

Implementation of Urban Waste Water Treatment Directive in Albania

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Abstract

The Urban Wastewater Treatment Directive concerns the collection, treatment and discharge of urban wastewater, but also of wastewater from certain industrial sectors. Albania needs to make due efforts for the proper approximation of this Directive.

This paper presents the results of the first study on this issue, completed in early 2009 by CARDS INPAEL project team: current gaps, challenges and recommendations, measures to be taken and costs to be afforded in order to achieve full approximation of this Directive in Albania in the way of country's accession to the EU.

A preliminary investment plan is drafted for the 15-20 years to come. Estimates have been made for 196 agglomerations along the 6 river basins of the country, representing a total wastewater load of 2,981,700 p.e. As water bodies sensitive to eutrophication have not yet been identified in Albania, it is assumed that all surface water bodies will be designated as 'sensitive areas'.

Different treatment methods have been considered according to the agglomeration size: for small agglomerations - pond systems and constructed wetlands, which may result in a significant reduction of construction and operational costs; for agglomerations of 2,000 - 10,000 p.e. - conventional treatment; for those larger than 10,000 p.e. - advanced treatment with higher removal efficiency for Nitrogen and Phosphorus.

The preliminary investment costs measured in constant 2008 prices made on the above assumptions are estimated to be about €2.4 billion, of which €0.9 billion will go for the Urban Wastewater Treatment Plants and €1.5 billion for the collection treatments. Operating costs build up ultimately to €52 million per year in the 19th year of implementation, when full compliance is expected. The overwhelming majority of costs will be the responsibility of the municipalities. Not necessarily these costs will be met through their own resources. Users of the sanitation services will contribute through. Support can be obtained also in the form of grants and soft loans from the EU, IFIs and other bilateral and multilateral aid providers.

Methods used for this study comprise documents and legal framework overview, legal gap analysis, discussion with main stakeholders, identification of necessary implementation measures and their cost assessment.

Key words: Wastewater, load, treatment, agglomerations.

Introduction

This paper gives an extract of the work done in the frame of the EU CARDS INPAEL Project for the implementation planning of the "Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC)" as amended by Commission Directive 98/15/EC of 27 February 1998 (in short Urban Waste Water Directive - UWWTD) in Albania. This implementation planning proposes a roadmap towards full approximation of the Directive.

Following the results of the legal, administrative and institutional assessment of the current state of approximation of UWWTD, this paper presents the overall plan of measures needed to obtain full approximation as part of the preparations of the country's EU accession. The paper also provides the best estimates of costs and benefits that can be made at the present time.

Material and methods

Work has started with the examination of related legislation and other existing relevant documentation in Albania. Then a legal gaps analysis of the current legislation vs. the UWWTD was carried out, as well as evaluation of the current structures and human capacities at the Ministry of Environment, Forests and Water Administration (MoEFWA) and other important stakeholders. Numerous contacts and detailed discussions were held both within the TA (Technical Assistance) Team and between it and working group established for this project and a wide range of key officials of the MoEFWA, Ministry of Public Works, Transport and Telecommunications (MoPWTT), General Directory for Water Supply and Sewerage (GDWSS), Regulatory Water Body (RWB), etc.

In October 2008 a questionnaire was sent to the municipalities, communes and water/sewerage companies. The purpose of the questionnaire was to obtain data on the existing status of public water supply and wastewater collection and treatment facilities.

This work included the identification of the list of implementation measures/interventions needed for full approximation of the Directive. An estimate was then made for the costs of the various actions needed to approximate the Directive, including the three levels of approximation: transposition, implementation and enforcement. The starting point was the list of implementation measures/interventions and this list was further disaggregated into actions and sub-actions. The resource requirements of each action were estimated. These resources comprised:

- ❖ human resources (these are generally assumed to be new resources, which will be required on an ongoing basis) and training requirements,
- ❖ devices and materials to be procured, as well as production of necessary documents, and
- ❖ technical assistance projects/ experts (the resource for technical assistance projects were based on estimates, drawing on experience, of the necessary TA project inputs in terms of international and national consultants and other resources).

The costs of transposition and of implementation are dealt with separately.

