regarding pollution prevention and control, WSS investment programming, the planning of least cost, optimal and efficient technical solution, the cost recovery of the provided services and the performance of WSS services by water utility companies.
- ✓ **Institutional frame** - the evolution of the WSS sector in Moldova during the last 15-20 years has been marked by many institutional changes. Some improvement began with the adoption of the MDGs. Judging by the current resources allocation to the Department for Water Management (DWM); it seems however that WSS infrastructure development has not been yet recognized as a key priority to enable the socio-economic development of the country. The institutions needed to oversee, drive, implement and operate sustainable WSS infrastructure are inadequately equipped to face the challenges of the approximation to the EU legislation and related good WSS practices.
- ✓ **Management of WSS sector** – It became a domain of attention at the governmental level when the MDGs goals revised in 2007 and the UN backed Water and Health Protocol, were adopted. Many difficulties none less remain. They are mostly related to design criteria and planning tools for WSS infrastructure, drinking and wastewater quality monitoring programs and laboratory quality control, inefficient and loss making Water Operating Companies (WOCs) that need to be aggregated to achieve economy of scale and lack of MIS/ GIS system for infrastructure planning and programming.

### 2.2 The Potential Benefits of Good WSS Infrastructure

The overall potential benefits of good WSS infrastructure go well beyond the improvement of people health and lives. It is a critical precursor of economic development. Providing quality of service, including reliability of supply, quality of water at tap, sufficient and continuous pressure in the supply network or efficient water pollution control and treatment stimulates economic, industrial and commercial investments. The necessary investment in public infrastructure in the WSS sector in

itself by its sheer volume of hundreds of millions of EUR equivalent can be a magnet to attract the private sector both in design, construction and operation.

In a WHO study (Hutton and Haller 2004) assessed a large number of household water supply and sanitation program in transition economies. It was found that 1 EUR invested in WSS infrastructure yields economic benefits in the range 5 to 28 EUR mainly arising from time savings from good access to services, gains in productive time of population and reduced expenses in water born diseases and related illnesses.

Other studies have demonstrated the large net economic benefits from spending on water resources management. Benefits range from protecting and enhancing the value of existing environmental assets or landscape to reduced expenditures for water treatment for human, commercial or industrial use.

### 3. The Objectives of the revised WSS Strategy

#### 3.1 Vision & Mission of the WSS Sector

This Strategy presents a vision of what it can be achieved for a timeline of 15 years. The achievement of the goals is not only the job of the Government - it is the job of all sectors of the society, particularly the hundreds of communities for whom the policy laid out in the Strategy represents the hope for a better life.

The successful implementation of the WSS Strategy presupposes a community based approach that will lead to job creation and business development. In urban areas this means the promotion of cost covering water services tariff allowing water utility companies to improve sustainably the quality of their services. In rural areas this means an intensive advocacy and social marketing program of the value of good WSS infrastructure and good sanitation facilities in schools. The planning process shall demonstrate the effectiveness and efficiency of the various technical options available. Clearly defined norms and standards shall compel local government to use resources effectively so that no one is left out without WSS services and everybody has access to at least a basic level of service.

**The VISION** of the WSS Strategy is to gradually provide access to safe water and adequate sanitation for all localities and people in the Republic of Moldova, contributing to an improved health, dignity and quality of life, and enabling the economic development of the country. The Implementation of the WSS Strategy presupposes a quantum leap improvement of the management and oversight of the sector that is crucial to attract WSS investments.

**The MISSION** of the WSS strategy is to enable the frame for achieving the coverage with services for water supply and sanitation compliant with the indicators for quality and efficiency, and/or access to improved drinking water sources and improved sanitation systems for all localities by the year 2027.

**The VALUES** promoted by the Strategy include the firm beliefs that good WSS infrastructure coverage in the country is a necessary precursor to sustainable socio-economic development and that WSS investment have incomparable rates of return for the beneficiary population and the country as a whole. Cashing in on these beliefs requires the establishment of a culture of inclusiveness of all population and stakeholders in the implementation of the Strategy facilitated by transparent decision making processes at all levels and the respect of the principles of due diligence and accountability for all people in charge of WSS policy framing, WSS investment programming and deployment, water resources mobilization, environmental protection, health and social safety, affordability and quality of WSS services and WSS systems operational sustainability.

#### 3.2 The general Objectives of the Revised Strategy

The 2007 Government Strategy for WSS divided strategic objectives in medium-term (2012-2017) and long-term (2017-2027) objectives. They are revised below taking into account the updated diagnostic of the current WSS situation in the country highlighted above.

Satisfy the demand of the population across the country for improved, efficient and cost covering water supply and sanitation services by:

- The implementation of Water Safety Plans and compliance with the quality requirements of EU Directive 98/83/EC water intended for human consumption
- The reduction by 50% of water-borne diseases and related illnesses;
- The achievement of the targets of the 2015 MDGs for safe water supply for 65 % of the population latest by the year 2020;
- The achievement of the targets of the 2015 MDGs for good wastewater system for 65 % of the population latest by 2025;
- The advancement in the implementation of the urban waste water treatment in compliance with the provisions of EU Directive 91/271/EEC;
- The access to information, education, and awareness raising of population about the need to save water and protect water resources;
- The stimulation of the development of scientific research in WSS technical and managerial solutions;
- The continuous monitoring of performance indicators in WSS sector and the periodic updating of targets to achieve milestone objectives of the strategy;
- The establishment of routine public consultation and involvement in the development of plans and programs;
- The fostering of regional cooperation in the field of water supply and sewerage planning;
- The opening and nurturing of the market for public water supply and sewerage services in a controlled way, and stimulation of competition in this field;
- The promotion of adequate cost covering tariff policy in the field of water supply and sewerage vetted by an independent regulator;
- The development of a system of subsidies for vulnerable poorer population segments of urban areas for which the provision of centralized WSS services is unaffordable.

### **3.3 The specific Objectives of the Revised Strategy**

- Professionalization of public WSS services by (i) an adequate legal framework, (ii) eliminating overlapping authority and responsibility of regulatory authorities and local governments, (iii) development of water safety plans and (iv) establishing a culture of commercially operated WOCs able to cover their costs essentially through user fees charged to consumer and beneficiaries;
- Promotion of market economy principles by (i) compulsory tendering of services, (ii) withdrawing licenses of the service providers that do not comply with performance criteria, (iii) reorganization of self-supporting utilities currently subordinated to local governments, (iv) ensuring transparency of WSS public services administration.
- Extension of WSS systems and increase of the coverage WSS infrastructure by (i) developing raional planning studies of the least cost optimal water supply and sanitation solution for each locality or group of localities of the raion, (ii) translating these solutions into prioritized lists of regional investment aligned with local and regional socio-economic development plans and supported by local commitment to implement, (iii) develop a periodically updated pipeline of prepared WSS infrastructure projects ready or to be ready for financing and implementation by domestic and foreign sources.
- Promotion of efficient and cost covering WSS services providers by (i) developing a legal and institutional framework for aggregating WOCs into larger regional entities

benefiting of economy of scale, (ii) establishing an independent regulator (ANRE) to license WOCs, review their yearly business plans, supervise their performance and oversee the adjustment of services tariff to fair, transparent and cost covering levels, and (iii) promote benchmarking practices for WOCs to stimulate a culture of customer orientation, and commercially oriented financial management.

- Promotion of social partnership by (i) increasing public participation of civil society in the development of strategies, policies, plans and programs, (ii) promoting cooperation with consumers associations, (iii) encouraging transparency of decisions and permanent communication and periodic reporting to consumers.

## **4. Necessary measures to achieve the objectives and the results within WSS Sector**

### **4.1 Legal Framework**

“Better policies, better regulations, better results” is what good governance aims at. Moldova has already started introducing methodologies for policy development and regulatory impact assessment of law drafting. There is however room for further improvement. Policy decisions shall make clear who does what, when, with which resources and for which intended impact. The law drafting mechanism shall be improved by the introduction of quality control, the simultaneous drafting of primary and secondary legislation, and a generalized use of regulatory impact assessment and economic and financial assessment. Implementation and impact of new regulation shall be periodically monitored with feedback loop mechanisms to the legislator to encourage periodic improvement or adaptation.

Moldova lives up to its commitments to approximate the “*EU Acquis*” in the WSS sector in line with the terms of the Association Agreement being finalized with the European Commission (Association Agreement). Moldova shall fully implement and monitor the international conventions linked to WSS that it has ratified.

#### **4.1.1 The current regulatory framework**

The current regulatory framework of Moldova’s WSS sector is presented in Annex 1. The most recent changes are briefly summarized below.

The new Water Law no. 272 (Official Journal no. 81/26.04.2012, entry into force on 26.10.2013) is shaping the water related legal framework for the years to come. The Water Law repeals the Water Code, and creates a legal framework for the management, protection and efficient use of surface water and groundwater, defining 2 river basins Nistru and Danube-Prut and Black Sea (art. 5(30)). River basin district committees are being created. They will represent the various stakeholders and have a consultative role in the development of water basin management plans, which will implement the Water Law. The Law endeavors to protect water from pollution and sets environmental quality standards. The wastewater discharges from urban areas and rural areas are regulated in distinct ways. Zones vulnerable to agricultural pollution will have to be designated.

Supply of drinking water is regulated by Law no. 272 of 10.02.1999 on drinking water. This Law sets requirements to ensure the safe operation of water supply. Supply is provided on a contractual basis between the operator and the consumer. A new Law on public water services will largely supersede it by the end of the year 2012, as it will supersede the Law of public utilities no. 1402 from 24.10.2002.

Government Decision no. 934 of 15.08.2007 on the establishment of automated information system "State Register of natural mineral waters, drinking and bottled soft drinks" and specifically its' annex 2 further regulate the quality of drinking water. It sets quality monitoring and reporting requirements. An overhaul of this regulatory frame for is envisaged for 2014.

Government Decision no. 1141 of 10.10.2008 on approval of the Regulation on conditions for urban wastewater into natural receiving water will be superseded by secondary legislation adopted pursuant to the new Water Law.

#### **4.1.2 International conventions**

Moldova is a signatory part of several international conventions and partnerships, relevant for the WSS sector: partnership and cooperation agreement with EU, Espoo Convention, Helsinki Convention, Protocol on Water and Health, ICPDR Convention, Protocol on Civil Liability, Aarhus Convention, bilateral agreements with Ukraine and Romania (Annex 2).

#### **4.1.3 The approximation toward EU Acquis**

In the framework of the Partnership and Cooperation Agreement (PCA) between the EU and neighbouring countries, approximation is to be understood as a way to strengthen economic links.

The EU and Moldova are finalizing negotiations on an Association Agreement. The new agreement will be an innovative and ambitious document going beyond the established framework of cooperation and opening a new stage in their relations, notably by enhancing political dialogue and deepening sectoral cooperation.

The Water Framework Directive (WFD) (2000/60/EC) dominates EU legislation in the water sector by establishing environmental objectives, prescribing a planning process for water management that entails monitoring, assessment and analysis of pressures and impacts. Preparation and implementation of river basin management plans designed to achieve environmental objectives is important in this respect.

In addition, there are associated Directives on dangerous substances and groundwater, and requirements of other Directives having mandatory water quality standards for specific uses: (i) drinking water; (ii) bathing water; (iii) controls over sources of pollution in particular urban wastewater treatment and nitrates from agriculture. Water related impact of industrial activities is regulated under the Industrial Emissions Directive. The Acquis also requires the preparation of flood risk management plans.

The Republic of Moldova made progress in developing river basin management plans with neighboring countries, and participated in the EU Water Initiative, including a national policy dialogue, as well as in the International Commission for the Protection of the Danube River (ICPD).

Some harmonization with the EU Acquis has already been advanced, notably through the adoption of the Water Law 272/2011 in December 2011. However, this and other primary and secondary legislation will have to be amended/ adopted to further approximate the EU WSS regulatory framework. A new Law on public services for water and sewerage has been prepared and is being consulted for approval by the Parliament.

To foster the WSS sector, it is recommended that the focus for further improvement of the regulatory framework focuses essentially on the approximation of the following Directives:

- Water Framework Directive (WFD) 2000/60/EC
- Directive 91/271/EEC on urban waste water treatment
- Directive 98/83/EC on quality of water intended for human consumption.

#### **4.1.4 Enabling the Public Sector for WSS and the Regulator**

Against the backdrop of consolidation, it is recommended that Water Operating Companies (WOCs) are encouraged to aggregate into Regional Operating Companies (ROCs) based on inter-municipal companies, enterprises, or PPP models benefiting from economy of scale enabling greater financial sustainability.

This consolidation of WOCs may be the right opportunity to bring a Water Sector Regulator into play. ANRE is already the regulator for the energy sector, in which it has acquired a good track record. It is recommended that ANRE jurisdiction is extended to the water supply and wastewater management services. Using the consolidation dynamic of WOCs into ROCs, ANRE should progressively license WOCs willing to consolidate and aggregate based on base line technical, institutional and financial criteria of potential sustainability.

WOCs license issued by ANRE should prescribe financial and technical improvement targets as evidenced by covenants, business plans, balance sheets, etc to be provided by the WOCs. The regulator should be responsible to oversee the tariff setting process, ensuring a reasonable balance between the need for renovation and quality of services and affordability constraints of certain tranches of population. The regulator should also act as mediator between WOCs and customers. In a sector of natural monopoly, the regulator should have the negotiating power that individual customer lacks. Access to national and international funding for investment should be made dependent on the existence of a license to operate under the new regulator

ANRE as an independent body should solely be accountable to Parliament. It should have the power to issue regulations, decisions and recommendations regarding the WSS sector operation. The appointment of the director should be shielded from political meddling. ANRE activities in the water sector should be funded by fees to be paid by the regulated entities.

#### **4.1.5 Technical Norms and Standards**

The present WSS standards are inadequate and cause unnecessary investment and operational costs for WSS infrastructure. It is recommended that WSS planning tools are revised and adapted through a participatory process that will review and revise the technical standards and provide improved guides for supply, design, work, services and equipment in areas previously identified as being critical and creating unnecessary costs. The main directions concern essentially:

- Design standard and norms for WSS infrastructure
- Quality standards and technical norms for Water Quality

- Quality management systems for the products/ services offered by a WOC

In the Article 10 of the Drinking Water Directive (DWD), quality assurance is prescribed for the treatment, equipment and materials in contact with drinking water. It means that a country shall take all measures to ensure that (i) materials and treatment chemicals do not impair the drinking water quality, (ii) input into drinking water is not higher than necessary for the purpose, and (iii) there is no reduction in protection level of DWD. It is recommended that the country develop a National Acceptance Scheme (NAS) to put on the market all the products in contact with drinking water.

