

MUNICIPAL ENVIRONMENTAL AND ECONOMIC GOVERNANCE PROJECT (MEG)

is supported and funded by the Swiss Government and implemented by the United Nations Development Program in Bosnia and Herzegovina (UNDP B&H)

SUMMARY REPORT

LOT 1 –Group of local self-government units of northwest B&H



October 2017

Disclaimer: This assessment has been prepared by Una Consulting within the MEG project and its content does not necessarily indicate the positions of the Swiss Government or the UNDP.

CONTENT:

1.	EXECUTIVE SUMMARY.....	7
2.	PROJECT CONTEXT.....	10
3.	METHODOLOGY AND REPORT ORGANIZATION	12
4.	IMPROVEMENT AREAS	13
4.1	LEVEL OF OPERATIONAL AUTONOMY OF THE UTILITY	13
4.1.1	Description of initial state	13
4.1.2	Objectives.....	13
4.1.3	Activities carried out	14
4.1.4	Performance indicators.....	15
4.2	ORGANIZATIONAL STRUCTURE	17
4.2.1	Description of initial state	17
4.2.2	Objectives.....	17
4.2.3	Activities carried out	18
4.2.4	Performance indicators.....	19
4.3	EMPLOYEES.....	21
4.3.1	Description of initial state	21
4.3.2	Objectives.....	21
4.3.3	Activities carried out	21
4.3.4	Performance indicators.....	22
4.4	CONSUMER RELATIONS.....	24
4.4.1	Description of initial state	24
4.4.2	Objectives.....	24
4.4.3	Activities carried out	24
4.4.4	Performance indicators.....	25
4.5	NETWORK MAPPING	27
4.5.1	Description of initial state	27
4.5.2	Objectives.....	27
4.5.3	Activities carried out	27
4.5.4	Performance indicators.....	28
4.6	EFFECTIVE ZONING OF THE NETWORK.....	30
4.6.1	Description of initial state	30
4.6.2	Objectives.....	30
4.6.3	Activities carried out	30
4.6.4	Performance indicators.....	32
4.7	METERING PROGRAMME	33
4.7.1	Description of initial state	33
4.7.2	Objectives.....	33
4.7.3	Activities carried out	33
4.7.4	Performance indicators.....	35
4.8	NON-REVENUE WATER (NRW) MANAGEMENT	37
4.8.1	Description of initial state	37
4.8.2	Objectives.....	37
4.8.3	Activities carried out	37
4.8.4	Performance indicators.....	38

4.9	TARIFF POLICY.....	40
4.9.1	Description of initial state.....	40
4.9.2	Objectives.....	40
4.9.3	Activities carried out	41
4.9.4	Performance indicators.....	42
4.10	COLLECTION AND REVENUE ADMINISTRATION, BILLING CYCLE.....	43
4.10.1	Description of initial state.....	43
4.10.2	Objectives.....	43
4.10.3	Activities carried out	43
4.10.4	Performance indicators.....	45
4.11	ACCOUNTING PROCEDURES AND MIS (MANAGEMENT INFORMATION SYSTEM)	46
4.11.1	Description of initial state.....	46
4.11.2	Objectives.....	46
4.11.3	Activities carried out	47
4.11.4	Performance indicators.....	48
4.12	BUDGETING AND BUSINESS PLANNING	50
4.12.1	Description of initial state.....	50
4.12.2	Objectives.....	50
4.12.3	Activities carried out	51
4.12.4	Performance indicators.....	52
4.13	FINANCIAL MANAGEMENT.....	53
4.13.1	Description of initial state.....	53
4.13.2	Objectives.....	53
4.13.3	Activities carried out	53
4.13.4	Performance indicators.....	54
4.14	INVENTORY AND FIXED ASSETS CYCLE, INCLUDING INFRASTRUCTURE OWNERSHIP AND DEPRECIATION	55
4.14.1	Description of initial state.....	55
4.14.2	Objectives.....	55
4.14.3	Activities carried out	56
4.14.4	Performance indicators.....	57
4.15	QUALITY AND QUANTITIES OF WATER.....	59
4.15.1	Description of initial state.....	59
4.15.2	Objectives.....	59
4.15.3	Activities carried out	60
5.	SUMMARY TABLE OF PERFORMANCE INDICATORS	61
5.1	Individual tables per LGU	61
5.2	Summary tables.....	67

LIST OF TABLES:

Table 4.1.1.	Performance indicators overview for each of 9 LSGUs	15
Table 4.1.2.	Summary overview of performance indicators for all 9 PUCs	16
Table 4.2.1.	Performance indicators overview for each of 9 LSGUs	19
Table 4.2.2.	Summary overview of performance indicators for all 9 PUCs	19
Table 4.3.1.	Performance indicators overview for each of 9 LSGUs	23
Table 4.3.2.	Summary overview of performance indicators for all 9 PUCs	23
Table 4.4.1.	Performance indicators overview for each of 9 LSGUs	26
Table 4.4.2.	Summary overview of performance indicators for all 9 PUCs	26
Table 4.5.1.	Performance indicators overview for each of 9 LSGUs	29
Table 4.5.2.	Summary overview of performance indicators for all 9 PUCs	29
Table 4.6.1.	Performance indicators overview for each of 9 LSGUs	32
Table 4.6.2.	Summary overview of performance indicators for all 9 PUCs	32
Table 4.7.1.	Performance indicators overview for each of 9 LSGUs	35
Table 4.7.2.	Summary overview of performance indicators for all 9 PUCs	36
Table 4.8.1.	Performance indicators overview for each of 9 LSGUs	39
Table 4.8.2.	Summary overview of performance indicators for all 9 PUCs	39
Table 4.9.1.	Performance indicators overview for each of 9 LSGUs	42
Table 4.9.2.	Summary overview of performance indicators for all 9 PUCs	42
Table 4.10.1.	Performance indicators overview for each of 9 LSGUs	45
Table 4.10.2.	Summary overview of performance indicators for all 9 PUCs	45
Table 4.11.1.	Performance indicators overview for each of 9 LSGUs	48
Table 4.11.2.	Summary overview of performance indicators for all 9 PUCs	48
Table 4.12.1.	Performance indicators overview for each of 9 LSGUs	52
Table 4.12.2.	Summary overview of performance indicators for all 9 PUCs	52
Table 4.13.1.	Performance indicators overview for each of 9 LSGUs	55
Table 4.13.2.	Summary overview of performance indicators for all 9 PUCs	55
Table 4.14.1.	Performance indicators overview for each of 9 LSGUs	58
Table 4.14.2.	Summary overview of performance indicators for all 9 PUCs	59

LIST OF IMAGES:

Image 1:	Plan Do Check Act Cycle.....	12
----------	------------------------------	----

LIST OF ABBREVIATIONS:

Abbreviation	Meaning
B&H	Bosnia and Herzegovina
CAD	Computer Aided Design
DMA	District Metering Area
FB&H	Federation of Bosnia and Herzegovina
GIS	Geographic Information System
CC	City Council
SEE	Southeast Europe
PUC	Public Utility Company
LSGU	Local self-government units
MIS	Management Information System
SB	Supervisory board
NRW	Non-revenue water
MC	Municipal council
PDCA	Plan Do Check Act
PI	Performance Indicator
PSA	Public Service Agreement
RS	Republic of Srpska
UNDP	United Nations Development Programme
USC	Una-Sana Canton

1. EXECUTIVE SUMMARY

The concept of improving the work of public utility companies (PUC) in local self-government units (LSGU) within the MEG project is based on methodology of the Financial and Operational Impact Improvement Program Action Plan. The basic concept is the Plan Do Check Act cycle, which has different steps with the goal of continuous improvement and standardization of procedures and standards. Earlier in the project (Entry Phase), several different areas of improvement have been identified, and for each of these areas, goals, benchmarks, and necessary activities that will guide to the achievement of set goals have been identified in a timely manner. During this phase of the project, in the previous year, improvement activities have been carried out in following areas:

- level of operational autonomy of the utility and defining the responsibilities of the utility and the LSGU as a founder;
- determining of optimal organizational structure;
- optimization of number and structure of job positions, and valuation of employee results;
- implementation of consumer relationship procedures, analysis of remarks, complaints, comments for the purpose of business improvement;
- network mapping and geographic information system design;
- efficient zoning of the network, in order to prepare regular zoning measurements as well as network pressure optimization;
- regular implementation of the measurement program, in the function of making water balances and better records of the amounts of actual and apparent losses;
- NRW management in order to reduce both actual and apparent losses;
- tariff policy, tariff based on key principles;
- improving revenue collection and administration;
- improving accounting procedures (in particular, introduction of bookkeeping according to cost centres);
- efficient budgeting and business planning;
- financial management;
- improving the management of fixed assets (investment maintenance of infrastructure for water supply and sewerage and wastewater treatment services);
- improving the protection of drinking water sources as well as supporting investment decisions in the sector;
- and other recognizable areas of possible improvements.

During the period of engagement, the Consultant, with constant consultations with representatives of utility companies as well as local self-government units when needed, has carried out the project task of defined activities and collected the values of selected performance indicators in order to allow analysis and possible decisions on the necessary corrective activities (if the results do not meet the expectations and are not sure to lead to set goals). All the values of the selected indicators at the beginning and end of the contract period, for each of the selected LSGU, are presented in chapters describing considered areas of progress, while Chapter 5 gives a table of indicators for each PUC monitored during the contract period.

For most water supply networks, it can be concluded that better results and visible progress have been achieved in "technical tasks", i.e. in the areas of network mapping and zoning, measurement,

and non-revenue water (NRW), and that progress is, however, slower in institutional and organizational areas such as organizational structure and the employees, to which it is desirable to focus attention on in the forthcoming project period. This progress is logical given that the institutional-organizational task groups foresee significant change within the PUC's own business structures, where not only physical changes are apparent but also changes in consciousness, both of PUC employees and LSGU as their founders, i.e. changes that by their nature require time. Bearing the aforementioned in mind, the PUC have, through the definition and adoption of the Proposals of the Optimal Organizational Structure and the Proposals for Long Term Rationalization with job descriptions in all PUCs in LOT1, provided a good basis for long-term solution of the issue of optimal organizational structure and employees in PUC. In addition, through the definition and adoption of the Public Service Agreement (PSA) in all 9 LSGU from LOT 1, the preconditions for further progress in this segment have been created.

In the area of customer service relations, significant improvement has been achieved through the systematised positions of the customer relationship service provider within the organizational structure for all 9 PUCs, and the adoption and beginning of implementation of procedures and tools that enable business improvement. This progress will enable better monitoring of the situation and take the necessary measures for improvement, especially in decision-making at a strategic level.

Visible progress has especially been made in mapping the water and sewage networks and accepting works of detection water network malfunctions as a regular work activity. This is also indicated by the fact that within each of the 9 PUCs, a malfunction detection unit was created and most PUCs during the project period has ordered basic equipment for the detection of losses (e.g. ultrasonic flowmeter, pressure gauge and geophone). All PUCs do not yet have fully trained and independent teams to carry out detection activities, nor all the necessary equipment, but an improvement is significant in working with delegated PUC representatives when it comes to understanding the concept of non-revenue water. For the complete conduct of malfunction detection activities, it is necessary to work on the isolation of measuring zones and installation of the necessary measuring equipment, since 6 PUCs at the beginning of the project did not even have a water supply network divided into the measuring zones. The consultant has developed an Action Plan for each of the 9 PUCs with defined short-term, mid-term, and long-term measures whose implementation will help the PUCs to reduce losses and establish monitoring in its water supply networks.

During the implementation period of the project a serious progress has been made regarding the adoption and application of the methodology for calculating the price of water supply and sewage services. PUC has calculated the fixed and variable part of the price based on realistic data on the costs incurred in the water production process, taking into account key principles to be respected (e.g. affordability principles, user pay, full coverage, etc.). From the point of view of PUC's business, full coverage of costs is, among other things, ensured by establishing cost accounting and defining cost centres in all 9 PUCs, and at the beginning of cost book accounting the place of their occurrence through accounting software. Detailed analyses of the level of collection and age of accounts receivables claims for the delivered services were carried out in order to shorten the period from invoice issuance to collection of receivables. Particular attention was paid to the process of developing business plans and strengthening the PUC's capacity to independently define needs based on an analysis of the existing state of affairs and available resources, thus defining strategic commitments, priorities, and action plans. Challenges to overcome in the planning period are numerous and relate to rationalization and optimization of workplaces, reduction of non-revenue

water, creation of a registry of basic / fixed assets, calculation of depreciation costs for all fixed assets managed by PUC, etc.

The need to register all fixed assets managed by the PUC has resulted in the creation of an "auxiliary" fixed assets book. The main objective is that the assets managed by the PUC, which are not officially entrusted with management and are not adequately charged for depreciation, are recorded in one place and that for those assets depreciation calculation is carried out, the amount of which is to be included in the calculation of the cost of services.

Also, a review of existing water source protection studies has been carried out for all LSGU and it has been indicated to PUCs which intends to undertake capital investments, the need for a prior examination of the affordability of the investment.

More details of all the areas considered can be found below.

2. PROJECT CONTEXT

Bosnia and Herzegovina is facing an intricate set of development challenges, including economic decline, high unemployment, growing poverty and socio-economic inequalities. Many constraints persist on the economy, including poor infrastructure and a generally unattractive investment climate. Placed within such a complex environment, local governments have monotype competences, despite considerable differences in their size. While the local governance legal framework is in place in both entities, part of cantons in FBiH failed to amend their legislation.

An additional problem is the maze of specific sectoral laws and bylaws, which often do not comply with the general/framework laws.

Unclear division of responsibilities among entities, cantons and LSGU coupled with unfunded mandates has resulted in under-provision of vital public services at the local level. The management capacities of LSGU require improvements if they are to become the driving force of local development processes and ensure quality services. They need to design integrated strategies, where social, economic, and environmental sectors are inter-connected to produce sustainable results and nearly 30% of local governments have begun to apply an integrated municipal management approach. Yet, deficiencies in decision-making, internal management and organisation, policy and regulatory frameworks, as well as inadequate operational capacity hamper effective policy delivery. While there have been improvements through formal partnership agreements and more transparent funding mechanisms, effective engagement of citizens and civil society organisations in municipal affairs is still marginal.