In considering the phasing over time of the actions required to implement and enforce the UWWTD relative years (starting with year 0) have been used. No assumption is made about when implementation would begin. The implicit assumption is therefore that once started, a Directive would be implemented as soon as reasonably practicable, having regard to the interdependencies between actions under this Directive and between different Directives in general. In practice the pace at which these Directives can be implemented will depend on the availability of scarce resources such as manpower, expertise, capital, and operating budgets. Not everything can be done at once. It is not possible to plot a realistic implementation timetable until the resource requirements of all the environmental sectors are placed side-by-side and compared with the estimated total resources available for this sector. Decisions on the starting date and the pace of approximation are to be decided by the Government of Albania.

Investigated area

As already explained earlier, the aspiration of Albania for EU accession makes it indispensable for the country to approximate its own legislation. This commitment was made through article 108 of the Stabilization and Association Agreement with the European Communities, where cooperation in all the fields of environmental *Acquis* has been agreed upon. This implies the water sector, and thus includes the UWWTD, too. As this formal compliance to the UWWTD has not yet been met by the country, a list of measures is needed to be taken in the future.

The Directive provides a framework for the collection, treatment and discharge of urban wastewater from centres of populations (described in the Directive as agglomerations¹), and the treatment and discharge of biodegradable wastewater from certain industrial sectors. Its goal is to protect the environment from the adverse effects of such wastewater discharges. Member States must ensure that urban wastewater is collected and treated prior to discharge according to specific standards and deadlines.

The principal requirements of the UWWTD include:

- ❖ **Collecting systems** must be supplied for all agglomerations with a wastewater load of 2000 person equivalents (p.e.) or greater. Population equivalent (p.e.) is used as a unit for expressing the organic biodegradable wastewater load, consisting of a mixture of wastewater sources of different sources, i.e. domestic, industrial, etc. One p.e. is defined as the organic biodegradable load having a five-day biochemical oxygen demand of 60g of oxygen per day (1 p.e. = 60 g BOD₅).
- ❖ **Treatment of urban wastewater:** In terms of treatment standards, secondary treatment is the general rule. Advanced treatment for higher levels of removal of nitrogen and phosphorus is required in sensitive areas. The discharge of treated wastewater must be subject to prior regulations and/or specific authorisation. Treated wastewater must be re-used whenever appropriate. The disposal routes for treated wastewater must be chosen so as to minimise the adverse effects on the environment. Treatment plants must be designed or modified so that representative samples of the incoming wastewater and of the treated effluent can be obtained before discharge to receiving waters.

The competent authority or appropriate bodies are required to monitor discharges from urban wastewater treatment plants. The Directive sets out minimum sampling regimes and reference methods of measurement.

- ❖ **Industrial wastewater:** discharges into collecting systems and UWW treatment plants must be subject to prior regulation and/or specific authorisation. Industrial wastewater must be subject to pre-treatment, if required.
- ❖ **Sensitive areas:** The identification of sensitive areas must be reviewed every 4 years. A water body must be identified as a sensitive area (UWWT Directive Annex IIA) if:
 - It is eutrophic² or may become eutrophic in the near future if protective action is not taken, or
 - It is surface fresh water used for the abstraction of drinking water and the nitrate concentration could be higher than 50mg/l nitrates (as laid down in Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water) if action is not taken, or
 - It is an area where further treatment is required to fulfil obligations of other Directives.
- ❖ **Less sensitive areas:** may be defined according to criteria set out in the Directive. Discharges to less sensitive areas may require less stringent treatment, provided that primary treatment is provided as a minimum.

¹ An agglomeration is a settlement or area where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to an urban wastewater treatment plant (WWTP) or to a final discharge point. An agglomeration may consist of one or more settlements, which for example are located in the same hydrological drainage basin so that discharge of the wastewater from the settlements in the agglomeration to one central WWTP may result in the most economic solution.

² Eutrophication is the excessive growth of algae and other plant forms in surface water due to high concentrations of nutrients (especially nitrogen and phosphorus) producing an undesirable disturbance of the balance of organisms present in the water and to the quality of the water itself. It mainly occurs in stagnant waters, such as lakes and canals with a low flow velocity. Waters that are sensitive for eutrophication are to be designated as sensitive areas in the sense of the UWWT Directive.

The goal of this assessment was the comparison between the UWWTD vs. Albanian current relevant water legislation and identification of the list of measures needed to be taken before the full approximation is obtained.

It is expected that the implementation of the UWWTD will impact upon both household and economic sector, including industrial facilities that discharge waste water into the water bodies, already have or are applying for a discharge permit, municipalities, etc.

Legal Gap Analysis

In Albania the framework for the water management is provided mainly by the Law No. 8093, dated 21.03.1996 "On water resources" (LWR) and the Water Supply and Waste Water Sector Strategy. The main structures involved include the MoEFWA, the MoPWTT, the Directory General for Water and Sewerage, and the Regulatory Water Body.

