



WWF Living Neretva project Phase III

EU-WFD and Economics in the Neretva-Trebisnjica River Basin

Handbook on the methodology to develop a baseline
scenario approach

for the WFD - Economic Analysis

Working Group Economics report

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“LIVING NERETVA. TOWARDS EU STANDARDS IN THE NERETVA RIVER BASIN (BiH)”

Living Neretva- Economic Valuation Working Group (WFD-WG1)

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Table of Contents

1	Background and Rationale	5
2	Modus operandi	7
3	The Neretva-Trebišnjica basin: an overview	8
4	The requirements of the WFD in regards to economics - an overview	11
4.1	The overall role of economics for developing a river basin management plan	11
4.2	The starting point for integrating economics: the economic analysis according to the WFD	12
5	How to develop a Baseline Scenario according to the WFD and the European guidelines	13
5.1	The Baseline Scenario approach as developed by the WATECO-group	14
5.1.1	Aims of the Baseline Scenario	14
5.1.2	Key issues when developing a Baseline Scenario	14
5.1.3	Practical Tasks for deriving the Baseline (Business-as-Usual) Scenario	15
5.1.4	The role of public participation in scenario-building	17
5.1.5	Summary: The BLS-approach according to WATECO	18
5.2	A methodology for developing the Baseline Scenario – CIS-group ECO1	19
5.2.1	The role of the Baseline Scenario in the WFD-implementation process	19
5.2.2	Outline of the methodology – main steps for deriving a BLS	20
6	Applying EU Economic Guidelines for the Economic Analysis to Neretva-Trebišnjica River Basin – the Baseline Scenario approach	28
6.1	First results regarding the Baseline Scenario from the economic analysis report	29
	Identified Gaps and Necessary Measures regarding the Baseline Scenario work in the economic analysis report – what to do next?	44
6.2	First results regarding the preparation of the cost-effectiveness analysis according to the WFD as linked to the Baseline Scenario work	46
	Identified Gaps and Necessary Measures regarding the cost-effectiveness analysis as linked to Baseline Scenario work in the economic analysis report – what to do next?	50
7	How to move ahead in the Neretva-Trebišnjica towards a full Baseline Scenario: elements of a work plan	51
8	Annex: Summary Table on information regarding the Baseline Scenario from the “Living-Neretva“ Economic Analysis report (2008)	53

Tables

Table 3-1: River Basin characteristics according to hydrological boundaries	9
Table 3-2: River Basin characteristics according to chosen administrative boundaries.....	10
Table 6-1: Natural growth in municipalities in the Neretva-Trebisnjica river basin.....	30
Table 6-2: Projected increase of VAT 2007-2010	32
Table 6-3: Planned water demand according to “BiH Water Management Framework”	35
Table 6-4: Forecast for drinking water demand in the Neretva-Trebisnjica river basin	35
Table 6-5: Proposed scenario for agricultural development.....	38
Table 6-6 Production of electricity FBiH for 2010-2020.....	40
Table 6-7: Production of electricity RS for 2010-2020.....	40
Table 6-8: Plan of investments into new HPP and TPP until 2020	41
Table 6-9: Measures for economic sectors	42
Table 6-10: Electricity production in planned HPPs in upper part of the Neretva-Trebisnjica river basin	47
Table 6-11: Characteristics of the planned HPP in upper part of The Neretva river	47
Table 6-12: Estimated costs of measures for UWWTPs.....	48
Table 6-13: UWWTP investment cost distribution – the Neretva-Trebisnjica river basin	49
Table 9-1: Summary of information on parameters and policy projections for the baseline scenario	54

Figures

Figure 3-1: Neretva-Trebisnjica river basin spatial coverage _____	9
Figure 4-1: Implementation steps of the WFD _____	12
Figure 5-1: Schematic logical steps on BLS _____	20
Figure 6-1: Population growth in BiH _____	30
Figure 6-2: Natural growth in the Neretva-Trebisnjica river basin _____	31

1 Background and Rationale

The “Living Neretva. Toward EU Standards in the Neretva River Basin (BiH)” - project and its Economic Valuation Working Group (WFD-WG2) are supporting the implementation of the WFD-Economics in the BiH-part of the Neretva-Trebišnjica.

In this context, during phase II of the project, the socio-economic survey of water uses and users in the Neretva-Trebišnjica river basin (*sensu* WFD) and the economic analysis of the water uses as required by the WFD and the water laws of BiH was prepared (final document dated June 2008). This report was produced by the members of the working group on economics of this project and in close cooperation with the relevant authorities. It focussed on collecting existing data, adjusting it to the Neretva-Trebišnjica situation (if needed and possible) when only more aggregated data exists and identifying the data/information gaps that need to be closed in the next phases of the project.

Based on the outcomes and experiences of this project outcome and in consultations with the authorities regarding which follow-up activities to close the gaps that the economic analysis-report showed are most urgent, the issue of Baseline Scenario development was seen as central step forward.

Therefore, this report aims at **supporting the representatives of BiH water administration in the development of full baseline scenario** in order to evaluate the status of water bodies not only on “historical” data, but also taking into account important socio-economic developments influencing the status of water bodies in the future, with focus on tourism, hydropower and agriculture as exercise areas.

It is a **user friendly handbook detailing the methodology to carry out a baseline scenario in Neretva and Trebišnjica basin**; while it presents guidelines at a theoretical and more general level as developed at the European level by the WATECO-group, it still allows for being specifically tailored and used for Neretva-Trebišnjica.

The specification of further work for Neretva-Trebišnjica will be taken further during a training workshop with the Neretva Trebišnjica water authorities which will be based on this handbook as a starting point.

The handbook is structured as follows:

- a short overview of the Neretva-Trebišnjica is given first, aiming at clarifying the administrative and hydrological boundaries. This is of special importance for economic analysis work including the Baseline Scenario), since it clarifies how the different available information needs to be modified/interpreted in order to be used;
- the main elements of WFD-economics are presented as an introduction;
- the methodology for setting up a Baseline Scenario as developed by the WATECO-group is presented, including further specifications and illustrations as developed by the “Working Group 2B: Drafting Group ECO1” of the Common Implementation Strategy (CIS) at the EU level;
- the results of the baseline scenario work of the economic analysis-report from phase II are presented, since they indicate the currently available information as well as main identified gaps;

- also the results regarding cost-effectiveness analysis of this report are presented, since important possible measures for the future (e.g. regarding hydropower) have been identified there and might be of interest for the future work on Baseline Scenario development.
- finally , first elements on the specification of the BLS-work at the Neretva-Trebinjica are given, to be discussed and further developed at the training meeting based on this guidebook in February 2009.

2 Modus operandi

The handbook has been prepared by the international consultant to the project (Mr Interwies) and reviewed by the local experts/members of the economics working group of the project, Mr Dalibor Vrhovac and Ms Erna Corić. These local experts also advised on specific details regarding the specific local situation as well as translated (and adjusted where necessary) this handbook on BLS development.

This handbook will be the basis for a training event taking place in February 2009.

3 The Neretva-Trebišnjica basin: an overview

A short overview of the Neretva-Trebišnjica is given first, aiming at clarifying the administrative and hydrological boundaries and the links to economic information gathering. This is of special importance for economic analysis work including the Baseline Scenario), since it clarifies how the different available information needs to be modified/interpreted in order to be used. This approach was developed and used for the economics analysis report prepared for the phase II of the Living Neretva project.

Bosnia and Herzegovina, situated in south-eastern Europe, in the central part of the Balkan peninsula, has a land area of 51,209.2km² and an estimated population of 3.5 million people, and is one of Europe's great reservoirs of natural resources. The land is mainly mountainous with an average altitude of 500m. Of the total land area, 5% are lowlands, 24% hills, 42% mountains and 29% karst area. Forest and forest lands cover about 50% of the territory, while the total agricultural land covers 2.5 million ha (or 0.7ha per capita).

The Neretva river is 225 km long and extends through the 2 entities of Bosnia and Herzegovina, that is the Federation and the Republika Srpska; the total surface of the Neretva-Trebišnjica river basin is 10,292km² which is 19.8% of the whole BiH territory, while the lower basin is located in Croatia covering a surface of 280km². The main cities in BiH part of The Neretva -Trebišnjica river basin are Mostar, Konjic and Capljina with an estimated population of 156,000 people, while in the Croatian part the main urban areas are Metkovic, Ploce and Opuzen (approximately 28,000 people).

Administratively, The Neretva and Trebišnjica river basin includes two Cantons in the Federation BiH (West Herzegovina Canton and Herzegovina-Neretva Canton) and the eastern region of Republic of Srpska called "Eastern Herzegovina".

The Neretva river originates in the eastern part of the country, under the mountains Lelija and Zelengora (1095 m a.s.l.), and with its full length flows aboveground and with the numerous tributaries. Its middle section is significantly used for hydro-energetic purposes, with 5 hydro power plants constructed. The Trebišnjica river is the "lost river", originating near the Bileća town (330 m a.s.l.). The river spring is flooded with the artificial accumulation of Bileća, having the capacity of 1.3 billions m³. Water drains from the Bileća Lake into the newly formed Gorica accumulation, from where the waters are conveyed to HPP Dubrovnik. Trebišnjica river sinks under the ground in two places near the border with Croatia, afterward partly joining the Neretva river catchment area, and partly again originating under the name Dubrovačka river just before it empties into the sea.

In order to collect the relevant information for the economic analysis it is important to note that the administrative borders within BiH do not entirely correspond to the hydrological boundaries of the Neretva-Trebišnjica RB. Therefore and for the economic analysis report of phase II of the Living Neretva project, the economics working group checked which administrative units fall into the Neretva-Trebišnjica area in order to provide economic information specifically for the Neretva-Trebišnjica. As a result, the detailed percentage of the different administrative units falling into the Neretva-Trebišnjica area was identified (see the full economic analysis report).

Based on this detailed information and in order to facilitate work, the working group included in the economic analysis report the information regarding the two Federation cantons having more than 90% in the Neretva-Trebišnjica, while the other 3 cantons were excluded since

they have only 9% or less of their area in the Neretva-Trebinjica and which is sparsely populated. For the RS, data/information on all municipalities that are in the Neretva-Trebinjica area with more than 60% where included. Overall, this approach does create some deviations from reality, but these are considered to be small.

The following map prepared by the working group shows the hydrological boundaries of the Neretva-Trebinjica as well as the borders of the relevant administrative units.

Figure 3-1: Neretva-Trebinjica river basin spatial coverage



The table below shows the “real” population number and surface of the Neretva-Trebinjica river basin according to hydrological boundaries.

Table 3-1: River Basin characteristics according to hydrological boundaries

Item	Surface (km2)	Habitants
Total Neretva Trebinjica river basin district	10,321.10	401,876
FBiH	6,242.20	310,512
FBiH	60.48%	77.27%
RS	4,078.90	91,364

RS	39.52%	22.73%
Population density FBiH	49.74	person/km2
Population density RS	22.40	person/km2

Source: Statistical Yearbook 2006, Federal Office of Statistics, 2006, Sarajevo; Directorate for Water Bijeljina – Water Information System Data base; RS Statistical institute estimation for 2004

However, working group did analyse data in the economic analysis report for the administrative units included in the Neretva-Trebišnjica river basin with a significant percentage. See the adjusted data in table below, according to administrative boundaries, which were used for the economic analysis report.

Table 3-2: River Basin characteristics according to chosen administrative boundaries

Item	Surface (km2)	Habitants
Administrative units of the Neretva Trebišnjica river basin district considered in this study	10,292	403,150
FBiH	5,763	309,712
FBiH	56%	77%
RS	4,529	93,438
RS	44%	23%
Population density FBiH	54	person/km2
Population density RS	21	person/km2

Source: Statistical Yearbook 2006, Federal Office of Statistics, 2006, Sarajevo; Directorate for Water Bijeljina – Water Information System Data base; RS Statistical institute estimation for 2004

Overall, the challenges connected to the Neretva-Trebišnjica basin are similar to the whole of BiH as regards to economic development and improvement of the living standards of the population. At the same time, significant water management issues to take into account in considering the sustainable development of the region are pollution from point (urban, industrial) and diffuse sources (mainly agriculture) as well as morphology, connectivity and water flows of the river(s) linked to hydropower installations.

4 The requirements of the WFD in regards to economics - an overview

In order to understand what the importance of the baseline scenario work according to the WFD, it is important to present an overview of the role of economics in the WFD and esp. of the economic analysis.

