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SUMMARY REPORT

LOT 2 – Group of Local Self-Government Units of Northeastern BiH



October 2017

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LIST OF ACRONYMS

Acronym	Meaning
BiH	Bosnia and Herzegovina / Bosna i Hercegovina
CAD	Computer Aided Design / računarski podržano projektovanje/projektiranje
CARL	Current Annual Real Losses / tekući godišnji stvarni gubici
DMA	District Metering Area / Zona mjerenja
EU	European Union / Ev/uropska unija
FBiH	Federation of Bosnia and Herzegovina / Federacija Bosne i Hercegovine
FOPIP	Financial and Operational Performance Improvement Program / program poboljšanja finansijskih i operativnih karakteristika
GIS	Geographical Information System / geografski informacioni sistem/sustav
HR	Human Resources / ljudski resursi
IFRS	International Financial Reporting Standards / međunarodni standardi finansijskog izveštavanja
ILI	Infrastructure Leakage Index / indeks infrastrukturnih curenja
IT	Information Technology / informacijske tehnologije
IWA	International Water Organisation (međunarodna organizacija za vode)
JKP	Public utility company / Javno komunalno preduzeće
JLS	Jedinica lokalne samouprave
KPI	Key Performance Indicator / ključni indikatori uspešnosti
MIS	Management Information System / upravljački informacijski sistem
NRW	Non-Revenue Water / neoprihodovana voda
PDCA	Plan Do Check Act / planiraj uradi provjeri prilagodi
VAT / PDV	Value Added Tax / Porez na dodanu vrijednost
PI	Performance Indicator / indikator uspešnosti
PSA	Public Service Agreement / Ugovor o javnim uslugama
RS	Republic of Srpska / Republika Srpska
TK	Tuzla Canton / Tuzlanski kanton
UARL	Unavoidable Annual Real Losses / neizbježni godišnji stvarni gubici
ZDK	Zenica-Doboj Canton / Zeničko-dobojski kanton

1. EXECUTIVE SUMMARY

The concept of improving the operations of the utility companies in the local self-government units within the MEG Project is based on the methodology set out in the Action Plan for financial and operational performance improvement programs. The underlying concept is Plan-Do-Check-Act (PDCA), which consists of different steps aiming at continuous improvement and standardization of procedures and standards. During the Project's Entry Phase, several different areas of improvement have been identified, and for each of these areas, objectives, benchmarks and required activities were defined to lead towards achieving the set goals within an appropriate timeframe. During this Project phase, the improvement activities implemented over the previous year were in the following areas:

- Level of operational autonomy of the companies and defining of corporate accountability of the companies and the local self-government units (JLS), as their founders;
- Identifying the optimal organizational structure;
- Optimization of the number and structure of job positions, and evaluating the employees' performance;
- Implementation of customer relations procedures, analysis of complaints, appeals, and comments for the purpose of improving the business operations;
- Network mapping and Geographic Information System (GIS) design;
- Effective network zoning for the purpose of preparing regular zoning measurements, as well as network pressure optimization;
- Implementation of the measurement program on a regular basis, for the purpose of developing the water balances and improved records of real and apparent losses;
- NRW management aimed at reducing both real and apparent losses;
- Pricing policy, billing based on the key principles;
- Improving collection and administration of revenues;
- Improving accounting procedures (particularly, introducing cost center accounting procedures);
- Efficient budgeting and business plan development;
- Financial management;
- Improving fixed assets management (investment maintenance of water supply, sanitation and wastewater treatment infrastructure);
- Improving the protection of drinking water sources, as well as supporting investment decisions in the sector;
- and other identified areas of possible improvements.

During the engagement period, the Consultant, in regular consultation with the representatives of utility companies and, when necessary, local self-government units, implemented the activities defined in the Project's Terms of Reference and collected the values for the selected performance indicators to enable both the analysis and the decisions on the required corrective activities, if any (in case that the results do not meet the expectations and that it is not certain that they would lead to

the set goals). All values for the selected indicators at the beginning and at the end of the contractual period, respectively, for each of the selected JLSs, are presented in Chapter 5.

For most of the water supply companies, it can be concluded that better results and tangible progress have been achieved in the areas of non-revenue water (NRW) management and accounting procedures, and that somewhat slower progress has been made in the areas of organizational structure and human resources, as well as in the fixed assets and inventory management, which requires a closer attention in the next project phase.

By the time this Report was drafted, the agreed text of the Public Service Agreement was adopted by the following Municipalities: Žepče, Kalesija, Doboј, Teslić and Tešanj (5), while the text of the Agreement was agreed in the Prnjavor and Gračanica Municipalities (2), respectively, and in the Prnjavor Municipality the said Agreement was in the process of adoption by the Municipal Council. In Gračanica Municipality, there is a final court verdict to partially annul the privatization, requiring the removal of the utility infrastructure from the ownership of the water supply company. At its session, the Municipal Council rendered a decision not to deliberate on the Public Service Agreement (PSA), until the aforementioned verdict is enforced. The Consultant has drafted the agreement for Gradačac Municipality (1) as well, however, this Municipality is required to sign a different contract – PSC, which was prepared for the purpose of using the EBRD loan. The Consultant is of the opinion that all important elements contained in the PSA, which was drafted within this Project, are incorporated in the PSC as well, and that consequently, the adoption of such a contract would also lead to the achievement of the MEG Project's objectives. It is important to stress that the PSC does not contain a strategy for subsidizing the services extended to vulnerable categories, but that it stipulates the need for its development. The Consultant recommended that the Strategy developed within the MEG Project should be agreed and adopted. In Tuzla Municipality, the agreement is in the drafting stage and according to the letter delivered by the water supply company, its adoption is expected by the end of this year.

In order to have the PSA actually produce the expected effects, the issues of ownership over the utility infrastructure and the methods for its accounting must be legally regulated, because the current status leaves room for different interpretations, improvisation and manipulation on these issues, as it is currently the practice.

During the implementation of the activities, the areas of Organizational Structure and Employees, due to the susceptibility of these issues, turned out to be the most difficulty for the actual implementation, which is why the results achieved were not satisfactory. Five water supply companies (Gračanica, Kalesija, Žepče, Teslić and Gradačac) adopted the planned job systematization document; two of them (Doboј and Prnjavor) adopted a new job systematization document, which, however, has not met the required criteria, but rather reflected the current status of the company and even introduced an increased number of employees; the Tuzla water supply company is in the process of developing a planning job systematization document (its completion is scheduled for the end of this year), while the Tešanj water supply company appointed an earlier missing Public Relations Officer and submitted the existing Rules of Procedure, considering it fulfilling this obligation. The five planning job systematization documents that have been adopted are of different quality in the sense that they were still tailored for the existing staff and their professional capabilities (the exceptions are Gračanica and Žepče).

However, progress has been made in the sense that all water supply companies assigned positions for customer relations, loss detection and mapping. Progress has been also made in terms of adopting criteria and methods for performance evaluation, as well as introducing performance-based

stimulation/de-stimulation measures. The exceptions are the water supply companies in Tuzla, Doboj and Prnjavor. The Tešanj water supply company has already undergone the process of adopting the criteria at the beginning of the project implementation.

Long-term job rationalization document, including the defined deadlines, was adopted by 7 water supply companies, whereas the water supply companies in Doboj and Prnjavor have not done so.

Significant progress has been made in the area of customer relations, as all nine water supply companies assigned the customer relations tasks to their employees. Some of the water supply companies (Teslić and Doboj) have initiated the procurement of a complaints database (software) and started the activities for arranging info-desks and informing their customers of these services. In most of the water supply companies, the customer survey has been posted on their respective websites. Most of the water supply companies (Gračanica, Žepče, Prnjavor and Kalesija) uses an Excel database for registering customer complaints. The Tešanj water supply company is the only one that has not adopted a procedure for customer relations, but has assigned a customer relations officer.

Significant progress has been made in the field of mapping, given that currently, in all nine water supply companies, the primary and secondary water-supply, as well as the sewage networks have been mapped to a significant extent. There are still parts of the network the attributes of which are unknown.

In the area of efficient zoning, significant progress has been made in relation to the initial state, especially in the water supply companies where there were no measuring zones defined.

The situation is similar in the area of measuring and NRW programs, where the loss detection personnel was trained, and a plan for NRW reduction developed in all nine water supply companies, including precisely defined objectives and deadlines for their achievement, as well as estimated funds required for their implementation. In each of the water supply companies, the key indicators were analyzed in accordance with IWA and IBNet Benchmarking system. These indicators are of particular importance because they are calculated on the basis of hydraulic measurement results and the analysis of the water balance for each zone separately, and also for the system as a whole. The KPI values for NRW have been defined precisely (bottom-up approach), as opposed to the practice applied in the earlier years when the analysis was made by taking a top-down approach.

In the light of the pricing policy, the utility companies expressed their concerns over the planned fixed assets revaluation and establishing of the more realistic, higher value of fixed assets and the subsequent increase in the depreciation, as a component that would be included in the calculation of prices. There was a concern that after the revaluation, the depreciation component would have a significant impact on the increase in water supply and sanitation prices, and that it would not be possible for this increase to be fully offset by the savings and rationalizations in other segments, such as reduced electricity consumption, smaller number of employees, and the like. The position of the Consultant is that the price increase does not have to occur, and that it would more important to allocate the depreciation funds in a meaningful way.

The position of the water supply companies, as well as the local self-government units, when it comes to pricing policy, is still rather skeptical, given that, in the opinion of the Consultant, they have not yet accepted this idea as their own and that they still share the same views and opinions as at the beginning of the Project implementation. Particularly stressed is the view that the sanitation cannot be separated as a single service and that the price thereof cannot be calculated adequately, but also the view that legal entities should continue paying a higher price for the services. In addition, there is also an open question of determining the adequate value of fixed assets.

In the area of Revenue Collection and Administration, regardless of the absence of written procedures, during the Project lifecycle, all water supply companies have taken specific measures to increase their collection rates and, according to the reported performance indicators, have managed to do so.

The Consultant also developed a Draft Communication Operational Plan that would be used in the event of an increase in the price of the utility services. This Plan was accepted by all water supply companies.

Taking into account the initial state of the water supply companies in the field of Accounting Procedures and MIS, significant progress has been made. All nine water supply companies accepted the idea that it would be necessary to separate the costs by cost centers, developed it well and made important business decisions accordingly. Five of the water supply companies, the accounting software of which needed only a certain upgrade to bring it to the appropriate level of cost monitoring, have started the process of upgrading the software in order to meet the set goals. Four water supply companies that did not have an appropriate accounting software decided to replace the entire software solutions, and started the process of its procurement either, through the MEG Project or independently. According to the available information, they are working on the implementation of the new software solutions, and according to the Consultant's free assessment, these software solutions will be in place early next year.

In view of the foregoing, in the forthcoming Project phase, it is necessary to provide consultancy support with regard to the appropriate settings of the new software solutions to meet the accounting requirements set out in the recommendations provided by the MEG Project.

In the area of Budgeting and Business Planning, the water supply companies have in principle adopted the drafts and proposals of both the annual plan and the operating budgets, as well as the three-year plan projections; however, none of the water supply companies, with the exception of the Tuzla water supply company, has formally adopted or included them in its current business plan.

All water supply companies committed themselves to align their business plans, and develop new ones in line with the MEG recommendations by the end of September 2017.

By the time of drafting this Summary Report, the five-year business plans aligned with the MEG Project's recommendations were developed by the following water supply companies: Gračanica, Žepče and Prnjavor (according to the chronological order of delivery).

With regard to Financial Management, the Consultant considers the idea of introducing a software-based (which is not the case at present) reporting of malfunctions by the customers, issuing work orders and feedback to the user about the intervention completed, a useful suggestion. This should be taken into consideration in the next phases of the Project.

In the area of Fixed Assets and Inventory Management, the deadlines set by the Terms of Reference could not be fully met, because most of the water supply companies or JLSs, have not had a clear picture of all the fixed assets or their value. In addition, in two JLSs, there are enforceable court verdicts to partially annul the privatization, requiring the removal of the utility infrastructure from the ownership of the utility companies, which are joint stock companies. This area is closely related to Section 1.

Most of the water supply companies (6 of them) have no problems with providing sufficient quantities of drinking water. Three water supply companies (Doboj, Kalesija and Tešanj) have problems with providing sufficient water quantities in hydrologically unfavorable periods (summer

season or long periods without precipitation). The situation in Tešanj Municipality is particularly difficult, given that the area is very poor with water.

Most of the water supply companies have developed their Studies on Sanitary Protection Zones for all sources. The exception is the water supply company in Prnjavor.

On the basis of an analysis of the measurements made so far in the DMA zones, the Consultant has estimated that in the Kalesija and Tešanj water supply companies, there are no real possibilities to significantly improve the situation by reducing the water losses, when it comes to water supply, because the measured values of losses are below the reducable economic level of physical losses. However, taking into account the importance of this issue, in the next Project phase, measurements should be made in the system as a whole in order to arrive at a final conclusion, and possibly detect the areas where the actual losses can be reduced.

Further details on all areas considered are presented below.

2. PROJECT BACKGROUND

Bosnia and Herzegovina (BiH) faces complex development challenges, including a decline in economic activities, a high unemployment rate, rising poverty, and socio-economic inequalities. There are many constraints to economic development, including poor infrastructure and generally unattractive investment environment. Set in such a complex environment, local governments (municipalities and cities) have equally defined competencies, despite significant differences in their size. While the legal framework of the local government has been established in both Entities, some of the cantons in FBiH have not amended its legislation. An additional problem is the maze of sectoral laws and by-laws, which are often inconsistent with framework laws.

Unclear division of responsibilities among the Entities, cantons and local self-government units, coupled with the lack of clear mandate funding, has resulted in inadequate delivery of crucial public services at the local level. The governance capacities of local self-government units need improvements to become the driving force of local development processes and to ensure quality services. They need to create integrated strategies, where the social, economic and environmental sectors are interrelated in order to achieve sustainable results, and nearly 30% of the units have started implementing an integrated approach to local community governance. Nevertheless, deficiencies in decision-making, internal governance and organization, policies and regulatory frameworks, as well as inadequate operational capacity hinder effective policies. Although there have been improvements through formal partnerships and more transparent funding mechanisms, the effective participation of citizens and civil society organizations in the affairs of the local community is still marginal.

The water supply and wastewater services are, by priority and the required funding, certainly the most important services provided by the local communities. More than 40% of BiH residents do not have access to safe (regularly controlled) drinking water and less than 40% are connected to public sewerage networks. Water losses in many water supply systems account for 50% or more, leading to excessive water resources exploitation and high distribution costs. Most water supply companies in the country are not financially viable, which is an indication of possible long-term water supply problems. The prices of water services in practice are often too low to cover merely operation and maintenance costs, let alone to enable capital investments. It is necessary to ensure that all expenditures are covered by the revenues generated by the approved price, with an emphasis on the justifiability of these costs. Water quality is also questionable, especially in the high-loss water systems. Depreciation for water supply infrastructure is often not accounted for, while there is a need for regulatory interventions in the utilities sector, in order to enable proper infrastructure management and maintenance.

Regarding drainage and wastewater treatment, the challenges rest with a low level of population connected to the public sewage systems, as well as the presence of a small number of wastewater treatment plants. The key issue is funding the operations and maintenance; Finances are also a key issue for building new ones. While some efforts are being made to expand the infrastructure, both in terms of WWTPs and in terms of wastewater networks, there is still significant room for improvement.

For all the aforementioned reasons, the Swiss Government has approved and funded the implementation of MEG Project, aiming to provide assistance in the process of allocating the relevant competencies and funds to the local self-governments, with the intention to improve democratic governance and delivery of public services in an inclusive, effective and efficient manner, particularly the services covered by the economic and environmental sector. The Project was designed as a 12-

year initiative that should be implemented in three phases. One-year preparation of the list of required activities was followed by the first Project phase of the four-year implementation of these activities. This report is one of the outputs of the first year in the first Project phase and it provides a summary overview of the activities carried out and the results achieved in all companies providing water supply, sewage and wastewater treatment services in the Lot 2 group of municipalities. The report deals with common characteristics and the specifics of the activities carried out and the results achieved, and presents an overview of the values of selected indicators that measure progress relative to the baseline in these water supply companies.

3. PDCA METHODOLOGY AND REPORT STRUCTURE

3.1 Plan Do Check Act

Improving institutional, operational and financial capacities in areas of potential improvements in water supply companies in the selected local self-governments, as well as the consequent Action Plan, are carried out on the basis of the Plan-Do-Check-Act approach (PDCA cycle). This is an approach to governance that is based on the following known facts:

- Improvement is always possible, and long-term sustainable organizations stand out precisely because they are constantly striving for improvement;
- Organizations can manage their own improvement through four phases of the PDCA cycle. After the initial stages of Planning (based on identified areas where improvements are possible and defined activities that will lead to such improvements - corresponds to the previous "input" phase of the Project) and Doing (i.e. implementing the planned activities - ongoing), it is necessary to evaluate the achievements after a certain predefined period of time (Check – periodically; already started in some areas) and based on this evaluation, take the necessary corrective actions, if any (Act). Upon completion of this cycle, the process is either considered completed, provided that the goal has been achieved, or a new cycle is started by re-planning a new set of activities, if the set goal has been only partially achieved (which is more often the case).

Therefore, the PDCA approach will be applied generally to each of the identified areas of possible improvement. If the management and all key persons in the water supply companies recognize the quality of this approach and accept its application in their respective areas of responsibility, it will ensure the achievement of the set goals and thus, the actual long-term objective of self-sustainability of the companies.

The Action Plan has been prepared earlier for each of the identified areas of possible improvement by applying the PDCA approach and it contains initial activities from the “Plan” phase. In the current phase of the “Plan” implementation (i.e. “Do” phase), the management and employees of the water supply companies, as well as the representatives of the local self-government units who are responsible for the respective companies, assisted by the Consultant, when necessary (through training, consultations, advising, drafting documents, implementing initial activities, such as measuring or making a water balance, etc.) will gradually take over the ownership of the entire PDCA cycle implementation.

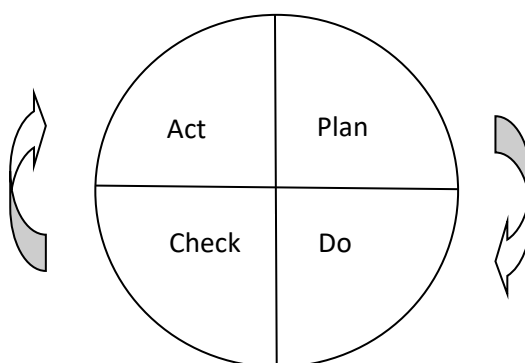


Figure 1: Plan-Do-Check-Act

Below is a summary overview of each of the identified areas where the improvement-oriented activities have been carried out.

4. AREAS OF IMPROVEMENT

4.1 LEVEL OF OPERATIONAL AUTONOMY OF THE COMPANIES

4.1.1 *Description of the Initial State*

The relations between the local self-government units and the business entities (utility companies with different status features) entrusted with the provision of water services in the municipalities where this Project is implemented, have not been contractually regulated in most of the cases. Likewise, the relations between these utility companies and users of their water services in the areas of the concerned municipalities have not been contractually regulated either (the water supply company in Prnjavor Municipality has signed the contracts with a part of its customers).