#### **4.1.6 Administration and Enforcement**

Overall regulation of WSS operation is done or planned to be done by:

- The Ministry of Environment, through licenses for water abstraction and waste water discharges
- The Ministry of Health, for drinking water quality
- ANRE for the tariffs and commercial practices of regulated WSS operators
- The National Agency for the Protection of Competition, in case of mergers of private operators.

It is recommended that strengthened rules and measures are deployed to assure that potential problems and risks of fraud in connection with reporting and/ or awarding of contract are well identified and addressed.

With regards to the affordability of tariffs, it is recommended that a block tariff system with several tariff levels adapted to the fair capacity to pay of consumer groups is introduced. The first block should be a low priced minimum charge for a volume of water that covers a person's basic needs to make water services accessible to all. This basic tariff may be then cross-subsidized by others higher tariff blocks to ensure the financial viability of the operators.

To address secondary causes of non-compliance or poor performance of WOCs, it is recommended that mandatory customer satisfaction tools are developed and applied systematically by all WOCs.

## **4.2 Institutional Development**

### **4.2.1 Current situation**

Current institutions active in the WSS sector are fragmented, inadequately policed and staffed and as a whole weakly equipped to address the WSS challenges. The Annex 3 provides an overview of the existing central and local level government structure.

Main shortcomings include:

- Weak WSS sector policy for oversight, management and monitoring;
- Fragmented, poorly defined or overlapping responsibility of actors and the national level (MoEn, MoH, MoRDC and subordinated bodies);
- Understaffing and inexperienced staff especially with the regards to policy development, sector monitoring and investment programming;
- Weak communication and coordination between existing structures especially regarding WSS investment programming and monitoring (MoF, MoEn and MoRDC).
- Uncoordinated development of WSS infrastructure at the local level often driven by donors without coherent oversight or monitoring at the national level;
- Lack of laboratory capacity to monitor drinking and waste water quality according to the requirements of GD 934/2007 and GD 1141/2008.

The main challenge of the WSS sector is to improve the policy framework and to strengthen the capacity of the existing key governmental institutions in order to:

- Plan and program the development of improved and coherent WSS infrastructure in a phased way for all the communities of the country based on well defined and transparent selection criteria and commitment of beneficiary communities,
- Mobilize adequate domestic and international funding resources for WSS infrastructure investment well coordinated between the government institutions (MoEn, MoRDC) and their subordinated bodies as well as regional development agencies (RDA and local government at the raional and local level,
- Coordinate the monitoring of infrastructural investment progress to ensure they are kept in line with this strategy objectives and other overarching strategic socio-economic development plans goals,
- Strengthen through the consolidation of the number and efficiency of operators, the capacity of water services operators to deliver quality and affordable water and sanitation services making sure their costs are covered to allow sustainable operation.

To successfully address these challenges, it is recommended to introduce a `number of policy instruments and managerial tools introduced below.

### **4.2.2 Strengthened capacity of MoEn for WSS investment programming**

To ensure a coherent and adequately coordinated development of WSS investment in the country, it is recommended to strengthen MoEn by creating a new unit dedicated to WSS investment programming and monitoring.

Responsibility of this Water Investment Unit (WIU) shall include but not be limited to:

1. Oversee the development, approval and later updating of WSS Master Plans at the Raional level to ensure recommended WSS infrastructure development are coherent with (i) existing infrastructure and their operational states, (ii) national investment priorities, (iii) water resources availability and their need for protection, (iv) the approximation process with EU regulation as per the negotiated agreement with the EU, (v) regional and local socio-economic development plan;
2. Develop and update periodically five years Sectoral Operational Program (SOP) for WSS infrastructure investment based on national, regional and local priorities and mobilize domestic and international funding for their timely deployments;
3. Coordinate with other Ministries and Agencies the yearly prioritization and selection of WSS investment and their alignment with the objective and targets of the current SOP;
4. Monitor WSS infrastructure investment progress and report to the government achievement, issues and shortcomings;
5. Ensure completed investment are performing as per specification and are commissioned and handed over to efficient WSS operators which can sustain operation and quality of services over time.

#### **4.2.3 Planning and approval system for WSS infrastructure**

Current National Approval System for (WSS) infrastructure in the Republic of Moldova covers two main elements:

- Planning of WSS infrastructure which is regulated by the Law no. 163/ 09.07.2010 regarding the authorization of the execution of construction works, that sets up the procedure for authorization, approval and checking of the design plans, construction or terminating of a WSS infrastructure, according to the documentation for urban and land planning. For initiating an activity in the WSS sector (planning, design, coordination, approval, authorization of the construction work), it is compulsory to obtain the urbanism certificate for design, the informative urbanism certificate, the check in and the approval of project documentation, and the construction authorization.
- Construction of infrastructure which is essentially regulated by the Law no. 721/ 02.02.1996 and the Law no. 160/22.07.2011 regarding the authorization of contractors and the quality in construction, including (i) norms in constructions, (ii) certification of the construction products, (iii) technical agreements for products, procedures and new equipments in construction, (iv) check in and expertise of projects and constructions, (v) licensing of commercial companies, (vi) certifications of construction experts, (vii) quality assurance and control in construction works, (viii) authorization and accreditation of testing and analysis laboratories in construction, (ix) metrology in construction, (x) construction reception, (xi) tracking construction behavior in service and interventions, (xii) post- use of construction works, (xiii) state control of the construction works quality.

To ensure WSS infrastructure are optimally planned and designed it is recommended that the WSS infrastructure project cycle is complemented by two critical precursory

planning and option analyzing steps specifically called (Raional) Master Planning and Project Feasibility Study.

- **Master Plan** To ensure the adequacy of the technical solution retained for investment and to guide the development of a WSS project pipeline, it is recommended that the planning, of WSS infrastructure is underpinned by a general planning process at the raional level called Master Plan (MP). A Raional WSS MP should (i) review the existing infrastructure and their operational state, (ii) assess the contextual water resources situation including health and pollution control compatibility for water abstraction and wastewater discharge, (iii) gauge the affordability of the beneficiary population for the proposed investment including sustainable operation, (iv) explore different possible and realistic options for water supply as well as for sanitation to each individual community in the raion including the adequacy of linking hydraulic systems with other community within or sometime outside the raion, (v) select the most responsive option based on a cost and benefit analysis taking into account investment as well as sustainable operation, (vi) document the WSS infrastructure need in a phased investment plan considering socio-economic priorities and constraints of the communities concerned. Raional WSS Master Plan will be technically approved by the competent authority designated by MoEn.
- **Project Feasibility Study** It is recommended that design and construction of any public WSS infrastructure project is preceded by a Feasibility Study (FS) documenting the technical, financial, economic, institutional and environmental adequacy and viability of the proposed WSS investment. The feasibility study will build on the findings and recommendation of the Master Plan mentioned above. It will refine technical options to take into account new development and enhance further the recommended technical solution based on upgraded technical standards aligned with EU practices. Feasibility study document should be concluded with clear recommendation for a least cost optimal solution together with its recommended phased investment plan adapted to the socio-economic capacity of the beneficiary community concerned. Importantly the feasibility study should also identify and document the source of funds (domestic and foreign) for the WSS public infrastructure investment, develop a financial and economic analysis of the project and document the tariff needed to cover the costs to operate sustainably the provided infrastructure and deliver qualitative related WSS services. It is recommended that the feasibility Study of any planned WSS infrastructure requires the approval of the competent authority or expert group designated by MoEn.

It is further recommended that the construction and implementation of a WSS infrastructure project should be subject to (i) the prior commitment of the concerned community/(ies) and WOC(s) to cover the cost of the services to be provided (service tariff agreement or covenant) and (ii) the securing of the entire funding sources needed to complete the entire investment (multi-annual funding commitment for domestic funding sources and foreign donors funding commitment when applicable).

#### **4.2.4 Water Use Permitting**

According to the Art 23 of the Water Law no. 272 from 23.12.2011, water abstraction from surface or underground water sources used for drinking water purposes need to be

authorized and permitted. MoEn, through its subordinated institution the Ecological State Inspectorate (ESI) is the responsible authority to issue the authorization for the use of water. ESI also administrate the Register of environmental authorizations for the special use of water. A water use authorization is also necessary for the abstraction of water for technical and industrial use, including food and agro-industry production, irrigation, aquaculture and fish-culture, the discharge of waste water, the production of hydropower, the construction of hydraulic buildings, and for beaches and bathing used for recreational purpose.

It is recommended that the authorization for special water use is streamlined, strengthened and simplified in the following directions:

- Single desk submission for applicant of water special use and coordination of assessment and review of request by a single competent authority;
- Integrative assessment of request for special use taking into account water quantity availability, water quality and water resources protection as well as water use efficiency to avoid excessive use of scarce resources;
- Development of a strengthened authorization/ permit document indicating clearly permit requirement and conditionality including (i) the limit of the use being authorized, (ii) the specific quantity to be abstracted and how it will be measured and reported and with which frequency, (iii) the quality of water discharged in to the receiving water and how it will be measured , by whom with which frequency and how it should be reported, (iv) the duration of validity of the permit and operator conditions that trigger the need for a review of the permission, (v) the prevailing legal force of data provided by the permit and/or by the competent authority in connection with the implementation of the permit.

#### **4.2.5 Management Information System (MIS) for Implementation Monitoring**

It is recommended that the implementation of the WSS strategy is supported by a Management Information System (MIS) managed by the WIU introduced in paragraph 4.2.2 with the following objectives;

1. Document WSS infrastructure strategic planning and programming activities at the national level integrating planned investment by all other Ministries and Agencies;
2. Develop and coordinate a nationwide WSS investment project pipeline documenting and periodically updating a long list of WSS investment under preparation and a short list of WSS investments ready to be funded from domestic and foreign sources and implemented based on (i) good preparatory and design study and documentation availability and (ii) commitment of beneficiary community and operator to warrant sustainable operation.
3. Provide a framework and periodically updated dataset for WSS investment programming under the MTBF process and the drafting of the five years WSS sector operational investment plan.
4. Monitor investment development progress and track investment implementation performance to identify development bottlenecks or difficulties encountered during

the WSS project life cycle (MP, FS, Design, Technical Specification and BoQ, Tendering, Construction Award, Construction, Commissioning and Operating).

5. Report periodically to the government and to the public progress and prospect of the implementation of the WSS strategy and its socio-economic impact.

#### **4.2.6 Regional Development Agencies (RDAs)**

Three Regional Development Agencies (RDAs) were created in 2010, North, Centre and South based on the Law Nr 438/28.12.2006 on the regional development in Republic of Moldova. RDAs cover most of the country population and are important institutions for the coordination of the planning of infrastructure at the regional level. Their important responsibilities include (i) the development and implementation of “regional development strategy” and (ii) the development of regional operational plans and the overseeing of their annual implementation.

WSS investments being essentially public infrastructure, RDAs have an important role to play in advancing WSS investment in the regions of the country.

It is recommended that the following tasks are delegated to the RDAs in connection with the implementation of the WSS strategy:

- To document and report on the socio-economic development issues in the regions and in particular the negative impact of neglected WSS infrastructure and the improved socio-economic prospects for communities with good WSS infrastructure.
- To collect from local administration, host and update at the regional level WSS relevant local water data such as (i) groundwater monitoring data (quality and quantity), (ii) surface water pollution issues, (iii) existing water infrastructure and gaps in the system efficiency.
- To recommend every year based on up to date water resources quantity and quality data, the raions and localities for which WSS raional Master Plans should be developed in priority.
- To guide the choice of priority investment coming out of raional Master Plans from a regional perspective and recommend allocation of funds for WSS infrastructure development by National Regional Development Fund (NRDF), the National Ecological Fund (NEF) and other national program that can support WSS infrastructure investment (SIF).
- To comment on the adequacy of the findings and recommendations of the raional WSS Master Plan studies and integrate and combine them together into regional WSS Master Plan documents.
- To communicate regional WSS Master Plan to the MoEn for integration at the national level into a national WSS Master Plan.
- To coordinate Master Plans study development in particular when WSS infrastructure needs to cross raional boundaries (transmission mains or similar).
- To contribute every five years regional operational plans for WSS investment development based on updated raional/ regional Master Plans and Feasibility Studies available.

- To coordinate and oversee the implementation of the approved regional operational plans for WSS investment from a regional perspective.
- To monitor the implementation of the regional operation plans for WSS investment and report to the MoEn progress, achievement and issues or difficulties which may hamper the smooth implementation of WSS infrastructure in the region.

#### **4.2.7 Water Operating Companies (WOCs)**

With the exception of perhaps the Chisinau water company, current water operating companies are mostly inefficient, poorly endowed with infrastructure and financially unsustainable. WSS infrastructures which are owned by the underlying local government are derelict and continuously deteriorating. WOCs are compelled to survive with service tariff and income well below cost recovery affecting their capacity to sustain the functionality of their assets and the quality of their services to customer.

All WOCs are members of the Association of Water Operators in Moldova (AMAC) to which they convey on a periodic basis operating data reported by AMAC on the IBRD IBNET website for benchmarking purposes.

The approach proposed to encourage the aggregation of WOCs is to strengthen first the WSS infrastructure of WOCs of all the raion capitals. This dynamic should build on the current experience of the EBRD project which covers six major raional capital cities (Orhei, Soroca, Leova, Hâncești, Ceadr Lunga and Florești).

WOCs consolidation should be accompanied by significant tariff increases compatible with sustainable operation and maintenance. This initial step will help identify particularly well managed and committed WOCs. In a second step a smaller group of around three (3) “best in class” operators per region will be further promoted as ROCs that aggregate several underlying WOCs.

The dynamic can be facilitated and possibly accelerated through a policy that clearly and strongly conditions access to domestic national and foreign donors investment finance to WOCs that (i) have achieved minimal standards of managerial (system of yearly business planning and performance review) and operating performance (quality of services and positive profit & loss statement) so that they are eligible to be issued an operating license by ANRE, and (ii) are willing to join or merge with other WOCs.

In this process it is recommended that local public administrations develop inter-municipal structures and covenants to allow joint oversight of WSS services. These covenants should negotiate long-term planning documents that include investment programs, Service performance indicators, and lists of assets and liabilities. WOCs (which may be the inter-municipal enterprises themselves) and ROCs should implement such covenant through professional and commercially structured yearly business plans. Covenants and business plans should be consistent with other planning documents, and specifically with regional development plans.