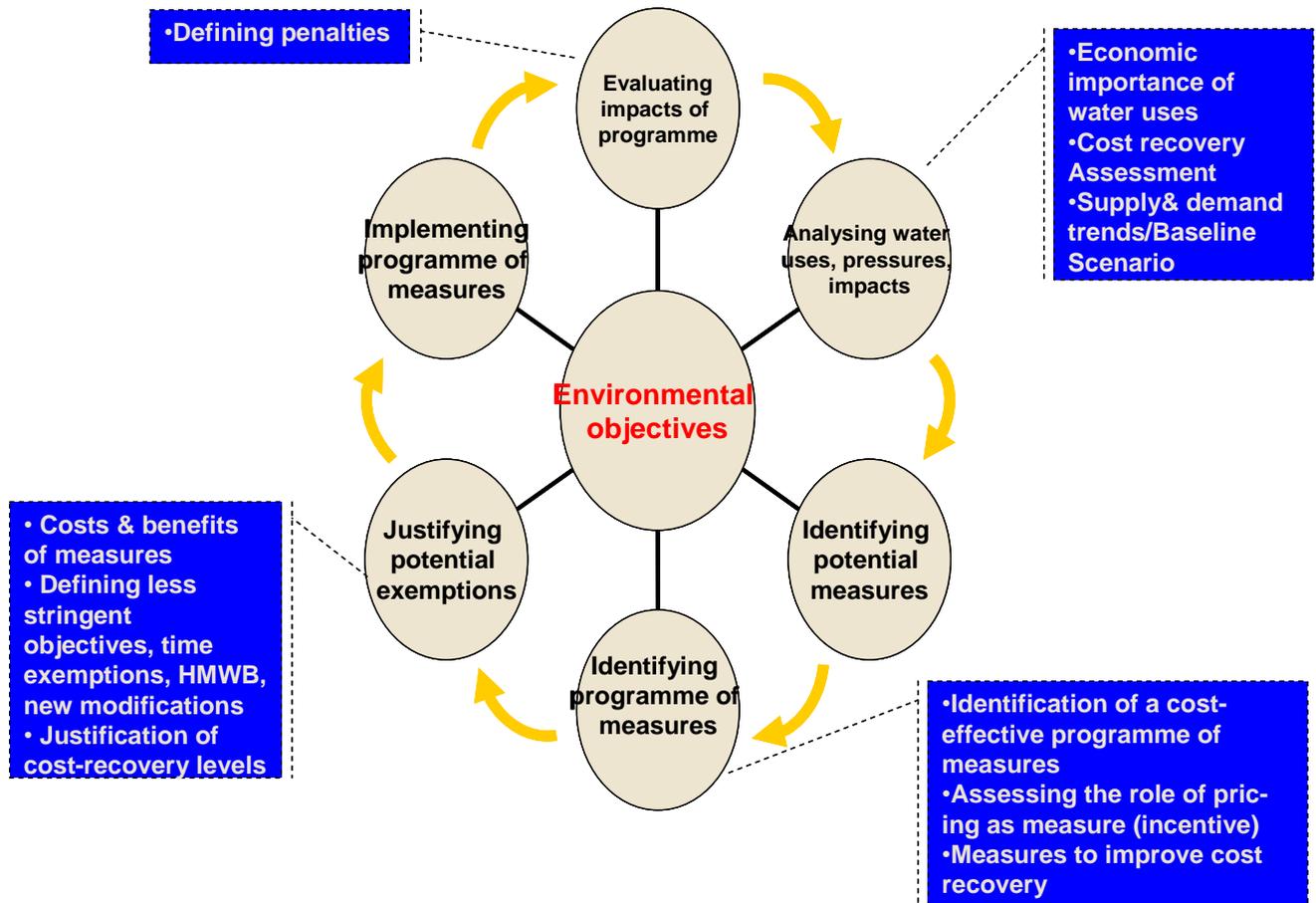
4.1 The overall role of economics for developing a river basin management plan

In the WFD, economics play a big role in the overall implementation of the Directive and especially for the development of the river basin management plan. The main points of the implementation cycle of the WFD for which economics provides necessary information are:

- estimating the **cost-effectiveness of measures** and sets of measures at different scales in order to reach the WFD objectives (Art. 11);
- assessing the **proportionality/disproportionality of costs** associated to proposed measures in order to justify potential exemptions from the WFD environmental objective of good surface water status by 2015 (Art.4) which can be sought on different grounds, they include: time derogation (Article 4.4 WFD) involving an extension of the timeframe in which the objectives have to be reached (beyond 2015); less stringent environmental objectives (Article 4.5 WFD) due to unfeasibility or disproportionate costs of the measures that would be required for reaching good water status; derogation obtained for new (hydromorphological) modifications and new sustainable economic activities that lead to a deterioration in water body status (Article 4.7 WFD). In addition, disproportionate costs play a role for the designation of Heavily Modified Water Bodies (HMWB) & Artificial Water Bodies (AWB) (according to Article 4.3 WFD). For each of these derogations, a number of "derogation tests" have to be applied as input into decision making.
- assessing and improving the **cost recovery level of water services** (including environmental and resource costs) as well as the adequate contribution of different water uses/service users to these costs (Art. 9).

The following diagram depicts the different implementation steps of the WFD and the role economics have to play in these steps.

Figure 4-1: Implementation steps of the WFD



4.2 The starting point for integrating economics: the economic analysis according to the WFD

The starting point for the integration of economic considerations into WFD implementation is the economic analysis that provides basic information on the water economics in the basin. Based on the articles of the WFD and of the WATECO-document developed at the European level, the main elements of the economic analysis are the:

- Economic importance of water uses
- Baseline scenario;
- Estimation of the situation regarding cost recovery levels of water services;
- Preparatory steps for the cost-effectiveness of measures.

In correspondence to the WFD, Article 29 of the Water Law FBiH and Article 30 of Water Law RS stipulate that a responsible Water Agency will “prepare economic analysis of water uses”. At the same time, there are no further details on how this analysis will be conducted and which elements will it contain in the BiH laws, so the WFD and the agreement reached at the European level regarding their interpretation is taken as the basis for this guidebook which focuses on the baseline scenario development.

5 How to develop a Baseline Scenario according to the WFD and the European guidelines

According to WATECO, the main overall aim of the Baseline Scenario development is to investigate the dynamics in river basin development.

This chapter first provides the methodological steps for developing a Baseline Scenario as developed in the WATECO document, but then also specifies how to turn the approach into practice by presenting the practical approach as proposed by the **“Information Sheet on the methodology to prepare a baseline scenario”** as developed by the Working Group 2B: Drafting Group ECO1 of the EU Common Implementation Strategy.

Overall, the economic analysis needs to complement the characterisation of the river basin today by an assessment of its future likely trends and baseline scenarios. This assessment is the basis for analysing the gap between likely water status and good water status (risk of non-compliance) and for undertaking the subsequent cost-effectiveness analysis of measures.

Being a joint activity between different expertise and disciplines, the specific role of the economic analysis in the development of baseline scenarios and the analysis of the dynamics of the river basin is the assessment of forecasts in key (non-water related) policy and economic drivers likely to influence pressures and thus water status.

The focus is likely to be on foreseen trends in (non-exhaustive list):

- General socio-economic indicators and variables (e.g. population growth);
- Key sector policies that influence the significant water uses identified in the river basin investigated (e.g. agricultural policy);
- Production or turnover of main economic sectors/significant water uses in the river basin;
- Land planning and its effects on the spatial allocation of pressures and economic sectors;
- Implementation of existing water sector regulation and directives; or
- Implementation of environmental policies likely to affect water (e.g. NATURA 2000).

Some of these forecasts will be developed jointly with technical experts (see for example the implementation of water sector directives and other environmental legislation). Complemented by analysis of changes in the hydrological cycle, e.g. for accounting for climate change, it will feed into an overall assessment of changes in key pressures, including water demand, and resulting impact on water status as key input into the identification of significant water management issues. It is important to stress that some analyses can be organised at the national or European scale as all river basins of a given country or of Europe will face similar changes (this is for example the case for changes in EU policies such as the Common Agricultural Policy). Other analyses such as changes in production and turnover of significant water uses and economic sectors will need to be developed at the scale of the river basin or for parts of the river basin according to the scale at which related pressures take place.

5.1 The Baseline Scenario approach as developed by the WATECO-group

As an overall objective, Article 5 requires that each Member State shall ensure that “an economic analysis of water use is undertaken for each River Basin District” and Annex III further specifies that this analysis should “take account of the **long term forecasts of supply and demand for water** in the RBD and where necessary: estimates of the volume, prices and costs associated with water services and estimates of relevant investment including forecasts of such investments”.

5.1.1 Aims of the Baseline Scenario

The construction of long-term forecasts is needed for:

- Identifying whether there is a gap in water status between the projected situation and the Directive’s objectives by 2015;
- Identifying potential measures to bridge that gap (if there is one) and construct a cost-effective programme of measures;
- Making the relevant calculations necessary for taking into account the principle of cost recovery of water services, taking into account long-term forecasts of supply and demand for water in the River Basin District.

Note that the business as usual scenario will only integrate what would happen in a given river basin district without the Water Framework Directive, due to changes in population, technologies, the implementation of water policies resulting from previous European directives, other sector policies, climate change, etc. It will be important to focus on the forecasting of pressures and of key socioeconomic drivers that are likely to affect those pressures. It is only after that that these forecasts are translated into an assessment of their impact on water status.

5.1.2 Key issues when developing a Baseline Scenario

Given the use of the baseline scenario, it is important to broaden the scope of the forecasting analysis suggested in Annex III in order to:

- Forecast not only investments but other key parameters and drivers influencing water supply and demand (or more generally all significant pressures), since a failure to do so would undermine the definition of the programme of measures,
- Not rely too much on a mere projection of past trends, as such forecasting method tends to produce misleading results: forecasts need to integrate predictable changes in past trends based on a series of assumptions concerning these changes;
- Identify (and distinguish) variables that can be derived with a high degree of confidence and those that are uncertain. This distinction should be made for ‘physical’ parameters as well as for economic and policy-based drivers; and
- Build a series of alternative scenarios using alternative assumptions, particularly with respect to policy options. This will allow stressing the main (significant water management) issues in the river basin district, and discussing policy options by simulating their consistency and their long-term significance (e.g. it can be useful to compare two distinct scenarios, one where water prices and charges are kept stable and

one where they increase: both assumptions are realistic, but stem from different policy options).

In order to build the baseline scenario, it will be necessary to forecast a set of variables before assessing the impact that these changes will have in terms of pressures and water status. It will be important to distinguish between three types of variables.

1. Trend variables: underlying (exogenous) trends, on which water policy has no direct influence (Examples: changes in demographic factors, e.g. population growth in specific urban areas; Economic growth and changes in economic activity composition, e.g. growth of the relative importance of services; changes in land planning, e.g. new areas dedicated to specific economic activities, land management in the catchment for reducing erosion etc.);

2. Critical uncertainties: variables which are particularly difficult to predict, and might have a significant impact on the final result (examples: changes in social values and policy drivers (e.g. globalisation / regionalisation; policies relying on economics, technology vs. on values and lifestyles); changes in natural conditions, e.g. climate change; changes in non-water sector policies, e.g. changes in agricultural policy or industrial policy that will affect economic sectors etc.);

3. Water policy variables: variables linked to the underlying water policies, independently from the implementation of the Water Framework Directive (as the focus is on building a “business as usual scenario”) (examples: planned investments in the water sector, e.g. for developing water services or for restoring the natural environment/mitigating for damaging caused by given water uses; development of new technologies likely to impact on water use for industrial production and related pressures etc.).

5.1.3 Practical Tasks for deriving the Baseline (Business-as-Usual) Scenario

Look out! Developing the baseline is an iterative process

The first baseline scenarios developed for supporting the development of river basin management plans are likely to build on existing knowledge of trends in key variables and lack robustness and to incorporate many uncertainties. As the assessment of significant water management issues evolves, it will be possible to identify areas where further work is needed to improve the baseline scenarios. To enable revisions, it would be important to keep a log of:

- Calculations made with respect to key variables, physical parameters and formulas (and ideally provide a schematic description of calculations);
- Perceived limitations in the analysis and suggested future work.
- The overall reasoning process: assumptions, choices of variables, range of variation, priorities in analysis;
- Databases used for calculations; and
- Perceived limitations in the analysis and suggested future work.

Task 1 - Assess current trends in “trend” variables (including physical parameters and socio-economic drivers)

The output of this task is a survey of past observations, historical data and a forecast of ongoing trends over a relatively short-term horizon. This work will be partly based on physical and ecological characterisation of the river basin and will build on technical and data handling/statistical expertise. The analysis of past evolution of water resources and physical parameters will mostly rely on technical expertise and on the analysis of trends in pressures, water uses, water services and impacts. The data to be gathered are summarised in Table 2 below.

The methodology for this task will be based on a comparison between the past and present status of trend variables in the river basin (including water uses, water services and physical parameters -as per Annex V of the Directive). This should enable:

- Pointing to significant changes in the river basin district: e.g. major degradations and improvements: what quality and quantity parameters have deteriorated or conversely improved, and what were the most apparent causes?
- Gathering knowledge on the evolution of the human and technical context: population and its location, economic activity components, equipment and water works;
- Assessing the rate of policy implementation and especially, the pace of water investments over the recent period;
- Evaluating the likelihood of the above trends to be prolonged over the mid-term future: are there good any reasons for assuming that the worsening /improving parameters will stop worsening / improving?
- Compiling a first identification of the main pressures likely to cause a future gap between the Directive’s objectives and the possible future situations, and thus help identifying key driving forces and drivers linked to these pressures.

Look out! Do not rely too much on past projections and examine alternative scenarios, rather than an unique one

Reviews of existing past projections have shown that long-term projections in the water sector usually proved false when evaluated afterwards. Accordingly, it would be dangerous to suggest that an adequate image of the future can be the result of a mere projection of past trends. In addition, it will be important to avoid presenting one “image of the future” as a baseline scenario. A plurality of images, from a series of combination of variables, will be preferred.