The situation that preceded the implementation of the Project activities is characterized by several more specific details that have to be mentioned here. In the first place, it is the lack of limits and clearly defined structure of rates for water utility services, within the framework acceptable at EU level, which would ensure compliance with the principle of affordability, along with the implementation of the other principles defined by the EU *acquis*, i.e. the user-pays principle and the polluter-pays principle. Similarly, there is evident lack of a binding strategic approach to subsidizing water services costs in case of disadvantaged categories of consumers in the municipalities.

In addition, in a large number of municipalities has been noted the existence of high claims by utility companies for providing water services to bodies and organizations which are under the control of the local self-government units.

The project implementation has also raised some important issues that are not precisely defined in the existing legislation. In the first place, this refers to the issue of title on the utility infrastructure facilities that is not precisely defined in any legal act and all related issues arising therefrom, such as property registration, depreciation calculation and the like. This is, to a certain extent, a reason for which the utility infrastructure assigned for management to the companies by the municipalities, is either not registered at all or is only partially registered, or is kept in off-balance sheet records. Given that the depreciation is calculated on the value of registered fixed assets, the investment maintenance is called into question, because allocations on this basis are not made for all assets that a particular company maintains. Given that the existing legislation has not clearly defined this area, in practice there are various interpretations of the existing legislation, as well as some improvisation in order to overcome certain problems. A particular problem is the privatization of utility companies that own part of the existing utility infrastructure. In two municipalities (Gračanica and Gradačac), there are enforceable verdicts to partially annul the privatization, which requires the removal of the utility infrastructure from the ownership of the company.

The general legal context in which the project is being implemented consist of the Entity, cantonal and municipal regulations governing water utility services (regardless of whether they are part of a broader legal framework governing all utilities, or are specifically tailored only to the provision of water utility services). In this context, one specific and very important aspect remained out of scope of work under this Project. Namely, some of the municipal regulations have remained incompliant with the corresponding Entity and cantonal regulations. In addition, no regulation at any level defines the notion of public property. On the other hand, the compliance of the Entity, cantonal and municipal regulations with the corresponding EU regulations is a matter of concern, as the

transposition of the *acquis* is only to take place within the activities envisaged in the Environmental Approximation Strategy and the implementing instruments of the Entities, which have been adopted both at the level of Bosnia and Herzegovina and at the level of the Entities.

4.1.2 Objectives

Due to all of the aforementioned, it has been necessary to ensure, through the implementation of this Project, that the relations between the JLSs and the utility companies (service providers) are regulated through a specific agreement (PSA), tailored to the specific conditions in each of the municipalities.

Likewise, it was also necessary to define all the essential elements of the strategic approach to be taken by each of the JLSs in terms of subsidizing the water services costs in case of vulnerable categories of users and propose an approach that will ensure the collection of outstanding claims for the utility services provided to the JLS bodies and the organizations controlled by the JLSs.

These objectives were identical for all 9 municipalities where the project is implemented.

4.1.3 Implemented Activities

With regard to this project component, the Consultant has prepared the templates for all three of these documents, namely the Public Service Contract (PSA), the Strategy of Subsidizing the Costs for Using Municipal Water Services for Socially Vulnerable Categories of Users and the proposal of measures that public utility companies and the municipalities should undertake to collect their outstanding claims. During the preparation of the said templates for these documents, the Consultant decided that the best and most efficient legal solution was to combine all three documents into one, so that all the essential elements of the Subsidy Strategy and the Collection Measures compiled in the form of an annex to the PSA. The model PSA with the aforementioned annex was submitted to the Project's beneficiaries (i.e. the municipalities and the utility companies providing water services in all 9 municipalities) in November 2016, proposing to them to send their comments, suggestions, observations and the like within a month, so to enable the Consultant to prepare the Agreement with the said (and other) Annex(es) in compliance with the regulations (Entity, cantonal, municipal) applied in each of the municipalities and tailored to the specific situation in each of them.

In December 2016, on the basis of all inputs received from the municipalities, the Consultant drafted the first version of the Agreements tailored to the conditions in each of the municipalities. It should be noted that at that moment, the feedback from some of the municipalities was still missing, and for that reason, in some cases, the Consultant tailored the Agreement according to the specific conditions in such municipalities on the basis of the information and documents he collected himself. The Agreement (PSA) with the envisaged annexes, including the aforementioned one that refers to the subsidy strategy, was submitted to the beneficiaries (i.e. the utility companies and the JLS competent bodies) asking them to review it and submit their opinions, comments and suggestions to the Consultant, for the purpose of fine-tuning of the contractual clauses and clarifying all pending issues.

An interactive communication between the Consultant, the municipalities and the utility companies took place in the first half of 2017, resulting in the PSA with the aforementioned annexes and all other envisaged schedules, by which the relations between the JLSs and the utility companies providing water services in their respective areas were fully defined and agreed (between the contractual parties and the Consultant), all in accordance with the terms of Reference. This approach

to the methodology of project implementation enabled the adoption of the Agreement by the Municipal Councils in the municipalities of Žepče, Kalesija, Doboj, Teslić and Tešanj (5), while it was agreed in the municipalities of Prnjavor and Gračanica (2), and put in the adoption procedure by the Municipal Council in the municipality of Prnjavor, by the time of drafting this Report. In the municipality of Gračanica there a final court verdict to partially annul the privatization, requiring the removal of the utility infrastructure from the ownership of the water supply company. At its session, the Municipal Council rendered a decision not to deliberate on the Public Service Agreement (PSA), until the aforementioned verdict is enforced. The Consultant also drafted the text of the Agreement for the municipality of Gradačac (1), however, this Municipality is required to sign a different contract – PSC, which was prepared within another project for the purpose of using the EBRD loan. Being familiar with the EBRD requirements in terms of regulating the contractual relations in question, and upon a review of the aforementioned text of the contract without going into details, the Consultant is of the opinion that all important elements contained in the PSA, which was drafted within this Project, are incorporated in the PSC as well, and that consequently, the adoption of such a contract would also lead to the achievement of the MEG Project's objectives. It is important to stress that the PSC does not contain a strategy for subsidizing the services extended to vulnerable categories, but that it stipulates the need for its development. The Consultant recommended that the Strategy developed within the MEG Project should be agreed and adopted. In Tuzla Municipality, the agreement is in the drafting stage and according to the letter delivered by the water supply company, its adoption is expected by the end of this year.

4.1.4 Performance Indicators

The following performance indicators have been agreed:

- Public Service Agreement (PSA) signed? YES/NO
- Law on Public Services provides operational and financial self-sustainability? YES/NO
- The administration of the local self-government influences the disconnection of non-payers? YES/NO
- Enforcement of existing regulations? YES/NO
- The administration of the local self-government has a list of people who are unable to pay their own bills, and there is a procedure for subsidizing these people? YES/NO
- Institutions owned by the local self-governments settle their liabilities? YES/NO

Table 4.1.1: Overview of performance indicators for each of the 9 JKP tables

LEVEL OF OPERATIONAL AUTONOMY OF UTILITIES – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ¹	E ²	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Public Service Agreement (PSA) signed?	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO	YES
Law on Public Services provides operational and financial self-sustainability?	Partly (<50%)	Partly (<50%)	NE	NO	YES	YES	PARTLY	Partly (<50 %)	Partly (<50 %)	Partly (<50 %)	YES	YES	NO	YES	NO	NO	YES	YES
The administration of the local self-government influences the disconnection of non-payers?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
The administration of the local self-government has a list of people who are unable to pay their own bills, and there is a procedure for subsidizing these people?	NO	NO	NO	NO	Partly (<50 %)	Partly (<50%)	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	No	NO	NO	YES

¹ S – start of the contractual period

² E – end of the contractual period

Table 4.1.2: A summary overview of performance indicators for all 9 JKPs

Start / end of the contract period	S	E	S	E	S	E	S	E
LEVEL OF OPERATIONAL AUTONOMY OF UTILITIES – PERFORMANCE INDICATORS:	Public Service Agreement (PSA) signed?		Law on Public Services provides operational and financial self- sustainability?		The administration of the local self-government influences the disconnection of non- payers?		The administration of the local self- government has a list of people who are unable to pay their own bills, and there is a procedure for subsidizing these people?	
Realized change:	0 signed	5 signed	3 YES	4 NO	0 YES	9 NO	2 YES	7 NO

4.2 ORGANIZATIONAL STRUCTURE

4.2.1 Description of the Initial State

Description of the initial state by water utility company is as follows:

- In almost all of the PUCs (with the exception of Gračanica and Kalesija), there was a cumbersome organizational structure with an unusually large number of organizational units (sections, departments, offices, units, etc.), very often hierarchically mismatched (sections within offices and the like). In addition to these, there were the governing bodies (Assembly, Board of Directors, Supervisory board) in place, which are different for each of the PUCs, depending on the form of organization (public company, joint stock company or limited liability company).
- In almost all of the PUCs, the problem of overstaffing was pronounced in this segment (the exceptions are Kalesija and Gračanica), especially in managerial positions, then inadequately assigned positions, very unfavorable qualification structure, and in addition, the inadequate coverage of certain positions with appropriate occupation and degree of professional qualifications, as well as the absence of clearly defined positions (such as the position for customer relations, detection of failures and mapping).
- Generally speaking, for all the water supply companies, it can be concluded that they do not pay particular attention to the establishment of their organizational structure at all, and especially the organizational structure that is in the function of improving the business.
- It is often the case that certain job positions are left insufficiently well defined in the job systematization document, or that a large number of positions and employees is envisaged.
- In all analyzed water supply companies, the organizational structure does not allow a clear allocation of costs to cost centers, i.e. there is no possibility of defining the method for allocating the costs for the services provided by the water supply company.

4.2.2 Objectives

The objectives of this improvement area are defined as follows:

- Provide high quality drinking water to the population in an efficient and reliable way;
- Ensure a high level of customer service, transparency and quality of reporting and performance tracking.
- All positions required for effective operations are formally defined, including those for customer relations, effective non-revenue water management, etc. all in compliance with the "full-time equivalent employee" principle.
- *Ensure periodic amendments to the job systematization document with the aim of achieving improvement in the operations*

4.2.3 Implemented Activities

The following activities were implemented:

- In this segment, the Consultant first prepared a list of all the necessary data/documents, which was delivered to all the PUCs, with a request for their submission. Simultaneously with the collection of data/documents that were submitted by the PUCs, the Consultant prepared a proposal of the organizational structure for each of the PUCs individually, as well as a proposal for job systematization, and drafted a plan for the rationalization of staff;

- Thereafter, individual visits to all the PUCs were paid and the meetings were held, when the PUC representatives, i.e. the coordinators for this area within the PUC, received detailed explanations regarding the tasks and activities that need to be undertaken in order to achieve the desired goal, i.e. the standards that are foreseen under this Project.
- In addition to the PUC visits, the exchange of information and data was done by electronic and regular mail, by telephone and by fax, and at presentations held at the initiative of UNDP as the Client, and which were attended by representatives of all nine JLSs, i.e. PUCs, the representatives of the Client and the Consultant.
- Considering the state of affairs and respecting the objective criteria and taking into account the capacity and the ability to modify the organizational structure for each of the PUCs individually, the Consultant, firstly, prepared and submitted the organizational charts in the form of a tabular overview of the PUCs' hierarchical organization. This tabular overview was later used as a basis for further developing the organizational structure (number and names of the organizational units), all with the aim of improving it or bringing it closer to the standards envisaged under this Project.
- Along with the development of the organizational structure, which has determined the systematization of jobs, the Consultant reviewed all internal acts of the PUCs in this area (Rules of Procedure, Rules on Systematization and Salaries Regulations, depending on whether they are separate documents or a Labor Rulebook that regulates all of the above: labor relations, job systematization and payroll regulations).
- It should be noted that the review of these documents coincided with the amendment of the umbrella regulations in this area: the General Collective Agreement and the Labor Laws in both Entities (2016), and accordingly, the PUCs were required to align their internal rules therewith. The Consultant certainly insisted on this.

During the implementation of the Project goals in this area, the Consultant sought to develop the awareness of the importance of a well-conceived organizational structure in all the nine PUCs, and to improve their business results, the quality of service and customer satisfaction, while at the same time achieving a quality working atmosphere and smooth operation process.

During the implementation of these activities, the areas of Organizational Structure and Employees, due to the susceptibility of these issues, turned out to be the most difficulty for the actual implementation, which is why the results achieved were not satisfactory. Five water supply companies (Gračanica, Kalesija, Žepče, Teslić and Gradačac) adopted the planned job systematization document; two of them (Doboj and Prnjavor) adopted a new job systematization document, which, however, has not met the required criteria, but rather reflected the current status of the company and even introduced an increased number of employees; the Tuzla water supply company is in the process of developing a planning job systematization document (its completion is scheduled for the end of this year), while the Tešanj water supply company has not defined a proposal or the timeframe for the development of this document. The five planning job systematization documents that have been adopted are of different quality in the sense that they were still tailored for the existing staff and their professional capabilities (the exceptions are Gračanica and Žepče).

However, progress has been made in the sense that all water supply companies assigned positions for customer relations, loss detection and mapping.

4.2.4 Performance Indicators

The selected performance indicators in this area are as follows:

- Has the customer service assignment been allocated within an appropriate office? YES/NO
- Has the Team responsible for the effective NRW measurement and management been established within the appropriate technical service/office? YES/NO
- Has the GIS Team been established within the appropriate technical service/office? YES/NO

- Have the separate cost centers been established to ensure the separation of water-supply and wastewater costs? YES/NO

Table 4.2.1: Overview of performance indicators for each of the 9 JKP tables

ORGANIZATION STRUCTURE –PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is there a subdivision for customer relations within the General Service)?	NO	Partly (>50%)	NO	YES	NO	NO	YES	YES	NO	Partly (<50%)	Partly (<50%)	YES	NO	NO	YES	YES	NO	YES
Has the Technical Services a subdivision for loss detection)?	Partly (>50%)	Partly (>50%)	Partly (>50%)	YES	NO	Partly (<50%)	YES	YES	NO	NO	NO	Partly (<50%)	Partly (>50%)	Partly (>50%)	YES	YES	NO	YES
Are the separated cost centers available to ensure separation of water supply and drainage costs and wastewater treatment?	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	NO	Partly (>50%)	NO	YES	YES	YES	NO	YES

³ S – start of the contractual period

⁴ E – end of the contractual period

Table 4.2.2: A summary overview of performance indicators for all 9 JKPs – Realized progress

ORGANIZATION STRUCTURE – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	number of NO	number of Partly >50%	number of Partly < 50%	Number of YES	number ofNE	number of Partly >50%	Number of Partly <50%
Is there a subdivision for customer relations within the General Service)?	2	6	0	1	5	2	1	1
Is there formed within Technical Services a subdivision for loss detection)?	2	4	3	0	4	1	2	2
Are the separated cost centers available to ensure separation of water supply and drainage costs and wastewater treatment?	4	5	0	0	7	1	1	0

4.3 EMPLOYEES

4.3.1 Description of the Initial State

Description of the initial state by water utility company is as follows:

- In almost all of the PUCs, the problem of overstaffing was pronounced in this segment (the exceptions are Kalesija and Gračanica), especially in managerial positions, then inadequately assigned positions, very unfavorable qualification structure, and in addition, the inadequate coverage of certain positions with appropriate occupation and degree of professional qualifications, as well as the absence of clearly defined positions (such as the position for customer relations, detection of failures and mapping).
- In most of the waterworks there is no regular modification of the rules on job systematization, and therefore, the current business operations were not in accordance with the existing rules.
- The positions defined in the regulations are not tailored to 40-hour weekly engagement, and there is no optimization of the required number of staff.
- There is no business performance assessment at any level within the company.
- There is no employee performance evaluation, and consequently, there are no stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all.

4.3.2 Objectives

The objectives in this area of improvement are defined as follows:

- Developed and legally compliant staff rationalization policy adopted and implemented.
- Temporary ban on further hiring, with the ultimate goal to optimize the number of staff and the period of time in which it can be achieved
- Revising and adapting all job descriptions to ensure 40-hour weekly engagement and optimization of the required number of employees.
- Introducing business performance assessment at all levels within the company; introducing stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all.

4.3.3 Implemented Activities

- In this segment, the Consultant first prepared a list of all the necessary data/documents, which was delivered to all the PUCs, with a request for their submission. Simultaneously with the collection of data/documents that were submitted by the PUCs, the Consultant prepared a proposal of the planning job systematization document for each of the PUCs individually, which would lead to the compliance with the standards specified under this Project and made a staff rationalization plan; in addition, the Consultant prepared a draft performance evaluation document for all employees, including evaluation criteria and methods.
- Thereafter, individual visits to all the PUCs were paid and the meetings were held, when the PUC representatives, i.e. the coordinators for this area within the PUC, received detailed explanations regarding the tasks and activities that need to be undertaken in order to achieve the desired goal, i.e. the standards that are foreseen under this Project
- In addition to the PUC visits, the exchange of information and data was done by electronic and regular mail, by telephone and by fax, and at presentations held at the initiative of UNDP

as the Client, and which were attended by representatives of all nine JLSs, i.e. PUCs, the representatives of the Client and the Consultant.

- In the course of these activities, the Consultant was also preparing the modified versions of the aforementioned documents by incorporating the comments submitted by the water supply companies and facilitated their adoption.
- Simultaneously with the aforementioned activities, the Consultant reviewed all internal acts of the PUCs in this area (Rules of Procedure, Rules on Systematization and Salaries Regulations, depending on whether they are separate documents or a Labor Rulebook that regulates all of the above: labor relations, job systematization and payroll regulations).
- It should be noted that the review of these documents coincided with the amendment of the umbrella regulations in this area: the General Collective Agreement and the Labor Laws in both Entities (2016), and accordingly, the PUCs were required to align their internal rules therewith. The Consultant certainly insisted on this.
- During the implementation of the Project goals in this area, the Consultant sought to develop the awareness of the importance of this area and achieve the objectives and standards of the Project in all the nine PUCs, as well as to point to the possibilities of improving the business results by resolving these issues within the company, while at the same time achieving a quality working atmosphere and smooth operation process.

During the implementation of the activities, the areas of Organizational Structure and Employees, due to the susceptibility of these issues, turned out to be the most difficulty for the actual implementation, which is why the results achieved were not satisfactory. Five water supply companies (Gračanica, Kalesija, Žepče, Teslić and Gradačac) adopted the planned job systematization document; two of them (Doboj and Prnjavor) adopted a new job systematization document, which, however, has not met the required criteria, but rather reflected the current status of the company and even introduced an increased number of employees; the Tuzla water supply company is in the process of developing a planning job systematization document (its completion is scheduled for the end of this year), while the Tešanj water supply company has not defined a proposal or the timeframe for the development of this document. The five planning job systematization documents that have been adopted are of different quality in the sense that they were still tailored for the existing staff and their professional capabilities (the exceptions are Gračanica and Žepče). Progress has been also made in terms of adopting criteria and methods for performance evaluation, as well as introducing performance-based stimulation/de-stimulation measures. The exceptions are the water supply companies in Tuzla, Doboj and Prnjavor. The Tešanj water supply company has already undergone the process of adopting the criteria at the beginning of the project implementation. Long-term job rationalization document, including the defined deadlines, was adopted by 7 water supply companies, whereas the water supply companies in Doboj and Prnjavor have not done so.