#### **4.2.8 Water users association in rural areas**

Community Management in the form of Water Users Associations (WUA) has been pioneered by the project “ApaSan”. Water supply systems have been developed with Swiss and Austrian Aid provided the community concerned or at least part of it is willing to invest in kind or in cash in the order of 10 % of the system investment cost. Owner of the system is then the local community administration with the association of people having contributed to the investment acting as operator of the system and managing user fees and costs for sustainable operation and maintenance.

The ApaSan experience demonstrates that community management of rural water systems is a viable option. It is incomplete in the sense that some people of the community which have not joined the association and not contributed to the initial investment are excluded from the scheme and may have difficulty to come in later. The WUA approach has already been duplicated by the National Social Fund. For villages which may not have the critical mass of beneficiaries to allow a cost recovering full fledged centralized system or which may not have the opportunity to be connected cost effectively to a regional water supply scheme, the strategy will encourage the advancement of the WUA solution. This may be then a transient solution until the time a WOC or ROC can take over to deliver enhanced services at lower cost and completing the service coverage to the entire community concerned.

#### **4.2.9 Public participation in decision making**

The UNECE Aarhus Convention is the benchmark in Europe for access to environmental information, public participation in environmental decision and access to environmental justice.

The strategy actively promote public participation in the delivery of WSS services especially in connection with the following aspects: (i) the financing of WSS public infrastructure in urban and rural context, (ii) the demand for efficiency gains (water quality, water service pressure and coverage) by water operators and therefore the need for operator aggregation, (iii) the participation of the private sector in WSS service operation, (iv) the supervision of the quality of the WSS services and (v) the affordability of the WSS services for the beneficiary communities.

#### **4.2.10 Consumer protection association**

A Governmental Agency for Consumer Protection is active based on the Law for Consumer Protection (Law no. 105-XV/ 13.03.2003).

ANRE has also a statutory obligation to protect the interest of the consumers in assessing the performance of the water operators.

Presently, there is no consumer protection association or activities dedicated to water supply and sanitation issues. Several NGOs are active in advocacy of consumer rights and awareness raising exercises. Some of these NGOs will be encouraged to play a greater awareness building role especially in promoting the beneficial health and socio-economic impact of good WSS infrastructure in urban and rural context.

#### **4.2.11 Communication and awareness raising**

Communication is an important tool of the advancement of the implementation of the strategy. In an urban context particularly important aspects to be communicated through events and reports may include among other (i) necessity of a commitment from beneficiaries for cost covering tariff to win access to funding for system improvement, (ii) importance of financial independence from the local administration and commercial culture of the WOCs, (iii) critical importance of fair, transparently and independently set tariff setting allowing cost recovery to sustain water system operation, (iv) importance of public access to information about urban water system performance and shortcoming of services to forces WOCs continuous improvement, (v) need to aggregate and consolidate WOCs into ROCs to warrant lower operating costs and good quality of services.

From a water resources perspective communication focuses on (i) the limited water endowment of the country in terms of water availability (less than 500 m<sup>3</sup>/ person and year), (ii) the risk that climate change impact may possibly significantly exacerbate the water availability stress of the country and (iii) the resulting need for the country to (a) protect water resources and therefore invest in pollution control infrastructure (urban and industrial wastewater treatment plants) and (b) use water resources sparingly and efficiently to ensure adequate water availability in the future.

MoEn as implementer of the strategy together with other actors and in particular the WOCs themselves and their association AMAC as well as the regulator ANRE need to dedicate staff to communicate with the public to (i) promote the development of WSS investments, (ii) show case that WSS investment leads to better water services and (iii) foster the acceptance by the beneficiary population that good water services has its fair cost if the services have to be improved, sustained and remain qualitative.

An equally important instrument to be enabled by the Strategy will be the development of awareness building campaigns. The Annex 4 provides an outline awareness building Strategy in the WSS sector. In an urban context the focus of awareness building measures will be to (i) showcase the benefits and the economically enabling character of good WSS infrastructure, (ii) emphasize the particularly stressed water endowment of the country leading to the need to actively save and protect water resources and (iii) to foster the development of WOCs that are financially sustainable through adequate cost covering tariffs and regional aggregation of operators.

In a rural context, awareness building campaigns will focus on (i) the importance of good water hygiene (ii) the risks of contamination and pollution of shallow wells and need to be informed periodically by the competent authorities of their water quality and trends and (iii) the impossibility to consider centralized wastewater system in many villages due to limited affordability constraints of the population and the efficient applicability of low cost decentralized sanitation systems (like EcoSan) and practices at the local level

#### **4.2.12 Institutional absorption capacity**

Institutional absorption capacity defines how good available funding resources can be translated by responsible institution and competent authority into sustainable water supply and sanitation infrastructure and services. Absorption depends very much on the

ability of the administration involved in the sector to manage efficiently the project development cycle and mobilize and disburse funds for these projects by minimizing cost and maximizing benefits for the concerned communities.

Funds management is the ability to acquire, allocate, disburse and account for the funds in a transparent manner by the different players in the sector. It requires an enabling and supportive environment for investors, e.g. Local Authorities, Operators, and Communities to document, manage and monitor their financial needs in a fair and importantly transparent manner toward all stakeholders.

Public access to project development information and wide public information dissemination by the competent authority and responsible administrations are important factor of the empowering environment. It requires decision makers to make informed decision based on transparent documentation based on predefined and publicly available decision criteria.

Absorption capacity constraints can appear along the entire project cycle from strategic national investment target settings, to master planning, feasibility study development, final design, specification, tendering and, construction up to sustainable O&M. Each step requires that preceding steps have been successfully mastered and implemented.

Other types of constraints that can affect the absorption capacity in the WSS sector include the absence of up to date WSS standards and norm in line with EU good practices and the limited availability of modern management and implementing capacities of design institutes, consultancy firms, contractors, and local providers.

Fostering the absorption capacity for funding in the WSS sector through adequate staffing of competent authority and training and capacity building of professionals along the WSS project cycle will be a critical element of the implementation of the strategy.

This will be exemplified by the development of a project “Pipeline” embedded in the WSS Management Information System of MoEn which will document and periodically update the emergence and progress of WSS infrastructure planning and development driven by the investment objectives of the central government as well as the commitment of beneficiary local government.

### 4.3 Water Resources

Water resources of Republic of Moldova are represented by surface waters (3.621 rivers, and 4.143 natural and artificial lakes), and ground waters (4.810 artesian wells, and 166.542 shallow wells). The main rivers are Nistru (length 660 km) and Prut (695 km). The biggest artificial lakes are Costești – Sîlnca on Prut river (59,0 km<sup>2</sup>), Dubăsari on Nistru river (67,5 km<sup>2</sup>). (Yearly Book “IES 2010 Environmental protection in Moldova”, MoEn, State Ecological Inspectorate). A brief overview of water resources issues in Moldova is documented in [Annex 5](#).

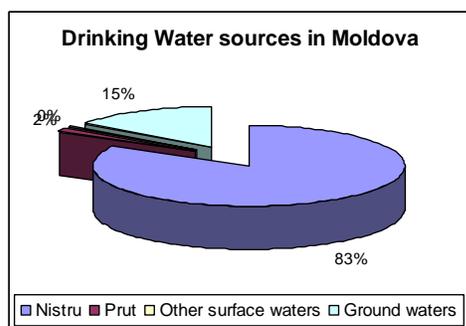
The current estimated water availability in Moldova is but limited to possibly around 500 m<sup>3</sup> per capita and year or less, making Moldova a “water scarce” stressed country and water scarcity may be further affected by climate change. The concept of “water stress” is defined as not enough water for all uses. Thresholds recommended at international level define 1,700 m<sup>3</sup> per capita and year of renewable freshwater availability as a safe level. Below this figure a country may begin to experience periodic or regular water stress. Below 1,000 m<sup>3</sup> per capita and year, water scarcity begins to hamper economic development and human health and well-being (FAO). Below 500 m<sup>3</sup> per capita and year, the country faces certain scarcity affecting its capacity to grow economically.

It is expected that in Moldova today, water resources availability has become a critical issue affecting the capacity of the country to advance economically.

#### 4.3.1 Water availability and quantity

The volume of surface water in Moldova is estimated to be around 1.32 billion m<sup>3</sup>/year. Moldova’s daily renewable groundwater reserves are estimated at the amount of 3,4 million m<sup>3</sup> out of which 2,1 million m<sup>3</sup> are approved by the State reserves out of which 2,0 million m<sup>3</sup> are reserved for household uses.

The use of surface water resources for drinking water purposes is largely restricted to the use of the Nistru and Prut Rivers.



Groundwater, especially from the Lower Baden-Sarmat aquifer is already widely exploited for water supplies. Ground water reserve usable for drinking water is also limited in several places due to naturally occurring or pollution caused quality issues such as presence of hydrogen sulfide, ammonia, fluorine, (Nisporeni, Fălești, Ungheni) as well as strontium, iron, nitrates, chlorides, arsenic and other pollutants.

**Figure 1** DW sources in Moldova (Source: IES, 2010)

In general, shallow groundwater of relatively good quality can be found in areas above and upstream of villages in hilly areas, although there is a serious lack of accurate data on groundwater use, pollution and trends

In summary the following water availability critical issues are worth documenting:

- Surface water availability is limited to the Nistru and Prut rivers and requires long and expensive transmission mains to reach out to communities in the centre of the country.
- Aquifers are already heavily exploited where available in adequate quantity and quality. Further groundwater exploitation may be possible but needs to be carefully and thoroughly explored. This may mean the need for more sophisticated treatment to remove pollution (See R&D paragraph).
- Yield of shallow wells is normally limited to below 0.5 m<sup>3</sup>/hr. This is sufficient for manual abstraction but insufficient for many centralized mechanical systems.

#### **4.3.2 Pollution issues**

The slowing down of economic activity following independence resulted in the stabilization of the level of pollution entering the river Nistru. Nevertheless, there is a need to co-ordinate water resource management including water pollution control between Moldova, Ukraine and Trans-Nistria.

Sources of pollution of surface water and groundwater are essentially due to households' individual sanitation systems, poorly or non treated municipal wastewater discharges as well as the leachates from inadequate solid waste management sites and discharges from power and industrial plants.

The impact of agricultural fertilizers and land-use seems to be less pronounced, and there also appears to be no extensive contamination from pesticides.

Monitoring of surface water is carried out by the State Hydrometeorology Service, through a network with 49 monitoring sections on 16 rivers, and 6 reservoirs; there are analyzed 49 hydro chemical indices and 5 groups' hydrobiology parameters. The State Public Health Surveillance Service has a sampling network of 60 points on 11 water bodies checking chemical, microbiological and parasitological parameters, according with the provisions of GD 384/2010.

According to most recent monitoring data, the level of pollution of rivers Prut, Nistru, and Danube do not seem to have changed significantly compared to earlier years. Generally speaking, these rivers are considered moderate polluted, and are situated in Class II-III of quality "clean and moderately polluted".

Shallow wells of 10-30 m depth are the main source of water in rural areas where there is no centralized water supply systems. Lack of adequate sanitation systems and sanitary protection zones around water sources means that 75 % of the rural population is relying on well water of inadequate quality.

#### **4.3.3 Data sources availability, integrity and administration**

Data quality and availability is critical for informed decision making process for WSS infrastructure development. Freshwater management challenges are increasing, and the allocation of limited water resources between agricultural, municipal and environmental uses now requires the full integration of supply, demand, water quality and ecological considerations. It is recommended that the water resources evaluation and planning

system for WSS infrastructure incorporate these issues into practical and robust tools for Integrated Water Resources Management (IWRM) especially at the river basin and sub-river basin level. An interesting initiative of IWRM and the establishment of a WRM committee have been developed in the Bâk river basin around Chisinau that is worth duplicating in other river basin across the country.

Regarding local data availability and data access on water resources issues, it is recommended that data are consolidated at a regional level under the RDAs where it can be easily compiled digitally and made accessible to engineers and developers for infrastructure planning and programming. Currently many important local water resources data are hogged by local administrators and not readily and freely accessible to engineers developing Master Plans and other related WSS engineering studies.

#### **4.3.4 Climate change threats**

Changes in climate will have a range of short-term and long-term consequences for cities, human health, physical assets, economic activities, and social systems, depending on how well prepared a city is and how it responds. Water resources in Republic of Moldova are sensitive to climate changes both from the point of view of quantity and quality. According to estimation, the surface water resources that are available will diminish with 16-20% by 2020. It means that the safety of water supply for all users will be jeopardized in 2020, when the intensity of water use will be of 100%. Considering the ground water availability, water deficiency is expected to be a barrier in front of the development, only beginning with 2030 (Source: National Report on Human development in Moldova – Climate change, socio-economic impact and adaptation policy, UNDP 2009).

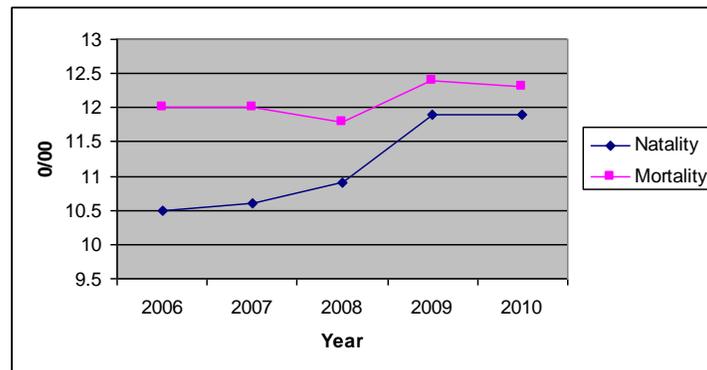
Climate change impact compounded to a water scarce country status, means that securing safe water supply in the future means the need to integrate urban planning considerations. Urban development in geographic areas with water deficit may need to be carefully managed in the perspective of future limited water supply access. This affects in particular the north of the country which is particularly water stressed and where there are numerous localities with relatively high urban density.

Three types of areas in particular may be affected in this respect:

- Areas with a traditional water deficit, in which the climate changes will add pressure on present economic activities but beyond drinking water availability for human consumption;
- Areas with vulnerable population, mainly from rural communities, e.g. South Trans-Nistru Region that already faces a water deficit and a drop of ground water level due to the overexploitation
- Central Region of Moldova that is exposed to a complex impact of diminishing water resources for both rural and urban population.