Task 2 – Project certain changes in water policy variables and derive longer-term projections

Based on the previous task, key driving forces and drivers related to water and water policy (be they hydrological, socio-economic or policy/regulatory related) should be identified and analysed. In this task, it is proposed to concentrate on changes that are more certain and for these certain changes:

- To make reasonable assumptions about the future dynamics of the analysed drivers;
- To assess the impact of changes in these drivers on pressures; and

- To estimate the resulting impacts and thus water status.

Above all, this task is intended to assess the outcomes that can be awaited from the implementation of other water and environmental Directives, and notably their results in terms of water pollution abatement investments, taking into account the future capacities that are effectively planned for the next years.

Task 1 will have given an estimation of the future increase in raw pollution from human activities (pressures analysis). This task will try to answer the following questions:

- What additional quantities of pollution will be abated in the future (e.g. following the construction of additional sewage treatment works)?
- What will be the effects of planned policies on water availability for the water services and uses (e.g. regulation policies, storage equipment policies...)?

This task is central to the Water Framework Directive process and thus has to be steered by the district authority at high decision-making level. A “strategic co-ordination group” will probably be needed to incorporate all expertise and interdisciplinary inputs in the process. Again, on these matters, it is recommended not to strive for describing one unique image of the future if not possible. When choices among different values are necessary for some variables (e.g. activities growth rates, technological changes, policy implementation rates...), a series of alternative baseline scenarios can be prepared.

Task 3 - Integrate Changes in Uncertain Parameters (integration of critical uncertainties)

In this task, more uncertain changes that are likely to have significant impacts on the pressures and water status are integrated into the analysis for developing the final business as-usual scenarios to be used for identifying the gap in water status. At this stage, the possibility of uncertain events or “what-if scenarios” will therefore be integrated into the “business-as-usual” scenario with questions such as:

- What if the river basin district goes through a technology or water consumption shift?
- What if a series of severe droughts or flooding events occur during the next 10 years?
- What if agriculture common policy is radically changed? etc.

Of course, possibilities for such variations are infinite. However the first two tasks will have helped designating the key parameters on which uncertainty analysis is necessary (e.g. if diffuse pollution appear as a major issue in a district, analysis of uncertainty in that field is worthwhile, through the analysis of alternative agricultural policies for example). Taking into account such changes of major issues will produce the Baseline scenarios for the district.

5.1.4 The role of public participation in scenario-building

The choice of assumptions made while developing a business as usual scenario will require discussions with the public and stakeholders, and input from economists and technical experts.

Look out! Participation in scenario building can take many forms

Participation in scenario building can take many forms. Most past experiences demonstrate that public participation should be placed as much “upstream” in the process as possible. At least 3 modes of participation are possible:

- Participation by collective building of scenarios: involve the public in the process in the choice of assumptions and their values;
- Participation by checking coherence of the proposed scenarios: check consistency of assumptions and of scenarios with the various visions that are shared or distributed among social groups;
- Participation by asking the public to question the main “statements” in water policy: scenarios illustrate and somehow caricaturise the most common policy statements, helping the public to input into decision-making and fostering transparency in the process.

One particular method of involving the public is to use scenario building (or foresight methodologies). This may usefully complement forecasting (i.e. the derivation of the business-as-usual scenarios) in order to structure policy discussion and public participation, and identifying key water management issues. Scenario building as an exercise is not so much carried out to produce one single image of the future, but it intends to foster the debate on present and immediate future policy options by exploring their possible future consequences. Prospective scenarios can provide colourful illustrations of the main issues for water management, give extended view of the ongoing policy debate on water (e.g. supply- or demand- management), illustrate the pros and cons of the possible solutions, reveal possible factors of change, and offer a possibility of a wide but formalised interdisciplinary discussion. Prospective scenario building is proved to be much less “data demanding” than forecasting a baseline.

Methods and practical tasks in this field are very diverse, with respect to:

- The spatial scale: world perspective, river basin / regional scale, local scale.
- The time horizon: preferably long-term horizons (25 to 100 years);
- The type of “input variables”: either in qualitative or quantitative terms;
- The type of output: contrasted “visions”, possible statements on water status, qualitative and/or quantitative scenarios, ...

5.1.5 Summary: The BLS-approach according to WATECO

The development of baseline or business-as-usual scenarios require a range of economic and technical expertise to account for, and investigate, trends and evolutions of a wide range of hydrological, technical, socio-economic and regulatory parameters. Methods that need to be mobilised include:

- Economic and environmental modelling, e.g. to assess the impact of changes in sectoral policy drivers on key pressures;
- Review of existing planning documents that develop scenarios for key socio-economic sectors; and

- Interaction with, or participation of, key stakeholders.

The development of the baseline scenarios investigates drivers and parameters at different scales:

- For parameters and drivers linked to local changes, input into the analysis of potential changes in these parameters and validation of key assumptions with stakeholders and the public is likely to enhance acceptance of results of the analysis and the selected baseline; and
- For global changes (e.g. climate change) and EU/national sector policies, interaction and feedback will be required between river basins and between countries to ensure coherent assumptions are made for foreseen changes in key drivers.

5.2 A methodology for developing the Baseline Scenario – CIS-group ECO1

In order to specify further how the approach of the WATECO-group could be implemented and to support the practical implementation of the BLS-requirement, the “Working Group 2B: Drafting Group ECO1 of the EU Common Implementation Strategy” developed a methodology for developing a Baseline Scenario. More specifically, it aimed at (a) providing suggestions on the possible organisation of work for the implementation of the Baseline scenario (BLS) and at (b) identifying the type of methodologies available.

5.2.1 The role of the Baseline Scenario in the WFD-implementation process

The Art.5 characterisation is to take early in WFD-implementation in order to provide an input to the decision-making and public participation processes and in order to prepare a programme of measures. As such it is necessary to integrate the current dynamics of the water status and policy as soon as possible, avoiding an assessment and a prognosis that would be obsolete when used for water management planning. In particular, it is necessary to anticipate the likely results from the completion of existing European water directives, that are not yet fully implemented (e.g. from completing the implementation of the Urban Waste Water Directive and of the Nitrate Directive). At the same time, some environmental factors may worsen (e.g. pesticides...). Deriving a Baseline Scenario is then useful for:

- Helping in characterisation of uses by pointing out trends to pay attention to (e.g. pointing out a need for attention to some specific urban, industrial or farming development);
- Setting out compliance plans for existing EU Directives in terms of estimated investment including forecasts of such investments and/or discharges and abstractions after implementation of these plans;
- Providing information on likelihood of failing to meet the objectives looking forward to 2015 (Annex II; e.g. providing data on forthcoming changes in chemical discharge, to be taken as one of the risk assessment criteria);
- Evaluating the significant issues at stake (art.14; e.g. pointing out the progress that was made in the last ten years and the “emerging” issues of water management for the next decade);
- Providing clarity in relation to the incremental impacts of the Water Framework Directive itself as opposed to the impacts of already agreed European and national legislation of trends that would continue in the absence of the Directive.

A baseline scenario is to be taken as a “projection” of business-as-usual policies and trends. It is not necessarily a prediction of a likely 2015 situation: things can change, and should change, after decision-making and implementation. Nor is it a definition of the aims and objectives of the district: on the contrary it involves stressing the unwanted or insufficient evolutions in order to highlight the need for action. It is not an exploration of various “possible futures” that would result from sudden changes in business or environmental conditions. Such elaboration should come after BLS, and be based on its results, with possible use of prospective/foresight methodologies.

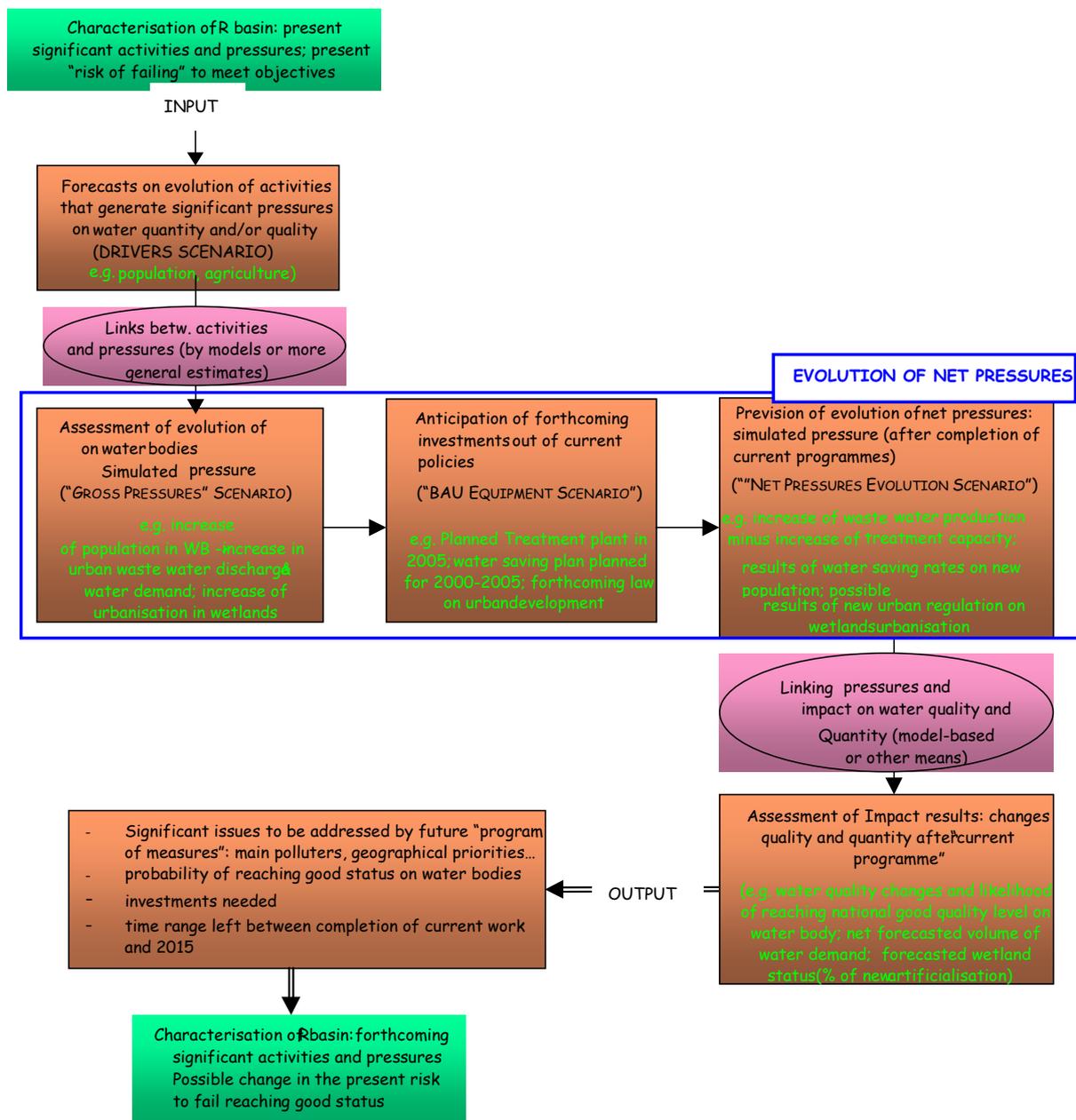
Look out!

- BLS is a proposed means for integrating the various approaches needed for the WFD, especially between skills related to Impact & Pressures, Public participation, surface and groundwater, economic analysis;
- BLS provides a general statement of the evolution in the near future all things being equal, as a support to the definition of the river basin management plan. It is not a tool for a precise determination of the likely future of water bodies, and should not by itself be used to justify a decrease of the present environmental vigilance (esp. with respect to the monitoring programme).

5.2.2 Outline of the methodology – main steps for deriving a BLS

Figure 5-1: Schematic logical steps on BLS

(green boxes: inputs and outputs to River basin characterisation)



There are four steps in the derivation of the BLS:

1. Assessing and defining the significant activities and pressures
2. Evolution of activities generating significant pressures on water bodies
3. Evaluation of net pressures
4. Possible outputs of the baseline scenario.

5.2.2.1 Step 1: Assessing and defining the significant activities and pressures

Problem to be solved: selecting the most relevant subjects to focus on for data collection, improvement and for calculation; though avoiding insufficient notice of significant emergent issues.

Proposal:

- 1) Starting with an initial screening of the present main water management issues for the basin on the basis of the RB characterisation and economic analysis of water use. Consider first defining major pressures on water quantity and quality, and major changes during the preceding decade.
- 2) Then pay attention to possible “emergent” issues out of trends analysis, by putting those first findings into an initial expert desk-based review.

Handy hints

- It may prove efficient to propose first a general statement based on current data and knowledge, on which various experts are invited to and provide reactions in order to create a better (shared) understanding of ongoing and future issues.

5.2.2.2 Step 2: Evolution of activities generating significant pressures on water bodies

Purpose: making a baseline scenario for the development of activities (industrial production, agriculture, population growth and consumption...) is commonly needed as a basis for assessing the likely evolution of pressures, and for assessing the activity sectors that will be responsible for the remaining pressures (and then should be targeted in the RB management plan). In some cases, when the evolution of pressures is apparently well known, and when the link between activities and pressures is considered to be certain and stable by both policy-makers and stakeholders, it may not be necessary to undertake a detailed scenario for the evolution of activities. Such conditions will probably be rare, and most often proposing a pressures evolution scenario for the evolution of pressures will have to be based on scenario for the evolution of the drivers.