Both finances and priority wise, water and environmental sanitation services are the most important local government services. More than 40% of the country population of 3.8 million lacks access to safe (regularly controlled) drinking water, with less than 40% connected to the public sewerage system. Water losses frequently amount to more than 50%, leading to overexploitation of water sources and high distribution costs. Most of the water utilities in the country are not financially self-sustainable, which poses long-term water supply issues in the future. Water tariff levels are often too low to cover operation and maintenance, let alone enable capital investments. Full costs recovery by the incomes obtained by the approved price, with focus on justified costs, needs to be secured. Quality of water is also questionable, especially within the systems with high losses. Depreciation for water supply infrastructure is often not accounted for, while there is a need for regulatory overhaul in the sector of communal services, so as to enable appropriate water supply infrastructure management and maintenance.

Regarding the wastewater collection and treatment, the problems are low level of population connected to public wastewater systems, as well as small number of wastewater treatment plants. Key issue is financing of operation and maintenance; Finances are also key issue for the construction of new ones. While some efforts are placed on expanding infrastructure, both in terms of WWTPs and wastewater networks, there is still considerable room for improvements.

Against this background, the Government of Switzerland decided to implement the MEG Project to contribute to assigning local governments with appropriate competences and finances, thus improve their democratic governance and provide public services in an inclusive, effective and efficient manner, particularly those related to economic and environmental sectors. The project is prepared as a 12-year initiative, which will be implemented in three phases. After a one-year preparation of the list of necessary activities, a four-year project phase of implementation of the same followed.

This report represents one of the results of the first year of the first project phase and it provides a summary of implemented activities and achieved results in all utilities which provide the water supply and wastewater collection and treatment services in the local communities in the group of municipalities of LOT 1. The report deals with common characteristics and specifics of implemented activities and achieved results and provides the overview of the values of selected indicators which are used to measure the progress in regard to the initial state in these utility companies.

Even though the MEG project is not specifically related to the gender issue, during the project implementation integration of gender equality has been considered to the extent it was possible. The Consultant, in accordance with the principles of gender equality, has made sure that within his team both sexes are equally involved in the implementation of project activities. Likewise, at all meetings and workshops organized within the project, the Consultant's team involved both sex groups regardless of the organizational structure within the company. Generally, it can be concluded that women are mostly employed in accounting and administration departments, while in technical departments men predominate. However, during the project, PUC from Gradiška and Kostajnica, employed 2 women in the technical department for network mapping. As far as management structures are concerned, only PUC from Sanski Most has a female director, while in the remaining 8 PUCs the positions of directors are held by men.

3. METHODOLOGY AND REPORT ORGANIZATION

Plan Do Check Act

Improvement of institutional, operational, and financial capacities in areas of possible water supply improvement in selected local self-governments, as well as the consequent Action Plan, are implemented on the basis of the Plan Do Check Act (PDCA cycle) approach. This is a management approach that is based on the following well-known facts:

- Improvement is always possible and long-term sustainable organizations stand out precisely by constantly striving to improvement;
- Organizations can manage their own improvement through four phases of the PDCA cycle. After the initial phase, the Plan (based on identified areas where improvement is possible and defined by activities that will lead to such improvements - responds to the previous "input" phase of the project), and Do (carrying out activities that are planned - ongoing) it is necessary after certain predefined amount of time to evaluate achievements (Check - periodical, already starting in some areas), and based on such a rating, take any corrective action (Act). Upon completion of this cycle, the process is either considered completed if the goal is achieved, or a new cycle is started by re-planning, but planning a new set of activities, as the previously set goal is only partially achieved (which is more commonly the case).

Therefore, the PDCA approach will be used as universal for each of the recognized areas of possible improvement. In case the management and all key persons in the Water Supply Company recognize the quality of this approach and accept the application of the PDCA in their respective areas of responsibility, it will ensure the achievement of set goals and thus the actual long-term goal of self-sustainability of the enterprise.

The Action Plan has been prepared early on for each of the considered possible improvement areas via the PDCA approach and contains initial activities from the Plan phase. In the ongoing phase of the implementation of such a plan (the Do phase), the management and employees of Water supply company, as well as representatives of local self-government units responsible for this company, with the assistance of a consultant where necessary (through training, consultancy, and advice, drafting of documents, activities such as measuring or drafting a water balance, etc.) gradually assume ownership over the application of the entire PDCA cycle.

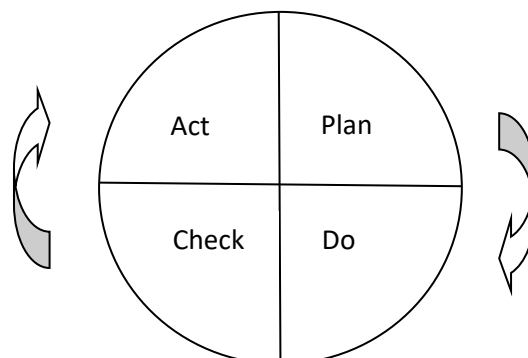


Image 1: Plan Do Check Act Cycle

The following is a summary overview of each of the observed areas where activities have been made towards improvements.

4. IMPROVEMENT AREAS

4.1 LEVEL OF OPERATIONAL AUTONOMY OF THE UTILITY

4.1.1 Description of initial state

Existing legal regulations regarding the water supply, sewerage, and wastewater treatment services do not provide a sufficient legal and business framework for efficient and sustainable operation of the PUC. Numerous identified shortcomings affect the poor state of water utilities in B&H, which is reflected in the following key issues: the quality and sustainability of water supply service (as well as sewage and wastewater treatment); development and maintenance of the system (infrastructure) and self-sustainability of service providers (PUC).

Bearing this in mind, there has been a real need for LSGU as a founder and PUC as a provider of services to conclude a Public Service Agreement, which will regulate more clearly and in more detail mutual relations, rights and obligations, roles and responsibilities, tasks, measures, and activities related to the provision of public water supply services, drainage and wastewater treatment.

At the beginning of the MEG project implementation (October 2016) out of 9 units of local self-government (LSGU) in LOT 1, only the City of Bihać had concluded an Agreement on the provision of public services with PC "Vodovod" Bihać, but they however did not solve some of the most important issues (e.g. the issue of fixed assets) that are of crucial importance for defining mutual responsibilities and the efficiency of PUC's work and operations.

4.1.2 Objectives

The following objectives have been set through the project assignment to achieve a better operational autonomy of the company:

- Defining the issue of responsibility for managing the fixed assets book, as well as records of all existing fixed assets and revaluation of their value.
- Defining the issue of financing and maintaining existing communal water infrastructure (including funding sources and procedures for their use).
- Defining competencies and capital investments funding.
- Defining the tariff setting procedure based on respect of the basic principles (cost recovery, economic efficiency, user pays, affordability, as well as preservation of natural resources).
- Defining the responsibility of the PUC in preparing the policy and plan for subsidizing categories of population in a state of social need, including the responsibility for conducting periodic research of affordability. Thereat, the subsidy strategy should be aligned with a standard that the water and sewerage bill does not exceed 4% of the average monthly household income (affordability level).
- Defining the responsibility of the LSGU to prepare a payment plan for those LSGU-owned companies which have large debts to the PUC.
- Defining the employment policy within the PUC that should result in achieving a long-term target for the optimal number of PUC employees (the long-term goal is 1-1,2 employees per 1000 inhabitants-service users).

4.1.3 Activities carried out

The Consultant's activities on the implementation of this task were related to the analysis of existing regulations and drafting of the document, and the continuous provision of support to LSGU and PUC in the process of the adoption and signing of the Contracts and its accompanying documents (annexes).

This includes the following activities:

- Collection and analysis of existing documentation from the water and utility activities sector (laws) and decisions at the LSGU level (decision on establishment/organization of PUC, decision on water supply, decision on sewerage, LSGU decision on methodology and formation of service price).
- Analysis of existing legal and sub-legal regulations in the field of water and utility activities (BiH, Entities, Cantons in FBiH, LSGU).
- Drafting of the Public Service Agreement and the following Annexes:
 - Subsidy program for part of the cost of utility services for water supply and sewerage, and wastewater treatment for socially vulnerable categories
 - Methodology for determining the cost of the service (Tariff Methodology)
 - Decision on measures for collecting due unpaid receivables
 - Decision on the use of depreciation funds
 - List of selected key performance indicators with goals.
- Submitting Draft PSA with LSGU and PUC contributions for comments and finalization of the document's final appearance.
- Development of an explanation of the PSA for the purpose of adoption process.
- Preparation and organization of meetings with all targeted PUC and LSGU for the purpose of presentation of the MEG project by tasks, with a special focus on LSGU's responsibility and deadlines for the adoption of the PSA. The Consultant gives clarifications and answers to questions asked.
- Preparation of responses to comments and attendance of consultants at Municipal / City Council (MC / CC) sessions upon which the Agreement was reached.

Given the nature of the PSA, LSGU and the associated PUC were largely responsible for carrying out this task. Their activities were related to review of the submitted draft, the harmonization of the final version of the PSA and its Annexes, work on preparation and clarification of the PSA and its Annexes for the MC / CC Council, presentation and proposal of the PSA and its Annexes at MC / CC sessions; support to the adoption and final signing of the, PSA.

The Consultant has also made additional efforts and participated in meetings with decision-makers (MC/CC representatives, representatives of political party clubs, representatives of supervisory boards of the PUC), to enable key actors to be adequately informed on all aspects of the PSA and its Annexes. This eventually resulted in increased understanding and adoption of PSA in all LSGU.

4.1.4 Performance indicators

At the beginning of reporting period, only the City of Bihać (in 2014) signed the Public Service Agreement. At the end of the reporting period, all 9 target LSGUs from LOT 1 have adopted the PSA, and 8 have signed it. The Municipality of Velika Kladuša is still awaiting the signing of the PSA by the Mayor of the Municipality. PSA can be an efficient transitional solution for improving the legislative framework at all levels in B&H, as they contain legal solutions that can overcome and improve inadequate existing status. Permanent and complete solution can be reached through amendments to the existing or the adoption of new legal regulations.

Table 4.1.1: Performance indicators overview for each of 9 LSGUs

LEVEL OF OPERATIONAL AUTONOMY OF UTILITY – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	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	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	No
The Law on Communal Affairs provides operational and financial self-sustainability?	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50	Partially >50
Does the administration of the LSGU affect the disconnection of non-payers?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Does the administration of the LSGU have a list of persons unable to pay their own bill and is there a subsidy procedure for those persons?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes

¹ S – start of the contracting period

² E – end of the contracting period

Table 4.1.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E
LEVEL OF OPERATIONAL AUTONOMY OF UTILITIES – PERFORMANCE INDICATORS:	Public Service Agreement (PSA) signed?		The Law on Communal Affairs provides operational and financial self-sustainability?		Does the administration of the LSGU affect the disconnection of non-payers?		Does the administration of the LSGU have a list of persons unable to pay their own bill and is there a subsidy procedure for those persons?	
Realized change:	1 signed	8 signed	Partially >50	Partially >50	0 YES	9 YES	1 YES	9 YES

4.2 ORGANIZATIONAL STRUCTURE

4.2.1 Description of initial state

The current state in BiH in terms of work and operations of the PUC as a provider of water supply, sewerage, and wastewater treatment services is characterized, among other things, by inadequate work organization. In most PUC in BiH the organizational structure of PUC is not fully in line with the activities that PUC needs to perform by its mission, i.e. basic PUC functions are not organized in an efficient and effective manner, the cost and performance monitoring is not at an appropriate level and such organizational structure does not contribute to the long-term business sustainability of PUC.

Existing organizational structures of PUCs included in the MEG Project have been established through internal acts, such as the Rulebooks on Work and Rulebooks on Internal Organization and Systematization. They are characterized by their relative complexity, predominantly vertical orientation, and non-separation of water supply from sewerage and waste water treatment (as well as other type of services that PUCs provide) as basic functions provided by PUC.

At the very beginning of the MEG Project implementation, out of the 9 PUCs included, only two had staff in charge of mapping and GIS, and non-revenue water management (NRW), however, none of them had clearly defined and elaborated job descriptions related to these functions. Also, none of the PUCs involved has had an elaborate NRW Reduction Strategy or strategy for work with users, but these jobs have been performed as necessity arose (*ad hoc*).

4.2.2 Objectives

Project assignment sets the following objectives to achieve the improved organizational structure of the utility:

- Established a simple and efficient organizational structure that enables the successful operation of all organizational units and ensures high quality of service delivery to users, while respecting the basic principles: horizontal organizational structure and separation of basic organizational units according to cost centres (minimum: water supply, sewerage, joint departments).
- Work functions are defined in accordance with the nature of the work, which are assigned to work positions, taking into account the principle of "Full Time Equivalent (FTE)".
- Defined and established are work positions needed for the efficient functioning of the company: consumer relations, detection and troubleshooting, mapping and GIS, etc.
- Regular updating of systematization with the aim of continually improving efficiency.
- Establishing an appropriate organizational structure (including employees) that enables efficient provision of water supply and sewerage and wastewater treatment services.
- The anticipated efficient organizational structure should:
 - Ensure quality drinking water for all customers in an efficient and reliable manner;
 - Ensure a high level of customer service, transparency, and quality of reporting and monitoring of management efficiency.

