



Republika e Kosovës  
Republika Kosova - Republic of Kosovo  
Qeveria - Vlada - Government  
Ministria e Mjedisit dhe Planifikimit Hapësinor  
Ministarstvo Sredine i Prostornog Planiranja  
Ministry of Environment and Spatial Planning



# CLIMATE CHANGE STRATEGY (CCS) 2014-2024

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*Ministry of Environment and Spatial Planning*

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## ABBREVIATIONS

AEM	Agency for Emergency Management
ARDP	Agriculture and Rural Development Plan
CA	Copenhagen Accord
CCS	Carbon Capture and Storage
COP	Conference of Parties
DoF	Department of Forestry
DRR	Disaster Risk Reduction
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EnCT	Energy Community Treaty
ERO	Energy Regulatory Office
EU	European Union
EU ETS	EU Emission Trading Scheme
EU TAIEX	Technical Assistance and Information Exchange Instrument managed by the Directorate-General Enlargement of the European Commission
FAO	Food and Agriculture Organization of the United Nations
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies Model
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HPP	Hydro power plant
ICJ	International Court of Justice
IEA	International Energy Agency
IFR	Institute for Forest Research
IMWG	Inter-Ministerial Working Group on Climate Change
IIASA	International Institute of Applied Systems Analysis
IPA	Instrument for Pre-Accession
KAA	Kosovo Cadastral Agency
KAP	Kosovo Agency for Privatization
KEEAP	Kosovo Energy Efficiency Action Plan
KES	National Environmental Strategy

KEPA	Kosovo Environmental Protection Agency
KEK	Kosovo Energy Corporation
KFA	Kosovo Forest Agency
KfW	Kreditanstalt fuer Wiederaufbau
LCP	Large Combustion Plants
LECRDS	Low-Emission Climate-Resilient Development Strategy
LEDC	Low Emission Development Component
LPG	Liquid Petroleum Gas
MAFRD	Ministry of Agriculture, Forestry and Rural Development
MEST	Ministry of Education, Science and Technology
MLSW	Ministry of Labor and Social Welfare
MESP	Ministry of Environment and Spatial Planning
MEF	Ministry of Economy and Finance
MTI	Ministry of Trade and Industry
MIA	Ministry of Internal Affairs
MED	Ministry of Economic Development
MESP	Ministry of Environment and Spatial Planning
Mt CO <sub>2</sub> eq.	Megaton (million tons) of CO <sub>2</sub> equivalent
MRV	Measurement, reporting and verification
NAMAs	Nationally Appropriate Mitigation Actions
NAC	National Adaptation Component
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
NREAP	National Renewable Energy Action Plan
RES	Renewable energy sources
SME	Small and medium size enterprise
SWD	Staff Working Document
TPP	Thermal power plant
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSCR	UN Security Council Resolution
WB	World Bank

## EXECUTIVE SUMMARY

### INTRODUCTION

The preparation of the Climate Change Strategy (CCS) is among the priorities of the Kosovo Government in the National Environmental Strategy (NES) and National Environmental Action Plan (NEAP) for the period 2013-2017 and also identified as priority for Kosovo's EU approximation process. The development of the Climate Change Strategy (CCS) has been initiated in December 2012 by the Ministry of Environment and Spatial Planning (MESP) with support from UNDP. The present Climate Change Strategy is an initial step in an adaptive management feedback policy process. It is also an opportunity to look for mitigation and adaptation measures that will boost sustainable development. Therefore, it consists of two components: Low Emission Development Strategy (LEDC) & National Adaptation Component (NAC) presented in this strategy simultaneously in two sections.

### PROBLEM DEFINITION

Climate Change Strategy is a document summarizing the mitigation and adaptation measures that will boost sustainable development. It is crucial for responding and anticipating the impacts of climate change in Kosovo. These current and expected impacts include:

- Total emissions of all greenhouse gases in 2008 in Kosovo reached 9.5 Mt CO<sub>2</sub> eq. They increased by almost 11% to 10.5 Mt CO<sub>2</sub> eq. in 2009. This relatively high increase was driven almost solely by increased fossil fuel combustion.
- In comparison with other countries in Europe Kosovo has relatively low emissions per capita (5.7 t CO<sub>2</sub> equivalent per capita per annum in 2008, while greenhouse gas emissions per unit of GDP (0.84 kg CO<sub>2</sub> equivalent per EUR in 2008) are higher. Per capita emissions are just over half of the EU average (9.93 t) and emissions per unit of GDP are almost double of those in the EU average (0.4 kg/EUR).
- These statistics illustrate the economic and social challenges for Kosovo in the trap with low but growing emissions, and even lower GDP per capita. This situation justifies the application of the principle of common but differentiated responsibility defined in Article 3.1 of the United Nations Convention on Climate Change (UNFCCC).
- Higher temperatures will cause heat waves and forest fires more likely. Since 2000 there have been an increasing number of forest fires in Kosovo;
- Increased temperatures, more uncertain rainfall, and reduced runoff combined with socio-economic developments and increased use of water resources will heighten exposure to drought;
- Ecosystem degradation and reduction of ecosystem services.

It is important to take into account that climatic hazards have a much greater impact than should normally be the case in a country such as Kosovo, owing to a high degree of vulnerability. This is the result of a variety of factors, including:

- Building and uncontrolled urbanization from 1999 until now;
- High socio-economic vulnerability due to a high incidence of poverty (among 45% of the population) and a fragile economy, combined with limited provision in the health, social welfare and employment sectors;

- Illegal construction in hazard zones and failure to adhere to building codes;
- Inadequate and deteriorated drinking water and sewerage infrastructure to match current development trends and population growth;
- Unsustainable water resources management;
- Inadequate land use and municipal planning, which increase population exposure to hazards;
- Unsustainable agronomic practices, deforestation, and destruction of slopes by mining activities.

## JOINT VISION, MISSION STATEMENT AND KEY OBJECTIVES

### VISION OF CLIMATE CHANGE STRATEGY

A climate-resilient Kosovo, which is effectively mitigating the causes of climate change, and is effectively anticipating on, and responding to, the impacts of climate change, taking into account internationally endorsed principles for sustainable development.

### MISSION STATEMENT

To reduce the risk and damage from current and future impacts of climate change in a cost-effective manner and to exploit potential benefits stemming from climate change.

Considering the large uncertainty regarding the current level and future projections of GHG emissions in Kosovo it is difficult to set a meaningful mitigation objective in terms of quantitative emission reduction targets. For the same reason, and for the reason of uncertainty of future social and economic development of the country, it is also difficult to set LED objectives for long term (e. g. 2050 as in the EU Roadmap). Because of this the mitigation objectives are set in qualitative terms as follows:

#### **LEDC Objective 1:**

Kosovo will develop the capacity to fulfil its future obligations under the UNFCCC and as a member of EU.

#### **LEDC Objective 2:**

Kosovo will slow the increase of GHG emissions through

- increased energy efficiency in all sectors,
- development of renewable energy sources and
- sustainable use of natural resources

The NAC has the following objectives:

#### **AC Objective 1:**

To introduce new and improve current mechanisms of disaster risk reduction, especially important for sectors of economic significance that are particularly vulnerable to climate change impacts;

**AC Objective 2:**

To enhance adaptive capacity<sup>1</sup> of natural systems, in particular vulnerable ecosystems, and society, in particular vulnerable communities, such as poor farmers, marginal groups and women, to address the climatic impacts and related risks on their lives and livelihoods;

**AC Objective 3:**

To build the capacity of national and local partners, actors and stakeholders to integrate climate change issues and adaptation into the local and national development processes, and empower them for addressing climate change issues.

**RECOMMENDED ACTIONS**

The Low Emission Development Component (LEDC) is very likely to lead to lower GHG emissions than in a business as usual scenario. It will help to:

1. propose priority mitigation solutions, which provide economic opportunities;
2. identify the barriers to low carbon emissions economy development;
3. reinforce and build on existing projects/investments, attracting additional international support;
4. decide on a quantified emission reduction contributions/commitments in the future.

In total the LEDC presents 9 **Nationally Appropriate Mitigation Actions (NAMAs)** ones that maximize benefits while minimizing negative consequences.

Using simple extrapolation of the GHG emissions and correlating them to the predicted energy demand in the Energy Efficiency Action Plan and compare them with the impact of these measures, we get an emission reduction of 7 to 14 % compared to the Business as usual scenario in 2018. This gives a first approximation of how an emission target could look like, which will be further refined when the emission inventory and projections are fully developed.

The Adaptation Component (AC) entails the following **eight strategic actions**:

1. Flood protection
2. Drought, addressing water scarcity and securing environmental (ecological) minimal flow
3. Forest and biodiversity management
4. Public health
5. Information management and exchange
6. Capacity building and awareness raising
7. Finances, cost recovery and risk management
8. Establishment of adequate cooperation mechanism

In total the NAC presents 38 **optimal interventions**, ones that maximize benefits while minimizing negative consequences. This includes measures which are cost effective in reducing risks and can be implemented safely without compromising (other) sustainable development trajectories, as well as adaptation options that provide benefits regardless of future climate conditions.

<sup>1</sup> Adaptive capacity: the ability of a system to adjust to climate change, to moderate potential damage or take advantage of opportunities or to cope with the consequences (IPCC, 2001).

Climate change adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change (UNFCCC Definition: <http://unfccc.int>). Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause. Early action will save on damage costs later. Adaptation component is needed at all levels of administration, from the local to the international level.

Examples of adaptation measures include using scarce water resources more efficiently, adapting building codes to future climate conditions and extreme weather events, building flood defences and raising the levels of dykes, developing drought-tolerant crops, choosing tree species and forestry practices less vulnerable to storms and fires, and setting aside land corridors to help species migrate. In the Section 6.2 are presented the adaptation component's interventions.

While climate change represents a huge challenge, it also represents an opportunity for innovation in the management of water resources and sustainable development of a modern economy, especially by means of new growth (e.g. wind and solar energy, development of green infrastructure, (sustainable) production of biofuels, thermal combustion, wastewater recycling, and technologies for carbon-neutral housing, carbon-neutral transportation and industries, etcetera).

Overall, the NAC for Kosovo envisages effectively anticipating, and responding to, the impacts of climate change, taking into account internationally endorsed principles for sustainable development. Adaptation to climate change is crucial for reducing the risk and damage from current and future impacts of climate change in a cost-effective manner and to exploit potential benefits stemming from climate change. The NAC will aim to introduce new and improve current mechanisms of disaster risk reduction, especially important for sectors of economic significance that are particularly vulnerable to climate change impacts, and to enhance adaptive capacity of natural systems, in particular vulnerable ecosystems, and society, in particular vulnerable communities, such as poor farmers, marginal groups and women, to address the climatic impacts and related risks on their lives and livelihoods. Hence, the NAC intends to build the capacity of the local partners, actors and stakeholders to integrate climate change issues and adaptation into the local and regional development processes, and empower them for addressing climate change issues.

Finally, the NAC intends to disseminate and upscale lessons learned, good adaptation practices, experiences and advocacy to influence policy and decision making processes at local, national and regional levels.

COMPONENT I

LOW-EMISSION  
DEVELOPMENT

## 1. INTRODUCTION

The preparation of the climate change strategy is among the priorities in the National Environmental Strategy (NES) and National Environmental Action Plan (NEAP) for the period 2011-2015 and also identified as priority for Kosovo's EU approximation process.

Although Kosovo has not participated in or signed the *UN Framework Convention on Climate Change* (UNFCCC) and its Kyoto Protocol yet, it has the responsibility to respond to the requirements of the Convention and the Protocol, as one of the signatories of the Energy Community Treaty. The Energy Community Treaty also sets clear reduction targets for the energy use while it demands increase the share of renewable energies.

The responsible authority for environment and climate policy is the Ministry of Environment and Spatial Planning (MESP). In 2012, with the support of UNDP, Kosovo prepared its first national inventory of GHGs for the period 2008 – 2009. The Ministry of Economic Development has responsibility for energy policy and is leading the efforts to achieve the EU 20-20-20 targets in the framework of the Energy Community treaty, including the Renewable Energy Action Plan and Energy Efficiency Action Plan and the Kosovo Energy Efficiency Agency planning several projects to reduce Greenhouse Gases (GHG) in buildings and other sectors.

The purpose of the LEDC is to provide a comprehensive climate change mitigation policy framework based on the present level of information. On one hand, the Strategy is taking into account the ongoing efforts of Kosovo, and on the other it provides guidance towards the next steps to be taken in terms of meeting EU requirements and future global responsibilities of Kosovo.

## 2. METHODOLOGY

The strategy development is based on a full participatory process ensuring consultation among central and local institutions. For this purpose an Inter-Ministerial Working Group on Climate Change (IMWG) was established in March 2013 by the Minister of Environment and Spatial Planning. The working group was supported in its efforts by UNDP Kosovo office, providing input of domestic and international experts and by project Technical Assistance and Information Exchange Instrument managed by the Directorate-General Enlargement of the European Commission (EU TA/EX).

The process has followed the UNDP Guidebook "*Preparing Low-Emission Climate-Resilient Development Components*" to the extent possible in relation to the time, information and resources available. For more details see Annex 6.

## 3. BACKGROUND

### 3.1. INTERNATIONAL CONTEXT

#### 3.1.1. What is Low Emission Development (LED)

The transition to low-emission development in both developed and developing economies has been recognized internationally as an imperative to stabilizing greenhouse gas (GHG) concentrations in line with a 2° C temperature increase scenario. Reaching emission reduction requires transition to low emission development pathways around the globe. This means decoupling carbon emissions from economic growth through a series of measures across all

economic sectors, such as energy efficiency improvements, usage of renewable energy sources, managing land use change and others.

A Low Emission Development (LED) is a strategic document to assist the country in shifting its development path to a low carbon economy and achieve sustainable development, based on its own socio-economic and development priorities. It is a long-term component that includes a strategic vision, and a short and medium-term component that presents specific actions to be undertaken to get on a low carbon pathway. The development of the LEDC is based on the specific circumstances in each country, including its institutional and professional capacity, track record in combating climate change and the overall policy context.

### 3.1.2. International position of Kosovo

Kosovo is a developing country and an EU accession country. The important circumstances taken into account in Kosovo are amongst others the following:

- Kosovo is not yet a party to the UN Framework Convention on Climate change (UNFCCC)<sup>2</sup>, however under its classification of countries it would be considered as a developing country (non-Annex I).<sup>3</sup>
- Kosovo aims at membership in EU, which entails transposing and implementing EU legislation and gradually moving from developing to a developed country status under the UNFCCC
- Being a new country, the capacity and track record in dealing with climate change are very limited due to other priorities in the recent years.
- The information on greenhouse gas (GHG) emissions and especially projections is still insufficient.<sup>4</sup>
- Numerous policy and strategic documents have already been developed and adopted, but they are still to be implemented. In this context an overarching document is needed to pull together all the activities related to climate change and set the right priorities.

In the context of the above, a comprehensive and detailed approach to the development of LEDC is neither feasible nor useful at this point of time. The key challenge and opportunity is to move towards a low carbon economy by reducing GHG emissions while achieving the objectives of rapidly improving the economic situation and social cohesion and receiving international support. This will require leapfrogging from the present situation to sustainable patterns of production, consumption and lifestyle so that Kosovo as future EU member contributes to European competitiveness and cohesion in a long-term.

As a leading principle of the present LEDC the **Precautionary Principle** of the UNFCCC (Article 3.3 UNFCCC) is used which states:

“The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve

<sup>2</sup> UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence

<sup>3</sup> According to UNFCCC Decision 1/CP.17 it is expected that the new UNFCCC agreement to be agreed by 2015 will cover all the countries with mitigation obligations after 2020

<sup>4</sup> Initial GHG inventory system of Kosovo was provided by the project “Transfer of Czech Experience: Developing Kosovo Greenhouse Gas (GHG) Inventory Management System” funded by UNDP. Because of the lack of separate historic statistical data, the global emission prediction models still consider Kosovo as part of a group together with Serbia and Montenegro.

this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.”

The present Strategy is an initial step in an adaptive management feedback policy process. It is also an opportunity to look for appropriate mitigation measures which will boost development. The current LEDC is likely to lead to lower GHG emissions than in a business as usual (BAU) scenario. It will help to:

- propose priority mitigation solutions, which provide economic opportunities;
- decide on a quantified emission reduction commitments in the future;
- highlight the barriers to low emissions development of the economy;
- reinforce and build on existing projects/investments, attracting additional international support.

### 3.1.3 The UN Convention on Climate Change and its Kyoto Protocol

The United Nations Framework Convention on Climate Change (UNFCCC)<sup>5</sup> was adopted on May 9, 1992 at the UN Conference on Environment and Sustainable Development<sup>6</sup> in Rio de Janeiro as a response of the international community to the global climate change phenomenon caused by the increased concentrations of greenhouse gases (GHG) in the atmosphere. The overall objective of the UNFCCC is aimed at stabilizing GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. To-date, 196 countries are Parties to the Convention.

The 3rd Conference of Parties (COP) under the UNFCCC (Kyoto, 1997) adopted the Kyoto Protocol (KP)<sup>7</sup>, which committed industrialized countries and economies in transition included in Annex I to Convention to reduce their total emissions of direct GHG by at least 5 per cent against 1990 levels over the five-year period 2008-2012 (first commitment period)<sup>8</sup>. At the end of the first commitment period an amendment was adopted at Doha in 2012 to extend the Protocol to 2020 (second commitment period 2013–2020). In this amendment, the EU is committed to reduce emission by 20% during the period to 2020, compared to the base year.

### 3.1.4. Climate action in non-Annex I Parties

In the Bali Action Plan adopted at COP 13 (2007)<sup>9</sup>, developing countries agreed for the first time to design and implement Nationally Appropriate Mitigation Actions (NAMAs)<sup>10</sup> in the context of sustainable development, supported and enabled by technology, financing and capacity building.

The 15th Conference of the Parties held in Copenhagen in December 2009, has taken note of the Copenhagen Accord (CA)<sup>11</sup> - a political declaration which agrees to limit climate change to not more than 2°C above preindustrial levels in the context of equity and sustainable development

5 [http://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/pdf/conveng.pdf](http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf)

6 <http://www.un.org/geninfo/bp/enviro.html>

7 <http://unfccc.int/resource/docs/convkp/kpeng.pdf>

8 [http://unfccc.int/kyoto\\_protocol/items/3145.php](http://unfccc.int/kyoto_protocol/items/3145.php)

9 <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>

10 <http://unfccc.int/focus/mitigation/items/7172.php>

11 [https://unfccc.int/meetings/copenhagen\\_dec\\_2009/items/5262.php](https://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php)

and reaffirms the developmental aspects of climate change, including low-emission development strategies.

The 16th Conference of the Parties held in Cancun in December 2010 adopted the Cancun Agreement<sup>12</sup>, which encourages governments to prepare low-carbon development strategies in the context of sustainable development and also developing countries to undertake NAMAs in the context of sustainable development. The Cancun Agreement *“realizes that addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development”*.

The Copenhagen Accord foresees that both developed and developing countries will implement mitigation actions. It further envisages that developing countries will prepare Low Emission Development Component (LEDC) as blueprints for decoupling their economic development and emission growth. Developing countries will also implement Nationally Appropriate Mitigation Actions.

In addition to setting overall vision and strategic goals of transition towards low-emission, sustainable, development, a LEDC should contain a concrete set of measures leading to GHG emission reduction, quantification of the corresponding emission reduction for each measure and the financial requirements to implement them. For non-Annex I Parties, the set of measures can be expressed as Nationally Appropriate Mitigation Actions (NAMAs). Finally, a LEDC should outline the approach to implementation, determining concrete steps and timelines, as well as the provisions for monitoring, measurement, reporting and verification of results achieved and a mechanism for further improvement on the basis of the experience in the implementation.

NAMAs, the appropriate form of mitigation action by developing countries, may in principle include a wide range of different approaches to mitigation actions with international support or domestically implemented, such as implementation of policies, programmes, individual projects or even implementing specific changes in the national economies to reduce their emissions of greenhouse gases. There are two main types of NAMAs: (i) unilateral NAMAs: mitigation actions undertaken by developing countries on their own; (ii) supported NAMAs: mitigation actions in developing countries supported by finance, technology and capacity building from Annex I countries.

According to the Copenhagen Accord, non-Annex I Parties will implement mitigation actions. Mitigation actions taken by non-Annex I Parties (unilateral NAMAs) will be subject to their domestic Measurement, reporting and verification (MRV) procedures and reported on every two years through the biennial update reports on the basis of guidelines to be adopted by the Conference of the Parties (COP) Provisions have to be made for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected.

NAMAs will be recorded in a registry<sup>13</sup> along with relevant technology, finance and capacity building support requested. They will be subject to international MRV procedures in accordance with guidelines adopted by the Conference of the Parties. A Guidance For NAMA design (building on countries experience) was recently developed by UNFCCC, it can be found at ([http://unfccc.int/files/cooperation\\_support/nama/application/pdf/guidance\\_for\\_nama\\_design\\_\(2013\)\\_final.pdf](http://unfccc.int/files/cooperation_support/nama/application/pdf/guidance_for_nama_design_(2013)_final.pdf))

Even if not yet a party to the convention, Kosovo supports and contributes to the global imperative to stabilize the concentrations in line with 2 degree temperature increase scenario

12 [https://unfccc.int/meetings/cancun\\_nov\\_2010/items/6005.php](https://unfccc.int/meetings/cancun_nov_2010/items/6005.php)

13 [http://unfccc.int/cooperation\\_support/nama/items/6945.php](http://unfccc.int/cooperation_support/nama/items/6945.php)

and should make a transition to low emission development path. Kosovo is already committed to emission reduction under the Energy Community Treaty. The first step is to develop a Low-Emission Development Strategy and NAMAs to be presented once it signs the Convention, or meanwhile to other donors for support of the development and implementation.

The 17th COP<sup>14</sup> was held in Durban, South Africa, in December 2011. The conference agreed that EU and some other countries would commit to a second Kyoto target period in the time frame between 2012 and 2020. After that, a new global agreement should get in force, applying to all countries of the world according to the principle of common but differentiated responsibility, to be prepared by 2015, and to take effect in 2020. There was also progress regarding the creation of a Green Climate Fund (GCF)<sup>15</sup> for which a management framework was adopted. By 2020 the fund is to distribute a part of the US\$100 billion per year to the developing countries for their mitigation and adaptation actions.

At the 18th COP in Doha, Qatar, an agreement was reached to extend the duration of the Kyoto Protocol, with the second commitment period until 2020, and to work on the Durban Platform, meaning that a “a new protocol, legal instrument or agreed outcome with legal force” is to be agreed by 2015 and enter into force in 2020. The Conference produced a package of documents collectively titled The Doha Climate Gateway<sup>16</sup>. The documents collectively contained:

- An eight year extension of the Kyoto Protocol until 2020.
- The capitalization of the Green Climate Fund is planned for mid-2014 and all the institutional structures for mitigation, adaptation, technology development and transfer, capacity building and MRV are in place working as planned.

The COP19 in Warsaw in 2013 adopted a decision agreeing on a timetable to facilitate the development of the new agreement; a request to all countries “to initiate domestic preparations for their intended national determined contributions”, and a request to further elaborate elements for the 2015 agreement negotiating text starting in March 2014.

### 3.1.5 Implications of EU Accession

The strategy provides a general climate change roadmap for Kosovo to support the EU accession process leading to an “Annex I type” (developed countries) or similar regime sometime after 2020. Until that time, the Strategy should strive to support the sustainable development of Kosovo, while maximising the utilisation of the available international support in finance, capacity building, and technology transfer, initially mainly through the mechanism of bilateral NAMAs. These financial mechanisms will only work well if climate change objectives and projects are well integrated into the national economic development policies and strategies, such as related to poverty alleviation, energy, transport, industry, etc. The consideration of these assumptions in the strategy may also require dialogue with the EU Commission within the available frameworks.

EU climate and energy targets<sup>17</sup> were set by EU leaders in March 2007, when they committed Europe to become a highly energy-efficient, low carbon economy, and were enacted through the Climate and Energy package in 2009. The package is a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020.