Bottom-up vs. top-down approaches

Two symmetrical means of making a drivers scenario are possible for a given river basin: (1) build up a local forecast for each important driver in the basin, and check afterwards its coherence with global forecasts (bottom-up); (2) start with general forecasting of population & urban development, social structure, economy and apply it to the River basin by interpolation of trends to its local drivers, and then check the quality of interpolation by assessing the likelihood of local drivers behaving as in the average situation (top-down). Considering that the top-down option is most often less data demanding and time-consuming, and considering the deadlines of the WFD, the following section focuses on this method.

Designing a top-down drivers scenario

For example the drivers scenario may use information from:

- Growth assumptions for each major activity from now to 2015 (or even further 2021 & 2027...)
- Evolution of land use (e.g. surface and farming practices)
- Evolution of industrial sectors. This task may prove the most difficult, because each sector is rather specific in terms of development and economic drivers: one activity can disappear while another benefits from a boom. Then, precision would theoretically require a

development scenario for each industrial sector (N.B. it is difficult to make out industries with significant impact on water quality, moreover, those that are not significant today may become so in the future, so they should not be put aside).

- Evolution of agriculture and CAP: the least easy to assess in terms of “business-as-usual”, for it is likely to incur heavy changes in the near future. But the scenario development will focus generally on some specific aspects relevant for the basin, thus enabling to restrict the agricultural forecasts to some sectors.

Handy hints:

- Check the consistency between drivers projections by defining their overall conditions for realisation and spelling out the general economic forecasts that underpin the projections (e.g. general growth, world markets, national demography, national and local policy development priorities...). Consistency will be favoured by basing drivers projections on general forecasts of European, national and/or regional situation (economy, households consumption, European and world markets, European integration);
- To avoid investment in inefficient work for industrial scenario: derive “general” forecasts on industrial discharge volume, derived from past data on industrial effluent trends. For example, consider alone the pollution abatement rates of industrial sectors, and past trends in that matter;
- Examine past trends to see if the factors included in the forecasts are a good explanation of past evolution. Factors that don't explain past trends well, might not properly explain future forecasts either.

Consistency between forecasts used by river basins

The main source of information is general prospective documentation on economic and social forecasts: growth, agricultural policy, land planning and housing, consumption habits, industrial sectors forecasts, etc. Such overall forecasts are an important means to ensure general coherence in further forecasting, by providing explicitly some kind of “backcloth” on which to draw specific water related forecasts on agriculture, population and industry.

Apart from what might already be available on activities, it is often found that some drivers or context variables are common to the evolution of population, agriculture and industry. “Common general forecasts” of these drivers for all European member states are not readily at hand for now. However, consistency between the River basins scenarios should come from the use of similar general “forecast references”. The evolution of the main drivers being mostly determined at European or even world-wide scale, the projections made for Europe's economic sectors may provide a good basis: see OECD economic forecasts, EC forecasts, etc. In addition, it may then prove efficient to share common prospective data between RB engaged in such processes, at European, then national, then regional level, especially for international rivers.

Treatment of uncertainties

Any projection is subject to several possibilities of change and variation in its basic assumptions: it is often said that long-term forecasts are always false. It should be recognised, however, that a forecast is inevitable. It is either explicit or implicit. Making no forecast implicitly defines the future as the same as today. As such explicit forecasts are

only “less false” than no anticipation and taking the present situation for a sufficient representation of 2009 or another future situation. It may then prove useful to:

- Separate and assess in turn the different kinds of variations in assumptions
- bear in mind the necessity of a sensitivity analysis of the BLS results
- manage the likelihood of a need for continuous updating of the BLS

It is proposed to examine three kinds of variations in the assumptions that will form the basis of BLS.

Look out! **Three significant issues when dealing with uncertainty:**

A. Treating undetermination by BLS “versions”: Some variation will come from the unavoidable undetermination of certain variables: although a demographic evolution is fairly easy to forecast, it is not possible to forecast with confidence the evolution of an industrial sector, of long term regional economic growth, of food markets... To treat such undetermination, a solution can be the definition of two or more “versions” of a BLS, by coherent combination of various assumptions on the most relevant and undetermined drivers. These versions are still “baseline” inasmuch as they do not suppose a fundamental change in the current conditions of the situation: they are still “business as usual”, but take in consideration the variation of important drivers. However the production of several “versions” will have to be limited by the ability of the technical assessments made in River Basin Characterisation to handle such variations of the BLS results. The question of choosing a “most probable” version may then come to discussion. Choosing a version will be necessary if the results from the versions provide different assessment of the likelihood for a given water body to meet the objectives. This choice should be then discussed in decision-making arenas and be kept transparent; the sensitivity of the probability assessment to that choice should be assessed.

B. Treating lack of data: sensitivity analysis and data improvement programme

Some possible errors and variations will come from the lack in knowledge for some variables. For such cases, a recommended method could be to evaluate the sensitivity of the main BLS results to the less known variables:

- If the analysis shows an important sensitivity to these variables, the range of error should be evaluated. When the range of error appears too large for confidence in the results, issuing the results should be postponed until knowledge improves.
- When the sensitivity is moderate or low, a probability assessment of the variable should be defined and working assumptions established on this basis.
- For all non-negligible variables, to design and implement a data improvement programme, focusing on the most sensitive and less known variables.

C. Treating uncertainties: “what if” scenarios and other futures thinking methodologies

Some possible errors and variations will come from the evolution of some variables that are naturally subject to large-scale or unpredictable changes (e.g. a series of extreme meteorological events after climate change, significant social or political changes...). Such variations are poorly suited to probability assessment, and coherence between such assessment is often very difficult. As suggested by the WATECO guidance, their treatment may be undertaken after the first economic analysis through the various futures thinking

methodologies: foresight, prospective, what-if scenarios... This can be taken as the step further to the BLS assessment.

Key outputs from Task 2

- Definition of a Business-as-usual relevant drivers scenario
- Possible definition of several “versions” of BLS with respect to undetermination of some major drivers
- Sensitivity analysis and data improvement programme

5.2.2.3 Step 3: Evaluation of net pressures

Handling issues without quantitative localised data

Problem to be solved: how to derive business-as-usual forecasts on pressures without relying on quantitative data covering sufficient parts of the RB and how to organise work in order to produce results in reasonable time (and/or budget) while enabling a minimum of participation and knowledge sharing? How to make use of partial data on environmental previsions (data about evolution of one only parameter, or limited to specific region, or incomplete series...)?

Proposal: the solution will have to come from a qualitative approach. Efficient methodologies with respect of time and budget constraints may be based on “expert groups”. Such groups are aimed at using partial knowledge to build a judgement on evolution, based on partial data plus deliberation. Various expert judgement methodologies can be used, such as scientific forums, panels and conferences, statistical inquiries, “Delphi” method (interrogation of experts, statistical measurement of “average” estimates, and re-evaluation by expert of their initial judgement)...

Handy hints:

- A clear definition and selection of the themes to deal with is needed: concentrate on the significant ones for water quality
- Pay attention to the constitution of the drafting group: appraisal can be only partially based on scientific evidence; separate “judgement” from “scientific knowledge”.

Key outputs from this task:

- Scenario(s) at river basin scale on the development of pressures for which qualitative data are not at hand, taking into account the evolution of drivers, the policies being implemented, and the links between drivers and pressures
- Pointing out the most significant issues likely to develop in the future

Handling issues with quantitative localised data

Problem: how to focus and organise work so that best use is made of pressures and impact data and of basin characterisation? How to participate in the determination of the significant issues of the district? How to help in assessing probability of reaching certain objectives, and for identifying the water management challenges for the first programme of measures?

Proposal: building a quantitative database linking drivers and equipment with pressures.

Due to the complexity of such an approach and the high data requirements of such a database/model approach, it is not described further here.

5.2.2.4 Step 4: Possible outputs of the Baseline Scenario

BLS is intended to provide multiple outputs, both for enabling the economic analysis and for supporting the rest of the WFD implementation.

1. Outputs to the economic analysis

- BLS provides a way of describing the dynamics of current water use and pollution. By assessing the major trends of social-economic drivers and the evolution of present water management issues, it helps giving relief to the economic analysis and makes use of the economic figures for water policy-making. By evaluating the likely improvements awaited from a business-as-usual policy (i.e. decrease in some pollution kinds / improvement in some sectors / decrease of unitary water consumption...), as well as the likely degradations (i.e. increase or progressive unveiling of pollution previously hidden / increase of demand, localised environment degradation...), it points out what will be important in the future and what is progressively becoming less problematic.
- The “equipment scenario” is an assessment of foreseen investment/behavioural adaptation and of the effect of these changes. By evaluating the awaited effect of what could be considered of the “basic measures” of water policy, it is then an output for the River Basin Management Plan preparation after 2004. BLS delivers a basis on which to assess afterwards the “remaining efforts”, especially through the need of supplementary measures to meet the 2015 objectives in comparison with the forecasted situation after completion of basic measures. Thus it provides the basis for the selection of possible measures and for the evaluation of their cost.
- Eventually BLS participates in building the cost-recovery analysis by at least two outputs. (1) The evaluation of future costs and their share among water services and uses allows addressing the near future evolution of cost-recovery status (by assessing changes in the burden of cost and changes in the environmental damages and costs for the environment and resource). (2) By providing an assessment of the present distribution of responsibility in the pollution and abstraction through the compilation of the database, which is helpful for assessing the contribution of households, industrial sectors and agriculture to the costs of water services.

2. Outputs to international rivers management plan

In the international districts, the national baseline provisions are not sufficient for obtaining a full-blown picture of the foreseen evolution of pressures. Each downstream basin has to take into consideration the influence of actions undertaken in upstream basins.

Example: extract from “Risk analysis and role of International Basin Scenario”: Meeting the 2015 WFD objectives

One of the WFD objectives is the prevention of any degradation of quality. Achieving this objective requires taking in consideration the likely evolutions in the upstream basins. Let us consider a pressure, of which 80% are due to activities upstream and only 20 % to activities in the basin located downstream. If the pressures upstream increases by an annual rate of 2

% during the 2003-2015 period, the result is a more than 100 % increase of pressure for the downstream basin due to the activities upstream and abroad. In such a situation of course, the WFD can not be met.

3. Outputs to the general WFD process

- BLS is intended to provide a convenient way of integrating the various approaches needed for implementing the WFD. Its realisation itself needs skills and approaches to be brought together in a balanced way, helping each approach to focus and to simplify.
- The outputs of the BLS provide major insights to the identification of options for the designation of the interim overview of the significant water management issues identified in the river basin (art. 14).
- It is intended to provide an assessment of progress and regression towards good status due to existing directives and other current policies (water or general policies, e.g. agricultural, land planning...). It provides essential outputs to the evaluation of the likelihood that water bodies within the River Basin District will fail to meet the environmental quality objectives set (Annex II). It must be reminded though that BLS results should be taken as participating in a more general probability assessment: they do not provide by themselves sufficient reasons for lowering monitoring objectives of water bodies.
- One important output of BLS to the water management and decision-making will come from measuring the “room for manoeuvre” for meeting the environmental objectives: the combination of the forecast situation compared to the objectives and time left to meet the objectives. This may be expressed in terms of annual mean investment needs after fulfilment of existing directives. Eventually it will prepare decision-makers for identifying the dimensions of the programme of supplementary measures and possible derogation if needed.

6 Applying EU Economic Guidelines for the Economic Analysis to Neretva-Trebisnjica River Basin – the Baseline Scenario approach

The economic analysis report of phase II of the Living Neretva project did use the existing European guidelines available for the economic analysis including on the baseline scenario development. At the same time and due to the limited resources available for this work, a full Baseline Scenario as described above was not developed. The work done centred in identifying and summarizing the information available as well as identifying the main information gaps and presenting ideas on the next steps.

Overall, the application of the economic analysis requirements for the Neretva-Trebisnjica river basin did face many challenges due to the overall data situation. Nevertheless, the economic analysis study systematically did go through all the requirements and collected and analysed information which was possible to acquire/estimate within the short time frame of the study.

Some basic elements of the data collection approach in order to deal with the difficult data situation were:

- The proposed base year for the economic analysis in the WFD based on the WATECO-document was the year 2000; since the time frame for the BiH economic analysis is different (up to 2010 and not 2004) the latest year for which the specific type of information is available is indicated as well as the periodicity of the update;
- It is indicated at what scale the information is readily available and in addition the lowest aggregation scale is at which a certain type of information is available (e.g. the individual company, municipality etc.);
- As far as possible, the reliability and quality of all gathered information/estimations has been evaluated its quality accordingly;
- The primary source of information has systematically been indicated.

The following chapters present the results of the economic analysis report regarding the Baseline Scenario as well as regarding the cost-effectiveness analysis. This second part is of interest, since certain measures under discussion in the Neretva-Trebisnjica are of big importance for the future developments in the basin, even if not already decided.

6.1 First results regarding the Baseline Scenario from the economic analysis report

Overall situation and problems in BiH regarding future development and policy planning

One of the elemental problems of BiH society is complex and entity-divided systems of government and administration. The existing system was created as a consequence of peace agreements which, in order to stop the war, have not envisaged functioning of a normal country. This system creates a possibility of manipulation, hiding of own interests, corruption and other following side-effects, becoming one of the biggest problems of development of BiH society. This situation is preventing or slowing down investments in development of industry, agriculture, infrastructure, social, health and education sector, and other sectors of society.