4.2.3 Activities carried out

For the purpose of fulfilling the objectives of the project, the Consultant defined and carried out the following activities:

- Collection and analysis of existing legal and sub-legal regulations related to the organization and systematization of public companies;
- Collecting and analysis of existing PUC internal documents related to organization and systematization of the company (work regulations, rulebooks on internal organization and systematization);
- Collecting and analysis existing examples of organizational structures in water supply companies around the world (establishing good practice examples);
- Drafting an organizational chart of optimal organizational structure and proposals of optimal organizational structure;
- Preparation and organization of meetings with all targeted PUCs and MEG project coordinators in front of LSGU for the purpose of discussing draft documents and drafting final versions based on comments and suggestions arising from the above-mentioned discussions;
- Support the PUCs in the process of adopting the optimal organizational structure by the competent bodies of the PUC (Supervisory Board-SB);
- Support in efficiency assessment of implemented changes.

4.2.4 Performance indicators

Table 4.2.1: Performance indicators overview for each of 9 LSGUs

ORGANISATIONAL STRUCTURE – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Has Consumer Relations Working Unit been formed within PUC, or has a job description been defined for a consumer relationship position?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Has a Loss Detection Team been formed within PUC?	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Has a Mapping and GIS unit been formed within PUC?	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
Are separate cost centres available to ensure separation of water supply and sewerage costs and wastewater treatment?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Table 4.2.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E
ORGANISATIONAL STRUCTURE – PERFORMANCE INDICATORS:	Has Consumer Relations Working Unit been formed within PUC, or has a job description been defined for a consumer relationship position?		Has a Loss Detection Team been formed within PUC?		Has a Mapping and GIS unit been formed within PUC?		Are separate cost centres available to ensure separation of water supply and sewerage costs and wastewater treatment?	

Start / end of project period	S	E	S	E	S	E	S	E
Realized change:	0 YES	9 YES	3 YES	9 YES	2 YES	9 YES	0 YES	9 YES

4.3 EMPLOYEES

4.3.1 Description of initial state

One of the basic features of the existing situation in BiH regarding the work and operations of PUC as a provider of water supply, sewerage and wastewater treatment is inadequate human resources management. Most PUCs in BiH are facing the problem of excessive employment and inadequate staff structure, which is a direct consequence of inadequate/uncontrolled employment policy. There is a shared responsibility for such a situation. On the one hand, LSGU as a founder sometimes impose PUC employment (because in fact, bigger employment is one of the important goals of LSGU, but this is the wrong way of achieving this goal) while, on the other hand, PUC does not have a developed human resources management policy. This creates "surplus" of employees, but at the same time the poor capacity of PUC, as they often employ inadequate / inexperienced people who have no capacity to contribute to the improvement of PUC business. As a result of this situation, most PUCs in BiH have an unfavourable staff structure with a large number of low-skilled staff, low level of expertise and skills, and inadequate occupation of positions with quality and qualified employees. This leads to questionable efficiency, functionality, and sustainability of PUC. The situation is even worse in most PUCs, since they pay little attention in their business plans to the construction and development of human capacities (training, additional education, and qualification) and the necessity of regular recovery of workforce, especially the professional (deficit) staff.

4.3.2 Objectives

The project assignment sets the following objectives:

- The number of PUC employees is aligned to the standard of up to 1,2 employees per 1000 inhabitants-service users.
- Employee performance assessment is carried out at all levels in the PUC, including measures of rewarding or punishing employees depending on their performance.
- Adopted and implemented a rationalization plan (strategy) for the number of employees. The plan is defined through the project and legally aligned with the existing legal framework.
- Temporary suspension of further employment in the PUC, with the defined objective of optimum number of employees (according to the defined standard up to 1,2 employees per 1000 inhabitants-service users) and the time period in which it can be achieved.
- Review and adjustment of descriptions of all positions in PUC to ensure full engagement of all employees during the 40-hour work week and optimization of the number of employees, in accordance with the envisaged rationalization plan.
- Conducting evaluation of employee performance at all levels in PUC, introduction of measures of rewarding or punishing employees depending on their performance.

4.3.3 Activities carried out

For the purpose of achieving the above objectives, the Consultant has carried out the following activities:

- Collection and analysis of existing legal and sub-legal regulations related to the organization and systematization of public companies;

- Collecting and analysing existing PUC internal documents related to organization and systematization of the company (work regulations, rulebooks on internal organization and systematization);
- Collecting and analysing existing examples of organizational structures in water supply companies around the world (establishing good practice examples);
- Drafting of the organizational chart of optimal organizational structure and proposals for long-term rationalization of working positions and optimization of work processes, proposal of optimal systematization with descriptions of all positions and indicators of quality for evaluation of employees;
- Preparation and organization of meetings with all targeted PUCs and MEG project coordinators in front of LSGUs for the purpose of discussing draft documents and drafting final versions based on comments and suggestions arising from the above-mentioned discussions;
- Support to PUC in the process of adopting long-term rationalization, descriptions of job positions, and indicators for the evaluation of quality of work of the employees by the competent bodies of PUC (Supervisory Board - SB);
- Drafting measure proposals to improve employees found to be ineffective.

The Consultant repeatedly visited LOT 1 PUCs with the aim of presenting the task and submitting document templates. In conversation with the PUC middle and upper management structures, implementation steps have been explained, as well as objectives of the task itself, explaining what information should be provided by PUC, in which format and in which time frame.

4.3.4 Performance indicators

At the beginning of implementation of the MEG project, none of the PUCs in LOT 1 had formalized and institutionalized performance evaluation, nor the measures of rewarding or punishing employees depending on their business performance. A number of PUCs had in their internal documents (Statute or Ordinance) provisions concerning the disciplinary responsibility of employees who did not perform their duties. However, this was not consistently implemented, in line with periodic performance evaluations, and thus lost its purpose of improving business efficiency. Through the MEG Project, measures to improve employee performance and employee performance indicators were developed and adopted.

Table 4.3.1: Performance indicators overview for each of 9 LSGUs

EMPLOYEES – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Are there performance evaluation measures at all levels of the utility?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Are there any rewarding or punishing measures for employees who are doing great, bad, or not doing their job?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Table 4.3.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E
EMPLOYEES – PERFORMANCE INDICATORS:	Are there performance evaluation measures at all levels of the utility?		Are there any rewarding or punishing measures for employees who are doing great, bad, or not doing their job?	
Realized change:	0 YES	9 YES	0 YES	9 YES

4.4 CONSUMER RELATIONS

4.4.1 Description of initial state

During the Initial Phase, it was estimated that most utility companies do not have a department and adopted procedures for customer service relationships or these obligations were formally transmitted through their own systematization rulebook. Several utility companies, which have determined the position for customer service relationships, still have no defined procedures for these relationships. Most often, phone calls (complaints) of the user are taken over by the company's secretary who forwards the call to other departments in accordance with the nature of the complaint. The whole process is so scattered across many departments, and solving problems depends on the goodwill of the staff. In most utilities companies, complaints are handled manually (if they are even recorded), there is no electronic database. Also, most utility companies do not actively collect feedback from users about their satisfaction with the services provided, and some utility companies do not collect feedback at all.

The most significant differences at the very beginning of the implementation were visible in larger PUCs, e.g. Bihać and Prijedor who already had appointed persons or service relations teams. More detailed insight showed that even though named or delegated, these persons usually only collect information from users, complaints, or claims, point them to the technical sector, but the administration does not take adequate measures for long-term business improvement.

4.4.2 Objectives

Objectives set by the project after the established initial state in the companies are:

- Delegate and train employees responsible for customer service relationships.
- Customer Service-related procedures are defined and regularly monitored.
- Methods of collecting collected data, with selected performance indicators, are defined and regularly implemented.
- Procedures for collecting feedback about satisfaction with the services provided have been defined and implemented.
- Procedures for analysing collected information with selected business indicators have been defined and implemented.

4.4.3 Activities carried out

The Consultant has, for the purpose of achieving the above-mentioned objectives, carried out the following activities:

- Collecting information about the existing status within 9 PUCs about named service relations persons / teams,
- Drawing up the draft and final Customer Relationships Procedures, and the Draft and Final Procedures on Customer Service Satisfaction,
- Drawing up a draft and a final survey to evaluate the satisfaction of service users,
- Drawing up a draft and final form for complaints and proposals,
- Drawing up the draft and final Operational Plan for Customer Relationships,

- Creating a simple software module for archiving public relations information and archiving customers' complaints, remarks, and comments,
- Preparation and implementation of one-day training on customer service relationships.

The Consultant presented drafted documents through field meetings, collected proposals and suggestions, and in co-operation with representatives of the PUC finalized the prepared draft of procedures.

4.4.4 Performance indicators

At the very beginning of the MEG Project implementation, 5 PUC did not have a systematic position for customer service relationships. After completion of the first phase of implementation, all 9 PUCs have systematized a workplace for customer service relationships. PUCs from V. Kladuša and Bihać had ISO standards already in place when initiating the implementation of the project. In addition, through the adoption of the submitted procedures through the MEG project, they agreed to harmonize and apply them for the purpose of further business improvement

However, the area of customer relations, although improved during the reporting period, requires continuity in the work of the company, which further on requires greater commitment of the company to that work.

Table 4.4.1: Performance indicators overview for each of 9 LSGUs

CUSTOMER SERVICE RELATIONS – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is there a person whose responsibilities relate to customer service relations?	Yes	Yes	No	Yes	No	Yes	No	Partially (>50%)	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Is there a database and regular update of complaints, comments, remarks?	Yes	Yes	Yes	Yes	-	Yes	No	Partially (>50%)	Partially <50%	Yes	No	Yes	No	Yes	No	Partially (<50%)	Yes	Yes
Is a regular analysis performed of data on complaints, comments, remarks, and comments, and is such an analysis submitted to PUC management?	Yes	Yes	Yes	Yes	-	No	Partially (<50%)	Partially (>50%)	No	Yes	No	Yes	No	Partially (<50%)	No	Partially (<50%)	Yes	Yes

Table 4.4.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period*	S	E	S	E	S	E
CUSTOMER SERVICE RELATIONS – PERFORMANCE INDICATORS	Is there a person whose responsibilities relate to customer service relations?		Is there a database and regular update of complaints, comments, remarks?		Is a regular analysis performed of data on complaints, comments, remarks, and comments, and is such an analysis submitted to PUC management?	
Realized change:	4 YES	9 YES	0 YES	9 YES	0 YES	9 YES

*Data from the table are collected through the provided performance indicators of all 9 PUCs for the period October 1, 2016 - June 30, 2017.

4.5 NETWORK MAPPING

4.5.1 Description of initial state

The mapped water and sewerage network provide the basis for many tasks and daily activities within the PUC. Based on the mapped water supply network, it is possible to properly set up DMA zones, to implement efficient measures of non-revenue water reduction, to improve the management of the company's fixed assets book and to establish a depreciation fund for the renovation of water supply network. Network mapping work in PUC is a work that has for many years been carried out randomly, and in most cases the drawn network and the established cadastre of waterworks lack purpose. Digitization of the sewerage network is even poor than the water supply network. Apart from PUC from Kozarska Dubica and Bihać, other PUCs did not have a systematic and structured approach in terms of developed symbology existence, layer structure and attribute tables for the development of cadastre of the water and sewage system. In addition to this, part of PUCs did not have adequate georeferenced maps. Employees delegated with the task of establishing cadastral installations (along with other regular tasks) usually spend most of their time doing other jobs. The Consultant found that in most PUCs, with the exception of PUC Kozarska Dubica, there is a lack of capacity to establish or improve GIS for mapping. At the beginning of the project period only PUC Kozarska Dubica had a complete water supply network in GIS software. Apart from PUC from Kozarska Dubica, GIS software was used by PUC from Bosanska Krupa, Velika Kladuša and Bihać, while the PUC from Prijedor has started with the establishment of GIS during the project.

4.5.2 Objectives

The objectives set by the project after the established initial status in the PUCs are as follows:

- Establish a GIS that will be used as a decision-making tool to facilitate the PUC business,
- Connect GIS to the Business Information System where possible,
- Connect GIS with telemetry wherever possible,
- Develop a hydraulic model where it is possible and necessary (long term goal).

4.5.3 Activities carried out

The Consultant has, for the purpose of achieving the above-mentioned objectives, carried out the following activities:

- Collected all available data on mapped water supply and sewage networks from all 9 PUCs, as well as all maps PUC disposes with, and analysed the collected data;
- For those PUCs that did not have georeferenced maps, the geo-referencing was performed;
- Constructed a symbology for drawing water supply and sewage networks in a structured way for data input in layers and with responsive attributes;
- Organized and held theoretical and practical training for all 9 PUCs for drawing water supply and sewage networks according to prepared symbology;
- Performed on the job training for those PUCs who needed additional training to work in GIS;
- Conducted a visit to each PUC in order to collect additional data on the water supply and sewage networks;
- Conducted the drawing up of missing primary and secondary water supply and sewage networks for all 9 PUCs;

- Performed the preparation of the drawn network data for import into specialized software for PUC in Prijedor and Bihać;
- Organized and completed theoretical training for all 9 PUCs for hydraulic modelling, since no PUC had collected the relevant data for the hydraulic model (nor was there such a need at this time).

4.5.4 Performance indicators

The water supply network mapping activities at the beginning of the project were regularly carried out only at the PUC in Kozarska Dubica, while other PUCs performed these tasks occasionally, and PUC from Kostajnica not at all. Through the MEG project the primary and secondary water supply and sewage networks were compiled and drawn in the software used by PUC at the beginning of the project (AUTOCAD or GIS – PROTOK, QGIS, MAPInfo) for all 9 PUCs. The established symbology allows easy transition from AUTOCAD to GIS software. An overview of the network mapping indicators during the MEG project is given in the following table.

All PUCs have capacity for carrying out mapping and GIS activities, where the greatest progress is visible in PUC from Kostajnica, where this company has employed a suitable person for doing these jobs. PUC from Bosanska Krupa has achieved the highest percentage of tertiary network and home connections drawing. The Consultant recommends that additional on the job training for the upgrading of GIS staff work should be undertaken in the forthcoming period, and that gradual transition to GIS be performed in those PUCs where GIS is still inactive. Those PUCs with a better-established GIS system should be oriented towards connecting GIS with accounting system, SCADA, MIS etc.