Article 28 of the LWR sets up the legal basis for sewage regulation. Law No. 9115/2003 "On the Environmental Treatment of Wastewaters" is the main piece of legislation on requirements for wastewater treatment together with Decision no.177, dt. 31.03.2005 "On the allowed norms of liquid releases and the zoning criteria for the receiving water bodies".

The key provisions of the Directive that have not been transposed include: Article 3.1 (obligations regarding collecting systems); Article 4.1 (requirements about the size of agglomerations and treatment levels); Article 11 (on industrial wastewater) - the national legislation relevant to is rather unclear; no clear permitting requirements as set out in Article 13 for Annex III industries; Article 14 (requirements regarding sludge disposal).

While the Law 9115/2003 transposes a number of definitions from the Directive, a number of them are lacking, or only partially transposed, including the definitions on 'urban waste water', 'collecting system', 'primary treatment' and 'secondary treatment'. Besides, the definition of '1 p.e.' conflicts with the Directive definition. The obligation to provide all agglomerations of 2,000 p.e. or more with collecting systems (Article 3.1) is lacking although the technical requirements for any collecting systems (Article 3.2) is transposed by the DCM 177/2005. While the requirement for UWW from agglomerations of between 2,000 and 10,000 p.e. to be subjected to secondary treatment before discharge to fresh-waters or to estuaries has been transposed, the remaining provisions of Article 4.1 have not. The discretionary exception for high mountain regions (Article 4.2) has been correctly transposed, as has the technical requirements for UWWTPs (Article 4.3). However, the method of calculation of the p.e. load (Article 4.4) is lacking.

The legal basis for identifying sensitive areas has been transposed (Article 5.1) but no sensitive areas have been designated yet. The substantive provisions of the rest of Article 5 have also been transposed.

The provisions of Article 6 which allow for less stringent treatment for discharges to less sensitive areas have been largely fully transposed. The provisions of Article 7, which allow for certain discharges to be subject to appropriate treatment, have been transposed. The transboundary provisions of Article 9 are lacking. The performance requirements of UWWTPs (Article 10) correspond in part.

Although a certain permitting regime is established for industrial WW discharged to collecting systems by the Water Pollution Law, the provisions in the DCM 177/2005 are not clear. The requirements of the permitting regime (Article 11.2 and 11.3) are lacking. However, permits are required for discharges from UWWTPs (Article 12). The provisions of Article 13 (biodegradable industrial WW) and Article 14 (disposal of sewage sludge) are lacking. A certain monitoring system is established in the legislation, although this does not extend to sewage sludge (Article 15.3). Nor is there any legal obligation to publish situation reports every two years (Article 16).

Annex I, Parts A and B are correctly transposed, while parts C and D are lacking. Annex II is correctly transposed, while Annex III is not transposed.

Current Investment Status

In drafting the plan for the implementation of UWWTD in Albania the following facts were considered:

The public water supply systems are managed and operated by 56 joint stock companies for water supply and sewerage services and a number of communal water companies. The organisational structure for public water supply services has been reformed.

Data indicate that about 2.5 million people are served by public water supply (78% of the population), and that nearly 1.5 million people are connected to sewerage systems (46% of the population).

Most of the urban wastewater is discharged without treatment. Nevertheless, investments in urban wastewater treatment plants have been made and continue to be made as indicated below:

Kavaje	WWTP operational
Vlore	WWTP construction completed, but not yet in operation
Pogradec	WWTP construction completed, due to start operation this year (2009)
Durres	WWTP under construction
Lezhe	WWTP construction not yet started
Sarande	WWTP construction not yet started
Korce	WWTP under construction
Shkoder	WWTP in first stage of construction
Shiroke	WWTP planned (in Shkoder Municipality)
Velipoje	WWTP planned
Tirana	WWTP planned

Approximation Plan

The overall plan to obtain full approximation consists of a legal transposition plan and an implementation plan (including enforcement):

- ❖ The **legal transposition plan** consists of drafting the new law on water, that will partially cover issues from this directive and one Decision, which will repeal and replace the existing DCM 177/2005.
- ❖ The **implementation plan** is composed of a number of actions which have been consolidated into the following five main groups of actions: a) Institutional strengthening and capacity building; b) Preparatory work; c) Wastewater collection and treatment; d) Disposal of treated wastewater and sludge; and e) Monitoring, data handling and reporting.