Problems often occur in different sectors due to unsolved jurisdiction between entities and state, absence of jurisdiction on the state level, etc. This causes problems in processes of planning of development, policy creation, elaboration of strategies on state level, etc.

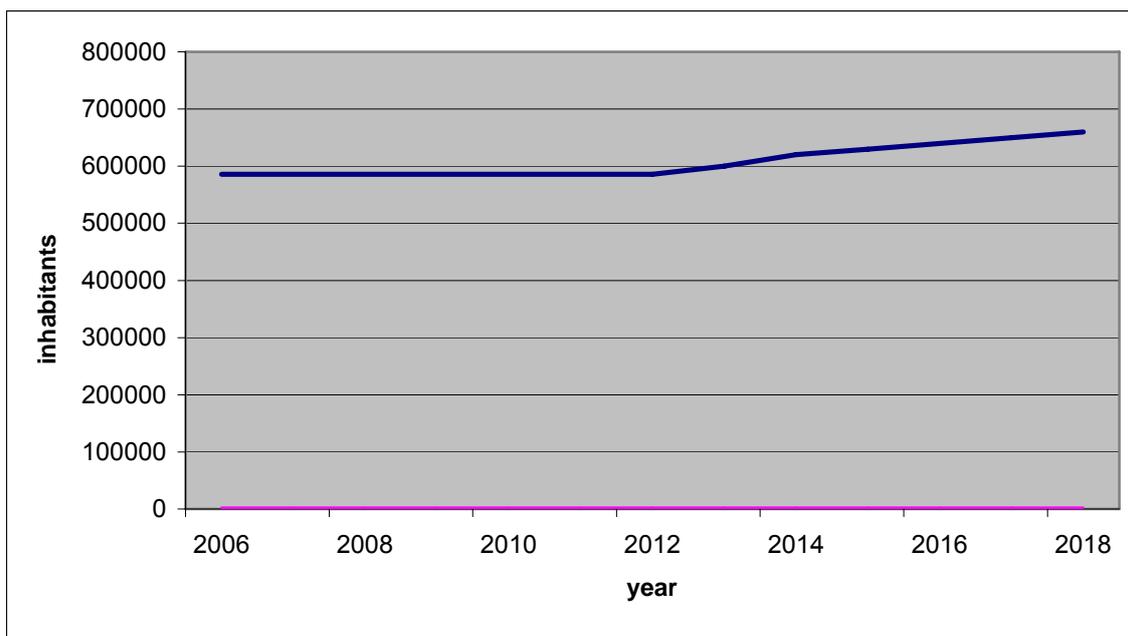
Exogenous drivers

Population growth

Due to the past war, many people have permanently moved from rural to urban areas. Moreover, today, these migrations are happening due to the poor living conditions in some distant areas of this region. This is especially the case in the upstream parts of rivers Neretva and Trebišnjica, where poor economic development and poor conditions related to water supply have forced people to abandon these areas. The most affected areas are the municipalities of Gacko, Kalinovik, Bileća, etc., where agricultural potential exists but the water is scarce. For this reason, some new projects have been planned which include the construction of new HPPs which would, among other things, serve as water diversion plants for the provision of water supply and irrigation (more information in section of CE analysis).

At this moment in time it would be very optimistic to forecast the growth of population at least by the year 2012. It would be realistic by that time to only stop the decline in population and to stabilize it and turn slowly to increase. These are indicators for the whole BiH and are presented in the following graph:

Figure 6-1: Population growth in BiH



Source: State Statistical Yearbook, Agency for Statistics BiH

The above estimation of population growth after 2012, which was obtained from the relevant literature, is doubtful according to expert judgment, because there is no realistic indication showing improvement of living standards in the near future. Experts have also emphasized that more data and analysis is needed to make better estimation for the purpose of future planning.

The official “living demography” statistical data in both entities demonstrate significant decrease of the natural growth rates. The following table with data for municipalities in the Neretva-Trebišnjica demonstrates a significant trend of natural growth rate decrease. The situation is similar on the average level in both entities; however the decrease rate is somewhat higher in Republic of Srpska.

Table 6-1: Natural growth in municipalities in the Neretva-Trebišnjica river basin

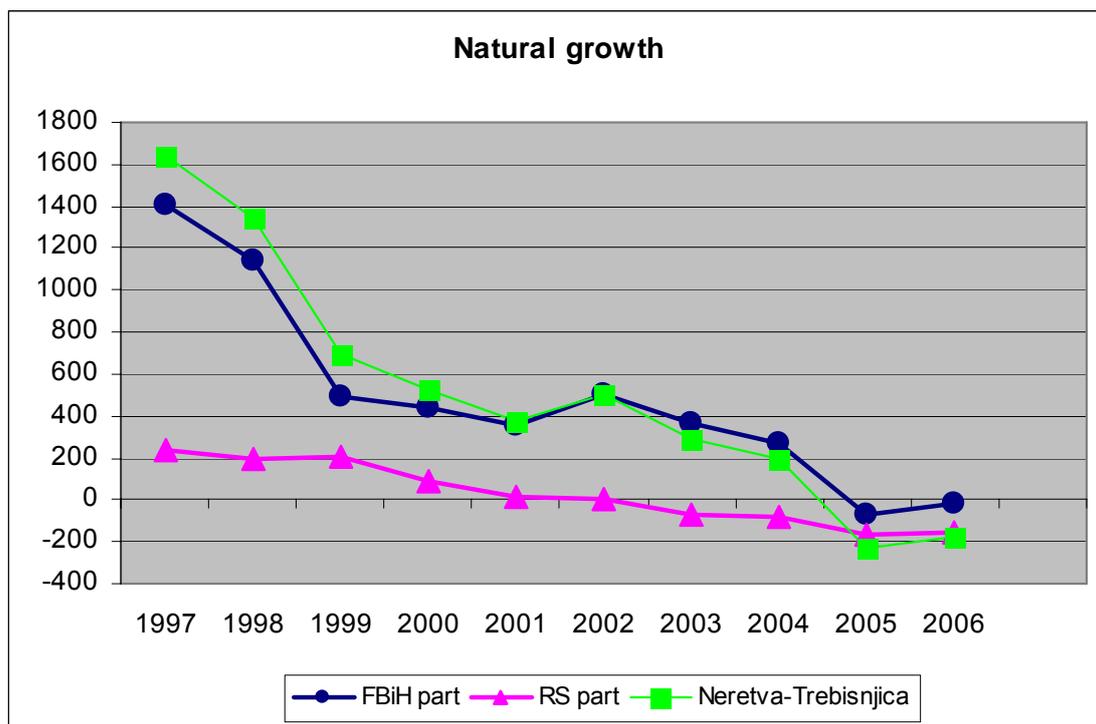
Municipality / Year	<i>Natural growth (expressed as a difference between number newborns and deaths)</i>									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Čapljina	58	6	-39	-32	12	-2	-17	-2	-94	-28
Čitluk	124	62	44	31	13	38	38	26	70	-9
Jablanica	73	27	19	16	8	7	26	5	-32	0
Konjic	223	162	98	60	73	70	93	49	-17	-43
Mostar	516	544	289	290	131	240	72	64	58	23
Neum	-32	-39	-38	-26	-22	-11	-19	-21	-31	-32
Ravno		-1	-5	-8	-8	-7	-11	-1	-12	-4
Prozor	104	113	92	76	125	123	98	91	63	56
Stolac	-17	3	-26	14	11	19	7	-16	-17	17
Grude	-12	-15	-24	-33	-24	-18	-14	-18	-32	8

Ljubuški	15	4	-121	-122	-105	-96	-34	-7	-96	-81
Posušje	169	132	74	71	18	39	33	12	6	0
Široki Brijeg	182	129	121	80	87	91	88	82	57	85
Berkovici	5	16	10	18	33	9	4	10	6	-11
Bileća	63	55	28	45	18	28	-14	-5	-27	-62
Gacko	63	76	68	28	12	17	16	9	4	-16
East Mostar	-1	-	-1	0	-1	-1	-2	0	-7	-1
Kalinovik	-14	-7	-12	-30	-19	-32	-26	-24	-19	-26
Ljubinja	15	-6	1	6	-14	-2	2	-8	-20	-28
Nevesinje	65	41	34	11	-19	-7	-15	-37	-11	-14
Trebinje	42	41	88	26	42	-2	-29	-12	-81	-12

Source: Federal Annual Statistical Yearbooks, 1998-2007; Demographic Statistics RS 2007.

The situation in the figure below shows natural growth decrease in the Federal part and the RS part of the Neretva-Trebinjica river basin separately, as well as the total natural growth for the whole river basin.

Figure 6-2: Natural growth in the Neretva-Trebinjica river basin



The other important driver of demographic changes is the process of internal migrations from rural areas to the municipal and urban centers within the Neretva-Trebinjica river basin. Official statistical data on this process do not exist but there is obvious and constant growth of population in major centers like Mostar and Trebinje.

General economic development (economic growth)

Future development plans or estimates were not available, so in this project phase and due to time constraints these were not further investigated based on expert judgements.

Technological changes

In this project phase, the working group could not obtain any available information on relevant technological changes affecting the water management situation.

Changes in tax/fiscal regimes

Value Added Tax (VAT) was introduced in BiH starting from 1st January 2006 replacing the sales tax. The VAT has a unified rate of 17% on all goods and services. The Department for Indirect Taxation is a public institution which is the only one authorised for calculation and collection of VAT, which is deposited on a Unique Account in the Central Bank of BiH. Currently there are no insinuations that the tax rate would be changed in the next period. The projected increase in collected VAT is shown in table below for the period 2007-2010.

Table 6-2: Projected increase of VAT 2007-2010

	2007	2008	2009	2010
VAT (net)	12.69%	6.94%	6.83%	5.78%

Source: Department for macro-economic analysis, operating within the Management Board of Department of Indirect Taxation

The introduction of VAT has influenced the increase of prices and thus reduction of population's purchasing power. VAT has, however, improved a tax discipline. It is also responsible for slowing/stopping the increase of imports in 2006, which has slowed down by 15-16% compared to 2005.

Another relevant reform that may have relevant influence in the future is discussed pension scheme reform, but since no conclusion has been made so far it is to be addressed in the next phases, when the reform plan would be known.

Water policies and investments

- According to the entity Water Laws, there is an obligation of each entity to elaborate their own Strategy for Water Management which is a first step towards elaboration of River Basin Management Plans. The Strategies will determine water management policies in BiH. General objectives of the Strategies are the following:
 - reducing pollution, prevention of degradation and achievement of good water status,
 - improving sustainable water use,
 - ensuring equitable access to water,
 - fostering social and economic growth,
 - ecosystem protection,
 - reducing the risk from floods and other negative effects of water,

- ensuring public participation in decision making related to water,
- preventing and solving conflicts related to water protection and water use,
- fulfilment of responsibilities from international contracts which are binding for BiH.

The indirect objectives of the Strategy, through creating a policy of water sector development, are:

- providing sufficient drinking water quantities for the population, and increasing the percentage of population connected to public water supply systems;
- providing sufficient water quantities for development of other economic activities in accordance with real possibilities and development plans of specific sectors;
- increase of safety level from the negative effects of water on people and property;
- bringing about an improvement in water quality with the long-term objective – achieving and preserving good status of waters.

The Federation BiH began the elaboration of the *Strategy for Water Management* in December 2007, and it will be completed by the end of 2008. RS has not yet started with the elaboration of the Strategy, but it has elaborated the *Framework Plan for Development of Water Management in RS* in 2006, which is a step towards the Strategy for Water Management.

According to the Inception Report of the Federal Strategy for Water Management, some of the objectives and activities for the future development of water sector, which will be further elaborated within the Strategy, are: rationalization of water consumption, bigger investments for gradual reduction of water losses, introduction of modern measures of production, distribution and charging of water, awareness raising on the significance and necessity of rational water use, etc.

The *Framework Plan for Development of Water Management in RS*, developed in 2006 in RS, has the following objectives:

- to serve as a starting point for elaboration of Strategy for Water Management, and also for Development Strategy of Republika Srpska;
- to serve as a basis for elaboration of planning documents of other economic sectors;
- to serve as a ground for defining spatial demands for development of water infrastructure;
- etc.

The Framework Plan defines criteria, conditions and limitations for further development of water infrastructure and for the whole water sector management.

In the sector of water supply, this document stipulates the following:

- increase of population covered with the public water supply system, or, depending on the settlement size, their complete coverage in the next 15 to 20 years,
- higher level of water services, without any water reductions,
- radical decrease of water losses, from the current 50% to the aimed 20%,
- reduction of specific water demand, to the level of 160 l/inh./day, and thus reduction of specific water production,

- ensuring that water systems can finance their own investments, and cover all the O&M costs.
- Every year the Federal budget is investing a certain amount of money in different projects in water sector. These investments are equal to the amount of money collected into the Federal budget from water management fees. In the last two years (2007 and 2008) these resources amounted about 2 million KM for the whole Federation (Source: official web site of the federal Ministry of Agriculture, Water Management and Forestry - www.fmpvs.gov.ba).

In more detail, the federal budget investments in The Neretva -Trebisnjica river basin in 2007 are:

- Construction of sewage in Neum municipality – 600.000 KM
- Sanitation of flood protection objects in Adriatic Sea watershed – 200.000 KM

Planned Federal budget investments in The Neretva -Trebisnjica river basin in 2008:

- to Water Company in Ljubuški – 300.000 KM
- to Water Company in Prozor-Rama – 250.000 KM
- to Water Company Broćanac Čitluk – 150.000 KM

The projects for 2008 will be realized in the first half of the next year (2009), after the necessary project documentation is elaborated during 2008.