With the exception of PUC Kozarska Dubica, which has a hydraulic model of the water supply system, other companies still lack sufficient capacity (necessary attribute data, information, employee with sufficient knowledge of hydraulics) to be able to approach hydraulic modelling.

Table 4.5.1: Performance indicators overview for each of 9 LSGUs

NETWORK MAPPING – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Length of water supply network (km)	263	450	45	217	560	565,5	158,5	342,5	0	45,1	150	150	192	346	121,9	250,6	480	500
Length of sewerage network (km)	30	65	20	22	18	21,7	29,3	47,26	0	18,28	0	60	0	82,23	11,9	16,2	0	10,87
Georeferenced maps	YES	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES	YES	YES	NO	YES	YES	YES
Are there capacities for mapping and GIS in the water supply company?	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Are there hydraulic modelling capacities in the water supply company?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO

Table 4.5.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E	S	E
NETWORK MAPPING – PERFORMANCE INDICATORS:	Length of mapped water supply network (km)		Length of mapped sewerage network (km)		Georeferenced maps		Are there capacities for mapping and GIS in the water supply company?		Are there hydraulic modelling capacities in the water supply company?	
Realized change:	1970,4	2866,7	125,4	339,24	5 YES	9 YES	7 YES	8 YES	1 YES	1 YES

4.6 EFFECTIVE ZONING OF THE NETWORK

4.6.1 Description of initial state

For the management and maintenance of the entire water supply system it is necessary to conduct a proper zoning and sub-zoning of the water supply network, primarily the establishment of separate measuring zones, district metering areas (DMAs) which are viewed as the smaller and detachable part of the water supply system. The significance of measuring zones establishment is primarily reflected in the measurement of input water quantity in the zone and comparison with water consumption readings, i.e. invoiced amount of water in that zone, and as a result the total balance of water per zone is obtained. They can be used to optimize the pressure, and especially to reduce excessive pressure in certain parts of the network, which increases the losses. Based on the water balance, it is possible to determine the amount of non-revenue water and losses in the system, and it is possible to define the narrower zones for larger water losses, and consequently take action to remedy them. Measurements and DMA zones point out early on to newly-generated failures, they enable faster interventions and repairs performance, thus reducing the actual (physical) loss of water. At the beginning of the project period, based on the draft of primary and secondary water supply networks, the PUCs from Bosanska Krupa, Cazin, Gradiška, Prijedor, Kostajnica and Sanski Most developed the initial concept of measuring zones (DMA zones), since these PUCs did not have a water supply network distributed to DMA zones. For PUCs from Bihać, Velika Kladuša and Kozarska Dubica, an overview of the existing zones was made and an improvement of the existing situation was carried out. The coverage of the DMA zones, the location of the entry points and the limiting valves required to form the zone, were established.

4.6.2 Objectives

The objectives set by the project after the established initial state in the PUCs are:

- The whole water supply system should be divided into an adequate number of measuring zones depending on the network configuration, springs, network pressure, network age, consumers, and the like;
- Perform flow and pressure measurement in defined metering zones and compare to compiled consumer water consumption readings in that zone to evaluate the water balance and improve non-revenue water management as well as optimize pressure management in that zone.

4.6.3 Activities carried out

For the purpose of achieving the above-mentioned objectives the Consultant has carried out the following activities:

- Performed initial zoning based on the design of the primary and secondary water supply network for six PUCs that did not have a system divided into the measuring zones. Due to complexity of the task, this activity was carried out together with the PUC representatives and as additional on the job training;
- Carried out the improvement of the water distribution system division into the measuring zone for the three PUCs that had the water system divided into the measuring zones. Due to complexity of the task, this activity was carried out together with the PUC representatives and as additional on the job training;

- Organized and conducted theoretical training to establish measuring zones in the water supply system;
- Developed and submitted to the representatives of the PUCs forms for field data collection on house connections for the purpose of more precisely setting the boundaries of measuring zones.

The Consultant recommended the PUC representatives to correctly determine the boundaries of the DMA zones up to the level of house connections.

4.6.4 Performance indicators

At the beginning of the project period, most PUCs did not have a water distribution system divided into measuring zones, nor did they see a benefit of system division into measuring zones. The following table shows an overview of PUCs for which initial zoning has been performed, with the emphasis that the Consultant has consistently advised PUCs to independently determine the boundaries of the measuring zones and define consumers in each zone.

Table 4.6.1: Performance indicators overview for each of 9 LSGUs

EFFICIENT ZONING – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is there a concept of measuring zones based on the draft of the water supply network?	YES	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES
Are there capacities to establish measuring zones in the water supply company?	YES	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES
Number of established DMA zones	14	17	0	20	0	23	0	13	0	6	18	18	0	26	0	21	11	11

Table 4.6.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E
EFFICIENT ZONING – PERFORMANCE INDICATORS:	Is there a concept of measuring zones based on the draft of the water supply network?		Are there capacities to establish measuring zones in the water supply company?		Number of established DMA zones	
Realized change:	3 YES	9 YES	3 YES	9 YES	43	155

4.7 METERING PROGRAMME

4.7.1 Description of initial state

After the establishment of the water network cadastre and division into the measuring zones, it is possible to execute the planned flow and pressure measurements. Measurements in the water supply network can be permanent and temporary, depending on the defined metering points and built-in metering equipment. The overall flow and pressure measurement process as a network control process aims to measure the amount of water in the water supply system, calculate water balance and point to narrow micro locations of leaks (street, settlement, transport pipeline, etc.) to undergo detailed research and repair failures. Flow measurement should be established at springs, pumping stations, reservoirs, main distribution pipelines, inlets to the DMA zones of the water supply system, and of course for all consumers in the system. If a system of measurements is established at the listed locations in the system, the establishment of complete monitoring of the water supply system is achieved. The status stated at the beginning of the project suggests that the conduct of measurement in most PUCs is not at a satisfactory level. Flow measurement is performed only on a small number of objects, while PUC from Gradiška does not measure water flow at all on water source. In PUC from Sanski Most, Cazin and Kostajnica, the flow meters on water source are of questionable accuracy. PUCs from Kozarska Dubica and Velika Kladuša have the best-established metering system in the water supply system and developed telemetry.

Although in some companies (Velika Kladuša, Prijedor, Bihać, Bosanska Krupa and Kozarska Dubica) there are already well-trained loss detection teams, they do not systematically and continuously measure flow and pressure in the network. None of the companies had an established database of carried out measurements.

Most companies, in addition to measuring customer consumption through a water meter, have a system of lump sum collection of water consumption. The Consultant found that most PUCs did not calibrate the consumer water meters after 5 years as prescribed by the Law on Metrology.

4.7.2 Objectives

The objective set by the project after the established initial state in the companies is:

- Establish reliable flow and pressure monitoring at all required metering points (continuously or possibly periodically where possible) and store data metrics in a database.

4.7.3 Activities carried out

For the purpose of achieving the above-mentioned objective, the Consultant has carried out the following activities:

- Prepared a simple database for data storage on the measurements performed;
- Organized and conducted theoretical and practical training on measuring flow and pressure;
- Performed Flow and Pressure Measurement in 3 DMA Zones for each of 9 PUCs;
- Created a draft document on needed installations of lacking measurement devices in the water supply network for all 9 PUCs;
- Provided support to representatives of all 9 PUCs in the development of equipment specification for the expenditure of financial resources foreseen by the MEG project for the establishment of metering points and procurement of mobile measuring equipment;

- Developed a draft document on installation and regular calibration of consumer water meters, which includes the installation plan of a water meter with remote reading for all 9 PUCs.

4.7.4 Performance indicators

The following table presents the most important indicators by which it is possible to determine the starting state and progress during the first year of implementation of the MEG project in all 9 PUCs.

Table 4.7.1: Performance indicators overview for each of 9 LSGUs

METERING PROGRAMME - PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
PUC owns a functioning mobile flow meter	YES	YES	YES	YES	NO	NO	NO	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
PUC owns a functioning mobile flow meter	YES	YES	NO	YES	NO	NO	NO	YES	NO	NO	NO	NO	YES	YES	NO	YES	YES	YES
PUC has a measurements database	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
PUC has trained staff to measure flow and pressure	YES	YES	YES	YES	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES	NO	YES	YES	YES
PUC has a regular replacement and water meter calibration plan	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Number of isolated DMA zone for performing measurements *	5	5	6	6	0	0	1	1	1	1	4	4	9	9	10	10	7	7
The number of DMA zones that are easy to isolate	7	7	9	9	3	3	0	0	2	2	8	8	9	9	9	9	3	3
The number of DMA zones that need to be isolated by the complete construction of the measuring site	5	5	5	5	20	20	12	12	3	3	3	3	8	8	3	3	1	1

*During the MEG project, each PUC was allocated funds in the amount of approximately KM 30,000 for the isolation of DMA zoned and the purchase of mobile equipment, but since the procurement and delivery of the equipment has not been completed during the Consultant's contractual time, progress is not visible in the isolation of zones during the first-year implementation of the MEG project.

Table 4.7.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
METERING PROGRAMME - PERFORMANCE INDICATORS:	PUC owns a functioning mobile flow meter		PUC owns a functioning mobile flow meter		Number of isolated DMA zone for performing measurements *		PUC has a measurement s database		PUC has trained staff to measure flow and pressure		PUC has a regular replacement and water meter calibration plan		The number of DMA zones that are easy to isolate		The number of DMA zones that need to be isolated by the complete construction of the measuring site	
Realized change:	6 YES	8 YES	3 YES	6 YES	43	43	0 YES	9 YES	5 YES	9 YES	0 YES	9 YES	50	50	60	60

4.8 NON-REVENUE WATER (NRW) MANAGEMENT

4.8.1 Description of initial state

The level of non-revenue water in Bosnia and Herzegovina and Southeast Europe is around 55% on average, meaning that more than a half of produced and treated water is lost through leaks in the distribution system, consumer connections, reservoir overflows, or is apparently lost through measurement errors, uncounted but authorized consumption, or through illegal consumption. Taking into account that this is an average of 55%, and that in some water supply systems non-revenue water amounts to as much as 70%, it is evident that activities to reduce non-revenue water must be a priority task for PUCs. Most PUCs do not have an organized data collection and water supply management system. The creation of water balances and regular monitoring of the water supply system has not been established in any of the 9 PUCs as a regular working procedure. The best-established procedure and teams for detection and elimination of failures are evident in PUC from Kozarska Dubica, while PUC from Velika Kladuša has in recent years, through participation in active capacity detection projects, started to actively detect losses and repair defects. PUCs from Bosanska Krupa and Bihać have all the prerequisites for the active detection of losses, however this activity is not being carried out on a continuous basis. The remaining PUCs do not have adequate water loss detection equipment, nor trained staff for these jobs, so it mainly conducts passive detection of water losses. At the beginning of the project period only PUC from Kozarska Dubica and Velika Kladuša had a developed Action Plan for reducing non-revenue water.

4.8.2 Objectives

Objectives set by the project after the established initial state in the companies are:

- Develop, adapt, and implement the Operational Plan for the Reduction of Non-Revenue Water (which includes preventive replacement of old and run out pipelines, periodic elaboration of water balance, and progress indicator monitoring);
- Monitoring of the water supply system through defined DMA zones;
- Continuous Pressure Management in the Network;
- Adjustment of the Action Plan to achieve the ILI factor 4 values for the entire system, or the percentage of losses in the system by 20% in the real-time period.

4.8.3 Activities carried out

For the purpose of achieving the above-mentioned objectives, the Consultant has carried out the following activities:

- Created a simple database for detected failures;
- Organized and conducted theoretical training on water balances and carrying out flow and pressure measurements;
- Performed flow and pressure measurements in 3 DMA zones for each of 9 PUCs;
- Carried out practical on the job training for water balance drafting using bottom-up approach for each of 9 PUCs;
- Created a water balance for the entire system for each company based on the data provided for the previous calendar year (using top-down approach) as well as a water balance for one DMA zone for each of 9 PUCs where 24-hour flow and pressure measurements were made (using bottom-up approach);

- Created a draft of Action Plan for the reduction of non-revenue water for each of 9 PUCs;
- Submitted questionnaires to the representatives of PUCs and necessary tools for water balance drafting, and suggested to all PUCs to independently draft water balances. After submitting the water balances, the Consultant provided support, reviewed, and made recommendations for improving water balance for each of the PUC representatives;
- Organized and conducted theoretical and practical training for sound leak detection in the pilot DMA zone, and in each of the 9 PUCs detected a malfunction together with PUC representatives.

4.8.4 Performance indicators

Based on the data provided to him by the PUC representatives, the Consultant made a water balance for the entire system and established the percentage of non-revenue water for 2015, followed by indicators for 2016 and the first half of 2017. The results are presented in the following table, in a way that 2015 is considered as the initial period and 2017 as the final period. Also, in view of the importance of this task for each PUC, the Consultant insisted that within each PUC a position be systematised: the leak detection team, since at the beginning of the project it was found that a larger number of PUC representatives were not trained enough to carry out any leak detection. Through the MEG project, most PUCs have commissioned, and at the end of reporting period received, mobile measuring equipment (flowmeters and pressure gauges) and a geofon, which is a good basis for improvement of the work on leak detection in the continuation of the project.

The PUC from Cazin, Gradiška, Kozarska Dubica and Velika Kladuša saw an increase in the percentage of NRW in the project period due to the following reasons:

- PUC from Cazin during the project period did not perform activities on detecting and eliminating losses in the network, because the team for such jobs was created just before the very end of the first year of implementation of the MEG project.
- At PUC in Kozarska Dubica there was a small increase in the percentage of NRW due to long-term works on the reconstruction of the water supply network and the need for frequent flushing and disinfection of the pipeline.
- PUC from Gradiška had a major failure in the water supply network that was detected and removed late due to the lack of measuring equipment and leak detection equipment, and for this reason there was an increase in the percentage of NRW in the reporting period.
- A specific situation is with PUC from Velika Kladuša because the NRW increase is the result of changes in the political leadership of LSGU, whereby a new decision was made that part of the water exported to the neighboring municipality would not be billed, causing an increase of NRW.