#### **4.3.5 Health issues**

The size of the population of The Republic of Moldova in January 2010 was 3,56 million inhabitants (without the administrative units located East of the Nistru River and the city of Bender). This is a decrease of 26.000 people compared to the year 2006. The percent of the rural population is 58,6%, and 41,4 % for the urban population with an increasing trend toward urbanization.



**Figure 2** Natural population growths 2006-2010

In terms of access to WSS infrastructure:

- 44% of the population has no access to safe drinking water;
- The quality of most groundwater used for drinking purpose, is inadequate due to naturally occurring or anthropogenic pollutants;
- There is a high degree of non-compliance for microbiological samples taken both in urban (9.4%) and rural (16.2) areas
- Water supplied in schools and children institutions is inadequate (23.8% of the samples exceeding the MACs for chemical and microbiological parameters).

Drinking water is estimated to cause up to 15-20% of cases of diarrhea and acute viral hepatitis mainly in rural areas, 20-25% of gastrointestinal illnesses and 100% of dental fluorosis cases. (Source: National Report on Environmental Status in Republic of Moldova, 2007-2010, MoEn, Academy of Science, and Institute of Ecology and Geography).

#### 4.3.6 Research & Development

An overview of research organizations in Moldova is shown in [Annex 6](#).

There is currently little WSS technology research in Moldova, the practice being to buy commercially available solutions from Check Republic, Letonia and Poland. Nevertheless some research activities like the groundwater drinking water treatment in Nisporeni or the wetland wastewater treatment for 4-5 ambulatory hospitals, and kindergartens in Orhei.

Areas of research that could support the WSS strategy could include:

- ✓ Low or acceptable cost treatment technology for polluted groundwater to minimize the need of long transmission mains for localities far from the two main rivers (Nistru and Prut). See the exemplary biological treatment plant developed in Nisporeni to remove  $H_2S$ ,  $NH_4^+$  and Fluoride.
- ✓ Low cost nature near or wetland centralized wastewater treatment technologies for large rural villages
- ✓ Advanced low cost, efficient, clean and low maintenance individual or communal sanitation systems like EcoSan or similar.

## 4.4 WSS Infrastructure

### 4.4.1 Water Demand, Trends and Projections

For the planning of the WSS infrastructure in Moldova, it is recommended to use planning criteria for domestic, public and industrial water demand both for urban and rural areas, are shown in Table 3.

**Table 1** Summary of Water Demand Planning Criteria

Specific water demand [l/inhabitant/d]			
Code	Demand type	Urban	Rural
1.1	Domestic consumption	<b>110</b>	<b>50</b>
	✓ house connections (HC)	110	
	✓ yard connections (YC)	80	
	✓ public tap supplies	50	
1.2	Public consumption	<b>20</b>	<b>10</b>
	✓ schools	50 l/pupil	
	✓ offices	30 l/employee	
	✓ workshop/shops	15-50 l/ employee	
	✓ hospitals	250-450 l/bed	
	✓ hotels	150 l/bed	
	✓ restaurants	60 l/seat	
1.3	Industrial consumption	<b>30</b>	<b>15</b> (if applicable)
1	Total consumption	<b>160</b>	<b>75</b>
2	Water losses (approx. 25%)	40	19
2.1	Apparent losses (approx. 10%)	16	8
2.2	Real losses (approx. 15%)	24	11
3	Total demand (daily average)	200	113
4	Peak factor (daily average)	1.4	1.6
5	Total demand (daily peak)	<b>280</b>	<b>181</b>

**Note:** the water losses value of (maximum) 25% is valid only for the new built systems or completely rehabilitated aged systems, the values for all other aged systems is likely to be much higher and should be assessed individually. The flow for industry is required for large communes where probably a light industrial activity is.

When considering larger industrial areas in main cities, the industrial water demand should be established on a case-by-case basis taking into account available data on existing consumptions, area, current and future production, and employees.

For the planning of centralized wastewater management infrastructure the following wastewater flow and load criteria are recommended to be used:

- Domestic wastewater production for localities ≤ 10.000 P.E. 135 l/P.E./day if urban, and 75l/s for rural areas
- Domestic wastewater production for localities > 10.000 P.E. 160l/P.E./day
- Domestic wastewater return factor as ratio of water consumption and wastewater production 100%
- Peak factor as a fraction of the daily flow for hourly flow rates of 1/10
- Pollution load: Unsettled Biological Oxygen Demand in 5 days (BOD<sub>5</sub>) of 60g/P.E./d.

The methodology and the assumptions of the socio-economic, of the water demand projections, and the wastewater flow and loads should be developed in compliance with EU legislation and international good practices, and should be based on published latest data provided by the Bureau of Statistic of Republic of Moldavia.

For smaller rural community that cannot afford the operation of centralized system (less than 3.000 population, it is recommended that only decentralized individual sanitation system are provided. This may include septic tanks and associated services for collecting the sludge and transport it to a WWTP, or low cost Eco-San solutions tested in schools and for individual households by the ApaSan project and that in principle eliminate or lower the frequency for the transport of sanitation sub-products. Cultural acceptance and therefore awareness building and training is a key element for the adoption of these alternatives.

#### **4.4.2 Existing WSS Infrastructure**

Moldova has currently 1.032 localities with centralized drinking water supply systems, out of which 3 municipalities and 52 cities (100%). There are in total about 2000 registered water supply systems in the country out of which 50 % are considered satisfactory (but often in a poor state), 44% need complete rehabilitation, 1% need to be abandoned, and 5 % where there are no available data.

The drinking water distribution networks have a total length of about 9.000 km, out of which at least 3.700 km are in a very poor technical condition. The rest may not be much better. This translates into 5 damages /km and year a sign of serious deterioration of pipe integrity across the country. Out of 271 registered pumping stations, 226 are in a poor technical condition.

Presently, 623 localities have a centralized wastewater management system, including 3 municipalities, 52 towns and 565 rural localities. The technical condition of the sewerage networks in these localities include 25 % as satisfactory, 13 % in need of repair, 40 % requiring full refurbishment, 15 % heavily deteriorated and 7 % under construction.

Centralized wastewater infrastructure includes 464 WWTP, 557 pumping stations and 2.966 km of sewers. An overview of existing WSS infrastructure is shown in [Annex 7](#).

Due to the poor technical conditions of WWTPs in the urban areas Rezina, Criuleni, Otaci, Soroaca, Taraclia, 80% of wastewater volume is estimated to be discharged without treatment.

Currently, 977 rural localities or 66 % of them have some level of centralized water supply systems. Main water sources in rural areas are groundwater extracted manually from private or public wells. 565 rural localities are registered as having some kind of centralized wastewater management infrastructure. In the majority of the rural areas these infrastructure are obsolete, derelict and non operated.

49 % of the population is living in communities where buildings have no connections to sewerage networks.

The critical issues to be addressed through the revised strategy include:

- Poor integrity status of the drinking water supply infrastructure;
- Poor integrity status of waste water collection and treatment infrastructure, and inefficient operation of WWTPs;
- Low percent of population covered by centralized waste water services;
- Very low percent of investments projects in progress.

A list of WSS investment currently under implementation is provided in [Annex 8](#).

#### **4.4.3 Programming and planning of infrastructure**

It is recommended that the planning and implementation of WSS infrastructure to implement the strategy follows the following approach:

1. Development of raional MPs for WSS infrastructure covering all the communities of each raion with a prioritization methodology established to define the raions for which such MP should be first developed.
2. Development of 5 years WSS Investment Development Plan based on priorities communities/ infrastructures established in available MPs and regional and raional development plans;
3. Development of Feasibility Studies by the concerned communities for priority communities/ infrastructure defined in the 5 years WSS Investment Plan. To facilitate the development of such studies which are extensive and may partially be beyond the means of local administration, establishment of a WSS study co-financing fund that can be tapped by committed local administrations for MP, FS development and technical design and tender documentation of WSS infrastructure;
4. Approval of the WSS investment project based on FS recommendation and identification and mobilization and commitment of funding sources for investment from domestic as well as foreign sources;
5. Detail design, technical specification, BoQ for the planned WSS infrastructure that have committed funding for investment;
6. Transparent tendering and contract award of supply, works and services for construction taking into account conditionality for tendering imposed by financiers.

#### **4.4.4 Methodology for prioritization**

The implementation of the WSS strategy along the approach outlined above requires the definition of prioritization criteria especially in the early steps of the process in particular (i) the choice of the raions where MPs should be developed in first priority and then (ii) the WSS infrastructure and communities within a MP covered area which should implemented in first priority.

Taking into account the recommendation of the OECD investment plan of 2011 the following group of prioritization criteria are recommended to be considered when selecting areas for MP study and/ or WSS infrastructure to be implemented:

A. WSS Strategy framework criteria:

- 1) Maximize the reduction of water related morbidity and water borne diseases in population especially vulnerable population;
- 2) Maximize the achievement of MDGs for WSS by increasing availability of safe drinking water and sanitation services to widest circle of population;
- 3) Contain/ reverse the deterioration of existing infrastructure integrity serving large population and improve the efficiency and reliability of existing assets through in depth system renovation;
- 4) Reduce significantly water pollution discharge into water bodies needed for water supply also in international context;
- 5) Maximize the advancement of the approximation toward EC Directives on WSS and the Water Framework Directive;
- 6) Availability of accurate ground and surface water resources record data allowing a meaningful option analysis comparing local versus trans-boundary technical solutions;
- 7) Interest for and commitment to WSS infrastructure investments from the raional and subordinate local administrations;

These criteria position water supply as having a higher priority over wastewater management and sanitation especially in areas where water supply is lacking.

#### B. Project framework criteria

- 1) Interest and commitment of concerned community(ies);
- 2) Availability of accurate data on water resources situation and existing infrastructure data;
- 3) Availability of recent studies facilitating planning and development;
- 4) Capacity of communities concerned to mobilize own financial and other resources for implementation;
- 5) Willingness of communities to accept cost covering tariff increase;
- 6) Willingness of WOC(s) to aggregate with other concerned operators to improve operation efficiency.

#### 4.4.5 Projects pipeline development

Based on the information generated by the raional MPs and Project FSs, it is recommended that MoEn develop as part of its MIS a national pipeline of WSS infrastructural projects showing a long list of WSS project under preparation along the project cycle and a short list of WSS infrastructure investment ready for financing and implementation.

Information about projects in the WSS infrastructure pipeline should preferably include:

1. Project Profile Basic Information
2. Project Developer Information
3. Surrounding Socio-economic Indicators
4. Project Development Maturity
5. Project Framework
6. Physical Project Components
7. Beneficiary(ies)
8. Expected Benefits
9. Project Investment Cost

10. Project Activities
11. Project Progress Indicators
12. Institutional Framework
13. Financing Sources for Investment
14. Sustainable Financial Viability
15. Environmental Safeguards
16. Implementation Arrangement

WSS project developers across the country seeking domestic national funding or international funding for their projects implementation should be required to feed information about their project(s) and the level of maturity of the documentation available and the readiness for funding and update the information periodically.

#### **4.4.6 WSS investment mid-term objectives**

The mid term investment included the present WSS Strategy is focused both on urban and rural areas, as follows:

**Water supply:** investments on rehabilitation of water catchments structure, water treatment plants, pumping station and networks, extension of the existing drinking water distribution network.

**Wastewater:** rehabilitation/upgrading of wastewater treatment plants and sewerage network extension.

The target for the first five years is to reach the coverage with WSS infrastructure for 30% of unconnected population in urban area and 20-25% in rural areas.

In the rural areas the communes and villages will be grouped by sizes as their needs are very different. Communes having more than 7000 inhabitants are assimilated with medium size cities and the ones having more than 5000 inhabitants were assimilated with small towns. Therefore, where not available, the calculated investments for new centralized water system and wastewater infrastructure, including a WWTP, are the cheapest and safety solutions.

Communes having between 2500-5000 inhabitants will also benefit by new centralized water supply systems, the model developed by the Swiss Agency for Development and Cooperation SDC already has been successful applied.

Concerning the wastewater, Public Eco-San toilets for public institutions and individual Eco-San toilets for households are considered to be a practical solution. Individuals will be encouraged and financially sustained to build such kind of toilets as the poverty level and the technical skills of the operators in the rural areas do not allow the construction of a centralized wastewater collection. The Government will initiate a public awareness program related to the environmental impact of using the existing cesspools.

The size and the economical situation of the settlements of Republic Moldova do not allow the implementation of the Urban Wastewater Directive 91/271/EEC. Grouping the settlements in so called "cluster agglomeration" suitable for large municipalities, will be performed when a Master Plan is in place, but only on a "case to case" analysis. The

same approach is considered for the water supply sector, in case of large municipalities and cities. Constructed wetlands are not considered to be an option as the climate of Moldova is not a favorable one for such type of wastewater treatment.

The same assumption is applied for the communes with 1500-2500 inhabitants. The communes above 1000 inhabitants will benefit by a centralized water system, while the household's owners will be financially sustained to build an Eco-San Toilet.

The need of investments is estimated based on the continuous decreasing of the population, mainly due to the migration and low birth- rate; it is very likely that in the future, some of small villages will not exist any more.

All entities assimilated to public consumption, such as commercial buildings, schools, hospitals will be mandatory connected to both water/wastewater infrastructures. For urban localities the development of new drinking water supply infrastructure, shall be accompanied by wastewater infrastructure. For rural localities the development of new drinking water supply infrastructure, shall be accompanied by any appropriate alternative of sanitation infrastructure.

Indicative Infrastructural Investment Policy Guidance of the WSS Revised Strategy is given in [Annex 9](#).

The indicative communities and WSS investment projects, for the period 2012-2017 are highlighted in [Annex 10](#).

#### 4.4.7 WSS investment long term objectives

The proposed long-term investments' objectives for water supply and wastewater disposal are:

- Long-term sustainability
- Sustainable improvement of the environment
- Compliance with the NDS, regional strategy objectives and the relevant EU Directives.