According to the data obtained from the Water Agency for Adriatic Sea Watershed, the Federal budget for 2008 will allocate 16 million KM into water sector, of which about 8 million KM for projects in the Neretva-Trebisnjica river basin. These projects should be realized in the second half of 2008 and the first half of 2009.

- The only document so far dealing with water management for the whole BiH is the *Framework for Water Management in BiH* prepared in 1994. This document was elaborated by the then existing public water management company “Water Management of Bosnia and Herzegovina” and “Water Management Institute Sarajevo”. It provides data and information on the existing situation in water sector in BiH, as also gives future projection of water sector development for the period 1990-2020. This document is available in hard copy at request in relevant ministries and Water Agencies. Of particular importance is that most of data are grouped by river basins in this document. Data included in the document are: water availability, drinking water demand, irrigation, flood retention, wastewater production and treatment, as well as general strategy and directions of development.

Water Demand

The “Framework for Water Management in BiH”, prepared in 1994, is so far the only document dealing with the projections of water demand. Data in this document are treated and grouped by river basins. Estimated data for water demand given in this document range from 1990 to 2020.

Estimation of the planned water demand in the Neretva-Trebisnjica river basin is given in table below.

Table 6-3: Planned water demand according to “BiH Water Management Framework”

Neretva and Trebisnjica river basin	Data from 1991 max Qd (m ³ /day)	Estimation for 2000 max Qd (m ³ /day)	Estimation for 2020 max Qd (m ³ /day)
Drinking water	208,328	297,389	426,298
Growth rate	-	43 %	43 %
Technological water	53,309	57,024	86,400
Growth rate	-	7%	51.5%

However, the above projections from 1994 are outdated and new ones are needed for the planning of future development of water management. Due to time constraints these issues haven't been further investigated/no expert judgements were obtained during the economic analysis preparation phase of the Living Neretva project.

These estimations assume an automatic increase in water demand over the years. However, the recent trend in BiH, and thus in The Neretva -Trebisnjica region, is that the population growth rate has been decreasing in the last ten years and is continuing to decrease. On the other side water prices are expected to increase due to the facts that Water Companies can not cover their costs with the current prices, that most of the municipalities need quite significant investments in replacement of their old water and wastewater systems, and that extending of systems and services are needed as well.

In addition, the above analysis does not account for the effects of the price increase on consumer behaviour expressed as elasticity of demand. In the country like BiH where water services are heavily under priced, the magnitude of the impact on consumption reduction as a result of the new price policy will be substantial. The overall price elasticity of water is estimated as -0.5, implying that for every 1% increase in the water tariff, the volume consumed will fall by 0.5%¹. Taking into account the expected price inelasticity of demand for water, but at the same time the apparently high per capita use and the relatively large percentage of the cost of water as a proportion of average household income/consumption (estimated as 1.5%), the estimate does not appear to be unreasonable.

Water losses and in general high rates of unaccounted for Water should be also accounted for. It is not unreasonable to expect decrease of UFV rates from current app. 55% to the reasonable 30%-35%.

Thus a new forecast for drinking water demand in the Neretva-Trebisnjica river basin demonstrates a significant decrease of demanded over next 30 years. See following table:

Table 6-4: Forecast for drinking water demand in the Neretva-Trebisnjica river basin

Population growth ratio	0.2%						
Neretva Trebisnjica River Basin District	Population number						
	2005	2010	2015	2020	2025	2030	2035
Neretva Trebisnjica River Basin	401,876	405,911	409,986	414,103	418,260	422,460	426,701
Total number of habitants:	401,876	405,911	409,986	414,103	418,260	422,460	426,701

¹ “True Cost of Water” Anil Markandya, World Bank, ECSSD, Barcelona, June, 2003

<i>Public water supply network connection rate:</i>	71.6	75	80	85	90	90	95
<i>Number of habitants connected on the public water supply system:</i>	287,743	304,433	327,989	351,987	376,434	380,214	405,366
<i>Specific consumption(l/capita/day)</i>	200	200	180	180	180	170	170
<i>Commercial sector, institutions and other</i>	20%	20%	20%	20%	20%	20%	20%
<i>Total consumption (l/capita/day)</i>	240	240	216	216	216	204	204
<i>Prise increase</i>	0.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
<i>Elasticity Demand ratio -0.05</i>	12.50%	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%
<i>Specific consumption(l/capita/day)</i>	200	178	158	140	125	111	111
<i>Commercial sector, institutions and other</i>	20%	20%	20%	20%	20%	20%	20%
<i>Total consumption (l/capita/day)</i>	240	213	190	169	150	133	133
<i>Average consumption demand (l/s)</i>	799	752	720	687	653	586	625
<i>Unaccounted for Water UFW</i>	0.55	0.50	0.40	0.35	0.30	0.30	0.30
<i>Average abstraction demand (l/s)</i>	1,239	1,128	1,008	927	849	762	812
<i>Average abstraction demand (m3/day)</i>	107,040	97,419	87,075	80,097	73,322	65,829	70,184

Source: EU - CARDS WQM Project – Utility Company Survey in BiH, 2007, Final Report.

Macro-economic policies

General economic development

- Strategy for economic development FBiH is in the process of preparation for its elaboration. The project coordinator is the Federal Ministry for Trade that has announced a tender for elaboration of the Strategy.
- In addition, an older “Mid-Term Development Strategy for BiH“ elaborated in 2003 encompasses all sectors. The actual status of each sector, development obstacles and problems are described in the document. There is an Action plan within the Strategy which defines measures which need to be implemented for each economic as well as social sector, with the indicated timeframe of implementation, responsible institution for implementation, and expected results and aims to be achieved. Financial dimensions for actions have not been defined. Timeframe for planning and prognosis in the Strategy is four years. Wider timeframe planning (up to 2020) exists for some (not all) sectors.

Tourism policy

- Elaboration of Strategy of Tourism Development FBiH has commenced in December 2007, and the project duration is 12 months. The project coordinator is Federal Ministry of Environment and Tourism, and the implementers are two companies from Croatia: “Engineer’s Bureau” Zagreb and “University in Rijeka” Rijeka. This Strategy will be developed for the period 2008-2018.
- Strategic Plan of Tourism Development for The Neretva River Basin was completed in October 2007 within the Project “Valorisation of environmental tourism in South-East Europe” financed by Toskana Region government, and implemented by NGO UCODEP. This document is publicly available on the official web site of Federal Ministry of Environment and Tourism. According to this strategic plan the main attractions of the Neretva valley are: wild nature; sport and adventure; history and culture. The document

also provides a three year plan of tourism development of this region. The plan includes the following activities:

- Introduction of micro reception structures: suggested activities of the Strategic plan are introduction of trekking routes, bicycle paths, access paths to significant landscape sights, resting areas, refreshment spots, rental service, etc. However, municipalities, taking into consideration the public interest and needs, will determine which of these facilities are the first priorities for implementation;
 - route signalisation and information – installation of information boards on tourist routes;
 - mapping of eco-ambient resources – printing and distributing of information material and maps of the tourist attraction and especially of sport tourism places;
 - construction of rural reception network – this assumes rural tourism development and printing materials and guidance for the tourists;
 - organization of various events which would be coordinated, including cultural and sport events, and entertainment;
 - organized elaboration of wide promotion and information material which would be distributed to information offices and fairs;
 - education of local operators;
 - installation of an internet portal;
 - web marketing.
- Based on expert judgement, it can be noted that the Mostar has seen a big increase in tourism in the recent years, a trend that is expected to continue in the future.
 - The “Study on Sustainable Development through Eco-Tourism in Bosnia and Herzegovina” was prepared by Padeco in cooperation with Pacific Consultants International and financed by JICA referred to the preparation of master plans for Blagaj, Podvezje and Nevesinje within the Neretva-Trebinjica area, but did not produce specific financial figures as an output that could be used for this study.

Agricultural Policy

- According to the Law on financial support to agricultural production (2004), the government of FBiH will allocate not less than 3% of Federal budget every year for the improvement of primary agricultural production. This amount will be divided to Cantons according to participation of specific resources of each Canton in total production or activity on Federal level. For RS the current percentage of the budget allocated for agriculture is 4%.
- In 2006 Agricultural faculty in Sarajevo under supervision and investment of Federal Ministry for Agriculture, Water management and Forestry, has completed a Mid-term Development Strategy of Agricultural Sector for period 2006-2010 on the level of FBiH.

The Strategy defines the general objectives of the agricultural sector, and those are:

- creating sustainable agricultural sector with bigger and more efficient food production which will be competitive on the domestic and foreign markets,

- improvement of foreign-trade alimetal balance,
- increasing employment,
- preparation of the sector for accession to WTO and EU integrations,
- improving living standards for life in the country,
- preserving environment from the negative effects of agriculture.

This Mid-term Development Strategy of Agricultural Sector mentions 2 possible scenarios for future development:

- *Scenario 1*, completely free market with state involvement only regarding price protection of agricultural products, when excess and dumping import threatens domestic production. According to this scenario, agriculture wouldn't have adequate conditions for development, and big part of the land with bad natural conditions would remain unused, and eventually lost for agriculture.
- *Scenario 2*, free market but with secured development of agricultural sectors and creation of a situation where agricultural production is supported by a wider social interest. State has a direct influence on structure of agricultural production and its intensity.

This Strategy, of course, supports the second Scenario, which requires higher levels of budget resources for support then the present ones. According to this scenario, the expected growth rate for agriculture is 6,5%. The scenario is shown in table below:

Table 6-5: Proposed scenario for agricultural development

Measures	Demands	Results
Abatement of rural development and inhabitation, abatement of agriculture, support of processing, active micro and macro marketing, focusing on profitable production, active foreign-trade policy	Higher level of budget resources compared to the present ones for support	Increase of active agricultural areas, harmonized alimetal balance, environmental compliance, higher employment, rural development

According to this Strategy, in the last five years, the Federal budget did not allocate the 3% of its resources into agricultural sector, as prescribed by the Law, but much less, that is only 1.4-1.5%. The Strategy proposes the measure of increasing the amount of financial support to the agricultural sector from prescribed 3%, and implemented 1.5%, to the necessary 6%.

- In 2006, the National Assembly of the RS has adopted the Strategy of agricultural development in the RS. This Strategy refers to the development period until 2015. According to this document, the percentage of the RS budget allocated for agricultural development, instead of 4%, will be 6% in the following three years, and after that it will be 8%. As defined in the document, the long-term objectives of the agricultural development in RS are: increasing and adjusting the structure of the agricultural production, optimal usage of agricultural resources, balance integral development – agrarian, rural and regional, stabile market of alimentary products, increase of export,

etc. As part of the Strategy, an Action Plan for implementation of the Strategy's objectives has also been developed.

- According to the special Decree, in 2008 the Federal Government will allocate the amount of 52.650.000 KM from the Federal Budget into the agricultural sector for the following purposes: vegetable and animal production, investment projects, expert projects, rural development, education, organization of agricultural workers, etc.
- The inflation in 2007 has caused an increase in prices of agricultural products as well. According to Department for statistics and economic research of Central Bank BiH the prices of agricultural products have increased 8.8% in FBiH and 10.3% in RS for 2007.
- In April 2008 the Federal Government has increased the minimum guaranteed prices for some agricultural products, like milk, tobacco, wheat, corn, rye, and barley. This increase in prices is based on the fact that the mentioned prices haven't been increased for years, while in the meantime the prices of raw materials, oil and fertilizers did increase.
- According to the expert judgement agricultural areas in the Neretva-Trebisnjica river basin are being privatized in the last years. As a result, some areas which were abandoned from agriculture in the past 20 year are being exploited again. Specifically around Mostar city, there are big newly planted areas with grapes. More data on this issue will be collected in the next projects phase due to current time constraints.
- Recently, discussions on rural development in BiH became more active and it is expected that an appropriate strategy in this area will be developed in near future – after that, issues of projections of agricultural development would be easier accessible and could be addressed in next phases of the project.

Industrial policy

- In 2007, the Government of FBiH reached a Decree approving the elaboration of Industrial policy and Industrial development Strategy for FBiH. The coordinator of this policy and strategy is the Federal Ministry for energy, mining and industry. In January 2008, the Federal Ministry signed a contract for the project "Development of Industrial Policy in FBiH" with the Consortium consisting of the Mechanical Engineering Faculty Sarajevo and Mechanical and Computer Engineering Faculty Mostar. This project will be completed at the end of 2008, and will be a constituent part of "Strategy for economic development FBiH".

Energy Policy

- The elaboration of a Study on the Electro-energetic Sector was completed in February 2008 on the BiH level (for both entities) and it is publicly available on the web site of the State Ministry of Foreign Trade and Economic relations BiH. The planned period of this Study is until 2020. The Study is dealing with several basic thematic units: energetic reserves; consumption, production, transmission and distribution of electricity, restructuring of energetic sector; support to the social categories consumers; coal, central heating, gas, oil; consumption management, energy saving and renewable sources; environment and investments.

The Study contains the following: overview of the existing hydro and thermo power plants, the needs for revitalization of the existing production units, estimations of production of electricity in existing plants until 2020 for three different scenarios, analysis of technical feasibility of options for future plants, new investment and operation costs, and their competitiveness on the market. One of the suggestions of this Study is to enact a Law on energy for the whole BiH.

