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**VIABLE BUSINESS MODELS FOR SANITATION  
IN SMALL TOWNS AND RURAL SETTLEMENTS IN MOLDOVA**

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## LIST OF ABBREVIATIONS

ANRE	The National Agency for Energy Regulation
CAPEX	Capital Expenditures
CEE	Central and Eastern Europe
CPA	Central Public Administration
DFBOT	Design, Finance, Build, Operate, Transfer
EAP Task Force	Environmental Action Programme Task Force
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EECCA	Eastern Europe, Caucasus and Central Asia
EU	European Union
EUWI	European Union Water Initiative
GoM	Government of Moldova
I/A	Investment/Action
IFI	International Financing Institution
IMC	Inter municipal co-operation / Inter communal co-operation /
KPC	Kommunalkredit Public Consulting GmbH
LPA	Local Public Administration
MDG	Millennium Development Goals
MoEnv	Ministry of Environment
MoF	Ministry of Finance
MoLPA	Ministry of Local Public Administration
MRDC	Ministry of Regional Development and Construction
MTEF	Medium Term Expenditure Framework
NPD	National Policy Dialogue
NBS	National Bureau of Statistics
OECD	Organisation for Economic Co-operation and Development
OPEX	Operational Expenditures
PE	Person Equivalent
PPP	Public Private Partnership
SPSP / Water SPSP	Sector Policy Support Programme for the water sector in Moldova (EC-funded)
WS	Water Supply
WSS	Water Supply & Sanitation
WUA	Water Users Association
WWT	Waste Water Treatment
WWTP	Waste Water Treatment Plant

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The views expressed herein are those of the authors and can in no way be taken to reflect the official opinion of the European Union, the Government of Moldova, or the Organisation for Economic Co-operation and Development.

Any errors and omissions in this report are those of the authors.

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## 1. EXECUTIVE SUMMARY

This report presents possible approaches to introducing sustainable business models for water and sanitation services in Moldova, with focus on small towns and rural settlements. This is an urgent and challenging task for Moldova, as recently the coverage by piped water supply in rural areas has been substantially improved, with donor support, while the lack of appropriate on-site or centralised sanitation (piped sewerage) and of wastewater treatment facilities, properly operated, increases the risks of water pollution and landslides. Therefore, the next urgent task for many small towns and rural settlements is to develop and/or rehabilitate respective sanitation systems. The absence of a sustainable business model represents probably the major institutional barrier to this improvement. Water systems in small towns and villages are usually too small and fragmented to raise the revenues and gather the capacities needed to operate and maintain them.

The business models are swiftly defined by "who pays for what". For this project, several options were considered to bundle services together and organise them at different scales ("what"), and to define user groups who will contribute to the revenues of the water services ("who"). Particular attention has been paid to the degree of regionalization of service provision; this refers to both the geographical scale of the service and the functions that can be mutualised. Another dimension is the aggregation of water services with other services (e.g. energy, or waste management).

Several criteria were used to assess the sustainability of the business models: the capacity to operate and maintain the service; the capacity to raise revenues to cover the operation and maintenance costs; impacts on affordability of water and sanitation services. The later criterion is very important as affordability constraints are among the major barriers to financial sustainability of WSS systems in Moldova.

Based on an overview of sustainable business models used in other European countries, the report provides recommendations on several business models applicable for sanitation in small towns and rural settlements in Moldova. The degree of regionalization is described in this report as one of the basic features of business models in Water Supply & Sanitation (WWS). Another important feature is the delegation of service provision: WWS can be provided directly by public authorities or they can be delegated by the authorities to other institutions (e.g. public or private institutions). In order to ensure uninterrupted, high-quality and reliable services, it is necessary to ensure sufficient financing for WWS operations. This relates both to investment needs and to coverage of all necessary costs for maintaining and operating the system (energy, labour, infrastructure maintenance etc.). The report describes financing models of WSS operations. Finally, different technological solutions can be applied for WWS provision in small towns and rural areas e.g. individual wells vs. small water distribution networks. It should be noted, however, that even if a system remains technically decentralised, it can still be operated by regional utilities that can concentrate larger technical capacities for technical maintenance and operation of the system

Key recommendations on business models from the report are as follows.

- The proposed business models for small towns and rural sanitation depend on the scale involved: rural areas around urban centres, rural communes which may form an agglomeration where wastewater collection and treatment is economically justified, or remote communes where local solutions have to be provided.
- The different options suggested below are indicative, and some flexibility is required to adjust them to local features.
- The institutional reforms recommended below are more effective when they build on local initiatives, and are not imposed from the top. Therefore, Moldovan authorities would benefit from considering incentives to drive reform and stimulate local initiatives. Incentives to be considered include fiscal incentives, privileged access to government support, or additional autonomy for tariff policy or investment planning.
- Based on the analyses undertaken in this project, we recommend that the following options be investigated further:
  - for sub-urban areas: "sub-urban regionalization", by creating joint stock companies and municipal associations (if legislation is improved), and creating multipurpose utilities around towns with significant revenues from sources other than provision of water and wastewater services;
  - for other agglomerations of significant concentration of population: centralized system with service provision through the regionalized utility and/or "light regionalization" through the creation of regional not-for-profit institutions that will provide technical services (expertise, laboratory test, leakage detection or similar services) to utilities.
  - for remote localities: "functional regionalisation" through improved management of decentralised systems (by municipal companies, small private operators or water user associations) and establishing a regional not-for-profit institutions that will provide some technical services (expertise, laboratory test, leakage detection or similar but not core water supply and wastewater services) to utilities.
- The implementation of proposed business models will be case-by-case. It is recommended that master plans for water supply and wastewater services are developed for each rayon and consider this issue, based on technical, economic and social analysis.

Not all recommendations can be implemented immediately and some will require amendments to legislation. In particular, this applies to regionalization (establishing municipal associations) and wider implementation of fiscal incentives to promote selected business models. On the other hand, many of the recommendations could be implemented in the short term; thus, a follow up to this project to focus on these recommendations is proposed.

All the models in question have successfully passed a reality check made jointly with local stakeholders (foremost mayors), complying the aforesaid criteria.

The reality check, that is, discussions on the applicability of different models in Moldova, was done by:

- Inviting mayors to the National Policy Dialogue (NPD) meetings in March 2012 and on 08 June 2012;
- Organizing an expert workshop on April 26, 2012. The aim of the workshop was to discuss among experts and with interested mayors the possible sustainable business models for small towns and rural water and wastewater services;
- Organizing a meeting in Cahul with mayors on May 4, 2012. The communes in the Cahul rayon are very close to deciding on regionalization of water and wastewater services; thus, the discussion on business models is very relevant for them;
- Participating in the conference on Inter municipal co-operation (IMC) in Moldova, on June 5-6, 2012, where intensive discussions on business models were conducted;
- Distributing a questionnaire on business models to interested parties.

The location for pilot testing recommended business model(s) was identified in collaboration with GIZ: the city of Cahul was selected, for potential synergies with GIZ programme of work, and for this very reason part of the effort during the “reality check” was performed in this specific location.

Inter alia, these discussions (the reality check) helped to identify some gaps in the legal framework and needs for improving the current legislation in Moldova to make the recommended models possible: e.g. the effective legislation in Moldova prohibits establishing non-profit economic entities by local public administrations. The removal of this ban is a requisite for some of the recommended models.

The report has also identified needs for some important follow up work, including:

- developing an Action plan, focused on urgent improvements in legislation, to create a favourable framework for the introduction of recommended business models, and assisting the Government of Moldova in implementing the Action plan;
- jointly with local stakeholders, foremost local public administrations, pilot testing the recommended models and replication thereof in the framework of the on-going and forthcoming technical assistance projects implemented by various donors (e.g. ADA, GIZ, SDC-funded APASAN project, and USAID);
- help the Government of Moldova to improve existing and/or establish new domestic solidarity mechanisms for WSS, so that to address existing affordability constraints highlighted in section 7 of this report.

## 2. INTRODUCTION

This document reports on Task 3 “Develop a viable business model for small towns and rural settlements” of the project “IMPROVING THE ENVIRONMENTAL QUALITY OF THE BLACK SEA THROUGH BETTER WASTE WATER TREATMENT & CLIMATE CHANGE ADAPTATION OF THE WATER SECTOR IN MOLDOVA”. The project consisting of three tasks was co-sponsored by EC (DG ENV) and OECD/EAP Task Force and implemented by a consortium led by Kommunalkredit Public Consulting in the framework of the European Union Water Initiative (EUWI) through a National Policy Dialogue with senior policy-makers in Moldova.

The purpose of Task 3 was to explore which business models could work in Moldova to support wastewater collection and treatment from rural localities and small towns in order to protect environment of the Black Sea. The need for developing a viable business model for operating and financing WSS systems in small towns and rural settlements in Moldova was identified under the previous OECD EAP Task Force project on developing a realistic mid-term Action and Investment plan for WSS in Moldova.

The Moldovan WSS sector "does not perform well and the major reason for non-functioning WWTPs in Moldova is that the existing business model where almost each village operates its system proved to be unsustainable due to the lack of technical and/or financial capacity in most villages" (see OECD, 2008).

A sectorial Investment/Action Plan has been developed, which, among other things, is intended to assist in the implementation of the 2007 Government Strategy for WSS. Further, the EBRD is implementing a project to foster regionalisation of water and sanitation operators in the cities and larger villages. The European Union is supporting this project by assisting institutional reforms to facilitate regionalisation of water utilities. The ERBD project covers six out of more than 40 cities and towns in Moldova (corresponding to 6 out of 42 existing Apa Canals), but does not include several hundred smaller villages and settlements.

Regionalisation of water utilities will not cover the whole territory and is not the only option. Alternative options have to be developed to cover the gap. Therefore, Task 3 of the project “IMPROVING THE ENVIRONMENTAL QUALITY OF THE BLACK SEA THROUGH BETTER WASTE WATER TREATMENT & CLIMATE CHANGE ADAPTATION OF THE WATER SECTOR IN MOLDOVA” has to be seen as complementary to the EBRD project, as well as to the Technical Assistance (TA) component of the EC-funded Sector Policy Support Programme for the water sector in Moldova (hereinafter – Water SPSP), especially to the following key objectives of the Water SPSP:

- institutional reform at central and local level, and
- WSS Sector Strategy updating and effective sector management,

by providing specific reviews and recommendations.

A summary of cross-fertilisation and synergies with the aforementioned and other relevant activities and projects is presented in Annex 5.

This Task 3 of the project entailed several stages:

- existing business models in Moldova have been inventoried and their strengths and weaknesses analysed;
- good practices in developing different business models in Europe and EECCA countries have been identified;
- one expert workshop was organised on April 26, 2012 in Chisinau, to discuss preliminary results;
- a "reality check" was undertaken, through discussions with various stakeholders as presented in Section 8;
- Intermediate outputs were presented at the 1st National conference on Inter-Municipal Cooperation (IMC) in Moldova;
- final recommendations were prepared, based on the analyses and the comments received in the different events mentioned above.

The report does not discuss technology solutions which do not require a business model, like small treatment facilities for individual houses (as part of on-site sanitation). The report does not discuss all problems related to the water supply and sanitation sector in Moldova but only those which have influence on business models for wastewater services in rural areas and small towns.

The report comprises of five parts:

- Review of the existing situation in Moldova with special focus to rural wastewater services (section 4);
- Country review, which compares different approaches in European countries towards organization and business models for (water and) wastewater sector (section 5);
- Summary information on different business models for the (water and) wastewater sector (section 6), with a particular focus on how they cope with affordability issues (section 7);
- Reality check of selected business models (section 8);
- Applicability of the selected business models in Moldova (section 9);
- Conclusions and recommendations (section 10);
- Annexes with selected case studies.

A note on the use of the terms "water supply," "wastewater," and "water supply and sanitation" is warranted. Formally, this report focuses on wastewater collection and treatment (i.e. water sanitation) in rural areas where such services are rarely provided. On the other hand, wastewater services are typically not provided without water services and it is important to consider both in an integrated system.

Affordability issues should also be considered based on integrated water and wastewater/sanitation services. Therefore, various service levels – including water supply and wastewater collection (and treatment) – and affordability thereof also need to be addressed in an integrated way.

### 3. WHAT IS MEANT BY A “SUSTAINABLE BUSINESS MODEL”?

According to previous OECD analyses, one major reason for the non-functioning of wastewater treatment services in small towns and rural settlements in Moldova is that the existing business model, where almost each village operates its own system, proved to be unsustainable due to the lack of technical and/or financial capacity in most villages. It follows that significant progress in wastewater treatment in Moldova can only materialise if alternative business models are considered.

In the first analysis, a sustainable business model for water supply and sanitation considers alternative geographical scales to organise the service, and mutualise selected functions. This can save costs, strengthen the capacities of the service provider, and enhance the ability to raise revenues for water and sanitation services. Therefore, a significant part of this report is devoted to different models of regionalization<sup>1</sup>, understood as organizing water/wastewater services in the area larger than a single commune. It has to be emphasized that regionalized services could be performed by a public entity; thus, regionalization does not necessarily mean privatisation<sup>2</sup>.

Regionalization is not the only option for the organisation of wastewater services in Moldovan small towns and villages. For this reason, this report does not focus on regionalization only. It also covers other aspects of sustainable business models, such as: who provides the services, degrees of private sector participation, regulatory framework, financing, tariff-setting and ways to address affordability problems. The report also touches on the problem of technological solutions used for rural sanitation, as they can drive decisions on which business model to implement.

In this report, a sustainable business model provides adequate services and secures funding for their delivery. It combines technical capacities (the capacity to monitor and maintain the operation of the service) and financial resources (the capacity to raise revenues to cover, at least, the operation and maintenance costs of the service). Financial sustainability relies on the appropriate combination of taxes (transferred from central budgets), tariffs (revenues from user charges), and transfers from international assistance. As the OECD made clear with the 3Ts concept, these are the three ultimate sources of financing for the water sector. Other sources of finance (bonds, loans and equity) need to be repaid or provide a return. Thus, they may serve as an intermediate solution in order to meet short term budgetary needs, whereas Taxes, Tariffs and Transfers (3Ts) are essentially the ultimate sources of finance which provide the future cash flows to fulfil budgetary requirements<sup>3</sup>. Chapter 9.4 elaborates on financial sustainability of water sector operations.

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<sup>1</sup> Regionalization could be understood as agglomeration/consolidation by delineating settlements into clusters and in each cluster creating (or expanding the existing one) a single entity servicing WSS systems in the cluster. In some cases, regionalization does not mean creating (or expanding the existing one) a single entity servicing WSS, but only selected services.

<sup>2</sup> Privatisation also has different levels. Privatization could involve management only, or whole WSS services, but operating on publicly owned assets. In some countries non-movable fixed WSS assets, including pipelines and treatment facilities, have been privatized.

<sup>3</sup> Methodological guide on Tariffs, Taxes and Transfers in the European Water Sector. EUREAU contribution to the European Regional Process towards the 6th World Water Forum. 2011. The report presents the concept of 3T financing of water sector as developed under the framework of OECD Horizontal Water Programme.

#### **4. PROVISION OF WATER SUPPLY AND SANITATION SERVICES IN SMALL TOWNS AND RURAL SETTLEMENTS IN MOLDOVA**

##### **4.1 Basic information**

Both, water and sanitation services are highly underdeveloped in Moldova. In rural areas, access to piped water services remains very low, whilst wastewater treatment is almost non-existing.

The business model for service provision in rural areas needs to be developed from the very beginning (in particular with respect to sanitation services).

According to the National Scientific-Practical Centre of Preventive Medicine (CNSPMP) in 2008, 47% of the Moldavian population had no access to safe drinking water and 54.8% of the population had no access to piped water.