4.3.4 Performance Indicators

The selected performance indicators in this area are as follows:

- The number of employees per 1,000 connections (water and sanitation combined)
- The number of employees per 1,000 people to whom services are provided (water and sanitation combined)
- There are business performance assessment measures at all levels within the company?
- There are stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all?

Table 4.3.1: Overview of performance indicators for each of the 9 JKP tables

EMPLOYEES –PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ⁵	E ⁶	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
There are business performance assessment measures at all levels within the company?	NO	NO	Partly (<50 %)	Partly (>50 %)	NO	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	Partly (>50 %)	NO	NO	NO	YES
There are stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all?	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	Partly (<50 %)	YES	YES	YES	YES	YES	YES	YES
The number of employees per 1,000 connections (water and sanitation combined)	10.13	9.20	4.13	4.32	5.55	5.47	3.27	2.91	6.37	6.76	6.11	5.52	2.67	5.21	7.62	7.56	3.89	4.01
The number of employees per 1,000 connections (only water)	5.94	5.75	2.17	0.00	3.70	4.66	3.10	2.74	0.00	0.00	0.00	0.00	1.97	2.36	6.25	6.20	2.83	2.92
The number of employees per 1,000 connections (only sanitation)	4.19	3.45	1.97	4.32	1.85	0.81	0.17	0.17	6.37	6.76	6.11	5.52	0.70	2.85	1.37	1.35	1.06	1.09
The number of employees per 1,000 service users (water and sanitation combined)	1.90	1.73	1.33	1.39	0.84	0.82	0.91	0.81	1.22	1.40	1.54	1.40	0.77	1.49	1.94	1.94	1.29	1.27

⁵ S – start of the contractual period

⁶ E – end of contractual period

Table 4.3.2: A summary overview of performance indicators for all 9 JKPs – realized progress

EMPLOYEES –PERFORMANCE INDICATORS	Beginning of period				End of period			
	number of YES	number of NO	number of Partly >50%	number of Partly < 50%	Number of YES	number of NO	number of Partly >50%	number of Partly <50%
There are business performance assessment measures at all levels within the company?	0	7	1	1	1	6	2	0
There are stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all?	6	2	0	1	7	2	0	0

4.4 CUSTOMER RELATIONS

4.4.1 Description of the Initial State

Description of the initial state by water utility company is as follows:

- The water supply companies in Gračanica, Gradačac, Kalesija, Žepče, Teslić and Tešanj have not had an assigned customer relation officer.
- In the Prnjavor water supply company, one person has been assigned for customer relations.
- The water supply companies in Tuzla and Doboj have established a customer relations office each.
- None of the water supply companies have had written procedures for customer relations
- No periodical customer satisfaction surveys have been made
- In most of the water supply companies, complaints have been recorded manually and there was no electronic complaint database
- In the water supply companies where certain information was being collected, their analysis, which could have led to an improvement in this area, was missing.

4.4.2 Objectives

The objectives in this area of improvement are defined as follows:

- Assigning staff for customer relations
- Improving customer relations through adopting customer relations procedures and strategies.
- Active collection of feedback from customers on their satisfaction with the services received, regular analysis of collected information and using of the analysis results for improving business operations and customer relations.

4.4.3 Implemented Activities

The following activities were implemented in the water supply companies:

- The Consultant carried out detailed desktop analyses of the reports developed during the previous Project phase, and made a plan of visits to each of the listed water supply companies.
- A draft customer relations procedure was prepared and it included the method of interviewing the customers on their satisfaction with the services, as well as the methods for analyzing the said surveys. The draft procedure also contained a customer complaint flow chart, as well as the reporting periods.
- A simple Excel database of customer complaints was also created
- The draft procedure and the Excel database of complaints were delivered to all the water supply companies for comments, and then the Consultant visited the water supply companies to customize the draft procedure according to the specific situation in respective water supply companies.
- The assigned staff of the water supply companies underwent a training.
- The Consultant was motivating the water supply companies and supported the adoption of the aforementioned procedures. In addition, the Consultant motivated the water supply companies to assign customer relation tasks to their staff.

Significant progress has been made in this area, as all nine water supply companies assigned the customer relations tasks to their employees. Some of the water supply companies (Teslić and Doboj)

have initiated the procurement of a complaints database (software) and started the activities for arranging info-desks and informing their customers of these services. In most of the water supply companies, the customer survey has been posted on their respective websites. Most of the water supply companies (Gračanica, Žepče, Prnjavor and Kalesija) uses an Excel database for registering customer complaints. The Tešanj water supply company is the only one that has not adopted the customer relations procedure, but has assigned a customer relations officer.

4.4.4 Performance Indicators

The selected performance indicators in this area are as follows:

- Is there a person in charge of customer relations? YES/NO
- Complaints/comments/remarks database is in place and regularly updated? YES/NO
- Regular analysis of data on the received complaints/ comments/remarks is performed and the reports are submitted to the water supply company management? YES/NO
- Number of complaints on an annual basis?
- Average number of days needed for responding to a complaint?

Table 4.4.1: Overview of performance indicators for each of the 9 JKP tables

CUSTOMER RELATIONS – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ⁷	E ⁸	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is there a person in charge of customer relations?	Partly (<50%)	YES	NO	YES	NO	NO	YES	YES	YES	YES	YES	YES	Partly (>50 %)	Partly (>50 %)	YES	YES	YES	YES
Complaints/comments/remarks database is in place and regularly updated?	Partly (>50%)	Partly (>50%)	NO	YES	NO	Partly (<50%)	YES	YES	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	NO	NO	NO	NO	YES	YES
Regular analysis of data on the received complaints/ comments/remarks is performed and the reports are submitted to the water supply company management??	Partly (<50%)	Partly (<50%)	NO	YES	NO	Partly (<50%)	YES	YES	YES	NO	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	NO	NO	YES	YES

Table 4.4.2: A summary overview of performance indicators for all 9 JKPs – realized progress

CUSTOMER RELATIONS – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	number of NO	number of Partly >50%	number of Partly < 50%	Number of YES	number of NO	number of Partly >50%	Number of Partly <50%
Is there a person in charge of customer relations?	5	2	1	1	7	1	1	0
Complaints/comments/remarks database is in place and regularly	3	4	1	1	3	2	2	2

⁷ S – start of the contractual period

⁸ E – end of the contractual period

CUSTOMER RELATIONS – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Numberof YES	number of NO	number of Partly >50%	number of Partly < 50%	Number of YES	number of NO	number of Partly >50%	Number of Partly <50%
updated?								
Regular analysis of data on the received complaints/ comments/remarks is performed and the reports are submitted to the water supply company management?	3	3	1	2	3	2	1	3

4.5 NETWORK MAPPING

4.5.1 Description of the Initial State

An analysis of the current situation in this area has shown that the situation differs considerably from one water supply company to another. Below is an overview of the situation:

- The Tuzla water supply company uses an Info-map software for mapping and storing spatial and attributive data. The water supply network has already been mapped. The Consultant was not provided with the said data. The sewage network has not been mapped. There have been scanned maps with the designated sewage network.
- The Gračanica water supply company has mapped both water supply and sewage network which was stored in shape files created in the Quantum-GIS software. All data were provided to the Consultant for review.
- The Tešanj water supply company has mapped a part of the water supply network. The data were stored in shape files created in ArcGIS software. The sewage network was mapped in the form of AutoCAD drawings.
- The Žepče water supply company had mapped a large part of the water supply and sewage network in the form of AutoCAD drawings.
- The water supply companies in Kalesija, Gradačac, Prnjavor, Doboj and Teslić have mapped part of the water supply and sewage network in the form of AutoCAD drawings.
- In most of the water supply companies, the data are mostly experience-based. In most cases, there is no geodetic survey of the constructed network. Part of the data was collected in hard-copies (printed maps).
- In the water supply companies where the network was mapped to a significant extent, there is no storing the attribute data in databases.
- In most of the water supply companies, there is no trained mapping personnel.

4.5.2 Objectives

The objective is to establish a single geo-information system for all water supply systems, which will be a systemic support in the quality performance of everyday basic business processes.

The Thematic Modules that should be covered by this single information system are as follows:

- Establishing the Geo-information System on the client/server platform
- Linking GIS to the Business Information System (BIS)
- Linking GIS to the Telemetry system and Monitoring of characteristic flows and pressures
- Establishing the End-to-End Management Information System (MIS).

4.5.3 Implemented Activities

The following activities were implemented in the water supply companies:

- The companies were visited for the purpose of reviewing the type and extent of data available to the water supply companies
- All available data were collected
- The base 'ortho-photo' maps of the relevant areas, i.e. municipalities were obtained or scanned topographic plans of the concerned area-municipalities

- The symbols and layers that will be used for the water-supply and sanitation facilities were defined, and the required technical characteristics for the identified facilities, which will be used within the GIS database, were determined
- A proposal for the GIS database was developed, including the required attributes for all facilities within the water-supply and sanitation network. The proposed attributive tables were submitted to all water supply companies for their review and comments.
- The Consultant prepared preliminary maps of the water-supply and sewage network, and thereafter, discussed them in each of the water supply companies.
- The Consultant drew additional parts of the network and added pertaining attributes
- The Consultant organized the data according to the proposed layers.
- In Tuzla, the Consultant entered the spatial data on the sewage network into a shape file
- The Consultant entered the spatial data and the pipe diameter attribute for the Tešanj sewage network into the GIS database
- The Consultant delivered a training of the assigned staff on the editing fundamentals using AutoCAD and/or GIS.
- Based on the collected data on the water supply and sewage system for the PUCs in Teslić, Prnjavor and Doboj, the system was digitized, including all system facilities. All data on the diameters, the types and the age of the pipeline have been entered into the compiled GIS database. The parameters that are included in the database are the volume, the bottom and overflow angles for the reservoirs, the characteristics and types of pumps in the buster stations and the pumping stations for water supply and sewage. The degree of water treatment has been entered as well.
- The possibility of using GIS/AutoCad software by the companies in their work was discussed with the representatives of the water supply companies, as well as the plans for further activities within the Project, which, *inter alia*, related to the practical part of training for upgrading the users' water and sewerage maps.

Significant progress has been made in this area, given that currently, in all nine water supply companies, the primary and secondary water-supply, as well as the sewage networks have been mapped to a significant extent. There are still parts of the network the attributes of which are unknown.

4.5.4 Performance Indicators

The selected performance indicators in this area are as follows:

- The main available cartographic data have been obtained,
- The entire water supply network, including all facilities, fittings and devices has been digitalized,
- Consumer measuring points have been digitalized,
- The entire sewage network, including all facilities, fittings and devices has been digitalized
- A single database of spatial and numerical data for water-supply and sewage system has been created,
- Hardware platform for the GIS establishment on the client/server platform,
- Software platform for the GIS establishment on the client/server platform,
- System monitoring, measuring of flows and pressures at the facilities and the network,

- System monitoring, measuring of flows and pressures in the Measurement Sections,
- The BIS has been completed and linked to GIS
- Flow and pressure measuring has been completed and an adequate database created,
- Completion of the Management Information System.

Table 4.5.1: Overview of performance indicators for each of the 9 JKP tables

MAPPING – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ⁹	E ¹⁰	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Obtained the basic maps (percentage of the entire service area)	100%	100%	100%	100%	90%	100%	90%	90%	0%	100%	0%	0%	100%	100%	100%	100%	60%	100%
Percentage of mapped primary and secondary networks	90%	90%	79%	83%	90%	100%	50%	60%	0%	60%	40%	50%	50%	70%	100%	100%	60%	65%
Percentage of mapped connection network	15%	20%	57%	58%	0%	0%	20%	30%	0%	30%	0%	0%	30%	50%	5%	5%	60%	60%
Percentage of mapped sewerage network	100%	100%	80%	95%	90%	95%	60%	70%	0%	60%	60%	70%	20%	50%	60%	60%	50%	50%
Percentage of mapped infrastructural objects and connected with it alfanumerical data entered in GIS (for each of elements -valves, watermeters, shafts, etc.)	0%	0%	79%	83%	0%	0%	0%	0%	0%	0%	0%	0%	10%	30%	85%	85%	0%	0%
A single database of spatial and numerical data for water-supply and sewage system has been created	0%	20%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	20%	30%	50%	65%	0%	0%
Software platform for the GIS establishment	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO
Are there capacities in water supply utility for mapping and GIS?	Partly (>50 %)	Partly (>50 %)	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	Partly (<50 %)

⁹ S – start of the contractual period

¹⁰ E – end of the contractual period

MAPPING – PERFORMANCE INDICATORS	Start of period Average	End of period Average
The main available cartographic data have been obtained	71%	88%
Percentage of mapped primary and secondary network	62%	75%
Percentage of mapped connection network	21%	28%
Percentage of mapped sewerage network	58%	72%
Percentage of mapped infrastructure objects and associated alphanumeric data entered in GIS (for each of the elements - valves, water meters, manholes, etc.)	22%	22%
Unified base of spatial and numerical data of water supply and sewerage	15%	18%

4.6 EFFICIENT NETWORK ZONING

4.6.1 *Description of the Initial State*

The general conclusion arising from the analysis of the current situation in this area can be summarized by saying that the situation in this area varies from one water supply company to another, while the description of the initial state by company is given below:

- The water supply companies in Tešanj, Gračanica, Gradačac and Tuzla have had an established system of measuring zones within their respective systems. The DMA zones in Tuzla are virtual and there is no built-in hydraulic parameters measurement system, as opposed to Gradačac and Gračanica where the measurements are taking place in all zones, with the possibility of remote meter reading. In Tešanj, the continuous measurement has been established in five, out of six zones, while in the zone that was established as a result of this Project, the planned measurement is done by means of a portable ultrasonic flow meter.
- The water supply companies in Kalesija, Žepče, Prnjavor, Teslić and Doboj have not established the zones in their respective systems. In Kalesija, at the exits of some reservoirs, there were meters which were used for measurements in 3 zones. It should be, however, noted that these are cascade zones and that these meters do not cover all the necessary measurements in these zones.

4.6.2 *Objectives*

- The objective is to achieve progress in each of the water supply company, and therefore, in the Tešanj, Gračanica and Gradačac water supply systems, only an adaptation of the existing zones has been carried out in order to align them with the IWA recommendations.
- In Tuzla, a zoning plan was developed and adopted in the framework of another project, which immediately preceded this Project. In the three zones that were subject to further analysis within the MEG project, the zone isolation and the suitability of the metering points were verified.
- Since the water supply companies in Kalesija, Žepče, Prnjavor, Teslić and Doboj did not have the zones identified within their systems, they received a Zoning Plan, including the proposed infrastructure. During the project, these companies managed to isolate a certain number of zones where further activities related to the MEG project were carried out.

4.6.3 *Implemented Activities*

The following activities were implemented in the water supply companies:

Žepče

- A complete zoning plan has been drawn up with all the instructions for its implementation. The plan also contains a list of necessary meters and a description of the measuring points,
- At the very beginning of the Project, a simulation of the establishment of the measuring zones was performed on a part of the network, since at that moment there was no possibility to align it with the submitted zoning plan, because they were planned for the same (i.e. the first) reporting period. The PUC employees have actively participated in these processes and without them, these activities would not have been feasible.

Kalesija

- A complete zoning plan has been drawn up with all the instructions for its implementation. The plan also contains a list of necessary meters and a description of the measuring points,
- One measuring zone is immediately isolated whereby the water supply staff are introduced to the methodology used for measuring and isolating the zone. Three zones were isolated during the project.

Tuzla

- A complete zoning plan has been drawn up with all the instructions for its implementation, based on the existing plan developed under another project that is being implemented simultaneously with the MEG Project. The plan also contains a list of necessary meters and a description of the measuring points.
- One (virtual) measuring zone was established immediately, and the PUC staff was introduced to the methodology used for measuring and isolating the zone.

Gradačac

- A complete zoning plan was developed, including minor corrections in relation to the DMA zones established in the system. The corrections refer to the flow measurement method in the zones. The plan also contains a list of necessary meters and a description of the measuring points,
- An isolation test of one metering zone was carried out, and the PUC staff was introduced to the methodology used for the measurement and isolation of the zone.

Gračanica

- A complete zoning plan was developed, including minor corrections in relation to the DMA zones established in the system. The corrections refer to the flow measurement method in the zones. The plan also contains a list of necessary meters and a description of the measuring points,
- An isolation test of one metering zone was carried out, and the PUC staff was introduced to the methodology used for the measurement and isolation of the zone.

Tešanj

- A complete zoning plan was developed, including minor corrections in relation to the DMA zones established in the system. The corrections refer to the flow measurement method in the zones. The plan also contains a list of necessary meters and a description of the measuring points,
- An isolation test of one metering zone was carried out, and the PUC staff was introduced to the methodology used for the measurement and isolation of the zone. Three zones were isolated during the project.

Doboj

- On the basis of the maps and the mathematical models developed for the water supply network of the City of Doboj, an insight into the water supply system was obtained and the system zoning was performed based on the required parameters for the establishment of the DMA zones. After reaching an agreement with the expert teams of the Doboj water supply company, the water supply system has been divided into ten DMA zones, each of which can be isolated and analyzed independently.
- Measuring zones 1 to 7 cover the first altitude zone, while the altitudes of the remaining three measuring zones are identical to the ones of the water supply zones. Measuring zones 8, 9 and 10 are supplied from the reference reservoirs Hunak, Krčevina I and Krčevina II, respectively, while the Rajčinovac reservoir serves as a pumping station for the altitude zones. All maps of the DMA zones are submitted within the Second Consultant's Report.

Prnjavor

- Based on all available data on the water supply system, the maps developed for the Prnjavor water supply system and the mathematical model, and with the assistance of technical services of the water supply company, the DMA measuring zones were established, subject to the aforementioned limitations. After reaching an agreement with the expert teams of the water supply company, 13 DMA measuring zones were defined in accordance with the IWA methodology and recommendations.
- DMA zones 1 to 6 are supplied with water from the Drenova reservoir, while the remaining DMA zones, from 7 to 11 are supplied from the Poveljč source. All maps of the DMA zones are submitted within the Second Consultant's Report.

Teslić

- Based on all available data on the water supply system, the maps developed for the water supply system and the mathematical model, and with the assistance of technical services of the water supply company, the DMA measuring zones were established for the water supply company in Teslić. After reaching an agreement with the expert teams of the water supply company, 13 DMA measuring zones were established.
- The maps of the DMA zones developed for the water supply systems in Doboj, Teslić and Prnjavor include the locations of the measuring points for flow and pressure measurement, and accordingly, the PUCs should plan the construction of special manholes that will be used for the purpose of measurements in the system. All maps of the DMA zones are submitted within the Second Consultant's Report.

Significant progress has been made in this area compared to the initial situation, particularly in the water supply companies that did not have the measuring zones defined.