The long-term investments will be based on the analysis and assessment of the existing situation, projections of future water demands and wastewater amounts, comparison with national and regional/ rayon targets, option analysis and regional/local strategies. A summary of the planned WSS infrastructure in Moldova is shown in Table

**Table 2** Indicative list of Water Supply infrastructure to be implemented

Water Supply Indicative Water Supply Investments Targets	Current Situation	2017	2027
DW Treatment Plants (no.)			
Rehabilitation/Upgrading DWTP			
Raional capital, towns and cities (no.)	no reliable data available	29	0
Localities > 7001 inhabitants (no.)	no reliable data available	4	0
Localities 5001 - 7000 inhabitants (no.)	no reliable data available	9	0
Localities 2501 - 5000 inhabitants (no.)	no reliable data available	0	0
Localities 1501 - 2500 inhabitants (no.)	no reliable data available	0	0
Localities 450 - 1500 inhabitants (no.)	no reliable data available	0	0
Total rehabilitated		42	
New DWTP			
Raional capital, towns and cities (no.)	no reliable data available	0	0

<b>Water Supply</b>	<b>Current Situation</b>	<b>2017</b>	<b>2027</b>
<b>Indicative Water Supply Investments Targets</b>			
Localities > 7001 inhabitants (no.)	no reliable data available	4	1
Localities 5001 - 7000 inhabitants (no.)	no reliable data available	3	1
Localities 2501 - 5000 inhabitants	no reliable data available	2	53
Localities 1501 - 2500 inhabitants	no reliable data available	0	98
Localities 450 - 1500 inhabitants	no reliable data available	0	191
Total new		9	344
<b>Water Distribution Network (km)</b>			
<b>Rehabilitation</b>			
Raional capital, towns and cities (km.)		767	0
Localities > 7001 inhabitants (km.)		42	0
Localities 5001 - 7000 inhabitants (km.)		81	0
Localities 2501 - 5000 inhabitants (km.)		0	0
Localities 1501 - 2500 inhabitants (km.)		0	0
Localities 450 - 1500 inhabitants (km.)		0	0
Total length		890	0
<b>New water distribution network</b>			
Raional capital, towns and cities (km.)		134	
Localities > 7001 inhabitants (km.)		171	
Localities 5001 - 7000 inhabitants (km.)		157	
Localities 2501 - 5000 inhabitants (km.)		46	
Localities 1501 - 2500 inhabitants (km.)		0	
Localities 450 - 1500 inhabitants (km.)		0	
Total new distribution network		508	
<b>New connected inhabitants</b>			
Raional capital, towns and cities (no.)		22,378	19,155
Localities > 7001 inhabitants (no.)		17,053	33,079
Localities 5001 - 7000 inhabitants (no.)		15,679	36,914
Localities 2501 - 5000 inhabitants (no.)		4,616	221,973
Localities 1501 - 2500 inhabitants (no.)		0	163,945
Localities 450 - 1500 inhabitants (no.)		0	177,826
Total new connected inhabitants		59,726	652,892
<b>Total population coverage with DW supply services (%)</b>			
Raional capital, towns and cities (%)	86	92	99
Localities 450 - 7001 inhabitants (%)	26	32	65

<b>Waste Water &amp; Sanitation</b>	<b>Current Situation</b>	<b>2017</b>	<b>2027</b>
<b>Indicative Water Supply Investments Targets</b>			
<b>Waste Water Treatment Plants (WWTPs)</b>			
<b>Rehabilitation/Upgrading DWTP</b>			
Raional capital, towns and cities (no.)	no reliable data available	29	0
Localities > 7001 inhabitants (no.)	no reliable data available	0	0
Localities 5001 - 7000 inhabitants (no.)	no reliable data available	0	0
Localities 2501 - 5000 inhabitants (no.)	no reliable data available	0	0
Localities 1501 - 2500 inhabitants (no.)	no reliable data available	0	0
Localities 450 - 1500 inhabitants (no.)	no reliable data available	0	0
Total rehabilitated WWTPs		29	
<b>New WWTPs</b>			
Raional capital, towns and cities (no.)	no reliable data available	0	0
Localities > 7001 inhabitants (no.)	no reliable data available	6	0
Localities 5001 - 7000 inhabitants (no.)	no reliable data available	14	0
Localities 2501 - 5000 inhabitants	no reliable data available	0	0
Localities 1501 - 2500 inhabitants	no reliable data available	0	0
Localities 450 - 1500 inhabitants	no reliable data available	0	0
Total new WWTPs		20	0
<b>Wastewater Network (km)</b>			
<b>Rehabilitation</b>			
Raional capital, towns and cities (km.)		511	0
Localities > 7001 inhabitants (km.)		0	0
Localities 5001 - 7000 inhabitants (km.)		0	0
Localities 2501 - 5000 inhabitants (km.)		0	0
Localities 1501 - 2500 inhabitants (km.)		0	0
Localities 450 - 1500 inhabitants (km.)		0	0
Total length		511	0
<b>New wastewater network</b>			
Raional capital, towns and cities (km.)		142	57
Localities > 7001 inhabitants (km.)		206	99

Waste Water & Sanitation Indicative Water Supply Investments Targets	Current Situation	2017	2027
Localities 5001 - 7000 inhabitants (km.)		219	111
Localities 2501 - 5000 inhabitants (km.)		0	666
Localities 1501 - 2500 inhabitants (km.)		0	492
Localities 450 - 1500 inhabitants (km.)		0	533
Total new wastewater network		566	1,959
<b>New connected inhabitants</b>			
Raional capital, towns and cities (no.)		47,300	19,155
Localities > 7001 inhabitants (no.)		25,702	33,079
Localities 5001 - 7000 inhabitants (no.)		27,348	36,914
Localities 2501 - 5000 inhabitants (no.)		0	221,973
Localities 1501 - 2500 inhabitants (no.)		0	163,945
Localities 450 - 1500 inhabitants (no.)		0	177,826
Total new connected inhabitants		100,350	652,892
<b>Decentralized wastewater facilities</b>			
Public ECOSAN Toilets (no)		214	
Individual ECOSAN Toilets(no)		296	610,088
<b>Total population coverage with DW supply services (%)</b>			
Raional capital, towns and cities (%)	73	82	98
Localities 450 - 7001 inhabitants (%)	3	10	57

#### 4.4.8 WSS infrastructure impact assessment

WSS services are essential for daily life and they are equally an indicator of the life standing in a country. Access to water and sanitation is essential for public health and economic development being expressed by indicators such as coverage in terms of localities and population, water consumption, water quality. For the analysis of the WSS services impact on the quality of people lives, the following indicators will be analyzed during construction and operation (data are available from statistics, publications, and WSS projects and mass-media):

- ✓ Availability, quantity and quality of water resources
- ✓ Quality of WSS services
- ✓ Environmental Impact Assessment of WSS Sector of (i) degraded infrastructure, (ii) water use for different purposes, (iii) waste water management, (iv) practices of discharging waste water treated or untreated, (v) sludge management at the level of waste water treatment plants, (vi) practice of capturing the emission of CH<sub>4</sub>, H<sub>2</sub>S and other gases resulted from anaerobic treatment of sludge, (vii) location of waste water treatment facilities toward localities, water sources, and recreational zones
- ✓ Socio-economic impact.

In order to mitigate the negative environmental impact of the WSS sector, within the planning activity for the construction of such facilities, those with a significant impact will be the subject of an EIA study according with the requirements of the Law 851/1996; this is a compulsory obligation previous to the design phase of the development of infrastructure.

## 4.5 WSS Services

### 4.5.1 Water Operating Companies (WOCs)

The WOCs are facing a number of major challenges to become efficient and sustainable in particular:

- ✓ Demand for huge investment to rehabilitate the existing and often obsolete infrastructure and equipment, to expand coverage to peripheral services areas and surrounding communities, and to meet the higher service standards required under EU norms;
- ✓ Need to improve the efficiency of operations, in particular the reduction of Non-Revenue Water (NRW), energy conservation, and increased revenue collection, and to improve the service delivery to the customers;
- ✓ Need to instil into water services operation a commercial culture aimed at providing quality services to its customers and based on modern management principles;
- ✓ Need to cover its cost of services including operation, maintenance and replacement costs required to maintain and upgrade services in the future while maintaining tariffs at an acceptable level for its customers

The approach proposed to be applied to stimulate the aggregation of WOCs is to invest into WSS infrastructure in raion capitals and to accompany these investments with significant tariff increases to allow them to become financially viable for sustainable operation. This initial step of around 10 years will help filter out reasonably well managed and committed WOCs. In a second step of 10 years a smaller group of around 4 operators per region composed of “best in class” of the raion capital operators assisted above will be further promoted. These most promising operators will be assisted through further subsidized infrastructure investment allowing them to increase service coverage and aggregate new willing settlements. Incentives will be also provided for capacity building and training. In the process, the more efficient operators will become growing seeds that progressively absorb less efficient operators of other cities and communities around cities.

This dynamic should be facilitated and possibly accelerated through a policy that clearly and strongly condition access to domestic national and foreign donors investment finance for WSS investment to WOCs that (i) has been issued a license to operate by ANRE and are therefore subject to continuous performance improvement through periodic business planning and performance review, and (ii) is willing to join or merge with a licensed water operating company, if it is still an unlicensed operator.

The intermediate target should be the creation of ROCs that serve at least 100 000 population for water supply and sanitation with a cut-off point of services for communities less than 5 000 persons (sanitation) and 500 persons (water supply).

The ultimate goal of regionalization may be the emergence of 3-5 ROCs that shall be provide WSS services to the entire population except the smaller villages. Efficiency and service level targets should be aligned with neighbouring EU Member States. This can be developed with the development of benchmarking schemes already pioneered by AMAC.

The creation of larger ROCs covering several raions is expected to yield numerous advantages including:

- ✓ Economies of scale: larger operations which will lead to decreasing costs of operation and maintenance (O&M) and lower cost covering tariffs charged to the customers
- ✓ Ability to attract resources: ROCs are better positioned to attract qualified staff and capital
- ✓ Quality of management: increase in size should go hand-in-hand with increase in quality of the management that shall be able to manage the required investments and to improve the efficiency of its operations and the quality of its service.

Other incentives could be provided to WOCs willing to aggregate like capacity building and training for directors. AMAC has for example developed an interesting educational 2 years training scheme for WOCs directors which allows WOCs decision makers to improve their technical, managerial and financial skills.

ROCs should be licensed by the Water regulator which should also assess periodically performance through transparent benchmarking exercises in connection with tariff review.

It is recommended that the Regionalisation process is supervised and monitored by a Steering Committee, chaired by the Ministry of Environment, and composed of concerned Ministries, i.e. Environment, Regional Development and Construction, Health, the Regulator, representatives from Public Local Administration (CALM, Associations of Mayors), and the Sector (AMAC and 1 or 2 selected WOCs).

It is recommended that the legal format of a ROC is a Joint Stock Company (JSC) with the shares owned by the participating Public Locals Administrations (PLA) and operating under a license issued by the Water Regulator. Regionalisation shall take place on a voluntary basis by the Owners of the systems (Local Government). The Government shall stimulate Regionalisation by conditioning budget support to an operating license. Investment Programmes shall be scrutinised during the review of tariff adjustment proposals.

The decision-making process within a ROC will be involving many actors with partially conflicting interests that will need to be mitigated. Transparency of decision process will be a must including the organization of public hearing prior important decision.

It is recommended for simplification and streamlined operation that ROC customers are subjected to single tariff system (possibly with differentiated tariff for different type of customers) across the entire area covered. To facilitate the emergence of ROCs an awareness raising programme for local administration highlighting the benefits of ROCs should be deployed.

Human Resources Development in the WSS sector should be proactively promoted. The current practice of cooperation between the Technical University of Chisinau and AMAC provides a good example of capacity development which could be further reinforced with ARA the Romanian counterpart of AMAC.

Training should target all job levels in WOCs and address in particular the most senior position which will have to manage the transition from WOCs to larger licensed ROCs.

Ideally training should lead to a system of competence certification. This can be facilitated by a National Training Plan in the WSS sector defining the scope of the Training Delivery System, its set-up, the training needs, identified training programs, and financing.

#### **4.5.2 Water Users Association in Rural Areas**

WUAs are local initiatives to address local problems for WSS and represent in most cases a temporary solution to rehabilitate or construct smaller WSS systems. Such initiative should be stimulated until the time a neighbouring WOC or ROC can take over operation and maintenance as well as system coverage extension.

#### **4.5.3 Shorter Term Objectives**

The strategy in the next 5 years (2012-2017) aims at the following:

- 1) To clarify the concept of ROCs, its legal basis and modus operandi
- 2) To put in place the necessary legislative and regulatory framework
- 3) To ensure that a first generation of aggregated WOCs/ ROCs are tested and assisted to prove the practicality of the concept
- 4) To ensure that the necessary institutions are established and refined to ensure they are functioning as intended, especially the Water Regulator (ANRE), and the Association of Moldovan Water Operators (AMAC).

#### **4.5.4 Longer Term Targets**

The longer -term objectives (2017-2027) aim at:

- ✓ Ensuring that each raion has a raional ROC aggregating services in several localities of the raion
- ✓ Advancing a small group (around 3 to 5 per region) of multi-raional ROCs serving several communities in several raions

Having ROCs in place does not automatically imply total coverage of WSS services in all localities served by the ROCs. Due to the rather scattered nature of housing in settlements in Moldova, investment to connect peripheral population may be costly to achieve. It does imply though that these ROCs can grow organically and progressively add covered areas and new settlements served in line with the evolving national WSS investment programme

#### **4.5.5 Performance measurement & Improvement**

WOCs aggregation means consolidation and integration of (i) the technical and physical infrastructure, (ii) financial and accounting systems and procedures, (iii) commercial systems and procedures (customer relations, billing and revenue collection), (iv) human resources, (v) management arrangements, systems and procedures.

Benchmarking at the national level can be an effective tool for the WOCs and their overseers to compare utilities performance and stimulate necessary improvement. It can also provide useful information to the Water Regulator to define performance targets that need to be documented in yearly business plans that underpin proposals for tariffs adjustments. It can also provide the Ministry of Environment with important information about the trend, progress and prospect of the WSS sector for monitoring and programming purposes.

It is recommended that benchmarking provide the basis to evaluate the performance of a WOCs and ROCs in comparison to other companies in the country and abroad. The Water Regulator shall develop a system of benchmarking, that identifies Moldova relevant Key Performance Indicators (KPIs), and establish a system for data collection and analysis, and comparison of results with other Moldovan companies and international practices.

KPIs should also cover the responsiveness to Government policy. It is recommended that the Water Regulator report and publish on a yearly basis the results of benchmarking exercises. This can build on the current experience and expertise of AMAC which already provide benchmarking services on a voluntary basis to WOCs for the IBNET website.

To support the process it is recommended that a manual of good practices is documented and used to train WOCs senior and technical staffs. An outline table of content of such guidance document is provided in [Annex 11](#).