14 [http://unfccc.int/key\\_steps/durban\\_outcomes/items/6825.php](http://unfccc.int/key_steps/durban_outcomes/items/6825.php)

15 <http://gcfund.net/home.html>

16 [http://unfccc.int/key\\_steps/doha\\_climate\\_gateway/items/7389.php](http://unfccc.int/key_steps/doha_climate_gateway/items/7389.php)

17 <http://ec.europa.eu/clima/policies/package/>

These targets, known as the “20-20-20” targets, set three key objectives for 2020:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%;
- A 20% improvement in the EU’s energy efficiency.

The 20-20-20 targets represent an integrated approach to climate and energy policy that aims to combat climate change, increase the EU’s energy security and strengthen its competitiveness. They are also headline targets of the Europe 2020 strategy for smart, sustainable and inclusive growth. This reflects the recognition that tackling the climate and energy challenge contributes to the creation of jobs, the generation of “green” growth and a strengthening of Europe’s competitiveness. It is estimated that meeting the 20% renewable energy target could have a net effect of creating around 417 000 additional jobs<sup>18</sup>, while getting on track to achieve the 20% energy efficiency improvement in 2020 is forecast to boost net employment by some 400 000 jobs. The climate and energy package does not address the energy efficiency target directly. This is being done through the 2011 Energy Efficiency Plan and the Energy Efficiency Directive.

The EU emission reduction effort is composed of two main approaches:

- The EU emission trading scheme - **EU ETS**<sup>19</sup>, where a target of 21% emission reduction by 2020 is set for the entire EU. The system includes large emitters: factories, power plants and other installations and works on the “cap and trade” principle. This means there is a “cap”, or limit, on the total amount of certain greenhouse gases that can be emitted by the system. Within this cap, companies receive emission allowances which they can sell to or buy from one another as needed. The flexibility that trading brings ensures that emissions are cut where it costs least to do so.
- The so-called “**Effort Sharing Decision**”<sup>20</sup> establishes annual binding greenhouse gas emission targets for Member States for the period 2013–2020. These targets concern the emissions from sectors not included in the EU ETS - such as transport, buildings, agriculture and waste. It is part of a package of policies and measures on climate change and energy that will help transform Europe into a low-carbon economy and increase its energy security. The combined target for all EU member states by 2020 is 10%, but individual targets vary from -20% to +20% depending on the national circumstances and the economic strength of individual countries. Some of the Member states are allowed to increase their emissions while the more advanced countries have to reduce more.

Assuming that the system remains the same, when Kosovo enters EU, its cap for ETS will be set based on historic emissions in the ETS sector and non-ETS reduction target will be set based on the applicable criteria including the level of overall development.

Under the Renewable Energy Directive<sup>21</sup>, Member States have taken on binding national targets for raising the share of renewable energy in their energy consumption by 2020. These targets, which reflect Member States’ different starting points and potential for increasing renewables production, range from 10% in Malta to 49% in Sweden. The national targets will enable the EU

18 <http://ec.europa.eu/clima/policies/package/>

19 EU emissions trading system (EU ETS) Emissions Trading Directive 2003/87/EC and its amendments [http://ec.europa.eu/clima/publications/docs/factsheet\\_ets\\_en.pdf](http://ec.europa.eu/clima/publications/docs/factsheet_ets_en.pdf)

20 Effort Sharing Decision (ESD) Decision No 406/2009/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0136:0148:EN:PDF>

21 Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC Biofuels Directive <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=Oj:L:2009:140:0016:0062:en:PDF>

as a whole to reach its 20% renewable energy target for 2020 - more than double the 2010 level of 9.8% - as well as a 10% share of renewable energy in the transport sector. The targets will also help to cut greenhouse gas emissions and reduce the EU's dependence on imported energy.

Another element of the climate and energy package is a directive creating a legal framework for the environmentally safe use of carbon capture and storage technologies<sup>22</sup>. Carbon capture and storage (CCS) involves capturing the carbon dioxide emitted by industrial processes and storing it in underground geological formations where it does not contribute to global warming. The directive covers all CO<sub>2</sub> storage in geological formations in the EU and lays down requirements which apply to the entire lifetime of storage sites.

### 3.1.6. Energy Community Treaty

For Kosovo, the key instrument and driver of energy and related environmental policy in the region is the Energy Community (EnCT) of the European Union and nine contracting parties from the South East Europe and Black Sea regions (Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Moldova, Montenegro, Serbia and Ukraine), established in 2005. Article 3 of the Treaty requires the contracting parties to implement the *Acquis Communautaire* on energy, environment, competition and renewables. More specifically, it sets out a timetable for the implementation of priority Directives. The EIA Directive and Article 4(2) of the Birds Directive were to be implemented by the entry into force of the Treaty; The Directive relating to a reduction in the sulphur content of certain liquid fuels by 31 December 2011; and the Large Combustion Plants (LCP) Directive is to be implemented by 31. December 2017.

Most Contracting Parties, including Kosovo<sup>23</sup>, committed to an energy saving indicative target of 9% of the final energy consumption between 2009 and 2018, through their National Energy Efficiency Action Plans. In 2012, the Ministerial Council of the Treaty agreed on the renewable energy targets for the parties (Kosovo shall increase the share of renewable energy sources from 19.9 to 25%)<sup>24</sup> and in October 2013 they agreed to introduce the obligation to implement the new EU Industrial Emissions Directive under the Treaty<sup>25</sup>.

## 3.2. SITUATION IN KOSOVO

### 3.2.1 Socio-economic situation

Kosovo is a landlocked country, situated in the center of the Balkan Peninsula, bordering Serbia, Macedonia (FYR), Albania and Montenegro. Kosovo's territory is 10,908 km<sup>2</sup>. Kosovo has continental climate with warm summers and cold winters. Kosovo is populated by about 193 persons per km<sup>2</sup>, with 38 municipalities and capital Prishtina.

Population estimate for 2012 is 1,815,606. The ethnic composition is 90 % Albanians, 5 % Serbs, 2 % Muslim Slavs (Bosnians, Gorans), 2 % Roma and 1 % Turks. Kosovo currently has the youngest population in Europe, with average age of 29.5 years and fertility estimated at 2.4 children per woman. There has been a major internal migration of the Kosovo population, mainly from rural toward urban areas, since conflict cessation in 1999, but still 58 % of the population lives in rural areas and 42 % in urban centers. Prishtina is the region with the highest rate of migration.

22 DIRECTIVE 2009/31/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the geological storage of carbon dioxide <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0114:0135:EN:PDF>

23 [http://mzhe.rks-gov.net/repository/docs/Kosovo\\_Energy\\_Efficiency\\_Action\\_Plan\\_2010-2018.pdf](http://mzhe.rks-gov.net/repository/docs/Kosovo_Energy_Efficiency_Action_Plan_2010-2018.pdf)

24 <http://www.energy-community.org/pls/portal/docs/1766219.PDF>

25 <http://www.energy-community.org/pls/portal/docs/2388178.PDF>

It is estimated that over 500,000 people are living abroad. Kosovar diaspora is an important factor of economic development of Kosovo. However, this potential is still not sufficiently utilized and channelled into productive activities that will have economic effects chain. In addition to addressing the needs and priorities of Diaspora of the Republic of Kosovo, Diaspora Strategy is being developed and supported in accordance with the applicable normative acts of the Republic of Kosovo.

Kosovo's economy is new and dynamic, using Euro as the currency and with Gross Domestic Product (GDP) in 2012 being € 4.723 billion, per capita GDP € 2,618. From 2010 to 2012 GDP grew 4 to 5 % annually. Exports of goods in 2011 were worth 319 million Euro and imports 2,492 Euro. Since 1999 Kosovo has been transformed from a centralist and controlled economy, to a free-market economy. The goal now is to increase competition within the economy, while increasing export capacity to reduce Kosovo's trade deficit. As well as being a CEFTA member, in June 2009 Kosovo became a member of the IMF (International Monetary Fund) and the WB (World Bank), and it aspires to other strong economic and financial mechanisms such as EBRD, the World Trade Organization (WTO) etc.

### 3.2.2. Climate change mitigation Policy

The responsible authority for environment and climate change policy is the Ministry of Environment and Spatial Planning (MESP). Based on an agreement between the UNDP and the MESP, as of December 2012 MESP jointly with UNDP coordinates donor support to the climate change agenda for Kosovo.

Kosovo has no register of sources and emissions of GHGs yet and it also has not identified the base year from which GHG emissions will be estimated. The Greenhouse Gas Inventories for 2008 and 2009 are one of the first initiatives in Kosovo contributing to the global efforts to minimize the human impact on the climate change. This project continues with further capacity building activities on GHG monitoring and reporting in 2013-2014. Kosovo has not yet started to submit National Communications to the Secretariat in the UNFCCC.

To some extent, climate change is a top four of the overall environmental policy documents described below.

**Environmental Strategy for Kosovo** (MESP) was developed for the period 2005-2015 with these priority areas: climate change, acidification, biodiversity, water, urban environment and waste management.

The priorities for the Strategy are:

- completion of environmental legislation in harmony within the EU acquis;
- gradual fulfilment of EU standards;
- efficient implementation and integration of the environmental legislation and methodologies into all sectors;
- establishment and further development of competent institutions including capacity building;
- establishment of ecofund;
- establishment and functioning of environmental monitoring network in Kosovo;
- rational use of natural resources;
- development of long term education programs;
- public awareness campaigns and projects;

- support the concept of import of clean technologies in Kosovo;
- application of the concept of energy efficiency in all sectors of energy users.

**The Kosovo Environmental Action Plan 2006-2010** (MESP) as part of the Governmental Programme was the first document developed in Kosovo aiming at gradual improvement of the environmental situation, a framework where all environment related priority activities of respective institutions will be based on.

The Plan specifically foresees the following actions to mainstreaming the environmental sector:

- Completing legislation and its harmonization with EU legislation
- Drafting of Agriculture Action Plan
- Rehabilitation of irrigation networks
- Setting grounds for development of eco-tourism
- Introduction of incentive instruments for applying alternative methods of agricultural products and compost
- Ensuring suitable conditions when importing input for agriculture and placement of food products
- Maintaining traditional farming methods
- Development and implementation of training programmes for farmers tackling the issues of good agricultural practices
- Developing agro-environmental indicators
- Establishment of a modern certification system for organic products

**Kosovo Environmental Strategy (KES) and National Environmental Action Plan (NEAP) 2011-2015** (MESP). The revised and updated Strategy and Action Plan aim to provide answers to the present and future needs of Kosovo society and specifically addresses the environmental management obligations at national and international level. It is a document which sets out objectives and priorities which should be implemented through the National Environmental Action Plan (NEAP) 2011-2015. It covers current state, objectives, and priorities for the following thematic areas:

- Air (climate change, acidification, ozone layer protection and radiation);
- Water;
- Soil;
- Natural Heritage;
- Sustainable use of natural resources;
- Biodiversity;
- Agriculture;
- Forestry;
- Solid Waste;
- Chemicals;
- Mining and mineral resources;
- Energy;
- Industry;
- Transport and Tourism

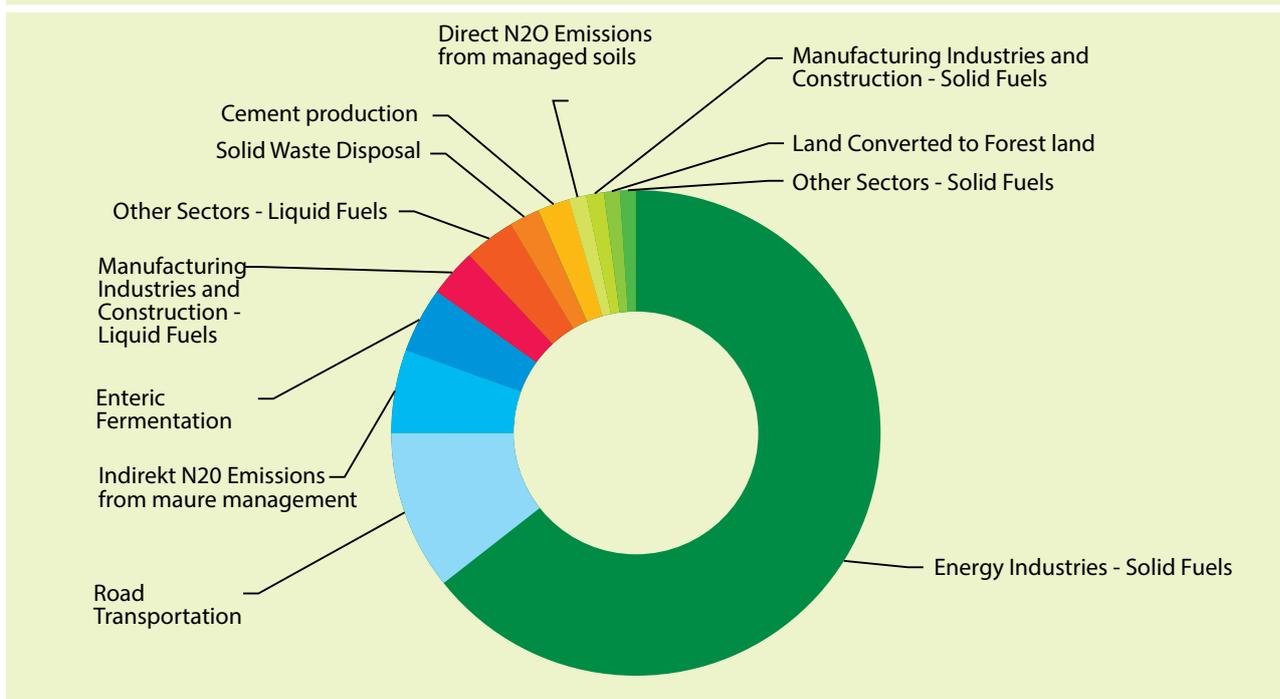
### 3.2.3 Greenhouse gas (GHG) emissions inventory

The availability of information on GHG emissions and local capacity to monitor them is insufficient. So far, the only information on historic and future emissions has been developed in the framework of the 2012 Feasibility study of greenhouse gas inventory system for Kosovo, prepared by the Environment Center of the Charles University in Prague<sup>26</sup>.

According to the results of this project, the total emissions of GHG in 2008 reached 9.5 Mt CO<sub>2</sub> eq. They increased by 11% to 10.5 Mt CO<sub>2</sub> eq. in 2009. This relatively high increase was driven almost solely by increased fossil fuel combustion. Carbon dioxide constitutes about 80 % of all emissions, while methane and nitrous oxide are both about 10 %. The so called F-gasses, such as HFCs and PFCs, are almost negligible.

The most important sector for whole inventory is sector "1A Fuel combustion activities" which constitute about 80% of all anthropogenic emissions in Kosovo. Most important source of GHG emissions for Kosovo is combustion of solid fuels – domestic lignite. Other so called "key categories" (those who cumulatively constitute 95% of emissions total) is shown in the following graph (Figure1).

**Figure 1.: Identified key categories of GHG inventory 2009 of Kosovo**



In comparison with other countries in the Europe Kosovo has relatively low emissions per capita (5.7 t CO<sub>2</sub> equivalent per capita per annum in 2008, while greenhouse gas emissions per unit of GDP (0.84 kg CO<sub>2</sub> equivalent per EUR in 2008) are high. Per capita emissions are just over half of the EU average (9.93 t) and emissions per unit of GDP are almost double of those in the EU (0.4 kg/EUR). These statistics illustrate the economic and social challenges for Kosovo in the trap with low but growing emissions, and even lower GDP per capita. This situation justifies the application of the principle of common but differentiated responsibility defined in Article 3.1 of the UNFCCC.

<sup>26</sup> "Transfer of Czech Experience: Developing Kosovo Greenhouse Gas (GHG) Inventory Management System" funded by UNDP

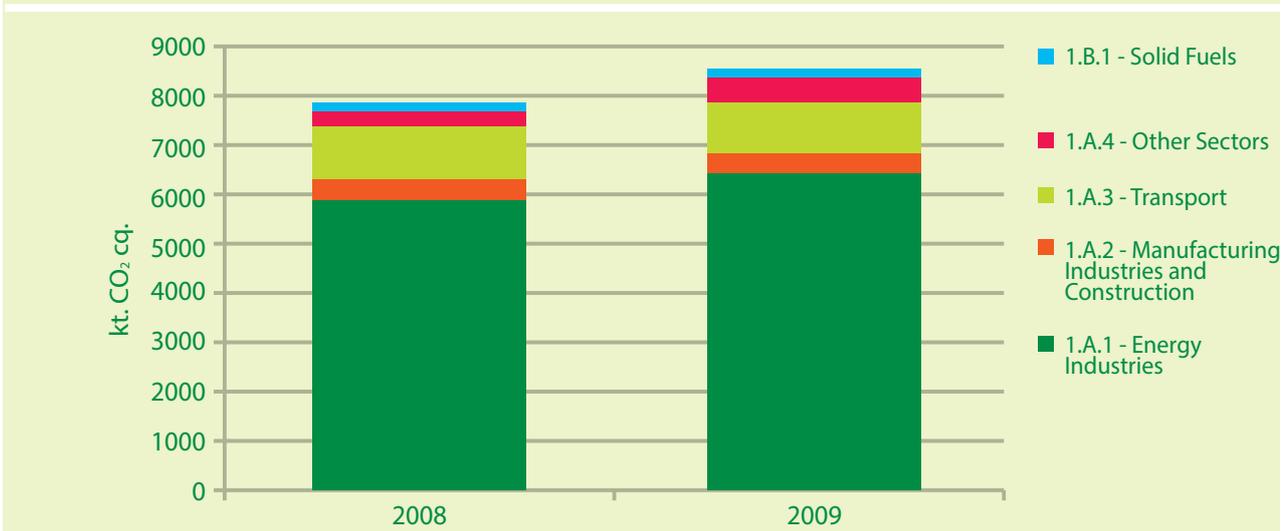
**Figure 2.: International comparison of GHG emission, 2009**

### 3.2.4. Energy

Energy sector produces about 82% of total national emissions of GHGs. This sector covers combustion, exploitation and distribution of fossil fuels in Kosovo. Combustion processes in energy industries in category 1A make a decisive contribution to total emissions of GHGs, especially by carbon dioxide, which is produced when carbon-based fuels are burned. Emissions from this category are almost solely based on incineration of lignite coal in Kosovo power plant. In future should the Kosovo look for opportunities to reduce their emissions of GHGs, improvement of energy efficiency of this important installation is win-win strategy for both, of energy production and reduction of GHG emissions.

Transport sector GHG emissions are growing due to the increasing number of cars and also increasing fuel consumption. As the incomes of people increase and the road system becomes more developed this category will certainly grow in importance.

Fugitive emissions that are included in the category 1B come from exploration, exploitation and distribution of fuels. In case of Kosovo it is minor importance as the lignite that is mined in Kosovo is relatively young and does not contain much methane.

**Figure 3.: GHG emissions in energy sector**

Energy sector along with mining and agricultural sector have been traditionally basic pillars of Kosovo economy. Kosovo has significant potentials for electricity production. The lignite reserves of Kosovo with around 12.5 billion tons, of which 10.9 billion are exploitable, are considered to belong to largest lignite reserves in Europe. Nevertheless, Kosovo is facing serious problems in meeting electricity demand for entire last decade even though since 1999 some improvements have been noted. Electricity is mostly generated from Thermal Power Plants (TPP) 'Kosova A' and 'Kosova B', while a smaller amount is generated from hydropower plants (Ujmani, Lumbardhi, Radaci, Dikanci and Burimi), (Table. 1&2).

**Table 1.: Thermal capacities of generation units in Kosovo<sup>27</sup>**

TPP Unit	TPP Unit capacity (MW)			Year of commissioning (age)
	Installed	Net	Available	
TPP Kosova A				
Unit A1	65	Not operational	0	1962 (51)
Unit A2	125	Not operational	0	1964 (49)
Unit A3	200	182	100-130	1970 (43)
Unit A4	200	182	100-130	1971 (42)
Unit A5	210	187	100-135	1975 (38)
TPP Kosova B				
Unit B1	339	310	180-260	1983 (30)
Unit B2	339	310	180-260	1984 (29)
Total TPPs A+ B	1478	1171		

**Table2.: Hydro capacities of existing HPP units in Kosovo<sup>28</sup>**

Generation units	Unit capacity (MW)		Commissioning (reconstruction)
	Installed	Net	
HPP Ujmani	35.00	32.00	1983
HPP Lumbardhi	8.08	8.00	1957 (2006)
HPP Dikanci	1.00	0.94	1957 (2010)
HPP Radaci	0.90	0.84	1934 (2010)
HPP Burimi	0.86	0.80	1948 (2011)
Total HPPs	45.84	42.58	

In 2012, gross electricity generation from existing thermal power plants was 5,383.975<sup>29</sup> GWh, while electricity generated in hydro power plants amounted to 95.579<sup>30</sup> GWh. The demand on electricity is at least 10% higher than generated electricity and in the last years the average

27 Source: Annual Report 2011, ERO

28 Source: Annual Report 2011, ERO

29 Source: draft realized electricity balance in 2012.

30 Source: draft realized electricity balance in 2012.

relative annual growth of electricity consumption in Kosovo has been at around 6-7%. According to base scenario (Tab. 3) in 2022 electricity demand will increase to 23,4% compared with 2012.

**Table3.: Base Scenario, gross electricity demand, by category of consumption (Energy balance 2012-2022).<sup>31</sup>**

<b>BASE SCENARIO OF ENERGY DEMAND [GWh]</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Household consumers	2.536	2.643	2.706	2.790	2.852	2954	3.053	3.129	32.63	3.355	3.477	3.571	3.676	3.769
Comercial consumers	701	745	798	789	807	837	873	899	942	972	1012	1042	1084	1123
Total industrial consumers	1.210	1.296	1.322	1.237	1.265	1.312	1.370	1.410	1.477	1.525	1.586	1.634	1.699	1.761
Losses in KOSTT	175	131	115	128	126	129	132	133	136	138	140	142	144	146
Technical losses in OSSH	799	780	785	797	770	734	749	741	734	726	719	712	705	698
Gross Electricity Consumption of Kosovo	5.421	5.594	5.725	5.742	5.820	5.966	6.176	6.312	6.551	6.716	6.934	7.100	7.307	7.496

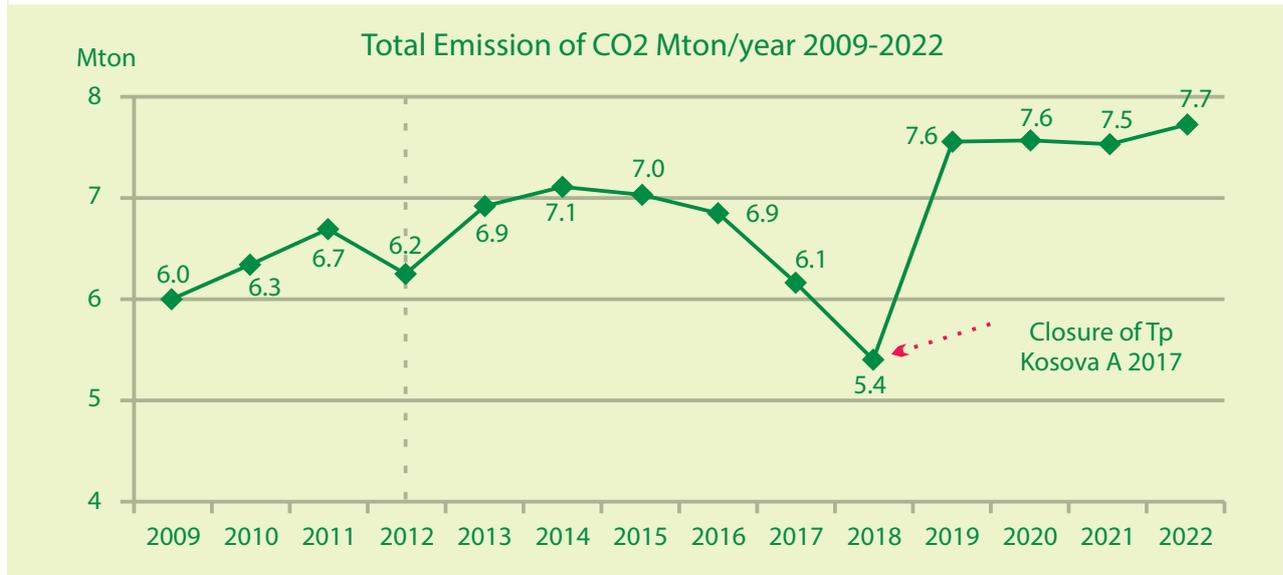
The poor quality or electricity supply with power cuts has been considered as one of major obstacles preventing economic growth of the country over the past decade. The lack of the electricity is seen as one of reason to bypassing the foreign investments towards other countries of region and makes the local companies to operate under very difficult circumstances and very often on the limit of economic feasibility.