Implementation Plan

Establishment of Competent Authorities (CAs) at national level

Institutional arrangements need to be carefully thought out. There must be authorities and institutional arrangements at national, regional and local levels for the implementation and enforcement of the directive. These include organisations not only for policy-making, but also for developing programmes for the construction of UWWT infrastructure, providing finance for construction; and monitoring the progress during construction of infrastructure. The TA project will work closely with all stakeholders to: assign responsibilities in detail between MoEFWA, other interested ministries (including MPWTT, MoF), municipalities, river basin councils; recommend procedures, workflows, changes in distribution of responsibilities among relevant institutions, as well as the relations between the key stakeholders in the sector; elaborate financing plan: sources of funds for operation, service contracts, etc.; issue recommendations for approval by the Albanian government.

Competent authorities may be assigned either using existing structures or creating new ones. Administrative arrangements must be made to ensure that the directive is implemented effectively within all River Basin Districts.

Four additional personnel must be employed in competent authorities. At the national level (MoEFWA) 3 persons are needed, of which 1 should be a database/GIS expert and at MPWTT 1 person. Training of the personnel of the Competent Authority (& other key institutions, e.g. river basin councils, municipalities) must take place in areas such as: economics, advanced WWT techniques, monitoring, public participation, GIS, planning process, wetlands and extensive WWT processes.

Hardware and software for competent authorities must be procured, additional to normal workstation equipment such as large-format colour printers, plotters, database and GIS software, hydrological/river basin models, project management software, etc.

A comprehensive database has to be established for the purposes of compliance control, data management, and presenting data for decision-making. The database will include information on: agglomerations, UWW collection systems, UWWT plants, responsible entity, sensitive areas & river basin data, monitoring data, laboratories and quality control data, database to be geo-referenced (where appropriate) and input in GIS, link with water resources database as planned for the WFD.

Identification of Sensitive Areas and Agglomerations

Identification of sensitive areas has not been carried out yet in Albania. The MoEFWA must still decide whether to identify individual sensitive areas or to apply the more stringent tertiary treatment criteria to the whole territory. Information may be obtained by carrying out studies on this purpose and/or using currently available data. Agglomerations, as defined in the Directive, have also to be identified and officially proclaimed by the Government. Assignment of agglomerations is also important for the elaboration of Water Master Plan and for the River Basin Management Plans.

It is envisaged that these important preparatory activities will be supported by a TA project the first time, which would help decide whether to identify individual sensitive areas or to apply the more stringent tertiary treatment criteria to the whole territory. If the former, precise definition and criteria for sensitive areas must be developed. In particular, this should specify the scientific criteria used to determine the eutrophic state of watercourses and water resources :

- ❖ sensitive areas and their catchment limits must be identified;
- ❖ within sensitive areas it must be determined which of the parameters for more stringent treatment (stipulated in Annex I.B) have to apply in the particular situation;
- ❖ a regulation for re-assessment of sensitive areas and of related criteria must be drafted;
- ❖ a plan for follow-up surveys must be developed;
- ❖ agglomerations of different sizes must be identified: (a) of more than 15,000 p.e. (b) of 10,000 - 15,000 p.e. (c) of 2000 - 10,000 p.e.

It is assumed that no derogations would be sought for less sensitive areas, since the Adriatic Sea is not regarded as a less sensitive area. All discharges from agglomerations greater than 10,000 p.e. within the whole of the sensitive area will have to be provided with more stringent wastewater treatment. Sensitive areas must be re-assessed every 4 years.

A technical assistance project is needed to support activities that help remove the financial obstacles to the creation of an infrastructure of compliant urban wastewater treatment plants, and to provide a basis for recovering costs from water users / sewage producers.

MPWTT must prepare and maintain bankable projects pipeline in order to access funds from IPA and other sources.

Provision of human resources and training in the Municipalities

New staff will be needed in the municipalities to call for and evaluate tenders, deal with lending institutions, central government and private enterprises, arrange billing, etc.

New staff must be employed in municipalities: 196 persons, corresponding to 1 for each of the agglomerations. Recruitment will be spread over quite a number of years, in parallel with the investment and installation of new infrastructure.

Construction of infrastructure (wastewater networks and urban wastewater treatment plants)

MoPWTT in co-operation with MoEFWA has to establish an implementation programme for the construction of sewerage networks and wastewater treatment plants. This is required in accordance with Article 17 of the Directive. The implementation programme must be revised every two years once Albania becomes a member of the EU. This study could serve as the basis for the first implementation programme. Infrastructure construction is planned in stages, giving priority to the agglomerations over 20,000 p.e..