#### **4.5.6 Establishing the Water Regulator**

An independent Water Regulator is in the process to be established under ANRE. The water regulator shall have the main tasks to

- ✓ Advise on tariff adjustment proposals
- ✓ Promote adequate quality of services, e.g. through licensing of Operators, benchmarking, and setting of standards
- ✓ Protect the interests of the Consumers
- ✓ Support the Government WSS policies in terms of aggregation of service providers, quality of services and coverage

In tariff matters, a strong and genuinely independent water regulator will determine affordable and justifiable WSS service costs for beneficiary population served. It will take away the political meddling and move the WSS tariff adjustment process into professional cost accounting. Tariff adjustment calculation will be based on predetermined methodology approved by politicians and policy makers.

The regulator will have among other the following important functions.

- ✓ Encourage the consolidation of water operators through the licensing of WSS services;
- ✓ Check the capacity of water operators to efficiently deliver WSS services and issue operating licenses and related reporting requirements to water operators;

- ✓ Receive, evaluate and endorse yearly the performance achievement report of licensed operators and the business plans for follow-up year with well documented performance improvement targets in terms of investment, service coverage and quality of services;
- ✓ Publish performance review and assessment reports of licensed WSS operators.
- ✓ Define and get approved by the government and if need be by the Parliament the methodologies for WSS services cost accounting;
- ✓ Review tariff increases received from licensed operators to ensure they are conform and justified according to the politically approved cost accounting methodologies and endorse the tariff adjustments as justified, necessary and conform with approved regulation;
- ✓ Pass the tariff adjustment endorsement to the concerned local authority to decide and promulgate officially the WSS tariff increase;
- ✓ Receive notification of the licensed water operators that the adjusted tariff has been practically applied.

Regulation shall be implemented gradually starting with the largest WOCs. This will start by the issuance of operating license to WOCs fulfilling minimal standards of performance based on an assessment of the current performance of the company and its key staffing (General Director and Financial Director). Only licensed WOCs should be eligible for funding under the national budget and donor financing and other available incentives provided to WOCs to improve their performance.

It is recommended that the Regulator will review tariff adjustment request by WOCs periodically preferably not more often than every 3 years. The regulator should also conduct benchmarking exercises of licensed WOCs and produce an annual benchmarking report on these companies.

Recommended preparatory action to help ANRE take over the regulation of the WSS sector services include the development of a tariff adjustment methodology tariff calculation, the development of a benchmarking system for WOCs, and the mobilisation of the necessary resources in terms of qualified staff and facilities.

#### **4.5.7 Water Safety Plans**

The WHO Guidelines for Drinking-water Quality advocates for the implementation of Water Safety Plans (WSPs), a risk based preventative approach to managing drinking-water safety from catchment to consumer. Since their introduction in 2004, WSPs are increasingly being recognized as the most effective approach to ensuring drinking-water safety and is being promoted by governments and implemented by water suppliers across the globe.

WSP is designated to increase confidence that safe water is consistently being delivered to consumers by ensuring that key elements in the WSP process are not overlooked and that the WSP remains up to date and effective. The WSP team is set up by the water supplier or similar entity managing organized drinking-water supplies. WSP could also be used by external assessors for an independent assessment on progress with WSP development and implementation.

The Republic of Moldova has committed itself within the target setting process for Water and Health Protocol to elaborate Water Safety Plans for all the cities by 2015 and for the rest of all localities over 5 000 inhabitants by 2020 (see Annex to the Joint Order no. 91/704 from 20.10.2010 of the Minister of Health and Minister of the Environment, and GD 934/2007, concerning the WSP under the Water and Health Protocol).

## **4.6 Management Information System (MIS)**

It is recommended that the Implementation of the WSS Strategy is supported by a MoEn managed and operated Management Information System (MIS).

Under MIS, the central government can also include additional data bases concerning WSS sector, coming from professional associations such it is the Electronic library hosted by AMAC.

### **4.6.1 MIS versus Operation Support System**

The MIS should provide complete information for the strategic planning, programming and monitoring of WSS investment for MoEn managers and governmental decision-makers also from other Ministries and Agencies. The MIS should rely on Data input Operation Support Systems (OSSs) managed by various Agencies (relevant units at other Ministries dealing with WSS investment, AAM, RDAs, Local Administrations, WOCs, etc.) for the day to day gathering and processing of raw data. The MoEn managed MIS should maintain essentially aggregated and quality controlled data and information (processed data) from these different OSSs. After a successful introduction and operation, the MIS could further grow to Decision Support System (DSS) providing what-if analysis grounds for decision-making and/or to an Executive Information System (EIS) providing critical information on certain KPIs needed for strategic oversight of WSS investment development. The MIS might also have its own GIS module or feed the information into national-wide GIS system in coordination with E-Government Initiative and other governmental GIS systems like Cadastre GIS.

The MIS to be developed to manage the implementation of the WSS Strategy will be essentially an Infrastructure Development MIS to tackle the three main functions:

- 1) Strategic WSS Investment Programming
- 2) WSS Projects Pipeline Development and Management
- 3) WSS Strategy Implementation Monitoring

### **4.6.2 Competent authority for data administration**

While E-Government initiative is offering in a sense the outsourcing of the data storage, archiving and management from the technical point of view, each respective Ministry including MoEn should be responsible for the content timeliness and accuracy of the WSS Database/MIS. It is recommended that the procedure for WSS investment data gathering, validating, processing and exchange under the MIS should be institutionalized in dialogue with the relevant Ministries.

### **4.6.3 MIS development procedures**

To achieve its objective to support the implementation of the WSS Strategy, it is recommended that the following procedures are deployed and verified: (i) Positions/Titles within the MoEn unit(s) responsible for data gathering, verification and processing are documented and in power, (ii) Reports required from and to MoEn and its

partner institutions are defined and approved; this should contain description of Format, Content and Timeliness, (iii) MIS is developed and hosted by E-Government with a minimum of 95% uptime availability, (iv) MIS Administrator is assigned and trained, (v) User, Administrator and Developer Manuals are developed and applied, (vi) Feedback facility for users of the MIS is in place and reviewed regularly (initially weekly, later monthly) by MIS Administrator to introduce new features, reports, data exchange formats, (vii) Report on usage of the system by responsible specialists for data entry and exchange is available for internal management review.

#### **4.6.4 Compatibility with Moldova E-Government initiative**

The WSS MIS should be compliant with the requirement of the E-government initiative. Apart from saving costs on hardware, networking and software costs, the main benefit of using E-Gov PaaS/SaaS will be availability of a single platform to share and exchange data with and between other governmental institutions related to the WSS sector. In exchange, the WSS MIS could be useful for the E-Gov initiative by contributing additional MIS information for a national-wide GIS/MIS if such a strategic decision is made at governmental level.

#### **4.6.5 Compatibility with EU databases and reporting**

The structure of the MIS database should be compatible with the concept of „Water Information System for Europe” (WISE), that contains the relevant information about water resources and their management at European level (WFD Circa library). The WISE principle is to create a multipurpose, multi-user data base to allow the analysis and decision making processes.

From the technical point of view, WISE can be accessed via Internet, with a „gateway” for the public access through „EEA-Reportnet”. Reportnet is like a library shelf where archived data, information and knowledge folders are held. „Reportnet” is already in function as an entry point for „EIONET Water” and include reports regarding the State of the Environment (SoE), and the progress of the implementation of the Water Framework Directive, the Urban Waste Water Directive, and other Directives regarding Drinking Water, Nitrates, and Bathing Water.

The set up of WISE system is also in compliance with the requirements of INSPIRE Directive, and SEIS initiative (Shared Environmental Information System).

#### **4.6.6 Data and information quality assurance**

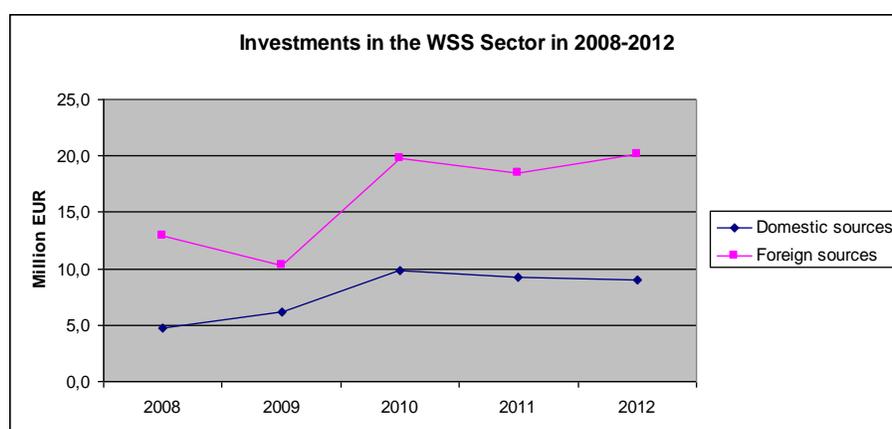
The WSS MIS to be developed should include a quality control system of the imputed data because it becomes useless if is based on outdated, inaccurate or invalid data. It is recommended that the following dimensions are integrated into the quality control system of the MIS: (i) Time: Timeliness, Currency, Frequency and Time Period, (ii) Content: Accuracy, Relevance, Completeness, Conciseness, Scope, Performance, (iii) Form: Clarity, Detail, Order, Presentation, and Media.

## 5. Impact Assessment of the Financial and Non-Financial implementation costs

### 5.1 Current funding for WSS infrastructure in Moldova

In 2010-2011, the OECD helped evaluate various alternative policy scenarios to fulfill the 2007 Strategy. Depending on the level of targeted objectives (compliance with EU Directives or achievement of the MDGs), the total investment cost was recognized to be in the range of 1,3 to 3,2 billion EUR.

Contrasting this huge demand for investment, an assessment was made of the current spending trend in WSS investments in the country. The total amount spent in the WSS sector of Moldova during the last five years (2008-2012) was only about 120 million EUR equivalent (see figure 3 below) with a split between domestic and foreign sources strongly tilted toward foreign donor contribution (32% versus 68% respectively).



**Figure 3** Investments in the WSS Sector in 2008-2012  
(Source: Ministry of Finance; own estimations)

As a share of National GDP, the total amount allocated in the WSS Sector (domestic plus foreign donors) was only 0.4% in 2008, 0.7 % in 2010 and 0.5% in 2011-12 years. For a country at an early stage of development of WSS infrastructure, the domestic share of WSS investment at less than 0.3 % is grossly insufficient.

### 5.2 Benefits of WSS infrastructure development

Evidences from studies such as the OECD study called “Benefits of Investing in Water and Sanitation, an OECD Perspective, 2011” indicate that in a country at an early stage of socio-economic development like Moldova, WSS investment can have a large positive socio-economic impact. Benefits from the provision of basic WSS services such as those implied by the MDGs are large and far outstrip costs. For example the achievement of the MDGs for water and sanitation are estimated to generate global benefits of 84 billion USD per year, yielding a benefit to cost ratio of 7 to 1. Such ratio makes the economic internal rate of returns of WSS projects very attractive. WSS infrastructure development may be in a country like Moldova with scarce financial resources, an investment that generate economic return far outweighing any other type of public investment and represent therefore an optimal allocation of public capital investment.

In the numerous rural villages of Moldova, benefits from good WSS infrastructure would include improved health, time saving, higher productivity, healthier children as well as improved status and dignity.

More broadly, adequate WSS services appear to be a key precursor of economic growth considering that companies need to rely on good and sustainable water and sanitation services for their production processes and their workers. Typical benefits relevant for Moldova could include increased school attendance, boosted tourism revenues or improved environmental quality and lower water treatment plant costs from better water quality of receiving waters.

### **5.3 Investment needs**

Water infrastructure and services incur both regular as well as one-off financial costs, requiring separate financing provision:

Recurrent costs are the continuous expenses involved in operating water systems, including wages and salaries, fuel, electricity, chemicals and other materials, spare parts and minor capital items necessary to maintain, repair and replace water systems. Some recurrent costs are overhead items, which are fixed and do not vary with the level of service (e.g. administration salaries, office rent, research, monitoring, meter reading, routine maintenance). Other items are variable and rise and fall with the volume of service provided (e.g. chemicals for treatment, electricity used for pumping). The most sustainable source of finance for recurrent costs is user charges, including cross-subsidies between different consumer categories.

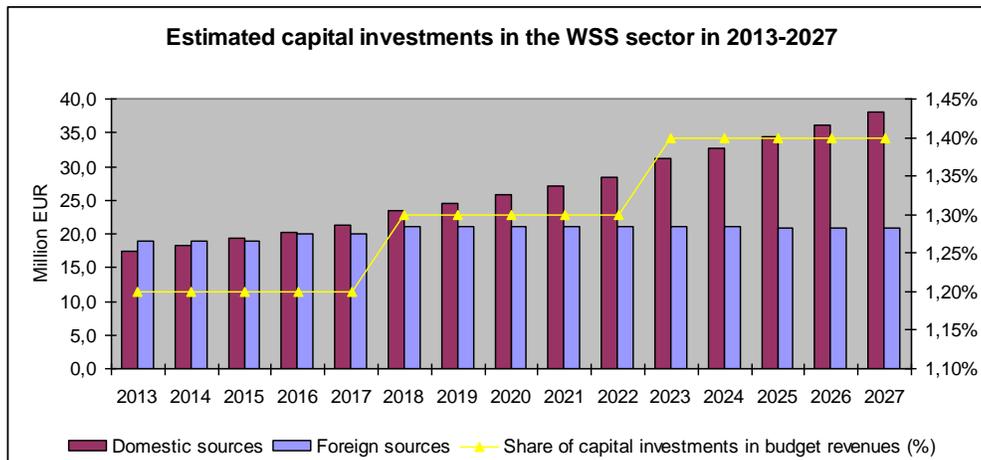
Capital costs are large one-off investment expenses needed to develop and construct the systems including major repairs and replacements, modernization and rehabilitation. In a mature economy, capital costs can also be met from provisions in present or future-user charges. In a country like Moldova, capital investments which are large outlays have to come essentially from national budget and donor financed Official Development Aid (ODA).

To improve the current dramatic underfunding of the WSS sector several mutually reinforcing approaches need to be activated:

- WOCs need to improve their operational efficiency and quality of services for which there is great scope;
- The development of the sector needs to be more demand-oriented, delivering services that consumers want and are willing to pay for;
- Tariff revenue should be increased by revising tariff rates and structures, and improving the collection rates (billed but non paid revenues);
- Sustainable cost recovery should be endorsed and accepted at the political level and systematically put into practice;
- Subsidies should be essentially targeted at investment. Their application should be transparent, predictable, properly justified and specifically designed to achieve their purpose;
- The Ministry of Finance should recognize the potential contribution of WSS investment to public health and economic development;

- Donors support should be stimulated by proactively developing a pipeline of well prepared projects that fulfill the donors' documentary requirement for ODA mobilization.