Besides the generation of electricity, distribution and supply are also facing with technical problems and loss of electricity. In the recent years, significant investments were made in the distribution system and have influenced the diminishment of losses, from 42.80% in 2009 to 38.15% in 2011<sup>32</sup>. Even with these investments, the qualitative and safe supply of electricity to consumers is yet to be achieved.

In Kosovo, from the total amount of GHG (ca. 10,5 million ton CO<sub>2</sub> eq.) emitted by anthropogenic activities in 2009, electricity production from coal accounts for ca. 6.9 million ton of CO<sub>2</sub> eq. (not counting the gases released by self-combustion of coal in mines - the amount of which is not known). Forecasts of electricity production show that by 2022 the production of electric power from coal will increase to ca. 33% in comparison with 2012. Although after 2017 new TPP will start with higher efficiency, therefore, it is expected that CO<sub>2</sub> emissions will continue to increase (figure 4.).

31 [http://mzhe.rks-gov.net/repository/docs/Balanca\\_afatagjate\\_2013\\_-2022\\_-\\_eng\\_finall.pdf](http://mzhe.rks-gov.net/repository/docs/Balanca_afatagjate_2013_-2022_-_eng_finall.pdf)

32 Source, 2011 Annual Report, ERO

**Figure 4.: Past and expected emissions from Kosovo thermal power plants**

Considering all the circumstances that characterize the country, but on top of it the low level of economic, social and technological development, lack of electricity power, increasing electricity demand, reduction of emissions below current level for many years will be not realistic. What it seems realistic is through to achieve a deviation from the business as usual scenario (slow down growth of emissions) with various mitigation measures. More could be achieved with additional assistance by the international community.

Energy Strategy pays special attention to compliance with European Union Acquis, the provisions of which are compulsory for Kosovo, as it has taken over these responsibilities through its membership to the Energy Community Treaty. The Strategy aims to stimulate rational use of energy and increased energy efficiency as well as utilization of renewable energy resources and introduction of new technologies for implementing the environmental standards as set forth by law.

In the medium term, lignite will remain the main energy source for production of electricity in Kosovo. Lignite reserves in Kosovo are located in two large basins called 'Kosova' and 'Dukagjini'. Geological lignite reserves are assessed to amount to 12.5 billion tons (including all categories of reserves). Table 4 presents a summary on lignite reserves by location<sup>33</sup>.

**Table 4.: Lignite reserves by location**

Basin	Surface [km <sup>2</sup> ]	Reserves [Million Ton]			
		Explored		Exploitable	
		t	t <sub>ce</sub>	t	t <sub>ce</sub>
Kosova	274	10,091	2,957	8,772	2,521
Dukagjini	49	2,244.8	782	2,047.7	464
Other	5.1	106,6	22	73.2	19
Total		12,442.4	3,761	10,892.9	3,004

<sup>33</sup> Inkos Institute – "Study on assessment of explorations and geological lignite reserves in Kosovo", Kosovo Basin, Prishtina 2007, page. 81; and Dukagjini, Drenica and other basins, Prishtina 2007, page 56 and page 24.

District heating systems exist only in Prishtina, Gjakova and Mitrovica. These systems meet only 3% of heating demand. Existing heating technologies are based on residual fuel oil and diesel. This sector also is challenged by old technology, negative environmental impacts and a low level of billing and collection of the energy supplied. Need for developing the heating market was included in the results of the Heating Market Study (ELC, World Bank Study, 2007). Development of such market will be incentivized by the Government. The Law on Public Enterprises has placed these enterprises under municipal administration.

The Law on Energy, 2004/8, Article 10, provides the framework for the implementation of energy efficiency and renewable energy in Kosovo. In particular, paragraph (a) of Article 10 concerns the preparation of an implementation program to promote the efficient use of energy and renewable energy resources (wind, solar, small and big scale hydropower). The energy efficiency and demand side management measures are critical for reducing the high rate of annual energy demand growth, which is due mainly to use of electricity for heating purpose.

Future energy demand is assumed to be covered through both domestic generation and imports. In the next period, electricity will be provided from generation in Thermal Power Plants 'Kosova A' and 'Kosova B', and subsequently from the new thermal power plant 'Kosova e Re', the first unit of which is planned to be commissioned in 2018 and the second in 2019. Also, in a long-term perspective, it is envisaged that new renewable energy resources powered generation capacities will be developed (Table 5).

**Table 5.: Gross electricity generation base scenario including own consumption and net generation (Kosovo Long-term Energy Balance 2013 – 2022).**

GROSS ENERGY PRODUCTION CONSERVATIVE SCENARIO (MED) [GWh]	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
TP KOSOVA A	1.622	1.908	2.203	1.676	2.007	1.974	2.010	2.010	2.010	0	0	0	0	0
TP KOSOVA B	3.638	3.573	3.494	3.769	4.068	4.062	4.062	4.075	3.556	3.556	4.062	4.024	4.003	3.983
TP KOSOVA E RE	0	0	0	0	0	0	0	0	0	0	2.100	4.200	4.200	4.200
NEW TPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FROM THERMAL POWER PLANTS (1+2+3+4)	5.260	5.481	5.696	5.446	6.075	6.036	6.072	6.085	5.566	3.556	6.162	8.224	8.203	8.183
HP UJMANI	89	115	75	82	82	82	68	82	82	78	78	78	78	78
HP LUMBARDHI	33	36	22	27	27	26	27	26	27	27	27	27	27	27
HP DIKANCE + BURIMI + RADA VCI	0	14	14	23	23	23	23	23	23	23	23	23	23	23
HP ZHURI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SMAL LHP	0	0	0	0	0	0	139	178	181	332	351	429	468	472

TOTAL FROM HYDRO POWER PLANTS (6+7+8+9+10)	121	166	112	133	133	131	257	309	314	460	480	558	597	601
PLANTS FROM BIOMASS	0	0	0	0	0	0	0	0	0	11	17	19	23	28
WIND PLANTS	0	3	0	0	3	57	57	114	114	172	172	229	229	267
SOLAR PLANTS	0	0	0	0	0	0	0	0	2	2	2	3	3	0
Total from biomass, wind, solar (12+13+14)	0	3	0	0	3	57	57	114	116	185	191	251	254	296
TOTAL RENEWABLE (11+15)	33	53	37	51	53	106	246	341	348	568	593	731	773	818
TOTAL GROSS PRODUCTION (5+11+15)	5.381	5.650	5.808	5.578	6.210	6.224	6.386	6.508	5.996	4.201	6.833	9.033	9.055	9.079
TOTAL OF TPP OWN CONSUMPTION	579	603	611	592	478	638	643	645	591	363	624	831	830	828
TOTAL NET PRODUCTION (18-19)	4.802	5.047	5.197	4.986	5.732	5.586	5.743	5.863	5.406	3.838	6.209	8.201	8.225	8.251

Kosovo aims for EU integration as early as possible. In view of this, Kosovo is a signatory party to the Treaty for the establishment of the Energy Community (EnCT) of South-East Europe that entered into force in 1 July 2006. Within this context, the Government of Kosovo remains substantially committed to developing the energy sector in compliance with EnCT requirements. EnCT requires implementation of *Acquis Communautaire* of the EU from all contracting parties following a timetable which provides for implementation of required reforms. This will require also implementation of the objectives of the EU plan 20-20-20 for the energy sector requiring member countries that by 2020:

- Reduce GHG emissions by 20%,
- Increase renewable energy share of final energy consumption to 20%,and
- Improve energy efficiency by 20%.

For this purpose, the **National Energy Efficiency Action Plan (KEEP) 2010 -2018**<sup>34</sup> was adopted in 2011 and the **National Renewable Energy Action Plan (NREAP) 2011 – 2020**<sup>35</sup> was prepared in 2013. The two plans set the targets for Kosovo in terms of energy efficiency and share of renewable energy sources by 2020:

- **Improve energy efficiency by 9 %**
- **Increase the share of renewable energy sources to 25 % (aiming at 29,47%)**

Kosovo is committed to achieving these goals while also complying with all relevant EU energy and environment directives, norms and standards and with the provisions of the Energy Community Treaty.

34 <http://www.energy-community.org/pls/portal/docs/1280177.PDF>

35 <http://www.energy-community.org/pls/portal/docs/2570177.PDF>

### 3.2.5. Buildings

According to the WB National Buildings Energy efficiency study of 2013, the buildings sector account for 48% of energy consumption and represents the largest share of Kosovo's final energy consumption. Biomass (45%) and electricity (44%) were the main energy sources used by the Household Sector, while for the Services Sector electricity was the main energy source (52%), followed by petroleum products (38%).

The total floor area of the building stock of Kosovo is estimated to be 45 million m<sup>2</sup>. About a third of the entire building stock is accounted for by one storey residential buildings and the residential building sector itself has a total floor area of just below 35 million m<sup>2</sup>, followed by the private building category with almost 8 million m<sup>2</sup>, while public buildings have a total floor area of just over 2 million m<sup>2</sup>.

The overall savings potential of the building sector in Kosovo is almost 11% of primary energy supply and 20.07% of final energy consumption for 2010. Total energy savings for the whole building stock are almost 45% of the total combined energy consumption of the household and service sectors.

The market assessment carried out for this study identifies a significant level of potential energy savings that could be achieved in Kosovo by implementing energy efficiency measures in the country's building stock. Realizing the full energy saving potential based on cost effective measures would require a total cumulative investment of €1.367 billion and this would generate annual cost savings to investors and end-users of about €198 million, meaning that the savings would cover the cost of the measures within about 7 years.

The largest contribution to the energy saving potential comes from the residential sector (72%), followed by the private and commercial sector (20%). Although the total energy saving potential of municipal and central public buildings is low in comparison with the other two sectors (8%), public buildings at present provide the best opportunities for achieving real energy savings because in many cases they already meet the required comfort levels. This fact suggests that any energy efficiency program should begin with the implementation of measures in public buildings.

### 3.2.6. Minerals and Industry

Until the end of 80's, industry and mining were participating in gross domestic production with about 50%, and was mainly based on rich natural resources (coal, ores etc.). Kosovo is rich in zinc, lead, gold, cadmium and bismuth, bauxite, nickel, etc. There are different mines, while the lead and zinc reserves of Kosovo are estimated to be around 48 million tonnes, those of nickel to 16 million tonnes. Chrome reserves amount to 89 million tonnes and bauxite reserves to 13.2 million tonnes.

After the end of war in 1999, the major part of industrial and mining activities has been stopped (metal and non-metal ore mines and respective metallurgic complexes) due to the delays in process of privatisation of socially owned enterprises. Private sector of production activities has started to develop during the last decade, but without sound concept.

Due to the drastic reduction of production, level of pollution from the industry and mining has been reduced, but some of the environmental problems from the past are still present: incomplete and lack of implementation of legal framework, old technology and equipment, huge amounts of mining and metallurgy waste inherited from the past, private production sector, although in its development phase, it represents a source of environmental pollution.

In 2011, mining and quarrying represented 1,5 per cent of GDP, manufacturing 8,7 per cent and construction 7 per cent. At the same time other services represented 25 per cent, agriculture 13 and public administration (Including health and education) 16%. This means that the level of industrial activity in Kosovo is low and will probably increase in the future, also increasing the GHG emissions related to mining and industry.

### 3.2.7. Transport

Transport in Kosovo is mainly based on road transport. The road network has 7,200 km of asphalt and non-asphalt roads in with 240.000 vehicles. The main and regional roads are still in bad shape apart from the highway towards Albania.

After 1999, an enormous increase of vehicles occurred. Participation of public transport in general transportation is low. The largest numbers of vehicles in Kosovo are old, made in late 80's and 90's, which do not meet minimum technical requirements. Around 99% of vehicles uses diesel and gasoline as energy sources, while railway transport uses only diesel. Additionally vehicles use bad quality fuel and without catalyst. Therefore, they do present a source of air, water and soil pollution, and they do also cause a noise above the allowed limits. Environmental pollution from transport sector is caused also through uncontrolled used oil spilling and old vehicles.

Railway is not in full function after the war. Kosovo Railway network consists of 334,451 km for public transport and 103,4 km for industrial use. Railway transport uses diesel as source of energy.

The Kosovo Environment Strategy foresees the following actions to be taken in the field of transport:

- Reduction of GHG emissions from vehicles;
- Noise reduction from vehicles;
- Development of road infrastructure that will be more favorable for environment protection;
- Development of more efficient and ecologically cleaner forms of transport (public transport);
- Regional cooperation on transport.

The priorities identified in the transport sector are:

- Completion of legislation framework for environment protection resulting from transport and its harmonization with international and EU norms;
- Use of better quality fuel;
- Use of alternative transport that will cause less environmental pollution (railways, transport means that runs on electricity, etc.);
- Time limit for use of old vehicles and those without catalyst;
- Enforcement of allowed noise level norms from vehicles;
- Rehabilitation of existing road infrastructure to avoiding traffic jams;
- Solving of the problem of abandoned old vehicles.

### 3.2.8. Waste management

Based on the recent data the amount of domestic waste is about 1.2 kg/capita/day, and the total amount of generated waste (of municipal origin) in Kosovo for the year 2009 was around 400,000 tons. This is approx. 193 kg per person per year, compared to 522 kg per person in EU 27 in 2007.

The quantity of waste is increasing from year to year due to better collection and increasing consumer lifestyle.

Separate collection and recycling system for waste management is not yet introduced in Kosovo. Hazardous waste is mainly connected with large industrial complexes and main “hot spots” are: Trepca, KEK, Ferronikeli and Sharrcem.

The Kosovo Environment Strategy, in the chapter dealing with waste management, foresees following actions:

- Establishment appropriate legal framework and necessary technical infrastructure for waste management.
- Reduction of waste at the source before disposal and usage of waste for energetic purposes.
- Separation of waste at the source, reuse and/or recycling.
- Reduction of waste hazard.

The Priorities are listed as follows:

- Completing of legal norms for waste management based on EU Directives.
- Establishment of infrastructure for waste management.
- Establishment of central database and information on state of waste.
- Drafting of programs for waste management in harmony with spatial plans.
- Decommissioning and closing of old landfills.
- Use of existing industrial capacities for treatment of hazardous waste.

### 3.2.9. Agriculture

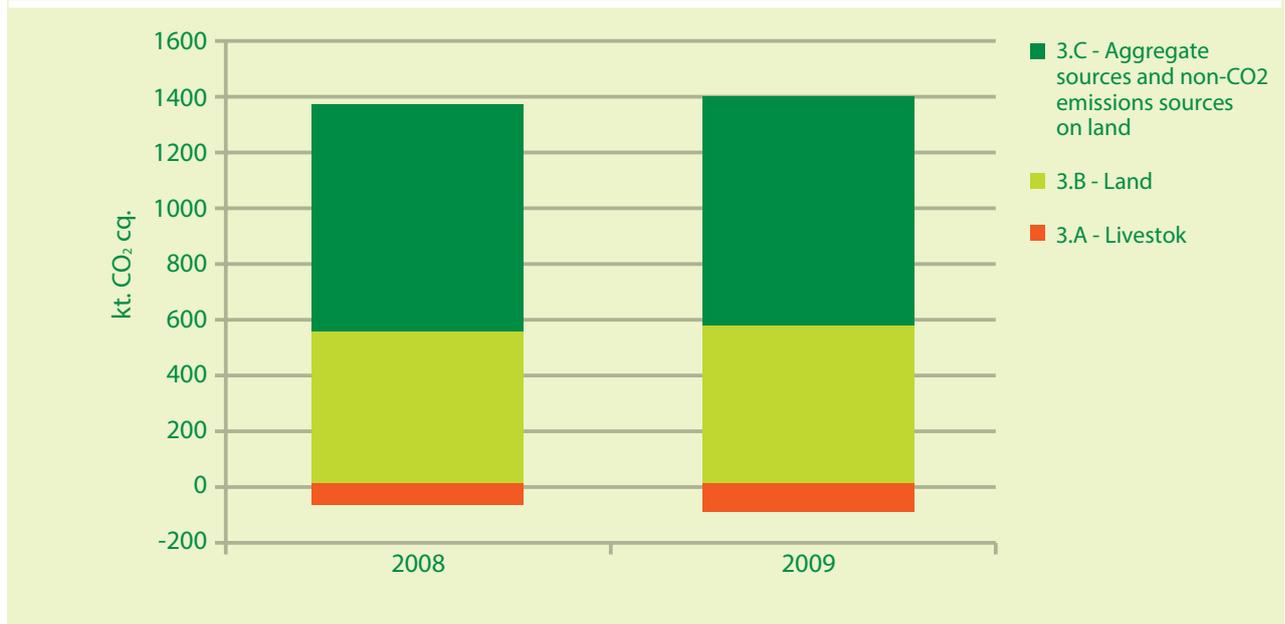
The agriculture in Kosovo remains underdeveloped with the low yields and productivity, as a result of small farm sizes, outdated farming practices, inadequate use of inputs and lack of access to technical expertise. Because of big pressure and demand for agricultural products i.e. food, agriculture even though small and underdeveloped at the moment, remains a sector with a potentially high impact on climate change.

Agriculture accounted for 25% of GDP in the 1980s and early 1990s, at present it reduced its share to about 14.1% of GDP. Agriculture accounts for around 35% of total employment. Agricultural sector also accounts for 16% of total export value and remains an important economic sector. In the other side, Kosovo still depends a lot on imported agricultural products, which accounted for 24.4% of overall imports.

Total area of agricultural land is assessed to be about 43,7% or (470,400 ha)<sup>36</sup>. Based on the latest information of the Agricultural Household Survey 2012 around 86% (404,544 ha) of this land is arable land and around 14% or (65,856 ha) is accounted as pasture.

Agricultural Sector, Forestry and Land Use is accounted for about 13% of total emissions of GHGs in Kosovo. This sector consists of three distinctive sub-sectors. The livestock, as first subsector, generates annually around 600 thousand tons of CO<sub>2</sub> eq. Land use subsector is dominated by forestry, which could be a powerful sink of atmospheric carbon. But in terms of carbon that annually flows through this sub-sector is the second largest sector in the country with about 2.750 thousand of tons of CO<sub>2</sub>. Good forest inventory and sustainable management of forests could contribute greatly to decreasing emissions. And the third sub-sector emissions of this category relate to manure management and fertilization of crops, which in total emits about 800 thousand tons of CO<sub>2</sub> eq.

<sup>36</sup> Inventarizimi nacional i pyjeve Kosove, 2012.

**Figure 5.: GHG emissions in agriculture, forestry and land use sector**

### 3.2.10. Forests and nature conservation

41% of Kosovo's land area is covered by forests or 47.4% (510,200 ha)<sup>37</sup>, of which 60% are state-owned forests (278,880 ha) and 40% are private forests (185,920 ha). The forest coverage in Kosovo is bigger than in neighboring countries (Albania 28%, Macedonia 39%, Montenegro 40%, and Serbia 31%); however, the quality and productivity of the existing forests is of high concern as a result of continuous degradation. In particular in steep, mountainous terrain there are alarming signals of desertification due to serious soil erosion. There are basically only 2 types of forests widespread in Kosovo:

- Broad-leaved forests, created through natural regeneration cover ca. 90% of the forest area. Dominating hardwood species are oak (*Quercus petraea*, *Q. cerris*, *Q. robur*) and beech (*Fagus silvatica*).
- Coniferous forests occur naturally, mainly at higher altitudes, and cultivated in form of forest plantations. Natural and planted coniferous forests cover ca. 5% of the total forest area. Important softwood species are: *Picea abies*, *Abies alba*, *Pinus sylvestris*, and *Pinus heldreichii*. *Pinus nigra* and *Pseudotsuga menziesii* are grown in plantations.

During the years 2003- 2004, a country-wide forest inventory was conducted; it is estimated that total standing volume on public forestlands is about 40.5 million m<sup>3</sup>.

**Table 6.: Strategic objectives in forestry sector**

Strategic objective	Aim
Forest management and silviculture	Seeding production, planting, thinning operations, road construction and maintenance
Forest planning	Forest inventories (strategic), management planning, annual planning
Harvesting & transport	Annual harvesting targets (public/private), sales of wood, control mechanisms

37 Inventarizimi nacional i pyjeve Kosove, 2012.

Capacity building	Education/training, research functions, awareness rising
Forest environment protection	Management restrictions, protected zones, biodiversity conservation, certification
Wood use	Optimal use of existing and future wood resources
Private sector development	Privatization issues, roles in admin/mgt of public forests, financing facilities
Non-wood products	Berries, herbs mushrooms fruits, medical plants, etc

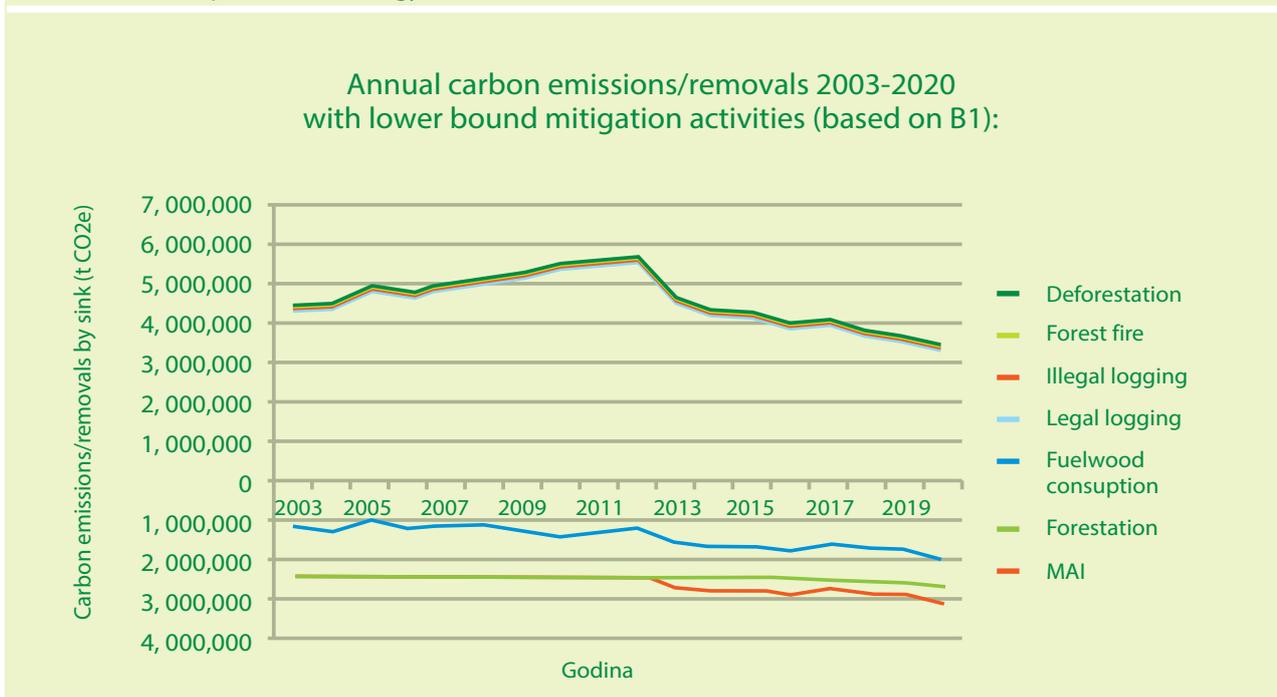
In 2012, the Climate protection strategy in the forest sector in Kosovo<sup>38</sup> was prepared under an EU twinning project between MAFRD/KFA and Austrian Federal Forests. In the Strategy deforestation and forest degradation agents have been identified. It confirms that the illegal logging of forests for commercial purposes to be among the most important drivers. It has also been cited that poor villagers living nearby forests cut wood for subsistence purposes.