Stage 1: agglomerations > 20,000 p.e. (there are 19 such agglomerations)

Stage 2: agglomerations 5,000 - 20,000 p.e. (there are 59 such agglomerations)

Stage 3: agglomerations 2,000 – 5,000 p.e. (there are 118 such agglomerations)

For each of the stages the following steps have to be made:

- ❖ Feasibility studies/financing applications
- ❖ Design of collection systems and WWTPs; an important aspect of the design will be appraising the existing infrastructure and assessing where improvements are required
- ❖ Construction of collection systems
- ❖ Design of WWTPs
- ❖ Construction of WWTPs

Establishment of treatment and effluent standards, prior authorisation regime, for industrial wastewater

TA project must establish standard treatment and effluent standards, prior authorisation regime, for industrial wastewater. There are two aspects here:

- ❖ the Article 11 requires that the discharge of industrial wastewater into collecting systems and urban waste water treatment plants is subject to prior regulations and/or specific authorisations, designed to ensure compliance with the Annex I.C criteria, and
- ❖ the Article 13 requires that biodegradable industrial wastewater for Annex III sectors from plants > 4000 p.e., which does not enter urban waste water treatment plants but is discharged directly, is subject to prior regulations and/or specific authorisations.

In the first place the project will need to make an inventory of the relevant discharges. The project will need to determine whether standards should be national or local, and are applied as regulations or conditions in individual permits. The standards must be appropriate to the particular industries concerned and will involve consultation with the industry sectors. The standards for discharges of the first type above will depend in part on what the proposed disposal route for sewage sludge is (see last criterion of Annex I.C). If sludges are to be used in agriculture then more stringent standards may be necessary to ensure that the sludge meets the necessary quality standards (as per Sewage Sludge Directive 86/278/EEC). Necessary legislation would be drafted and/or the necessary provisions for permitting will be made, including drafting of model conditions.

If a prior authorisation regime is to be introduced then additional personnel will be needed to process applications and prepare the conditions to apply. The affected establishments will have to take any technical or organisational measures needed to comply with the standards.

Guidance and capacity building

A number of guidance documents need to be prepared and distributed to policy-makers, operators, other interested parties, covering for example the following topics:

- ❖ precise definition of sensitive areas to be used (elaboration of Annex II);
- ❖ design, construction and maintenance of sewerage networks, based at least on the provisions of the directive. Such guidance should also address the issue of limiting pollution from overflows in combined sewage systems. Comparable technical guidance documents from other countries, prepared by national or regional authorities, technical associations or others, might be useful in this context.
- ❖ design, construction and maintenance of waste water treatment plants; comparable technical guidance documents from other countries, prepared by national or regional authorities, technical associations or others, might be useful in this context. Where appropriate, guidance documents should be prepared with suitable alternatives to collecting systems, ensuring at least the same level of environmental protection. Compliance could be a condition for authorisation or continuing authorisation of the WWTP;
- ❖ how the concept of "appropriate treatment" can be operationalised in practical situations; such treatment has to ensure the necessary good quality of the receiving water.

Sewage sludge management system

The study would consider what the options are for the environmentally and technically sound reuse or disposal of sewage sludge, identify the actions which need to be taken to put these options into effect and make recommendations as to the best choice, adopt criteria and prepare guidelines. Options may include:

- ❖ use as a fertiliser/soil improver in agriculture;
- ❖ incineration in a cement kiln (but this may mean that the cement kiln has to comply with the Waste Incineration Directive (2000/76/EC));
- ❖ use as a cover materials in landfills;
- ❖ disposing in a landfill, subject to the Directive on Landfill of Waste (99/31/EC).

The project may also need to draft legislation, including for example a ban on any disposal of sewage sludge to surface waters.

Establish monitoring system and strengthen inspection

The MoEFWA must establish a monitoring and inspection program for compliance assessment of discharges from urban wastewater treatment plants and for assessing the amounts and composition of sludge. This monitoring has to be part of the comprehensive monitoring as prescribed with the Water Framework Directive (2000/60/EC). The capacity of the monitoring institutions has to be improved and the number of monitoring points and the number of samples taken to be increased.