Most of the potable water in Moldova comes from groundwater resources (65% on average in Moldova). In rural areas the population relies almost exclusively on groundwater sources for their water supplies, and by far the majority obtain their water from shallow wells. Frequently water from those wells does not meet health and epidemiological standards. OECD/EUWI report (2007)<sup>4</sup> contained the following conclusions regarding the water supply situation in rural areas:

- The yield of shallow wells in Moldova is generally suitable for manual abstraction, but is unlikely to be sufficient for pumped supplies.
- Water quality in shallow wells is impacted by its location with respect to housing rather than agriculture. High levels of Fluoride are related to geological factors rather than land use.
- Higher yields can be obtained from deeper aquifers, but the investment and running costs can be deterrents to low income communities.
- Groundwater quality problems in Moldova include high levels of Hardness, Total dissolved solids, Selenium, Nitrates, Sulphates, Fluoride and Chloride.

The data of National Bureau of Statistics (NBS) indicates that in 2010, 60% of rural population did not have access to piped water networks. NBS data indicates that access to piped water increased in rural areas from 18.1% in 2009 to 39.8% in 2010. This data, however, requires verification and explanation as they do not correspond to other data on the development of water supply networks in Moldova.

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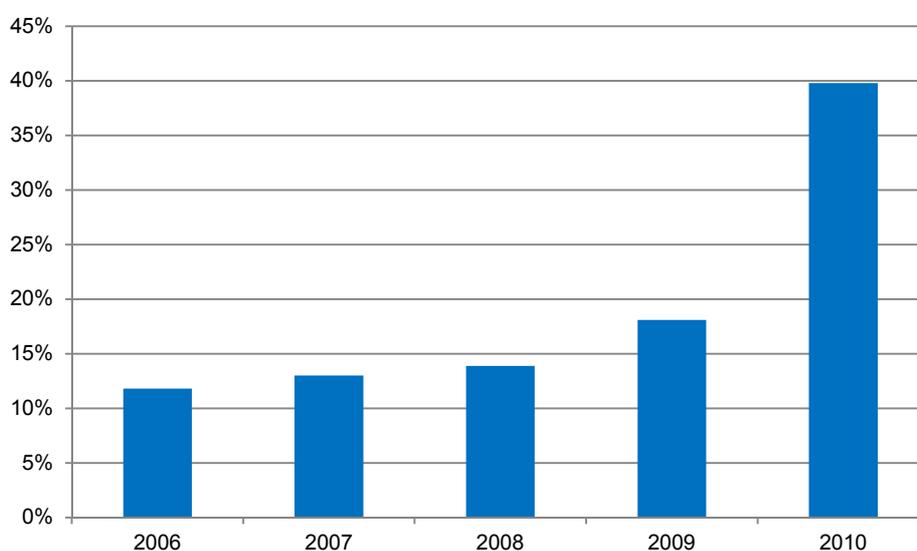
<sup>4</sup> Facilitating policy dialogue, and Developing a National Financing Strategy for Urban and Rural Water Supply and Sanitation in Moldova. JE Jacobs. OECD EAP Task Force, EUWI. 2007. P. 39

The OECD/EUWI (2007) assessment of access to water supplies in rural settlements made the following observations:

- Supplied with in house piped supplies: 3%
- Supplied by yard standpipes: 9%
- Shallow wells and other sources: 88%.

The study took into account the fact that significant part of infrastructure reported in national statistics was out of operation (in 2002 only 50% of piped water supply systems were operational).

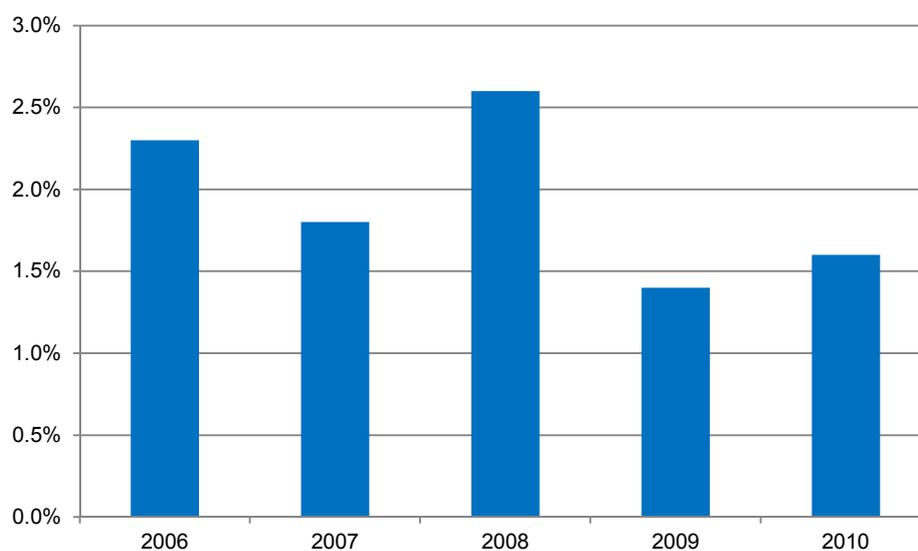
**Figure 1. Access to piped water in rural areas in Moldova**



Source: National Bureau of Statistics.

Wastewater treatment is almost non-existing in Moldovan rural areas. According to the data of National Bureau of Statistics (NBS) less than 2% of the rural population has access to the sewerage network. Only a slightly different estimation emerges from OECD/EUWI (2007) study:

- Rural population connected to wastewater collection system: 5%
- Percent of rural wastewater treated: 0%
- Use of simple pit latrines: 95%.

**Figure 2. Access to sewerage network in rural areas in Moldova**

Source: National Bureau of Statistics.

There are several limitations to understanding the statistical data provided above:

1. The statistic for wastewater services in rural areas in Moldova is difficult, due to lack of organizational structures (service providers);
2. If wastewater services do exist in some village, they cover a small part of the village, usually public institutions like: schools, kindergartens, health centres, municipal administration and surrounding households. Thus often it is reported, that wastewater services do exist in the village, while their coverage is minimal.

Understandably, access to water and wastewater network remains higher in densely populated/urban areas. In 2005 36% of population of medium towns (ranging between 5,000 and 20,000 inhabitants) was connected to wastewater network. For the larger towns (20,000 to 50,000 inhabitants) this was 55%<sup>5</sup>.

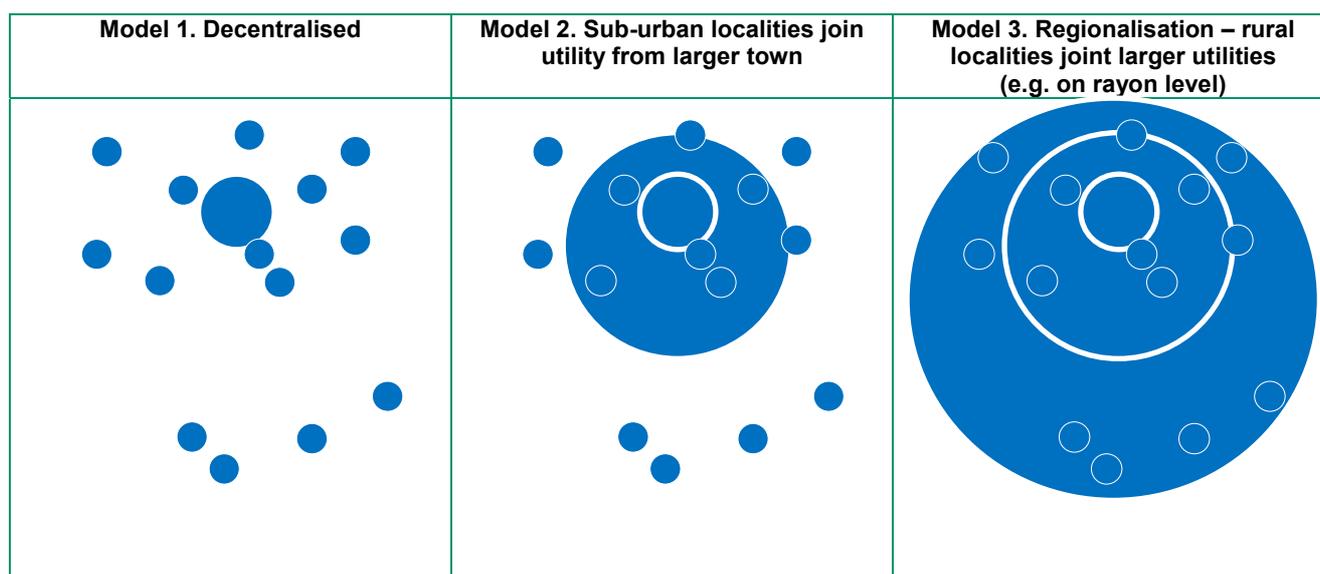
While the investment needs remain significant both in rural and urban areas access to financial resources (domestic and international funds) is limited.

#### **4.2 Degree of regionalization**

The following business models for water supply and sanitation in rural areas in Moldova are considered in this report.

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<sup>5</sup> OECD/EUWI. 2007.



In the Decentralized Model local authorities provide water/sanitation services themselves. There is formal co-operation between local authorities in joint provision of water and sanitation services. The most significant disadvantage of this model is that rural authorities in Moldova are too small to build sufficient institutional and technical capacities to operate and maintain infrastructure properly.

In the Sub-urban Model, localities join utilities from neighbouring towns (e.g., the extension of services in rural localities by SA „Apă-Canal Chişinău”, Î.M. Regia „Apă-Canal” Orhei, S.A. „Servicii Comunale Floreşti”).

In the Regional Model, a regional structure (operator) is set-up. The regionalisation process can be voluntary or obligatory (as a result of government policy). Regionalisation of services requires setting up clear rules for co-operation between participating localities (tariff-setting<sup>6</sup> mechanisms, votes in decision-making processes, rules for setting investment priorities, etc.). Usually, localities delegate service provision to a regional utility. Depending on the model, assets may remain on the books of local authorities, regional utility or asset-holding companies that belong to the local authorities.

#### 4.3. Service provision: advantages and disadvantages of existing organisational structures

There are 32 districts (raioane) in Moldova ranging from 29,200 to 125,900 inhabitants, 3 municipalities Chişinău, Bălţi, Bender. One autonomous territorial unit: Gagauzia, and one territorial unit: Transnistria.

Moldova has a total of 982 incorporated localities, of which 5 have municipality status, 60 have city status, and 917 are villages with commune status.

In Moldova it is the responsibility of local administration (municipalities, cities and villages with commune status) to ensure proper conditions for water supply and sanitation services.

<sup>6</sup> It has to be emphasized that currently there is on-going discussion in Moldova regarding tariff setting responsibilities. There are advanced discussion to pass the tariff approval responsibility to central institution, the National Agency for Energy Regulation (ANRE).

While in urban areas (municipalities, cities) water and wastewater utilities exist as legal entities and operate, **specialised water/wastewater utilities are almost non-existing in rural areas** (only 1.6% of the population is covered by wastewater treatment services<sup>7</sup> and approx. 12% uses piped supplies / yard standpipes<sup>8</sup>).

In those rural localities, some public infrastructure for water supply and wastewater treatment exists in the following organisational structures:

- **Associations (co-operatives) of water consumers** – this model is applied by ApaSan (see next section). Associations work under legal framework defined by Civil Code of Republic of Moldova, art. 180, „General Provisions on Non-commercial Organizations”. The key feature is their not-for-profit character.
- **Municipal enterprises (and state enterprises):** State enterprises are founded and provided with property by the Government or other public administration authorities. Municipal enterprises are established and provided with property by local public administration authorities. State and municipal enterprises are legal entities liable for their obligations with all their property.
- **Departments within municipality** – these are organisational units that do not act as separate municipal enterprises, commercial companies or associations. In this model the system is operated directly by the municipality.
- Commercial companies (joint stock or limited liability companies).
- **Private operators** – sometimes water supply is provided by private operators, especially if one owns a part of the infrastructure.

It should be noted, however, that in most cases these are utilities without sufficient technical and financial means to ensure sustainable operations and maintenance of the infrastructure.

The table below presents advantages and disadvantages of each organizational structure.

Organizational structure	Advantages	Disadvantages
Associations	Voluntary association of services consumers; The report regarding the activity of association is delivered to the association's members and LPA; The decisional factors are also the services consumers; Possibilities to attract financings from foreign donors; the important decisions are taken with the approval of the majority of association's members;	It does not provide comprehensive solution to water supply in rural areas. The association of water users approves connection of new users. In case of water resource scarcity there are tensions from those new users whose participation in the system was rejected (e.g. Cărpineni village, Hîncești rayon, other localities from Nisporeni and Hîncești rayons without quality water). The management of the association is usually not recruited from among water professionals (that is not optimal from the perspective of system operation and management).

<sup>7</sup> NBS data 2010

<sup>8</sup> OECD/EUWI. 2007

Organizational structure	Advantages	Disadvantages
Municipal enterprises	Property is owned by local public authority (LPA). Direct subordination to CPA and LPA; Impossibility to get bankrupt; Possibility to attract the funding from internal and foreign donors; Possibility to receive funding from the budgets of CPA and LPA; Local councils have the possibility to monitor the quality of water supply and sewerage services;	Powerful political influences on management and especially regarding the tariff policy <sup>9</sup> ; Operator's management is negatively influenced by CPA and LPA due to the lack of authorisation contracts with administration. The first contract models could be found within the EBRD project for regionalization of 6 water companies. Legislative framework is not according to the reality of relation development between local public administration and service operators regarding the water supply and sanitation sector.
Departments within municipality	Property is owned by local public authority (LPA). Impossibility to get bankrupt;	Lack of capacity Very little staff, who also have other duties Powerful political influences on management and especially regarding the tariff policy; Operator's management is negatively influenced by LPA
Commercial companies	Great importance of institutional documents (quality of institutional documentation); Possibility to attract private investments; Welcome for private public partnership and concession; Possibility to accumulate financial assets for the rehabilitations of fixed assets and the extension of existing systems; The main scope of activity is to make profit; Possibility to ensure a performant management; Reduce the policy's influence on the activities of service operator; Increase the quality level of water supply and sewerage services.	Decreased possibilities to attract the funding of foreign donors (grants and preference loans) regarding the private properties on production means; Reduced involvement of population (consumers) in the operator's activity regarding water supply services; Severe consequences of the mistakes and gaps made in the delivery process to operate the service by LPA to Operator; High risks regarding the tariff policy applied by Operator in the conditions of small user charge revenues;

Source: own assessment by authors.

#### 4.4. Existing initiatives

There are many initiatives of donors in Moldova in water supply and wastewater sector. In this section only three are described due to their usefulness for the development of business model for wastewater.

##### *Technical Assistance for the implementation of the SPSP*

EC-funded Technical Assistance for the implementation of the Water SPSP is currently being implemented. The overall aim of the TA project is to support Moldova in the implementation of reforms in

<sup>9</sup> This is one of the reason on discussions to pass tariff setting responsibility to ANRE.

its drinking water and sanitation sector by providing finance, technical assistance and policy dialogue for priority activities of high relevance for the Moldovan population and environment. The Technical Assistance project has the following key objectives:

- To improve WSS sector policy and legal framework in Moldova;
- To facilitate institutional reform at central and local level;
- To improve Financial planning and coordination;
- To update Moldova's WSS Sector Strategy and to provide direction for effective sector management;
- To provide administrative support to the Steering Committee of the Water SPSP.

In addition, the Technical Assistance for the implementation of the Water SPSP provides several capacity building activities. This project supports two activities: on institutional reform and on updating Moldova's WSS Sector Strategy.

#### ***Swiss Water and Sanitation Project in Moldova (ApaSan)***

Swiss Water and Sanitation Project in Moldova has been carried out since 2001. This is built on the bottom-up approach of the **establishment of an association of water users**. Since the beginning of its operation the project organized provision of services for approx. 50 thousand consumers (water supply in the villages, wetland for wastewater treatment (WWT) for public buildings, toilets and schools).