The outbreak of forest fires takes place due to the careless burning of nearby harvested agricultural plots or grassland by farmers and pastoralists. The lack of awareness of the entire society also contributes to the outbreak of forest fires nearby camp grounds and picnic places.

Inadequate forest planning and implementation of management due to insufficient cooperation between Kosovo Forest Agency (KFA) and municipal authorities undermines needed investment in the forest sector. Two baselines for carbon emissions and two mitigation scenarios were considered and presented in the figures 6 and 7 below.

**Figure 6.: Estimated potential of a portfolio of mitigation activities across time (B1, lower bound)**

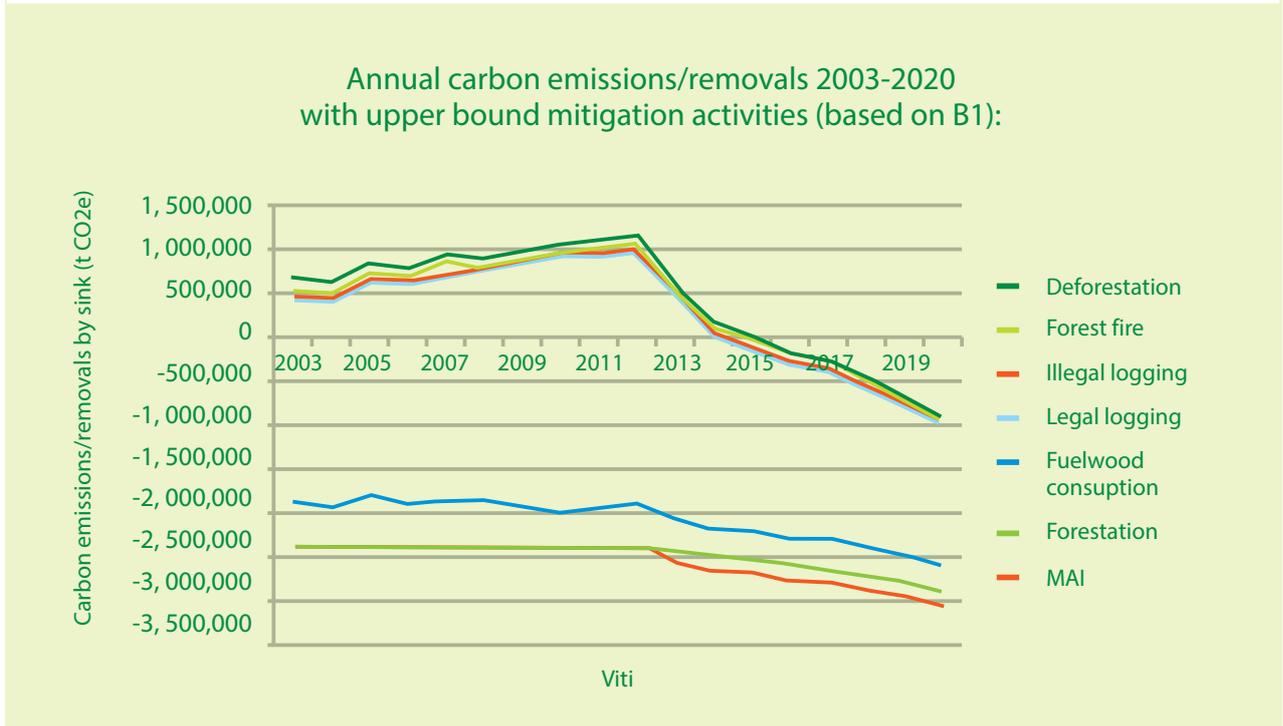
Source: Climate protection strategy in the forest sector in Kosovo



38 Krause, M.; Ruiz, P.; Horst, A.: Climate protection strategy in the forest sector in Kosovo. Final report. EU Twinning Project KS09IBEN02, „Further support to sustainable forestry management“. MAFRD/KFA and ÖBf-led international consortium. Prishtina, Kosovo.

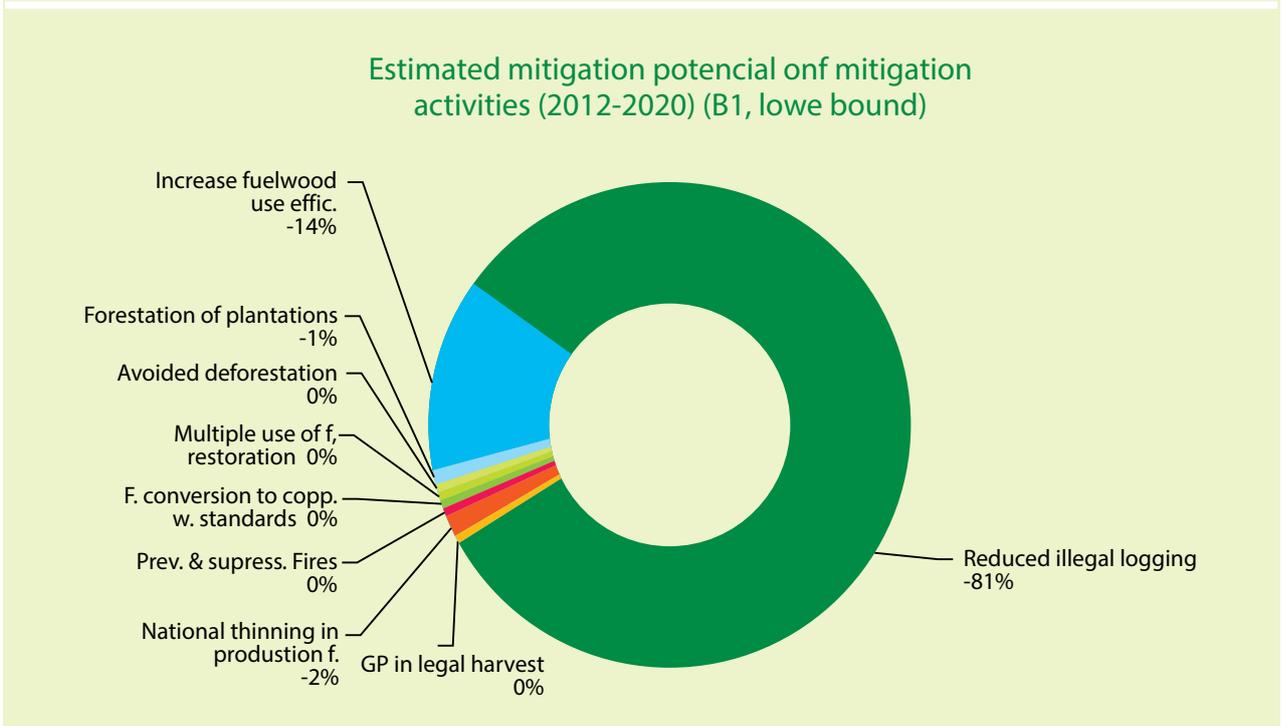
**Figure 7. Estimated potential of a portfolio of mitigation activities across time (B2, upper bound)**

Source: Climate protection strategy in the forest sector in Kosovo



In both scenarios the highest potential for emission reduction is in prevention of illegal logging as shown in fig.8 below.

**Figure 8. Estimated potential of a portfolio of mitigation activities (B1, lower bound)**



## 4. GOALS AND OBJECTIVES

Considering the large uncertainty regarding the current level and future projections of GHG emissions in Kosovo it is difficult to set a meaningful mitigation objective in terms of quantitative emission reduction targets. For the same reason, and for the reason of uncertainty of future social and economic development of the country, it is also difficult to set the objectives for long term (e. g. 2050 as in the EU Roadmap). Because of this the mitigation objectives are set in qualitative terms as follows:

- 1. Kosovo will develop the capacity to fulfil its future obligations under the UNFCCC and as a member of EU.**
- 2. Kosovo will slow the increase of GHG emissions through:**
  - **increased energy efficiency in all sectors,**
  - **development of renewable energy sources and**
  - **sustainable use of natural resources**

If supported with finance, technologies and capacity building for the Nationally Appropriate Mitigation Action (NAMAs) Kosovo can achieve more significant emission reductions. The objectives are coordinated with goals and objectives of the strategic documents and policy documents of Kosovo, such as the Kosovo Environmental Strategy and National Environmental Action Plan, Energy Strategy as well as strategies for the Agriculture and Forestry sector. Some of the NAMAs are already being implemented with the resources of Kosovo and with donor support, such as Kosovo Energy Efficiency Action Plan, Renewable Energy Action Plan and Forestry Climate Protection Strategy.

## 5. ALTERNATIVES CONSIDERED: POSSIBLE DEVELOPMENT SCENARIOS

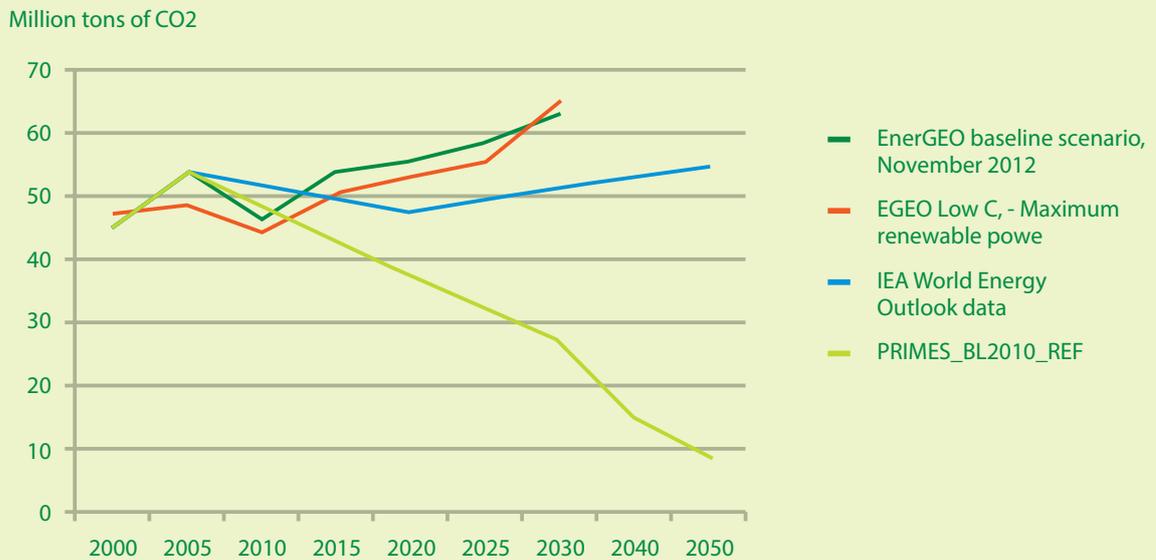
### 5.1. GLOBAL PREDICTION MODELS

The GAINS model, used by the European Commission in climate policy planning, and the *US based International Futures* considers Kosovo as part of a group of countries together with Serbia and Montenegro due to lack of separate historic statistical data. So only very general observations regarding scenarios for Kosovo are possible until separate datasets are developed and entered in these models for the country.

The GAINS model<sup>39</sup> is a set of models managed by the IIASA in Laxenburg, Austria on behalf of the EU. It includes various scenarios and data resulting from different EU research project. Below the projections from some of these scenarios are presented for the group of countries.

<sup>39</sup> <http://gains.iiasa.ac.at/gains/EUN/index.login?logout=1>

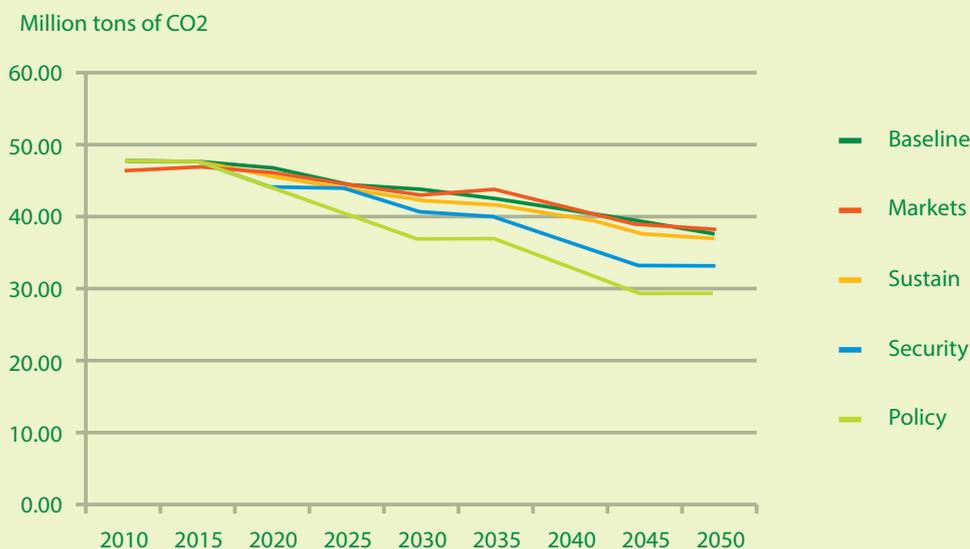
**Figure 9.:Past and future emissions under different scenarios of the GAINS model.**  
**Because not all scenarios are calculated for all years, some of the values are interpolated.**  
 Source: Gains Europe <http://gains.iiasa.ac.at/gains/emissions.EUN/index.menu?page=241>



The two EGEO Scenarios compare different low carbon policy options to the baseline scenarios. PRIMES 2010 is the main EU scenario and the IEA World Outlook scenario is using the International Energy Agency data instead of the EU base data. The different scenarios produce very different results and are only useful to demonstrate the choices available. Except the EGEO Renewable, they all predict a future increase of emissions in the region.

The International Futures is a global model and sometimes numbers for small countries are not very good. But it provides different scenarios in global context. The Figure below presents the predicted emissions for the group of countries until 2050. Different from GAINS, all scenarios under IFs predict a moderate drop in emissions in the future.

**Figure10: Predicted emissions under the baseline and 4 development scenarios developed by UNEP in 2007: Markets First, Security First, Policy First and Sustainability First. The International Futures (IFs) modeling system, version 6.69. IFs was initially developed by Barry B. Hughes and is based at the Frederick S. Pardee Center for International Futures, Josef Korbel School of International Studies, University of Denver, [www.ifs.du.edu](http://www.ifs.du.edu).**



GEO 4 development scenarios were developed by UNEP in 2007 and are presented below. ([http://www.unep.org/geo/geo4/media/fact\\_sheets/Fact\\_Sheet\\_17\\_The\\_Future.pdf](http://www.unep.org/geo/geo4/media/fact_sheets/Fact_Sheet_17_The_Future.pdf))

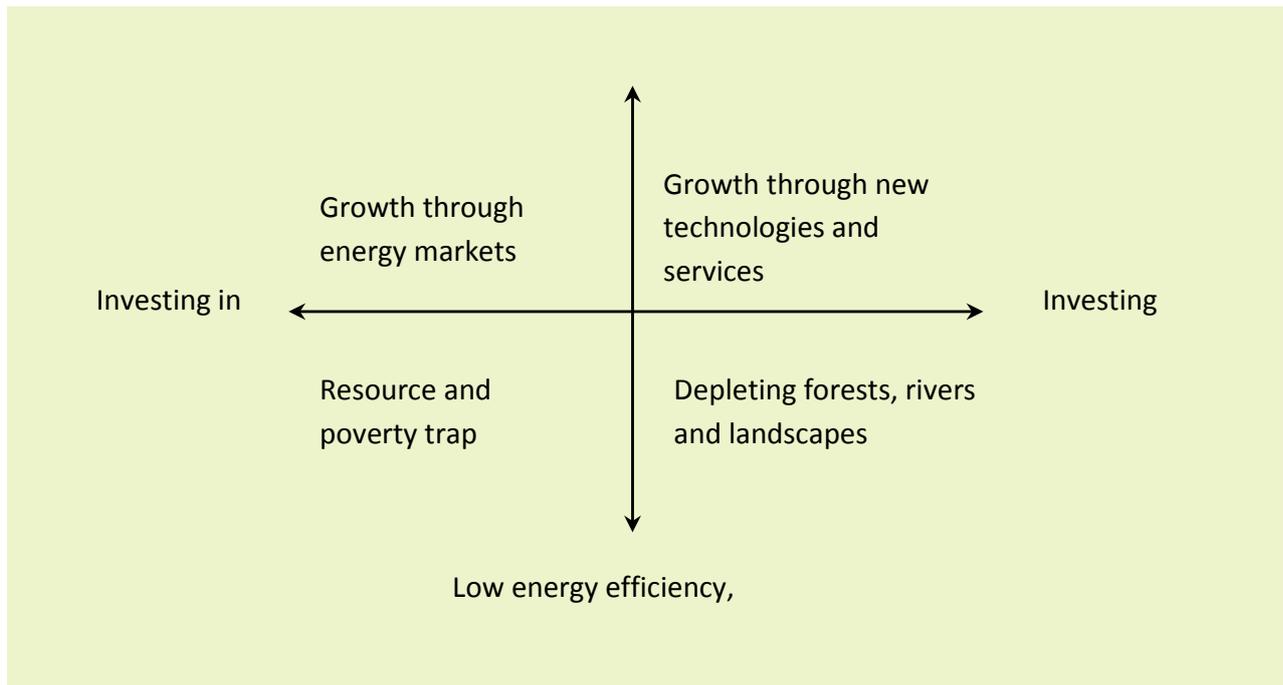
- **Markets First** pays lip service to sustainable development in terms of the ideals of the Brundtland Commission, Agenda 21 and other major policy decisions. There is a narrow focus on the sustainability of markets rather than in the context of the broader human-environment system.
- **Policy First** introduces some measures aimed at promoting sustainable development, but the tensions between environment and economic policies are biased towards social and economic considerations.
- **Security First** focuses on the interests of a minority: rich, national and regional. It emphasizes sustainable development only in the context of maximizing access to and use of the environment by the powerful.
- **Sustainability First** gives equal weight to environmental and socio-economic policies, accountability, and it stresses transparency and legitimacy across all actors. It emphasizes the development of effective public-private sector partnerships not only in the context of projects but in the area of governance, ensuring that stakeholders across the environment-development discourse spectrum provide strategic input to policy making and implementation.

Should Kosovo sign UN Framework Convention on Climate Change and its Kyoto Protocol it will be obliged to annually monitor their GHG emissions. Initially Kosovo probably will not be part of the Annex I countries but will become part of the group of so called non-Annex I parties. Reporting system for non-Annex I Parties under UNFCCC is through National Communications with a flexible multiannual timetable, reporting on GHG inventories and other information. Annual monitoring, reporting and review of greenhouse gas emissions and removals are one of the key obligations for Annex I Parties under the Convention and its Kyoto Protocol (decisions 18/CP.8, 19/CP.8 and 14/CP.11). Kosovo may actually need to start annual reporting even before becoming Annex I party as part of reporting obligations towards European Environment Agency (EEA).

Based on the existing information and scenarios it is not possible to set quantitative targets for the future emissions of Kosovo.

But it seems that there are two main axes along which the possible scenarios for the present LEDC could be developed. First axis is related to energy efficiency and sustainability and the second to investment in electricity generation – coal or the renewables. The possible scenarios are presented in Figure 11 below.

Figure 11: Possible LEDC scenarios



**The description of these scenarios is as follows:**

- **Resource and poverty trap:** Kosovo continues to depend heavily on coal for its electricity production as well as heating of buildings. Modern thermal power-plants are built with higher efficiency and lower emissions, but the energy demand and energy prices grow. Households and industry, who cannot afford investments in energy efficiency, pay higher and higher cost of energy, especially after the energy sector enters EU ETS and has to pay for the emission quotas.
- **Depleting forests, rivers and landscapes:** Kosovo will create environment for foreign investors. Potential is in hydropower large and small scale wind energy and solar power. At the same time coal mining areas are in decline and require additional government support for restructuring. Due to low energy efficiency the energy demand grows faster than the supply of energy, leading to over exploitation of natural resources such as forests, rivers, landscape and biodiversity in general. This causes additional problem with adaptation to climate change, reduces quality of life and tourism potential of the country.
- **Growth through energy markets:** Kosovo attracts investment in its coal power sector with imported technology, significantly improving its efficiency and reducing specific emissions. The life span of coal mines is extended for another generation, making it possible to gradually restructure their economy at low cost. At the same time energy efficiency measures in households and industry keep the energy demand below the supply and energy costs within reason. Kosovo exports electricity to other EU countries and can thus afford the necessary emission quotas under the EU ETS.
- **Growth through new technologies and services:** An energy sector transformation is achieved combining investment into renewable energy and energy efficiency. This generates new business opportunities and workplaces replacing the lost workplaces in the coal mining regions. High technology manufacturing, service and financing businesses emerge that increase the exports of industrial products and services. Energy demand and energy prices are stable; households and industry are not exposed to increasing price of carbon or the volatility of global energy markets.

Obviously the first two scenarios should be avoided if at all possible, while a genuine choice exists regarding the future investment in the electricity generation. If Kosovo decides to invest in the next generation of coal fired power plants, it should do this before entering the EU. In doing this it can count on the interest of investors due to high demand for electricity in the Mediterranean region of the EU. But Kosovo can probably attract similar investment in its renewable potential. Here biomass, hydropower (small and large scale) and wind are already commercially viable and photovoltaics should be competitive without public subsidies before 2020.

Regardless of the choice made on the energy supply side, investment is very justified on the demand side – in energy efficiency and sustainable transport. Here the cost effective potential and co-benefits in terms of poverty reduction and generating economic growth are significant.

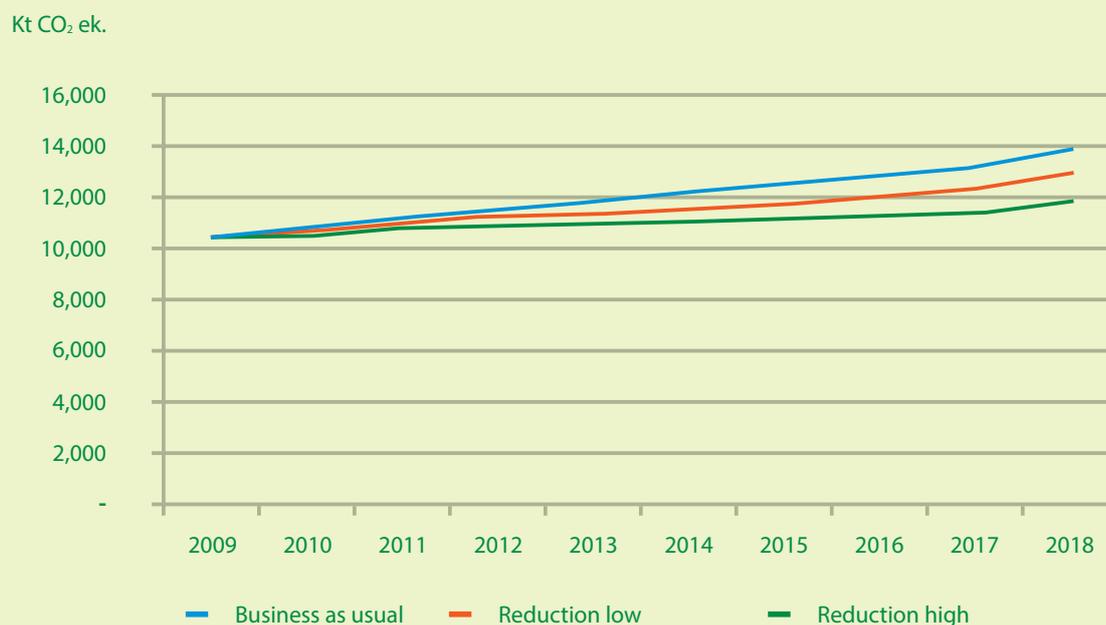
The proposed mitigation goals of the Strategy accommodate both possible scenarios in terms of sources of energy while clearly setting energy efficiency as a key priority.