This Study includes elaboration of complex energy balances for production and consumption of energy for the period until 2020, according to three scenarios:

- *Scenario S2* or reference scenario, which assumes a big increase in GDP and the highest consumption of energy, without any additional measures;
- *Scenario S3*, with assumption of bigger usage of renewable sources of energy and measures of energetic efficiency;
- *Scenario S1*, with relatively slow increase of GDP and the least consumption of energy.

The tables below provide the overview of the forecast of production and consumption of electricity for the three scenarios until 2020.

Table 6-6 Production of electricity FBiH for 2010-2020

Scenario	2010 (GWh)	2015 (GWh)	2020 (GWh)
S2			
Hydro Power Plant	3374,3	3722,4	3722,4
Thermo Power Plant	5403,1	8315	8905
Windmills	302,2	302,2	1057,8
Total	9079,6	12339,6	13685,2
S3			
Hydro Power Plant	3374,3	3722,4	3722,4
Thermo Power Plant	5370,5	8315	8905
Windmills	302,2	302,2	453,3
Total	9047,0	12339,6	13080,7
S1			
Hydro Power Plant	3374,3	3722,4	3722,4
Thermo Power Plant	5428,5	8315	8905
Windmills	302,2	302,2	302,2
Total	9105,0	12339,6	12929,6

Table 6-7: Production of electricity RS for 2010-2020

Scenario	2010 (GWh)	2015 (GWh)	2020 (GWh)
S2			
Hydro Power Plant	2651,3	2679,4	2687,2
Thermo Power Plant	3420	6472,2	6472,2
Total	6071,3	9151,6	9159,4
S3			
Hydro Power Plant	2648,8	2677,7	2687,2

Thermo Power Plant	3420	6472,2	6472,2
Total	6068,8	9149,9	9159,4
S1			
Hydro Power Plant	2637,1	2669,9	2682,4
Thermo Power Plant	3420	6472,2	6472,2
Total	6057,1	9142,2	9154,6

The Study on the Electro-energetic Sector also contains the plan of investments for the period 2007-2020, related to the Neretva-Trebisnjica river basin, with the following characteristics:

Table 6-8: Plan of investments into new HPP and TPP until 2020

HPP and TPP	Installed power (MW)	Specific investment (KM/kW)	Total investment (000 KM)	Period of investing
HPP Glavaticevo	171.80	2.050	352.140	2009-2013
HPP Mostarsko blato (in construction)	61	2.347	143.167	2007-2009
Small HPP Tihanjina-Mlade-Trebizat	19.92	3.679	73.284	2008-2009
Small HPP Listica river	7.01	3.583	25.117	2017-2018
Revitalization of TPP Gacko	300	930	278.958	2009
TPP Gacko 2	330	2.347	774.509	2014-2017

Transport Policy

- BiH does not have a Strategy for Transport Development yet. One of the conclusions of the First Congress on Roads, which took place in Sarajevo in September 2007, was that this Strategy has to be elaborated urgently, which would develop instruments like: plans, programs and strategies for construction of motorways, their financing, managing, etc.
- According to the 2006 Revised document of Mid-Term Development Strategy BiH 2004-2007, the following investments are planned for transport in BiH:
 - Subsidies to the Railway RS in period 2006-2008 28,3 million KM;
 - Roads maintenance in RS in 2005 were 7,1 million KM;
 - Ministry of transport and communications FBiH for mid-term period 2006-2008 is planning capital expenditures in amount of 386 million KM, which will be invested into continuation of motorway the Sarajevo-Zenica;
 - Planned expenditures of Ministry of communication and transport BiH for elaboration of project documentation for Corridor 5C for period 2006-2008 are 55,5 million KM.
- Planned Corridor 5C (Budapest-Osijek-Sarajevo-Ploče) in the area of The Neretva - Trebisnjica river basin includes the route which will pass alongside following centres: Konjic, Mostar and Čapljina. A feasibility study of this route was completed. The

commencement of its construction is not determined yet. It can be expected that this activity will have impacts on the situation in the Neretva-Trebisnjica, both on general economic indicators but also on pressures on water.

- BiH transport policy is considered in the Study on a Transport Master Plan in BiH. This Study was completed in 2001 by JICA (Japan International Cooperation Agency) and relevant ministries at national and entity level. Document includes comprehensive overview of transport infrastructure grouped by transport ways. A hard copy is available in relevant ministries at request (in local and English language). For all types of transport (waterway transport, airway transport, etc) is provided pre-war situation (1990), existing plans for future development, prognosis on demands and projections up to 2020. Projections are given in three scenarios – basic growth, minimum growth and maximum growth.

Global policies

EU accession

Bosnia and Herzegovina has signed the Agreement of Stabilisation and Accession to EU in June 2008. BiH has a Directorate for European integration, whose role is to assist in implementation of activities and obligations concerning EU accession. Its main tasks are:

- Reform process monitoring,
- Reporting to European Commission,
- Coordination of EU support programs to BiH,
- Translation of EU Laws,
- Informing the public on European integration process,
- Public Awareness Program on EU.

The Directorate for European integration BiH has elaborated a “Strategy for Integration of BiH into the EU”.

Impact on key economic sectors

The above mentioned “Strategy for Integration of BiH into the EU” defines the measures for each economic sector which are necessary to be fulfilled by BiH in the process of stabilisation and accession to EU. Measures for some of the economic sectors are indicated in the table below.

Table 6-9: Measures for economic sectors

Economic sector	Measures
Industry	Define priorities of industrial development, elaborate Strategy of industrial development, harmonize development of industrial policy with EU Lisbon Strategy, support public and private companies to introduce EMAS ² , create structural funds and venture funds for support of industrial

² EMAS – Environmental Management and Audit Scheme

	development, etc.
Agriculture	Harmonize domestic legislative with EU legislative in area of agriculture, elaborate Strategy of agricultural development BiH, adopt necessary regulations for land protection that is being degraded and destroyed, define the rule on ownership and renting the land, regulate crediting of agriculture and subsidizing specific products, enable institutional capacities in agricultural sector in BiH for planning and efficient usage of EU funds, establish a system of quality control for priority products, etc.
Energy	Elaborate Strategy for energetic sector in BiH, strengthening institutions at BiH level for preparation and implementation of reforms of electro-energetic sector, integration into EU energetic market, etc.
SME	Elaborate Strategy for development of SME, adopt and implement regulations for collateral, leasing, bankrupt and force charging, establish a Council for development and enterprising, institutionalize a dialog between the government, businessmen and the union, etc.

The Common Agriculture Policy

According to the revised document of “Mid-Term Development Strategy BiH 2004-2007”, the current state in BiH agriculture is such that it couldn’t be competitive with products from EU, because BiH supports for this sector are still very low. In the period of negotiations and before accession to the EU, BiH has to make a lot of effort in achieving necessary reforms in this sector, which would facilitate its integration into the EU Common Agriculture Policy. Support of EU pre-accession Funds is expected for one part of the reforms in agricultural sector. However, in pre-accession phase, all candidate countries first have to invest significant amounts from their own national budgets, in order to become institutionally ready for the EU accession phase and to have access to these Funds.

Specifically, the Neretva-Trebisnjica river basin has a very good potential for a big increase of agricultural production, due to numerous big agricultural fields which have not been used to their full potential, and due to flat areas towards the south and favourable climatic conditions. These are all the reasons why this area should benefit significantly from the access to the above mentioned Funds. However, there are still no specific plans about the future allocation of those potential investments.

Such an increase in agricultural production would create additional pressures on the water resources, both on quantity (higher abstractions for agriculture) and quality (increase of diffuse pollution).

Identified Gaps and Necessary Measures regarding the Baseline Scenario work in the economic analysis report – what to do next?

Based on the work done above, the economic analysis report identified the main gaps and most important next steps to be taken:

- While some starting points for the development of the baseline scenario can be found in existing data sources, it overall can be seen as not sufficient for an appropriate understanding of the future developments that will influence the future water situation and the reaching of the WFD environmental objectives in the basin.
- While additional, coordinated work for the development of projections of the main drivers/policies is needed for implementing the WFD requirements (as specified in the WATECO-document), a promising process is underway: according to the entity Water Laws, there is an obligation of each entity to elaborate their own Strategy for Water Management which is a first step towards elaboration of River Basin Management Plans. The Strategies will determine water management policies in BiH. The elaboration of these strategies (commenced in the FBiH, yet to start in RS which has elaborated the Framework Plan for Development of Water Management in RS in 2006 as a step towards the Strategy for Water Management). These strategies should be based on the prospective thinking of the WFD and make explicit links to the development of the BLS according to the WFD.

In more detail, the following main gaps have been identified in this project phase:

- Due to the lack of realistic and reliable population increase projections it is very difficult to develop a realistic future planning in terms of economic growth or water management development. Population growth is based on estimate from Institute for Statistics' report, but last census was in 1991, so in future we expect the census and better information about population, including more reliable population growth estimates;
- Economic growth projections are based on expert judgments because future development plans are not available;
- Data on technological changes in this phase of project are not available, but could be investigated on more detail in the next phases of the project;
- Water policies and investments are partly available on municipality level but are not coordinated with the institutions in charge for water in entity level or canton;
- Projections on exogenous drivers and specific sectors (such as industry and agriculture) are available but at not sufficient quality, further work will be required to suit all WFD intended purposes of the BLS;
- Related to this, it remains difficult to estimate the overall future water demand in the basin which is a central projection for an efficient water management and the selection of relevant measures; the existing estimates are outdated;
- Problems regarding the coherence between existing projections, which could be resolved through better co-operation of the involved ministries/institutions,
- Due the highly decentralized structure of the BiH, overlapping responsibilities among different ministries and administrative levels and insufficient internal communication, the

preparation of common, harmonized strategic sectoral documents is a challenge for the BiH administrative structures, including those for the Neretva-Trebišnjica River Basin.

Based on the above, the economic analysis report identified some activities that (in close cooperation with the authorities) could take place on the issue of the Baseline Scenario development:

- While some estimations exist on how agriculture could develop in the basin indicating a potential increase, more detailed work on future demand from agriculture, potential increase in diffuse pollution etc. would be helpful; this activity could be well linked to a survey of the agriculture activities and related use of the water in the basin;
- The overall strategy for the development of the energy sector indicates a potential increase in hydropower production in the basin. The potential influence of such a strategy to reaching the environmental objectives according to the WFD and the fulfilment of the requirements of “new modifications” in order to allow for a deterioration of environmental quality due to this strategy need to be investigated.

Chapter 7 of this handbook will try to integrate these ideas into a feasible and practical work plan for the development of a specific Baseline Scenario in the Neretva-Trebišnjica River Basin.

6.2 First results regarding the preparation of the cost-effectiveness analysis according to the WFD as linked to the Baseline Scenario work

In order to prepare for the cost-effectiveness-analysis of potential measures for reaching the objectives of the WFD, a number of activities can be helpful, e.g. data on the unitary costs of key measures to be considered for the development of river basin management plans (including ranges of costs (minimum, maximum)).

As another preparatory activity done in the context of the economic analysis report, the main focus has been to investigate any potential measures of significance for the future situation in the basin that are discussed. The categories of measures that the study focussed on are the one that are considered most important for the basin (see below).

Hydropower

In the region of The Neretva -Trebisnjica river basin there are 3 electrical power industries:

- Elektroprivreda RS,
- Elektroprivreda BiH,
- Elektroprivreda HZHB.

Elektroprivreda EPHZHB has an ongoing project of construction of new HPP Mostarsko Blato. It is situated southwest of Mostar, and will use the waters of the Lištica River (the right tributary of the Neretva) and Ugrovača River (the right tributary of the Lištica). It will use a natural fall of 176m between the Mostarsko Blato accumulation lake and the Neretva River. It will have 2x30 MW of installed power and will produce 167 GWh of electricity per year. The HPP is expected to be functioning by 2010.³ This information is also verified by the relevant experts.

Elektroprivreda RS is planning new projects in Trebišnjica river basin. These projects include channelling some underground waters which only partly belong to Trebišnjica river basin into this basin. These waters flow through underground karst channels towards sources of rivers Bregava, Buna and Bunica, right tributaries to river Neretva. These waters, according to the project, will be channelled towards the existing accumulation Bileća, and further used in the downstream HPPs: Trebinje I, Trebinje II, Dubrovnik I and Čapljina. This project would provide additional 856.2 GWh of electricity per year. Furthermore, these waters would be used for irrigation of karst fields in upper part of Trebisnjica river basin, and thus contribute to the economic growth of this area, which is currently very underdeveloped, as well as provide water supply for households and industry in this area. The problem of flooding of Nevesinjsko, Dabarsko and Fatničko fields would be solved by this project, because the mentioned underground waters flow under these fields. This project includes construction of three new hydro power plants: HPP Nevesinje, HPP Dabar and HPP Bileća. Additional produced electricity will be distributed as follows:

³ www.ephzhh.ba

Table 6-10: Electricity production in planned HPPs in upper part of the Neretva-Trebinjica river basin

Hydro Power Plant	New annual production (GWh)
Nevesinje	100.6
Dabar	270.6
Bileća	117.0
Trebinje I	140.0
Trebinje II	228.0

For all karst fields (Gatačko, Nevesinjsko, Dabarsko, Fatničko and Dubrave) specific technical designs have been elaborated for irrigation and drainage. Systems for water supply of households and industry are designed, connecting all settlements of this region. Proposed designs for water supply and irrigation are made for the period until 2020.⁴

In the area of upper part of river Neretva, upstream from Konjic, area managed by **Elektroprivreda BiH**, there is a project of constructing three new HPP: Glavatičevo, Bjelimići and reversible HPP Bjelimići (which is not directly on the Neretva river course)⁵. The Feasibility Study for the project of construction of all three HPP was done in 2006 by an independent company "Intrade energija Ltd." which is in majority owned by Slovenian company "Istra Benz". Characteristics of the planned HPPs, according to this Study, are as follows:

Table 6-11: Characteristics of the planned HPP in upper part of The Neretva river

Hydro Power Plant	Installed power (MW)	Annual production (GWh)	Investment (KM)	Type
Glavatičevo	28,497	108,25	142.936.228	Accumulation
Bjelimići	100,039	219,40	324.263.029	Accumulation
RHPP Bjelimići	2 x 293	1029	456.000.000	Reversible / pumping HPP

Considering that RHPP Bjelimići uses pumps for pumping the water from HPP Bjelimići, it consumes big quantities of electricity (1338 GWh annually), which creates a negative difference in electricity production of 309 GWh annually. This fact makes the RHPP Bjelimići rentable due to the fact that there is a big difference between electricity prices during the day and those during the night, because the plant would pump the water during the night, and produce the electricity during the day.