Table 4.8.1: Performance indicators overview for each of 9 LSGUs

NON-REVENUE WATER - PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Percentage of non-revenue water	53	51	58	54	53	59	53	59	61	56	46	48	81	78	70	66	53	62
PUC owns leak detection equipment	NO	YES	YES	YES	NO	NO	NO	YES	NO	YES	YES	YES	YES	YES	NO	YES	YES	YES
PUC has trained staff for drafting water balances	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES
PUC has trained staff for conducting sound leak detection	YES	YES	YES	YES	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
PUC has drafted an Action plan for non-revenue water reduction	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	YES

Table 4.8.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E	S	E
NON-REVENUE WATER - PERFORMANCE INDICATORS:	Percentage of non-revenue water		PUC owns leak detection equipment		PUC has trained staff for drafting water balances		PUC has trained staff for conducting sound leak detection		PUC has drafted an Action plan for non- revenue water reduction	
Realized change:	58,67	59,22	4 YES	8 YES	2 YES	9 YES	6 YES	9 YES	2 YES	9 YES

4.9 TARIFF POLICY

4.9.1 Description of initial state

The current way of determining the price of water supply and sewage services in the project PUCs does not provide full coverage of the costs incurred in the water supply and sewage processes by the PUC. The reason for this is the adoption of tariffs that did not contain all the necessary elements in the calculation of the service price, the tariffs were not based on the actual costs that would be related only to the provided service (therefore recorded at the cost centres related to the individual services), and the investment maintenance funds are most often missing. At the same time, the mutual relations between the founders and the PUC are often very complex, so adopting the prices of water supply and sewage services in most cases becomes a political issue.

None of the PUCs at the beginning of the project had full coverage of costs through existing tariffs, thus generating direct losses, the state of the communal infrastructure is aggravated by the lack of investment maintenance funds, and the procedures and time of collection of receivables are not satisfactory. Also, the subsidization of socially vulnerable categories does not exist or is insufficiently implemented due to the lack of or failure to apply defined roles and responsibilities of LSGU towards these categories of service users. The PSA between LSGU and PUC has allowed all these issues to be defined in a transparent and unambiguous way, since its components are the methodology for calculating the tariff of the water supply service (tariff methodology), the program of subsidizing socially vulnerable categories, the decision on measures for collecting due unpaid receivables, and decision on the use of depreciation funds. The Agreement itself includes the obligation to calculate depreciation for all infrastructure assets managed by the PUC. During the implementation of the project, serious progress was made in defining mutual roles and responsibilities between PUC and LSGU, and all 9 Public Service Agreements were adopted by municipal councils / municipal assemblies (8 were signed between the PUCs and LSGUs), thus initial assumptions have been made for the implementation of the methodology for the calculation of the tariff of water supply and wastewater collection services and the achieve full coverage of costs by applying appropriate cost accounting measures, depreciation of all fixed assets, improved collection and subsidization of socially vulnerable categories.

4.9.2 Objectives

The terms of references sets the following objectives for this task:

- To support the discussion and adoption of the tariff methodology by using the document “Tariff setting methodology for water supply and sewerage services in Bosnia and Herzegovina” prepared by UNDP in 2015 as the basis (draft) for this activity, make changes in the proposed methodology only to specific requirements of local government or PUC; document and adjust all possible modifications, include documented procedures for tariff change procedures;
- Deliver training of delegated employees for the tariff methodology application;
- Support the implementation of affordability survey (if organized specifically, it is not part of this task) in the municipality with the provision of key inputs or data needed regarding water supply and wastewater services, support the use of results (including the creation of databases on socially endangered subsidizing users) with the tariff methodology;

- Draft and support discussion and adoption of documented and transparent procedures for subsidizing payment services for vulnerable (vulnerable groups), monitor its implementation and provide related advises if appropriate;
- Link a tariff model with accounting data (with costs recorded by cost centres).

4.9.3 Activities carried out

For the purpose of achieving the above-mentioned objectives, the Consultant has carried out the following activities:

- Analysis of the existing ways of calculating the price of water supply and sewerage services in all 9 PUCs;
- Analysis and individual adjustment of "Tariff setting methodology for water supply and sewerage services in Bosnia and Herzegovina" prepared by UNDP, as well as drafting the "Proposed Tariff setting methodology for the calculation of price of water supply and sewage services", which was adopted as an integral part of the Public Service Agreement between PUCs and LSGUs;
- Carried out practical training of all 9 PUC personnel to calculate the price of water supply services and made brief reports;
- Made a draft of procedure for subsidizing socially vulnerable categories;
- Supported the discussion on the adoption of a Public Service Agreement, whose integral parts were the tariff methodology, the subsidy program for socially vulnerable categories, and presented it to decision makers (representatives of municipal councils, representatives of political party clubs, representatives of supervisory boards and others);
- Created a practical Excel tool for calculating the price of water supply services in accordance with the principles of financial and cost accounting;
- Performed connection of the tariff model to the accounting data and prepared short reports;

The Consultant provided continuous support to PUC employees in the process of calculating the price of water supply services and analysing the financial indicators required for the calculation of prices. PUCs have shown significant interest, and the managements of companies understand the measures that need to be taken to achieve a full coverage of PUC work expenses. During the implementation period of the project, the City of Cazin has adopted a new cost of water supply and sewage service, using parts of the methodology for calculating the price of water supply, and thus equalizing the price of water for all categories of users. However, it is necessary to apply all other elements of tariff methodology in the forthcoming period, which has not been implemented in this process. All PUCs are committed to integrating tariff adjustment plans into their business plans with an aim to achieve full cost coverage, which will be implemented over a longer period of time (3-5 years). This will also enable other necessary measures, such as optimizing the number of employees, reducing non-revenue water, gradually registering all fixed assets, and calculating the total depreciation, as well as allocating investment maintenance funds, to be fully implemented.

4.9.4 Performance indicators

Table 4.9.1: Performance indicators overview for each of 9 LSGUs

PRICE POLICY – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
PRICE POLICY																		
Is there a documented methodology for tariff calculation?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Does the price cover all the relevant costs?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Is periodic check of payment ability of citizenship carried out?	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Is there cross-subsidization between customer categories and / or types of services?	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4.9.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E
PRICE POLICY – PERFORMANCE INDICATORS:	Is there a documented methodology for tariff calculation?		Does the price cover all the relevant costs?		Is periodic check of payment ability of citizenship carried out?		Is there cross-subsidization between customer categories and / or types of services?	
Realized change:	0 YES	9 YES	0 YES	0 YES	N/a	N/a	9 YES	8 YES

4.10 COLLECTION AND REVENUE ADMINISTRATION, BILLING CYCLE

4.10.1 Description of initial state

PUCs are facing serious difficulties in its business when it comes to collecting receivables for the delivered services. Even though PUCs apply different billing mechanisms, still, a significant number of invoiced services are not charged because they transition to the statute of limitations (over 365 days). PUCs take legal action in respect of claims immediately before statute of limitations or do not take any steps regarding the collection of claims at all. In certain cases, invoicing of the service is done without service user analysis, which results in cash outflow from by calculation obligation according to the value added tax law.

The consequence of uncollected receivables is the lack of money, i.e. the money is locked in receivables and is not available for payment of due obligations or new projects. Customer payment delays lead to additional costs for the company in terms of lawsuits and similar legal actions. In addition, in accordance with the regulations, the company must deduct the value of the receivables in order for the financial statements to be fairly presented. PUCs do not conduct a regular analysis or impairment of its receivables in some cases, which questions the accuracy of the stated items of receivables and accumulated profit / losses in the PUCs' financial statements.

Receivables from PUC generally continue to grow, while revenue growth is not so intense. As a result, the coefficient of trade receivables decreases and the number of billing days increases. Selling "on credit" brings both benefits and costs. The effect of invoicing is to show revenue at significantly higher amounts from the inflow, which prevents proper planning of costs and investments in future periods.

None of the 9 PUCs at the beginning of the implementation of the activity had an elaborated and adopted communication plan in the event of an increase in the prices of services. These activities are mostly done ad-hoc, and most often when price changes are made.

The same situation is with the procedure for increasing the receivables collection. At the beginning of the Project implementation, none of the 9 PUCs had a procedure with defined measures and activities that would regulate the process and aim at increasing the receivables collection.

4.10.2 Objectives

The terms of references set the following objectives for this assignment:

- Analyse all debts and receivables by type of service provided and maturity and provide recommendations for improvement;
- Support improved receivables administration with separate payment accounting by type of service and better linked with issued invoices;
- Draft and discuss procedures leading to increased collection, support their implementation and monitor the results achieved (improving the procedure if the results are weakened, having in mind all the above-mentioned measures);
- Draft the Communication operational plan to be used when tariff increase is needed, discuss it with PUC and accordingly revise;
- Analyse different options of billing cycles and agree on the optimal (not necessarily the same for all customers).

4.10.3 Activities carried out

The Consultant has carried out the following activities with the aim of achieving the above objectives:

- Held meetings and consultations with PUC representatives discussing procedures for collecting revenues and recommendations for improving the existing procedures;
- Conducted a data analysis on suspicious and disputable receivables for all 9 PUCs;
- Produced an analysis of receivables and revenues from service users for each individual PUC;
- Produced recommendations for reducing the number of unpaid revenues (within the above-mentioned analysis of receivables and revenues from service users) for all 9 PUCs;
- Draft the Communication Operational Plan in case of increase of the prices of services, discussed the plan with PUC and prepared final documents accordingly;
- Collection and analysis of existing legal and sub-legal regulations, as well as existing PUC internal documents related to the collection of receivables;
- Drafting of the Procedure for increasing in collection of receivables;
- Preparation and organization of meetings with all targeted PUCs and MEG project coordinators in front of LSGUs for the purpose of discussing draft documents and drafting final versions based on comments and suggestions arising from the above-mentioned discussions.

4.10.4 Performance indicators

Table 4.10.1: Performance indicators overview for each of 9 LSGUs

COLLECTION AND ADMINISTRATION OF REVENUES, BILLING CYCLE - PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is a regular analysis of unpaid claims carried out?	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES	Partially >50 %	YES
Are there procedures for increasing billing?	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Is there a communication operating plan for working with service users?	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

Table 4.10.2: Summary overview of indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E
COLLECTION AND ADMINISTRATION OF REVENUES, BILLING CYCLE - PERFORMANCE INDICATORS:	Is a regular analysis of unpaid claims carried out?		Are there procedures for increasing billing?		Is there a communication operating plan for working with service users?	
Realized change:	9 Partially >50%	9 YES	0 YES	9 YES	0 YES	9 YES

4.11 ACCOUNTING PROCEDURES AND MIS (MANAGEMENT INFORMATION SYSTEM)

4.11.1 Description of initial state

All PUCs apply the accounting system and procedures that are in line with Entity Laws, and which are based on international financial reporting standards. Individual differences in accounting systems are related to the types of services that each individual PUC performs and through which it conducts accounting policies in practice. All PUCs have more or less made or adopted internal accounting rulebooks that needed to be analysed and, with the support of the Consultant, modifications and amendments were needed to be proposed.

According to the provisions of Entities' Laws on Accounting and Auditing in the Federation of B&H and the Republika Srpska, a rulebook on the outline chart of accounts has been enacted, whose attachment is chart of accounts framework. The Rulebook stipulates that the balance and changes in the value of assets, capital and liabilities, revenues and expenditures, and the determination of operating business results are based on the basic three-digit accounts of the chart of accounts framework in accordance with the Accounting and Audit Law at Entity Levels. The analysed PUCs therefore have legally defined synthetic part of the chart of accounts, and the focus of the Consultant was on the possible extension of the analytical part of the chart of accounts of each PUC. At the moment, there is no unique chart of accounts that specifically monitors the water supply and wastewater collection and treatment functions separately from other public services.

Part of the analysed PUCs has stated at the beginning of the project that they are carrying out cost accounting at cost centres and that such recording is enabled through accounting software. In part of the PUCs cost accounting per cost centres was not possible, and therefore those PUCs have been the subject of support for the purchase of improved accounting software. However, it has been established that the cost centres are not clearly defined and it is necessary to provide a proposal for the structure of cost centres for each of those PUCs, based on which it would be possible to carry out gradual recording of costs all the way to their place of creation.

In order to enable the monitoring of business indicators, key business indicators and certain values of the initial indicators for 2016 were defined at the beginning of the project, which enabled the monitoring of the progress of each PUC individually in each of the areas of intervention.

4.11.2 Objectives

The terms of references set the following objectives for this assignment:

- Develop or amend and improve internal accounting rulebooks including:
 - Rulebook on accounting policies;
 - Rulebook on financial operations;
 - Rulebook on operations with cash;
 - Rulebook on data archiving.
- Develop and implement tailored chart of accounts;
- Draft proposal on cost centres that will allow not only the separation of costs for each service provided, but will also enable cost optimization; discuss it with the PUC management, revise accordingly;
- Support improvements of existing accounting software to enable fully analytical monitoring and delineation of cost by cost centres; if such software development is not possible, prepare purchase order for the appropriate accounting software;
- Deliver training on use of new chart of accounts and bookkeeping of costs by cost centres (both theoretical and practical hands-on training using existing accounting software);
- Support continuous bookkeeping of costs by cost centres (monitor and support posting of all costs according to defined cost centres);

- Propose a list of PIs, including the evaluation methodology, discuss and decide on KPIs to be regularly monitored.