## 6. RECOMMENDED GHG REDUCTION MEASURES

The table 7 shows the planned GHG emission reduction measures by sectors in sequence of their priority and are described in more detail in the Annex 2. However, due to insufficient level of information about present emissions, it is difficult to assess the mitigation impact of the individual actions.

If the GHG emissions are extrapolated in correlation with the predicted energy demand in the Energy Efficiency Action Plan (assuming other emissions remain constant) and compare them with the impact of these measures, it is expected to achieve a reduction of GHG's from 7 to 14 % compared to the business as usual scenario in 2018 (figure 12). This gives a first approximation of what an emission target could look like when the emission inventory and projections are fully developed.

**Figure 12. Possible emission reduction based on proposed mitigation measures compared to rough estimate of the business as usual scenario. Low estimate of emission reduction is 1 Mt CO<sub>2</sub> eq. per annum in 2018 and high estimate is 2 Mt CO<sub>2</sub> eq.**



**Table 7. GHG emission reduction measures by sectors and sub-sectors (NAMAs)**

Sector or sub-sector	Possible measures
<b>Capacity building</b>	<b>Setting up National Inventory System of and strengthening reporting on GHG (KEPA)</b>
	National climate change policy developed and implemented for all GHG's contributing sectors.
	Training on negotiations under UNFCCC and EU respectively
<b>Energy efficiency</b>	<b>Implementing Kosovo Energy Efficiency Action Plan 2010-2018</b>
	Introducing energy efficiency standards
	Promotion and awareness raising
	Energy auditing system
	Establishing subsidy/lending schemes for energy efficiency measures
<b>Renewable energy</b>	Implementing National Renewable Energy Action Plan (NREAP) 2011 - 2020
	Developing the available hydro-power potential through concessions
	Developing the available wind potential through concessions
	Securing reliable supply of fuel wood and biomass for heating
	Promoting use of biomass for district heating and industrial co-generation
	Setting favourable regulatory conditions for photovoltaic electricity generation (without subsidies)
	Shallow geothermal for heating
	Biogas production from animal husbandry waste
<b>District heating and industrial co-generation</b>	Reconstruction and extension of district heating networks
	Introducing renewable energy and high energy efficiency (combined heat and power) energy generation
	Co-generation on industrial sites for both district heating and industrial needs
<b>Thermal power plants and coal mines</b>	Improving efficiency of existing TPPs
	<b>Increasing the efficiency of production of electricity through replacement of TPP Kosovo A with Kosova e Re Power Plant</b>
	Preventing self-combustion of lignite

<b>Transport</b>	<b>Sustainable mobility concepts in the cities and towns of Kosovo</b>
	Promoting public road transport (bus)
	Reconstruction of railways, including securing quality passenger service
	Precedence of walking and cycling before cars in urban development
	Tax incentives discouraging old, polluting, inefficient cars
	Developing settlements, road network and inter-modality facilitating public transport
<b>Waste management</b>	Separate waste collection and recycling
	<b>Using non-hazardous solid waste (domestic waste, tires, etc.) as alternative fuel in industrial production</b>
	Home composting
<b>Agriculture</b>	<b>Manure storage, preparation and application methods</b>
	Proper application of mineral and organic fertilizers
	Organic production
<b>Forests and nature</b>	<b>Implementing Climate Protection Strategy in the Forest Sector in Kosovo</b>
	Sustainable forest management increasing resilience of forests
	Protection from forest fires
	Afforestation and reforestation of bare lands
	Promotion of wood products
	Integrating carbon sequestration into forest management
Parts of forests and protected areas left to natural development	
	Designation and development of protected areas

## 7. NEXT STEPS FOR IMPLEMENTING THE LOW-EMISSION COMPONENT

### 7.1. INSTITUTIONAL DEVELOPMENT

From the review of the existing strategies it appears that the key obstacle is effective implementation and enforcement. This means that first priority will be the actions on capacity building. Other actions will be designed so that they involve private sector, public private partnerships, local communities and NGOs. It also seems that very little funding from domestic public sources will be available in the foreseeable future. This means that the financing of actions will have to be based mainly on private sector (population, companies, banks), "classical" donors and EU funds as they develop in the process of accession.

### 7.2. DEVELOPMENT AND IMPLEMENTATION OF NAMAS

Some of the NAMAs such as in the energy and forestry sector are already under way. Others still need to be prepared and implemented. Based on the list of NAMAs and their short descriptions, the details of the NAMAs will be prepared in 2014 in cooperation between the MESP, UNDP and other relevant authorities and interested donors. During the preparation of each NAMA, budget and institutional responsibilities will be determined to secure realistic planning and their eventual implementation.

### 7.3. MONITORING AND ASSESSMENT OF STRATEGY IMPLEMENTATION

Monitoring of the implementation of the low emission development component is an important means of tracking the progress of Kosovo towards the goals and the objectives of the strategy. At present a major weakness of Kosovo is reliable information on GHG emissions. Establishing a working system of monitoring emissions and mitigation actions, as well as of evaluating and adjusting the Strategy should be one of the first priorities of the Strategy if Kosovo wants to attract any funding for the mitigation measures. The first steps are being made through the foreign partners' studies, but the capacity building effort in this respect will have to continue.

A reliable system of monitoring and evaluation is also an important compliance mechanism internationally which can facilitate recognition of the actions implemented by the Kosovo.

Despite the lack of definitive requirements and procedures towards estimation of greenhouse gases in developing countries, the general direction and the intention of the strategy will be clearly set out.

As a signatory of the Energy Community Treaty, Kosovo will be required to submit biennial reports, containing updates about their national greenhouse gas emissions, including the greenhouse gas inventories and the national inventory report, information on mitigation actions, needs for support and support received.

The steps that could be taken towards the implementation of an effective monitoring and evaluation system may include:

- Establish, update and maintain GHG inventory system;
- Securing capacities at the national and local level with regards to compiling statistical information related to the greenhouse gas activity data, specific performance indicators of mitigation actions and policies,
- Taking actions to identify and implement a system of specific indicators for the measurement of progress in implementation of various sectoral mitigation measures identified in the low emission development strategy with the view of analysing their current performance and identifying opportunities for their further enhancement in the future,
- Developing Kosovo specific approaches and methods of evaluation, emission factors and benchmarks for emission reduction estimation that would be suitable for the local conditions,
- Enhancing strategic planning and performance assessment capacities at the national and local level for measurement and analysis of the effectiveness of mitigation measures.

Furthermore, the authorities, industries, businesses, organizations, agencies and bodies of local public administration should be encouraged to maintain annual accounting of the funds spent on the implementation of the low emission development strategy and measures supporting it, to enable evaluation of its technical and economic effectiveness, as well as for correct reporting to the international community.

### 7.4. REVISION OF THE STRATEGY

Once the GHG inventory system is fully operational and adequate future emission projections are developed, the Strategy should be revised accordingly. The detailed plans and interim results of individual NAMAs should be taken into account in order to set a realistic quantitative emission reduction objective for 2020 and possibly an indicative objective for 2030. Other elements of the Strategy should also be reviewed and revised in accordance to the developments in the intervening period.

COMPONENT II

ADAPTATION  
COMPONENT (NAC)

# 1. INTRODUCTION

## 1.1. NAC IN RELATION TO GOVERNMENT PRIORITIES

The National Adaptation Component relates to different (sectoral) strategies and action plans in Kosovo. An overview of these sectoral strategies is provided below (for more details see Annex 5).

Furthermore, the NAC provides an important reference point for the Disaster Risk Reduction (DRR)-strategy, currently being developed by the Ministry of Internal Affairs (MIA) and the Emergency Management Agency (EMA).

*Legislation related to climate change adaptation  
Sectoral strategy/plan/law*

*Spatial Plan of Kosovo 2010 - 2020 (MESP)*

*Agriculture and Rural Development Plan, 2009 -13 (MAFRD)*

*Strategy for Forest Development 2010 - 2020*

*Strategy and Action Plan for Biodiversity 2011 - 2020*

*Mining Strategy of the Republic of Kosovo 2012 – 2025*

*Heating Strategy of the Republic of Kosovo 2011 – 2018*

*Environmental Strategy (ES) 2013-2022*

*Strategy on Air Quality 2013-2022*

*Energy Strategy of the Republic of Kosovo 2009-2018*

*Kosovo Strategy for Management of Waste 2013-2022*

*Law No. 04/L-147 on Waters of Kosovo*

*Law on Hydro-meteorological Tasks No. 02 /L-79*

*Law on Public Health No. 02/L-78*

*Law on providers of waste, water, and sewage services No. 03/L-086*

*Law on Irrigation of Agricultural Land No. 02/L-9*

*Law on Local Self Governance No. 03/L-040*

*Law of Nature Protection No.03/L –233*

*Law on Environmental Impact Assessment No. 03/L-214*

*Law on Environmental Protection No. 03/L-025*

*Law on Waste No.04/L-060*

*Law on Spatial Planning No 04 - L - 174*

*Law No. 04/L-027, Law for protection against natural and other disasters*

*Law No. 03/L-230 on Strategic Environment Assessment*

*Law No. 2004/30 on Air Protection*

*Law No. 2003/3 on Kosovo Forests*

*Law No. 03/L-184 on Energy*

## 1.2. THE RATIONALE FOR INITIATING THE DEVELOPMENT OF NAC

The preparation of the Climate Change Strategy is among the priorities in the National Environmental Strategy and National Environmental Action Plan for the period 2013-2022 and also identified as priority for Kosovo's EU approximation process. The National Adaptation Component (NAC) is an initiative of MESP, supported by UNDP. The NAC was developed in coordination with the Low Emission Development Component (LEDC), and together they form the Climate Change Strategy for Kosovo.

## 2. METHODOLOGY

### 2.1. INTRODUCTION

The strategy development is based on planning process including national and local stakeholders. For this purpose an Inter-Ministerial Working Group (IMWG) has been established by the Ministry of Environment and Spatial Planning (MESP).

An important function of the planning process was to integrate different interests into one single Nation Adaptation Component, being streamlined with the Low Emission Development Component (LEDC), which has been developed parallel to the NAC development, both under auspices of the Ministry of Environment and Spatial Planning (MESP). The NAC and LEDC together form a Climate Change Strategy for Kosovo.

### 2.2. LIST OF MINISTRIES AND INSTITUTIONS INVOLVED IN THE STRATEGY DEVELOPMENT

The following ministries and institutions have been involved during the process of strategy development as members of the Inter-Ministerial Working Group:

- Ministry of Environment and Spatial Planning (MESP)
  - Department for environment protection
    - Division for nature protection
    - Division for waste management
  - Water department
  - Department of inspectorate
  - Kosovo environment protection agency
  - Hydro-meteorological institute of Kosovo
- Ministry of Agriculture, Forestry and Rural Development (MAFRD)
- Ministry of Economic Development (MED)
- Ministry of European Integration (MEI)
- Ministry of Infrastructure (MI)
- Ministry of Trade and Industry (MTI)
- Ministry of Internal Affairs (MIA)

#### 2.2.1. List of stakeholders involved in strategy development

This section provides an overview of stakeholders which have been consulted during the process of strategy development, either by their participation in the roundtable meetings, by means of bilateral interviews or by means of the questionnaire survey at the local level.

- UNDP Kosovo and UNDP RBEC,
- European Commission Liaison Office to Kosovo
- Inter-Ministerial Water Council Secretariat, Office of the Prime Minister
- FAO team Kosovo
- Regional Environmental Centre (REC), Kosovo

- Emergency Management Agency (EMA), Kosovo
- World Health Organization (WHO) Kosovo
- Technical Assistance and Information Exchange Instrument managed by the Directorate-General Enlargement of the European Commission
- Climate Change Adaptation Program in Western Balkans/ GiZ

### 2.2.2. Local questionnaire survey

Questionnaire for adaptation measures in Kosovo which helped for assessing the current state of affairs on dealing with climate-related threats in Kosovo was prepared and disseminated to local and national level, including the Inter- Ministerial working group for the NAC.

The questionnaire served as an instrument for the first participatory assessment of current and possible adaptation measures in Kosovo. Based on the results of 15 questionnaires at the local level and voting rounds by 12 members of the Interministerial Working Group (IMWG) at the national level, a list with total of 74 possible adaptation measures with high or medium priority was presented (see chapter 5). Potential adaptation measures with low priority have not been included.

For identifying best practices and/or lessons learned the adaptation measures highlight municipalities where scores for implementation and/or planning are significantly higher than in other municipalities. Hence, since implementation or planning has occurred or is ongoing in these places they require specific attention to see whether obstacles and opportunities for adaptation, lessons learned or best practices can be identified and possibly up-scaled. A second selection took place in September 2013 based on multi-criteria analysis (MCA).

## 3. BACKGROUND

### 3.1. PROBLEM DESCRIPTION

There are multiple lines of evidence that climate change is happening now, and the impacts are being seen now (Intergovernmental Panel on Climate Change (IPCC), 2007, 2013; World Water Development Report, 2009; Human Impact Report, 2009; International Association of Research Universities (IARU), 2009; WHO, WMO, 2012). Even worse, recent observations show that greenhouse gas emissions and many aspects of the climate are changing near the upper limit of the IPCC range of projections (IARU, 2009). Climate change is happening more rapidly than anyone thought (Human Impact Report, 2009; IARU, 2009). Many key climate indicators are already moving beyond the patterns of natural variability within which contemporary society and economy have developed and thrived. These indicators include global mean surface temperature, sea-level rise, global ocean temperature, Arctic sea ice extent, ocean acidification, and extreme climatic events (IARU, 2009).

Climate change can directly affect the hydrological cycle and, through it, the quantity and quality of water resources. An increase in the surface temperature of water, and changes in the hydrological cycle could result in changing rainfall patterns over the region. Some areas may experience intense rainfall resulting in heavy floods, while other areas may witness less rainfall, and also frequent droughts (IPCC, 2013; IARU, 2009; World Water Development Report, 2009). Climatic changes can lower minimum flows in rivers, affecting water availability and quality for its flora and fauna and for drinking water intake, energy production (hydropower), thermal plant cooling.

Besides environmental and economic damage, the ultimate impact of climate change is a toll on our most precious resource - human lives and health. Health impacts are among the most significant damages from climate change – and health can be a driving force for public engagement in climate solutions.

Hence, Kosovo needs to be planning to adapt to the challenges and opportunities that a changing climate will bring. Institutions responsible for management of water resources, agriculture, forestry, industry, public health, land use planning and environment related issues are under pressure to respond to the unprecedented impacts of climate change such as larger floods, more severe droughts, ecosystem degradation and reduction of ecosystem services, water supply shortages, increase and new forms of pollution and water related diseases.

If one takes into consideration that under present conditions climate variability is already important to successful management of water in many parts of the world in that it drives processes of local, national and regional adaptation (Palmer et al., 2008; Hallegatte, 2009), then climate change adds to the existing complexities of achieving just socio-economic development which involves multiple uses of water among growing numbers of users in ways that are both fair and sustainable (Lebel, 2007, 2009). Pro-active integration of climate change adaptation, disaster risk reduction, and sustainable development strategies is often needed. However, we know, as yet, little about the 'politics' of how strategies actually work, e.g. in regard to trust building, conflict resolution and the way in which different interests are weighed against each other.

Often, technical measures are not sufficient anymore, and public authorities, non-governmental organizations and private companies are looking for other solutions to ensure that the vulnerable water resources are managed in a sustainable manner. However, current institutional arrangements are often insufficient to manage these new challenges adequately and innovative and adaptive ways for the governance of climate adaptation are required.

Within this context, Kosovo is faced with great challenges to make its public governance system more resilient and flexible, for instance related to: 1) decentralization; 2) participative processes in decision-making; 3) dealing with uncertainties in decision-making, in particular related to the unpredictable future of climate change, for example by means of long term scenario analyses, risk assessments and vulnerability assessments; 4) involving the private sector in natural resources management, for instance through public-private partnerships; 5) introduction of integrated approaches and adaptive management concepts; 6) reorganizing and strengthening of central authorities; 7) introduction of pricing, cost recovery and incentive mechanisms; 8) implementation of anti-corruption measures.

### 3.2. CLIMATE CHANGE IMPACTS IN KOSOVO

A Climate Change Adaptation Strategy is crucial for responding and anticipating the impacts of climate change in Kosovo. These current and expected impacts include (Sources: IPCC, 2007, 2013, UN-Habitat 2009, OSCE 2008, UNDP/WMO 2009):

- Climate change will increase exposure to hazards such as droughts, floods, and forest fires;
- Rising intensity and frequency of precipitation extremes like heavy rain events, as well as more severe drought. Flash floods are getting more common in mountain areas, while river floods occur more often in plains and lowlands;
- Higher temperatures will make heat waves and forest fires more likely. Since 2000 there have been an increasing number of forest fires in Kosovo;
- Ecosystem degradation and reduction of ecosystem services;

Furthermore, it is important to take into account that climatic hazards have a much greater impact than should normally be the case in country such as Kosovo, owing to a high degree of vulnerability. This is the result of a variety of factors, including (source: UN-Habitat 2009, OSCE 2008, UNDP/WMO 2009):

- Unprecedented construction boom and urbanization since 1999;
- High socio-economic vulnerability due to a high incidence of poverty (among 45% of the population) and a fragile economy, combined with limited provision in the health, social welfare and employment sectors;
- Illegal construction in hazard zones and failure to adhere to building codes;
- Inadequate design of drainage and sewage systems;
- Inadequate land use and municipal planning increase population exposure to hazards;
- Unsustainable water management and agronomic practices, deforestation, and destruction of slopes by mining activities.

The following subsections provide a more detailed problem definition for different sectors especially vulnerable for climate change impacts.

### 3.2.1 Water resources

Kosovo has relatively small and limited amounts of fresh water resources. Fresh water resource shortages are most likely to occur in near future dry years if appropriate adaptive actions are not implemented right now.

Furthermore, available water resources are unevenly distributed throughout the territory, divided into four river basins / watersheds: Drini i Bardhë, Ibër, Morava e Binçës and Lepenci. The average annual renewable water supply per person in Kosovo is about 1'980 m<sup>3</sup>/person/year, and is classified as no stress (Falkenmark indicator), which is significantly low compared to the world average of 7'243 m<sup>3</sup> (CEDARE AWC, 2006). Because the water availability differs from one river basin to other, there is a need to conduct research to explore the possibilities and potentials for additional water storage reservoirs within river basins. Development of environment impact assessment, feasibility studies analysing viability of water transfer options, shall precede the final establishment of appropriate infrastructure to transport water from one to the other river basin.

The western and southern parts of Kosovo, known as Dukagjini Plain, are richer in surface and groundwater resources. The northern and eastern parts of Kosovo, known as Kosovo Plain, have less water resources available. Yet, this area has the largest concentration of population and the most hot spots sites that causes extreme water pollution.

Main user categories of fresh water resources are: Drinking Water Supply for households, Water Supply for Industry and Energy (for hydro-power and for cooling power plants) and for Irrigation purposes. Based on the Annual Performance Report of Water Service Providers in Kosovo for the year 2012, the water industry in Kosovo is still weak; showing deficiencies in most of performance indicators such as service coverage, which is at the level of 78%.

River water quality in Kosovo is poor owing to the lack of wastewater treatment plants, disposal of wastes along / or near the river banks, poor or no maintenance of river beds. Usually the quality of rivers upstream represents a healthy aquatic habitat and meets the environmental standards. Some of the main rivers downstream of larger municipalities and industries are heavily polluted that the water cannot be used for water supply or for irrigation purposes. The main rivers in Kosovo belong to the pollution category 2 and 3.

The impact of climate change may further aggravate the quality of water courses, in particular during summer months when it is expected the variation in the precipitation pattern that will be reflected in lower river stream and by the increase of temperatures, while the sources of contamination remain constant. Pollution of surface and groundwater resources would have serious effect on people's health, it may hamper economic growth and can impact food sufficiency and security.

Most of rural and urban population not having the sewage network are using septic tanks or discharge, on the individual base, the waste waters to nearby rivers or creeks. Lack of sewage network and lack of adequate treatment of waste waters is increasing additionally the stress on fresh water resources. Sewerage network, in overall, is assessed to be in a very poor condition. Except the municipality of Skenderaj that has wastewater treatment plant, other urban centres and rural villages in Kosovo do not have yet wastewater treatment. As of 2013, works have started for Prizren WWTP. Also feasibility studies have been completed for Prishtina, Peja, Gjakova, Gjilan and for Ferizaj. Feasibility study is expected to be finalized during the course of 2014. Most urban and industrial wastewater is discharged directly to the rivers without pre-treatment. Pollution with heavy metals and other toxic substances represents challenge and concern as regard to the quality of surface and ground-waters. State Strategy on Waters and the Law on Waters oblige the treatment of waste water and industrial water.

Pressures on natural water resources are being enhanced by human activities and increases in water demand in all sectors and pollution along the water courses. The temperature increase and decrease in rainfall patterns in the last decade will be directly reflected in river flow regimes and in the groundwater levels.

### **Recommendations**

Based on above considerations, freshwater vulnerability assessment to identify potential risks, providing decision makers with an early warning signal about the need to monitor potential variation over time is crucial.

To adequately respond to the challenges of climate change, new strategic policy papers and action plans to integrate mitigation and adaptation measures shall be developed. Development of new policy papers and/ or amendment of existing policy framework shall be based on a comprehensive scientific research to evaluate potential climate change impacts on water resource. The following issues are recommended to be mainstreamed into the State Water Strategy and river basin management plans, under the legal framework for water resources management:

- Wastewater treatment, water reclamation and reuse, including incentive packages for water reclamation and reuse.
- Groundwater management, replenishment of groundwater aquifers, mandatory groundwater withdrawal restrictions and groundwater monitoring.
- Program for risk management, including flood protection and identification of the flood prone areas.
- Program for management for droughts, water allocation/ portioning and prioritizing the customer categories under the drought situations.
- Stimulating rainwater harvesting and incentive programmes for rainwater harvesting.

### **3.2.2. Agriculture, forestry, biodiversity and land use planning**

Kosovo is in the process of restructuring the agricultural and forestry sector with a view to sustainable economic development based on European environmental standards, particularly

in the in legislation framework. The Government of Kosovo supports of an integrated approach aiming to find a balance between economic developments, environmental protection and land use. The legal framework for agriculture, forestry and land use sectors is largely in place and approximated to a high degree with the relevant EU legislation, although implementation and enforcement of laws is weak.

The Agricultural Household Survey in 2012 indicated that the total agricultural land is about 378,768 ha; out of this around 277,364 ha (73 %) belong to private property. Around 41 % of this area is used as arable land and 26.0 % as meadows and pastures. 5 % of the agricultural land – an decreasing amount - was left fallow in 2012. The use of agricultural land for planting orchards increased during the period 2009 to 2012 by 10.1 %. Also areas used for arable crops, vineyards and greenhouses substantially increased over the last years.

Livestock production has a high economic importance and is a profitable agricultural sector promoting also other agricultural sectors like plant production, processing industry etc. It is estimated that about 94,000 farms (52 % of the total farms) are active in livestock production. Most livestock production is done in an extensive way in rural households. Semi commercial and commercial farms have more intensive livestock production with higher quality animal breeds.

Agriculture used to account for 25% of GDP in the 1980s and early 1990s, reduced its share to about 14.1% of GDP in 2011. (Source: KAS data from 2011). Agriculture accounts for about 35% of total employment (Country Snapshot 2013 April WB report). The agricultural sector also accounts for 16% of total export value and remains an important economic sector.

As regards forestry, 42,7% of Kosovo's land area is covered by forests and forest land's (464,800 ha), of which 60% are state-owned forests (278,880 ha) and 40% are private forests (185,920 ha) (Source: Strategy for Forest Development 2010-2020). The forest cover in Kosovo is larger than in neighbouring countries (Albania 28%, Macedonia 39%, Montenegro 40%, and Serbia 31%); however, the quality and productivity of the existing forests are a cause of concern. In particular in steep, mountainous terrain there are alarming signals of desertification due to serious soil erosion (Source: Support to Implementation of the Forest Policy and Strategy in Kosovo GCP/KOS/005/FIN):

- 32,200 ha are considered as forests "without trees";
- 171,200 ha are forests developed through natural seeding, categorized as high forests (h > 16 m);
- 115,800 ha are categorized as low forests (created by stems), which dominate in the central part of Kosovo;
- 21,200 ha are called low forests (low forests with presence of trees);
- 2,200 ha are forests created through forestation.