The overall estimated capital investment for implementing the WSS Strategy over the period 2013-2027 is summarized in the figure 4. It is estimated to be around 705 million EUR (equivalent of 11.329 Million MDL), of which 194 million EUR would need to be invested in the first five years (2013-2017).



**Figure 4** Estimated capital investments in the WSS sector in 2013-2027

The following assumptions were made to demonstrate the financial viability of the forecasting:

- The consolidated budget (state budget + local budgets) revenues will increase in average by 5% annually;
- The Government will rethink its contribution to the WSS Strategy by raising its allocation of budget revenues to WSS capital investment starting with at least 1.2% in the first 5 years (2013-2017) as a share of consolidated budget revenues (state budget + local budgets). This government contribution will then be increased gradually to 1.3% in 2018-2022 and to 1.4% in 2023-2027 years;
- Considering the limited current absorption capacity of Moldova for foreign ODA, the donor contribution will remain in the range of 19 to 21 million EUR per year.
- Due to planned increasing domestic budget contribution, the share of the donors contribution to the yearly capital invested in WSS infrastructure will decrease from about 52% in 2013 to 35% in 2027 (to the total every year investments in the WSS sector);
- The exchange rate used in the forecast assumes 15.5 MDL/EUR for 2013-2017, 16.0 MDL/EUR for 2018-2022 and 16.5 MDL/EUR for 2023-2027.

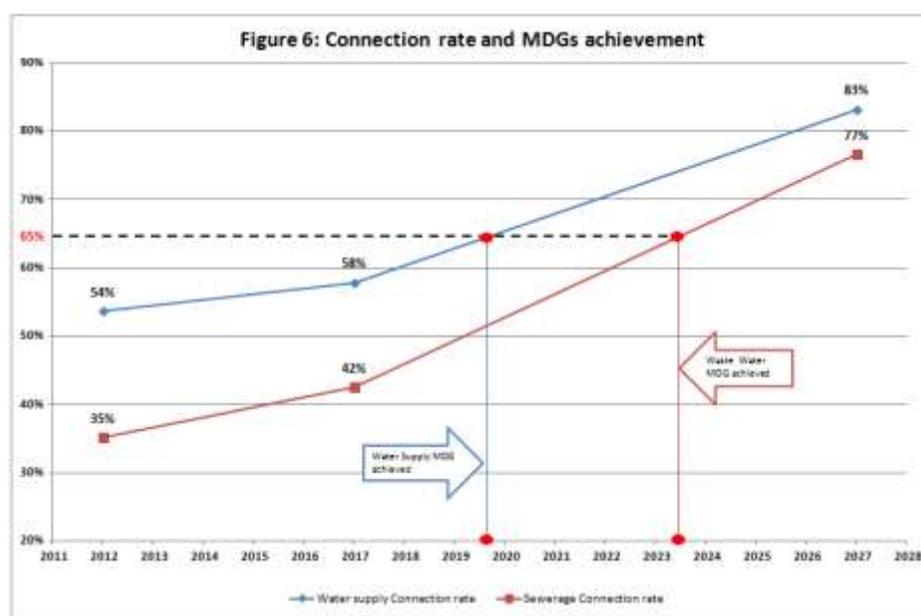
As increased investment will generate increased recurring costs for operation, there is a need to address the issue of unbalanced financing between capital investment and other life-cycle costs in the WSS sector considering the following principles:

- All expected financial flows (from tariffs, taxes and transfers) need to be assessed against life-cycle costs to ensure that secured funds and tariff revenues are realistically available to cover the services delivered.
- To enable this, information on life-cycle costs should become increasingly available from WOCs for sector development monitoring. Financial planning and budgeting should increasingly be informed by evidence based cost information instead of assumptions.
- Support from the government is required to set up and properly finance (or provide financing mechanisms) for financial post-construction support, both for operators and service authorities (e.g. local government), in particular for soft loans to enable capital maintenance.

## 5.4 Advancement of the MDGs and Targets

The proposed investment effort described in the previous paragraph was carefully and reasonably estimated based on realistic assumptions of funding mobilization possibilities domestically and internationally. This means that the advancement and achievement of the MDGs were purposely not primary criteria for defining WSS investment targets.

Based on the above funding guidance and assumption the figure 6 indicates when water related MDGs for 2015 (65 % overall connection rates for the country) can practically be achieved. For water supply systems it would happen around 2020, for wastewater management system and sanitation it may be around 2023.



## 5.5 Cost recovery of services

Sustainable cost recovery of services implies three main features:

- An appropriate mix of the '3Ts' (tariffs, taxes and transfers) to finance recurrent and capital costs, and to leverage other forms of financing;

- Predictability of public subsidies to facilitate investment (planning);
- Tariff policies making services affordable to all, including the poorest, while ensuring the financial sustainability of service providers.

Sustainable cost recovery entails securing future cash flows from a combination of the 3Ts, and using this revenue stream as the basis for attracting repayable sources of finance – loans, bonds and equity – depending on the local situation. In a longer term perspective, the repayable sources cannot substitute for a shortage of basic revenues – they merely displace the burden to future years. Even national state subsidies and external assistance are performance-related to some extent, and hence depend on adequate revenue flows.

In Moldova today, the full cost of the services including investment and re-investment cannot be charged to the users. Subsidies are necessary for investment. It is recommended that some basic principles are set in place for the future deployment of WSS infrastructure. These should include (i) investment subsidies to localities should be provided when it is assured that the population can sustain operation out of user fees, (ii) when a community is not in a position to sustain the O&M cost of a centralized system, only decentralized individual solution or semi-central users driven solution should be programmed, (iii) users and beneficiary should be responsible for covering the full costs of operation & maintenance of the centralized system out of user fees tariff adjusted from time to time to remain cost covering, (iv) charges should take affordability concerns into consideration and set to allow cross subsidization of the more vulnerable people by the better endowed. In exceptional cases in which vulnerable poorer households may not afford the services of a central water supply system, and for which cross subsidization from better off users groups is not practicable or affordable, it is recommended that the government establish means tested subsidy schemes to ensure that the water company which should operate the facilities under commercial principles can cover its costs and is not forced to absorb losses and act as a social institution.

In addition the following general principles for the application of subsidies are recommended: (i) subsidies should be predictable to ensure longer-term planning and budgeting, (ii) subsidies should be transparent, and reviewed continuously to ensure that they provide sufficient incentives for the WOC to improve performance; (iii) subsidies should be reduced over time in a phased approach, with charges increasing in importance.

## **5.6 Domestic funding sources**

In Moldova, for local governments, the capital investments financing are allocated on a centralized basis from the state budget by including as a separate annex to the annual budget law, specifying the total amount of funding recipients and objects. These funds are allocated as special purpose transfers for delegated function by the Government.

Local governments also have the right to allocate funds from its own revenues to finance investment projects, including co-finance of projects funded by foreign ODA and prospective consumer contribution. Administrative-territorial units in addition to direct transfers from the state budget and own resources for investment can benefit from other sources as well, such as the National Fund for Regional Development, the Social Investment Fund, and the National Ecological Fund, etc.

In the last five years, government support from domestic sources did not exceed 1%. Taking into account the critical precursory role of the WSS sector for the socio-economic development of the country, it is recommended that starting with 2013, budget support for the sector is increased significantly to around 1.2% from consolidated budget revenues for the next five years, with further gradual increase every five years thereafter as shown in the table 4.

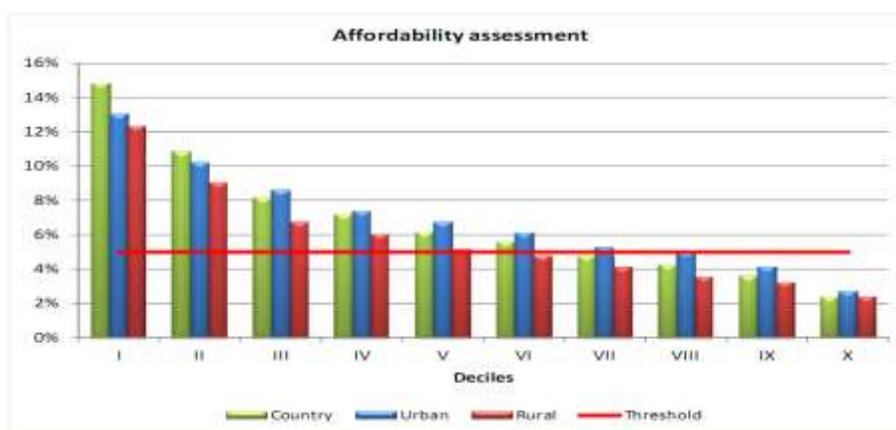
**Table 3** Projected budget support for WSS Sector in 2013-2027

	2013-2017	2018-2022	2022-2027	TOTAL
Percentage of budget revenues allocated to WSS infrastructure investment	1,2	1,3	1,4	
Recommended domestic contribution to WSS capital investment (million MDL)	1.498	2.072	2.847	6.418
Equivalent, ( million EUR)	96,7	129,5	172,6	398,7

### 5.7 Affordability of services

In setting tariffs for WSS services, it is common to take as “affordability” yardstick a range of 3-5% of the average disposable household income.

The macro-affordability assessment presented in the figure 5 suggests that the average Moldavian household currently already spent 5% of its monthly disposable on WSS services. As 5% is commonly considered a reasonable higher limit of affordability of WSS services for households in developing countries, there is some concern in Moldova that the delivery of minimal efficient WSS services may not be fully affordable for a non negligible segment of the population.



**Figure 5** Affordability Assessment by Country and Types of Community (Source: Own calculations)

A micro-affordability analysis of households grouped by deciles in line with the National Bureau of Statistics methodology confirm that the poorest deciles would have to spend 15% of its disposable income to afford minimal WSS services standards. This is a far too high cost for the concerned households. According to the assessment, only the four

highest earning household deciles in the country may afford to pay the full operation of WSS services. This may limit the possibility of cross subsidizing tariff schemes in which higher income households can pay higher tariff and subsidize lower income households which cannot afford the services.

WOCs should operate along commercial principles. They cannot be considered social service providers that have to absorb losses from poorer households. To solve the issue of poorer households, the following approaches are recommended:

- Adapt the technical design standards and technology applied in centralized systems to lower to the maximum their investment and future operating costs;
- Promote and apply decentralized on site systems when it is clear that the operation cost of a centralized system is unaffordable to the beneficiary population as a whole;
- In urban areas where centralized systems are necessary and where services is partially unaffordable to some segment of the population in spite of a cross subsidizing block tariff scheme, consider the possibility of social subsidy scheme, and other type of instruments that can subsidize the payment due by poor households to the WOCs to allow them to cover their costs.

## 5.8 International funding sources

Moldova needs ODA support for the deployment of WSS investments to complement the domestic revenues effort. While ODA grant support through the general national budget may not be the optimal solution due to weak domestic budgetary and accountability systems and the need for Donors to claim attribution, it is recommended to aim toward the pooling of donors grant resources into basket funding to support a national WSS programme that would co-fund WSS infrastructure. The pooling of donor resources would yield several benefits.

- Enable borrowers to institute a single procurement, financial management, and disbursement system, to reduce the transaction costs of parallel systems;
- Enhance the government's own fiduciary system to strengthen ownership, internal capacity, and program sustainability;
- Encourage harmonization of borrower and donor fiduciary systems;
- Improve efficiency by avoiding unnecessary duplication of actions;
- Avoid the possibility of different project rules undermining each other.

Medium/long term loans shall also be available from International Financing Institutions (IFIs). For a Country like Moldova which is eligible for very favourable IBRD IDA funding, their terms are expected to be significantly lower than those on offer from commercial sources.

The ODA contributions that can realistically be mobilized for the WSS sector up to 2027 is estimated to be about 307 million EUR (equivalent of 4.911 million MDL) as shown in the table 5. This corresponds to about 44% of the total projected investments in the WSS Sector in the period.

**Table 4** Projected external financing support for WSS Sector in 2013-2027

	2013-2017	2018-2022	2022-2027	TOTAL
Estimated Investments, in Million MDL	1503.5	1680.0	1727.6	4911.1

Equivalent, in Million EUR	97.0	105.0	104.7	306.7
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The limited absorption capacity assumed for the country merges three dimensions:

1. **The macroeconomic absorption capacity**, which can be defined and measured in terms of ratio of GDP levels to ODA and/or structural funds allocated. At the European Summit in Berlin the upper limit for EU Structural and Cohesion Funds for EU member countries was set at 4 percent of the GDP of the respective Member State. Moldova being a neighboring country to the EU is eligible to funding under the European Neighboring and Partnership Instrument (ENPI) which is less endowed than for member and candidate countries.
2. **The administrative absorption capacity**, which can be defined as the ability and skills of central, regional and local authorities to prepare acceptable plans, programs, and projects in due time, to decide on programs and projects, to arrange co-ordination among the principal partners, to cope with the vast amount of administrative and reporting work required by the donors, and to finance and supervise implementation properly, avoiding fraud as far as possible.
3. **The financial absorption capacity**, which means the ability to co-finance EU and other donor supported programs and projects, to plan and guarantee these national contributions in multi-annual budgets, and to collect these contributions from several partners (public and private), interested in a program or project.

## 5.9 Financial resources mobilization

To efficiently mobilize the financial resources needed for the WSS sector, it is recommended that the government establish and provide various financial support mechanisms such as a tightly controlled and supervised grant scheme for preparatory studies by local administration interested in developing the WSS sector. To use these mechanisms though it is also necessary to strengthen MoEn through the long demanded but so far not accepted by the Government, creation of a special new unit at the Ministry specifically dealing with WSS investment strategic planning, programming and monitoring which could act as Projects Supervisory Unit (PSU) for all WS investments developed in the country.

The government should also address a series of systemic issues on how to increase the release of national funds allocated to the water sector. Systemic issues are largely outside the control of the water sector. They are mainly related to (i) improving budget procedures; (ii) the need to harmonize programming, procurement, disbursement and monitoring procedures of investments, and (iii) donors improving the predictability and reliability of their funding to the sector.

The following measures are recommended to be undertaken:

- Improve the use of the Medium-Term Economic Framework (MTEF) as a reference point for multi-annual planning and budgeting. So far the annual deviations from the MTEF show that the tool is not adequately supporting multi-years planning and

budgeting. This will require building capacity in ministries and local governments to plan more strategically.