4.6.4 Performance Indicators

The selected performance indicators in this area are as follows:

- Number of established measuring sections,
- Number of sections where the affiliation of all elements of the water supply system was defined by section,
- Number of sections where flow and pressure monitoring is performed,
- Number of constructed metering shafts, leading to the separation of the sections,
- Number of consumers in each of the sections,
- Number of consumers in each of the sections, where readings are made (if not a lump sum),
- Number of alarms for flow and pressure disorders in the sections,
- Reduction of non-revenue water quantities, by section.

Table 4.6.1: Overview of performance indicators for each of the 9 JKP tables

EFFICIENT NETWORK ZONING - PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ¹¹	E ¹²	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Defined measuring sections?	YES	YES	YES	YES	Partly (<50 %)	YES	YES	YES	NO	YES	pARTLY (<50 %)	YES	YES	YES	NO	NO	NO	YES
Measuring sections can be easily isolated?	YES	YES	YES	YES	Partly (<50 %)	YES	PARTLY	Djelo mično (>50 %)	YES	DA	Partly (>50 %)	Partly (>50 %)	YES	YES	NO	NO	NO	Partly (<50 %)
Measuring sections have installed watermeters on input and output of sections?	YES	YES	YES	YES	Partly (<50 %)	Partly (<50%)	PARTLY	Partly (>50 %)	NO	Partly (<50 %)	Partly (<50 %)	Partly (<50 %)	YES	YES	Partly (<50 %)	Partly (<50 %)	NO	NO
Are there existing in water supply utilities capacities for hydraulic modelling?	Partly (>50%)	Partly (>50%)	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	Partly (>50 %)	NO	NO	NO	NO

¹¹ S – start of the contractual period

¹² E – end of the contractual period

Table 4.6.2: A summary overview of performance indicators for all 9 JKPs – realized progress

EFFICIENT NETWORK ZONING – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
Defined measuring sections?	4	3	0	2	8	1	0	0
Measuring sections can be easily isolated?	4	2	1	2	5	1	2	1
Measuring sections have installed watermeters on input and output of sections?	3	2	0	4	3	1	1	4
Are there existing in water supply utilities capacities for hydraulic modelling?	0	6	2	1	0	6	2	1

4.7 MEASUREMENT PROGRAM

4.7.1 *Description of the Initial State*

Description of the initial state by water utility company is as follows:

- There is a great diversity in the organization, existence and measurement methods in the 9 water supply systems.
- The water supply systems in Tešanj, Gračanica and Gradačac have established remote meter reading systems and analysis of the results,
- The water supply company in Tuzla performs occasional measurements using the portable flow meters,
- The water supply companies in Žepče, Kalesija and Teslić have not performed any hydraulic measurements, either regular or occasional, prior to this Project.
- The water supply company in Doboj owns its own flow measurement and leak detection equipment, and constantly conducts flow measurements in the system in order to detect and repair the leakages. The water supply company in Doboj has an ultrasonic flow meter, as well as the pressure loggers that are not in operation currently. The PUC staff have experience in working with measuring devices.
- The water supply company in Prnjavor has installed zone meters for some of the inhabited areas in order to monitor the overall consumption. The PUC does not have a leak detection device.

4.7.2 *Objectives*

The objective was to improve or make a proposal for improvements in the metering systems of the water supply companies that have established it, and to make a plan for its establishment in the water supply companies that do not have a metering system in place.

4.7.3 *Implemented Activities*

The Consultant has carried out the following activities within each of the 6 water supply companies in question:

- Delivered a database for the analysis and registration of detected leaks in the network "Leak report!"
- Delivered the training on measuring hydraulic parameters for water balance calculation and performance indicators,
- Participated and provided support to the water supply companies when measuring water balance in two zones in Gradačac, Tuzla, Žepče, Kalesija and Tešanj, and in five zones in Gračanica.
- The expert teams of the PUC in Doboj, with the support of the Consultant, performed measurements in three DMA zones. The measurements were performed in DMA zone 11 in the settlement of Pjeskovi, DMA zone 6 in the settlement of Poljice and in the sub-zone of DMA zone 4 which covers the central part of the city. A detailed report on the measurement results for DMA zone 4 is shown in the Second Report, while the results for DMA zone 6 and DMA zone 11 are shown in the Third Report. After the measurements were completed, and by the time of drafting this Report, the Doboj water supply company constructed special manholes for measuring purposes, and intensified the activities on measuring, detecting and repairing the leaks.

- The Consultant, with the support of expert teams of Prnjavor water supply company, performed the measurements in DMA zone 7, in the central part of the city and the settlements supplied from the reservoir Maćino brdo from the Povelich source, as well as in DMA zone 5, in Ratkovac settlement and in the sub-zone of DMA zone 6, in the settlement of Vijaka, which are supplied from the Drenova reservoir.
- In Teslić, the measurements were performed in DMA zone 2, in the settlement of Banja Vrućica and other villages gravitating towards the measuring zone, all the way to the bridge over the river Velika Usora, at the entrance to the city of Teslić. In addition, the measurements were performed in DMA zone 1 and DMA zone 10. After analyzing the data from DMA measuring zones 2, certain discrepancies were detected between the monthly water consumption readings and the flow readings taken from the meter by the Consultant. For this reason, the results were verified and the measurements were repeated in DMA zone 2 in the period from 27 July to 29 July 2017. After the repeated measurements, the obtained results corresponded to the actual situation on the ground.
- In the water supply companies that have no leak detection equipment or experience in working with it, the Consultant provided additional explanations for performing certain measuring activities during the preparation, installation and programming of the device.
- Detected and produced a document proposing the missing measuring techniques in each of the pertaining water supply companies. The proposals also include an estimate costs for their procurement,
- In close co-ordination with each of the water supply companies, developed a program for installing the missing water meters in the system, as well as the regular calibration of existing ones.

4.7.4 Performance Indicators

The selected performance indicators in this area are as follows:

- Number of installed metering points in the distribution system.
- Number of installed metering points for measuring the inflows in the sections.
- Number of installed metering points for measuring water pressure in the sections.
- Number of regularly maintained water meters.
- The number of operating water meters that have not been maintained for longer than the legally prescribed time period
- Number of connections without a water meter or with a faulty/idle water meter.
- Number of consumers (households) in apartment buildings that are billed based on common water meter measurements.
- Number of consumers in apartment buildings that are billed based on lump sum consumption.

Table 4.7.1: Overview of performance indicators for each of the 9 JKP tables

MEASUREMENT PROGRAM – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ¹³	E ¹⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Percentage of Consumer Measurement (% of the number of correct water meters in relation to the number of connections)	100%	100%	117% ¹⁵	119%	100%	99.80%	95.36%	92.4%	98.6%	99.0%	97.7%	100%	100%	100%	100%	100%	90.4%	89.4%
Percentage of consumption measuring (% measured in relation to the invoiced water)	100%	100%	99.9%	99.8%	99.9%	99.90%	96.70%	94.4%	99.6%	99.6%	100%	100%	100%	100%	100%	100%	140%	100%

¹³ S – start of the contractual period

¹⁴ E – end of the contractual period

¹⁵ Connections with more than one water meter.

4.8 NON-REVENUE WATER - NRW

4.8.1 Description of the Initial State

At the beginning of the Project it was established that the water supply companies in Tešanj, Gračanica, Gradačac and Dobož had established their own NRW control systems. The water supply company in Tuzla started activities on the NRW Reduction Strategy shortly before the commencement of this Project, while the water supply companies in Žepče, Kalesija, Prnjavor and Teslić did not have any strategy adopted.

4.8.2 Objectives

The objectives were to improve the NRW monitoring system in the companies where it was developed, and to prepare a proposal for measures to improve the analysis and reduction of NRW in the remaining companies.

4.8.3 Implemented Activities

- At the very beginning, the Consultant delivered the CalculEAKator, its own software for analyzing the measurement results and calculating the water balance by applying bottom-up approach, to all water supply companies.
- Developed a plan to reduce NRW, including well-defined goals and deadlines for achieving them, as well as estimating the funds required to meet them,
- Practical training for measuring the hydraulic parameters necessary for the water balance calculation, as well as for calculating the key IWA performance indicators was delivered using practical examples in the zones belonging to each of the systems.
- Training on leak detection equipment has been delivered in each of the water supply companies.

Prior to this Project, only the Gradačac PUC has applied this methodology to a certain extent, and therefore, its introduction is already a major step forward for all the concerned water supply companies, since it is an internationally recognized methodology, which does not give room for presentation of erroneous and inaccurate data.

In some of the water supply companies, the Infrastructure Leakage Index (ILI) is currently slightly higher compared to the previous years, because the KPIs for NRW are now very precise (bottom-up approach), as opposed to the previous years when the analysis was top-down. This means that there was no increase in the value of real losses, but that they were very precisely defined in the zones where the measurements were made in 2017.

4.8.4 Performance Indicators

In the area of NRW, the Consultant introduced an analysis of key indicators in accordance with IWA and IBNet Benchmarking system in each of the water supply companies.

These indicators are particularly important because they are calculated based on the results of hydraulic measurements and the water balance analysis both for each zone separately, and for the system as a whole.

The indicators are divided into two main groups:

1. Apparent losses indicators
 - Apparent losses in relation to legal consumption (%)

- Apparent Losses Index (ALI),
 - Liter per connection per day,
2. Real Loss Indicators
- Infrastructure Leakage Index,
 - Liter per connection per day
 - Liter per connection per day per m of pressure,
 - m^3 per km of pipeline

Table 4.8.1: Overview of performance indicators for each of the 9 JKP tables

NON REVENUE WATER – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ¹⁶	E ¹⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Non revenue water (%)	36%	34%	34%	32%	51%	55%	31%	37%	33%	28%	38%	43%	24%	22%	50%	51%	29%	39%
Non revenue water (m³/km/day)	22.53	19.2	8.76	8.15	24.93	32.39	2.08	2.75	2.1	1.6	15.54	20.98	3.62	3.75	35.93	37	4.27	6.95
Non revenue water (m³/connection/day)	0.33	0.28	0.22	0.21	0.42	0.55	0.08	0.1	0.14	0.11	0.18	0.25	0.13	0.14	0.71	0.72	0.13	0.22
Real losses (% from water production)	30%	27%	31%	29%	51%	55%	31%	37%	28%	25%	0.00%	0.00%	24%	22%	36%	37%	29%	39%
Real losses (m³ per connection per day)	0.268	0.22	0.199	0.184	0.424	0.545	0.079	0.105	0.12	0.096	0	0	0.129	0.135	0.512	0.526	0.128	0.215
Apparent losses (% from water production)	6.46%	7%	3%	3%	0.00%	0.00%	0.00%	0.00%	4%	3%	38%	43%	0.00%	0.00%	14%	14%	0.00%	0.00%
Apparent losses (m³ per connection per day)	0.058	0.06	0.021	0.022	0	0	0	0	0.018	0.013	0.184	0.248	0	0	0.196	0.196	0	0
Inevitable annual real losses (UARL)	47	59	70	69	66	81	69	59	80	100	47	46	73	73	62	62	74	75
Current annual real losses (CARL)	297	265	197	183	480	446			166	117	216	194	177	161	546	532	135	127
Infrastructure leakage index (ILI)	6.29	4.49	2.83	2.64	7.24	5.47			2.07	1.18	4.62	4.21	2.43	2.21	8.78	8.61	1.83	1.7
Category of success	B	B	A	A	B	B	A	A	A	A	B	B	A	A	C	C	A	A

¹⁶ S – start of the contractual period

¹⁷ E – end of the contractual period

NON REVENUE WATER – PERFORMANCE INDICATORS	Početak perioda prosjeak	Kraj perioda prosjeak
Non revenue water (%)	36%	38%
Non revenue water (m ³ /km/day)	13.31	14.75
Non revenue water (m ³ /connection/day)	0.26	0.29
Real losses (% from water production)	29%	30%
Real losses (m ³ per connection per day)	0.21	0.23
Apparent losses (% from water production)	7%	8%
Apparent losses (m ³ per connection per day)	0.05	0.06
Inevitable annual real losses (UARL)	65.33	69.33
Current annual real losses (CARL)	246.00	225.00
Infrastructure leakage index (ILI)	4.01	3.39

4.9 TARIFF POLICY

4.9.1 *Description of the Initial State*

As regards the pricing policy, all water supply companies shared the following common features at the beginning of the MEG Project implementation:

- In most of the water supply companies, there was no detailed and documented method of calculating the prices for water and sanitation services based on the principle of full cost recovery, or if it existed, it was neither detailed nor based on the principle of full cost recovery.
- Neither the companies nor the local self-government units had a list of consumers who need subsidies for water supply and sanitation services, although there was a need for such subsidies. In some of the water supply companies there was a common practice, but no written document, that the company itself was subsidizing certain categories of population, which, in effect, meant that the water services were not even billed to such categories.
- There is no mechanism for eliminating cross-subsidies among the user categories and services. The concept of subsidies is often misunderstood by the water supply companies as they believe that it is quite logical to have different prices for different categories of consumers or that the price of one service partly covers the costs of the other.
- The population's payment capacity is not analyzed;
- There was no consistent mechanism for regular tariff adjustments based on a documented methodology, which would ensure keeping track of changes in costs, and hence the need for tariff change;
- There was no tariff model associated with the accounting system.

In this area, in the initial phase, there were almost no differences among the nine water supply companies. Most of the water supply companies generally had a standard tariff system featuring different tariffs for water and sanitation services, which is calculated per m³ of water consumed for different categories of consumers. The tariffs are applied on the basis of recorded meter readings of water consumption. The sanitation tariff is applied based on the quantity of drinking water that is invoiced, and this tariff is determined in a certain percentile ratio in relation to the price of water.

The service prices in this phase (and, unfortunately, still) have not been determined on the basis of the actual costs, but rather on the basis of the prices applied in the neighboring areas, or depending on the price that certain municipal authorities wish to have in the local self-government unit, either for the sake of social peace or for some other sociopolitical reasons.

4.9.2 *Objectives*

The objectives of this improvement area are defined as follows:

- Develop, propose, discuss (with the utilities and the local authorities), revise, adopt and implement a tariff assessment methodology based on full cost recovery, with gradual equalization of the prices for consumer categories that do not trigger substantially different costs. Operational and investment maintenance must be included in the tariff model, taking into account both potential capital investments and environmental costs.

- Develop, discuss, revise, adopt and implement documented and transparent procedures for tariff changes, including raising awareness in the local self-government (the Mayor, the Council, and the relevant administration) on the adequacy of tariffs.
- Conduct periodical surveys on the affordability of services in the municipality and include the results of such surveys in the tariff methodologies (including a database on subsidization needs).
- Develop, discuss, revise, adopt and implement documented and transparent procedures for subsidizing the services extended to the disadvantaged (vulnerable groups).
- Ensure that the tariff model is fully linked to the accounting system (where the costs are recorded by cost centers)

4.9.3 Implemented Activities

In the first reporting period, the financial experts coordinated their activities, held internal meetings and agreed on the future work method and common approach. Each expert carried out a detailed desktop analysis of the reports developed within the previous Project phase and relevant for his/her scope of work, and developed a plan of visits for each of the aforementioned water supply companies.

The common approach to the pricing policy included the following:

- The Draft Tariff Methodology submitted by UNDP has been elaborated in detail, and a common position has been agreed on the issue of subsidizing the vulnerable categories of users.
- The Tariff Methodology was presented at the internal meetings in each of the water supply companies; a group training on the Tariff Methodology, as a mandatory part of the Terms of Reference, was also held. After this, and after reaching an agreement on the Methodology, the trainings were held for each of the water supply companies, individually.
- The Draft Methodology was attached to the PSA, which was agreed with each of the water supply companies separately.
- A simple Excel sheet was developed for calculating the prices for each of the water supply companies, following the cost-centers principle.
- During the first visits to the water supply companies, the available documents were obtained, and the information related to the current state was updated in accordance with the data given in the available Action Plans, which were developed in the first Project's phase.
- A proposal for the method of subsidization was developed and attached to the PSA in the form of an Annex, which was then delivered to all JLSs; the PSAs were discussed and agreed with each of the water supply companies individually.

The experts took part in the initial visits to the water supply companies, when they informed the PUCs' staff and management of the Project's objectives and activities, in accordance with the Terms of Reference. Together with the staff members, they reviewed the current situation and compared it to the situation during the previous Project phase, and obtained the available documents. The water supply company staff is fully acquainted with their obligations.

On 23 December 2016, the planned seminar on pricing methodology was held in Dobož, when the issues and ambiguities related to the operational implementation of the proposed methodology were clarified.

The first phase conclusion on the Pricing Policy was that it would be crucial to formally establish cost centers within the shortest possible period of time and to introduce appropriate software for cost accounting and monitoring by categories and locations, as the necessary input information for calculating the prices according to the new proposed tariff methodology.

In the second reporting period, the focus in the area of 'Pricing Policy' was on additional clarifications of the proposed Draft Tariff Methodology that made an integral part (Annex) of the PSA, as well as on the arrangements related to the proposed cost centers accounting procedures.

The Consultants suggested the possible method for meeting the MEG Project's criteria in terms of cost centers accounting procedures in each of the water supply companies, which was generally accepted by the representatives of the companies, with minor or greater adjustments. Some of the companies have started applying these accounting procedures manually, while others, whose software solutions support cost centers accounting procedures, included them in their current applications.

Based on the completed accounting entries, the Consultants calculated the 'current cost price' of the water and sanitation services, and thereafter, proposed additional adjustments in some of the accounting entries. The general conclusion is that most of the entries were correct; that the cost centers, as well as the key to the allocation of indirect costs were determined, but that most of the water supply companies must continue working on the distribution of shared costs, in particular the costs associated with their employees.

At this stage of test calculations, it was not possible to determine the fixed part of the cost of services, since the requirements set out in the Tariff Methodology were not met.

For the "test" calculation purposes, the depreciation costs were calculated in relation to the fixed assets that were included in the companies' books during this period.

A draft Subsidization Methodology was delivered to the local self-government units and attached to the PSA as an Annex in each of the units that approved the PSA.

The third Project phase in the field of pricing policy was a continuation of the previous one and included new calculations of test prices, as well as new proposals for some of the entries.

In this Project phase, the Consultants also made an analysis of the affordability of services for each of the water supply companies, and the common position has been that when adjusting the amount of average revenues, the position must be commonly agreed.

In the light of the pricing policy, the utility companies expressed their concerns over the planned fixed assets revaluation and establishing of the more realistic, higher value of fixed assets and the subsequent increase in the depreciation, as a component that would be included in the calculation of prices. There was a concern that after the revaluation, the depreciation component would have a significant impact on the increase in water supply and sanitation prices, and that it would not be possible for this increase to be fully offset by the savings and rationalizations in other segments, such as reduced electricity consumption, smaller number of employees, and the like. The position of the Consultant is that the price increase does not have to occur, and that it would more important to allocate the depreciation funds in a meaningful way.

The position of the water supply companies, as well as the local self-government units, when it comes to pricing policy, is still rather skeptical, given that, in the opinion of the Consultant, they have not yet accepted this idea as their own and that they still share the same views and opinions as at the beginning of the Project implementation. Particularly stressed is the view that the sanitation cannot be separated as a single service and that the price thereof cannot be calculated adequately, but also the view that legal entities should continue paying a higher price for the services. In addition, there is also an open question of determining the adequate value of fixed assets.