There are about 120,000 private forest owners in Kosovo, who manage their forests in the traditional coppice system and usually do not plant trees. They rely on natural seeding to regenerate their forests, which is said to regenerate abundantly, and practice replanting only in a few exceptional cases. It is estimated that the area that is replanted in private forests does not exceed 30 ha/yr entirely in Kosovo. The average size of a private forest estate is about 2 ha spread over several plots and usually complemented by pasture and agricultural land. The main purpose of keeping the forest areas for majority of private forest owners is production and selling of fuel wood to secure their living and occasionally protection of soil from erosion; only very few forest owners are willing to convert their coppice forest to high forest.

As regards to biodiversity, Kosovo is rich with plant species, considering its relatively small surface. There are 13 species of plants that grow only in Kosovo and approximately 200 species are grown in Balkans. Total number of plant species is larger than in some European countries. This diversity is a result of complex activities of physical factors, as the soil and climate that create diversity of habitats and conditions for growth of plants. In the territory of Kosovo there are around 24 species of threatened plants as a result of human activities. These are mainly concentrated in mountain areas but also in field areas.

### 3.2.3 Public health

Climate change has impact on human health and at the same time health can be a positive driving force for the climate agenda, and a means to engage the public in finding solutions. The responsibility for protecting lives and wellbeing ultimately falls on the health sector. Investing in health protection and adaptation can save lives now and increase resilience to climate change. Hence, protection and enhancement of health is an essential pillar of sustainable development, and of the response to climate change.

## 3.3. CHALLENGES

**Climate change adaptation requires adaptive approaches for resources management such: water, agricultural land, forestry, biodiversity, etc. This is achieved with involvement of all institutions at all levels and of the civil society. In following text are summarized key challenges for climate change adaptation:**

**Governance has to be adapted to the context and to capacity, to the size and nature of the problem as well as to the objective targeted.** The challenge is increased by the local specificity of areas affected by climate impacts, given that each area has its own physical, geographical and socioeconomic characteristics.

Kosovo presents many examples of sectors with competing interests, such as agriculture, industry, domestic water supply, health and minimum flows for sustaining ecosystems. Development and implementation of management plans often remain a problem because of poor cooperation between different ministries, poor cooperation across administrative boundaries, and also the protection of vested interests of important individuals in government, industry or the scientific world. Thus, the process of formulating climate adaptation action plans should involve not only representatives of the different sectors that depend directly on water resources (such as agriculture or industry), but also sectors that indirectly affect water resources (such as urban development and rural planning). A major challenge to the governance of climate adaptation is cross-sectoral cooperation. If successful, cooperation between policy fields and sectors provides tremendous opportunities in terms of cost efficiency.

Delegating to local governance structures can produce good results, and a framework for encouraging subsidiarity should be in place, in line with several EU directives. In some cases, collective management approaches at the local level have demonstrated good outcomes, often in partnership between stakeholders and local public agencies or projects.

**Information and knowledge sharing and communications are insufficient** to support management or to foster good governance. Information is typically not in a format that is suitable for use, and very often information sharing is inefficient.

**Improving “participatory planning” approaches that integrate public and stakeholder input in decision-making.** Participation and local collective management can be effective approaches to good governance. Participation appears to be effective in improving outcomes

because it increases stakeholder ownership and because stakeholders often have access to information and can devise solutions better than or complementary to those delivered from the top down. Perhaps the most important aspect of participation is that it can align government objectives with those of local people. This gives the local stakeholders incentives to manage natural resources and environment well, and can empower them by giving them influence over outcomes during the implementation process.

There is a risk that participatory approaches may reflect existing inequalities among the stakeholders. The more powerful stakeholders may either dominate participatory deliberations or not participate at all. A further aspect of this asymmetry of power is that most people do not 'own' any resource, but they are nevertheless stakeholders. Ways to include and empower these people are often hard to negotiate, especially when there are social or cultural barriers. An equal challenge is how to get the participation of those who are not directly benefitting from the resource but who may be polluting, or are vulnerable to the impacts of climate change. Hence, the NAC Kosovo recommends to involve a wide representation of stakeholders during implementation of the strategy, including those directly, but also indirectly, benefiting from the proposed strategy.

**Experience yields some do's and don'ts: build on existing social capital, promote equity and inclusion, start in areas of good potential, go step-by-step, and learn lessons and adapt.** It seems that costs are less and outcomes better where participatory approaches build on existing social capital, and so interventions should be adapted to take advantage of it. Principles of equity and social fairness demand that the voices of the less powerful should also be heard, and this is something that public agencies can advocate. Interventions could start in areas with potential for success and where intervention costs are lower, in the expectation of spontaneous replication.

Adjusting the incentives structure is a possible mechanism for supporting climate adaptation at the local level, but adjustments are politically difficult and can have negative or unintended consequences. **Positive and negative incentives** are very powerful determinants of behavior and, in the case of climate adaptation, governments are usually able to adjust them easily. Thus, they are attractive mechanisms, especially in an area with limited administrative capacity. Options include adjusting input prices like energy or output prices like farm produce; providing subsidies to encourage specific behaviors; or imposing bans on crops or on irrigation methods, for example. However, all these approaches have also big disadvantages.

### 3.4. GOVERNMENT ACTIVITIES AND LEGISLATION AIMED AT ADDRESSING CLIMATE CHANGE

This section provides a summary of major existing and planned (funded) government activities and legislation aimed at addressing climate change.

#### **At international level:**

The 2011 UNDP Human Development Report provides overwhelming evidence that we are reaching an upper limit to our capacity to emit greenhouse gases without dire consequences. It has been estimated that stabilizing the greenhouse gas concentrations in the atmosphere at a level that prevents catastrophic climate change will require a 50% reduction of the GHG emissions by 2050 from 1990 levels.

Addressing climate change requires two types of response. Firstly, and importantly, we must reduce our greenhouse gas emissions (GHG) (i.e. take **mitigation** action) and secondly we must

take **adaptation** action to deal with the unavoidable impacts. The EU's recently agreed climate change legislation puts in place the concrete measures to reach the EU's commitment to reduce emissions to 20% below 1990 levels by 2020 and is capable of being amended to deliver a 30% reduction if agreed as part of an international agreement in which other developed countries agree to comparable reductions and appropriate contributions by economically more advanced developing countries based on their responsibilities and capabilities. However, even if the world succeeds in limiting and then reducing GHG emissions, our planet will take time to recover from the greenhouse gases already in the atmosphere. Thus we will be faced with the impact of climate change for at least the next 50 years. We need therefore to take measures to adapt.

The United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol (KP) under the Conventions and their subsequent decisions, as well as the EU policy in the area, support developing countries and countries with economies in transition in their efforts to continue economic growth with the least competitive distortions, while in the same time decrease growth in emissions and adapt to the effects of the changing climate. In the Bali Action Plan (2007), the developing countries agreed for the first time to design and implement Nationally Appropriate Mitigation Actions (NAMAs) in the context of sustainable development, supported and enabled by technology, financing and capacity building. The 15th Conference of the Parties" (COP) held in Copenhagen in December 2009, have taken note of the Copenhagen Accord (CA) - a political declaration containing which agrees to limit climate change to not more than 2°C above preindustrial levels in the context of equity and sustainable development and reaffirms the developmental aspects of climate change, including low-emission development strategies. The Conferences in Cancun and Durban provided further details in this regard.

Many important steps have been taken in the development of the adaptation regime under the UNFCCC, as well as many activities mandated towards the implementation of the Convention. Two key milestones important for Kosovo are indicated below, however, these should be recognized within the context of the many other important steps that have been taken in the process leading up to, as well as beyond these milestones.

- **Nairobi Work Programme (NWP):** In 2006, at COP 12 in Nairobi, the Subsidiary Body for Scientific and Technological Advice (SBSTA) was mandated to undertake a 5 year project to address impacts, vulnerability and adaptation in relation to climate change – the Nairobi work programme. Activities under the NWP are ongoing.
- **Cancun Adaptation Framework (CAF):** In 2010, at COP 16 in Cancun the Cancun Adaptation Framework (CAF) was established. Activities under the CAF relate to the following five clusters: Implementation, including a process to enable Parties to formulate and implement national adaptation plans (NAPs), and a work programme to consider approaches to address loss and damage; support; institutions, including the establishment of an Adaptation Committee at a global level, as well as regional and national level arrangements; principles; and stakeholder engagement. Activities under the CAF are ongoing to enable full operationalization.

The national adaptation plan (NAP) process was established under the Cancun Adaptation Framework (CAF). It enables Parties to formulate and implement national adaptation plans (NAPs) as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programmes to address those needs.

In addition to the mandates from the UNFCCC, there are now strong political mandates from the international health governing bodies, through a 2008 World Health Assembly resolution (WHA 61.19<sup>40</sup>) on climate change and health, and equivalent commitments at

40 [http://www.who.int/globalchange/A61\\_R19\\_en.pdf](http://www.who.int/globalchange/A61_R19_en.pdf)

European Regional level (European Regional Framework for Action was welcomed in the 2010 Parma Declaration on Environment and Health<sup>41</sup>). These political mandates are also supported by advances in technical guidance, and in health adaptation projects.

Parties adopted the Cancun Adaptation Framework (CAF) as part of the Cancun Agreements at the 2010 Climate Change Conference in Cancun, Mexico (COP 16/ CMP 6). In the Agreements, Parties affirmed that **adaptation must be addressed with the same level of priority as mitigation.**

The objective of the **Cancun Adaptation Framework** (paras 11-35) is to enhance action on adaptation, including through international cooperation and coherent consideration of matters relating to adaptation under the Convention. Ultimately enhanced action on adaptation seeks to reduce vulnerability and build resilience in developing country Parties, taking into account the urgent and immediate needs of those developing countries that are particularly vulnerable. At the Durban Climate Change Conference in November/December 2011, Parties significantly advanced the implementation of the Framework.

### **At EU level:**

In April 2009 the European Commission presented a policy paper known as a White Paper which presents the framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change.

The framework focuses on the following key areas:

- building a stronger knowledge base since sound data is vital in the development of climate policy
- taking climate change impacts into consideration in key EU policies
- financing climate change policy measures
- supporting wider international efforts on adaptation by helping for example non-EU countries to improve their resilience and capacity to adapt to climate change.

From 21 May 2012 to 20 August 2012 the EU implemented a consultation process on the Preparation of the EU Adaptation Strategy. This consultation seek to collect opinions from stakeholders and experts in the field of adaptation to climate change with a view to getting additional information for the preparation of the EU Adaptation Strategy.

### **EU adaptation strategy has been adopted on 16 April 2013 ([http://ec.europa.eu/clima/policies/adaptation/what/index\\_en.ht](http://ec.europa.eu/clima/policies/adaptation/what/index_en.ht))**

To facilitate implementation of the first pillar of the White Paper, in March 2012 the web-platform Climate-ADAPT (European Climate Adaptation Platform) became publicly accessible. This platform provides users with information in the following areas:

- Expected climate change in Europe;
- Current and future vulnerability of regions and sectors;
- National and transnational adaptation strategies;
- Adaptation case studies and potential adaptation options;
- Mainstreaming at the European level;

<sup>41</sup> <http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/Climate-change/publications/2010/protecting-health-in-an-environment-challenged-by-climate-change-european-regional-framework-for-action>

- Tools that support adaptation planning;
- Profiles of adaptation-related research projects, guidance documents
- (e.g., for the management of uncertainty), reports, additional information sources,
- links, and announcements of events.

#### EU Adaptation Strategy Package<sup>42</sup>:

- 30/07/2013 - SWD (2013) 299 - Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 European Maritime and Fisheries Fund operational programmes (179 kB) 
- 18/06/2013 - Council conclusions on the EU Adaptation Strategy 
- 16/04/2013 - COM (2013) 216 - An EU Strategy on adaptation to climate change <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0216:FIN:EN:PDF>
- 16/04/2013 - SWD (2013) 131 - Summary of the Impact Assessment [http://ec.europa.eu/smart-regulation/impact/ia\\_carried\\_out/docs/ia\\_2013/swd\\_2013\\_0131\\_en.pdf](http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/swd_2013_0131_en.pdf)
- 16/04/2013 - SWD (2013) 132 - Impact Assessment Part 1(716 kB) 
- 16/04/2013 - SWD (2013) 132 - Impact Assessment Part 2(2.27 Mb)
- 16/04/2013 - COM (2013) 213 - Green paper on the insurance of natural and man-made disasters <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0213:FIN:EN:PDF>
- 16/04/2013 - SWD (2013) 133 - Climate change adaptation, coastal and marine issues(448 kB) 
- 16/04/2013 - SWD (2013) 136 - Adaptation to climate change impacts on human, animal and plant health(354 kB) 
- 16/04/2013 - SWD (2013) 137 - Adapting infrastructure to climate change(494 kB) 
- 16/04/2013 - SWD (2013) 138 - Climate change, environmental degradation and migration(286 kB) 
- 16/04/2013 - SWD (2013) 135 - Technical guidance on integrating climate change adaptation in programmes and investments of Cohesion Policy(228 kB) 
- 16/04/2013 - SWD (2013) 139 - Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 rural development programmes(204 kB) 
- 16/04/2013 - SWD (2013) 134 - Guidelines on developing adaptation strategies(697 kB) 

#### At National level:

As a result of issues related to its status, Kosovo is still not recognized by United Nation Institutions. Consequently, it is not eligible to be party to international conventions and it can participate in negotiations only as an observer. However, compliance with international laws, including Multi-National Environment Agreements remains extremely important for the future of Kosovo in its domestic strategy as well as for its international relations.

#### Post-Disaster Assessment<sup>43</sup>

The Department for Emergency Management (DEM) within the Ministry of Interior is formally in charge of the coordination and or conduct of damage assessments. Data collection and storage for each disaster event is ad hoc. For example, following the forest fires of 2007 an Inter-ministerial Committee assigned the Ministry of Agriculture to conduct data collection and assessment. This

<sup>42</sup> [http://ec.europa.eu/clima/policies/adaptation/what/documentation\\_en.htm](http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm)

<sup>43</sup> UNDP/WMO, 2011. IPA Beneficiary Needs Assessment Kosovo (as defined by UNSCR 1244/99)

was done according to the practices of this ministry. Finally all of the information was transferred to the Situation Centre (SitCen) within the Office of the Prime Minister, where it was stored and archived. A post-action analysis and report were later performed.

### Risk Assessment<sup>44</sup>

AEM is tasked with coordinating and preparing risk assessments for natural and man-made disasters. In 2009 the Kosovo Risk Assessment was conducted covering all potential hazards for the population of Kosovo and attempting to quantify the expected level of damage. The assessment focuses mostly on hazards and structural vulnerability, as AEM and other organizations possess little expertise in analyzing socioeconomic vulnerability and assessing capacity. Besides hazard maps, other available relevant data include maps of road, railway and electric power infrastructure, as well as of population distribution. However, as of yet, climate change vulnerability data for Kosovo is not available (Source: Climate Change Knowledge Portal, World Bank Group, 2013.)

At the local level, municipalities possess little or no risk assessment capacity. Kosovo Red Cross is working with municipalities to strengthen this area and is looking to secure funding to conduct vulnerability and capacity assessments.

### Information Management<sup>45</sup>

AEM is formally charged with maintaining an emergency management database, which includes the collection, storage and updating of information. For this purpose the DEM has prepared a draft methodology, which has yet to be approved by the Government. However, as noted above in response situations most agencies forward their information to SitCen. It is unclear how AEM receives this information.

The Ministry of Environment and Spatial Planning also maintains a database in support of the Kosovo Spatial Plan. In addition to geographic, demographic, poverty, land and environmental data analyses, it includes sector reports and data on the system of education, habitation, agriculture, forests, rural areas, the energy sector, the health sector, transportation infrastructure, hydrology, trade, industry, culture, information technology and tourism in Kosovo. All of this information is managed under the oversight of the Department for Spatial Planning. There appear to be no coordination or linkages between this database and those of AEM and Sit Cen.

## 4. GOALS AND OBJECTIVES

Mission statement for NAC is

- to reduce the risk and damage from current and future impacts of climate change in a cost-effective manner and to exploit potential benefits stemming from climate change

Objectives:

- **Objective 1:** Introduce new and improve current mechanisms of disaster risk reduction, especially important for sectors of economic significance that are particularly vulnerable to climate change impacts;
- **Objective 2:** To enhance adaptive capacity<sup>46</sup> of most vulnerable natural systems, in particular the most vulnerable ecosystem and of the society;
- **Objective 3:** To build the capacity of the local partners, actors and stakeholders to integrate

44 UNDP/WMO, 2011. IPA Beneficiary Needs Assessment Kosovo (as defined by UNSCR 1244/99)

45 UNDP/WMO, 2011. IPA Beneficiary Needs Assessment Kosovo (as defined by UNSCR 1244/99)

46 Adaptive capacity: the ability of a system to adjust to climate change, to moderate potential damage or take advantage of opportunities or to cope with the consequences (IPCC, 2001).

climate change issues and adaptation into the local and regional development processes, and empower them for addressing climate change issues.

## 5. ALTERNATIVES CONSIDERED: PRIORITY ADAPTATION MEASURES

The list below presents a total of 74 possible adaptation measures with high or medium priority. Potential adaptation measures with low priority have not been included. Hence, the list provides a first and important step in the **selection of possible adaptation measures** for the NAC.

Additionally, it highlights municipalities where scores for implementation and/or planning are significantly higher than in other municipalities, in order to identify **best practices and/or lessons learned**.

The priority list is based on the results of 15 questionnaires at the local level<sup>47</sup> and voting rounds by 12 members of the Inter-ministerial Working Group (IMWG) at the national level<sup>48</sup>. Hence, below list represents priorities for the national as well as the local level, although the current state of implementation and/or planning is only specified for the local level.

Below priorities are presented in **high-low ranking**, related to necessity as indicated by the stakeholders at national and local level. Measures with an average score of more than 4 (on a scale of 1 to 5) are indicated as highly necessary, thus have highest priority. Measures with an average score between 2.5 – 4.0 (on a scale of 1 to 5) are labeled as medium priority, while average scores below 2.5 are labeled as low priority. Low priorities have not been included in the list.

In order to support the identification of potential best practices and/or lessons learned the adaptation measures presented below are **highlighting municipalities** where scores for implementation and/or planning are significantly higher than in other municipalities. Hence, since implementation or planning has occurred or is ongoing in these places they require specific attention to see whether obstacles and/or opportunities for adaptation, lessons learned or best practices can be identified and possibly upscaled.

### Flood protection

High priority (>4):

- 1) Restriction of settlement/building development in risk-prone areas
- 2) Deepening of summer *bed*
- 3) Upgrade and/or raise dykes to prevent flooding
- 4) Adjustment or removal of hydraulic obstacles in river bed (e.g. buildings, trees, infrastructure, trash, etc)
- 5) Construction of retention areas (also called inundation areas to reduce flood run-off)
- 6) Upgrade drainage systems
- 7) Standards for building development (e.g. permeable surfaces, greening roofs etc.)
- 8) Floodplain restoration (which involves lowering/deepening of floodplain)
- 9) Reforestation areas to reduce flood run-off

Medium priority (<4):

<sup>47</sup> The local questionnaire survey took place from 6th of June 2013 until 10th of July 2013

<sup>48</sup> The voting took place during the Second Roundtable Meeting on 27th of June 2013 in Prishtina by the Inter-Ministerial Working Group for developing the NAC

- 10) Replacement of dykes to enlarge river bed capacity
- 11) Change of land use (for enabling natural retention of flood water)
- 12) Enlarge reservoirs to increase buffer capacity
- 13) River bypasses (also used as 'green rivers' when there is no peak discharge)

### **Drought / low flow / water scarcity**

High priority (>4):

- 14) Landscape planning measures to improve water balance (e.g. change of land use, reforestation)
- 15) Leakage reduction
- 16) Water recycling and re-use, e.g. use of grey water, treated sewage and industrial water
- 17) Point-of-use conservation in households and industry
- 18) Water transfers (for more explanation see annex 3)
- 19) Securing minimum flows in dry periods
- 20) Crop adaptation: High resilient crop seeds & Crop choice (crops with more efficient water use)
- 21) Water saving technologies in irrigation
- 22) Rainwater harvesting
- 23) Sustainable groundwater management (including recharge measures)
- 24) Increase Reservoir volumes
- 25) Restriction of water uses

Medium priority (<4):

- 26) Crop rotation (for soil recovery)

### **Forest and biodiversity management**

High priority (>4):

- 27) Strengthening forest protection policy
- 28) Educating people about the benefits of forest and the harmful effects of deforestation
- 29) Strictly handling cases of illegal cutting /deforestation
- 30) Planting trees/reforestation (see also measure 9 and 14)
- 31) Removal of fuel wood in order to decrease vulnerability to forest fires
- 32) Ecological corridors to help species migrate
- 33) Incorporating local biodiversity objectives into the planning, delivery and management of green infrastructure measures

Medium priority (<4):

- 34) Choosing tree species and forestry practices less vulnerable to storms and fires
- 35) Creating micro-climatic variation and ecologically resilient landscapes through varied topology to help species respond to changes in temperature and increase the chance that species will be able to migrate locally into newly favourable habitat

## **Public health**

Medium priority (<4):

- 36) Public health programs for heat-related deaths (e.g. heat warning systems)
- 37) Awareness program on climate change and health among public health and medical practitioners
- 38) Public health programs related to changing patterns of infectious diseases
- 39) Infectious disease surveillance systems that can detect potential "signature" diseases that may affect Kosovo consequent to climate change
- 40) Alert practitioners and their patients to the potential for changes in patterns of exposure to aeroallergens that exacerbate allergic diseases like asthma and allergic rhinitis ("hay fever")
- 41) Existing public health surveillance systems are sufficiently comprehensive and sensitive to detect potential effects of climate change on health
- 42) Public awareness program related to consequences of heat exposure

## **Information management & exchange**

High priority (>4):

- 43) Uncertainties are not glossed over but communicated (in final reports, orally)
- 44) Adoption of an M&E plan during project preparation that includes establishment of process indicators, stress reduction indicators, and environmental status indicators

Medium priority (<4):

- 45) Government actively disseminate information and data to the public: on the Internet, but also by producing leaflets, through the media, etc.
- 46) Different government bodies are involved in setting the TORs for adaptation projects in related sectors and supervising the research, or at least consulted (interviews, surveys etc.)
- 47) Long term monitoring of surface water (quality and quantity)
- 48) Multidisciplinarity: Different disciplines are involved in defining and executing research on climate change adaptation: e.g. in addition to technical and engineering sciences also for instance ecology and the social sciences
- 49) Decision support systems, e.g. hydrometeorological information systems are up to standards
- 50) Long term monitoring of groundwater (quality and quantity)
- 51) Modernizing the hydrometeorology sector (i.e. strengthening forecast & early warning or disaster warning system)
- 52) Governments exchange information and data with other governments

## **Capacity building, training, awareness raising**

Medium priority (<4):

- 53) Public awareness programs on climate change
- 54) Awareness campaign on the risks of building, living and working in vulnerable areas
- 55) Awareness campaign on saving water for citizens, companies, factories, etc.
- 56) Training on efficient irrigation management for farmers
- 57) Training on climate change adaptation for advanced professionals in water, agriculture, forestry, land use planning, public health, etc

**Finances and cost recovery**

High priority (>4):

58) Financial resources for adaptation program/projects are diversified by using a broad set of private and public financial instruments

Medium priority (<4):

59) Costs of adaptation are recovered from the 'users' by public and private financial instruments (charges, prices, insurance etc.)