In its activities the Swiss ApaSan Project builds on expertise and partnerships established by the Swiss Agency for Development and Cooperation. On that basis, the ApaSan project<sup>10</sup>:

- Scales up the decentralized water supply service delivery model and works on the mobilization and empowerment of the public /private sector and civil society;
- Implements pilot projects, demonstrates good practices and promotes innovative sanitation systems (waste water treatment, ecological sanitation facilities in public buildings and individual households);
- Advocates for consensus among donors and government on feasible models of WSS services delivery and for reviewing the national sector strategy;
- Transfers the current "project implementation approach" into a "sector support approach" by shifting from direct implementation to project cycle management facilitation.
- Supports the conjugation of efforts of the main WSS stakeholders in Moldova with a view to improving the situation in the sector.

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<sup>10</sup> [http://www.apasan.md/index.php?option=com\\_content&view=article&id=102&Itemid=93&lang=en](http://www.apasan.md/index.php?option=com_content&view=article&id=102&Itemid=93&lang=en)

### **Box 1. Case study example of ApaSan project**

The village of Cioresti, approx. 60 km N-W from Chisinău, is situated in the district of Nisporeni. The total population is around 3'600. The official request for the assistance in building a water supply system was received in September 2007.

The water prospecting activities were set up in winter 2007/08. The catchment areas are located at approximately 4 km N-W of the village. It consists of two groups of springs, totalling 18 springs confined in the forest. Yield tests and chemical analysis confirmed good quality of water and its availability for the whole local population.

Thanks to the motivated leadership of the mayor, Water Consumers Association (WCA) "Roua Codrilor" was created and its status accepted during the spring of 2008. The beneficiaries accepted the SDC's conditions of collaboration and the collection of the first cash contribution. A project concerning two springs in the catchment area and a clean water reservoir (25 m<sup>3</sup>) "Biserica" was implemented in autumn 2009.

The works started with the catchment's improvements and the construction of pipelines to the reservoirs, including their installation. This is the SDC's largest water supply project, totalling almost 35 km of network and supplying 663 households. Thus being so wide, the water supply will mainly be guaranteed by gravity, only supply of 15 houses needs pumping. This project is a real challenge, on both the technical side, having 18 springs supplying the systems and 663 households to coordinate. Moreover, the network installation was mandated to two different companies, asks for clear coordination.

Local contribution was provided by the Rayonal Council: MDL 200.000, Mayoralty: MDL 50.000, and Population: MDL 994.500 (663 households x MDL 1500 per household).

The works were transferred from SDC and conducted from January 2009 by the ApaSan project. During 2009, 26 km of distribution pipelines were installed in the village and 663 individual household connections made. In addition to the main water source including 150 m<sup>3</sup> of reservoirs capacity, one more 25 m<sup>3</sup> reservoir was built for the catchment "Biserica" (70 m<sup>3</sup>/day).

Source : [www.apasan.md](http://www.apasan.md).

### ***GIZ financed project to find cost effective solutions for water supply in pilot rayons: Riscani and Cahul***

Up to April 2012 the Consultant developed a proposal of clusters for two pilot rayons: Riscani and Cahul. In the case of Rayon Riscani, due to the lack of suitable water sources, two clusters supplying the drinking water for almost entire rayon were proposed. Technical options were proposed using different source of drinking water (from Prut river or from Soroca-Balti water main) however the differences in cost effectiveness are insignificant.

In the case of Rayon Cahul, 6 clusters were proposed and presented to the stakeholders during the roundtable no. 4 in March 2012. Clusters were prioritized according to national and local priorities developed during the participatory process involving 3 roundtables. The prioritization of clusters constitutes an input to the Action plan for the update of the Socio Economic Development Strategy, which is currently under way.

### ***EBRD loan to regionalisation of water/wastewater operations***

The EBRD is considering providing a sovereign loan of up to €10 million to support municipal utilities in most reform-minded municipalities. The programme comprises the regionalisation of water companies by expanding their operations into neighbouring localities and is structured as priority investments focusing on the water utilities from Floresti, Soroca, Hancesti, Orhei, Leova and Cedar-Lunga, municipalities committed to adjust the tariffs and introduce cost recovery of their water companies to ensure financial viability.

The programme also aims at strengthening these municipal utilities to ensure the provision of an adequate supply of drinking water and improve wastewater treatment systems.

The following matrix summarize synergies between selected initiatives which have highest influence on the deployment and diffusion of business models for sanitation services in small towns and villages.

<b>Donor initiative</b>	<b>Main synergy with the task 3</b>
<i>Technical Assistance for the implementation of the Water SPSP</i>	By updating WSS Sector Strategy the project will provide the comprehensive guideline into the sector development in Moldova. The focus on institutional development and capacity building is welcome to accompany the diffusion of appropriate business models for rural sanitation in Moldova.
<i>Swiss Water and Sanitation Project in Moldova (ApaSan)</i>	ApaSan project already tested some business models: Water User Association and alternative technologies for wastewater treatment: EcoSan and wetlands
<i>GIZ financed project “ Modernization of Local Public Services in the Republic of Moldova”</i>	Project, by supporting update of WSS chapter of rayon Economic Development Strategies helped to find a cost effective solutions for water supply in pilot rayons: Riscani and Cahul. Under the next stage feasibility studies for selected clusters will be prepared.
<i>EBRD loan to regionalisation of water/wastewater operations</i>	Under the Technical Assistance for the EBRD project, specific business model for regionalization is tested in 6 rayons.

Source: author's assessment made on available data on donors' activities.

## 5. OVERVIEW OF WATER / WASTEWATER OPERATING AND REGULATORY MODELS IN SELECTED EUROPEAN COUNTRIES

This section provides an overview of water/wastewater operating and regulatory models in selected European countries. Taking into account local demand driven by the political will of Moldova for European integration, a selection was made from the following two groups of countries:

- new EU-member states with similar past experience (from former Soviet block); and
- old EU-member states with extensive experience in implementing water-related EC Directives.

The wish to present the whole variety of existing models and information availability were two other criteria.

### 5.1. Austria

#### Basic information

Population	8.4 million
Administrative division	85 counties (Kreis), 15 towns (Stadt), 2,368 municipalities (Gemeinde)
Average number of citizens per municipality	> 3,500 people
Connection rate – wastewater	91% of population is connected to public sewage networks
Connection rate – water	Approx. 90% of population connected to public water supply networks

#### Fragmentation

Both wastewater & water supply operations are highly fragmented.

Type of Utility / Owner	Water supply		Wastewater treatment	
	Number of water Suppliers	Connected inhabitants [%] – based on a WIFO study	Number of sanitation companies	Connected inhabitants [%] – based on a WIFO study
Provincial enterprise (state run, public enterprise)	2	6%	-	-
Associations of municipalities (publicly owned)	125	21%	330	51%
Municipalities - publicly owned	1,900	59%	1,100	38%
User Cooperatives (cooperation of private persons)	3,300	4%	650	1%
Private wells / cesspits*	250,000	10%	250,000	10%

\* Note: Some of the population in rural areas are still not connected to public water supply and sanitation. About 10 % of the Austrian population have their own wells for the extraction of the drinking water and they use cesspits for wastewater disposal, especially in rural areas.

Source: Kommunalkredit Public Consulting GmbH, database 2007 and WIFO 2002.

**Business model**

The most frequently seen model is direct public management by public utilities (e. g. municipalities or associations of municipalities or public enterprises) and partly by publicly owned companies. Traditionally, user cooperatives play an important role in some parts of Austria, in particular in rural areas, mainly concerning water supply.

**Regulator/price policy**

In Austria there is no national regulator in charge of tariff control. Municipalities set-up tariffs for water & wastewater services (the legislation, however, sets tariff ceilings).

**Private sector involvement**

The number of private companies providing water services (water supply and/or sanitation) is negligible.

**5.2. Bulgaria****Basic information**

Population	7.5 million
Number of provinces (regions)	28
Connection rate – improved water supply	98%
Connection rate – improved wastewater	95% of towns have sewage networks. 3.2% villages connected to sewage systems.

**Fragmentation**

Service delivery has been highly consolidated by creating regional WSS companies. Only a few municipalities have not participated in the regional companies and have provided services on their own. According to new law (2012 proposal) all municipalities will be obliged to join regional companies.

**Business model**

Publicly owned regional water & wastewater utility companies. According to new policy, utilities will be operators of the infrastructure and assets ownership will be transferred to municipalities and state.

**Regulator/price policy**

National regulator: State Energy and Water Regulatory Commission (SEWRC) is responsible for tariff policy control.

**Private sector involvement**

Limited private sector involvement (e.g. concession in Sofia).

### 5.3. Croatia

#### Basic information

Population	4.3 million
Number of municipalities	429
Average number of citizens per municipality	10,000 people
Connection rate – wastewater (2005)	40% (sewerage collection), 12% (sewerage treatment)
Connection rate – piped water (2005)	75%

#### Fragmentation

Large degree of fragmentation of water & wastewater operations. A few examples of voluntary consolidation.

#### Business model

Water / wastewater companies are commercialized (limited liability companies) owned by local governments.

#### Regulator/price policies

The Ministerial order established the formula for calculation of the lowest tariff. The government collects the information on water/wastewater utilities' performance and prepares benchmarking for internal purposes. The Hrvatske Vode is a governmental institution that collects a water & wastewater fee (collected as an additional fee to tariffs).

#### Private sector involvement

Private sector involvement in wastewater treatment is very limited (approx. 17% of population is served under PPP contracts). Two contracts have been signed 23 DFBOT contract for Austrian company EVN to serve 10,000 inhabitants in Vodice. And BOT contract awarded to RWE (Germany)/EVN (Austria) to operate a wastewater treatment plant in Zagreb (750,000 inhabitants).

### 5.4. Czech Republic

#### Basic information

Population	10.5 million
Number of municipalities ( <i>obce</i> )	6,249
Access to improved sanitation	99%
Access to improved water source	100%

#### Fragmentation

Large degree of fragmentation. In 2006 there were approx. 1,200 operating utilities and 3,500 owners of water & sewage infrastructure.

**Business model**

Two major models are present in Czech Republic: (1) French model of service delegation to private companies. Private company operates assets owned by municipality. (2) (Full) Divestiture – sale of assets to a private company. The first model is a more popular one.

**Regulator/price policy**

Price policy is based on the cost plus formula (cost coverage and reasonable regulated profit). This means the reasonable profit is considered to be profit commensurate with the usual profit associated over the long term with comparable economic activities, which provides for a reasonable return on the capital employed over a reasonable period of time. Guidelines for calculating return on capital (based on regulatory asset value model).

There is not an economic regulator of water & wastewater operations.

**Private sector involvement**

High degree of private sector participation. Veolia Water Czech Republic - operates infrastructure in more than 1,200 municipalities, supplies water to 4.3 million inhabitants (40% market share). Ondeo Czech Republic supplies water to 1.2 million inhabitants (15% market share).

**5.5. Denmark**

**Basic information**

Population	5.5 million
Number of municipalities	98 (until 2007 there were 270 municipalities)
Connection rate – improved wastewater	89% (almost entire volume of drinking water comes from groundwater reservoirs)
Connection rate – improved water	100%

**Fragmentation**

One of the most fragmented system in Europe (including a large number of water cooperatives supplying water). There are approx. 160 municipal utilities and approx. 2,500 co-operatives (in particular in rural areas). Traditionally there have been a large number of individual wells (71,000 in 2003). The number of co-operatives and individual wells is constantly decreasing due to stricter administrative requirements and standards. Some of the co-operatives close down and some of them merge with larger entities<sup>11</sup>.

**Business model**

There are two main models:

1. Direct service provision by municipal utility (approx. 160).

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<sup>11</sup> Water and Sanitation Services. Public Policy and Management. Jose Esteban Castro and Leo Heller. Earthscan. 2009. Page 221.

2. Service provision by co-operatives of individuals (approx. 2,500). This model relates mostly to water supply. The number of co-operatives is decreasing (due to groundwater pollution and stricter water and service quality standards).

### **Regulator/price policy**

Tariffs are regulated by municipalities, using cost plus formula (usually zero profit rate). In 2009 the reform of the water sector had started, with one of the aims being a shift towards incentive-based tariffs. The government requires benchmarking in order to stimulate efficiency in service provision.

Political agreement for the reform requires:

- Set-up small regulatory body;
- Intensive regulation (price caps and benchmarking)
- Disincentives for privatisation.
- A new foundation to finance R&D in environmentally friendly technologies.

### **Private sector involvement**

Negligible in the water sector. Only several municipalities delegated sewage treatment services to private companies.

#### **Box 2. Danish Water and Wastewater Association**

Danish Water and Wastewater Association (DANVA) is a national association of water and waste water utilities. DANVA is a non-profit organization funded by the members, who are utilities, municipalities, consultants, contractors and personal members.

The members are responsible for 85 per cent of the Danish drinking water supply and for the collection and treatment of waste water from about 85 per cent of the Danish population.

The objective of the association is to look after the common interests of Danish water and sewerage suppliers in promoting a steady and high-quality water and sewerage supply on an environmentally sustainable basis.

As a planning and supervising authority, any local authority, with or without public (municipal) water supply and sewerage in its area, may need service from the association.

DANVA published data resulting from the Benchmarking project and Water Statistics.

Source : <http://www.danva.dk>

## 5.6. England & Wales

### Basic information

Population	England: 51.4 million Wales: 3 million
Number of counties	England is divided into 48 counties that are subsequently divided into districts. There are 22 principal areas in Wales.
Connection rate – improved wastewater	98%
Connection rate – improved water	100%

### Fragmentation

The system is highly regionalized. In 2009 there were 10 regional water and wastewater companies and 11 water-only companies.

### Business model

In 1989 the government privatised 10 public regional water utilities by selling their assets (such privatisation is named *(full) divestiture*). In this model private companies both own and operate the infrastructure. This reform has been one of the most widely recognized examples of water service privatisation in the world.

### Regulator/price policy

The full privatisation process is particularly sensitive, therefore it necessitates a strong independent, professional regulator.

Water Services Regulation Authority (OFWAT) is the economic regulator. Every five years the companies provide to OFWAT their business plans. OFWAT determines price limits (price caps) for the next five-year period.

Full privatisation has made impossible the usage of **incentives for efficiency** created by the competition for contracts (“competition for the field”) immanent e.g. to the “French model”. Hence, a problem of establishing an alternative incentive structure (as strong as that creating by competition for contracts) emerged.

It was thought that the price caps and benchmarking would provide incentives for efficiency improvements. Evidence suggests that it was like this for the first several 5-year periods. However, over the last two 5-year periods tariffs ensuring full cost recovery failed to meet the price caps set by the regulator. Causes of the problem are not yet fully clear but this fact challenges the ability of price caps and benchmarking to substitute for the incentives created by the “competition for the field”.

### Private sector involvement

Full privatisation by selling the assets to private sector.

**Box 3. About OFWAT**

“Our job is to make sure that your water company provides you with a good quality service at a fair price.

We do this by:

- keeping bills for consumers as low as possible
- monitoring and comparing the services the companies provide
- scrutinising the companies' costs and investment
- encouraging competition where this benefits consumers

If a company falls short of what we or customers expect we take the action necessary to protect consumers' interests, which may include legal steps such as enforcement action and fines.

As the economic regulator of the water industry in England and Wales we work closely with a wide range of other stakeholders. These include water quality regulators (the Environment Agency and the Drinking Water Inspectorate) and the Consumer Council for Water.”

Source : <http://www.ofwat.gov.uk/aboutofwat/>.

**5.7. France****Basic information**

Population	63.5 million
Number of municipalities	36,700
Connection rate – improved wastewater	82% (2004). 18% of population using on-site sanitation systems.
Connection rate – improved water	Almost 100%

**Fragmentation**

The system is highly fragmented. There are approx. 15,000 entities responsible for sanitation services (municipalities or their associations), and approx. 13,500 entities in the water supply sector. Common features are inter-municipal associations (over 60% of settlements participate in inter-municipal associations (syndicates) dealing with water supply and/or sanitation).