4.9.4 Performance Indicators

The following performance indicators have been agreed:

- There is a documented tariff calculation methodology? (YES/NO)
- The price cover all the related costs? (YES/NO)
- The analysis of financial capacities of citizens is performed periodically? (YES/NO)
- There is cross-subsidization between customer categories and/or types of services? (YES/NO)
- There is an agreed tariff adjustment mechanism based on a documented methodology? (YES/NO)

In the initial phase of the Project, this indicator was mostly NO and only some of the water supply companies answered YES/partially, while the situation is different now, and all the water supply companies have a documented tariff methodology (with the exception of those who have not signed the PSA yet)

- Payment capacity - a share of household monthly invoice for water and sanitation services in the average total household income (%)

This indicator is different for all the water supply companies, however, the general conclusion is that the companies, in cooperation with Consultants, will have to work on reducing the relevant costs, in order to meet the limits of affordability of their services; otherwise, the local self-governments will have to subsidize a large number of residents.

Table 4.9.1: Overview of performance indicators for each of the 9 JKP tables

PRICING POLICY – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ¹⁸	E ¹⁹	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
There is a documented tariff calculation methodology?	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	YES	NO	YES
The price cover all the related costs?	YES	YES	NO	NO	YES	YES	NO	NO	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	NO	Partly (>50 %)	NO	NO	YES	YES
The analysis of financial capacities of citizens is performed periodically?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
There is cross-subsidization between customer categories and/or types of services?	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
Total revenue per user of services in relation to gross national income per capita			1.95%	1.87%	1.92%	1.70%			0.54%	0.53%			0.88%	0.76%	1.54%		0.53%	0.69%
Household bill amount with a consumption of 15 m3 per month (only water and sewerage, excluded charge and VAT)	268.2	214.6	144	115.2	324	259.2	255.6	204.5	297	237.6	171	136.8	228.6	182.9	259.2	207.4	152.6	152.6
Part of monthly household bill (15 m3, water and sewerage) in average household monthly income			2.22%	1.76%	4.54%	3.63%		3.10%	2.48%	1.98%	1.78%	1.43%	3.41%	2.67%	2.45%	2.06%	46.8%	1.82%

¹⁸ S – start of the contractual period

¹⁹ E – end of contractual period

Table 4.9.2: A summary overview of performance indicators for all 9 JKPs – realized progress

EFFICIENT NETWORK ZONING – PERFORMANCE INDICATORS	Beginning of period				End of period			
	number of YES	number of NO	number of Partly >50%	number of Partly < 50%	number of YES	Number of NO	number of Partly >50%	number of Partly <50%
There is a documented tariff calculation methodology?	3	6	0	0	5	4	0	0
The price cover all the related costs?	4	4	0	1	3	3	2	1
Periodically, is making checkup of the payment ability of the citizen?	1	8	0	0	1	8	0	0
There is cross-subsidization between customer categories and/or types of services?	5	4	0	0	4	5	0	0

4.10 COLLECTION AND ADMINISTRATION OF REVENUES, INVOICING CYCLE

4.10.1 Description of the Initial State

The common characteristics of the water supply companies at the initial phase of the Project were the following:

- System-based calculation of the collection rate is not performed per service, i.e. the collection rate is calculated summarily for all services. The same applies to the collection of claims irrespective of the invoicing period, while the real collection rate is, as a rule, much lower. .
- No information on the maturity dates of individual debts was obtained; Debts that are more than 180 days overdue make up the majority of claims.
- The water supply companies have no clearly defined procedures for illegal users and non-payers; there are no system-based inducement for increasing the collection rates, except for the legal proceedings.
- Some of the water supply companies had to a certain extent developed and adopted methodologies for invoicing and collecting revenues. The collection rates in such companies were relatively high (e.g. in Tešanj – above 95%).

4.10.2 Objectives

The general approach in the area of Collection and Administration of Revenues includes the following objectives:

- Analyze all payments and debts by type of service and maturity dates, and provide appropriate recommendations for improvement;
- Develop a draft and discuss the procedures for improving the collection rates;
- Support the implementation of the procedures for improving the collection rates and track their performance; update them if the results are poor;
- In the case of water supply companies that have recorded high collection rates, the objective was to further improve and formalize the procedures for collecting and administering revenues, and invoicing and collecting claims;
- Develop an operational communication plan in case of an increase in the price;
- Discuss the operational communication plan in case of an increase in the price with the PUCs and review it in line with the submitted comments.

4.10.3 Implemented Activities

The common approach within the first Project phase in the area of Collection and Administration of Revenues included the following:

- Analyze all payments and debts by type of service and maturity dates, and provide appropriate recommendations for improvement;
- Develop a draft and discuss the procedures for improving the collection rates;
- Support the implementation of the procedures for improving the collection rates and track their performance; update them if the results are poor;
- Develop an operational communication plan in case of an increase in the price;

- Discuss the operational communication plan in case of an increase in the price with the PUCs and review it in line with the submitted comments.

In this Project phase, draft invoicing procedures, as well as a prompt analysis of claims were developed. The water supply companies have no records of debts by their maturity dates, but are rather focused on the amounts, and based on the latter, they make decisions on possible imposition of compulsory collection measures. The water supply companies keep records of claims mostly by consumer categories, and for all services together. They have no ability to provide further details, either by type of service, or by maturity date of debt. Most water supply companies have large amounts of outdated claims that are still recorded in their books, and that are not written off.

The Consultant made an analysis of claims based on the available information, and provided the recommendations for improving the collection of revenues, the measures to be taken, as well as the draft procedures for collection of claims.

The Consultant proposed, *inter alia*, the following measures:

- Development of draft procedures for collection of claims (including consideration of early payment remuneration);
- Penalties and default interests for late payments;
- Termination of service in case of non-payment or late payment;
- Reduction in the level of services for permanent debtors, or those with fixed debt;
- A note on debts on the invoices;

Establishing criteria for the designation of socially vulnerable categories in cooperation with the municipality and identifying the socially disadvantaged consumers (natural persons) who cannot afford to pay the full price for services and defining the forms of financial support.

Determining the ways in which assistance is to be provided (vouchers, subsidies or other), and the parameters (amount of water to be subsidized per capita) and implementing the mechanism in close co-operation with the Municipality.

Establish an agreement with the local self-government unit regarding the payment of debts to the companies owned by the municipality.

In the final phase of the Project, these procedures were agreed with all the water supply companies.

Regardless of the absence of written procedures, during the Project lifecycle, all water supply companies have taken specific measures to increase their collection rates and, according to the reported performance indicators, have managed to do so.

The Consultant also developed a Draft Communication Operational Plan that would be used in the event of an increase in the price of the utility services. This Plan was accepted by all water supply companies.

4.10.4 Performance Indicators

This improvement area has the following measurable performance indicators:

- Percentage of collection measured as the ratio of collected revenues and invoiced services over the same period;
- Total amount of claims that are more than 180 days overdue;
- Number of illegal users of services;
- Number of users who do not pay the bills on a regular basis;
- Percentage of debtors who were disconnected from the network;
- Percentage of debtors who were sued in court;
- Average annual revenue per m3 (KM/m3);

- Average annual revenue per connection (BAM per connection);
- Average annual revenue per sanitation service user (KM/person);
- Average billing period in days;
- The level of cross-subsidization between different categories of consumers (or, is there cross-subsidization) (% or YES/NO);
- The water supply company has clearly defined procedures for illegal users and non-payers that they apply on a regular basis (YES/NO).

The indicator values for each of the water supply companies are given in the Appendices to this Report.

According to the Consultant's assessment, significant progress in this area can be expected in the coming year, as all the provisions of the PSAs signed will begin to apply only in that period and as the proposed measures for improving the collection rates will produce an effect.

Analysing performans indicators it can be seen that in 2017 in all utility companies increased number of connections has been shown compared to the same period in 2016 while the income is in the same level. This indicator should be checked in the future.

Tabela 4.10.1: Overview of performance indicators for each of the 9 JKP tables

COLLECTION AND ADMINISTRATION OF REVENUES, INVOICING CYCLE – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ²⁰	E ²¹	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Average revenue per m ³ , water and sewerage	1.99	2.06	1.29	1.27	2.04	1.98	1.28	1.22	1.86	1.83	1.19	1.19	1.4	1.47	1.43	1.47	1.24	1.24
Average annual revenue per connection	455.8	440.1	219.9	209	348.5	328.3	85.1	84.9	192.6	198.7	150	138.9	238.2	233.9	387.8	388.9	151.9	147.9
Average revenue per m ³ , only water	1.53	1.57	1.05	1.03	1.59	1.52	1.14	1.1	1.56	1.5	1.04	1.03	1.17	1.21	1.17	1.22	1.11	1.11
Average revenue per wastewater service user	23.06	24.28	15.25	14.83	25.09	22.91	14.3	13.83	9.63	10.92	7.29	7.25	27.7	29.39	25	22.39	15.25	15.42
Average period of payment – water and sewerage	142	118	172	105	109	171	95	79	96	87	387	326			584	618	148	140
Percentage of payment -water and sewerage	105%	103%	73.9%	108%	102%	113%	145%	146%	121%	118%	103%	110%			105%	102%	106%	111%
Internal subsidies between consumer categories - the ratio of water prices to legal entities and households	2.99	2.99	3.67	3.67	1.86	1.67	2.12	2.12	1.3	1.3	2.15	2.15	2.27	2.27	1.75	1.75	2.82	2.82
Percentage of users of the water supply service to whom the service is excluded - households	0.15%	0.08%	0.19%	0.27%	0.00%	0.00%	0.07%		0.15%	0.11%	0.01%	0.03%	0.01%	0.12%	0.03%	0.00%	0.05%	0.04%
Percentage of users of water supply services who are sued by the court - households	0.21%	0.13%	0.10%	0.08%	0.33%	0.01%	0.02%		0.00%	0.00%	0.00%	0.00%	0.20%	0.24%	2.37%	1.95%	0.32%	0.54%
Percentage of users of the water supply service to whom the service is excluded - legal entities	0.95%	0.17%	0.66%	0.34%	0.00%	0.00%	0.00%	0.18%	0.00%	0.21%	0.08%	0.04%	0.03%	0.14%	0.03%	0.00%	0.29%	0.38%
Percentage of users of water supply services who are sued by the court - legal entities	0.40%	0.09%	0.10%	0.10%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.12%	0.14%	0.51%	0.90%	0.55%	0.29%	0.29%

²⁰ S – start of the contractual period

²¹ E – end of the contractual period

COLLECTION AND ADMINISTRATION OF REVENUES, INVOICING CYCLE – PERFORMANCE INDICATORS	Start of period Average	End of period Average
Average revenue per m ³ , water and sewerage	1.52	1.53
Average annual revenue per connection	247.76	241.18
Average revenue per m ³ , only water	1.26	1.25
Average revenue per wastewater service user	18.06	17.91
Average period of payment – water and sewerage	216.63	205.50
Percentage of payment -water and sewerage	108%	114%
Internal subsidies between consumer categories - the ratio of water prices to legal entities and households	2.33	2.30
Percentage of users of the water supply service to whom the service is excluded - households	0.07%	0.08%
Percentage of users of water supply services who are sued by the court - households	0.39%	0.37%
Percentage of users of the water supply service to whom the service is excluded - legal entities	0.23%	0.16%
Percentage of users of water supply services who are sued by the court - legal entities	0.20%	0.19%

4.11 ACCOUNTING PROCEDURES AND MIS

4.11.1 Description of the Initial State

As regards the area of Accounting Procedures, in the initial phase of MEG project the Consultant identified a number of irregularities related to having in place the relevant rulebooks such as: Rulebook on Accounting Policies, Rulebook on Financial Matters, Rulebook on Cash Transactions, Rulebook on Archiving of Data, and particularly important Rulebook on Accounting of Expenditures and Revenues per Cost Centers.

The situation in the area of MIS is as follows:

Utility hardware and network infrastructures are not being regularly maintained, PCs are on average older than 6 years, and sometimes quite outdated. The practice of data storing and backup is rarely systematic. Most of utility companies do not have available and do not use any Management Information System (MIS).

The current state of play regarding financial management, accounting and accounting entry in water supply companies varies. Most companies have a financial and accounting department within their organizational structure. In case a company is not exclusively engaged in water supply and sanitation, financial and accounting operations are usually performed by a common service/department and for the entire company. The tasks performed by the employees of this department are mostly related to purely financial and accounting issues while in many cases budgeting/cost planning is not done, particularly not at the level of defined cost centers, nor is the implementation of the potential plan analyzed.

It has been noted that many operations in these departments are done manually, and almost by a rule there are overlaps in operations and book entries, with multiple entries of some data. This is a consequence of outdated or incomplete accounting software in many water supply companies, the consequence of which is also a lack of links between different accounting modules. Only the reports prescribed by the law are prepared by means of accounting software, if it has this option available, while many other reports are done manually by simple count and calculations done by the head of department. There are also situations where an array of options for development of different reports offered by the accounting software have not been used because the relevant department has no capacity for this.

The practice shows a very frequent situation where water supply companies are not able to analytically single out each business activity (water supply, wastewater disposal, other activities such as waste management, heating, park areas, etc.) as they only keep aggregated data about both the costs and revenues for the entire company.

Essentially, the water supply companies' problem lies in inadequate entry of costs incurred, usually at the position of the entire company instead of that where they had been incurred, i.e. defined cost center. All accounting records are kept at the level of company as a whole; hence revenues, costs and financial results are recorded in this way too. Systemic records are not kept so as to be able to link individual costs (or revenues) with the relevant services or activities and even the fixed assets are not kept analytically per cost centers or business units.

In more complex utility companies, which provide a number of other services such as transport of solid waste, management of public green areas or parking lots, green markets, cemeteries, etc., this problem is even more acute. However, it has to be stressed that the problem exists in companies such as "water supply and sanitation company" because it is impossible to precisely calculate the individual water supply and wastewater tariffs due to such bookkeeping. Due to a lack of precise data

on the relevant costs, the wastewater tariff is often determined in a proportional relation to the water tariff, and based on the company's own assessment (e.g. 30%, 50% and the like).

In any case, it is necessary to define clearly separated cost centers in the company which will provide for separate entry of costs (and revenues) of water supply services and those of sanitation, and of course, of costs of all other services. Revenues also have to be entered based on the costs centers/business units, and reporting on the costs and revenues by business units should be enabled through the accounting software. Of course, in terms of reporting, such a software has to provide synthetic reporting by larger organizational units, which include individual cost centers, and hence aggregated reporting for the entire company.

4.11.2 Objectives

The project inception phase defined the reference level of potential improvements area as:

- Adopt and implement the accounting rulebooks: Rulebook on Accounting Policies, Rulebook on Financial Transactions, Rulebook on Petty Cash, Rulebook on Keeping the Accounting Documentation.
- Adopt and define cost centers which will enable not only separation of costs and revenues of individual services but also supervision and optimization of all costs, as well as performance indicators which will be monitored,
- Costs and revenues are calculated by cost centers, reports are developed regularly at the level of cost centers and optimization of costs is used. Adopt and implement indirect costs distribution pattern, with the consent of business, i.e. organizational units, in order to enable recognizing relevant costs for each service. Indirect costs should be distributed based on a pattern which would be defined based on direct costs of a business unit as follows:
 - Employees' wages,
 - Number of employees,
 - Depreciation,
 - Other operating costs (electricity, equipment maintenance, insurance, etc.).
- Chart of accounts tailored to the needs of utility companies so as to enable development of a detailed balance sheet and income statement, as well as other dedicated financial reports needed for operational and strategic management and also to provide a basis for operational and capital budgeting (harmonized with international accounting practices according to which monthly reports are developed). This will facilitate monitoring of revenues and expenditures in more details, and more importantly their separation per cost centers and business functions. It is only with such an improved chart of accounts which provides insight into the real costs by types of services the company provides that consistent pricing of these services will be made possible. The new chart of accounts model should use a flexible account structure which is based on cost centers while the company itself should be able to determine the level of details.

4.11.3 Implemented Activities

In order to attain the above mentioned objectives, consultants assessed and analyzed in details the current state of accounting and its processes in each of 9 water supply companies to get an updated status for this area. A combination of desktop analysis, questionnaires received from water supply companies and field visits have been used to this end.

The following activities have been implemented:

- Detailed analyses of accounting software, analyses of the processes, elaboration of methodology and modification of accounting separation and cost accounting drafts to meet the specific needs of utility companies, and defined list of indicators to be monitored,
- A draft chart of accounts was developed and adapted to utility companies, which then public utility company tailored as needed,
- Proposal of cost centers was prepared, which public utility company adjusted and adopted,
- Draft internal bookkeeping rulebooks were designed (Rulebook on Accounting Policies, Rulebook on Financial Operations, Rulebook on Petty Cash, Rulebook on Keeping the Accounting Documentations), which public utility company adjusted, adopted and implemented,
- Theoretical and practical parts of training course related to cost separation have been delivered,
- Activities on implementation of set objectives supported.

At the initial Project phase, the consultants provided support to water supply companies in terms of guidelines for the necessary future activities which were then further managed by the water supply companies. Consequently, following the analysis of accounting systems, a recommendation was issued to replace the existing system due to its being outdated and incomplete in 4 water supply companies while for other 5 companies recommendations related to the specific segments which could be improved by upgrading the existing systems, thus bring the existing solutions to the desired level.

As regards the internal bookkeeping rulebooks, draft documents were developed and submitted for further adjustment, adoption and implementation to those water supply companies which did not have or had inadequate rulebooks regulating this area.

The Consultant developed individual proposals of cost centers which were then submitted to the water supply companies for adjustment and adoption.

A model chart of accounts was developed and adjusted, the primary goal of which is to enable preparation of a more detailed balance sheet and income statement, as well as other dedicated financial reports necessary for operational and strategic management and to provide a basis for operational and capital budgeting (harmonized with international accounting practices according to which monthly reports are developed). This will facilitate monitoring of revenues and expenditures in more details, and more importantly their separation per cost centers and business functions. The improved model of accounting records provides insight into the real costs by types of services the company provides, thus enabling consistent pricing of these services. The new model of records is based on a flexible structure which is based on cost centers while the company itself is in a position to decide on the level of details.

Taking account of the initial state of water supply companies in this area, a considerable progress has been made. All 9 water supply companies accepted the idea that it is necessary to separate costs per cost centers, elaborated it in a quality manner, and in line with this made important business decisions. 5 water supply companies, whose accounting software needed just an upgrade to bring it to the adequate level of cost accounting, implemented the improvements in order to meet the set objectives. 4 water supply companies, which did not have adequate accounting software, opted for replacement of the entire software solution, and started the procurement process either through MEG project or on its own. According to the available information, they are implementing the new software solutions and, according to the consultant's assessment, the software will be functional beginning of next year.

Given the aforesaid, in the next project phase it will be necessary to provide consulting assistance regarding adequate settings of the new software solutions in order to meet the needs of book entry in line with the MEG project recommendations.

Further details about the initial and current state of play could be found in indicators by areas in the following text.