60) Authorities can take loans and depreciate their assets, to facilitate efficient use of resources and replacement of assets

61) Wide-spread private sector participation in water and natural resources management

**Cooperation structures**

High priority (>4):

62) Downstream governments (either local or national) are involved in decision-making by upstream governments

Medium priority (<4):

63) Legal provisions concerning access to information, participation in decision-making (e.g. consultation requirements before decision-making) and access to courts

64) Non-governmental stakeholders actually contribute to agenda setting, analyzing problems, developing solutions and taking decisions ("coproduction")

65) Co-operation structures include government bodies from different hierarchical levels; many contacts generally

66) Co-operation structures include non-governmental stakeholders (e.g. environmental NGO's, user groups, citizen groups or private sector)

67) Sectoral governments actively involve other (national and local) government sectors (e.g. agriculture, nature, environment, tourism, forestry, health, navigation, spatial planning)

68) Lower level governments are involved in decision-making by higher level governments

69) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed

70) International/ transboundary co-operation structures exist (e.g. river basin commissions); many contacts generally

**Risk management**

High priority (>4):

71) Harvest insurance mechanisms are available

Medium priority (<4):

72) Insurance against housing and property damage is available

73) Risk perception by formal expert judgment and risk perception by the stakeholders

74) Both governmental and non-governmental stakeholders are involved in decisions on what are acceptable climate change risks

## 6. RECOMMENDATIONS

The NAC for Kosovo envisages to effectively anticipate on, and respond to, the impacts of climate change, taking into account internationally endorsed principles for sustainable development. Adaptation to climate change is crucial for reducing the risk and damage from current and future impacts of climate change in a cost-effective manner and to exploit potential benefits stemming from climate change. The NAC will aim to introduce new and improve current mechanisms of disaster risk reduction, especially important for sectors of economic significance that are particularly vulnerable to climate change impacts, and to enhance adaptive capacity of the vulnerable communities. NAC intends to build the capacity of the local partners, actors and stakeholders to integrate climate change issues into the local and regional development processes.

### 6.1. INCREASING ADAPTIVE CAPACITY

One of the key objective of the NAC is to increase the adaptive capacity of both natural and social systems, based on a sound understanding of what determines resilience and vulnerability of these systems. The problem to be tackled is to increase the ability of the whole system to respond to change rather than reacting to undesirable impacts of change.

Adaptive capacity is an indication of the capacity to deal with change and disturbance, and reflects learning through knowledge sharing and responding to feedbacks. Increasing the ability of systems to adapt, or building their adaptive capacity, is an important consideration to prepare and respond to climatic changes: systems with high adaptive capacities can thus retain their integrity under a broader range of conditions than systems with low adaptive capacities. In social systems, adaptive capacity refers to the ability to learn from mistakes and to generate experience of dealing with change, which in turn largely depends on the ability of individuals and their social networks to innovate.

Building upon the insights above the NAC includes several measures targeted at increasing adaptive capacity:

1. Improving information management and exchange, i.e. joint/participative knowledge production, a commitment to dealing with uncertainties, broad communication between stakeholders, open and shared information sources, and flexibility and openness for experimentation.
2. Capacity building, training and awareness raising.
3. Financial and economic measures and improving risk management.
4. Involvement of government and non-government stakeholders.

### 6.2. OVERVIEW OF ADAPTATION COMPONENT'S INTERVENTION SHEETS

This chapter presents the course of action which is considered to be the most effective way of achieving the objectives, in light of budgetary constraints and implementation considerations. Below are presented 38 interventions in total; for each intervention is indicated the information about location, objective, responsibility (i.e who will carry out the intervention), impact, roughly estimated costs and implementation period.

The following section 6.2 presents a multi-criteria analysis (MCA) of the different interventions. The objective of the MCA is to provide an overall ordering of interventions and to distinguish between short term, medium term and long term interventions. In turn, this information has been used to develop an intervention framework (see section 6.3).

Strategy component NAS	Overview of Intervention Sheets
<p><b>Flood protection</b></p>	<p><b>1) Restriction of settlement/building development in risk-prone areas</b></p> <p>2) <b>Increasing river discharge capacity, including</b> a) Deepening of summer bed, b) Adjustment or removal of hydraulic obstacles in river bed (e.g. buildings, trees, infrastructure, trash, etc), c) Floodplain restoration (which involves lowering/deepening of floodplain), d) Replacement of dykes to enlarge river bed capacity, e) River</p> <p>3) Construction of <b>retention areas</b> (also called inundation areas to reduce flood run-off)</p> <p>4) <b>Standards for building development</b> (e.g. permeable surfaces, greening roofs etc.)</p> <p>5) <b>Enlarge reservoirs</b> to increase buffer capacity</p> <p>Note: Reforestation areas to reduce flood run-off (see intervention sheet 19)</p>
<p><b>Drought / low flow / water scarcity</b></p>	<p>6) <b>Landscape planning measures to improve water balance</b> (e.g. change of land use, reforestation, reduced sealing of areas)</p> <p>7) <b>Leakage reduction</b></p> <p>8) <b>Water recycling and re-use</b>, e.g. use of grey water, treated sewage and industrial water</p> <p>9) <b>Point-of-use conservation</b> in households and industry</p> <p>10) <b>Water transfers</b></p> <p>11) <b>Securing minimum flows</b> in dry periods</p> <p>12) <b>Crop adaptations</b>, including a) High resilient crop seeds, b) Crop choice (crops with more efficient water use), c) Crop rotation (for soil recovery)</p> <p>13) <b>Water saving technologies in irrigation</b></p> <p>14) <b>Rainwater harvesting</b></p> <p>15) <b>Sustainable groundwater management</b> (including recharge measures)</p> <p>Note: Increase Reservoir volumes (see intervention sheet 6)</p>
<p><b>Forest and biodiversity management</b></p>	<p>16) <b>Strengthening forest protection policy</b>, including a) Strictly handling cases of illegal cutting /deforestation, b) Educating people about the benefits of forest &amp; the harmful effects of deforestation, c) Removal of fuel wood in order to decrease vulnerability to forest fires, d) Choosing tree species and forestry practices less vulnerable to storms and fires, e) also related to interventions mentioned under information management and cooperation structures</p> <p>17) <b>Planting trees/reforestation</b>, also for dealing with water scarcity and floods</p> <p>18) <b>Ecological corridors</b> to help species migrate</p> <p>19) Incorporating local <b>biodiversity objectives into the planning</b>, delivery and management of green infrastructure measures</p> <p>20) Creating <b>micro-climatic variation</b> and ecologically resilient landscapes through varied topology to help species respond to changes in temperature and increase the chance that species will be able to migrate locally into newly favourable habitat</p>
<p><b>Public health</b></p>	<p>21) <b>Public health programs</b>, including programs for a) heat-related deaths (e.g. heat warning systems) and consequences of heat exposure, b) programs related to changing patterns of infectious diseases, c) Alert patients to the potential for changes in patterns of exposure to aeroallergens that exacerbate allergic diseases like asthma and allergic rhinitis ("hay fever")</p> <p>22) <b>Awareness program on climate change and health among public health and medical practitioners</b>, e.g. alert practitioners to the potential for changes in patterns of exposure to aeroallergens that exacerbate allergic diseases like asthma and allergic rhinitis ("hay fever")</p> <p>23) <b>Strengthening public health surveillance systems towards sufficiently comprehensive and sensitive to detect potential effects of climate change on health</b>, e.g. Infectious disease surveillance systems can detect potential "signature" diseases that may affect Kosovo consequent to climate change</p>

Strategy component NAS	Overview of Intervention Sheets
Information management & exchange	<p>24) <b>Strengthening joint/participative information production</b>, including a) Different government bodies and non-governmental organisations are involved in setting the TORs and supervising the search, or at least consulted (interviews, surveys etc.), b) Multidisciplinarity: Different disciplines are involved in defining and executing the research: in addition to technical and engineering sciences also for instance ecology and the social sciences, c) Researchers allow their research to be challenged by stakeholders and present their own assumption in as far as they are aware of them, d) Research results are not presented in an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want, e) Uncertainties are not glossed over but communicated (in final reports, orally), f) Researchers are willing to talk with stakeholders about uncertainties</p> <p>25) <b>Modernizing the hydrometeorology sector</b>, including a) strengthening forecast &amp; early warning or disaster warning system, b) Long term monitoring of surface and groundwater (quality and quantity)</p> <p>26) <b>Improving communication</b> (exchange of data and produced information), including a) Governments exchange information and data with other governments, b) Open shared information sources that fills gaps and facilitate integration, e.g. an open shared database for data about long term monitoring of surface water (quality and quantity) , c) Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, through the media, etc.</p> <p>27) <b>Improving utilization of information</b>, including a) New information is used in public debates (and is not distorted), b) Decision support systems, e.g. hydrometeorological information systems are up to standards, c) Adoption of an M&amp;E plan during project preparation that includes establishment of process indicators, stress reduction indicators, and environmental status indicators</p>
Capacity building, training, awareness raising	<p>28) <b>Public awareness programs</b> on climate change and how to deal with its impacts, including a) Awareness campaign on the risks of building, living and working in vulnerable areas, b) Awareness campaign on saving water for citizens, companies, factories, etc.</p> <p>29) <b>Training for professionals</b>, including: 1) training on efficient irrigation management for farmers, b) training on climate change adaptation for advanced professionals in water, agriculture, forestry, land use planning, public health, etc</p>
Finances, cost recovery and risk management	<p>30) <b>Financial and economic measures</b>, including a) Financial resources are diversified by using a broad set of private and public financial instruments, b) Costs are recovered from the 'users' by public and private financial instruments (charges, prices, insurance etc.), c) Authorities can take loans and depreciate their assets, to facilitate efficient use of resources and replacement of assets, d) Improving private sector participation in water and natural resources management, e.g. by public/private partnerships</p> <p>31) <b>Improving risk management</b>, including a) Risk perception by formal expert judgment and risk perception by the stakeholders, b) Both governmental and nongovernmental stakeholders are involved in decisions on what are acceptable risks, c) Harvest insurance mechanisms are available, d) Insurance against housing and property damage is available</p>
Cooperation structures	<p>32) <b>Strengthening the level of, or provisions for, stakeholder participation</b>, including: a) Legal provisions concerning access to information, participation in decision-making (e.g. consultation requirements before decision-making) and access to courts, b) Co-operation structures include non-governmental stakeholders (e.g. environmental NGO's, user groups, citizen groups or private sector), c) Non-governmental stakeholders actually contribute to agenda setting, analysing problems, developing solutions and taking decisions ("coproduction"), d) Non-governmental stakeholders are enabled or allowed to undertake parts of natural resources management themselves, e.g. through water users' associations</p> <p>33) <b>Improving cross-sectoral cooperation</b>, including: a) Sectoral governments actively involve other government sectors (e.g. agriculture, nature, environment, tourism, forestry, health, navigation, spatial planning), b) Co-operation structures include government bodies from different sectors; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)</p> <p>34) <b>Improving cooperation between administration levels</b>, including: a) Lower level governments are involved in decision-making by higher level governments, b) Cooperation structures include government bodies from different hierarchical levels; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)</p> <p>35) <b>Improving cooperation across administrative boundaries</b>, including: a) Downstream governments are involved in decision-making by upstream governments, b) International/ transboundary co-operation structures exist (e.g. river basin commissions); many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)</p>
Miscellaneous	<p>36) <b>Management plan and rehabilitation measures for Iber-Lepenci channel</b></p> <p>37) <b>Design and construction of a treatment plant Novoberde mine acid discharge water</b></p> <p>38) <b>Design and implementation of reactivation of tailing sites and treatment of acid mine drainage</b></p>

### 6.3. EVALUATION AND ORDERING OF INTERVENTIONS

In total there are chosen 38 interventions based on multi-criteria analysis (MCA), in order to provide an overall ordering of interventions and to distinguish between short term, medium term and long term interventions. In turn, this information has been used to develop an implementation framework (see section 6.4).

Important to note is that the interventions may differ in the extent to which they achieve several objectives, and no one intervention will be obviously best in achieving all objectives. In addition, some conflict or trade-off is usually evident amongst the objectives; interventions that are more beneficial are also usually more costly, for example. Costs and benefits typically conflict, but so can short-term benefits compared to long-term ones, and risks may be greater for the otherwise more beneficial interventions.

The criteria are measures of performance by which the interventions have been evaluated. The following 8 criteria have been used for the analysis:

- **Technical considerations** (e.g. ease of implementation, redundancy and robustness of the solution, flexibility to changing conditions, durability);
- **Estimated costs;**
- **Water quality and quantity impacts;**
- **Habitat disturbance** (aquatic, riparian, upland);
- **Ecological & environmental impacts;**
- **Socio-economic impacts** (community amenities, tourism opportunities, village disruption, religious considerations, historic/archaeological);
- **Institutional (compatibility) considerations** (which agencies are responsible for implementation, does it fit within existing national programs, does it help achieve or impact national goals, how will it complement, reinforce and build on existing projects/investments?);
- **Political considerations** (do the solutions enjoy political support or opposition etc.)

Below table provides an overview and legenda of evaluation criteria and scores used for the MCA.

Table 6.1 - A summarized overview of scores used for evaluation

	++	+	0	-	--	?
<b>Technical considerations</b>	Highly appropriate or feasible in technical terms	Appropriate	Neutral	Medium inappropriate	Highly inappropriate or not feasible in technical terms	Unknown / further study required
<b>Estimated costs</b>	Extreme low costs ( $\leq$ 0.5 mil. Euro's)	Low costs (0.5 - 2.0 mil. Euro's)	Neutral (2.0 - 5.0 mil. Euro's)	High costs (5.0 - 10.0 mil. Euro's)	Extreme high costs ( $\geq$ 10.0 mil. Euro's)	Unknown / further study required
<b>Water quality and quantity impacts</b>	Highly positive impact	Positive impact	Neutral	Negative impact	Highly negative impact(s)	Unknown / further study required
<b>Habitat disturbance</b>	No disturbance	Low disturbance	Moderate disturbance	High disturbance	Extreme disturbance	Unknown / further study required
<b>Ecological &amp; environmental impacts</b>	Highly positive impact	Positive impact	Neutral	Negative impact	Highly negative impact(s)	Unknown / further study required
<b>Socio-economic impacts</b>	Highly positive impact	Positive impact	Neutral	Negative impact	Highly negative impact(s)	Unknown / further study required
<b>Institutional (compatibility) considerations</b>	Highly positive	Positive	Neutral	Negative	Highly negative	Unknown / further study required
<b>Political considerations</b>	Strong political support	Some political support	Neutral	Some opposition	Strong opposition	Unknown

Table 6.2 - Description of Intervention Sheets, duration, scoring according to the previous table (6.1) &amp; ranking according to evaluation

Intervention sheets	Duration of project	Scores			Ranking according to Evaluation	
		+	0	- ?		
1) <b>Restriction of settlement/building development in risk-prone areas</b> > This a legal requirement of the water law	Mid - Term	2	4	1	1	
2) <b>Increasing river discharge capacity</b> , including a) Deepening of summer bed, b) Adjustment or removal of hydraulic obstacles in river bed (e.g. buildings, trees, infrastructure, trash, etc), c) Floodplain restoration (which involves lowering/deepening of floodplain), d) Replacement of dykes to enlarge river bed capacity, e) River bypasses (also used as 'green rivers' when there is no peak discharge) > see also: EC Water Strategy and Water Investment Action Plan	Short Term & long term measures	10	0	2	0	8
3) Construction of <b>retention areas</b> (also called inundation areas to reduce flood run-off)	Mid - Term	5	2	1	0	4
4) <b>Standards for building development</b> (e.g. permeable surfaces, greening roofs etc.)	Short Term	13	1	0	0	13
5) <b>Enlarge reservoirs to increase buffer capacity</b> > Check with Water Strategy	Long term	6	2	2	0	4
6) <b>Landscaping measures to improve water balance</b> (e.g. change of land use, reforestation, reduced sealing of areas)	Short Term	8	2	0	0	8
7) <b>Leakage reduction</b> > Check with Water Strategy	Long Term	12	1	2	0	10
8) <b>Water recycling and re-use</b> , e.g. use of grey water, treated sewage and industrial water	Short Term	12	2	0	1	12
9) <b>Point-of-use conservation</b> in households and industry	Short Term	13	1	0	0	13
10) <b>Water transfers</b> > <b>Check with Water Strategy</b>	Long term	10	1	0	1	10
11) <b>Securing minimum flows in dry periods</b> > <b>Check with Water Strategy</b>	Mid - Term	10	1	1	1	9
12) <b>Crop adaptations</b> , including a) High resilient crop seeds, b) Crop choice (crops with more efficient water use), c) Crop rotation (for soil recovery)	Medium Term	2	5	1	0	1
13) <b>Water saving technologies in irrigation</b> > see also draft irrigation strategy as of November 2013	Mid - Term	9	1	2	0	7
14) <b>Rainwater harvesting</b>	Short Term	7	3	0	0	7
15) <b>Sustainable groundwater management</b> (including recharge measures) (> > Check with Water Strategy): Before anything, Kosovo needs to develop a groundwater monitoring network, since there is no baseline data on groundwater availability, amount and quality. The only information available is a hydrogeological map from KFOR.	Mid - Term	12	0	0	0	12
16) <b>Strengthening forest protection policy</b> , including a) Strictly handling cases of illegal cutting /deforestation, b) Educating people about the benefits of forest & the harmful effects of deforestation, c) Removal of fuel wood in order to decrease vulnerability to forest fires, d) Choosing tree species and forestry practices less vulnerable to storms and fires, e) also related to interventions mentioned under information management and cooperation structures > Harmonize with Forest strategy so we avoid duplication and double financing	Short Term	13	1	0	0	13
17) <b>Planting trees/reforestation</b> , also for dealing with water scarcity and floods > Harmonize with Forest strategy so we avoid duplication and double financing	Short Term	8	2	0	0	8

Intervention sheets	Duration of project	Scores			Ranking according to Evaluation
		+	-	?	
18) <b>Ecological corridors</b> to help species migrate > Harmonize with Biodiversity strategy to avoid duplication and double financing.	Short Term	8	2	0	8
19) Incorporating local <b>biodiversity objectives into the planning</b> , delivery and management of green infrastructure measures > Harmonize with Biodiversity strategy to avoid duplication and double financing	Mid - Term	6	3	0	6
20) Creating <b>micro-climatic variation</b> and ecologically resilient landscapes through varied topology to help species respond to changes in temperature and increase the chance that species will be able to migrate locally into newly favourable habitat > Harmonize with Biodiversity strategy to avoid duplication and double financing	Short Term	11	1	0	11
21) <b>Public health programs</b> , including programs for a) heat-related deaths (e.g. heat warning systems) and consequences of heat exposure, b) programs related to changing patterns of infectious diseases, c) Alert patients to the potential for changes in patterns of exposure to aeroallergens that exacerbate allergic diseases like asthma and allergic rhinitis ("hay fever")	Mid Term	8	2	0	8
22) <b>Awareness program on climate change and health</b> among public health and medical practitioners, e.g. alert practitioners to the potential for changes in patterns of exposure to aeroallergens that exacerbate allergic diseases like asthma and allergic rhinitis ("hay fever")	Short Term	8	2	0	8
23) <b>Strengthening public health surveillance systems</b> towards sufficiently comprehensive and sensitive to detect potential effects of climate change on health, e.g. Infectious disease surveillance systems can detect potential "signature" diseases that may affect Kosovo consequent to climate change	Short Term	8	2	0	8
24) <b>Strengthening joint/participative information production</b> , including a) Different government bodies and non-governmental organisations are involved in setting the TORs and supervising the search, or at least consulted (interviews, surveys etc.), b) Multidisciplinarity: Different disciplines are involved in defining and executing the research: in addition to technical and engineering sciences also for instance ecology and the social sciences, c) Researchers allow their research to be challenged by stakeholders and present their own assumption in as far as they are aware of them, d) Research results are not presented in an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want, e) Uncertainties are not glossed over but communicated (in final reports, orally), f) Researchers are willing to talk with stakeholders about uncertainties	Short Term	12	1	0	12
25) <b>Modernizing the hydrometeorology sector</b> , including a) strengthening forecast & early warning or disaster warning system, b) capacity building, c) Long term monitoring of surface and groundwater (quality and quantity)	Short Term	8	2	0	8
26) <b>Improving communication</b> (exchange of data and produced information), including a) Governments exchange information and data with other governments, b) Open shared information sources that fills gaps and facilitate integration, e.g. an open shared database for data about long term monitoring of surface water (quality and quantity), c) Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, through the media, etc.	Long Term	11	0	0	11
27) <b>Improving utilization of information</b> , including a) New information is used in public debates (and is not distorted), b) Decision support systems, e.g. hydrometeorological information systems are up to standards, c) Adoption of an M&E plan during project preparation that includes establishment of process indicators, stress reduction indicators, and environmental status indicators	Short Term	8	3	0	8
28) <b>Public awareness programs</b> on climate change and how to deal with its impacts, including a) Awareness campaign on the risks of building, living and working in vulnerable areas, b) Awareness campaign on saving water for citizens, companies, factories, etc.	Short Term	13	0	0	13

Intervention sheets	Duration of project	Scores			Ranking according to Evaluation
		+	0	- ?	
29) <b>Training for professionals</b> , including a) Training on efficient irrigation management for farmers, b) Training on climate change adaptation for advanced professionals in water, agriculture, forestry, land use planning, public health, etc	<b>Short Term</b>	8	3	0	8
30) <b>Financial and economic measures</b> , including a) Financial resources are diversified by using a broad set of private and public financial instruments, b) Costs are recovered from the 'users' by public and private financial instruments (charges, prices, insurance etc.). Authorities can take loans and depreciate their assets, to facilitate efficient use of resources and replacement of assets, d) Improving private sector participation in water and natural resources management, e.g. by public-private partnerships	<b>Mid - Term</b>	7	3	0	7
31) <b>Improving risk management</b> , including a) Risk perception by formal expert judgment and risk perception by the stakeholders, b) Both governmental and non-governmental stakeholders are involved in decisions on what are acceptable risks, c) Harvest insurance mechanisms are available, d) Insurance against housing and property damage is available	<b>Mid - Term</b>	7	3	0	7
32) <b>Strengthening the level of, or provisions for, stakeholder participation</b> , including: a) Legal provisions concerning access to information, participation in decision-making (e.g. consultation requirements before decision-making) and access to courts, b) Co-operation structures include non-governmental stakeholders (e.g. environmental NGOs, user groups, citizen groups or private sector), c) Non-governmental stakeholders actually contribute to agenda setting, analysing problems, developing solutions and taking decisions ("coproduction"), d) Non-governmental stakeholders are enabled or allowed to undertake parts of natural resources management themselves, e.g. through water users' associations	<b>Short Term</b>	7	3	0	7
33) <b>Improving cross-sectoral cooperation</b> , including: a) Sectoral governments actively involve other government sectors (e.g. agriculture, nature, environment, tourism, forestry, health, navigation, spatial planning), b) Co-operation structures include government bodies from different sectors; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	<b>Long Term</b>	7	3	0	7
34) <b>Improving cooperation between administration levels</b> , including: a) Lower level governments are involved in decision-making by higher level governments, b) Co-operation structures include government bodies from different hierarchical levels; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	<b>Long Term</b>	6	4	0	6
35) <b>Improving cooperation across administrative boundaries</b> , including: a) Downstream governments are involved in decision-making by upstream governments, b) International/ transboundary co-operation structures exist (e.g. river basin commissions); many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	<b>Short Term</b>	8	3	0	8
36) <b>Management plan and rehabilitation measures for Iber-Lepenci channel</b> > the plan to complete phase 2 of Iber-Lepenc was recently estimated to cost around 300M€ by the WB	<b>Short Term</b>	11	0	1	10
37) Design and construction of a <b>treatment plant Novoberde mine acid discharge</b> water > harmonize with Environmental Strategy and KEAP.	<b>Short Term</b>	11	0	1	10
38) Design and implementation of <b>recultivation of tailing sites and treatment of acid mine drainage</b> > harmonize with Environmental Strategy and KEAP.	<b>Long Term</b>	11	0	3	8