**Box 4. France**

In France, provision of water service is a municipal responsibility and many small towns have decided to combine service areas to improve service efficiency with private participation contracts. The local representative of the central government (the Prefect) can mandate or influence the creation and shape of proposed aggregated structures. In particular, the Prefect can apply the principle of “territorial continuity,” requiring that all aggregated municipal services have a geographical boundary in common to strengthen the technical coherence of the grouping.

Source : Approaches to Private Sector Participation in Water Services. Toolkit. The World Bank and PPIAF. 2006 p. 55.

## Business model

Municipalities can delegate service provision to private companies through *affermage* or concession contracts. In France, municipalities are legally prohibited from selling their water and sanitation assets to private companies (leasing contracts are allowed).

In concession contracts, the private operator has both operational and investment obligations. In *affermage* contracts, the private operator has only operational obligations. There are mix contractual arrangements as well, which combine *affermage* and investment obligations.

## Regulator/price policy

In France, the central government adopted model concession and *affermage* contracts as secondary legislation, to help small municipalities negotiate and sign contracts with operators.

This is particularly important, given the strong market power of private companies in the country.

The French model is sometimes described as “regulation without regulator”. The contracts, obligations and tariff policies are constrained by law. The *Conseil d’État* serves as a “quasi regulator”: it resolves disputes between municipalities (customers) and suppliers (private operators). The *Conseil d’État* has effectively modified the acceptable tariff-setting system, from a fixed price cap with no adjustments allowed for the contract period, to a cost-of-service tariff regime with indexed adjustments for input cost changes.

## Private sector involvement

In 2006, 85% of water and sanitation services in France are provided by private operators under various types of leasing agreements<sup>12</sup>. French companies (Veolia, Suez Environnement, and Saur) are leading international players in water supply and sanitation services, globally.

## 5.8. Lithuania

### Basic information

Population	3.2 million
Number of municipalities	60
Average number of citizens per municipality	> 50,000 people
Connection rate – improved wastewater	68%
Connection rate – improved water	73% provided with good quality drinking water services. Approximately 25% of the total population of 3.4 million people in Lithuania are supplied with water from individually (dug) wells, mostly serving one family each. Out of the 1918 centralized public drinking-water suppliers in Lithuania, 6% serve between 100 and 1000 m <sup>3</sup> per day and 91% serve less than 100 m <sup>3</sup> per day <sup>13</sup> .

<sup>12</sup> Handbook for Evaluating Infrastructure Regulatory Systems. A.C. Brown, J.Stern, B.W. Tenenbaum. The World Bank. 2006.

<sup>13</sup> Small-scale water supplies in the pan-European region. UN Economic Commission for Europe. WHO. 2010.

### **Fragmentation**

Water and wastewater services used to be highly centralised during soviet times. There was a state water & wastewater company with 14 daughter companies. When Lithuania regained independence municipalities took over control the operations of utilities.

### **Business model**

Public service provision by municipally owned companies.

### **Regulator/price policy**

National utility sector regulator: the National Control Commission for Prices and Energy (NCCPE) is in charge of tariff clearance.

Municipal councils are responsible for final tariff approval.

### **Private sector involvement**

So far private sector involvement has been rejected. There have been political concerns about involving private operators in water and wastewater service provision.

## **5.9. Poland**

### **Basic information**

Population	38.5 million
Number of municipalities	2,479 (rural 1,571; rural-urban: 602; urban: 306)
Connection rate – improved wastewater	61.5%
Connection rate – improved water	87.2% (2009). In rural areas: 74.7%.

### **Fragmentation**

Water and wastewater service delivery is highly fragmented. There are some examples of voluntary inter-municipal co-operation in service provision. Voluntary inter-municipal co-operation are not widespread.

There were 1,400 utilities in Poland in 2006, of which 41% were budgetary organizations, 32% commercial code companies, 17% water code companies, and 10% of other legal forms.

### **Business model**

Water supply and wastewater collection is statutory responsibility of municipalities.

Three types of utilities:

- Budgetary units;
- Budgetary enterprises;
- Limited or joint stock company.

In some rural areas there are water supply cooperatives (owned and operated by groups of individuals).

### **Regulator/price policy**

There is no special economic regulator of water and wastewater services, as tariffs are regulated by respective municipalities. Tariffs are approved by municipal councils annually. Water tariffs are calculated using the cost plus formula.

### **Private sector involvement**

There is negligible private sector participation in Polish water supply and wastewater sector (3%).

## **5.10. Romania**

### **Basic information**

Population	19 million
Administrative division:	41 counties (and municipality of Bucharest), 319 cities and 2,686 municipalities
Connection rate – improved wastewater	72%
Connection rate – water supply network	60% (10% in rural areas)

### **Fragmentation**

Government has implemented regionalization reform aiming at sector consolidation. Only regional companies could benefit from EU Cohesion Fund grants. The number of municipal utilities has been constantly reduced.

The approach is aimed at the regionalization of currently dispersed and fragmented services. The regionalisation process consists of the concentration of the operation of the services provided to a group of municipalities within a geographical area defined with respect to a river basin and/or to administrative boundaries (municipalities, county). The Regionalization of Services aims to provide 2,600 localities of more than 2,000 inhabitants to meet 2018-performance targets established by the Sectoral Operation Programme Environment, by concentrating the management of water and wastewater services **in around 50 stronger operators, set up and developed by merging the existing local utilities into so called Regional Operating Companies (ROCs)**. Regionalisation of the water services is planned to overcome excessive sector fragmentation and to achieve economies of scale<sup>14</sup>.

### **Business model**

The government has promoted the following business model for regionalisation reform:

- Formation of Intercommunity Development Association (IDA)
- Setting up regional operator/regional operating company (ROC)
- Delegating water supply and wastewater services to respective regional operator.

<sup>14</sup> Guide on regionalization of drinking water and wastewater services. Government of Romania. 2008.

### **Regulator/price policy**

Sector regulator is National Authority for Regulation of Community Services (ANRSC). Among others, it sets procedures for tariff calculation and approval. Tariffs are calculated based on the cost plus formula.

### **Private sector involvement**

The private sector share of the Romanian water sector amounted to 11% in 2006. In 2000 Vivendi, via its Romanian subsidiary Apa Nova Bucuresti SA, signed a 25-year water concession contract in Bucharest (2.2 million inhabitants).

## **5.11. Serbia**

### **Basic information**

Population	7.5 million
Number of municipalities	108
Average number of citizens per municipality	> 69,000 people
Connection rate – wastewater network	35% (2008)
Connection rate – improved water	78.3% (2008)

### **Fragmentation**

Water & wastewater service provision is fragmented.

### **Business model**

Water / wastewater companies are publically owned by local governments. Water / wastewater companies are in the special legal form of Public Utility Company (PUC) which is legally separated from the local government but the degree of commercialization is much lower than in the case of limited liability companies.

### **Regulator/price policy**

Even the tariff approval is solely the responsibility of the local government, the government limits the tariff increase through administrative orders – in the event that the local governments increase the tariff by more than inflation, the government (Ministry of Finance) may (but rarely uses that possibility) reduce general transfers to the local governments.

### **Private sector involvement**

There is no private sector involvement in water and wastewater sector in Serbia.

## 5.12. The Netherlands

### Basic information

Population	16.8 million
Number of municipalities	431
Average number of citizens per municipality	>40,000 people
Connection rate – improved wastewater	100%
Connection rate – improved water	100%

### Fragmentation

The degree of fragmentation is very different for water supply, wastewater collection and treatment. Water supply is highly consolidated with only ten regional water supply utilities. Wastewater collection is much more fragmented as most of the municipalities operate their own systems. On the other hand wastewater treatment is the responsibility of 25 wastewater boards.

### Business model

Public service provision.

### Regulator/price policy

There is no special sector regulator. There are separate wastewater and water supply charges. Water boards (responsible for wastewater treatment) impose two kinds of taxes, which fund more than 95% of the services provided (...) fixed component, called the ‘water board fixed charge’ and variable component for pollution produced<sup>15</sup>. It should be noted, however, that typically domestic users do not pay volume-based charges but the charges linked to standardised environmental pollution unit that is charged depending on a number of people in a household.

Additional tariffs are collected by municipalities (responsible for wastewater collection).

Water companies (responsible for water supply) collect tariffs that consist of three components: (1) service provision (OPEX and CAPEX) – representing 76.5% of total costs, (2) water abstraction charges amounting to 9.1%, (3) state taxes, including VAT and tax on tap water: 14.4%.

Association of Water Utilities promotes good practices in the sector (it is involved in benchmarking).

### Private sector involvement

According to Dutch legislation provision of water services by private sector is not allowed.

<sup>15</sup> Regulation of Water and Wastewater Services – an International Comparison. Rui Cunha Marques. IWA Publishing 2010. Page 151.

## 6. REVIEW OF DIFFERENT BUSINESS MODELS' APPLICABILITY FOR SMALL TOWNS AND RURAL SETTLEMENTS

As illustrated in the previous section there are significant differences across European countries in approaches to water and wastewater service (WWS) provision. Some countries implement more centralized models than other (i.e. where the service is provided by the utilities operating on regional/province level instead of local/municipal levels). **Degree of regionalization** is described in this section as one of the basic features of business models in WWS.

As presented in the previous section, some of the European countries have chosen regionalisation to provide sanitation services (e.g. Italy, England, Romania and Bulgaria). Others (e.g. Serbia, Croatia, Denmark, Poland) follow a decentralized approach, where municipal authorities are responsible for organized water and wastewater services provision (there are examples of very small municipalities with their own utilities). In decentralised systems some municipalities may decide on voluntary co-operation in order to increase efficiency of service provision or get easier access to investment funding.

The regional approach requires the Government of Moldova and the Parliament to create well-grounded organizational, regulatory and legal framework, which includes:

- A legal framework to create municipal / inter-communal associations;
- specific regulations on organization of regional utilities (including rules of participation of local authorities in regional structures, provisions on delegation of services to operator etc.);
- regulation on ownership of assets used for WSS.

In practice, a number of difficulties may emerge when forming regional structures (e.g. reluctance of some local authorities who perceive that their position in the regional structures is weak). Therefore, the decision on regionalisation should be preceded with thorough assessment of cooperation possibilities between administrative units in Moldova.

Similarly to Romania, regionalization may work in the following way: the local authorities set-up Inter-municipal Association, the service provision is delegated to regional utility company, in which municipalities are the shareholders. This approach however requires changes in legislation so that local governments will have rights to establish a municipal / inter-communal association and delegate responsibilities to the association. The immediate solution is to establish a joint stock company, owned by local governments. This is possible under the current legislation framework and currently tested by EBRD/EIB/EU project. However, the effective legislation in Moldova bans establishing non-for-profit associations by local governments.

In absence of the initiatives that encourage bottom-up regionalisation, "light-regionalisation" is a valuable alternative. Light regionalisation is based on the concept of setting up a regional entity that provides assistance to local authorities and their utilities, while not providing the water/wastewater services. The degree of assistance can vary:

- Provision of know-how;

- Assistance in project preparation and mobilisation of funding sources;
- Taking over certain operating responsibilities (e.g. maintenance services, leakage detection).

In “light regionalisation” model local authorities retain all responsibilities in shaping water and wastewater policies at the local level, but at the same time they get access to professional assistance (both in terms of project preparation and system operation). The advantage of this model is that: (a) it would help address local technical and managerial capacity constraints; and (b) it is relatively easy to test in a pilot region.

Another important feature of business models for WWS is **delegation of service provision**: WWS can be provided directly by public authorities or they can be delegated by the authorities to other institutions (e.g. public or private institutions).

A separate type of WSS service provision is **provision by multi-purpose utilities**. This model was widely used in the former Soviet Union and is still present in some European countries (for example Italy).

In order to ensure uninterrupted, high-quality and reliable services, it is necessary to ensure sufficient financing for WWS operations. It relates both to investment needs and to operation and maintenance costs (energy, labour, infrastructure maintenance etc.). The way such costs are covered determines **the financial dimension** of a business models.

Finally, different **technological solutions** can be applied for WWS in rural areas e.g. individual wells vs. small water distribution networks. It should be noted, however, that even if a system remains technically decentralised it can still be operated by regional utilities that can concentrate larger technical capacities for technical maintenance and operation.

The choice of the technological approach should be based on the following principles:

- Ensuring compliance with legal standards;
- Assessment of the best, feasible technological options;
- Least-cost planning.

A clear distinction should be made between **institutional centralisation** (i.e. regional vs. local operators), and **technical centralisation** (small isolated systems vs. centralised systems for water and wastewaters).

When considering alternative technical and institutional options to WWS provision, economies of scale need to be factored in. While small systems may prove to be operational, they may turn to be more expensive than consolidated ones (see the separate section: “Unit costs of service provision”).

The applicability of different business models for small towns and rural settlements in Moldova is synthesised in the following table.

**Table 1. Applicability of different business models for small towns and rural settlements in Moldova**

<b>Business model</b>	<b>Applicability for small towns and rural settlements in Moldova</b>
<b>Degree of regionalization of service provision</b>	
Decentralized model	Model does not create required economies of scale and does not address the problem of lack of capacity of water/wastewater operators Decentralized model is applicable in remote and small settlements only.
Light regionalization	The model addresses the lack of capacity problem; it is applicable in combination with other models.
Voluntary regionalization	The model addresses the problem of economies of scale; it is applicable in combination with appropriate fiscal and economic incentives.
Obligatory regionalization	The model addresses the problem of economies of scale; however it goes against the autonomy of local governments; a wide political consensus will be required.
<b>Delegation of service provision</b>	
Direct service provision:	
<ul style="list-style-type: none"> <li>• Service provided directly by local governments</li> </ul>	Main model in place
<ul style="list-style-type: none"> <li>• Service provided directly by neighbouring local government (but without creating an association)</li> </ul>	Applicable, but weak governance is an obstacle
<ul style="list-style-type: none"> <li>• Service provided directly by neighbouring local government by creating an association for water service provision</li> </ul>	Applicable, but weak governance; requires legislation on municipal / inter-communal associations
<ul style="list-style-type: none"> <li>• Service provided directly by not-commercialized local/regional public utilities or co-operatives</li> </ul>	Applicable, but little obvious benefit
<ul style="list-style-type: none"> <li>• Service provided directly by commercialized (limited liability companies or joint stock companies) local/regional public utilities</li> </ul>	The model is applicable especially around towns (by transforming ApaCanals into joint stock companies)
<ul style="list-style-type: none"> <li>• Co-operatives</li> </ul>	The model is applicable, especially in small remote rural settlements
<ul style="list-style-type: none"> <li>• Small private operators, including informal ones.</li> </ul>	The model is applicable, especially in small remote rural settlements
<b>Different levels of private sector participation</b>	
<ul style="list-style-type: none"> <li>• Delegated services through leasing or concession model where public authorities retain ownership of infrastructure</li> </ul>	Little experience on concession and no experience on leasing in Moldova; the model would be applicable but capacity building and new legislation are required.
<ul style="list-style-type: none"> <li>• Management contracts</li> </ul>	No experience on management contracts in Moldova; the sector is not attractive for private providers in Moldova, due to affordability constraints and tariff setting rules.
<ul style="list-style-type: none"> <li>• BOT</li> </ul>	No experience in Moldova and the sector is not attractive for private providers due to affordability constraints and tariff setting rules.
<ul style="list-style-type: none"> <li>• Full privatisations where private companies both own and operate the infrastructure.</li> </ul>	The model is not applicable in Moldova.
<ul style="list-style-type: none"> <li>• Multi-purpose utilities</li> </ul>	The model is applicable in towns where other municipal services exist. The best approach would be to apply the model as a second step after regionalization.
<b>Sector financing</b>	
Financing through tariff only	not applicable due to affordability constraints
Financing through tariff <u>and</u> from local government budget	partially not applicable due to affordability constraints and insufficient local government budgets
Solidarity funds and revolving funds	Applicable in Moldova; requires new legislation and cooperation with donors.