- Improve the link between planning in local governments and budget planning at the central government level. Districts have a planning process in place which is based on initial data from the central government that tend to vary significantly from the final data approved by Parliament. This disconnect makes the budget planning a rather inefficient and inaccurate tool for budget mobilization. Ensuring that the data provided by local government is up-to-date and consistent is paramount for better planning and implementation of investments.
- Better targeting of budget allocations to local government authorities; the formulas for determining the recurrent block grant and development grant to local government authorities are not consistently applied in the WSS sector budget allocations. As a result, the efficiency in targeting water supply funds to those regions with the largest water supply access gaps is not optimal, while the transparency with which funds are allocated is seriously jeopardized.
- The budget process should be concluded before the beginning of the new fiscal year. The current practice of the discussions in Parliament spilling into the new fiscal year has major adverse effects as it delays the release of funds up to three months, reducing the actual budget implementation period to less than one year. Particularly for local governments, whose water budgets tend to be relatively small and disbursements being often late, this provides incentives to undertake only small sized investments on an ad-hoc basis.
- Budget allocations should be immediately published once the budget process is finalized by Parliament to ensure that the information from central government on funds transfers is provided to local government authorities and other water sector agencies in a timely and reliable manner.
- Government and donors should also agree on a harmonization of procurement, disbursement and monitoring procedures to reduce the number of parallel systems in place, that constrain already scarce capacity at both central and local levels. The recent shift towards a programmatic approach in funding should be accompanied by measures to benefit from economy of scale.

Government disbursement procedures of funds should be improved, especially to local government authorities, which could significantly benefit when funding is provided to them on a more reliable basis. As the sector's dependency on donor funds is high, it is important that donors improve their disbursement procedures accordingly to ensure that water agencies are better able to plan and implement their investments.

The cost of implementing the EU Directives for water supply and sanitation (DWD and UWWTD) for the entire human settlements in Moldova including the smallest villages would amount to about then 2,04 billion EUR in real terms spread into 998 million EUR for Water Supply and 1,04 billion for Wastewater Management. Such investments are unaffordable for the country in terms of both (i) resources mobilization and absorption capacity in the foreseeable future within the proposed strategy implementation period up to 2027, and (ii) cost recovery for operation and maintenance by the beneficiary (mostly rural) population.

## 6. Expected Results & Progress Indicators

### 6.1 WSS development monitoring indicators and targets

WSS Strategy monitoring requires the collection, processing and evaluation of data both in a quantitative form based on field projects data and statistical data from local government or Agencies managing or overseeing the funding of WSS investment as well as qualitative data documenting the assessed impact of the investments and their alignment with the WSS strategy objectives. KPIs included in the MIS will provide the main indicators for tracking the WSS Strategy implementation.

Monitoring indicators for the implementation of the WSS Strategy should be established in the multi-annual operation plans and include indicators and targets in the 5 following types as practiced in the EU.

- Baseline indicators which document the WSS situation in the country and locally before the implementation of the concerned operational plan in alignment with the WSS strategy.
- Input indicators which refer to the budget or other resources allocated to projects. Financial input indicators are used to monitor progress in terms of the (annual) commitment and payment of funds available for any operation, measure or project in relation to available budget and eligible costs.
- Output indicators which measure activities directly realized within the WSS Strategy and multi-annual operation plans. These activities are the first step towards realizing the operational objectives of the intervention and are measured in physical or monetary units. Examples: number of communities receiving investment support, total volume of investment.
- Result indicators which document the direct and immediate effects of projects. They provide information on changes in, for example, the behavior, capacity or performance of direct beneficiaries and are measured in physical or monetary terms. Examples: number of additional population connected to new systems.
- Impact indicators which refer to the benefits of the WSS Strategy Implementation beyond the immediate effects on its direct beneficiaries both at the level of the intervention but also more generally in the program area. They should preferably be expressed in “net” terms which mean subtracting effects that cannot be attributed to the projects and taking into account indirect effects (displacement and multipliers). Example: increase in employment in rural areas or increased productivity due to better water supply services.
  - o To enable effective monitoring, it is recommended that a multi-annual plan for timely collection and aggregation of WSS investment data is established that include:
    - o The identification of sources and mechanisms to ensure statistical validation;
    - o Arrangements for publication and public availability;
    - o An effective system of results indicators including:
      - o The selection of result indicators that can provide information on those aspects of the well-being and progress of people that motivate policy actions financed under the WSS Strategy;
      - o The establishment of targets for these indicators;
      - o The respect for each indicator of requisites of robustness, statistical validation, clarity of normative interpretation, responsiveness to policy, timely collection and public availability of data;

- Adequate procedures in place to ensure that all operations financed under the WSS Strategy adopt a coherent, single and effective system of indicators.

## **7. Implementation Stages of WSS Strategy**

### **7.1 Necessary measures**

Necessary immediate measures refer to a 3 years Action Plan that contains the following issues:

- ✓ Completion of the legal frame: (i) Approximation of national legislation in the WSS sector to EU Directives, (ii) Approval of the Law of public services, (iii) Elaboration the secondary legislation for enabling the implementation the Water Law, (iv) Elaboration the procedure to set up a Regulator for WSS sector, (v) Revision of present WSS Strategy.
- ✓ Institutional capacity building: (i) Strengthening the administrative capacity of MoEn and in particular DWM, (ii) Strengthening the administrative capacity of the Regional Development Agencies in regional WSS management planning, (iii) Set up a Project Implementation Unit for the management of WSS sector, (iv) Set up 6 Regional Development Association, (v) Trainings.
- ✓ Set up appropriate financial tools: (i) Elaboration the procedure for the policy of setting up tariffs, (ii) Elaboration Investment plans for South, North and Central Regions.
- ✓ WSS Infrastructure: (i) Implementation of on-going projects, (ii) Programming and planning new infrastructure (Development of Raional Master Plans for Water and Wastewater Sector, allowing the progressive coverage of the entire Regions and country, Development of the Application for funding, Development of the Tender Documents.
- ✓ WSS Services: (i) Elaboration WSS Services Performance criteria, (ii) Development of Water Safety Plans.
- ✓ Management Information System (MIS): (i) Development and implementation.
- ✓ Communication: (i) Development the Strategy for communication between all stakeholders involved in the WSS sector management.

### **7.2 Implementation plan**

According to the GD 33/2007, the implementation plan includes two stages: elaboration of the conceptual structure, and establishment of the actions to be fulfilled. A plan should include: objectives, practical activities to achieve the objectives, deadlines for the activities, costs related to implementation of actions, responsible, progress indicators, and procedures for evaluation and reporting.

The Action Plan for the implementation of the revised WSS Strategy covers a 3 years period and is reflected in Annex 12.

The Action plan is presented in a table form split into fields of actions. The table provides proposed actions, the proposed performance indicator(s), the proposed contribution of

the TA Water-SPSP when applicable and the proposed target dates for implementation and completion. The two additional columns to the right provide an estimation of the central level additional manpower input (MoEn and Other Central level or national level Agencies) required for the management and oversight of the implementation of the action plan and the parallel supervision of the implementation of the WSS strategy. This two additional columns should help the central government understand that the implementation of the WSS strategy requires additional supervising manpower without which implementation cannot be deployed smoothly.

It is strongly recommended that this action plan should be evaluated after the 3 years period in line with the evaluation guidance reflected in preceding chapter. There is a strong recommendation to be updated following the mechanism to monitor the progress ([Annex 12](#)).

### **7.3 Initial investment plan (2012-2017)**

The Indicative list of WSS projects and communities proposed to be implemented in terms of investments in the shorter term at the horizon 2017 is given in [Annex 9](#).

### **7.4 Administrative feasibility**

Although administrative feasibility is difficult to be judged in an objective, quantifiable manner, this has to be an integral part of a policy proposal. In order to be implemented the WSS Strategy must be politically acceptable, which means a supportive policy environment, motivated key players, shared values, and resources to make it real. The estimated additional input of staff necessary by MoEn to manage and supervise the implementation of the revised WSS Strategy is estimated to be around 14 full time equivalent professionals.

## 8. Reporting & Monitoring Procedures

The monitoring and evaluation of the implementation of the WSS Strategy should be a permanent task during the whole period of the Strategy's implementation to be able to track slippage or delay in implementation and their causes and provide recommendation for mitigation or corrective actions as required by GD no. 33/2007.

Monitoring should focus on daily management issues. Typical questions of monitoring activities are: "How many?" "When?" "How?" "For how much?". Monitoring activities strive to assess whether activities are implemented effectively and efficiently. Evaluation should address more strategic questions: "So what?"(impact and sustainability) and "Why?" (relevancy). Evaluation tries to get a deeper understanding of cause-results relationships and eventual implications of the observed situation of the implementation of the WSS strategy. The table 5 compares the characteristics of Monitoring and Evaluation Tasks

**Table 5** Comparative Characteristics of Monitoring and Evaluation

Characteristics	Evaluation	Monitoring
Subject:	usually focused on strategic aspects	addresses operational management issues
Character:	incidental, flexible subject & methods	continuous, regular, systematic
Primary client:	stakeholders and external audience	program management
Approach:	objectivity, transparency	utility
Methodology:	rigorous research methodologies, sophisticated tools	rapid appraisal methods
Primary focus:	focus on relevancy, outcomes, impact and sustainability	focus on operational efficiency and effectiveness
Objectives:	to check outcomes / impact, verify developmental hypothesis	to identify and resolve implementation problems
	to document successes and lessons learned	to assess progress towards objectives

### 8.1 Monitoring reports

Monitoring activities and results need to be reported periodically preferably on a yearly basis in line with Moldovan relevant regulation. Periodic reporting should document progress, achievement, trends, slippage and delays compared to objective and targets defined in the current implementation plan of the WSS strategy implementation and underlying multi-annual operation plans. Monitoring reports should provide recommendations of projects, actions and measures that may need to be adjusted, and completed, and objectives and targets that may need to be revised and why.

Monitoring results should be presented in reports that show the achievement of the specific objectives, cost/expenses engaged, fulfillment of the performance indicators specific for each activity, and elaboration of proposals for improvement and/or correction of public policies. The Monitoring report should be based on information provided by

responsible institutions, based on a reasonable frequency (preferably annually) approved by Governmental Decision. The monitoring reports needs to identify at least the following issues: (i) institutional arrangements needed to facilitate the timely implementation of the Strategy, (ii) Changes in target groups during, and at the end of operational implementation plans, (iii) Economic, legal, ecologic impact of the implementation, (iv) Implementation costs, (v) Degree of compliance with the requirements of the implementation plan in respect of responsibilities, costs, actions, and deadlines by actors and responsible institutions, (vi) Reasons for not executing or partially fulfillment of any action or measure by the responsible institution, (vii) Conclusions and proposals regarding the adaptation of the current implementation plan.

The monitoring results and recommendation should preferably follow forms of reporting and associated data bases compatible with EU system.

## **8.2 Evaluation of the WSS Strategy implementation**

It is recommended that WSS strategy implementation is evaluated at the end of each 5 years operation plans defined in the Strategy. The family of evaluation criteria and indicators to be covered in each evaluation is proposed to include the followings dimensions.

Relevance criteria and indicators; These cover to which the objectives of the projects, actions and measures implemented under the 5 years operation plans continue to be consistent with beneficiaries' requirements, country needs, WSS Strategy priorities and funding agencies policies

Effectiveness criteria and indicators; these concerns to which extend the objectives of the projects, actions and measures objectives implemented under the 5 years operation plans were achieved, or are expected to be achieved, taking into account their relative importance.

Effectiveness criteria and indicators: These measure how economically resources/inputs (funds, expertise, time, etc.) imputed into projects, actions, or measures are converted to results.

Sustainability criteria and indicators: These documents to which extend the benefits of the projects, actions or measures will be continued after completion of their investment and implementation.

Impact criteria and indicators: These assess the expected positive and negative, primary and secondary long-term effects produced by the project, action or measure, directly or indirectly, intended or unintended.

Coherence/ complementarity criteria and indicators: these documents to which extend the implemented projects, actions or measures are or remain coherent with the WSS Strategy, current other strategic documents at the national, regional or local level, relevant current donors' policies as well as the content and orientation of the current action plan related to the current EU – Moldova association agreement.

Moldova Value addition criteria and indicators: these assess to which extend the projects, actions or measures implemented adds benefits to other non WSS related strategies and action plans in Moldova that are either domestically developed or assisted by donors.

To strengthen the weak program evaluation culture prevailing in Moldova, it is recommended that the government:

1. Works over introducing a Moldovan program evaluation system, supported by relevant legislative provisions, training and information that stimulate proactive attitudes toward objective evaluation beyond listing success and failure.
2. Develops a national evaluation system in the context of building transparent and accountable public administration and civil society. Initiatives like benchmarking of public services, promoting citizens participation and spreading ethical standards in public administration can magnify eventual impact of the evaluation system.
3. Provides trainings in monitoring and evaluation techniques for project managers, public officials, NGOs, and media. A step-by-step manual on designing and managing evaluation projects would help increase the quality and ownership of evaluation reports. To this end EU or other international organizations' handbooks could be translated and adapted to local conditions.
4. Develop and strengthen a national professional association of evaluators which could play a major role in setting professional standards and facilitating development of technical skills among M&E specialists.
5. Simplify and streamline the technical language used in evaluation reports. At minimum a requirement for adding short, written in English language summaries could be introduced.
6. Strengthen the rules and procedures needed for access to available data sources by various agencies and develop better ways of cooperation and coordination between data providers, holders and users.
7. Provide an incentive mechanism enabling people to better learn from previous experience.

## **Annexes**

**Annex 1:** Current regulatory framework of Moldova's WSS sector

**Annex 2:** International conventions & national legislation in Moldova

**Annex 3:** Central, Regional and Local governmental structures

**Annex 4:** Public Awareness Development Plan

**Annex 5:** Overview of Water Resources in Moldova

**Annex 6.** Overview of Research Institutions in Moldova

**Annex 7.** WSS Infrastructure in Moldova

**Annex 8:** WSS investment currently under implementation

**Annex 9:** Indicative Infrastructural Investment Policy Guidance of the WSS Revised Strategy

**Annex 10:** The indicative communities and WSS investment projects, for the period 2012-2017

**Annex 11:** Table of content of the WOCs' manual of good practices

**Annex 12:** Action Plan for the implementation of the WSS strategy