Improvement can be seen by analyzing performance indicators of unit operating costs just for water and unit operating costs just for sanitation where it can be seen that there has been an increase in unit costs for water supply and a decrease in unit costs for sewage, which is realistic because most utility companies have significant costs on water supply services, while significantly higher costs on sewer services have been recorded in the previous period. Also, it can be noticed that operating costs are mostly unrealistically determined in the previous period, so it is ensured that the coverage of them is enormously large (eg utility company Prnjavor). An analysis of the indicators in this area show also improvement in this respect.

4.11.4 Performance Indicators

Key performance indicators in this area have been selected, measured and described:

- New chart of account is developed and in use?? (YES / NO)
- Cost centers are defined and the costs and revenues are recorded at appropriate cost centers? (YES / NO)
- Reports based on the cost centers structure are regularly used for effective management and tariff setting? (YES / NO)
- Indirect cost distribution pattern is defined, adopted and in use? (YES / NO)
- Improved accounting software is installed and in use (potentially indicators per modules, are they integrated)? (YES / NO)
- Unit operating costs for water and sanitation (KM/m³, in relation to the total invoiced water)
- Unit operating costs for water and sanitation (KM/m³, in relation to the total water abstracted)
- Unit operating costs just for water (KM/m³, in relation to the total invoiced water)
- Unit operating costs just for sanitation (KM/person, in relation to the total number of population - users of this service)
- The share of labor costs in operating costs (%)
- The share of energy costs in operating costs (%).

The values of indicators by areas and utility companies are given bellow.

Table 4.11.1: Overview of performance indicators for each of the 9 JKP tables

ACCOUNTING PROCEDURES AND MIS - PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ²²	E ²³	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
New chart of account is developed and in use	YES	YES	NO	YES	YES	YES	yes	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Cost centers are defined and the costs and revenues are recorded at appropriate cost centers	YES	Partly (>50%)	NO	YES	YES	YES	YES	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	NO	YES	NO	NO	YES	YES
Reports based on the cost centers structure are regularly used for effective management and tariff setting?	YES	Partly (>50%)	NO	Djelo mično (>50 %)	Djelo mično (<50 %)	Djelomično (<50%)	NO	NO	YES	NO	NO	Djelo mično (<50 %)	NO	Partly (>50 %)	NO	NO	YES	Partly (>50 %)
Indirect cost distribution pattern is defined, adopted and in use?	YES	YES	NO	NO	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	YES	Djelo mično (<50 %)	YES	NO	NO	NO	YES
Improved and integrated accounting software is installed and in use ?	YES	NO	Partly (<50 %)	Partly (>50 %)	YES	YES	NO	NO	YES	Partly (<50 %)	NO	NO	Djelo mično (>50 %)	YES	NO	NO	YES	NO

²² S – start of the contractual period

²³ E – end of the contractual period

RAČUNOVODSTVENE PROCEDURE I MIS - INDIKATORI USPJEŠNOSTI	Doboj		Gračаница		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ²⁴	E ²⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Unit operating costs for water and sanitation (KM/m ³ , in relation to the total invoiced water)	1.723	2.228	1.089	1.244	2.038	1.953	0.002	1.019	0.367	0.714	1.514	1.312	1.185	1.679	1.433	1.347	0.942	1.038
Unit operating costs for water and sanitation (KM/m ³ , in relation to the total water abstracted)	1.145	1.48	0.719	0.842	1.004	0.874	0.001	0.638	0.247	0.512	0.932	0.752	0.897	1.266	0.712	0.663	0.673	0.634
Unit operating costs just for water (KM/m ³ , in relation to the total invoiced water)	0	0	0.817	0.933	1.325	1.224	0.002	0.972	0.293	0.607	0	0	0.829	1.583	1.196	1.118	0.927	0.803
Unit operating costs just for sanitation (KM/person, in relation to the total number of population - users of this service)	3461 55	2450 26			2172	3651			352.65	302.2			103.9					
The share of labor costs in operating costs (%)	69.9%	55.6%	62.4%	57.5%	38%	35.3%	70.20%	97.8%	278.4%	149%	60.8%	64.9%	30.8%	18%	50.4%	51.5%	87.8%	78.4%
The share of energy costs in operating costs (%)	6.64%	5.45%	5.33%	6.20%	13.8%	15%	11.72%	18.3%	32.10%	24.8%	6.33%	8.32%	13.8%	9%	12.9%	14.1%	3.58%	3.37%

Tabela 4.11.2: A summary overview of performance indicators for all 9 JKPs – realized progress

ACCOUNTING PROCEDURES AND MIS – PERFORMANCE INDICATORS	Start of the period				End of the period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
New chart of account is developed and in use??	7	2	0	0	8	1	0	0
Cost centers are defined and the	4	3	1	1	5	1	2	1

²⁴ S – početak ugovornog perioda

²⁵ E – kraj ugovornog perioda

ACCOUNTING PROCEDURES AND MIS – PERFORMANCE INDICATORS	Start of the period				End of the period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
costs and revenues are recorded at appropriate cost centers?								
Reports based on the cost centers structure are regularly used for effective management and tariff setting?	3	5	0	1	0	3	4	2
Indirect cost distribution pattern is defined, adopted and in use?	1	6	0	2	4	4	0	1
Improved and integrated accounting software is installed and in use ?	4	3	1	1	2	5	1	1

ACCOUNTING PROCEDURES AND MIS – PERFORMANCE INDICATORS	Start of period Average	End of period Average
Unit operating costs for water and sanitation (KM/m ³ , in relation to the total invoiced water)	0.70	0.85
Unit operating costs for water and sanitation (KM/m ³ , in relation to the total water abstracted)	0.60	0.80
Unit operating costs just for water (KM/m ³ , in relation to the total invoiced water)	115.537	302.20
Unit operating costs just for sanitation (KM/person, in relation to the total number of population - users of this service)	83%	68%
The share of labor costs in operating costs (%)	12%	12%

4.12 BUDGETING AND DEVELOPMENT OF BUSINESS PLANS

4.12.1 Description of the Initial State

Most of the water supply companies shared the following common features at the initial phase:

- Budget execution and implementation of business plans are not analyzed nor are any corrective actions undertaken;
- Operating budget is not developed by the cost position nor is there a sufficiently detailed cost analysis in the narrative part of the budget;
- There is no capital investments budget employing own funds;
- Planning and budgetary operations are mostly done at the level of finance and accounting departments. There is no staff member formally responsible for analysis and implementation of plans;
- There are no written instructions related to the preparation of budgets and business plans nor is there a method in place for development of these documents;
- Annual plans are being prepared, however planning is mostly done by means of assessment of increases in certain percentages relative to the previous year. There is a lack of comparison and analysis between planned and current implementation and corrective measure are not being proposed;
- Budget execution and implementation of business plans are not being analyzed nor are any corrective actions taken;
- Operating budget is not developed by the cost position nor is there a sufficiently detailed cost analysis in the narrative part of the budget;
- Capital investments budget employing own funds cannot be considered satisfactory since there is a lack of cost analysis for capital investments from other sources and these sources are not defined.

The activities concerning planning, budgeting, analyses, etc. are mainly performed by accounting, finances and economic affairs departments.

None of the water supply companies has written procedures for preparation of budgets and business plans in place nor is there a methodology in place for preparation of these documents.

Budgeting (financial forecasting) and business plans, if developed, are developed at the level of company and very rarely for individual services. There are no clearly defined procedures or responsibilities for development of plans.

The mandatory 3-year plans are prepared by most water supply companies. Generally, 3-year plan includes a list of company's objective for the planning period; however with no detailed action plan in support of these objectives and with no defined responsibilities for implementation of the set objectives. The individual reports provide details of the way these plans are developed for each water supply company.

Business planning was at a high level in some water supply companies. For example, Gračanica water and sanitation company used to develop plans on monthly, quarterly, 6-month and 9-month basis in addition to the annual and 3-year plans.

Budget execution and implementation of business plans are not being analyzed nor are any corrective actions taken.

Capital investments budget employing own funds does not exist in any of the water supply companies.

4.12.2 Objectives

The general approach in this area includes the following:

- Operating budgets are prepared regularly by cost centers and on consolidated basis.
- There is a basic module for capital budget in place.
- Business planning process is documented and regularly implemented.
- Analyses of business plans and budget execution are regularly performed and corrective measures are undertaken.

The objectives for this area of improvements are defined as follows:

- Train company's management, including heads of each department, on the basis of budgeting and business planning.
- Develop operating budget by cost centers (business units) and prepare it on annual and 3/6 month basis, and use it for management improvements.
- Develop a 3-year business plan (medium-term).
- Analyze business plan and budget execution and make a decision on the necessary corrective actions.
- Prepare the basic module for capital budget as part of the tariff model.
- Include evaluation and projections of selected KPI in the business plan.

4.12.3 Implemented Activities

In the first Project quarter, financial experts coordinated their activities, held internal meetings and agreed on the future *modus operandi* and common approach. The elements which business plans of the relevant utility companies need to include were agreed. Also, a theoretical training course was delivered on this common topic for all 9 water supply companies.

In this Project phase, the Consultant analyzed 2015 and 2016 plans as well as annual activity reports for 2015. The state of play was as follows:

- Budget execution and implementation of business plans are not analyzed nor are any corrective actions taken;
- Operating budgets are not developed by the cost position nor is there a sufficiently detailed cost analysis in the narrative part of the budget;
- There is no capital investments budget employing own funds.

The planned seminar on strategic planning and budgeting procedures was held in Doboj, on November 23, 2016, focusing on cost centers and the principle of consolidation of plans in order to have an overall plan for the entire company. The seminar gathered representatives of local self-government units participating in the project.

In the second Project phase, the Consultant updated the draft budgets in accordance with the planned employee cost reduction and with cost planning for NRW reduction.

In principle, water supply companies adopted the drafts and proposals for both annual plan and operating budgets as well as projections for 3-year plans; however none of the companies adopted these formally nor included them in the existing business plans, with the exception of Tuzla water supply company.

All water supply companies committed to align their business plans accordingly and develop new ones in accordance with MEG recommendations by the end of September 2017.

At the time of preparation of the summary report, draft 5-year business plans were developed in accordance with MEG Project recommendations by the following water supply companies: Gračanica, Žepče and Prnjavor (chronologically as they were submitted).

4.12.4 Performance Indicators

This area of improvements can hardly have numerical performance indicators expressed; however they have been described as follows:

- Operating budget and cash flow projections are established per cost center and on cumulative basis? (YES/NO)
- 3-year plan is developed per cost centers? (YES/NO)
- Capital budget developed per cost centers and on cumulative basis? (YES/NO)

The annual business planning cycle is implemented? (YES/NO)

Table 4.12.1: Overview of performance indicators for each of the 9 JKP tables

BUDGETING AND DEVELOPMENT OF BUSINESS PLANS – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ²⁶	E ²⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Operating budget and cash flow projections are established at cost centers and on summative basis?	NO	NO	NO	Partly (<50 %)	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	DA	Partly (>50 %)
Is there a basic capital budget module?	NO	NO	NO	NO	NO	NO	YES	YES	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	YES	YES	Partly (<50 %)	Partly (>50 %)
The cycle of annual business planning has been implemented?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES

Table 4.12.2: A summary overview of performance indicators for all 9 JKPs – realized progress

BUDGETING AND DEVELOPMENT OF BUSINESS PLANS – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
Operating budget and cash flow projections are established at cost centers and on summative basis?	1	6	0	2	0	5	1	3
Is there a basic capital budget	2	5	0	2	2	5	1	1

²⁶ S – start of the contractual period

²⁷ E – end of the contractual period

BUDGETING AND DEVELOPMENT OF BUSINESS PLANS – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
module?								
The cycle of annual business planning has been implemented?	8	1	0	0	8	1	0	0

4.13 FINANCIAL MANAGEMENT

4.13.1 Description of the Initial State

All companies implement the Public Procurement Law procedures though not all companies had written procedures for their implementation in place.

Written procedures for internal work order are mostly undefined, and if defined, there is room for improvement.

4.13.2 Objectives

The following objectives have been set for financial management:

- Full implementation of the Public Procurement Law procedures;
- Procedures for internal work order documented and in use.

4.13.3 Implemented Activities

In this area the experts analyzed the current state regarding the company's public procurement system as well as whether the work order system is in place.

As regards Public Procurement Procedures the Consultant developed (or improved) the procedures for implementation of the Public Procurement Law, which were revised and finally adopted following the discussions with the representatives of water supply companies. The procedure was not adopted by Tešanj utility company as the opinion of the company was that this is redundant since the Public Procurement Law is being implemented properly. The Consultant and UNDP representatives agreed with this at the meeting held in Tešanj.

The Consultant developed a draft internal work order procedure which was discussed and in principle accepted by most water supply companies. The adopted procedures are being implemented, however not always fully.

The Consultant found the idea to have a software (which is not the case now) linking the failures reported by users, issuing of work orders and feedbacks to the users on intervention performed a useful suggestion.

4.13.4 Performance Indicators

There are both numeric and descriptive performance indicators in this area of improvements:

- The public procurement system implemented? (YES/NO);
- The internal workflow of work orders is documented and in use? (YES/NO).

Table 4.13.1: Overview of performance indicators for each of the 9 JKP tables

FINANCIAL MANAGEMENT - PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ²⁸	E ²⁹	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
The public procurement system implemented?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
The internal workflow of work orders is documented and in use?	YES	YES	YES	YES	Partly (>50 %)	Partly (>50%)	PARTLY	Partly (>50 %)	YES	YES	NO	NO	YES	YES	YES	YES	NO	YES

Table 4.13.2: A summary overview of performance indicators for all 9 JKPs – realized progress

FINANSIJSKI MENADŽMENT – INDIKATORI USPJEŠNOSTI	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NO	Number of Partly >50%	Number of Partly <50%
The public procurement system implemented?	9	0	0	0	9	0	0	0
The internal workflow of work orders is documented and in use?	5	2	1	1	6	1	2	0

²⁸ S – start of the contractual period

²⁹ E – end of the contractual period

4.14 MANAGEMENT OF FIXED ASSETS AND INVENTORY

4.14.1 Description of the Initial State

Water supply companies calculate depreciation of own fixed assets. Depreciation is calculated in the accounting software where all data on assets, depreciated values, to date depreciation and current asset values are recorded. In some water supply companies, depreciation is calculated manually.

Software modules for fixed assets are not integrated with other modules.

None of the water supply companies records assets by business units but for the company as a whole.

Depreciation is generally not calculated for assets owned by municipalities and given to water supply companies to manage. The problem all companies have is that calculated depreciation is not only used to renew fixed assets but also to cover other running costs.

Movable and immovable property is entered by the type of fixed assets in the fixed assets ledger. All fixed assets are entered into the company's books, however the assets municipalities gave companies to manage do not exist in the company's books, are partially entered or are kept in off-balance records. Given that depreciation is calculated based on the value of entered fixed assets, investments into maintenance are at risk because funds for this purpose are not allocated for all assets which a relevant company maintains.

Water supply companies do not perform realistic revaluation of asset value.

Though calculation of depreciation is done in different ways, there are no significant differences in this segment in LOT 2 water supply companies, except for Tuzla water supply company which has an agreement with the City of Tuzla which partially regulates the issue of depreciated assets in a way that the fee for use is spent on maintenance.

4.14.2 Objectives

The following objectives have been set for management of fixed assets and inventory:

- Conduct inventory and revaluation of all fixed assets, update the fixed assets ledger;
- Analyze adequacy of the existing software in order to integrate it with other modules, thus facilitating automated calculation of depreciation based on the given depreciation classes;
- Incorporate realistically calculated depreciation into the tariff model;
- Allocate funds from calculated and reimbursed depreciation fully to a specific sub-account and use them exclusively for asset renewal.

4.14.3 Implemented Activities

In this area the Consultant analyzed company's records and inventory lists of fixed assets and concluded the following:

- Most difficulties were found in this area given that none of the water supply companies had detailed lists of the entire infrastructure for a number of reasons. Water supply companies account their fixed assets and depreciate them on regular basis; however they are not regularly revaluated and hence, the values are often understated. Public goods are owned by local self-government units and their values are not realistic either nor are they appropriately recorded so as to be able to determine whether the assets relate to water supply or wastewater services.

Based on the mapping of water infrastructure and the existing data available from water supply companies, the Consultant developed a proposal of updated lists of fixed assets and of their assessed value.

The proposal to include depreciation in the price of service and to establish a 'depreciation fund' was provided as part of PSA and was, in principle, adopted by all water supply companies. General, additional comments include:

- Considering that adoption of organizational changes related to the establishment of cost centers and separation of revenues and expenditures by cost centers is a precondition for majority of needed actions, it is necessary to adopt this concept as soon as possible and adjust the existing calculation system. Also, this certainly includes implementation of appropriate software solutions to support such a calculation.
- Determining the real value of fixed assets is a potential problem (in particular due to the issues of still ongoing privatization), i.e. concern that the value of fixed assets will be recorded inadequately.

The deadlines set by the Terms of Reference in this area could not be met in full, because most water supply companies, and also local self-government units, have no clear overview of all fixed assets or their value. Moreover, in 2 local self-government (Gračanica and Gradačac) units there are final court verdicts to partially annul the privatization, requiring the removal of the utility infrastructure from the ownership of those water supply companies which are registered as a joint-stock company.