<b>Business model</b>	<b>Applicability for small towns and rural settlements in Moldova</b>
<b>Technological solutions</b>	
Centralized wastewater collection and treatment (mechanical and biological)	Applicable in towns and surrounding rural settlements
Centralized wastewater collection and treatment through water ponds	Applicable in towns and surrounding rural settlements
Septic tanks and wastewater delivery to WWTP by trucks.	Applicable in rural settlements
<b>Incentives</b>	
Fiscal incentives, especially access to capital and investment funds	Applicable in Moldova
Economic and other incentives	Applicable in Moldova

Source: own assessment by authors.

## 7. AFFORDABILITY

### 7.1. Unit cost of service provision

The costs of service provision should be considered in the design phase of the new water supply and wastewater treatment systems since they affect the tariff to be paid by users (the more cost-effective the system, the lower tariff the users pay).

**Least Cost Analysis (LCA)**<sup>16</sup> is a tool applied to compare alternative project options and to identify the most cost-effective one. The authorities responsible for developing the municipal water supply and wastewater treatment options may consider various project strategies that would meet the same objectives (e.g., water supply with centralized or decentralised systems). The unit cost calculation takes into account all necessary costs – for investment and operation of the system.

The most cost-effective option is the one that delivers the same outcome as the other options (i.e., achieves the same quantitative objectives) at the lowest unit cost. For investments in water and wastewater treatment systems, unit costs may be expressed as the cost per cubic meter of wastewater or water supplied (e.g., EUR / m<sup>3</sup>).

In wastewater treatment, the unit cost is strongly correlated with the size of the wastewater treatment plants (WWTP). See the table and the graph below.

**Table 2. Relationship between size of agglomeration and unit costs of WWT**

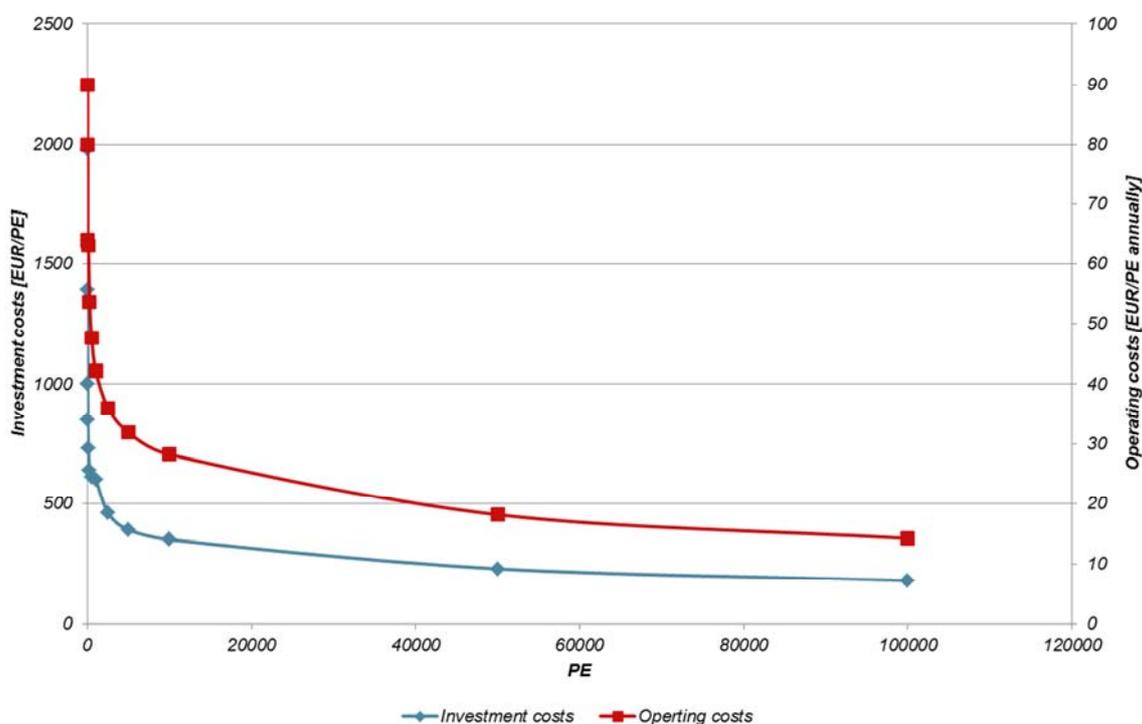
PE (Population equivalent)	Unit investment costs EURO/PE	Unit operating costs EURO/PE annually
5	€ 1.980.0	€ 90.00
10	€ 1.390.0	€ 70.00
25	€ 1.000.0	€ 64.10
50	€ 850.0	€ 64.00
100	€ 730.0	€ 63.10
250	€ 640.0	€ 53.70
500	€ 610.0	€ 47.60
1,000	€ 600.0	€ 42.20
2,500	€ 460.0	€ 36.00
5,000	€ 390.0	€ 31.90
10,000	€ 350.0	€ 28.20
50,000	€ 230.0	€ 18.10
100,000	€ 180.0	€ 14.20

Source: KPC.

The investment costs for very small WWTPs (for 5 PE) are 10 times higher than in case of WWTP for 100,000 PE. Even WWTP for 500 PE (that is, for a small village), costs more than 3 times as much as a large WWTP and operating costs are also more than 3 times higher. The following chart illustrates this relationship.

<sup>16</sup> Not to be confused with the different technique of life-cycle analysis (also known by the acronym LCA).

Figure 3. Relationship between size of agglomeration and unit costs of WWT



Source: KPC.

## 7.2. Affordability - influence on water consumption

Affordability constraints have a high impact on water consumption and this further determines the applicability of the proposed business models.

The disposable income per person and per family<sup>17</sup> shows that in urban areas in Moldova, some 33.9% of population has to limit water consumption due to affordability constraints, while in rural areas, consumption below even 45 litres per person per day would be a problem for 73.5% of population. Indeed, such consumption is observed in Moldova and reported by IB-NET data-base.

This leads to the following conclusions:

- In rural areas, even if a system (piped water supply, wastewater services) is built, a cost recovery tariff will be a problem for the majority of the population; the population will cope, among others, by lowering water consumption;
- Low water consumption affects the unit costs of service provision;
- Low water consumption leads to technological problems, especially for centralized wastewater systems: blockages will occur in the sewage network, while the WWTP will not be fully operational if the unused capacity is high.

<sup>17</sup> According to "Aspects regarding the living standards of population in 2010, National Bureau of Statistics of the Republic of Moldova".

Thus, centralized wastewater collection and treatment could be used in urban areas only with extension to sub-urban areas where the marginal costs of services for rural areas are not very high.

The affordability constraints also show a need for improved social programmes targeted to poor rural population and/or need to establish a solidarity fund, and use other **solidarity mechanisms**.

### 7.3. Affordability of different technological solutions

The affordability constraint depends on the technological solution; the investment and operating costs of solution, however, depend on the particular situation in which the solution will be applied.

For example, for piped sewage collection, both investment and particularly operating costs depend on how many pumping stations are required. If a gravity system could be applied, then the costs would be significantly lower than if pumping is required.

Similarly, piped water supply, which is presented here in order to see the affordability constraints for both water supply and wastewater services, depends on whether water treatment is required and the distance water should be transported and, as necessary, pumped.

Following the conclusions of the Task 1 report (Moldova will more depend on surface water supply from rivers), the costs presented here for the affordability calculation were taken from the GIZ financed project for piped water supply from rivers for larger area (half of a rayon)<sup>18</sup>. The investment costs include not only pipes, but also a water treatment station, pumping stations, and reservoirs.

Thus, the following analysis has many constraints and should be understood as a rough estimation not applicable to the situation of a particular locality.

The following table presents the unit costs (MDL/person/month) of providing services for larger agglomerations and urban/sub-urban areas of about 10,000 PE. The costs were calculated for average consumption of 120 lcd (litres per capita per day). Only in the case of septic tanks, was alternative information on an average consumption of 20 lcd provided.

**Table 3. Unit costs for different technologies**

Technology		Unit capital costs MDL/person/month	Unit operating costs MDL/person/month
Piped water supply (120 lcd)		42.0	28.8
Piped sewage - gravity system (120 lcd)		42.0	14.4
<b>WWTP (120 lcd)</b>	Trickling Filter	11.58	21.22
	Extended Aeration	14.26	30.20
	Aerated Ponds	22.96	32.63
	Constructed Wetlands	32.60	38.43
Piped sewage + WWTP (Trickling Filter), (120 lcd)		53.58	35.6
Septic tank (20 lcd)		51	15
Septic tank + WWTP (20 lcd)		51	20
Septic tank (120 lcd)		51	92
Septic tank + WWT (120 lcd)		51	122

Source: own calculations based on:

**Piped water supply and sewage** - Own calculation based on study „Concept for clustering of water supply and sewerage communal services in Cahul and Riscani Rayons” prepared under the German Technical Cooperation with Moldova project “Modernisation of local public services, Moldova”.

**WWTP** - Own calculation based on the study „WATER SUPPLY AND WASTEWATER DISPOSAL CONSULTING ENGINEERS FOR THE CITY OF CANTEMIR REPUBLIC OF MOLDOVA. FEASIBILITY STUDY ON WASTEWATER COLLECTION AND TREATMENT”

**Septic tanks** - Because septic tanks are rarely constructed in Moldova, the calculation is based on average costs from different countries in Central and Eastern Europe.

<sup>18</sup> “Concept for clustering of water supply and sewerage communal services in Cahul and Riscani Rayons”.

The following table provides information on affordability constraints – that is, what would be the share of costs of given services in disposable household income (in this case per person). The calculation is done for rural areas and for urban/rural, which corresponds to the situation of sub-urban population. Some explanations of the table are warranted. First, the term “cost recovery” refers to a tariff that is sufficient to cover operating and maintenance costs. Second, “full cost recovery” refers to a tariff that is sufficient to cover operating and maintenance costs, as well as capital costs (depreciation and any debt service).

The figures in the table refer to the percentage of household income that would be spent depending on the technology used. Thus, in the following table, a rural family using 120 lcd (a high figure) would be expected to spend 8.8% of their income for piped water services and 7.0% for piped sewage services. Various service combinations are provided with the percentage of household income that would need to be spent on that service combination.

**Table 4. Affordability constraints for different technologies**

Technology	Urban + rural Income per family: 3066.17 MDL/month		Rural Income per family: 2402.70 MDL/month	
	Cost recovery %	Full cost recovery %	Cost recovery %	Full cost recovery %
Piped water supply (120 lcd)	2.8%	6.9%	3.6%	8.8%
Piped sewage (120 lcd)	1.4%	5.5%	1.8%	7.0%
<b>WWTP (120 lcd)</b>	Trickling Filter	2.1%	3.2%	2.6%
	Extended Aeration	3.0%	4.4%	3.8%
	Aerated Ponds	3.2%	5.4%	4.1%
	Constructed Wetlands	3.8%	6.9%	4.8%
Piped sewage + WWTP (120 lcd)	3.5%	8.5%	4.4%	10.8%
Septic tank (20 lcd)	1.5%	6.5%	1.9%	8.2%
Septic tank + WWTP (20 lcd)	2.0%	6.9%	2.5%	8.9%
Septic tank (120 lcd)	9.0%	14.0%	11.5%	17.9%
Septic tank + WWTP (120 lcd)	11.9%	16.9%	15.2%	21.6%

Source: own calculations based on:

**Piped water supply and sewage** - Own calculation based on study „Concept for clustering of water supply and sewerage communal services in Cahul and Riscani Rayons” prepared under the German Technical Cooperation with Moldova project “Modernisation of local public services, Moldova”.

**WWTP** - Own calculation based on the study „WATER SUPPLY AND WASTEWATER DISPOSAL CONSULTING ENGINEERS FOR THE CITY OF CANTEMIR REPUBLIC OF MOLDOVA. FEASIBILITY STUDY ON WASTEWATER COLLECTION AND TREATMENT”

**Septic tanks** - Because septic tanks are rarely constructed in Moldova, the calculation is based on average costs from different countries in Central and Eastern Europe.

**Income per family** - „Aspects regarding the living standards of population in 2010”, National Bureau of Statistics of the Republic of Moldova.

The analysis of the table leads to the following conclusions:

- Water supply services themselves fully absorbs the ability of the population to pay for services.
- Adding wastewater collection and treatment services to piped water supply will more than double costs.
- The consumption of 120 lcd is not affordable for rural and sub-urban population.
- Full cost recovery will not be possible in most cases.
- Septic tanks will be affordable only for a very low volume of water.

The modified table presents the calculations for lower water consumption that is currently observed in small towns:

**Table 5. Affordability constraints for different technologies - reduced water consumption**

Technology		Urban + rural Income per family: 3066.17 MDL/month		Rural Income per family: 2402.70 MDL/month	
		Cost recovery %	Full cost recovery %	Cost recovery %	Full cost recovery %
Piped water supply (45 lcd)		0.7%	4.8%	0.9%	6.2%
Piped sewage (45 lcd)		0.4%	4.5%	0.5%	5.7%
<b>WWTP (45 lcd)</b>	Trickling Filter	0.5%	1.7%	0.7%	2.1%
	Extended Aeration	0.8%	2.2%	1.0%	2.8%
	Aerated Ponds	0.8%	3.1%	1.1%	3.9%
	Constructed Wetlands	1.0%	4.2%	1.2%	5.3%
Piped sewage + WWTP (45 lcd)		0.9%	5.9%	1.1%	7.5%
Septic tank (20 lcd)		1.5%	6.5%	1.9%	8.2%
Septic tank + WWTP (20 lcd)		2.0%	6.9%	2.5%	8.9%

Source: own calculations based on:

**Piped water supply and sewage** - Own calculation based on study „Concept for clustering of water supply and sewerage communal services in Cahul and Riscani Rayons” prepared under the German Technical Cooperation with Moldova project “Modernisation of local public services, Moldova”.

**WWTP** - Own calculation based on the study „WATER SUPPLY AND WASTEWATER DISPOSAL CONSULTING ENGINEERS FOR THE CITY OF CANTEMIR REPUBLIC OF MOLDOVA. FEASIBILITY STUDY ON WASTEWATER COLLECTION AND TREATMENT”

**Septic tanks** - Because septic tanks are rarely constructed in Moldova, the calculation is based on average costs from different countries in Central and Eastern Europe.

**Income per family** - „Aspects regarding the living standards of population in 2010”, National Bureau of Statistics of the Republic of Moldova.

The current, low water consumption provides the opportunity to maintain prices that guarantee cost recovery (but not full cost recovery) and that are affordable for the population. Bills for water supply and wastewater collection and treatment services will absorb 0.9% and 1.1% of disposable household income, respectively, for the cheapest technological solution. This means that services would be affordable for the average household if the capital costs are subsidized.

It has to be emphasized that the percentage of household income provides a convenient decision rule such that above the given threshold (4% for water and wastewater services<sup>19</sup>) percentage, customers will have difficulty paying for services and will undertake coping mechanisms, including reducing consumption. Yet, the fact that water/wastewater prices may be below these levels does not mean that no problems exist. The use of such an indicator for decision-making can be misleading, as it may hide serious income distribution disparities. Indeed, it does not reflect a possible simultaneous price rise for other essential goods and services (e.g., increase in tariffs for gas and electricity), in which case even a 4% burden may be too high. Few if any country-specific studies are undertaken to see if this affordability level is really acceptable.

In the case of calculations presented above, the affordability level refers to average household income. This means, however, that the lowest quintile of household income represents people who will have significant difficulties to pay.