These requirements arise under Article 15, which provides for Competent Authorities to monitor:

- ❖ discharges from urban waste water treatment plants to verify compliance with the discharge standards in the Directive;
- ❖ amounts and composition of sludge disposed of to surface waters;
- ❖ waters subject to discharges from urban waste water treatment plants and direct discharges as described in Article 13 in cases where it can be expected that the receiving environment will be significantly affected;

Additional inspectors will therefore be required. It is assumed that one additional full-time person equivalent would be required. A budget will be needed to cover necessary expenses such as inspectors' travel, costs of chemical analysis, etc.

Inspections of WWTPs will be necessary to ensure that sludge is being appropriately treated (e.g. dewatered) and disposed of in accordance with the installation's authorisation. This will in fact form part of the water quality monitoring programme as envisaged under the Water Framework Directive.

Assessment and improvement of the necessary laboratory capacity on national and regional level

The MoEFWA must ensure adequate laboratory capacities either within the administration or through outsourcing to accredited and licensed commercial laboratories under contract. Accreditation schemes for all laboratories are a means of constantly ensuring such quality control. The laboratories must use the methods specified in Annex I of the Directive and be subject to regular quality control. The Government must ensure quality control with the laboratories involved through review undertaken by qualified staff knowledgeable in this area. Sampling and analysis methods have to comply with the Directive. It is assumed that the activities identified in the DSIP for the Water Framework Directive in this connection will be sufficient to ensure adequate laboratory capacity for this Directive also.

Reporting and consultation

The relevant authorities are required to publish reports to the public every two years on the disposal of urban wastewater and sludge in their areas (Art. 16). They also have a number of reporting obligations to the Commission (see last bullet point of 1.3). This will be a responsibility of the competent authorities, but it is assumed that external support may be needed (local consultancy, mapping, printing).

The Government must also ensure adequate cooperation and exchange of information with other Member States in cases where discharges of wastewater have a transboundary effect on water quality of shared waters.

Preliminary investment plan

A preliminary investment plan for urban wastewater collection and treatment infrastructure has been drafted. The Urban Waste Water Treatment Directive is one of the most cost-heavy elements of the environmental Acquis, and will involve a major programme of investment in wastewater infrastructure over the next 15 to 20 years.

A preliminary plan is developed based on the information available at present. It can gradually be refined as the preparatory research and data-gathering, feasibility studies, etc., as described above, are conducted. This preliminary plan was developed in the following stages:

- ❖ Identification of urban agglomerations in river basin districts on the basis of population data and geographical information.
- ❖ Assessment of the needs for wastewater collection and treatment systems on the basis of information on existing facilities.
- ❖ Selection of sensitive areas and other areas with specific requirements for water resources protection.
- ❖ Preliminary design and cost estimates of wastewater collection and treatment systems for the agglomerations.

Albania is divided into 6 river basins. Some parts of it do not belong to these river basins since they drain directly into the sea. For water management purposes it is recommended that such parts are incorporated into the river basin districts. In this respect it is proposed that the coastal and lakeshore districts are incorporated into the river basin districts, as follows:

- ❖ Malesi e Madhe and Shkodra districts are incorporated into the Drin river basin district.
- ❖ Lezha and Kurbin districts are incorporated into the Mati river basin district.
- ❖ Durres and Kavaje districts are incorporated into the Ishmi and Erzeni river basin district.
- ❖ Lushnja, Fier, Pogradec, Devoll and Korçe districts are incorporated into the Semani river basin district.
- ❖ Vloza, Saranda and Delvine districts are incorporated into the Vjosa river basin district.

Eligible agglomerations have been identified, mainly on the basis of a) population data from the Census 2001 Report³, b) actual data that were provided by some of the municipalities and communes, and topographic information.

The preliminary selection of the agglomerations has been made on the following basis:

- ❖ All settlements with a population of 2,000 inhabitants or more require wastewater collection and treatment systems. At this stage it is presumed that in general a municipality or a commune can be served by one central wastewater treatment plant, to which the individual settlements are connected through pipelines.
- ❖ In communes without settlements of more than 2,000 inhabitants it may be possible that close-lying urbanised settlements are combined into agglomerations with more than 2,000 inhabitants. Such agglomerations also require wastewater collection and treatment systems according to the UWWT Directive. For this reason all communes with a settlement of over 1,000 inhabitants also have been identified as potentially eligible under the UWWT Directive. *More detailed studies are required for final selection of such agglomerations.*
- ❖ In the selection of the agglomerations, municipalities and communes may be combined into one agglomeration where it seems feasible to treat all wastewater from the agglomeration in one centralised wastewater treatment plant. In principle centralised wastewater treatment may be feasible technical solution under the condition that:
 - the distance of the settlements to the central WWTP is less than 10 km,
 - the settlements and the WWTP are located in the same drainage area,
 - the topography is suitable for connection of the settlements to the WWTP.