4.14.4 Performance Indicators

The following indicators have been selected for this area of improvements:

- Regular inventory of fixed assets is conducted, fixed assets ledger is up to date? (YES/NO);
- Revaluation of all fixed assets is carried out periodically, where necessary, and is regulated by an internal regulation? (YES/NO);
- A software module for fixed assets ledger is used, integrated with other modules and enables automated calculation of depreciation based on the given depreciation classes? (YES/NO);
- Realistically calculated depreciation is part of the tariff model? (YES/NO);
- Regular inventory checks are conducted and procedures for removing assets from inventory are documented and implemented? (YES/NO);
- Annual value level of depreciation of fixed assets (in KM);
- Status of inventory (in KM)
- Average number of asset storage days

Tabela 4.14.1: Overview of performance indicators for each of the 9 JKP tables

MANAGEMENT OF FIXED ASSETS AND INVENTORY – PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³⁰	E ³¹	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Regular inventory of fixed assets is conducted, fixed assets ledger is up to date?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Revaluation of all fixed assets is carried out periodically, where necessary, and is regulated by an internal regulation?	NO	NO	NO	NO	NO	NO	Partly	Partly (>50%)	NO	NO	Partly (<50%)	Partly (<50%)	NO	NO	YES	YES	NO	NO
A software module for fixed assets ledger is used, integrated with other modules and enables automated calculation of depreciation based on the given depreciation classes?	YES	YES	YES	YES	YES	YES	NO	NO	Partly (>50%)	YES	YES	YES	YES	YES	YES	YES	NO	YES
Realistically calculated depreciation is part of the tariff model?	YES	YES	Partly (<50%)	Partly (<50%)	Partly (>50%)	Partly (>50%)	NO	Partly (<50%)	YES	YES	NO	NO	Partly (>50%)	Partly (>50%)	NO	NO	YES	YES
Regular inventory checks are conducted and procedures for removing assets from inventory are documented and implemented?	YES	YES	YES	YES	YES	YES	NO	Partly (<50%)	YES	YES	YES	YES	YES	YES	YES	YES	YES	DA
Annual value level of depreciation of fixed assets	473,388	326,666	102,211	53,677	193,558	145,887	19,311	12,310	156,378	104,543	124,002	66,209	685,525	439,675	936,977	457,218	113,116	56,559
Average number of asset storage days(average number of days which asset spend on storage)			215	210	276	438			75	350			438	888	27	66	30	30

Table 4.14.2: A summary overview of performance indicators for all 9 JKPs – realized progress

MANAGEMENT OF FIXED ASSETS AND INVENTORY – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NE	Number of Partly >50%	Number of Partly <50%
Regular inventory of fixed assets is conducted, fixed assets ledger is up to date?	9	0	0	0	9	0	0	0
Revaluation of all fixed assets is carried out periodically, where necessary, and is regulated by an internal regulation?	1	6	0	2	1	6	1	1
A software module for fixed assets ledger is used, integrated with other modules and enables automated calculation of depreciation based on the given depreciation classes?	6	2	1	0	8	1	0	0

³⁰ S – start of the contractual period

³¹ E – end of the contractual period

MANAGEMENT OF FIXED ASSETS AND INVENTORY – PERFORMANCE INDICATORS	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partly >50%	Number of Partly < 50%	Number of YES	Number of NE	Number of Partly >50%	Number of Partly <50%
Realistically calculated depreciation is part of the tariff model?	3	3	2	1	3	2	2	2
Regular inventory checks are conducted and procedures for removing assets from inventory are documented and implemented?	8	1	0	0	8	0	0	1

4.15 WATER QUALITY AND QUANTITY

4.15.1 Description of the Initial State

- Most water supply companies (6 of them) have no problems with the provision of sufficient quantities of drinking water. 3 water supply companies (Doboj, Kalesija and Tešanj) have problems with the provision of sufficient quantities of water in poor water years (summer period or longer periods without precipitation).
- Doboj and Kalesija water supply companies have relevant studies developed, and the possibilities for identifying potential new water sources to resolve the issue of sufficient water quantities have been analyzed.
- Tešanj water supply company is in the most difficult situation regarding this issue since water is very scarce in this municipality. No new studies or analyses of the potential new water sources have been developed in this municipality.
- Majority of water supply companies have a drinking water treatment facilities in place (6 companies). Generally, these facilities are not fully automated. In some cases the available quantity of water is limited by the capacity of the facility.
- Studies on sanitary protection zones for all water sources are in place in most water supply companies, with the exception of Prnjavor company. The studies are in accordance with the applicable legislation. Protection zones are defined by these studies as well as the measures that need to be implemented. In practice, measures are usually implemented only in the first protection zone.
- Wastewater treatment devices have been installed in Gardadžac and Žepče municipalities and both are in operation. The device in Gradačac was reconstructed in 2016. Both devices meet the effluent quality parameters defined by the Decree on Conditions for Discharge of Wastewater into Natural Recipients and Public Sewer Systems, BiH Federation Official Gazette No. br. 101/15, 1/16.
- Teslić and Tešanj municipalities are involved in WATSAN projects through which a wastewater treatment facility should be built.
- In its short-term plans, Kalesija municipality addresses the issue of wastewater treatment in the center of the municipality. In Kalesija wastewater puts at risk the quality of drinking water at the water source of the public water supply system.
- Prnjavor municipality and the City of Doboj included this issue in their planning documents. The City of Tuzla has not yet started implementing the activities to address the issue of treatment of wastewater from public sewage system.

4.15.2 Objectives

The objectives for this area are:

- Provision of sufficient quantities of drinking water which will meet the needs of users.
- Water supply companies which have problems with water quality will provide adequate water treatment.
- Develop a plan and a register of water quality sampling and adequate database for recording key quality parameters. Enable access to data via Internet.

- Treat wastewater before discharging it to the recipient (designing, construction and operation of the wastewater treatment facility).

4.15.3 Implemented Activities

The implemented activities are given below:

- A questionnaire was prepared in order to collect relevant data and submitted to all water supply companies.
- All water supply companies have been visited with the aim of filling in the questionnaire and collecting data.
- All collected data have been analyzed and based on the analysis conclusions specific guidelines and advices have been given to water supply companies regarding, primarily, construction of wastewater treatment facilities.
- Based on the analysis of metering made in DMA thus far, the Consultant assessed that Kalesija and Tešanj water supply companies do not have realistic possibilities to significantly improve the situation regarding water supply by reducing the losses because the measured values of losses are below the economic threshold below which the physical losses are not reduced; however taking into consideration the importance of this issue, measuring in the entire systems should be performed in the next Project phase in order to reach the final conclusion and potentially identify areas where real losses could be reduced.

4.15.4 Performance Indicators

The selected performance indicators in this area are:

- Quantity of abstracted water by water sources (m³/month)
- Energy consumption by water sources (kWh/month)
- Total number/number of unacceptable water samples at water sources (by months)

Tabela 4.15.1: Overview of performance indicators for each of the 9 JKP tables

WATER QUALITY AND QUANTITY - PERFORMANCE INDICATORS	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³²	E ³³	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Water production	165.1	157.1	211.1	204.4	136.1	158	82.65	77.46	89.29	79.93	135.1	147.1	170.4	160.6	368.9	364.3	150.3	174.7
Continuity of service delivery, average hours of water supply per day	24.00	24.00	23.87	23.90	24.00	24.00	24.00	24.00	23.99	23.99	24.00	24.00	24.00	23.24	24.00	24.00	23.96	23.95
Water quality - number of residual chlorine tests			100%	106%	168%	100%	100%	100%		944%	100%	100%	103%	100%	100%	100%	100%	101%
Water quality - number of successful residual chlorine tests	100%	100%	98.4%	98%	59%	100%	100%	100%	100%	100%	98%	97%	100%	99%	100%	100%	96%	95%

WATER QUALITY AND QUANTITY - PERFORMANCE INDICATORS	Start of period Average	End of period Average
Water production	160.34	168.27
Continuity of service delivery, average hours of water supply per day	23.99	23.90

³² S – start of the contractual period

³³ E – end of the contractual period

WATER QUALITY AND QUANTITY - PERFORMANCE INDICATORS	Start of period Average	End of period Average
Water quality - number of residual chlorine tests	182%	206%
Water quality - number of successful residual chlorine tests	99%	99%

5. Total number/number of unacceptable water samples in water supply network (by months). SUMMARY TABLE OF PERFORMANCE INDICATORS

5.1 Individual tables by local self-government units:

INDICATORS (by areas)	Unit of measurement	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
		S ³⁴	E ³⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Production and consumption of water																			
Water production	l/person/day	167	157	208.6	204.4	126	148.2	70.43	77.46	88.96	79.93	121	147.1	155	161	357.1	364.3	149	175
Water consumption	l/person/day	106	104	137.6	138.4	62	66	48.46	48	59.95	57.40	74.51	84.22	117.3	121.1	177.4	179.3	106.4	106.7
Residential water consumption	l/person/day	88.49	88.1	113.5	112.2	50.31	50.07	42.60	41.94	48.66	47.07	60.11	64.79	90.88	83.93	106.6	108.9	87.69	87.56
Non-revenue water																			
Non-revenue water	%	36%	34%	34%	32%	51%	55%	31%	37%	33%	28%	38%	43%	24%	22%	50%	51%	29%	39%
Non-revenue water	m ³ /km/day	22.53	19.2	8.76	8.15	24.93	32.39	2.08	2.75	2.10	1.60	15.54	20.98	3.62	3.75	35.93	37.00	4.27	6.95
Non-revenue water	m ³ /connection/day	0.33	0.28	0.22	0.21	0.42	0.55	0.08	0.10	0.14	0.11	0.18	0.25	0.13	0.14	0.71	0.72	0.13	0.22
Real losses (% of water abstraction)	%	30%	27%	31%	29%	51%	55%	31%	37%	28%	25%	0.00%	0.00%	24%	22%	36%	37%	29%	39%
Real losses (m ³ per connection per day)	m ³ /connection/day	0.268	0.22	0.199	0.184	0.424	0.545	0.079	0.105	0.120	0.096	0.000	0.000	0.129	0.135	0.512	0.526	0.128	0.215

³⁴ S – start of the contractual period

³⁵ E – end of the contractual period

INDICATORS (by areas)	Unit of measurement	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
		S ³⁴	E ³⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Apparent losses (% of water abstraction)	%	6.46%	7%	3%	3%	0.00%	0.00%	0.00%	0.00%	4%	3%	38%	43%	0.00%	0.00%	14%	14%	0.00%	0.00%
Apparent losses (m ³ per connection per day)	m ³ /connection/day	0.058	0.06	0.021	0.022	0.000	0.000	0.000	0.000	0.018	0.013	0.184	0.248	0.000	0.000	0.196	0.196	0.000	0.000
Costs																			
Unit operating costs for water and sanitation, in relation to the total water sold	KM/ m ³	1.723	2.228	1.089	1.244	2.038	1.953	0.002	1.019	0.367	0.714	1.514	1.312	1.185	1.679	1.433	1.347	0.942	1.038
Unit operating costs for water and sanitation in relation to the total water abstraction	KM/ m ³	1.145	1.480	0.719	0.842	1.004	0.874	0.001	0.638	0.247	0.512	0.932	0.752	0.897	1.266	0.712	0.663	0.673	0.634
Unit operating costs just for water in relation to sold water	KM/ m ³	0.000	0.000	0.817	0.933	1.325	1.224	0.002	0.972	0.293	0.607	0.000	0.000	0.829	1.583	1.196	1.118	0.927	0.803
Unit operating costs just for sanitation in relation to the number of users	KM/inhabitants	3461 55	2450 26			2172	3651			352.6 5	302.2			103.9					
The share of staff costs in operating costs	%	69.9%	55.6%	62.4%	57.5%	38%	35.3%	70.2%	97.8%	278%	149%	60.8%	64.9%	30.8%	18%	50.4%	51.5%	87.8%	78.4%
The share of energy costs in operating costs (%)	%	6.64%	5.45%	5.33%	6.20%	13.8%	15%	11.7%	18.3%	32.1%	24.8%	6.33%	8.32%	13.8%	9%	12.9%	14.1%	3.58%	3.37%
The share of costs of external contracts in operating costs (outsourcing)	%	0.00%	0.00%	30.2%	27.8%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0%	0.00%	0.00%	0.00%	0.00%
Quality of service																			
Continuity of service, the average number of hours of water supply per day	hours/day	24.00	24.00	23.95	23.90	24.00	24.00	24.00	24.00	23.99	23.99	24.00	24.00	24.00	23.24	24.00	24.00	23.98	23.95
Water quality – number of chlorine residual tests	%	100%		100%	106%	100%	100%	100.0 0%	100%	833%	944%	100%	100%	102%	100%	100%	100%	100%	101%
Water quality – number of successful chlorine residual tests	%	100%	100%	98.2%	97.9%	100%	100%	100%	100%	100%	100%	98.3%	97.2%	99.5%	99%	100%	100%	94.2%	95.3%
The percentage of water supply service users who were disconnected from	%	0.15%	0.08%	0.19%	0.27%	0.00%	0.00%	0.07%		0.15%	0.11%	0.01%	0.03%	0.01%	0.12%	0.03%	0.00%	0.05%	0.04%

INDICATORS (by areas)	Unit of measurement	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
		S ³⁴	E ³⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
water supply network – households																			
The percentage of water supply service users who were sued in court – households	%	0.21%	0.13%	0.10%	0.08%	0.33%	0.01%	0.02%		0.00%	0.00%	0.00%	0.00%	0.20%	0.24%	2.37%	1.95%	0.32%	0.54%
The percentage of water supply service users who were disconnected from water supply network – legal entities	%	0.95%	0.17%	0.66%	0.34%	0.00%	0.00%	0.00%	0.18%	0.00%	0.21%	0.08%	0.04%	0.03%	0.14%	0.03%	0.00%	0.29%	0.38%
The percentage of water supply service users who were sued in court – legal entities	%	0.40%	0.09%	0.10%	0.10%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.12%	0.14%	0.51%	0.90%	0.55%	0.29%	0.29%
Population coverage of services																			
Population water supply coverage	%	59.4%	59.4%	32.4%	34.7%	72.3%	81.2%	56.91 %	57.9%	91.72 %	91.6%	83.3%	90.8%	50.3%	52.7%	94.2%	95.4%	35.9%	27.1%
Population sanitation coverage	%	47.9%	47.9%	27.8%	29.7%	36.3%	40.7%	9.5%	9.6%	57.6%	62.7%	52.4%	57.1%	21.6%	21.9%	78.0%	71.5%	9.3%	9.3%
Percentage of wastewater which is purified only in primary treatment	%	0.00%	0.00%	0.00%	0.00%	100%	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage of wastewater which is purified at least in secondary treatment	%	0.00%	0.00%	0.00%	0.00%	100%	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100%	100%
Non-revenue water																			
The Unavoidable Annual Real Losses (UARL)	l/connection/day	47	59	70	69	66	81	69	59	80	100	47	46	73	73	62	62	74	75
Current Annual Real Losses (CARL)	l/connection/day	297	265	197	183	480	446	0	0	166	117	216	194	177	161	546	532	135	127
Infrastructure Leakage Index (ILI)	number	6.29	4.49	2.83	2.64	7.24	5.47	0.00	0.00	2.07	1.18	4.62	4.21	2.43	2.21	8.78	8.61	1.83	1.70
Success category	description	B	B	A	A	B	B	A	A	A	A	B	B	A	A	C	C	A	A
Measurement																			
Percentage of metering of consumers (% of the number of valid water meters in relation to the number of connections)	%	100%	100%	117%	119%	100%	99.8%	95.36 %	92.4%	98.57 %	99.0%	97.7%	100%	100%	100%	100%	100%	90.4%	89.4%
Percentage of consumption measuring	%	100%	100%	99.9%	99.8%	99.9%	99.9%	96.7%	94.4%	99.6%	99.6%	100%	100%	100%	100%	100%	100%	100%	100%

INDICATORS (by areas)	Unit of measurement	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
		S ³⁴	E ³⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
(% of metered in relation to the invoiced water))																			
Failures in the pipelines																			
The total number of failures in water supply network per kilometer per year	failures/km	2.26	2.14	1.89	1.70	11.82	11.61	0.86	0.77	0.84	0.44	2.43	3.30	1.87	0.00	4.73	3.36	2.23	1.81
Number of clogged sewer pipes per km of network	clogging/km	0.67	0.78	1.44	0.99	0.80	0.29	4.00	2.67	1.13	0.78	2.38	2.15	4.44	0.00	7.27	6.86	6.00	4.93
The number of failures detected by sound detection in water supply network per kilometer per year	failures/km	0.40	0.40	0.56	0.53	0.18	0.00	0.04	0.02	0.02	0.01	0.17	0.17	0.47	0.00	0.00	1.68	0.00	0.06
Employee productivity																			
The number of employees per 1000 connections, water and sanitation combined	#/'000	10.55	10.13	4.37	4.13	5.53	5.55	3.32	3.27	5.80	6.37	5.11	6.11	2.73	2.67	8.00	7.62	5.00	3.89
The number of employees per 1000 connections, just water	#/'000	6.75	5.94	2.19	2.17	3.69	3.70	2.77	3.10	2.90	0.00	0.00	0.00	2.01	1.97	6.58	6.25	4.64	2.83
The number of employees per 1000 connections, just sanitation	#/'000	3.80	4.19	2.19	1.97	1.84	1.85	0.55	0.17	2.90	6.37	5.11	6.11	0.72	0.70	1.42	1.37	0.36	1.06
The number of employees per 1000 users of services, water and sanitation combined	#/'000	1.87	1.90	1.40	1.33	0.89	0.84	0.88	0.91	1.14	1.22	1.23	1.54	0.80	0.77	2.37	1.94	1.24	1.29
Invoicing and billing																			
Average revenue per m ³ , water and sanitation combined	KM/ m ³	1.99	2.06	1.29	1.27	2.04	1.98	1.28	1.22	1.86	1.83	1.19	1.19	1.40	1.47	1.43	1.47	1.24	1.24
Average annual revenue per connection	KM/connection	455.8	440.1	219.9	209	348.5	328.3	85.1	84.9	192.6	198.7	150.0	138.9	238.2	233.9	387.8	388.9	151.9	147.9
Average revenue per m ³ , just water	KM/ m ³	1.53	1.57	1.05	1.03	1.59	1.52	1.14	1.10	1.56	1.50	1.04	1.03	1.17	1.21	1.17	1.22	1.11	1.11
Average revenue per user of wastewater disposal	KM/person	23.06	24.28	15.25	14.83	25.09	22.91	14.30	13.83	9.63	10.92	7.29	7.25	27.70	29.39	25.00	22.39	15.25	15.42
The average collection period – water and sanitation combined	number of days	142	118	172	105	109	171	95	79	96	87	387	326			584	618	148	140

INDICATORS (by areas)	Unit of measurement	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
		S ³⁴	E ³⁵	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
The collection rate – water and sanitation combined	%	105%	103%	73.9%	108%	102%	113%	145%	146%	121%	118%	103%	110%			105%	102%	106%	111%
The internal subsidizing between categories of consumers – the ratio of water tariff for legal entities and households	#	2.99	2.99	3.67	3.67	1.86	1.67	2.12	2.12	1.30	1.30	2.15	2.15	2.27	2.27	1.75	1.75	2.82	2.82
Financial results																			
Coverage of operating costs	%	114%	101%	707%	537%	117%	104%	5294 %		111%	137%	97%	72%	123%	129%	107%	105%	614%	615%
Current ratio (the ratio of current assets and current liabilities)	number	3.99	1.97	12.20	9.36	7.05	6.37	1.92	2.23	0.81	0.96	14.32	8.67	4.55	5.05	6.57	6.78	4.39	5.02
Debt Service Ratio	%	0.00	0.00							9.97	10.92					1.70	2.72		
Affordability of services																			
The total revenue per service user in relation to the gross domestic product per capita	%			1.95%	1.87%	1.92%	1.70%			0.54%	0.53%			0.88%	0.76%	1.54%		0.53%	0.69%
The amount invoiced for a household with a consumption of 15 m ³ per month (just water and sanitation, without fees and VAT)	KM/annually	268.2	214.6	144.0	115.2	324.0	259.2	255.60	204.5	297.0	237.6	171.0	136.8	228.6	182.9	259.2	207.4	152.6	152.6
The share of monthly bill for a household (15 m ³ , water and sanitation) in the average monthly household income	%			2.22%	1.76%	4.54%	3.63%		3.10%	2.48%	1.98%	1.78%	1.43%	3.41%	2.67%	2.45%	2.06%	2.27%	1.82%
Gender																			
The percentage of women in company (water and sanitation)	%				14%		26%		12 %		22%		29%		21%				9%
The director is a woman or a man?	gender	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Number of women in leadership positions	number				0		1		0		3		1		2				2

DESCRIPTIVE INDICATORS (values can only be YES, NO or partially (more or less than 50%)):