<sup>19</sup> Some well-known affordability thresholds for combined water and wastewater services (measured as a percentage of household income spent on each type of utility service) include: Organisation for Economic Cooperation and Development: 3-5%; European Union: 3-4%; US Environmental Protection Agency: 2.5%; International Financing Institutions: 4%.

These affordability levels are based on the assumed ability to pay of the population. In order to devise the best tariff policy, a country-specific study of affordability in Moldova should be conducted that includes the population's *ability* to pay for water and sanitation services.

The OECD/EUWI (2007) report included a study of water services and willingness to pay based on surveys conducted in two towns: Causeni and Nisporeni. The study found that 40% of households with access to piped water service faced daily shortages and a large proportion of households considered the water quality to be poor. As a result of the perceived inadequacies of the existing water supplies, around 50% of the total household expenditure on water supplies goes to purchasing bottled water and maintaining supplementary water sources.

Altogether, average households spent 3.8% to 5.4% of their monthly income on water supplies, whilst the households in the lower income quintiles spent 6%-7% of their income. The willingness and ability to pay survey found that the lowest income groups would be willing to spend 5%-7% of their monthly income in order to have improved water supply services. The cited study shows some scope for willingness to pay provided water services are improved. Such studies need to be repeated in other urban areas, as well as in rural areas in particular.

#### **7.4. Affordability - conclusions for business models**

The affordability constraints presented in previous sections affect the proposed business models. Thus, the conclusions from the discussion on affordability are the following:

1. Piped wastewater collection and treatment could be proposed for an urban area, where the majority of the population has a better financial situation. While this report is focused on rural areas in Moldova, it also takes into account small towns.
2. Villages surrounding towns may also benefit from piped wastewater collection and treatment as the marginal costs of extending the system into those villages are not significant. Often, a WWTP already exists in small towns (they often require some rehabilitation) and their capacity is much higher than the needs of those small towns; thus, the marginal costs of expanding services into villages are basically the capital costs of expanding of sewage network, electricity costs for pumping and a small increment in the costs of treatment.
3. Due to affordability constraints, inexpensive treatment technologies should be selected, provided they meet environmental and health standards.
4. Piped wastewater collection and treatment could also be proposed for larger agglomerations of villages. By "larger agglomeration" is meant an area of high concentration of population – several bigger villages (of population more than 1000 citizens each) closely located where a gravity sewage network could be installed. An agglomeration should provide at least 2000 PE of wastewater from a consumption of at least 120 lcd. Taking into account current water consumption for rural areas in Moldova, agglomerations should be defined at 6000 PE.
5. It is highly recommended that agglomerations are decided by the GoM as a result of the sector planning process, ideally by developing master plans.
6. Piped wastewater collection and treatment will not be affordable for most of the rural areas in Moldova that are out of sub-urban areas and not suitable to constitute an agglomeration.
7. Part of the population will require enhanced social programmes and other solidarity mechanisms: e.g. it would need to be cross-subsidized in order to afford wastewater services (even without a WWTP).

## 8. REALITY CHECK

The reality check of the reviewed business models was conducted by:

- Inviting mayors for the NPD meeting in March 2012;
- Organizing the expert workshop on April 26, 2012. The aim of the workshop was to discuss among experts the possible sustainable business models for rural water and wastewater services;
- Organizing a meeting in Cahul with mayors on May 4, 2012. The communes in the Cahul rayon are very close to deciding on the regionalization of water and wastewater services; thus, the discussion on business model is very relevant for them;
- Participating in the conference on Inter municipal co-operation in Moldova on June 5-6, where intensive discussions on business models were conducted.

During the reality check process, the Consultant used a simple questionnaire (see Annex 4) on business models; due to the small sample, however, the results are not quantified.

During the expert workshop on April 26, the various business models were presented and advantages and drawbacks of each model were discussed. Participating mayors emphasised a lack of technical expertise. This problem is present in all small operators, regardless their legal form: water user associations, small private operators, and municipal enterprises. Thus, a model of organizing a non-profit organization providing professional services for utilities (described through examples from Austria and Montenegro) was highly appreciated. This model was also appreciated at the meeting in Cahul and the IMC conference. At the expert workshop, participants emphasized the need to have a professional operator instead of providing services directly by a local government. Also the need for subsidization of rural services was appreciated.

The location(s) for pilot testing recommended business model(s) was identified in collaboration with GIZ: the city of Cahul was selected for potential synergies with GIZ activities, and part of the effort during the “*reality check*” was performed in this specific location.

At the meeting in Cahul, particular problems of Cahul and surrounding villages (especially Manta and Rosu) were discussed. As a conclusion of the meeting, the model of sub-urban regionalization was appreciated by organizing a joint stock company on the basis of the current ApaCanal from Cahul. During the discussion, some drawbacks of the current legal situation and capacity of local governments to enter into such regionalization were discussed. The use of existing infrastructure was also discussed and the problem is rather a need of significant maintenance than that some parts will not be used in the future.

The GIZ project “Modernization of Local Public Services in the Republic of Moldova” is planning for pilot support of two clusters in developing feasibility studies for aggregated water supply and wastewater services. Thus two location: rayon of Cahul and western part of rayon of Ricani (around town Costesti) shall be considered for further development of sustainable business models.

Also planned rehabilitation of the Soroca-Balti main pipeline shall give a good location for testing business models around city of Balti and Riscani.

At the IMC conference, interviewed participants focused on cooperation between local governments. During the work in groups, participants discussed advantages, drawbacks and solutions to drawbacks in inter-communal co-operation. Further, the results of the IMC conference are provided<sup>20</sup>, as they useful for the purpose of this report

### **Specific situation in Moldova**

- Gaps in IMC in Moldova in the following fields: know-how and capacities, cooperation culture and supportive legal framework
- Challenges for IMC in Moldova: administrative structure is very fragmented; financial decentralization is still pending, LPAs have limited financial autonomy
- The areas for public service delivery (for example in the form of IMC) do not necessarily correspond to administrative areas
- For municipalities, it is a big challenge to start the IMC process in their own administrative unit: mayors have to convince the council, staff and - very important - also the population of the advantages of IMC. For this reason, it is important to work from the very beginning in close collaboration with experts and advisors and to involve the population in the whole process.
- Moldova should start developing simple IMC solutions and forms, which then should be pilot-tested, before going on to more complex IMC models
- IMC should be based on **voluntary cooperation with strong incentives** (cooperation should not be obligatory)
- Legislation should allow municipalities and LPAs to form non-profit associations
- Tariffs are a very sensitive issue. Key issues are: who make decisions on tariffs; should tariffs be unique for all partner municipalities or calculated specifically for every municipality; should tariffs be the result of a political decision or only of economic calculations?
- Projects of donors on local and regional development with their national partners have already tackled the issue of IMC, but should incorporate the IMC vision even stronger and consequently in planning and implementation.

### **Suggestions from LPAs**

- Creation of a National Agency for regulating local public services, which supervises and advises LPAs to develop strategies on delivery of public services at the level of rayons;
- Creation of an Association for IMC, which supervises and coordinates the IMC development and the establishment of IMC models in Moldova;
- Promote and facilitate continuous capacity developing activities for LPAs in IMC.

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<sup>20</sup> Results were shared by GIZ office in Chisinau.

### **Resolutions/General suggestions**

- Commitment from government officials, ministries, regional and local authorities, and donors to promote and support IMC as a tool for decentralization and regional development
- Agreement on importance to change legislative framework in order to support and encourage initiatives of inter-municipal (inter-communal) cooperation
- IMC should be integrated as a cross-cutting issue within the Socio-Economic Development Strategies of the rayons and municipalities (LPA 1 and 2)
- The demographic trends and the economic transformation process of the region should be analyzed and used as a basis for developing IMC models and solutions
- With the help of IMC, increase the access of municipalities to national and international funding schemes
- **Inter-communal cooperation** is the term used in Moldova and is agreed upon by participating institutions.

## **9. RECOMMENDATIONS ON APPLICABILITY OF BUSINESS MODELS FOR SANITATION IN SMALL TOWNS AND RURAL SETTLEMENTS IN MOLDOVA**

The review of business models for wastewater collection and treatment in small Moldovan towns and villages indicates that some models exist in small towns, which can be improved, adjusted, or reformed. However, in rural areas, the situation is essentially ad hoc, and the sanitation services are usually absent.

Appropriate models can be developed, combining three dimensions:

- Degree of regionalization;
- Model for service provision;
- Sector financing.

### **9.1. Degree of regionalization**

The degree of regionalization was described in section 4.3, which presents conclusions regarding decentralized and regionalized models in Moldova.

There are two major reasons why the decentralized model will not work for piped wastewater collection and treatment for rural areas in Moldova:

1. Small utilities lack institutional capacity;
2. Unit costs of wastewater collection and treatment (capital and operating) are very high for small facilities (see section 0 7.1. Unit cost of service provision).

This leads to the conclusion that some degrees of regionalization are needed for rural sanitation in Moldova. Experience from other countries, however, shows that regionalization is not always a solution. It has to be noted that the EU Directive on urban wastewater treatment deals with agglomerations of more than 2,000 population equivalents and the agglomeration area is determined in a manner such that the wastewater collection and treatment is economically justified. Thus, the first step would be to determine agglomerations by developing policy documents and/or master plans. Urban centres will play a significant role; thus, sub-urban regionalization is a valuable option for providing services. Still, there will be a number of localities that either has to constitute an agglomeration separate from an urban area or even to stand alone (this applies to remote places, where traditional wastewater collection and treatment is not efficient).

Through discussions with mayors on a “reality check”, the model of service provision through a joint stock company owned by town and communes seems to be the solution with the most advantages. While service provision is discussed in the next section, it has to be emphasized that better legislation towards inter-communal co-operation is required. Experience from other countries shows that municipal associations are not just another type of NGO but have a special status. This status can be characterized in the following way:

- Local governments are eligible to establish and be members of the municipal association;
- Municipal associations have some rights similar to local governments, especially the rights to establish an operator, to own assets and similar, to set tariff;
- Certain local government tasks could be delegated to the municipal association.

In other areas – where piped wastewater collection and treatment is not economically justified (which would be the majority of villages in Moldova), centralized system will not be feasible due to affordability constraints. Thus, a decentralized model needs to be established based on:

- Water user associations;
- Municipal companies;
- Small private operators, especially for septic tanks;

Due to the lack of professional capacity, however, a “light regionalization” should be concurrently proposed. The “light regionalization” is described in the next section that focuses on service provision.

## **9.2. Service provision**

The Moldovan water/wastewater sector has little experience with service provision through concession. Thus, during the “reality check” discussion, concession and private sector participation was rarely mentioned. On the other hand, there is already some experience in Moldova through an EBRD/EIB/EU financed project in sub-urban regionalization through creating commercialized joint stock companies. The model has several advantages:

1. Service provision through joint stock companies is one of the currently eligible business models existing in Moldova; thus, it does not require significant changes in legislation;
2. Joint stock company is owned by local governments;
3. Joint Stock Company is commercialized, meaning that it operates in a slightly better legal framework than public utilities. Operational and financial aspects are separated from the local governments and some elements of corporate governance are obligatory.

The lack of capacity of local governments to provide services through a joint stock company is currently a problem for this business model in Moldova. Thus, the following steps have to be considered:

1. Prepare guidelines for local governments on how to organize joint stock companies for water/wastewater services or how to change the existing Apa Canal into a joint stock company owned by several local governments;
2. Prepare templates of the joint stock company: statute, regulations, performance-based service contract between operator and local governments;
3. Provide technical assistance for those local governments that want to establish a joint stock company;

4. Provide other incentives (capital funds) to those local governments that want to establish a joint stock company<sup>21</sup>;
5. Organizing multi-purpose utilities (described in the next sub-section), where feasible, as a next step after regionalization.
6. Improve the legal framework, especially on tariff-setting by regional utilities.

As mentioned above, the sub-urban regionalization does not solve the problem of the whole rural territory of Moldova. There will be many agglomerations that consist of rural communes only, where wastewater collection and treatment is still economically justified. Creating a joint stock company for service provision in such a case does not solve the problem: the newly created utility will face similar problems like current providers (municipal enterprises, water user associations), that is, a lack of technical and managerial expertise (on top of local affordability constraints).

Thus, experience from “light regionalization” in other countries has to be taken into account. The experiences of Oberösterreich Wasser from Austria, or Vodacom from Montenegro, are especially important.

The regionally created institution may provide paid but non-profit services for water/wastewater utilities (it means that utilities may outsource some services to that institution). The range of services could be:

- preparation of capital investment projects/project implementation unit;
- advice in technical, legal, financial and organizational questions;
- preparation of tariff studies;
- technical audit of facilities (quality assurance);
- water metering;
- water analyses;
- measurement and detection services, leak detection, location of pipes and valves, CCTV analysis;
- water loss analysis, measuring flow rates and pressure;
- operational services (especially for WWTP);
- emergency water supply service;
- laboratory: measurement of chemical, physical and bacteriological parameters;
- maintenance services;
- education and training for officials and technical personal / capacity development;
- others.

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<sup>21</sup> It has to be noticed that recently the Regional Development Fund requires inter-communal cooperation as an eligibility criteria for funding.

At least in the short and medium term, such a regional institution should be provided with technical assistance from donors (and Regional Development Agencies). Technical assistance, or even initial financing of running costs, will have a positive influence on sector financing.

### 9.3. Multi-purpose utilities

A multi-purpose utility is a method of service provision through a single company that provides different utility services, not only water supply and wastewater services. The model is widely used in some EECCA countries, notably in Russia and Ukraine, but is also present in other places in Central Europe as well (such as Serbia, Poland, and Hungary), in particular in small municipalities. These multi-purpose utilities provide different kinds of municipal services, such as water supply and wastewater collection and treatment, heating, solid waste management, street cleaning, greenspace management, housing management and maintenance, and some additional services. In Italy, in addition to the typical municipal services, multi-purpose utilities provide gas and electricity distribution services. The advantage of a multi-purpose utility lies in its larger scale and scope (and eventual “economies of scope”), which enables it to cover overhead and maintenance costs from different sources, not only from water and wastewater services. This would be especially important for Moldova, where the financial capacity of small water utilities is an important problem.

On the other hand, multi-purpose utilities have significant disadvantages, which is why they are not used in many countries. The major disadvantage is the problem related to distinguishing the costs attributable to different services, which requires enhanced accounting skills and information technology. Another disadvantage, which reduces the applicability of the model in Moldova, is that it is a rare situation when other municipal services can be provided in combination with water supply and wastewater. For example, the district heating sector is very limited in Moldova while solid waste management is considered to be organized on larger service provision areas than even regionalized water / wastewater services. Gas and electricity distribution are not considered as municipal services. Street cleaning, greenspace management, housing management and maintenance are organized in larger towns only.

Thus, a sustainable solution is that, where feasible, multi-purpose utilities are established together or as the next step after regionalization proposed in section 9.1, and only around towns that already have considerable revenues from other services apart from water and wastewater.

### 9.4. Sector financing

The water and wastewater sector is traditionally financed through a combination of **tariffs**, **taxes** from central budgets, and **transfers** from donors (the 3Ts concept proposed by the OECD). The affordability level in rural areas in Moldova is very limited and there is almost no experience with tariffs for either water supply or wastewater, especially for the treatment of wastewater. From rough estimates, the tariff that would cover operating costs for water and wastewater would exceed the affordability level of the majority of the population. Accompanying measures may not be appropriate when a large share of the population is unable to foot water bills. As a transition period, direct subsidies may be justified, when the water bill, and wastewater treatment costs in particular, represent a disproportionate effort for a large part of the community. Such public support is partly justified by the public good dimension of some elements of the wastewater treatment services. However, it should be transitional only, recurrently reviewed, with a view to phase out (and be focused only on the public good dimension of the service).

Such provisional public support could be provided in several ways:

- Utilities are subsidized by owners (local governments), but this solution is not sustainable due to financial constraints of local governments;

- Establishing revolving fund for capital investments;
- Establishing solidarity fund.