The selection of the agglomerations was also made on the basis of topographical data. The population numbers of the agglomeration have been estimated on the basis of the Census 2001 Report and on actual population data, where available. The estimated waste loads (as number of person equivalents) are equivalent to the population number. For the larger agglomerations (> 25,000 inhabitants) the estimated waste load was calculated as the sum of the population number and 20% of the population number, accounting for industrial and institutional wastewater loads.

An overview of the selected agglomerations is given in the Table below.

For the identification of the agglomerations all urban settlements with a population ≥ 1000 inhabitants were selected from data on population statistics. These settlements were marked on maps, and on the basis of assessing the natural drainage patterns in the areas, it was assessed whether settlements can be combined into agglomerations of more than 2000 PE, which can be served by one central WWTP. Cost-effectiveness is the predominant criterion in defining agglomerations, considering that the costs of several small WWTPs are higher than that of one larger WWTP, treating the same wastewater load, both in terms of investment and operational costs.

³ The Census 2001 Report provides data on the population of all municipalities and communes, and of the settlements that are part of the communes.

Criteria for the selection and formation of agglomerations are:

- ❖ Settlements of more than 1000 inhabitants are identified as potential agglomeration centres
- ❖ Combination of settlements in one catchment area into an agglomeration, if the distance between the settlements is less than 10 km and if it seems feasible to connect the settlements with the central WWTP by gravity or pressure wastewater transportation pipes (on the basis of an evaluation of the natural drainage situation in the agglomeration area). Criteria in this respect are:
 - Settlements are located in same natural drainage catchment area
 - Absence of physical obstacles for connecting settlements to each other or of settlements with central WWTP
 - Evidence that transportation of wastewater from settlement to central WWTP is more economical than operation of an independent WWTP for the settlement.

An overview of the selected agglomerations is given in the Table below.

Table 1. Summary of selected agglomerations

River basin district	Number of communes	Number of agglomerations	Wastewater load (p.e.)
Semani	99	49	626,800
Drin-Shkoder-Buna	81	42	288,200
Mati	36	24	173,200
Ishmi-Erzeni	44	25	1,328,300
Shkumbini	47	28	278,700
Vjosa	67	28	286,500
Total	374	196	2,981,700

In Albania, water bodies, that are sensitive for eutrophication, have not been selected yet. Currently sufficient data is not available to designate sensitive areas as required by the UWWT Directive. For the time being it is assumed that all surface water bodies will be designated as 'sensitive areas' in the sense of the Directive until official decisions are made on this issue.

For each of the agglomerations, preliminary investment costs of wastewater collection and treatment systems have been estimated as follows:

The cost estimates for wastewater collection systems include contingencies of 30% due to the uncertainties in the cost estimates. All cost estimates exclude the costs of land required for the systems.

All cost estimates have been made under the assumption that completely new sewerage systems and wastewater treatment plants have to be constructed for all agglomerations, although the cost estimates have been reduced somewhat if part of the agglomeration has been provided with sewerage, if data are available.

The wastewater management plan may be implemented in 3 phases over a period of 15 to 20 years. The largest agglomerations, with an estimated waste load > 20,000 p.e. should be handled during Phase I.

In the Phases II and III the agglomerations with a waste load of 5,000 – 20,000 p.e. and with a waste load of 2,000 – 5,000 p.e. should be dealt with respectively.

- ❖ For the agglomerations larger than 10,000 p.e. costs have been estimated on the basis of advanced treatment with higher removal efficiency for Nitrogen and Phosphorus in order to fulfil the effluent quality requirements for discharge into sensitive areas.
- ❖ For agglomerations between 2,000 and 10,000 p.e. the costs have been estimated on the basis of conventional treatment.
- ❖ For the small agglomerations also alternative wastewater treatment methods may be considered, such as pond systems and constructed wetlands, which may result in a

significant reduction of construction and operational costs. The selection of such systems mainly depends on the availability of suitable land space.