However, according to 2005 FBiH government analysis of economic justification of construction of HPPs in upper part of river Neretva, it was concluded that construction of HPP Glavatičevo is not economically justified, while the remaining two HPPs were not even planned then. Although the recent Feasibility Study states that the whole project is justified, there are still confronting opinions about this project. Therefore, the implementation is quite

⁴ www.ers.ba

⁵ "Our View of Hydro Energy System Upper Neretva" of NGO "Zeleni Neretva", 2007.

questionable. Adding to this issue, there is a big resistance of the local community and environmental organizations towards this project.

The Upper Horizon project is planning to increase energy production in order to cover energy needs, so as to improve irrigation and support local agriculture, the construction is on going. At present detailed project data are lacking and it is advised to stress the analysis of costs and benefits.

Plans on water supply and wastewater investments

According to the information received from the Water Agency for Adriatic Sea Watershed, there are no long-term plans for investments in water supply and wastewater services. Water Companies make only annual plans, which are then forwarded to the Water Agencies and entity level authorities, who decide on the priorities for investments. For the purpose of future development planning and defining cost-effective set of measures, all in accordance with the WFD, some longer-term planning needs to take place in the future.

However, according to the UWWD requirements, there are some calculated estimations from the "EU - CARDS WQM Project – Utility Company Survey in BiH, 2007, Final Report", which indicate what needs to be done in order to meet those requirements. Estimations on the future investment and O&M costs are provided in the following table.

Table 6-12: Estimated costs of measures for UWWTPs

Agglomeration	PE	Total Investment cost	NEW UWWTP COSTS
			Total annual O&M cost
		mill EURO	mill EURO
Čitluk	15,246.000	3.662	0.2075
Grude	9,486.000	1.269	0.0732
Nevesinje	9,090.000	1.230	0.0708
Posušje	5,000.000	0.792	0.0445
Mostar	125,000.000	21.168	1.2731
Stolac	5,530.000	0.853	0.0481
Široki Brijeg	8,300.000	1.150	0.0660
Prozor-Rama	3,500.000	0.609	0.0338
Kalinovik	2,500.000	0.475	0.0261
Čapljina	9,174.000	1.238	0.0713
Konjic	16,500.000	3.878	0.2205
Jablanica	5,000.000	1.627	0.0886
Vrapčići	3,464.000	0.604	0.0335
Jasenica	2,071.000	0.414	0.0226
Potoci	2,921.000	0.533	0.0294
Gnojnice	2,211.000	0.434	0.0237
Gacko	9,500.000	1.271	0.0733
Ljubinje	3,400.000	0.596	0.0331
Bileća	11,250.000	2.935	0.1644
TOTAL	249,143.000	44.738	2.6035

Source: EU - CARDS WQM Project – Utility Company Survey in BiH, 2007, Final Report.

For the future period there is also a plan for reduction of water losses in the water systems by 10 %. For the planning period of the following few years, new Waste Water Treatment Plant Investments are planned, and O&M Costs for two municipalities in the Neretva-Trebisnjica river basin, as follows:

- Međugorje 5,59 mil. EURO for 30000 PE
- Nevesinje 1,23 mil. EURO for 9090 PE.

Interesting information is that each municipality has some plans about future investments in water supply and waste water treatment but implementation always depends on the political situation and decisions. The following table shows mentioned future investments and O&M costs.

Table 6-13: UWWTP investment cost distribution – the Neretva-Trebisnjica river basin

River	Urban waste water treatment plant / PPUOV		Sewerage (60% connection rate/		Percentage of total costs
	Total Investment cost	Total annual O&M cost	Total Investment cost	Total annual O&M cost	
	mill EURO	mill EURO	mill EURO	mill EURO	
Neretva	45.929	1.478	26.180	2.241	10.28%
Trebisnjica	4.802	0.174	1.178	0.226	1.07%

Source: EU - CARDS WQM Project – Utility Company Survey in BiH, 2007, Final Report.

Plans on increasing irrigated agriculture

No data were available due to lack of planning documents and the lack of expert judgement.

Plans on increasing tourism/ecotourism

No data were available due to lack of planning documents and the lack of expert judgement.

Identified Gaps and Necessary Measures regarding the cost-effectiveness analysis as linked to Baseline Scenario work in the economic analysis report – what to do next?

The focus of the economic analysis report conducted in 2008 was on current plans under discussion (mainly on hydropower and plans regarding water supply and wastewater investments) that will influence the environmental status of water bodies in the basin. More work is required regarding the future plans for agriculture and tourism/ecotourism.

Beyond work on the preparation of developing of a methodology for selecting cost-effective sets of measures for the implementation of the WFD (to be integrated in the river basin management plan) and the unitary costs of measures, the following main gaps have been identified during the economic analysis report and are linked to the Baseline Scenario work:

- While information related to the public water supply and sewage systems are available, according to the information received from the Water Agency, there are no detailed, long-term plans for investments in water supply and wastewater services. Water Companies make only annual plans, which are then proceed to Water Agencies and entity level authorities, who decide on the priorities for investments. However, according to the UWWD requirements, there are some calculated estimations from the "EU - CARDS WQM Project – Utility Company Survey in BiH, 2007, Final Report", which indicate what needs to be done in order to meet those requirements. For the purpose of future development planning and defining cost-effective set of measures, all in accordance with the WFD, some longer-term planning needs to take place in the future;
- Data on overall costs of future projects are in most cases available, as well as costs of individual phases. At the same time, more details on the structure of costs are more difficult to obtain; in addition, data on these project costs are not quite reliable, because it is possible to expect changes in projects budget, particularly if only local institutions are involved in it;
- Additional information on future measures in the hydropower sector will be necessary in the future in order to better estimate their impacts on reaching the environmental objectives according to the WFD and the fulfilment of the requirements of "new modifications" in order to allow for a deterioration of environmental quality due to these measures;
- Plans on increasing irrigated agriculture in the basin are not finalized yet, but some information is partly available on entity level in "Strategy for the development of agriculture" document, but also in RS "Strategy for Irrigation" which will be available in July 2008;
- More information needs to be collected on plans regarding the development of tourism/ecotourism in the basin.

Chapter 7 of this handbook will try to integrate ideas on how to close the Baseline Scenario-related gaps into a feasible and practical work plan for the development of a specific Baseline Scenario in the Neretva-Trebišnjica River Basin.

7 How to move ahead in the Neretva-Trebišnjica towards a full Baseline Scenario: elements of a work plan

The development of a full baseline scenario in order to evaluate the status of water bodies not only on “historical” data, but also taking into account important socio-economic developments influencing the status of water bodies in the future, is a challenging yet important task for better water management and alignment to EU-water legislation.

For the Neretva, it is crucial to note that a full IMPRESS-analysis according to the WFD is not available yet. Therefore, while preparatory work on the BLS can and should start, the development of an IMPRESS-analysis and the related risk analysis (risk of failing the objectives of the WFD) needs to be taken further. The development of a socio-economic BLS as described in this handbook is only useful if a risk analysis based on the existing situation is available; the BLS can then be used in order to adjust the risk analysis for taking into account also important future developments on water status.

Based on the above methodological specifications from the European working groups and the first assessment of available information on the Neretva-Trebišnjica River Basin, the following future steps of BLS work are presented for discussion:

1. Institutional set-up of developing the BLS in the Neretva-Trebišnjica:

It needs to be clarified in which way the water administration is planning to develop a full BLS and in which institutional structure.

PROPOSAL: In order to deal with the significant lack of data/projections by utilizing expert judgement and in order to develop projections that are accepted by the stakeholders, it is proposed to develop the BLS through expert working groups that are set up by the responsible water authorities; participants should be (according to the specific topic, see below) renowned experts of the specific issue, representatives of the relevant state institutions/ministries as well as the relevant/interested stakeholders.

In addition, it needs to be clarified if the efforts to develop a BLS for the Neretva will be embedded in an overall approach of the BiH administration regarding BLS – development.

PROPOSAL: in case a BLS will be set up also for the other River Basins to which BiH is part, some of the projections could be developed at national level and then adjusted for the Neretva. If a national approach is not planned at this stage, work on BLS could go ahead only for the Neretva, serving as a “best practice” example for the whole of BiH.

Regarding the four main steps of the development of the BLS (see also figure 5 -1):

2. Assessing and defining the significant activities and pressures:

The initial work regarding the trends in the Neretva basin (that can be seen as an initial screening) showed that, even if the importance of some of the other variables has not been clarified to the full extent, shows some main issues for the Neretva. It is proposed that the main issues/significant activities and pressures for which projections are to be developed through expert working groups are the following:

- A. Agriculture
- B. Hydropower
- C. Tourism

D. Clarification and specification of importance of other potential drivers / “trend” variables

3. Evolution of activities generating significant pressures on water bodies

Based on the above, for each of the main topics the developments in the Neretva needs to be estimated, if needed disaggregated even further (in case differences are to be expected from region to region, e.g. regarding agriculture)

[See the different elements of step 2 in chapter 5.2.2.2.]

4. Evaluation of net pressures

Based on the overall lack of data, it is proposed to perform this step based on a qualitative approach through expert groups. It will be crucial to make best use of existing pressures and impact information, even if a full IMPRESS-analysis is not available (yet).

5. Specify the outputs of the baseline scenario:

Proposal:

Specify the importance of the BLS developed for:

- the international (transboundary) level (the whole of the Neretva);
- the selection of measures based on a re-estimate of the risk analysis.

8 Annex: Summary Table on information regarding the Baseline Scenario from the “Living-Neretva“ Economic Analysis report (2008)

Table 8-1: Summary of information on parameters and policy projections for the baseline scenario

Parameter/ Policy Projection	Availability		Reliability & Quality [1=very good; 5= poor]	Date of Projection	Period for trend analysis considered	Source/ Responsibility Institution, data format (paper/electronic)	Remarks If projection not available: what are the results of the expert judgements and how did we reach them?]
	Y	N					
Strategy for Water Management in FBiH		x		2008	projection from 2008 to 2020;	Federal Ministry of Agriculture, Water management and Forestry	The Strategy is in process of elaboration
Framework Plan for the water sector development of Republic of Srpska	X			2006	Future planning activities	Ministry of Agriculture, Water management and Forestry RS and Republic directorate for water RS	Finalized and adopted from government RS
Implementation of project of Institutional strengthening of water sector in Republic of Srpska	X			2004		Ministry of Agriculture, Water management and Forestry RS and Republic directorate for water RS	Finalized
Estimation of status and rehabilitations activities on communal system in the area of Republic of Srpska	x			2006		Institute for water management RS	
Strategy for economic development RS	X			2007	2007-2015	Government of RS	The Strategy is in process of elaboration
Strategy for economic development FBiH		x		2008	2008-2009	Federal Ministry of Trade	The Strategy is in process of elaboration
Strategy of Tourism Development FBiH		x		2008		Federal Ministry of Environment and Tourism	The Strategy is in process of elaboration
Strategic Plan of Tourism Development for Neretva River Basin	x		1	2007	projection from 2007 to 2010;	Federal Ministry of Environment and Tourism	
Mid-term development Strategy of Agricultural Sector	x		1	2006	projection from 2006 to 2010;	Federal Ministry of Agriculture, Water management and Forestry	

Parameter/ Policy Projection	Availability		Reliability & Quality [1=very good; 5= poor]	Date of Projection	Period for trend analysis considered	Source/ Responsibility Institution, data format (paper/electronic)	Remarks If projection not available: what are the results of the expert judgements and how did we reach them?]
	Y	N					
Strategy of agricultural development RS	X			2006	2007-2015	Ministry of Agriculture, Water management and forestry RS	
Industrial Policy in FBiH		x		2008		Federal Ministry for energy, mining and industry	The policy is in process of elaboration
Study of Electro-Energy Sector	x		1	2008	projection from 2008 to 2020;	State Ministry of Foreign Trade and Economic relations BiH	
Strategy For Transport Development		x					Elaboration of this strategy is indicated as an objective in Mid-Term Development Strategy BiH