A **revolving fund** could be established through donor technical assistance and equipped with a core fund from central government and/or donors. The revolving fund may provide soft loans to water/wastewater utilities for capital investments. Depending on the financial situation of the fund, part of the soft loan could be converted into a grant.

A **solidarity fund** could be established and replenished from a small (say, 1 percent) surcharge on the tariff for water supply and/or wastewater. The surcharge, collected through utilities but centrally managed, could be later distributed to support national priorities, such as rural WSS, and soften local affordability constraints by providing targeted assistance to vulnerable households. This solidarity fund could be organised at national or regional/basin level.

In any event, it should be reiterated that water tariffs tend to drive water efficiency, avoid wastage, and promote low cost options. OECD experience in EECCA suggests that affordability constraints tend to be over-estimated; plus, as countries develop, a significant share of the population (including in small towns and villages) can afford sustainable tariffs, which fully cover the operation and maintenance costs of water services. Similarly, *willingness to pay* is often underestimated: households are ready to pay more when they see a substantial improvement of the service they receive – it was confirmed also by the case-studies in Moldova. Full cost recovery through tariffs remains a **long term objective** for the sustainable development of water supply and sanitation services, including in rural Moldova.

## 9.5. Technological solutions

While agglomerations require wastewater collection and treatment (mechanical and biological, but also could be wastewater ponds), remote areas require small WWTPs or septic tanks (with wastewater delivered to the WWTP) or alternative sanitation technologies (EcoSan). It is important that the Government of Moldova establishes clear rules where small WWTP could be installed. Otherwise small WWTPs, which are expensive (both capital and operating costs), will be installed randomly by local governments that do not want to wait for proper wastewater collection and treatment systems or that are lobbied by manufacturers of small WWTPs.

## 9.6. Economic and fiscal incentives

The business model(s) for wastewater services in small towns and rural settlements in Moldova could be implemented by imposing certain legal regulations. For example, in Italy a Galli law<sup>22</sup> of 1994 imposed a rationalization of water / wastewater services by establishing a regional ATO<sup>23</sup>. It has to be noticed, however, that such a law was implemented over a period of more than 10 years and required very broad political consensus.

On the other hand, economic and fiscal incentives may speed the process of implementing selected business models. This happened in Romania where municipal associations and regional operators are imposed by law, but EU funds are provided only for regionalized utilities.

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<sup>22</sup> Law 36/1994 (Galli law).

<sup>23</sup> Ambito Territoriale Ottimale (Optimal Management Area).

Thus, it is recommended that fiscal incentives are provided to stimulate the application of selected business models for wastewater services in small towns and rural settlements in Moldova. When such incentives already exist, they should be applied in a more comprehensive way and applied for wider sources of sector financing. The existing incentives in Moldova are as follows:

1. Recently, the National Fund for Regional Development requires inter-communal cooperation as an eligibility criterion for funding. The shortcoming of this approach is that requirement for inter-communal cooperation is defined in very generous way, not as prompting a practical business model.
2. A major incentive is provided by the EBRD/EIB/EC project currently being implemented in 6 rayons.
3. Other donors often require or promote inter-communal cooperation to provide support.

The more systematic way of providing fiscal incentives to promote selected business models for wastewater services in small towns and rural settlements in Moldova would be to:

1. Apply eligibility criteria whereby only selected business models receive support for capital investment from:
  1. National Fund for Regional Development
  2. National Environmental Fund
  3. Transfers from the central budget to the local level (rayons, towns or communes) for the wastewater sector
  4. The same rule should be applied for financing from the possible revolving fund.
2. Discuss with donors who are active in Moldova to apply the same rules in case of financing investment project directly.

Such fiscal incentives will effectively support the dissemination of the selected (preferred) business models.

Another type of incentive that could be considered is to provide grants to finance the preparation of supporting documentation, such as development plans and feasibility studies.

Once business models are already implemented, the effectiveness of water utilities can be further improved through the introduction of performance-based contracts between utilities and municipality (association of municipalities). Performance-based contracts with incentives for management are widespread in some EECCA countries and OECD experience shows there is potential for improvement of utility performance when local governments may use such a tool.

**10. CONCLUSIONS: SUMMARY OF PROPOSED MODELS, THEIR BENEFITS AND DRAWBACKS, AND OBSTACLES FOR IMPLEMENTATION**

**The proposed business models for rural sanitation services** depend on the scale involved:

- rural areas around urban centres,
- rural communes which may create an agglomeration, where wastewater collection and treatment is economically justified,
- or remote communes where local solutions have to be provided.

**The proposed business model for sub-urban areas** is:

- Sub-urban regionalization by creating joint stock companies and municipal associations (if legislation is improved);
- As a second step, where feasible, organizing multi-purpose utilities in towns where the scale of other services exceeds water/wastewater services;
- Next, performance based contracts to improve efficiency of regional utilities could be implemented;
- Establishing revolving fund for capital investments or a solidarity fund to support services in rural areas;
- Centralized (piped) wastewater collection and mechanical + biological WWTP.

**Proposed business model for other agglomerations** is:

- Regionalization through creation of a municipal association;
- Establishing a regional institution that will provide some technical services to utilities (light regionalization);
- Establishing a revolving fund for capital investments or a solidarity fund to support services in rural areas;
- Centralized (piped) wastewater collection and mechanical + biological WWTP (or wastewater ponds).

**The proposed business model for localities that are not included in sub-urban regionalization or agglomerations is:**

- Improved decentralized system through municipal companies, small private operators or water user associations;
- Establishing a regional institution that will provide some technical services to utilities (light regionalization);
- Establishing a revolving fund for capital investments or a solidarity fund to support services in rural areas;
- Small WWTPs, septic tanks or alternative sanitation technologies (for example, EcoSan toilets).

Regardless the scale, fiscal incentives on providing support for capital investments shall be implemented. Fiscal incentive could be accompanied by other incentives.

The implementation of proposed business models require a clear distinguish on which business model is applicable to which local government, thus it is recommended that master plans for water supply and wastewater services are developed for each rayon and master plan will answer to this questions based on technical, economic and social analysis.

The following table summarizes the proposed business models:

**Table 6. Proposed business models for wastewater services in small towns and settlements in Moldova**

Type of area	Degree of regionalization	Service provision	Professional services	Technology	Sector financing	Incentives
Sub-urban	Regionalized	Joint stock company based on existing ApaCanal Multi-purpose utilities	Small need for "light regionalization"	Piped sewage collection + WWTP	Improved social programme	Fiscal incentives for capital investments Performance based contracts
Agglomeration	Regionalized	Association of localities or assets holding company hiring an operator	High need for "light regionalization"	Piped sewage collection + WWTP	Improved social programme + solidarity fund	Fiscal incentives for capital investments Performance based contracts
Remote localities	Decentralized	WUA Municipal company Private operator	High need for "light regionalization"	Small WWTP Septic tanks or alternative sanitation technologies (for example, EcoSan)	Improved social programme + solidarity fund	Fiscal incentives for capital investments Performance based contracts

Source: own assessment by authors.

Annex 1 presents a table with the distinctive advantages and drawbacks of each business model, as well as possible improvements of the current situation that models could achieve.

Due to affordability constrains, the proposed business models for service provision can be implemented only together with measures granting proper sector financing (improved solidarity mechanisms (social programme, solidarity fund) and fiscal incentives for capital investments).

To facilitate the development and deployment of the appropriate business models, the Government of Moldova might wish to consider the following reforms:

- Set national targets with regard to water supply and sanitation services for different sizes of agglomerations. This would cover:
  - Agglomerations, where common wastewater collection and treatment is economically justified;
  - Conditions (such as number of households per km<sup>2</sup>) where small WWTP can be installed;
  - Conditions where septic tanks can be installed.
- Strengthen the capacity to monitor and enforce these targets;
- Reform the regulatory framework for setting up inter-community associations for water and wastewater services (especially the possibility to establish a non-profit municipal association);
- Develop incentives to stimulate local initiatives in this area. Based on the international experience reviewed in this report, such measures could be fiscal incentives, privileged access to public support, additional autonomy to set tariffs and/or service development plans, etc.

In addition, the Government may wish to consider a provisional and transitory mechanism to channel funds from cities and towns which can afford to pay for water services to rural areas, where affordability constraints are severe. Such a mechanism can be provisory only. It should be recurrently monitored and assessed, with a view to phase out.

The benefits and drawbacks of proposed business models are presented in the table in Annex 1.

## ANNEX 1. BENEFITS AND DRAWBACKS OF PROPOSED BUSINESS MODELS

Recommended business model	Benefits	Drawbacks	Possible improvements of existing business model
Sub-urban regionalization through establishing a joint stock company based on existing ApaCanal.	<ul style="list-style-type: none"> <li>- Small marginal costs for connecting rural areas</li> <li>- Possibility to use presently unused capacity of existing WWTP</li> <li>- Possible cross subsidization of rural areas</li> <li>- Softer affordability constrains</li> <li>- Professional capacity of existing ApaCanals</li> </ul>	<ul style="list-style-type: none"> <li>- Possible urban-rural tensions due to cross subsidization</li> <li>- Smaller local governments could have little say in the regional utility</li> </ul>	<ul style="list-style-type: none"> <li>- Model practically does not exist in Moldova. Now it is tested by the EBRD project on regionalisation.</li> </ul>
Regionalization in agglomerations of 6000 PE or more based on inter-communal associations	<ul style="list-style-type: none"> <li>- High potential to attract capital investments</li> <li>- Lower unit costs due to high concentration of population</li> <li>- Softer affordability constrains</li> <li>- Possibility for efficient treatment of wastewater</li> </ul>	<ul style="list-style-type: none"> <li>- The operator will be developed from scratch, it means it needs a lot of capacity development</li> </ul> <p>There will be few such agglomerations, which are not part of sub-urban regionalization</p>	<ul style="list-style-type: none"> <li>- Model does not exist in Moldova.</li> </ul>
"light regionalization"	<ul style="list-style-type: none"> <li>- Solves major problem of existing operators: lack of technical capacity</li> <li>- Cheaper than outsourcing to private operator</li> <li>- Possible development with donor support (both capital costs and technical assistance)</li> <li>- Possible to support of different type of operators</li> </ul>	<ul style="list-style-type: none"> <li>- It does not solve all problems of small operators</li> <li>- it could not be a standalone business model, it will work only in combination with another one</li> <li>- Requires high commitment on regional or national level</li> </ul>	<ul style="list-style-type: none"> <li>- Model does not exist in Moldova.</li> </ul>
Multi-purpose utilities	<ul style="list-style-type: none"> <li>- Some economy of scale and scope, especially through common usage of maintenance services</li> <li>- Reduced unit overhead costs</li> <li>- Possible cross subsidization of wastewater services from profitable services</li> </ul>	<ul style="list-style-type: none"> <li>- Other than water / wastewater services are either scarce in Moldova (like district heating) or have different area of service (solid waste management)</li> <li>- Need for very good accounting</li> </ul>	<ul style="list-style-type: none"> <li>- To implement where feasible as second step after regionalization</li> </ul>

Recommended business model	Benefits	Drawbacks	Possible improvements of existing business model
Decentralized services through WUA	<ul style="list-style-type: none"> <li>- Involvement of the society</li> </ul>	<ul style="list-style-type: none"> <li>- Small scale</li> <li>- Lack of technical capacity</li> <li>- The association of water users approves connection of new users. In case of water resource scarcity there are tensions with potential new users</li> </ul>	<ul style="list-style-type: none"> <li>- Problem with technical capacity could be solve through outsourcing (light regionalization) and applying a national rules for all providers (licensing)</li> <li>- WUA should be open for new connections</li> </ul>
Decentralized services through municipal associations	<ul style="list-style-type: none"> <li>- Model widely used across Europe</li> <li>- It is a basic model for providing common services</li> <li>- Association could hold assets and/or decision making (tariff, investment policy) while service could be provided by variety of operators (established by association or hired through concession)</li> </ul>	<ul style="list-style-type: none"> <li>- Concept of municipal associations is not reflected in legislation in Moldova</li> <li>- Associations, similarly to other models of regionalization (like joint stock company) requires a clear rules on ownership of assess and decision making</li> </ul>	<ul style="list-style-type: none"> <li>- Model does not exist in Moldova.</li> </ul>
Decentralized services through small private operators	<ul style="list-style-type: none"> <li>- Private sector involved, bringing its management and technical expertise, and capital (even if just working capital)</li> <li>- Improved efficiency</li> </ul>	<ul style="list-style-type: none"> <li>- Limited technical capacity</li> <li>- Relations LPA – operator should be based on contractual basis</li> <li>- Profit making operator what may exacerbate affordability constraints</li> </ul>	<ul style="list-style-type: none"> <li>- Problem with technical capacity could be solved through outsourcing (light regionalization) and applying a national rules for all providers (licensing)</li> <li>- Service contracts to be introduced</li> </ul>
Improved social programmes	<ul style="list-style-type: none"> <li>- Soften the affordability constraints</li> </ul>	<ul style="list-style-type: none"> <li>- Distribution of social aid is complicated and it costs</li> </ul>	<ul style="list-style-type: none"> <li>- Social programme should target wider group of vulnerable rural population</li> </ul>
Solidarity Fund	<ul style="list-style-type: none"> <li>- Soften the affordability constraints</li> <li>- Often is cheaper to the state then social programmes</li> </ul>	<ul style="list-style-type: none"> <li>- Requires good design in order that bureaucracy is not overwhelming</li> </ul>	<ul style="list-style-type: none"> <li>- Model does not exist in Moldova.</li> </ul>
Revolving Fund	<ul style="list-style-type: none"> <li>- Stable, long term capital financing (if properly designed and managed)</li> </ul>	<ul style="list-style-type: none"> <li>- Requires a very good appraisal system</li> <li>- Requires a basic creditworthiness assessment of beneficiaries</li> <li>- Requires replenishment time to time, as percent of nonperforming loans might be high</li> </ul>	<ul style="list-style-type: none"> <li>- Model does not exist in Moldova.</li> </ul>

<b>Technical solutions for sanitation in villages and small towns</b>	<b>Benefits</b>	<b>Drawbacks</b>	<b>Possible ways out</b>
Piped sewage collection and WWTP	<ul style="list-style-type: none"> <li>- Comprehensive solution for wastewater collection and treatment</li> </ul>	<ul style="list-style-type: none"> <li>- Expensive, especially for small remote villages</li> </ul>	
Small WWTP	<ul style="list-style-type: none"> <li>- Quick to implement</li> <li>- Requires minimum of capital investments from public sector</li> <li>- Suitable for small remote villages</li> </ul>	<ul style="list-style-type: none"> <li>- Requires high capital investment from households, there is a need for support programme</li> <li>- Difficult to control</li> <li>- Not suitable for larger towns</li> </ul>	Model does not exist in Moldova.
Septic tanks	<ul style="list-style-type: none"> <li>- Quick to implement</li> <li>- Requires minimum of capital investments from public sector</li> <li>- Suitable for small remote villages</li> </ul>	<ul style="list-style-type: none"> <li>- Requires operational WWTP nearby</li> <li>- Requires high capital investment from households, there is a need for support programme</li> <li>- Difficult to control</li> <li>- In Moldova, suitable and affordable only for very small water consumption</li> </ul>	Model does not exist in Moldova.
Dry sanitation facilities (EcoSan toilets)	<ul style="list-style-type: none"> <li>- Affordable</li> <li>- Quick to implement</li> <li>- Requires minimum of capital investments from public sector</li> <li>- Suitable for small remote villages</li> </ul>	<ul style="list-style-type: none"> <li>- Cannot be a universal solution for larger settlements with high water consumption</li> </ul>	Implementation of fiscal incentives would help with implementation

Source: own assessment by authors.