4.11.3 Activities carried out

The Consultant has carried out the following activities with the aim of achieving the above objectives:

- Conducted an analysis of the existing accounting rulebooks of all 9 PUCs;
- Based on the analysis of the existing ones, prepared, and submitted to all PUCs drafts of the following rulebooks:
 - Rulebook on accounting policies;
 - Rulebook on financial operations;
 - Rulebook on operations with cash;
 - Rulebook on data archiving.
- Conducted an analysis of the existing chart of accounts and prepared a document with comments and recommendations for improving the chart of accounts for all 9 PUCs;
- Supported the adoption and implementation of accounting rulebooks and recommendations for improving chart of accounts.
- Supported the analysis of the status of accounting software and cost recording at cost centres in existing software.
- Created proposals for cost centre structures for all 9 PUCs individually.
- Supported the process of introducing cost accounting and cost recording by cost centres in all 9 PUCs;
- Conducted periodic data collection on PUC KPIs with the purpose of determining initial indicators and indicators based on which the progress of individual PUCs will be measured;
- Created a document with the proposal of 10 KPIs to monitor financial and operational performance of PUCs.

4.11.4 Performance indicators

Table 4.11.1: Performance indicators overview for each of 9 LSGUs

ACCOUNTING PROCEDURES AND MIS – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is chart of accounts developed and in use?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cost centres are defined and costs are booked at the appropriate cost centre?	Part ially >50 %	YES	NO	YES	Part ially >50 %	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	Part ially >50 %	YES
Reports based on cost-centre-structure are used regularly for efficient management and pricing of services?	NO	Part ially <50 %	NO	Part ially <50 %	NO	Part ially <50 %	NO	NO	NO	NO	NO	Part ially <50 %	NO	NO	NO	Part ially <50 %	NO	Part ially <50 %
The key to the allocation of indirect costs is defined, adopted and in use?	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Advanced and integrated accounting software is installed and in use?	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES

Table 4.11.2: Summary overview of indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E	S	E
ACCOUNTING PROCEDURES AND MIS – PERFORMANCE INDICATORS:	Is the new chart of accounts developed and in use?		Cost centres are defined and costs and revenues are booked at the appropriate cost		Reports based on cost-centre- structure are used regularly for efficient management and pricing of services?		The key to the allocation of indirect costs is defined, adopted and in use?		Advanced and integrated accounting software is installed and in use?	

Start / end of project period	S	E	S	E	S	E	S	E	S	E
			centre?							
Realized change:	9 YES	9 YES	3 Partially >50%	9 YES	0 YES	6 Partially	0 YES	9 YES	5 YES	9 YES

4.12 BUDGETING AND BUSINESS PLANNING

4.12.1 Description of initial state

Business planning at the level PUC is a legally prescribed obligation, which is realized through the development of three-year PUC business plans and annual operating plans. In most cases, PUCs have been involved in developing business plans through financial management and planning on a traditional basis. For example, planning was largely based on a proportional increase in financial results without prior specific analysis of activities or forecast of financial operations. Reporting is performed on the basis of statements from balance sheets, income statement and cash flows statements, and business planning is performed at the level of the entire company. Detailed business analyses by service types and cost centres have not been carried out, nor has the monitoring of business indicators been carried out whose purpose is to point to the necessary corrective measures. Budgeting based on detailed analysis and plans is most often not implemented. Likewise, prior to the implementation of the MEG project, there was no practice of developing operational plans at cost centres, i.e. cost projections according to actual generated costs.

Given that the development and monitoring of PUC business plans implementation is a process which should lead to changes in the overall approach to business planning, the beginning of work on their structuring and drafting by PUC was not easy. An analysis of the three-year business plans of all 9 PUCs was made. Given that most of the necessary measures initiated by the MEG project take a longer period of time (for some tasks such as optimizing the number of employees it will take between 7 and 10 years), in cooperation with UNDP, it has been decided that the business plans for PUCs are made for a period of implementation of 5 years (2017 - 2021). Based on that decision, the concept of a business plan was created on the basis of which PUCs approached their design. In regard to the previously established practice of drafting three-year business plans, the five-year concept of PUC business plans includes a number of objectives and measures to achieve long-term objectives, which are defined on the basis of needs of each PUC, such as;

- reduction of non-revenue water;
- reduction of electrical energy costs;
- number of employees' reduction and Workplace Optimization (FTE);
- an increased share of recorded assets with an adequate depreciation calculation;
- calculation of water supply and sewage price which includes all costs;
- improving relations and working with service users, reducing the collection period and the share of unpaid receivables;
- monitoring based on established key performance indicators;
- other needs depending on the specificity of the PUC's performance.

In this process, specific emphasis of the project is to strengthen the capacity of PUC's staff who need to identify, prioritize, and systematically implement measures and activities defined by the PUC business plan.

4.12.2 Objectives

The terms of references set the following objectives for this assignment:

- Deliver training for management and leaders of each sector on the fundamentals of budgeting and business planning (includes training for preparation of individual cost centres budgets and the consolidated budgets, creating procedures for the consolidated budget);

- Support preparation of the consolidated operational budget and budget by cost centres for the year 2017 (includes investment maintenance costs), so as preparation of the capital investment budget; these budgets will be used with the dedicated tariff model and they have to be discussed with the local government (Mayor, council representatives, relevant administration);
- Support preparation of the three-year business plan (for the period 2017 - 2019) that includes all needed activities for cost optimization (underlying optimization of electricity costs, and related NRW management, and staffing costs), so as valuations and projections of selected KPIs;
- Support monitoring of six month implementation (mid 2017) of the prepared budgets and business plans, provide advices for eventually needed corrective actions.

4.12.3 Activities carried out

The Consultant has carried out the following activities with the aim of achieving the above objectives:

- Conducted thematic training on the basics of budgeting and business planning for all 9 PUCs;
- Prepared a template for the creation of a consolidated budget per cost centres for 2017 and supported the preparation of the consolidated budget for 2017 by the PUC;
- Created a template for a five-year business plan for the period 2017 - 2021;
- Held a series of bilateral meetings with the PUC with an aim to support business plans development for the period 2017 - 2021;
- Perform an overview of business plans and submit written recommendations for the necessary corrective measures (expected in the period immediately following the reporting period), in particular:
 - Data organizations and indicators of the existing operational performance of PUC,
 - Estimates of financial performance and allocation of operating costs by cost centres (water supply, wastewater collection, wastewater treatment, common services, etc.)
 - SWOT analysis and strategic orientation for each of the PUC activities;
 - Forecast of service needs;
 - Strategic goals and measures with performance indicators (and target values).
 - Action plans for each of the PUC activity areas.
 - PUC's Financial Projections.

4.12.4 Performance indicators

Table 4.12.1: Performance indicators overview for each of 9 LSGUs

BUDGETING AND DEVELOPING BUSINESS PLANS – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Operational budget and cash flow projections are established per cost centres and on summative basis?	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially <50%	NO	Partially <50%	NO	Partially <50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%
There is a consolidated budget module?	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Has the cycle of annual business planning been implemented?	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%
The draft business plan for the period 2017-2021 was created?	NO	Partially >50%	NO	Partially >50%	NO	Partially <50%	NO	Partially >50%	NO	Partially <50%	NO	Partially <50%	NO	Partially >50%	NO	Partially >50%	NO	Partially >50%

Tabela 4.12.2: Summary overview of indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E
BUDGETING AND DEVELOPING BUSINESS PLANS – PERFORMANCE INDICATORS:	Operational budget and cash flow projections are established per cost centres and on summative basis?		There is a consolidated budget module?		Has the cycle of annual business planning been implemented?		The draft business plan for the period 2017-2021 was created?	
Realized change:	0 YES	5 Partially > 50% 4 Partially < 50%	0 YES	9 YES	0 YES	9 Partially >50%	0 YES	6 Partially >50% 3 Partially <50%

4.13 FINANCIAL MANAGEMENT

4.13.1 Description of initial state

One of the basic postulates of financial management in PUC is the management of a system of public procurement and a system of work orders.

In the first reporting period, the Consultant submitted all the targeted PUCs draft Public Procurement Ordinance, as well as the Procedure for Internal Work Orders.

The Public Procurement Ordinance more specifically defines the measures and activities in the conduct of public procurement, as well as rights and obligations, i.e. roles and responsibilities of the PUC, and as such elaborates the procedure for the implementation of the Law on Public Procurement.

The Internal Work Order Procedure completes the process of opening, executing, concluding, processing, and completing work orders. This enabled PUC to plan the scheduling of employee engagement and resources, as well as consideration of costs after completing activity on a work order.

Analysis of the current situation at the beginning of the MEG project implementation has shown that out of nine (9) targeted PUCs in LOT 1, only two have formal public procurement procedures, therefore adopted in the form of an internal utility act (PUC "Vodovod" Prijedor and PUC "ViK "Sanski Most"). When it comes to internal work order procedures, four PUCs use their internal documents in their business to run the internal work order procedure. Of these two PUCs use in their operations a procedure that is part of the international standard ISO 9001: 2008 (PUC "Vodovod" Bihać and PUC "ViK" Velika Kladuša), PUC "Vodovod" Cazin has Instructions for completing the work order and PUC "Vodovod" Gradiška uses the Rulebook on the Movement of Bookkeeping Documents.

4.13.2 Objectives

The objectives set by the project after the established initial status in the companies are:

- Prepare and adopt procedures in the public procurement process, respect them and effectively apply them.
- Document the flow of work orders, monitor implementation and application of control measures.

4.13.3 Activities carried out

For the purpose of achieving the above-mentioned objectives, the Consultant has carried out the following activities:

- Collecting and analysing existing legal and sub-legal regulations related to public procurement and internal work orders.
- Collection and analysis of existing PUC internal procurement acts and internal work orders (rulebooks, procedures).
- Creating draft procedures for the implementation of the Law on Public Procurement.
- Creating a draft procedure for internal work orders.
- Preparing and organizing meetings with all targeted PUCs and MEG Project Coordinators in front of the LSGUs for the purpose of discussing draft documents and making the final version based on the comments and suggestions arising from the afore mentioned discussions.

4.13.4 Performance indicators

At the beginning of the reporting period most PUCs in LOT 1 has been conducting the public procurement procedure by direct application of the Law on Public Procurement. The situation with internal work orders was even more indefinite, as there was no legal solution that would directly define the procedure for internal work orders. The MEG Project recommendation was the formal adoption of the Ordinance on Public Procurement, i.e. Ordinance on internal work order procedures, as an internal PUC act for the purpose of implementing the prescribed steps by automation, it would increase the possibility of control and supervision over cost management while minimizing the possibility of subjective decision making and manipulation of the procedure itself.

Table 4.13.1: Performance indicators overview for each of 9 LSGUs

FINANCIAL MANAGEMENT – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
The public procurement system implemented?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Internal work order system documented and applied?	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes

Table 4.13.2: Summary overview of performance indicators for all 9 PUCs

Start / end of project period	S	E	S	E
FINANCIAL MANAGEMENT – PERFORMANCE INDICATORS:	The public procurement system implemented?		Internal work order system documented and applied?	
Realized change:	2 YES	9 YES	2 YES	9 YES

4.14 INVENTORY AND FIXED ASSETS CYCLE, INCLUDING INFRASTRUCTURE OWNERSHIP AND DEPRECIATION

4.14.1 Description of initial state

None of the PUCs participating in the project have an all-assets record which was entrusted to them to manage by the LSGU in the main book of fixed assets, and consequently none calculate the entire amount of depreciation on the assets it manages. The reasons that led to this are numerous, but the essential reason is that the transfer of part of the jurisdiction over the management and maintenance from the owner (LSGU) to service provider (PUC) has not been carried out in a proper way. PUCs cannot record in the financial bookkeeping assets that were not officially assigned to, they cannot make an adequate depreciation calculation, nor provide funds for their maintenance and reconstruction without the need for additional efforts to resolve these issues together with LSGUs. Consequently, the price of the service does not contain the total amount of depreciation required, which should be allocated to a dedicated investment fund. It is important to note that, despite the fact that the total assets are not included in the financial statements, the costs related to its maintenance are certainly incurred. Also, for the previously mentioned reason, the funds for covering maintenance costs are not provided. All this leads to a continuous deterioration of communal infrastructure, whose parts should have long been replaced.

In order to overcome the gap created by the overall unresolved situation regarding the assignment of all assets to the PUC management, asset recording and depreciation calculation, a mechanism was created to create "auxiliary" (parallel) fixed assets book in which the present fair value of the asset and the depreciation would be calculated, which would also be the basis for a gradual transfer of such registered assets to the main book.

4.14.2 Objectives

Objectives set by the project after the established initial state in the companies are:

- Support making agreement between the city / municipality and the PUC (it can be a part of the previously mentioned public service agreement) on responsibilities for updating the inventory of all fixed assets and their revaluation so as on responsibilities over decisions making for expenditures using the "depreciation fund";
- Support the PUC in upgrading the inventory of all fixed assets and their revaluation, use the outputs of other activities implemented (e.g. mapping), prepare draft update of complete fixed asset book (assigned to cost centres) before the end of the year, and use it for business plan preparation and tariff evaluation;
- Supervise the PUC in calculating depreciation of all fixed assets of the updated book of records, analyse if the existing software allows automatic calculation of depreciation based on pre-defined depreciation classes, as well as integration with other (accounting) modules;
- Supervise PUC in tariff evaluation using an adopted tariff model that includes fully accounted depreciation;
- Supervise the PUC in allocation part of the revenues, proportional related to the depreciation in the tariff, into the "depreciation fund" (which could be a separate account or sub-account of the PUC or even the municipal administration);
- Provide support to management on deciding for optimal use of "depreciation fund – investment maintenance fund" (these funds cannot be used for any purpose other than

investment maintenance - this includes programs for reducing non-revenue water, e.g. leak detection and repairs, replacement of pipelines, and other infrastructural components).