INDICATORS (by areas)	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³⁶	E ³⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
LEVEL OF OPERATIONAL AUTONOMY OF COMPANY																		
Public Service Agreement (PSA) signed?	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO	YES
Law on Public Services provides operational and financial self-sustainability?	Partly (<50 %)	Partly (<50 %)	NO	NO	DO	DO	PARTLY	Partly (<50 %)	Partly (<50 %)	Partly (<50 %)	YES	YES	NO	YES	NO	NO	YES	YES
The administration of the local self-government influences the disconnection of non-payers?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
The administration of the local self-government has a list of people who are unable to pay their own bills, and there is a procedure for subsidizing these people?	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	NO	NO	NO	YES
ORGANIZATIONAL STRUCTURE																		
Has a sub-department for customer relations been established within the general service department?	NO	Partly (>50 %)	NO	YES	NO	NO	YES	YES	NO	Partly (<50 %)	Partly (<50 %)	YES	NO	NO	YES	YES	NO	YES
Has a sub-department been established within the appropriate technical service/office for detection of losses?	Partly (>50 %)	Partly (>50 %)	Partly (>50 %)	YES	NO	Djelo mično (<50 %)	YES	YES	NO	NO	NO	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	YES	YES	NO	YES

³⁶ S –start of the contractual period

³⁷ E –end of the contractual period

INDICATORS (by areas)	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	Š ³⁶	£ ³⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Have the separate cost centers been established to ensure the separation of water-supply and wastewater discharge and treatment costs?	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	NO	Partly (>50 %)	NO	YES	YES	YES	NO	YES
EMPLOYEES																		
There are business performance assessment measures at all levels within the company?	NO	NO	Partly (<50 %)	Partly (>50 %)	NO	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	Partly (>50 %)	NO	NO	NO	YES
There are stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or not doing their job at all?	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	Partly (<50 %)	YES	YES	YES	YES	YES	YES	YES
CUSTOMER RELATIONS																		
Is there a person in charge of customer relations?	Partly (<50 %)	YES	NO	YES	NO	NO	YES	YES	YES	DA	DA	DA	Partly (>50 %)	Partly (>50 %)	YES	YES	YES	YES
Complaints/comments/remarks database is in place and regularly updated?	Partly (>50 %)	Partly (>50 %)	NO	YES	NO	Partly (<50 %)	YES	YES	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	NO	NO	NO	NE	YES	YES
Regular analysis of data on the received complaints/ comments/remarks is performed and the reports are submitted to the water supply company management?	Partly (<50 %)	Partly (<50 %)	NO	YES	NO	Partly (<50 %)	YES	YES	YES	NE	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	NO	NO	YES	YES
NETWORK MAPPING, EFFICIENT ZONING AND MEASUREMENT PROGRAM																		
Metering areas defined?	YES	YES	YES	YES	Partly (<50 %)	YES	YES	YES	NO	YES	Partly (<50 %)	YES	YES	YES	NO	NO	NO	YES
Metering areas can be easily isolated?	YES	YES	YES	YES	Partly (<50 %)	YES	PARTLY	Partly (>50 %)	YES	YES	Partly (>50 %)	Partly (>50 %)	YES	YES	NO	NO	NO	Partly (<50 %)
Metering areas have installed flow meters at the inlet and outlet from the area?	YES	YES	YES	YES	Partly (<50 %)	Partly (<50 %)	PARTLY	Partly (>50 %)	NO	Partly (<50 %)	Partly (<50 %)	Partly (<50 %)	YES	YES	Partly (<50 %)	Partly (<50 %)	NO	NO
Are capacities for mapping and GIS available in	Partly (>50 %)	Partly (>50 %)	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	Partly (<50 %)

INDICATORS (by areas)	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³⁶	E ³⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
water supply company?	%)	%)																%)
Are capacities for hydraulic modeling available in water supply company?	Partly (>50 %)	Partly (>50 %)	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	NO	NO	NO	NO	Partly (>50 %)	Partly (>50 %)	NO	NO	NO	NO
TARIFF POLICY																		
There is a documented tariff calculation methodology?	NO	NO	NO	NE	NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	YES	NO	YES
The tariff represents the full-cost recovery tariff?	YES	YES	NO	NO	YES	YES	NO	NO	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	NO	Partly (>50 %)	NO	NO	YES	YES
The analysis of financial capacities of citizens is performed periodically?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
There is cross-subsidization between customer categories and/or types of services?	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
ACCOUNTING PROCEDURES AND MIS																		
A new chart of accounts is developed and in use?	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
Cost centers are defined and the costs and revenues are recorded at appropriate cost centers?	YES	Partly (>50 %)	NO	YES	YES	YES	YES	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	NO	YES	NO	NO	YES	YES
Reports based on the cost centers structure are regularly used for effective management and tariff setting?	YES	Partly (>50 %)	NO	Partly (>50 %)	Partly (<50 %)	Partly (<50 %)	NO	NO	YES	NO	NO	Partly (<50 %)	NO	Partly (>50 %)	NO	NO	YES	Partly (>50 %)
Indirect cost distribution pattern is defined, adopted and in use?	YES	YES	NO	NO	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	YES	Partly (<50 %)	YES	NO	NO	NO	YES
Improved and integrated accounting software is in place and in use?	YES	NO	Partly (<50 %)	Partly (>50 %)	YES	YES	NO	NO	YES	Partly (<50 %)	NO	NO	Partly (>50 %)	YES	NO	NO	YES	NO
BUDGETING AND DEVELOPMENT OF BUSINESS PLANS																		
Operating budget and cash flow projections are established per cost center and on cumulative	NO	NO	NO	Partly (<50 %)	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	Partly (<50 %)	Partly (<50 %)	YES	Partly (>50 %)

INDICATORS (by areas)	Doboj		Gračanica		Gradačac		Kalesija		Prnjavor		Teslić		Tešanj		Tuzla		Žepče	
	S ³⁶	E ³⁷	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
basis?																		
Basic capital budget module is in place?	NO	NO	NO	NO	NO	NO	YES	YES	Partly (<50 %)	Partly (<50 %)	NO	NO	NO	NO	YES	YES	Partly (<50 %)	Partly (>50 %)
The annual business planning cycle is implemented?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NE	YES	YES	YES	YES	YES	YES
FINANCIAL MANAGEMENT																		
The public procurement system implemented?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
The internal workflow of work orders is documented and in use?	YES	YES	YES	YES	Partly (>50 %)	Partly (>50 %)	PART LY	Partly (>50 %)	YES	YES	NO	NO	YES	YES	YES	YES	NO	YES
MANAGEMENT OF FIXED ASSETS AND INVENTORY																		
Regular inventory of fixed assets is conducted, fixed assets ledger is up to date?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Revaluation of all fixed assets is carried out periodically, where necessary, and is regulated by an internal regulation?	NO	NO	NO	NO	NO	NO	PART LY	Partly (>50 %)	NO	NO	Partly (<50 %)	Partly (<50 %)	NO	NO	YES	YES	NO	NO
A software module for fixed assets ledger is used, integrated with other modules and enables automated calculation of depreciation based on the given depreciation classes?	YES	YES	YES	YES	YES	YES	NO	NO	Partly (>50 %)	YES	YES	YES	YES	YES	YES	YES	NO	YES
Realistically calculated depreciation is part of the tariff model?	YES	YES	Partly (<50 %)	Partly (<50 %)	Partly (>50 %)	Partly (>50 %)	NO	Partly (<50 %)	YES	YES	NO	NO	Partly (>50 %)	Partly (>50 %)	NO	NO	YES	YES
Regular inventory checks are conducted and procedures for removing assets from inventory are documented and implemented?	YES	YES	YES	YES	YES	YES	NO	Partly (<50 %)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

5.2 Summary tables:

INDICATORS (by areas)	Unit of measurement	Beginning of the period			End of period		
		MIN	MAX	Prosjek	MIN	MAX	Prosjek
Production and consumption of water							
Water production	l/person/day	70.43	357.10	160.34	77.46	364.30	168.27
Water consumption	l/person/day	48.46	177.40	98.85	48.00	179.30	100.57
Residential water consumption	l/person/day	42.60	113.50	76.54	41.94	112.20	76.06
Non-revenue water							
Non-revenue water	%	24%	51%	36%	22%	55%	38%
Non-revenue water	m³/km/day	2.08	35.93	13.31	1.60	37.00	14.75
Non-revenue water	m³/connection/day	0.08	0.71	0.26	0.10	0.72	0.29
Real losses (% of water abstraction)	%	0%	51%	29%	0%	55%	30%
Real losses (m³ per connection per day)	m³/connection/day	0.00	0.51	0.21	0.00	0.55	0.23
Apparent losses (% of water abstraction)	%	0%	38%	7%	0%	43%	8%
Apparent losses (m³ per connection per day)	m³/connection/day	0.00	0.20	0.05	0.00	0.25	0.06
Costs							
Unit operating costs for water and sanitation, in relation to the total water sold	KM/ m³	0.00	2.04	1.14	0.71	2.23	1.39
Unit operating costs for water and sanitation in relation to the total water abstraction	KM/ m³	0.00	1.15	0.70	0.51	1.48	0.85
Unit operating costs just for water in relation to sold water	KM/ m³	0.00	1.33	0.60	0.00	1.58	0.80
Unit operating costs just for sanitation in relation	KM/inhabitant	103.90	346155.00	115537.18	302.20	302.20	302.20

INDICATORS (by areas)	Unit of measurement	Beginning of the period			End of period		
		MIN	MAX	Prosje	MIN	MAX	Prosje
to the number of users							
The share of staff costs in operating costs	%	31%	278%	83%	18%	149%	68%
The share of energy costs in operating costs (%)	%	4%	32%	12%	3%	25%	12%
The share of costs of external contracts in operating costs (outsourcing)	%	0%	30%	3%	0%	28%	3%
Quality of service							
Continuity of service, the average number of hours of water supply per day	Hours/days	23.95	24.00	23.99	23.24	24.00	23.90
Water quality – number of chlorine residual tests	%	100%	833%	182%	100%	944%	206%
Water quality – number of successful chlorine residual tests	%	94%	100%	99%	95%	100%	99%
The percentage of water supply service users who were disconnected from water supply network – households	%	0.00%	0.19%	0.07%	0.00%	0.27%	0.08%
The percentage of water supply service users who were sued in court – households	%	0.00%	2.37%	0.39%	0.00%	1.95%	0.37%
The percentage of water supply service users who were disconnected from water supply network – legal entities	%	0.00%	0.95%	0.23%	0.00%	0.38%	0.16%
The percentage of water supply service users who were sued in court – legal entities	%	0.00%	0.90%	0.20%	0.00%	0.55%	0.19%
Population coverage of services							
Population water supply coverage	%	32.40%	94.20%	64.05%	27.10%	95.40%	65.64%
Population sanitation coverage	%	9.30%	78.00%	37.82%	9.30%	71.50%	38.93%
Percentage of wastewater which is purified only in primary treatment	%	0.00%	100.00%	11.11%	0.00%	100.00%	11.11%

INDICATORS (by areas)	Unit of measurement	Beginning of the period			End of period		
		MIN	MAX	Prosjek	MIN	MAX	Prosjek
Percentage of wastewater which is purified at least in secondary treatment	%	0.00%	100.00%	22.22%	0.00%	100.00%	22.22%
Non-revenue water							
The Unavoidable Annual Real Losses (UARL)	l/connection/day	47.00	80.00	65.33	46.00	100.00	69.33
Current Annual Real Losses (CARL)	l/connection/day	0.00	546.00	246.00	0.00	532.00	225.00
Infrastructure Leakage Index (ILI)	number	0.00	8.78	4.01	0.00	8.61	3.39
Success category	description						
Measurement							
Percentage of metering of consumers (% of the number of valid water meters in relation to the number of connections)	%	90.40%	117.00%	99.89%	89.40%	119.00%	99.96%
Percentage of consumption measuring (% of metered in relation to the invoiced water)	%	96.70%	100.00%	99.57%	94.40%	100.00%	99.30%
Failures in the pipelines							
The total number of failures in water supply network per kilometer per year	failures/km	0.84	11.82	3.21	0.00	11.61	2.79
Number of clogged sewer pipes per km of network	clogging/km	0.67	7.27	3.13	0.00	6.86	2.16
The number of failures detected by sound detection in water supply network per kilometer per year	failures/km	0.00	0.56	0.20	0.00	1.68	0.32
Employee productivity							
The number of employees per 1000 connections, water and sanitation combined	#/'000	2.73	10.55	5.60	2.67	10.13	5.53
The number of employees per 1000 connections, just water	#/'000	0.00	6.75	3.50	0.00	6.25	2.88

INDICATORS (by areas)	Unit of measurement	Beginning of the period			End of period		
		MIN	MAX	Prosjek	MIN	MAX	Prosjek
The number of employees per 1000 connections, just sanitation	#/'000	0.36	5.11	2.10	0.17	6.37	2.64
The number of employees per 1000 users of services, water and sanitation combined	#/'000	0.80	2.37	1.31	0.77	1.94	1.30
Invoicing and billing							
Average revenue per m ³ , water and sanitation combined	KM/ m ³	1.19	2.04	1.52	1.19	2.06	1.53
Average annual revenue per connection	KM/connection	85.10	455.80	247.76	84.90	440.10	241.18
Average revenue per m ³ , just water	KM/ m ³	1.04	1.59	1.26	1.03	1.57	1.25
Average revenue per user of wastewater disposal	KM/person	7.29	27.70	18.06	7.25	29.39	17.91
The average collection period – water and sanitation combined	Number of days	95.00	584.00	216.63	79.00	618.00	205.50
The collection rate – water and sanitation combined	%	74%	145%	108%	102%	146%	114%
The internal subsidizing between categories of consumers – the ratio of water tariff for legal entities and households	#	1.30	3.67	2.33	1.30	3.67	2.30
Financial results							
Coverage of operating costs	%	97%	5294%	809%	72%	615%	225%
Current ratio (the ratio of current assets and current liabilities)	number	0.81	14.32	6.20	0.96	9.36	5.16
Debt Service Ratio	%	0.00%	9.97%	3.89%	0.00%	1092.00%	454.67%
Affordability of services							
The total revenue per service user in relation to the gross domestic product per capita	%	0.53%	1.95%	1.23%	0.53%	1.87%	1.11%
The amount invoiced for a household with a consumption of 15 m ³ per month (just water and sanitation, without fees and VAT)	KM/annually	144.00	324.00	233.36	115.20	259.20	190.09

INDICATORS (by areas)	Unit of measurement	Beginning of the period			End of period		
		MIN	MAX	Prosjek	MIN	MAX	Prosjek
The share of monthly bill for a household (15 m3, water and sanitation) in the average monthly household income	%	1.78%	4.54%	2.74%	1.43%	3.63%	2.31%
Gender							
The percentage of women in company (water and sanitation)	%				9.00%	29.00%	19.00%
The director is a woman or a man?	gender						
Number of women in leadership positions	number				0.00	3.00	1.29

Summary descriptive indicators (whose values can only be YES, NO or partially (more or less than 50%): :

INDICATORS (by areas)	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%
LEVEL OF OPERATIONAL AUTONOMY OF COMPANY								
Public Service Agreement (PSA) signed?	0	9	0	0	5	4	0	0
Law on Public Services provides operational and financial self-sustainability?	3	3	0	3	4	2		3
The administration of the local self-government influences the disconnection of non-payers?	0	9	0	0		9	0	0
The administration of the local self-government has a list of people who are unable to pay their own bills, and there is a procedure for subsidizing these people?	0	8	0	1	1	6	1	1
ORGANIZATIONAL STRUCTURE								
Has a sub-department for customer relations been established within the general service department?	2	6	0	1	5	2	1	1
Has a sub-department been established within the appropriate technical service/office for detection of loses?	2	4	3	0	4	1	2	2
Have the separate cost centers been established to ensure the separation of water-supply and wastewater discharge and treatment costs?	4	5	0	0	7	1	1	0
EMPLOYEES								
There are business performance assessment measures at all levels within the company?	0	7	1	1	1	6	2	0
There are stimulation measures for employees who are performing well or de-stimulation measures for those who are performing poorly or	6	2	0	1	7	2	0	0

INDICATORS (by areas)	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%
not doing their job at all?								
CUSTOMER RELATIONS								
Is there a person in charge of customer services?	5	2	1	1	7	1	1	0
Complaints/comments/remarks database is in place and regularly updated?	3	4	1	1	3	2	2	2
Regular analysis of data on the received complaints/ comments/remarks is performed and the reports are submitted to the water supply company management?	3	3	1	2	3	2	1	3
NETWORK MAPPING, EFFICIENT ZONING AND MEASUREMENT PROGRAM								
Metering areas defined?	4	3	0	2	8	1	0	0
Metering areas can be easily isolated?	4	2	1	2	5	1	2	1
Metering areas have installed flow meters at the inlet and outlet from the area?	3	2	0	4	3	1	1	4
Are capacities for mapping and GIS available in water supply company?	5	3	1	0	5	2	1	1
Are capacities for hydraulic modeling available in water supply company?	0	6	2	1	0	6	2	1
TARIFF POLICY								
There is a documented tariff calculation methodology?	3	6	0	0	5	4	0	0
The tariff represents the full-cost recovery tariff?	4	4	0	1	3	3	2	1
The analysis of financial capacities of citizens is performed periodically?	1	8	0	0	1	8	0	0
There is cross-subsidization between customer categories and/or types of services?	5	4	0	0	4	5	0	0

INDICATORS (by areas)	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%
ACCOUNTING PROCEDURES AND MIS								
A new chart of accounts is developed and in use?	7	2	0	0	8	1	0	0
Cost centers are defined and the costs and revenues are recorded at appropriate cost centers?	4	3	1	1	5	1	2	1
Reports based on the cost centers structure are regularly used for effective management and tariff setting?	3	5	0	1	0	3	4	2
Indirect cost distribution pattern is defined, adopted and in use?	1	6	0	2	4	4	0	1
Improved and integrated accounting software is in place and in use?	4	3	1	1	2	5	1	1
BUDGETING AND DEVELOPMENT OF BUSINESS PLANS								
Operating budget and cash flow projections are established per cost center and on cumulative basis?	1	6	0	2	0	5	1	3
Basic capital budget module is in place?	2	5	0	2	2	5	1	1
The annual business planning cycle is implemented?	8	1	0	0	8	1	0	0
FINANCIAL MANAGEMENT								
The public procurement system is implemented?	9	0	0	0	9	0	0	0
The internal workflow of work orders is documented and in use?	5	2	1	1	6	1	2	0
MANAGEMENT OF FIXED ASSETS AND INVENTORY								
Regular inventory of fixed assets is conducted, fixed assets ledger is up to date?	9	0	0	0	9	0	0	0

INDICATORS (by areas)	Beginning of period				End of period			
	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%	Number of YES	Number of NO	Number of Partially >50%	Number of Partially < 50%
Revaluation of all fixed assets is carried out periodically, where necessary, and is regulated by an internal regulation?	1	6	0	2	1	6	1	1
A software module for fixed assets ledger is used, integrated with other modules and enables automated calculation of depreciation based on the given depreciation classes?	6	2	1	0	8	1	0	0
Realistically calculated depreciation is part of the tariff model?	3	3	2	1	3	2	2	2
Regular inventory checks are conducted and procedures for removing assets from inventory are documented and implemented?	8	1	0	0	8	0	0	1