Data on the 3 different categories of agglomeration size ranges are summarised in the table below:

Table 2. Categories of agglomeration size ranges

Size range (p.e.)	No. of agglomerations	Total wastewater load (p.e.)	Investment costs (€)	
			WWTP	Sewerage
I. > 20,000	19	2,172,000	333,120,000	564,590,000
II 5,000 – 20,000	59	486,800	170,311,800	244,730,200
III. 2,000 – 5,000	118	322,900	180,073,100	172,395,600
TOTAL	196	2,981,700	683,504,900	981,715,800

The preliminary estimated investment costs for wastewater treatment and collection systems for the agglomerations are given below.

Table 3. Preliminary estimated investment costs (€)

	Construction works	Contingencies	Design, supervision, commissioning	Total
WWTPs	683,504,900	68,350,490	136,700,980	888,556,370
Collection systems	981,715,800	294,514,740	196,343,160	1,472,573,700
TOTAL	1,665,220,700	362,865,230	333,044,140	2,361,130,070

Overall Resources and Costs

An estimate has been made of the costs of the various actions needed to approximate and implement the Urban Waste Water Treatment Directive.

Preliminary estimated costs of transposition

The legal drafting resources in MoEFWA will be under pressure in the coming years, even if capacity is increased. It would be wise to allow for a technical assistance project to support the Ministry in this work. It is estimated that an appropriate technical assistance project would cost about €300,000.

Preliminary estimated implementation costs

Implementation of the Urban Waste Water Treatment Directive will mainly be the responsibility of the competent authority designated to implement the Directive at the national level and of the municipalities. The estimated overall costs of implementing the Directive are shown in the table below. They are the best estimate possible at the moment when the study was carried out and were based on 2008 prices and the information available at that moment. They can get closer to the reality as the time goes by and the country gets closer to the implementation of the directive and when more detailed and accurate information is available.

Table 4. Total implementation costs for UWWT Directive

Responsible agency/sector	Capital / one-off costs ⁴ (€000)	Operating / recurrent costs (€000/y)
Albanian government	1,600	-
MoEFWA	7,240	82
MPWTT	-	29
Environment and Forests Agency	-	14
Municipalities	2,377,782	49,683
Industry	37,500	1,875
Total	2,424,122	51,683

⁴ All costs are estimated in constant 2008 prices.

It can be seen that implementation of the Urban Waste Water Treatment Directive will be extremely costly. The total implementation costs will be a capital cost of some €2,400 billion and operating costs which build up ultimately to €52 million per year. The costs are shown in the table against the party responsible in the first place for the activity. The overwhelming majority will be the responsibility of the municipalities. This is because on the assumptions made it will be the responsibility of the municipalities not only to operate and maintain the sanitation infrastructure, but also to carry out the requisite investment.

This does not mean that municipalities will have to meet those costs from their own resources. Ultimately the increased municipal costs will be recovered from the users of the sanitation services in the form of higher water/sanitation charges. In the short- to medium-term, when these costs are rising steeply, municipalities can expect to obtain support in the form of grants and soft loans from the EU, IFIs and other bilateral and multilateral aid providers.

Conclusions

The general challenges in implementing the provisions of the UWWTD in Albania involve:

- Providing the financing for the investments and other measures to be taken under the Directive. Not necessarily everything will be borne by the Albanian Government. Support may be received by different donors, as well,
- Integrating urban waste water treatment issues with other aspects of water management, identifying synergies and enabling the efficient management of water resources at the local level,
- Establishing an effective horizontal co-operation between local authorities, as well as vertical co-operation among the different levels of administration,
- Setting up efficient monitoring systems to facilitate effective enforcement of the Directive,
- Ensuring sufficient administrative capacity at the regional and local level by providing sufficient financial resources, information and technical expertise,
- Enhancement of public participation and the transparency of policy processes.

Wastewater discharges include biodegradable organics, hazardous organic substances, heavy metals and nutrients. Implementation of this Directive will result in a significant reduction of the quantity of pollutants that are currently discharged into inland surface waters, coastal waters, wetlands, groundwater aquifers and the soil.

The benefits associated with its implementation are:

- The pollution from the discharge of wastewater into water bodies will be minimized, which will improve health (reduction of waterborne diseases) giving a positive effect on the national economy;
- The aquatic environment will be better protected against pollution from hazardous substances and will get closer to its original state, providing better living conditions for aquatic life, as well as for terrestrial animals and birds;
- The surface water bodies will facilitate better leisure opportunities for the public, which will enhance the tourist sector, thereby generating additional workplaces and income and benefiting the national economy;
- Reduced costs for the treatment of drinking water abstracted from surface waters.

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