4.14.3 Activities carried out

The Consultant has carried out the following activities with the aim of achieving the above objectives:

- Analysis of existing legal and sub-legal regulations, as well as PUC internal documents in the field of water and utility activities.
- Drafting of the Public Service Agreement and Decision on the use of depreciation funds.
- Preparation and organization of meetings with all targeted PUCs and LSGUs for the purpose of discussing draft documents and drafting final versions based on comments and suggestions arising from the above-mentioned discussions.
- Support to the process of adoption of the above-mentioned documents.
- An "auxiliary" book for fixed assets was developed, for those not recorded in the register of assets managed by the PUC and for which no depreciation calculation is made.
- User manual was developed for entering data into the "auxiliary" fixed assets book, the introduction of depreciation rates for individual infrastructure elements and instructions for transferring assets to the main book of fixed assets.
- An evaluation was carried out of the repurchase of fixed assets by profiles, materials, types of equipment, and the price of works in order to allow the estimation of the "fair" purchase value of the recorded asset. The amount of the depreciation charge for each individually recorded asset is determined;
- Based on the estimated fair value at the time of the calculation of the recorded asset and its age, the calculation of the depreciation was calculated, based on which an immediate estimate of the assets value recorded in the "auxiliary" fixed assets book was obtained;
- At the end, the evaluation of the status of part of income allocating was made, in proportion to the depreciation charge in the tariff, in the "amortization fund" (investment maintenance fund).

4.14.4 Performance indicators

Table 4.14.1: Performance indicators overview for each of 9 LSGUs

FIXED ASSETS MANAGEMENT – PERFORMANCE INDICATORS	Bihać		Bosanska Krupa		Cazin		Gradiška		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladuša	
	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Is a regular inventory of fixed assets carried out, is the book of basic assets up to date?	NO	NO	NO	NA	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Are there recorded missing assets in the "auxiliary" book of fixed assets?	NO	Part ially < 50%	NO	Part ially > 50%	NO	Part ially > 50%	NO	Part ially < 50%	NO	Part ially < 50%	NO	YES	NO	Part ially > 50%	NO	Part ially < 50%	NO	Part ially < 50%
Is re-evaluation of all fixed assets carries out periodically, if necessary, regulated by an internal act?	N/a	YES	N/a	YES	N/a	YES	N/a	YES	N/a	YES	N/a	YES	N/a	YES	N/a	YES	N/a	YES
Is the software module for the fixed assets book integrated with the other modules, which enables automatic calculation of depreciation based on the default depreciation class?	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES
Is realistically calculated depreciation a part of the tariff model?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Regular inventory control of stock is performed, stock inventory exclusion procedures are documented and implemented?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 4.14.2: Summary overview of indicators for all 9 PUCs

Start / end of project period	S	E	S	E	S	E	S	E	S	E	S	E
FIXED ASSETS MANAGEMENT – PERFORMANCE INDICATORS:	Is a regular inventory of fixed assets carried out, is the book of basic assets up to date?		Are there recorded missing assets in the "auxiliary" book of fixed assets?		Is re-evaluation of all fixed assets carried out periodically, if necessary, regulated by an internal act?		Is the software module for the fixed assets book integrated with the other modules, which enables automatic calculation of depreciation based on the default depreciation class?		Is realistically calculated depreciation a part of the tariff model?		Regular inventory control of stock is performed, stock inventory exclusion procedures are documented and implemented?	
Realized change:	0 YES	0 YES	0 Yes	1 YES 5 Partially < 50% 3 Partially >50%	9 N/a	9 YES	5 YES	9 YES	0 YES	0 YES	9 YES	9 YES

4.15 QUALITY AND QUANTITIES OF WATER

4.15.1 Description of initial state

One of the basic conditions for regular water supply is the availability of sufficient quantities of potable water in the water sources. These quantities must meet current needs, as well as the need for future population growth and industry development. It is very common in water supply company practices to see examples where new water sources are being intake, additional pumping and water treatment being made, and with such a practice business loss is being significantly increased. Often, local water supply systems are being taken over which water supply companies find difficult to manage. PUCs from Velika Kladuša and Sanski Most expect problems in regular water supply due to the lack of sufficient water in smaller, existing water sources.

Parallel to current water quantity concerns, water quality issues are increasingly pronounced. Water supply companies are faced with water quality preservation problems at water sources themselves and further on in the distribution system (steel pipelines, asbestos cement pipelines, retraction of the surrounding terrain in damaged pipelines, sewerage systems, etc.). Water Laws ("Official Gazette of the Federation of Bosnia and Herzegovina" No.70 / 06 and "Official Gazette of Republic of Srpska" No. 50/06, 92/09 and 121/12) stipulate that areas which have water sources which by quantity and quality can be used for public drinking water supply, must be protected against pollution and other impacts that may adversely affect the health or water quality change or the spring's abundance. The protection is carried out by establishing the sanitary protection zone and by implementing protective measures in accordance with the Ordinance on the manner of determining the conditions for determining sanitary protection zones and protective measures for water sources for public water supply ("Official Gazette of the Federation B&H", No. 88/12), and on territory of Republic of Srpska in accordance with the Ordinance on Protection Measures, Methods of Determination, Maintenance and Marking of the Sanitary Protection Zone ("Official Gazette of Republic of Srpska" No. 76/16). The created studies on protection of water sources, i.e. sanitary protection programs in RS, PUCs from Bihać, Bosanska Krupa, Kostajnica, Prijedor, Sanski Most and Velika Kladuša are not in accordance with applicable legal and sub-legal acts. PUCs from Bihać, Cazin, Gradiška, Sanski Most and Velika Kladuša do not even have developed studies for all the water sources in the municipality that are in the function of public water supply. Based on the submitted data, the Consultant has determined that the quality of water in springs is not checked in the extent and number of samples prescribed by the Ordinance on the health of drinking water in certain PUCs.

Currently, PUC from Bihać has a constructed wastewater treatment plant, as well as a non-conventional wastewater treatment plant at the locality of the local community Ljubijankići in Cazin municipality. In the area of the municipalities Gradiška and Cazin the construction of wastewater treatment plants is planned in the shortest time, while in the area of Bosanska Krupa municipality is currently implementing a project for the construction of sewerage collectors and wastewater treatment plants.

4.15.2 Objectives

The following objectives for this task are set by the project assignment:

- Delivery of sufficient quantities of quality drinking water that meets the needs of customers,
- Water supply companies that have problems with water quality will provide adequate water treatment;

- Prepare a cadastre of locations for sampling water quality and prepare a database to record key quality parameters; provide access to data via the Internet;
- Treatment of wastewater before discharge to the recipient (design, construction, and operation of wastewater treatment plants).

4.15.3 Activities carried out

For the purpose of achieving the above-mentioned objectives, the Consultant has carried out the following activities:

- Developed a data collection questionnaire for the purpose of producing a report on needs of the PUC for additional drinking water quantities;
- Produced a report on PUC needs for additional drinking water quantities for all 9 PUCs;
- Developed a data collection questionnaire for the purpose of drawing up a report on the review of existing sources protection studies in the area of each of the 9 PUCs;
- Produced a report on the review of existing sources protection studies in the area of each of the 9 PUCs;
- Developed a data collection questionnaire for the purpose of producing reports on the implementation of capital investments in the area of each of the 9 PUCs;
- Produced a report on the implementation of capital investments in the area of each of the 9 PUCs.

5. SUMMARY TABLE OF PERFORMANCE INDICATORS

5.1 Individual tables per LGU

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Production and consumption of water																			
Water production	l/inh/day	301,58	280,2	218,84	208,82	224,43	246,93	262,85	250,57	127,38	126,57	154,78	173,90	452,84	424,15	206,89	200,78	277,17	290,87
Water consumption	l/inh/day	143,33	137,0	87,21	96,75	96,66	100,55	113,88	102,37	54,39	55,96	88,18	90,83	93,03	92,95	66,48	67,69	108,63	111,66
Residential water consumption	l/inh/day	118,34	113,5	79,88	86,00	88,26	90,71	99,15	88,55	46,18	47,62	77,66	79,86	78,65	78,50	59,15	60,46	97,19	97,97
Non-revenue water																			
Non-revenue water	%	53	51,0	60	54,0	57	59	57	59	57	56	43	48	79	78	68	66	61	62
Non-revenue water	m ³ /km/day	25,86	24,41	14,68	12,14	13,63	15,61	16,40	16,33	15,01	14,61	8,78	10,95	63,49	51,89	23,93	22,7	11,28	12,13
Non-revenue water	m ³ /connection/day	0,44	0,504	0,48	0,413	0,45	0,505	0,42	0,417	0,41	0,395	0,22	0,278	1,25	1,161	0,49	0,462	0,55	0,59
Real losses (% of water intake)	%	n/a	n/a	n/a	n/a	40	41	20	22	20	36	27	30	60	47	68	66	43	41
Real losses (m ³ per connection per day)	m ³ /connection/day	n/a	n/a	n/a	n/a	0,312	0,353	0,147	0,155	0,145	0,254	0,14	0,175	0,946	0,696	0,487	0,462	0,391	0,394
Apparent losses (% of water intake)	%	52,29	51,1	60,33	53,04	17,12	17,78	36,71	37,2	36,89	19,95	15,97	17,77	19,47	31,23	n/a	n/a	18,06	20,50
Apparent losses (m ³ per connection per day)	m ³ /connection/day	0,443	0,504	0,484	0,408	0,134	0,151	0,273	0,262	0,262	0,141	0,083	0,104	0,307	0,464	n/a	n/a	0,164	0,196
Costs																			
Unit operational costs for water and sewage in regard to the sold water	BAM/ m ³	0,871	0,830	0,886	0,746	1,944	1,721	1,581	1,648	1,601	0,284	1,70	1,828	1,294	1,595	2,012	2,496	1,444	1,562

³ S – beginning of contracting period (data for the entire 2016)

⁴ E – end of the contracting period (data until 30th July 2017)

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Unit operational costs for water and sewage in regard to the water intake	BAM/ m ³	0,414	0,406	0,353	0,345	0,837	0,701	0,685	0,673	0,684	0,126	0,968	0,955	0,266	0,349	0,647	0,841	0,566	0,599
Unit operational costs only for water in regard to the sold water	BAM/ m ³	0,822	0,799	0,727	0,589	1,943	1,713	1,265	1,369	1,569	0,267	1,156	1,243	1,048	1,276	1,811	2,246	1,298	1,421
Unit operational costs only for the sewage in regard to the number of users	BAM/inhabitant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	136,94	177,48	n/a	n/a	n/a	n/a
Share of costs for employee in the operational costs	%	49,81	58,71	88,47	98,49	44,29	50,1	42,70	54,74	50,37	n/a	66,30	63,13	61,22	53,04	52,12	44,61	44,02	45,56
Share of costs for electricity in the operational costs (%)	%	20,06	20,93	19,79	21,79	15,66	18,28	5,87	6,36	6,23	30,95	7,55	7,16	18,56	13,74	10,03	8,14	16,47	15,38
Share of costs of external contracts in the operational costs	%	1,39	0,44	0,00	0,00	3,30	3,65	42,43	35,34	0,17	15,34	0,00	0,00	11,10	8,88	0,00	0,00	0,00	0,00
Service quality																			
Continuous service provision, average number of hours of daily water supply	hours/day	24	24	22	22,68	24	24	23,95	23,92	24	24	24	24	22,95	23,44	24	24	24	24
Water quality – number of tests for residual chlorine	%	100	100	100	100	100	100	100	100	100	100	100	100	189,8	201,23	383,80	474,07	127,00	127,50
Water quality – number of successful tests for residual chlorine	%	100	100	93,30	98,81	91,67	96,67	100	100	100	100	100	100	98,7	98,16	76,72	90,63	98,23	99,22
Percentage of water supply service users to whom the service has been turned off - households	%	0,04	0,11	0,24	0,36	0,00	0,00	0,00	0,00	0,30	0,14	0,13	0,00	0,03	0,03	0,12	0,12	0,61	0,16
Percentage of water supply service	%	4,53	3,06	0,23	0,00	1,07	1,46	0,88	1,31	0,14	0,36	0,46	0,00	1,60	0,86	0,14	0,07	0,23	0,08

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
users who are sued in court - households																			
Percentage of water supply service users to whom the service has been turned off – legal entities	%	0,04	0,22	1,18	0,00	0,00	0,00	0,00	0,10	0,46	0,00	0,18	0,00	0,23	0,17	0,24	0,00	0,58	0,29
Percentage of water supply service users who are sued in court – legal entities	%	1,24	0,51	3,38	3,68	0,38	0,47	1,23	1,97	0,92	0,00	0,31	0,00	0,17	0,50	0,00	0,00	1,28	0,29
Population coverage by service																			
Population coverage by water supply service	%	90,0	93,97	96,5	96,66	90,81	91,10	86,62	86,68	66,9	67,33	83,1	83,1	68,53	69,51	81,34	81,38	92,55	93,62
Population coverage by the sewage service	%	10,0	13,97	37,2	37,33	12,15	12,19	28,87	28,89	66,90	67,33	67,73	67,73	39,24	39,80	15,73	15,75	17,02	17,02
Percentage of wastewater being treated only by primary treatment	%	n/a	n/a	0,00	0,00	n/a	n/a	0,00	0,00	n/a	n/a	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Percentage of wastewater being treated at least by secondary treatment	%	n/a	n/a	0,00	0,00	n/a	n/a	0,00	0,00	n/a	n/a	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Non-revenue water																			
Unavoidable Annual Real Losses (UARL)	l/conn./day	56	61	77	83	n/a	n/a	51	51	57	57	63	63	53	54	55	55	90	90
Current Annual Real Losses (CARL)	l/conn./day	0	0	478	222	312	184	147	44	406	208	140	88	946	356	0	0	391	208
Infrastructure Leakage Index (ILI)	number	0	0	6,19	2,67	n/a	n/a	2,89	0,87	7,12	3,64	2,24	1,41	17,94	6,55	0,00	0,00	4,34	2,32
Success category	description	A	A	B	A	n/a	n/a	A	A	B	A	A	A	D	B	A	A	B	A
Measurement																			