## ANNEX 2. INTER-MUNICIPAL ASSOCIATIONS IN POLAND

WWT sector in Poland is a highly fragmented one. No significant trends towards regionalization of WWT services in Poland have taken place in the past. Most frequent model is that municipalities provide WWT services through limited liability companies (usually owned by municipalities), budgetary units or budgetary enterprises. Some municipalities, however, decide to enter inter-municipal cooperation to provide jointly services (waste management, WWT etc.).

First inter-municipal associations providing WWT services were formed in 1990s. In the EU pre-accession period and in the initial period after Poland's accession to the EU (2000-2006) some municipalities decided to establish such associations in order to get easier access to EU grants for infrastructure investments (only larger projects could apply to the ISPA and Cohesion Fund). Such bottom up processes were not primarily driven by attempts towards operational improvements or by geographical factors.

Unlike in Romania, the government in Poland has never formulated clear guidance on inter-municipal co-operation in WWT sector. In this model municipalities (through inter-municipal association) delegate services to inter-municipal company (usually limited liability company).

In many cases setting up inter-municipal enterprises is highly difficult and turbulent process. In particular, ownership and decision power of members/shareholders are of crucial meaning. The concern of smaller municipalities (with minor shares) was about getting into disadvantageous position when delegating services to inter-municipal company. One can find examples of municipal companies that are both operators and owners, as well as examples where such company only operate assets owned by municipalities.

There were cases where some municipalities located in the middle of the area covered by inter-municipal utility operation decided to not join common enterprise leaving "black spots" in the system. A notable example is Podhalańskie Przedsiębiorstwo Komunalne (Podhale Communal Enterprise) Ltd. established by some municipalities of Podhale Inter-municipal Association to provide wastewater services. 11 municipalities joint the system transferring their assets to the enterprise. One of these municipalities subsequently leased the assets from the company and re-started provision of wastewater services on its own. Two municipalities (including the largest one i.e. city of Nowy Targ) refused asset transfer and did not join the enterprise.

Other examples of inter-municipal cooperation:

1. Dolina Redy i Chylonki Inter-Municipal Association (DRCA): was established in 1991 by eight municipalities (population of 446.4 thousand). The DRCA tasks comprise water supply/wastewater treatment, waste management, central heating and ecological education. Jointly with its members the association owns three limited liability companies: (i) water and wastewater company, (ii) central heating company, (iii) waste management company. The shareholder structure of WWT utility company (PEWIK Gdynia Ltd.) is following: the DRCA holds 14.1% of shares, the city of Gdynia (the largest DRCA member with 247.3 thousand inhabitants) has 43.8% of shares and other five municipalities have 42.1%. One large member of the DRCA (i.e. city of Sopot with 38 thousand inhabitants) does not participate directly in the

company, as it has delegated WWT services to the utility company from another neighbouring City of Gdansk (i.e. to Saur-Neptun Joint Stock Company that is joint venture of French based company Saur: 51% and City of Gdansk 49%). Interesting fact is that Gdansk is not a member of DRCA. This complex structure of DRCA shows that the co-operation within the association is possible even if some member municipalities decide to not participate in DRCA with regard to selected activities (as in case of WWT services in Gdynia). DRCA is one of the most recognised and successful examples of inter-municipal co-operation in Poland.

2. Zakład Usług Wodnych sp z o.o. in Konin: WWT utility is 100% owned by inter-municipal association consisting of 15 small municipalities. Utility serves 22 thousand inhabitants and operates 60 separate water networks and four wastewater treatment plants. Large neighbouring municipalities (city of Konin: 79 thousand inhabitants, Turek: 28.7 thousand inhabitants operate their own utilities).
3. Międzygminny Związek Wodociągów i Kanalizacji w Strzelcach Wielkich is an inter-municipal association set-up in 1991 by four municipalities. It supplies water to 28.5 thousand inhabitants. The association also sells water to two neighbouring municipalities. It operates 14 water treatment stations and two wastewater treatment plants. In 2010 the association received financial support from the Cohesion Fund (amounting to PLN 40 million/Euro 10 million) for sewer network expansion and construction of two wastewater treatment plants (total investment PLN 76 million/Euro 19 million).
4. Chorzowsko-Świętochłowickie Przedsiębiorstwo Wodociągów i Kanalizacji Sp. z o.o. 100% of shares in the company belong to two neighbouring municipalities (city of Chorzów 112.7 thousand inhabitants and Świętochłowice 54 thousand inhabitants).

### ANNEX 3. INTER-COMMUNAL COOPERATION IN FRANCE<sup>24</sup>

In France, there is a long tradition of inter-municipal cooperation as municipalities have long been able to transfer the competency in providing water services to structures called *syndicate intercommunaux* (joint boards of several municipalities). The act of 22 March 1890 first institutionalised the cooperation of municipalities by providing a legal scheme for the creation of single-purpose inter-municipal associations (SIVU, *syndicat intercommunal à vocation unique*), a legal structure that links two or more municipalities for a single purpose. The SIVUs were created on an entirely voluntary initiative of the municipalities concerned and funded from members' budgets. They spread rapidly, particularly in rural areas, and typically applied to the provision of public services and utilities (Wollmann, 2008). At this time the driving force for the creation of inter-municipal cooperation was to realise economies of scale in the provision of public services, i.e. to achieve efficiency gains.

The legal basis for municipal cooperation was extended by later legislation, particularly by the decree of 5 January 1959 which introduced multiple-purpose inter-municipal associations (SIVOM, *syndicats à vocation multiple*). As of 2008, there were approximately 16,000 associations throughout France with a slight decreasing tendency. Almost 12,000 of these associations were SIVUs (*Ministère de l'intérieur*, 2008). Among some other legal acts concerning inter-municipal cooperation, the Chevènement law of 12 July, 1999 has to be highlighted as it established new types of inter-municipal public bodies and also abolished some structures of inter-communal institutions. Depending on the number of inhabitants of an agglomeration, three new types of body may be distinguished (*communauté urbaine* for agglomerations >500,000 people, *communauté d'agglomération* for middle-sized agglomerations with more than 50,000 inhabitants, and the *communauté de communes* for small, mainly rural agglomerations) These public bodies differ in terms of their compulsory and optional competences, decision-making rules and funding. Besides delivering collective local public services (e.g. water supply, sanitation, waste management), the communities were established to manage more complex issues such as spatial planning, economic development or city management. An overview of the three different types of inter-municipal institutions is given in the Table below.

**Table 7. Forms of inter-municipal institution in France and their main characteristics**

Communauté urbaine (CU)	Established in 1966. Extensive compulsory competencies in areas of urban services, infrastructure, planning and economic development. No possibility of withdrawal. Compulsory for Bordeaux, Strasbourg, Lyon and Lille and voluntarily adopted by further 10 municipalities, i.e. a total of 14 CU in 2006. Compulsory single business tax as a source of local fiscal resources. Management of public services, such as the provision of water, is compulsory under this form of inter-municipal institution.
Communauté d'agglomération (CA)	Established by the Chevènement law in 1999. Intended for contiguous urban areas of more than 50,000 inhabitants with a central municipality of more than 15,000. Compulsory competences for urban planning and development. Compulsory single business tax as a source for local fiscal resources. In 2004, 155 inter-municipal institutions of this type existed, covering around 38 million French citizens. The number of CA increased to 164 in 2006. Member municipalities must transfer three of the following five blocks to the inter-municipal institution: (i) creation, planning and maintenance of highways and car parks; (ii) environmental protection and use; (iii) construction, planning and maintenance of cultural and sports facilities; (iv) water treatment; (v) water distribution. The provision of water services is described as a semi-optional function under this form of inter-municipal cooperation.
Communauté de communes (CC)	Rules about competences and mode of funding depend on the size of the Communauté – 2,286 existed in 2004 and in 2006 2,389 CC were recorded. The transfer of responsibilities regarding the provision of water services is optional and can be transferred to inter-municipal cooperation.

Source: West, 2007 and Pezon, 2006.

<sup>24</sup> OECD, 2009. *Dealing with post-decentralisation implications in the water sector based on country experience cases*.

Under later legislation, the formation of *communautés* was encouraged by financial incentives, particularly the right to levy taxes and a temporary state contribution (Wollmann, 2008). The success of *communautés* is evident, both in rural areas and in urban areas. Between 1999 and 2006 the number of CCs increased by 77 per cent to 2,389 and the number of CAs rose from zero to 164 within the same period (Pezon, 2006). As of 2008, there were approximately 2,600 *communautés* throughout France.

The significance of inter-municipal cooperation in the French water sector is evident, as shown in Table A3.2. Although the competency in the provision of water services lies with the municipalities, they have the right to transfer the competency for organising water supply and sanitation services to inter-municipal institutions (*syndicats intercommunaux*). The majority of French communes, i.e. around 70 percent of all municipalities, exercise this right, in particular with regard to water production and distribution. The share is much lower in the context of the provision of services regarding the collection and treatment of wastewater.

**Table 8. Organisation of the French water sector (in % of municipalities)**

	<b>Municipal</b>	<b>Inter-municipal</b>
<b>Water production</b>	28	72
<b>Water distribution</b>	32	68
<b>Sewage collection</b>	70	30
<b>Sewage treatment</b>	61	39

Source: Ibid.

Since the early 1990s a shift in French politics and attitude towards inter-municipal cooperation has been evident. This in particular is observable with regard to the funding of inter-municipal institutions, as they now can be financed directly via local taxes compared to in the past when they were financed via municipal budgets. Realising economies of scale and scope, as well as addressing local capacity constraints must still be seen as an argument for inter-municipal cooperation, but the tasks under the responsibility of municipalities are now broader, often implying that there is a need for new municipal organisational forms in order to deal with often complex urban policy issues such as economic development, health and education, rather than simply provision of public services such as water supply. Inter-municipal cooperation today is seen as an important instrument of French State policy on territorial administration (West, 2007).

When discussing inter-municipal cooperation it is important to highlight some of the recently adopted administrative and institutional changes. For example, the decision-making process has undergone a number of changes. It is no longer the case that each member municipality has one vote. The vote of member municipalities is now weighted and decisions are no longer made by unanimity but based on majority voting. The funding of inter-municipal cooperation underwent some important changes too. In the past inter-municipal cooperation were funded from the budgets of the member municipalities. Today the revenues from local taxes are earmarked for the budgets of inter-municipal institutions, i.e. inter-municipal institutions have their own revenue raising capability. Two different fiscal schemes are available and which scheme is applicable depends on the different form of inter-municipal institutions as listed in Table 3.1. The most interesting schemes are *communautés urbaines* and for *communautés d'agglomération* as they give the right to the inter-municipal institutions to raise revenues by levying a single business tax that is not set by the member municipalities but by the inter-municipal institution itself.

These two forms of inter-municipal cooperation have not only the fiscal power described above but communes also receive financial support from the government based on the size of their population. This latter aspect is an incentive for municipalities to team up and form inter-municipal institutions.

**ANNEX 4. QUESTIONNAIRE**

**Questionnaire**

**Business models for rural sanitation (wastewater services) in Moldova**

**I. Regionalization**

Please assess on the scale which decentralization model would be the most/least advantageous one in provision sanitation services in Moldova (1 = model is not advantageous at all, 5 = model is the most advantageous one).					
Decentralised – the provision of the sanitation services is organized on local level (co-operation between local governments is not necessary). Tariffs are set by local authorities.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
“Light regionalisation” - the provision of the sanitation services is organised on local level, but regional institution (enterprise, NGO) is set up to facilitate provision of services (preparation and co-ordination of the investment projects, advisory services, laboratory, legal services etc.). Tariffs are set by local authorities.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Voluntary regionalization – local governments enter formal co-operation to provide jointly the services. They set-up inter-municipal utility responsible for sanitation services. Tariffs are set by inter-municipal utility.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Obligatory regionalization – the government sets up the policy and divides country into regions. Municipalities are obliged to join regional utility company for sanitation services. Tariffs are set by regional utility.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Other (please describe) ..... ..... ..... ..... .....	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Please <b>rank</b> the models indicated in question 1 by putting numbers from 1 = the model that is the most suitable for Moldova, 5 = the model that is the least suitable for Moldova	
Decentralised	
“Light regionalisation”	
Voluntary regionalization	
Obligatory regionalization	
Other (indicated in point 1.5.)	

**II. Service provision, financing and other solutions**

Please assess on the scale which decentralization model would be the most/least advantageous one in provision sanitation services in Moldova (1 = model is not advantageous at all, 5 = model is the most advantageous one).					
<b>Delegation of service provision</b>					
Direct service provision:					
Service provided directly by local governments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Service provided directly by neighbouring local government (but without creating an association)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Service provided directly by neighbouring local government by creating an association	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Service provided directly by not-commercialized local/regional public utilities or co-operatives	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Service provided directly by commercialized (limited liability companies or joint stock companies) local/regional public utilities:	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Co-operatives (water user associations)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Small private operators, including informal ones.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Different levels of private sector participation					
Delegated services through leasing or concession model where public authorities retain ownership of infrastructure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Delegated services through leasing or concession model where assets belong to the assets holding company belonging to commune(s)					
Management contracts	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Full privatisation where private companies both own and operate the infrastructure	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>Sector financing</b>					
Financing through tariff	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Financing through tariff and from local government budget	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Solidarity funds and revolving/environmental funds	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
<b>Technological solutions</b>					
Centralized wastewater collection and treatment (mechanical and biological wastewater treatment plants)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Centralized wastewater collection and treatment through water ponds	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Small (individual) waste water treatment facilities for one or few houses	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Septic tanks and wastewater delivery to wastewater treatment plants by trucks.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Describe necessary changes in state and local water sector policy to make the most suitable model applicable (legal changes, changes in tariff policy, obligation for ensuring sanitation services etc.)
.....
.....
.....
.....

## ANNEX 5. SUMMARY OF CROSS-FERTILISATION AND SYNERGIES WITH OTHER ACTIVITIES, PROJECTS AND PROCESSES

Project Tasks	Facilitation of ...	Complementarily or Input to ...	Links or Synergies with ...
	... the following ongoing projects/activities and processes:		
Tasks 1- 2	Ongoing policy discussions of climate change adaptation issues in Moldova	NCCAS**, developed with support from UNDP	“Dniester III floods and climate project” sponsored by the UNECE
		EC-funded TA Water SPSP (section on adaptation in the revised Moldova’s WSS Sector Strategy)	
		National Plan for Flood Protection (to be drafted with support from EIB <i>et al</i> ) and a national plan for reducing risks of other natural hazards	
Task 3	EC-funded Water SPSP**		
		EBRD project on regionalisation of water operating companies	Institutional component of the ApaSan project funded by SDC
		Regional development process: pilot testing some recommended business models in the frame of the ongoing regional development project funded by GIZ ***	
	Inter-communal cooperation in Moldova (e.g. input to the 1 <sup>st</sup> National conference on Inter-Municipal Cooperation (IMC) in 2012)		

Source: own assessment by authors.

\* NCCAS stands for the National Climate Change Adaptation Strategy

\*\* SPSP stands for the Sector Policy Support Programme (for the water sector in Moldova)

\*\*\* **Note:** The location(s) for pilot testing recommended business model(s) was identified in collaboration with **GIZ**: the **city of Cahul** was selected and for this very reason part of the effort during the “*reality check*” under Task 3 was performed in this specific location.

By February 2013, GIZ has supported the city of Cahul and 3 neighbouring rural communes (villages: Rosu, Manta, Crihana Veche) to expand water supply services to those villages. The physical connection has already been constructed and institutional setup is under preparation. Cahul and the 3 rural communes have issued local council resolutions and in the next month it is expected that the institutional and legal form of the service provider will be decided (now the municipal water utility (*ApaCanal*) in Cahul is a municipal enterprise)

There are also similar plans to expand and improve wastewater services under the same institutional setup. A feasibility study to further expanding WSS services to other villages surrounding the city of Cahul is under preparation. Similar approach is planned for the **town of Costesti** in Riscani rayon of Moldova, however as of February 2013 a feasibility study was only under an early stage of preparation.