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Percentage of measurement of consumers (% number of correct water meters in regard to the number of connections)	%	80,0	80,0	91,42	71,91	98,81	99,36	85,28	85,58	100	100	95,26	94,18	86,00	86,00	92,98	93,04	100,00	100,00
Percentage of consumption measurement (% of measured in regard to the billed water)	%	86,63	99,46	98,82	100	99,28	99,44	85,00	94,04	100	100	85,53	75,13	86,00	86,00	93,13	92,19	99,58	99,51
Breaks in pipelines																			
Total number of breaks in the water supply network per kilometre per year	breaks/km	4,25	2,60	2,84	1,32	4,56	2,49	1,40	0,30	1,39	0,49	0,32	0,15	4,71	2,25	3,76	1,74	2,37	1,12
Number of cloggings of pipes per km of network	clogging/km	2,01	1,45	4,27	3,11	8,93	5,22	4,23	0,88	0,27	0,09	1,32	0,70	2,18	1,41	5,19	1,34	1,35	0,10
Number of detected breaks by sound detection in the water supply network per kilometre per year	breaks/km	0,37	0,14	0,89	0,23	0,00	0,01	0,00	0,00	0,00	0,02	0,32	0,19	0,17	0,06	0,29	0,11	0,01	0,00
Employee productivity																			
Number of employees on 1000 connections, water and sewage	#/'000	6,55	7,51	4,18	4,17	4,48	4,42	4,91	5,15	7,93	8,58	6,65	6,64	5,78	5,73	4,14	4,23	3,93	3,89
Number of employees on 1000 connections, only water	#/'000	5,91	6,80	3,73	3,73	4,48	4,42	4,11	4,29	6,61	7,26	4,72	4,72	5,42	5,37	3,24	3,33	3,93	3,89
Number of employees on 1000 connections, only sewage	#/'000	0,64	0,72	0,45	0,45	0,00	0,00	0,80	0,86	1,32	1,32	1,92	1,92	0,36	0,36	0,90	0,90	0,00	0,00
Number of employees on 1000 service users, water and sewage	#/'000	2,34	2,13	1,14	1,13	1,28	1,28	1,74	1,83	1,42	1,53	1,98	1,98	1,63	1,61	1,19	1,22	1,20	1,18
Billing and collection																			

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Average revenue per m ³ , water and sewage	BAM/ m ³	1,34	0,68	1,59	1,58	1,56	1,52	1,93	1,83	1,56	1,63	1,82	1,98	1,63	1,73	1,73	4,16	1,26	1,31
Average annual revenue per connection	BAM/connection	196,06	57,72	186,66	94,85	191,67	88,12	225,81	46,46	172,00	86,96	196,51	103,02	192,22	99,17	144,98	75,60	164,76	77,93
Average revenue per m ³ , only water	BAM/ m ³	1,21	0,61	1,41	1,41	1,51	1,47	1,55	1,52	1,20	1,23	1,29	1,40	1,41	1,50	1,58	3,30	1,20	1,24
Average revenue per user of wastewater collection service	BAM/person	62,28	11,76	14,87	7,37	13,08	6,17	47,10	8,39	14,21	15,3	20,81	10,91	12,65	6,74	18,91	23,22	12,78	6,41
Average collection period – water and sewage	Number of days	207	233	195	196	94	108	152	361	210	166	321	384	623	586	141	158	72	82
Percentage of collection – water and sewage	%	115,32	126,94	117,94	106,52	n/a	n/a	68,87	93,61	77,23	159,91	115,29	97,34	105,03	105,08	110,95	92,58	118,92	111,53
Internal subsidies between the consumers categories – relation between the price of water for legal entities and for households	#	1,81	1,81	2	2	1,44	1,44	1,72	1,72	3,23	3,23	2,05	2,05	2,10	1,95	2,36	2,36	2,00	2,00
Financial results																			
Coverage of operational costs	%	153,73	83,13	n/a	n/a	80,01	84,11	122,22	107,23	97,18	122,25	107,12	106,61	118,59	108,80	85,55	89,44	87,50	89,41
Current relation (relation of current funds and current liabilities)	number	3,51	5,40	1,46	n/a	0,92	0,90	2,13	2,28	0,72	0,82	0,95	1,00	0,88	0,89	0,56	0,46	1,29	1,43
Coefficient of debt coverage (Debt Service Ratio)	%	n/a	n/a	0,12	0,95	n/a	n/a	3,21	4,30	0,42	0,40	0,69	0,17	26,25	17,70	0,00	0,00	0,55	0,20
Affordability of services																			
Total revenues per service user n regard to the gross national income per inhabitant	%	n/a	n/a	0,69	0,35	n/a	n/a	1,13	0,23	3,70	3,84	n/a	n/a	n/a	n/a	0,52	0,27	n/a	n/a

INDICATORS (by sectors)	Unit measure	Bihac		Bosanska Krupa		Cazin		Gradiska		Kostajnica		Kozarska Dubica		Prijedor		Sanski Most		Velika Kladusa	
		S ³	E ⁴	S	E	S	E	S	E	S	E	S	E	S	E	S	E	S	E
Amount of bill for household with the consumption of 15 m ³ monthly (only water and sewage , charge and VAT excluded)	BAM/ per year	214,2	214,2	243,0	243,0	279	279	342,00	342,00	167,40	167,40	225,00	225,00	234,00	252,00	286,20	286,20	216,00	216,00
Share of monthly bill for household (15 m3, water and sewage) in average monthly income of household	%	n/a	n/a	2,89	2,89	n/a	n/a	3,40	3,40	4,65	4,36	n/a	n/a	n/a	n/a	1,69	1,69	n/a	n/a
Gender																			
Percentage of women in the company (water and sewage)	%	17,48	18,38	21,43	21,43	15,58	15,58	20,00	21,43	16,67	19,23	18,42	18,42	24,32	24,32	21,74	21,28	13,46	13,46
Director is female or male?	gender	M	M	M	M	M	M	M	M	M	M	M	M	M	M	Ž	Ž	M	M
Number of woman in managerial positions	number	3	3	2	2	0	0	3	3	1	1	0	0	4	4	3	3	0	0

COMMENT: The indicator values for the end of the contracting period are based on the half-yearly calculation for the period January 1, 2017 - June 30, 2017, so their calculation is based on data that does not include the same calculating period as the starting indicators (beginning of the contracting period). For this reason, it should be noted that some of the obtained and displayed indicator values for the end of the contracting period show significant oscillations in relation to their starting indicators. These will be adequately displayed only when the entire annual cycle of business data collection for 2017 is rounded off. Indicators showing significant oscillations are therefore marked with an asterisk (*) in summary tables.

5.2 Summary tables

INDICATORS (by sectors)	Unit measure	Beginning of the period			end of the period		
		MIN	MAX	Average	MIN	MAX	Average
Production and consumption of water							
Water production	l/inh./day	127,38	452,84	247,42	126,57	424,15	244,75
Water consumption	l/inh./day	54,39	143,33	94,64	55,96	137,00	95,08
Residential water consumption	l/inh./day	46,18	118,34	82,72	47,62	113,50	82,57
Non-revenue water							
Non-revenue water	%	43,00	79,00	59,44	48,00	78,00	59,22
Non-revenue water	m ³ /km/day	8,78	63,49	21,45	10,95	51,89	20,09
Non-revenue water	m ³ /connection/day	0,220	1,250	0,520	0,278	1,161	0,530
Real losses (% of water intake)	%	20,00	68,00	39,71	22,00	66,00	40,43
Real losses (m ³ per connection per day)	m ³ /connection/day	0,140	0,946	0,370	0,175	0,696	0,360
Apparent losses (% of water intake)	%	15,97	60,33	32,11	17,77	53,04	31,07
Apparent losses (m ³ per connection per day)	m ³ /connection/day	0,083	0,484	0,270	0,104	0,504	0,280
Costs							
Unit operational costs for water and sewage in regard to the sold water	BAM/ m ³	0,871	2,012	1,480	0,284	2,496	1,410
Unit operational costs for water and sewage in regard to the water intake	BAM/ m ³	0,266	0,968	0,600	0,126	0,955	0,560
Unit operational costs only for water in regard to the sold water	BAM/ m ³	0,727	1,943	1,290	0,267	2,246	1,210
Unit operational costs only for the sewage in regard to the number of users	BAM/inhabitant	136,94	136,94	136,94	177,48	177,48	177,48
Share of costs for employee in the operational	%	42,70	88,47	55,48	44,61	98,49	58,55

INDICATORS (by sectors)	Unit measure	Beginning of the period			end of the period		
		MIN	MAX	Average	MIN	MAX	Average
costs							
Share of costs for electricity in the operational costs (%)	%	5,87	20,06	13,36	6,36	30,95	15,86
Share of costs of external contracts in the operational costs	%	0,17	42,43	6,49	0,44	35,34	7,07
Service quality							
Continuous service provision, average number of hours of daily water supply	hours/day	22,00	24,00	23,66	22,68	24,00	23,78
Water quality – number of tests for residual chlorine	%	100,00	383,80	144,51	100,00	474,07	155,87
Water quality – number of successful tests for residual chlorine	%	76,72	100,00	95,40	90,63	100,00	98,17
Percentage of water supply service users to whom the service has been turned off - households	%	0,03	0,61	0,16	0,03	0,36	0,10
Percentage of water supply service users who are sued in court - households	%	0,14	4,53	1,03	0,07	3,06	0,80
Percentage of water supply service users to whom the service has been turned off – legal entities	%	0,04	1,18	0,32	0,10	0,29	0,09
Percentage of water supply service users who are sued in court – legal entities	%	0,17	3,38	0,99	0,29	3,68	0,82
Population coverage by service							
Population coverage by water supply service	%	66,90	96,50	84,04	67,33	96,66	84,82

INDICATORS (by sectors)	Unit measure	Beginning of the period			end of the period		
		MIN	MAX	Average	MIN	MAX	Average
Population coverage by the sewage service	%	10,00	67,73	32,76	12,19	67,73	33,33
Percentage of wastewater being treated only by primary treatment	%	0,00	0,00	0,00	0,00	0,00	0,00
Percentage of wastewater being treated at least by secondary treatment	%	0,00	0,00	0,00	0,00	0,00	0,00
Non-revenue water							
Unavoidable Annual Real Losses (UARL)	l/conn./day	51,00	90,00	62,75	51,00	90,00	64,25
Current Annual Real Losses (CARL)	l/conn./day	140,00	946,00	313,33	44,00*	356,00*	145,56*
Infrastructure Leakage Index (ILI)	number	2,24	17,94	5,09	0,87	6,55	2,18
Success category	description	D	A	-	B	A	-
Measurement							
Percentage of measurement of consumers (% number of correct water meters in regard to the number of connections)	%	80,00	100,00	92,19	71,91	100,00	90,01
Percentage of consumption measurement (% of measured in regard to the billed water)	%	85,00	100,00	92,66	75,13	100,00	93,97
Breaks in pipelines							
Total number of breaks in the water supply network per kilometre per year	breaks/km	0,32	4,71	2,84	0,15	2,60	1,38
Number of cloggings of pipes per km of network	clogging/km	0,27	8,93	3,31	0,09	5,22	1,59
Number of detected breaks by sound detection in the water supply network per kilometre per year	breaks/km	0,01	0,89	0,23	0,01	0,23	0,08
Employee productivity							

INDICATORS (by sectors)	Unit measure	Beginning of the period			end of the period		
		MIN	MAX	Average	MIN	MAX	Average
Number of employees on 1000 connections, water and sewage	#/'000	3,93	7,93	5,39	3,89	8,58	5,59
Number of employees on 1000 connections, only water	#/'000	3,24	6,61	4,68	3,33	7,26	4,87
Number of employees on 1000 connections, only sewage	#/'000	0,36	1,92	0,71	0,36	1,92	0,73
Number of employees on 1000 service users, water and sewage	#/'000	1,14	2,34	1,55	1,13	2,13	1,54
Billing and collection							
Average revenue per m ³ , water and sewage	BAM/ m ³	1,26	1,93	1,60	0,68	4,16	1,82
Average annual revenue per connection	BAM/connection	144,98	225,81	185,63	46,46*	103,02*	81,09*
Average revenue per m ³ , only water	BAM/ m ³	1,20	1,58	1,37	0,61	3,30	1,52
Average revenue per user of wastewater collection service	BAM/person	12,65	62,28	24,08	6,17*	23,22*	10,70*
Average collection period – water and sewage	Number of days	72,00	623,00	223,89	82,00	586,00	252,67
Percentage of collection – water and sewage	%	68,87	118,92	103,69	92,58	159,91	111,69
Internal subsidies between the consumers categories – relation between the price of water for legal entities and for households	#	1,44	3,23	2,08	1,44	3,23	2,06
Financial results							
Coverage of operational costs	%	80,01	153,73	106,49	83,13	122,25	98,87
Current relation (relation of current funds and current liabilities)	number	0,56	3,51	1,38	0,46	5,40	1,65
Coefficient of debt coverage (Debt Service Ratio)	%	0	26,25	3,09	0,17	17,70	3,39

INDICATORS (by sectors)	Unit measure	Beginning of the period			end of the period		
		MIN	MAX	Average	MIN	MAX	Average
Affordability of services							
Total revenues per service user n regard to the gross national income per inhabitant	%	0,52	3,70	1,51	0,23	3,84	1,17
Amount of bill for household with the consumption of 15 m ³ monthly (only water and sewage , charge and VAT excluded)	BAM/ per year	167,40	342,00	245,20	167,40	342,00	247,20
Share of monthly bill for household (15 m3, water and sewage) in average monthly income of household	%	1,69	4,65	3,16	1,69	4,36	3,09
Gender							
Percentage of women in the company (water and sewage)	%	13,46	24,32	18,79	13,46	24,32	19,28
Director is female or male?	gender	8 male 1 female	8 male 1 female	88,9% M/ 11,1% F	8 male 1 female	8 male 1 female	88,9% M / 11,1% F
Number of woman in managerial positions	number	0	4	2,66	0	4	2,66