23) <b>Strengthening public health surveillance systems</b> towards sufficiently comprehensive and sensitive to detect potential effects of climate change on health, e.g. Infectious disease surveillance systems can detect potential "signature" diseases that may affect Kosovo consequent to climate change	++	+	0	0	+	++	+	++	+	+	+	+	+	+	+	+	+	Short Term 2014 – 2016
24) <b>Strengthening joint/participative information production</b> , including a) Different government bodies and non-governmental organisations are involved in setting the TORs and supervising the search, or at least consulted (interviews, surveys etc.), b) Multidisciplinarity: Different disciplines are involved in defining and executing the research: in addition to technical and engineering sciences also for instance ecology and the social sciences, c) Researchers allow their research to be challenged by stakeholders and present their own assumption in as far as they are aware of them, d) Research results are not presented in an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want, e) Uncertainties are not glossed over but communicated (in final reports, orally), f) Researchers are willing to talk with stakeholders about uncertainties	++	?	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	Short Term 2014 – 2015
25) <b>Modernizing the hydrometeorology sector</b> , including a) strengthening forecast & early warning or disaster warning system, b) Long term monitoring of surface and groundwater (quality and quantity)	+	+	+	++	++	+	+	+	+	+	+	+	+	+	+	+	+	Short Term 2014 – 2017
26) <b>Improving communication</b> (exchange of data and produced information), including a) Governments exchange information and data with other governments, b) Open shared information sources that fills gaps and facilitate integration, e.g. an open shared database for data about long term monitoring of surface water (quality and quantity) , c) Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, though the media, etc.	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	Long Term 2014 - 2015 (inception phase) 2014 - 2024 (maintaining)
27) <b>Improving utilization of information</b> , including a) New information is used in public debates (and is not distorted), b) Decision support systems, e.g. hydrometeorological information systems are up to standards, c) Adoption of an M&E plan during project preparation that includes establishment of process indicators, stress reduction indicators, and environmental status indicators	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	Short Term 2014 – 2015
28) <b>Public awareness programs</b> on climate change and how to deal with its impacts, including a) Awareness campaign on the risks of building, living and working in vulnerable areas, b) Awareness campaign on saving water for citizens, companies, factories, etc.	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	Short Term 2014 – 2016
29) <b>Training for professionals</b> , including a) Training on efficient irrigation management for farmers, b) Training on climate change adaptation for advanced professionals in water, agriculture, forestry, land use planning, public health, etc	++	+	0	++	++	++	++	++	++	++	++	++	++	++	++	++	++	Short Term 2014 - 2017
30) <b>Financial and economic measures</b> , including a) Financial resources are diversified by using a broad set of private and public financial instruments, b) Costs are recovered from the 'users' by public and private financial instruments (charges, prices, insurance etc.). Authorities can take loans and depreciate their assets, to facilitate efficient use of resources and replacement of assets, d) Improving private sector participation in water and natural resources management, e.g. by public-private partnerships	++	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Medium Term 2014 – 2018

31) <b>Improving risk management</b> , including a) Risk perception by formal expert judgment and risk perception by the stakeholders, b) Both governmental and non-governmental stakeholders are involved in decisions on what are acceptable risks, c) Harvest insurance mechanisms are available, d) Insurance against housing and property damage is available	++	+	0	0	0	0	0	0	++	+	+	+	Medium Term 2014 – 2018
32) <b>Strengthening the level of, or provisions for, stakeholder participation</b> , including: a) Legal provisions concerning access to information, participation in decision-making (e.g. consultation requirements before decision-making) and access to courts, b) Co-operation structures include non-governmental stakeholders (e.g. environmental NGO's, user groups, citizen groups or private sector), c) Non-governmental stakeholders actually contribute to agenda setting, analysing problems, developing solutions and taking decisions ("coproduction"), d) Non-governmental stakeholders are enabled or allowed to undertake parts of natural resources management themselves, e.g. through water users' associations	++	+	0	0	0	0	0	0	++	+	+	+	Short Term 2014 – 2016
33) <b>Improving cross-sectoral cooperation</b> , including: a) Sectoral governments actively involve other government sectors (e.g. agriculture, nature, environment, tourism, forestry, health, navigation, spatial planning), b) Co-operation structures include government bodies from different sectors; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	++	+	0	0	0	0	0	0	++	+	+	+	Long Term 2014 – 2025
34) <b>Improving cooperation between administration levels</b> , including: a) Lower level governments are involved in decision-making by higher level governments, b) Co-operation structures include government bodies from different hierarchical levels; many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	++	0	0	0	0	0	0	0	++	+	+	+	Long Term 2014 – 2025
35) <b>Improving cooperation across administrative boundaries</b> , including: a) Downstream governments are involved in decision-making by upstream governments, b) International/transboundary co-operation structures exist (e.g. river basin commissions); many contacts generally, c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)	++	++	0	0	0	0	0	0	++	+	+	+	Short Term 2014 – 2015
36) <b>Management plan and rehabilitation measures for Iber-Lepenci channel</b>	++	-	++	+	+	+	+	+	++	+	++	+	Short Term 2015-2018
37) Design and construction of a <b>treatment plant Novoverde mine acid discharge water</b>	++	+	++	++	++	++	++	++	+	+	+	-	Short Term 2015-2016
38) Design and implementation of <b>reclamation of tailing sites and treatment of acid mine drainage</b>	++	--	++	++	++	++	++	++	++	+	+	--	Long Term 2015 – 2025

**Table 6.3 Performance evaluation of interventions as defined in the chapter 6.3**







15) Sustainable groundwater management	4,500,000 - 5,000,000	Medium Term 2014-2018	500,000	500,000	250,000	250,000	250,000	250,000	250,000	500,000	1,500,000	2,500,000
<b>Strategy Component: 3. Forest and biodiversity management</b>												
16) Strengthening forest protection policy	900,000	Short Term 2013-2015	90,000	90,000	315,000	315,000	315,000	315,000	315,000	90,000	405,000	405,000
17) Planting trees/ reforestation, also for dealing with water scarcity and floods	2,700,000	Short Term 2013-2015	270,000	270,000	945,000	945,000	945,000	945,000	945,000	270,000	1,485,000	945,000
18) Ecological corridors to help species migrate	1,500,000 - 2,000,000	Short Term 2011-2015	175,000	175,000	450,000	450,000	450,000	450,000	450,000	175,000	1,175,000	450,000
19) Incorporating local biodiversity objectives into the planning, delivery and management of green infrastructure measures	700,000 - 1,000,000	Medium Term 2012 - 2015	90,000	90,000	300,000	300,000	300,000	300,000	300,000	90,000	480,000	480,000
20) Creating micro-climatic variation and ecologically resilient landscapes	200,000 - 500,000	Short Term 2013-2015	40,000	40,000	180,000	180,000	180,000	180,000	180,000	40,000	200,000	200,000









## 7. NEXT STEPS FOR IMPLEMENTING THE ADAPTATION COMPONENT

This chapter includes recommendations for the implementation of the NAC Kosovo; first section presents recommendations for additional policy analysis work, including financing structures.

### 7.1. ADDITIONAL POLICY ANALYSIS WORK

This section recommends additional policy analysis work (including concept papers) planned to develop more detailed recommendations.

#### 7.1.1. Financing

##### Public-Private Partnerships

One of the main challenges for implementing the NAC Kosovo is finding ways to finance climate change adaptation plans, operations, infrastructure and projects. In the last few decennia, new forms of finance scheme and structures have become available and are now commonly used. These modern forms, finance schedules and structures are often known as public-private partnerships (or PPP's). Within the context of climate change adaptation, PPP's might enable the public sector to spread the cost of the investment over the lifetime, in contrast to traditional financing where the public sector is required to provide capital, while the benefits will come much later and are mostly uncertain. For example in Kosovo, the potential of public-private partnerships related to the climate-proofing of the industrial zones and agricultural activities needs further study.

In some adaptation projects it might be advisable to set up public-private partnerships for the realization of projects, since this could increase efficient and cost effective delivery of the project. It could also provide value for money for the taxpayer through optimal risk transfer and risk management, and create efficiencies from integrating design and construction of public infrastructure with financing, operation and maintenance/upgrading.

PPP's will also create an added value through synergies between public authorities and private sector companies, in particular, through the integration and cross transfer of public and private sector skills, knowledge and expertise. It could also create better competition and greater construction capacity (including the participation of overseas firms, especially in joint ventures and partnering arrangements). Furthermore the delivery of quality public services could be improved through a performance incentive management / regulatory regime, and it could reduce the use of governmental budgets to the benefit of all users of public services.

In short, aspects to consider with PPP's are:

- PPP enables generation of private investments
- PPP enables to mobilize private sector experience
- PPP requires a positive business case (profits)
- PPP creates market discipline if allocation of risks are properly designed (commercial risks should be borne by private partner).
- PPP requires clear responsibilities and commitments, both on public as well as on private side
- PPP cannot represent public interests only
- PPP requires effective dispute resolution schemes

### Economic Diversification

Kosovo might also explore opportunities for entirely new economic activities in the field of renewable energy, for example solar energy, wind resources, with or without coupling to food production, including a community based (and decentralized) method to adapt to and mitigate climate change.

### Payment for ecosystem services

Ecosystem services such as carbon sequestration, flood protection and protection against soil erosion are directly linked to climate change and healthy ecosystems are an essential defence against some of its most extreme impacts. A comprehensive and integrated approach towards the maintenance and enhancement of ecosystems and the goods and services they provide is therefore needed.

For example, in the forestry area in Kosovo it is important to acquire more experience and develop legislation for PFES, Payments for Forest Ecological Services. This experience shows that working with nature's capacity to absorb or control impacts in urban and rural areas can be a more efficient way of adapting than simply focusing on physical infrastructure. Green Infrastructure<sup>49</sup> can play a crucial role in adaptation by providing essential resources for social and economic purposes under extreme climatic conditions. Examples include improving the soil's carbon and water storage capacity, and conserving water in natural systems to alleviate the effect of droughts and to prevent floods, soil erosion and desertification. Hence, it is important to explore the potential for policies and measures to boost ecosystem storage capacity for water in Kosovo, and more in general the potential for payment of ecosystem services.

## **7.1.2. Drafting, amendment and implementation/ enforcement of laws**

### Law revision and enforcement on forest protection

One of the most important threats to sustainable and climate-resilient water management mentioned by stakeholders is the uncontrolled cutting of forest areas for construction materials, firewood and charcoal. A possible alternative to dealing with illegal cutting is payment for ecosystem services (see previous section).

## **7.1.3. Governance of Climate Adaptation**

### **Aligning interests and harmonizing sectoral policies**

Correcting the mismatch or conflict among sectoral policies is one of the biggest challenges for the governance of climate change adaptation. Typically, the political gain and economic incentives weigh in heavily on the side of the water using sectors, particularly the interests of agriculture and municipal and industrial supply. Further study is needed on what governance mechanism can ensure that sectoral policies and integrated planning promote good natural resources and environmental management.

### **Set up of inter-sectoral coordination mechanisms**

Some approaches to promote inter-sectoral coordination have been proposed during the planning process: (i) confiding a coordination role to a neutral ministry, typically the Ministry of the Environment and Spatial Planning or alternatively the Ministry of Education, Science and Technology, to reconcile the interests of different sectors; and (ii) institutional analysts have also

<sup>49</sup> Green Infrastructure is the interconnected network of natural areas including some agricultural land, such as greenways, wetlands, parks, forest preserves and native plant communities, that naturally regulate storm flows, temperatures, flooding risk, and water, air and ecosystem quality.

proposed multi-level governance as a mechanism to facilitate cross-sectoral harmonization as well as vertical linkages between the center and the local level. It is recommended to confide a coordination role to a neutral ministry to reconcile the interests of different sectors. By doing this, it is possible to facilitate data and information sharing between sectors. A prelude to this could be the experience of the Water Task Force in Kosovo, which has now transformed into the Inter-Ministerial Water Council, chaired by DPM, and comprising also of Ministers of MED, MESP, MLGA and MEI.

### **Groundwater needs to be adequately factored into IWRM planning**

Where integrated water resources management planning has been adopted, whether at the level of national master plans or at the local river basin level, specific dedicated human and financial resources should be devoted to groundwater. Some activities, of course, are common between groundwater and surface water, so creation of entrenched “empires” needs to be avoided. For example, groundwater management can benefit from the experiences in surface water with regard to participatory approaches and collective choice arrangements, which are often more developed for surface water management. Nonetheless, groundwater requires specialized capacity in term of knowledge and resource monitoring and additional efforts for information and communication compared to surface water. Before anything, Kosovo needs to develop a groundwater monitoring network, since there is no baseline data on groundwater availability, amount and quality.

### **Open access to and exchange of data and information**

An important issue regarding the improvement of coordination and cooperation in the water sector is a free exchange of relevant data and information on hydrology, hydraulics and meteorology. It is realized that the collection of such data and information is costly and as such field monitoring is a capital investment. Nevertheless, a mechanism will be necessary for better and free exchange of data between relevant institutions, in order to improve governance of adaptation and not to hamper social and economic development. Probably the national government should take the lead in setting up an acceptable system that will be adopted by other government parties as well as research institutions etc. For example, the Water Strategy project in Kosovo is developing a Water Information System at the end of 2013, in compliance with the requirements of the Water Law.

**Various Recommendations** regarding the governance of climate adaptation:

- Ensure to delegate decision making regarding local problems and local projects to the appropriate corresponding local level of government (the principle of subsidiarity).
- Improve the participatory decision making and consensus building.
- Ensure equity and social fairness between stakeholders and inhabitants, when taking decisions about strategy design/selection and project implementation.

## ANNEX 1: KEY DEFINITIONS

This glossary provides common definitions of the terms used frequently in this report, and by the climate change community in general. It was taken from the European Climate Adaptation Platform. The Platform compiles the most relevant terms from various reports, including the IPCC's 4th assessment reports of the different working groups (Working Group I, II and III) and the UN ISDR.

### **Abrupt climate change**

The nonlinearity of the climate system may lead to abrupt climate change, sometimes called rapid climate change, abrupt events or even surprises. The term abrupt often refers to time scales faster than the typical time scale of the responsible forcing. However, not all abrupt climate changes need to be externally forced. Some possible abrupt events that have been proposed include a dramatic reorganisation of the thermohaline circulation, rapid deglaciation and massive melting of permafrost or increases in soil respiration leading to fast changes in the carbon cycle. Others may be truly unexpected, resulting from a strong, rapidly changing forcing of a nonlinear system.

### **Adaptation**

Adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation..

### **Adaptive capacity (in relation to climate change impacts)**

Adaptive capacity describes the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

### **Baseline/reference**

The baseline (or reference) is the state against which change is measured. It might be a 'current baseline', in which case it represents observable, present-day conditions. It might also be a 'future baseline', which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.

### **Climate**

Climate in a narrow sense is usually defined as the 'average weather', or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system. The classical period of time is 30 years, as defined by the World Meteorological Organization (WMO).

### **Climate change**

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), which defines 'climate change' as: 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'.

## Climate (change) scenario

A plausible and often simplified representation of the future climate, based on an internally consistent set of climatologically relationships and assumptions of radiative forcing, typically constructed for explicit use as input to climate change impact models. A 'climate change scenario' is the difference between a climate scenario and the current climate.

## Climate sensitivity

In IPCC reports, equilibrium climate sensitivity refers to the equilibrium change in the annual mean global surface temperature following a doubling of the atmospheric equivalent carbon dioxide concentration. Due to computational constraints, the equilibrium climate sensitivity in a climate model is usually estimated by running an atmospheric general circulation model coupled to a mixed-layer ocean model, because equilibrium climate sensitivity is largely determined by atmospheric processes. The effective climate sensitivity is a related measure that circumvents the requirement of equilibrium. It is evaluated from model output for evolving non-equilibrium conditions. It is a measure of the strengths of the climate feedbacks at a particular time and may vary with forcing history and climate state. The climate sensitivity parameter (units:  $^{\circ}\text{C} \cdot [\text{W m}^{-2}]^{-1}$ ) refers to the equilibrium change in the annual mean global surface temperature following a unit change in radiative forcing. The transient climate response is the change in the global surface temperature, averaged over a 20-year period, centred at the time of atmospheric carbon dioxide doubling, that is, at year 70 in a 1 % yr<sup>-1</sup> compound carbon dioxide increase experiment with a global coupled climate model. It is a measure of the strength and rapidity of the surface temperature response to greenhouse gas forcing.

## Climate system

The climate system is defined by the dynamics and interactions of five major components: atmosphere, hydrosphere, cryosphere, land surface, and biosphere. Climate system dynamics are driven by both internal and external forcing, such as volcanic eruptions, solar variations, or human-induced modifications to the planetary radiative balance, for instance via anthropogenic emissions of greenhouse gases and/or land-use changes.

## Climate variability

Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability).

## Cost-benefit analysis

Monetary measurement of all negative and positive impacts associated with a given action. Costs and benefits are compared in terms of their difference and/or ratio as an indicator of how a given investment or other policy effort pays off seen from the society's point of view.

## Disaster

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Comment: Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects

on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. There are different ways in which disasters can be framed. See for example an inventory made for the disaster reduction community.

### **Disaster risk**

The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period. The definition of disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.

### **Disaster risk management**

Disaster risk management stands for a systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. This term is an extension of the more general term "risk management" to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

### **Disaster risk reduction**

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

### **Emission scenario**

An emission scenario is a plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g. greenhouse gases, aerosols), based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socioeconomic development, technological change) and their key relationships. Concentration scenarios, derived from emission scenarios, are used as input to a climate model to compute climate projections. In IPCC (1992) a set of emission scenarios was presented which were used as a basis for the climate projections in IPCC (1996). These emission scenarios are referred to as the IS92 scenarios. In the IPCC Special Report on Emission Scenarios (Nakienovi and Swart, 2000) new emission scenarios, the so-called SRES scenarios, were published, some of which were used, among others, as a basis for the climate projections presented in TAR-IPCC (2001) and 4AR-IPCC (2007).

### **Extreme weather event**

An extreme weather event is an event that is rare at a particular place and time of year. Definitions of rare vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile of the observed probability density function. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense. Single extreme events cannot be simply and directly attributed to anthropogenic climate change, as there is always a finite chance the event in question might have occurred naturally. When a pattern of extreme weather persists for some time, such as a season, it may be classed as an

extreme climate event, especially if it yields an average or total that is itself extreme (e.g. drought or heavy rainfall over a season).

### **Global warming**

Global warming refers to the gradual increase, observed or projected, in global surface temperature, as one of the consequences of radiative forcing caused by anthropogenic emissions.

### **Greenhouse gas effect**

Greenhouse gases effectively absorb thermal infrared radiation, emitted by the Earth's surface, by the atmosphere itself due to the same gases, and by clouds. Atmospheric radiation is emitted to all sides, including downward to the Earth's surface. Thus, greenhouse gases trap heat within the surface-troposphere system. This is called the greenhouse effect. Thermal infrared radiation in the troposphere is strongly coupled to the temperature of the atmosphere at the altitude at which it is emitted. In the troposphere, the temperature generally decreases with height. Effectively, infrared radiation emitted to space originates from an altitude with a temperature of, on average,  $-19\text{ }^{\circ}\text{C}$ , in balance with the net incoming solar radiation, whereas the Earth's surface is kept at a much higher temperature of, on average,  $+14\text{ }^{\circ}\text{C}$ . An increase in the concentration of greenhouse gases leads to an increased infrared opacity of the atmosphere, and therefore to an effective radiation into space from a higher altitude at a lower temperature. This causes a radiative forcing that leads to an enhancement of the greenhouse effect, the so-called enhanced greenhouse effect.

### **Greenhouse gas (GHG)**

Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour ( $\text{H}_2\text{O}$ ), carbon dioxide ( $\text{CO}_2$ ), nitrous oxide ( $\text{N}_2\text{O}$ ), methane ( $\text{CH}_4$ ) and ozone ( $\text{O}_3$ ) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, dealt with under the Montreal Protocol. Beside  $\text{CO}_2$ ,  $\text{N}_2\text{O}$  and  $\text{CH}_4$ , the Kyoto Protocol deals with the greenhouse gases sulphur hexafluoride ( $\text{SF}_6$ ), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

### **Hazard**

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

### **Likelihood**

The likelihood is described as an occurrence, an outcome or a result, where this can be estimated probabilistically.

### **Maladaptation**

Action or investment that enhances vulnerability to climate change impacts rather than reducing them. E.g. in the face of rising sea-levels it would be maladaptive to build new key infrastructure on a shallow coastline (UKCIP).

**Measures**

Adaptation measures are technologies, processes, and activities directed at enhancing our capacity to adapt (building adaptive capacity) and at minimising, adjusting to and taking advantage of the consequences of climatic change (delivering adaptation).

**Mitigation**

An anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies and measures to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks. Examples of mitigation measures are renewable energy technologies, waste minimization processes and public transport commuting practices, etc.

**Natural hazard**

Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

**Prevention**

Prevention is an outright avoidance of adverse impacts of hazards and related disasters. Prevention (i.e. disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.

**Projection**

The potential evolution of a quality or set of quantities, often computed with the aid of a model. Projections are distinguished from predictions in order to emphasise that projections involve assumptions — concerning, for example, future socio-economic and technological developments, that may or may not be realised — and are therefore subject to substantial uncertainty.

**Resilience**

Resilience describes the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for selforganisation, and the capacity to adapt to stress and change.

**Risk**

Risk is a combination of the probability of an event and its negative consequences. This definition closely follows the definition of the ISO/IEC Guide 73. The word “risk” has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in “the risk of an accident”; whereas in technical settings the emphasis is usually placed on the consequences, in terms of “potential losses” for some particular cause, place and period. It can be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks.

**Scenario**

A plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections, but are often based on additional information from other sources, sometimes combined with a narrative storyline.

**Socio-economic scenarios**

Scenarios concerning future conditions in terms of population, gross domestic product and other socio-economic factors relevant to understanding the implications of climate change.

**Threshold**

A threshold is a level of magnitude of a system process at which sudden or rapid change occurs. A point or level at which new properties emerge in an ecological, economic or other system, invalidating predictions based on mathematical relationships that apply at lower levels.

**Uncertainty**

An expression of the degree to which a value (e.g. the future state of the climate system) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined concepts or terminology, or uncertain projections of human behaviour. Uncertainty can therefore be represented by quantitative measures, for example, a range of values calculated by various models, or by qualitative statements, for example, reflecting the judgement of a team of experts.

**Vulnerability**

Vulnerability is the degree, to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.

## ANNEX 2: LEDC INTERVENTION SHEETS (DESCRIPTION OF PRIORITY NAMAS)

LEDC Intervention Sheet No.1		
<b>Setting up National Inventory System of and strengthening reporting on GHG (KEPA)</b>		
<b>Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):</b> Enabling action	<b>Location:</b> Kosovo wide	<b>Type of intervention:</b> Capacity building Regulatory instruments
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• Build the local capacity for data collection and reporting,</li> <li>• Develop the GHG inventory for future use under the UNFCCC, including the base year</li> </ul>		
<p><b>Description of Action:</b></p> <p>Set up the 'national inventory system' and 'system for policies and measures and projections' according to the Article 3 (2) and (15) of the EU Regulation No 525/2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change. This means a system of institutional, legal and procedural arrangements established within a Member State for estimating anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information in accordance with Decision 19/CMP.1 or other relevant decisions of UNFCCC or Kyoto Protocol bodies;</p> <p>The system of institutional, legal and procedural arrangements established for reporting policies and measures and projections of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol as National Inventory System for GHG emissions should also:</p> <ul style="list-style-type: none"> <li>• address reporting on projections, policies and measures and provide consistency with other legal instruments targeting air pollutants.</li> <li>• This is an efficient way forward as, despite the related burden, it will lead in the long-run to better compliance, simplification and lower costs.</li> <li>• The proposal also includes better quality assurance / quality control provisions and introduces streamlined reporting formats and guidance to increase the quality and completeness of the data provided and to simplify existing reporting requirements without imposing an undue administrative burden.</li> </ul> <p>This system will be developed within the MESP and KEPA.</p>		
<p><b>Expected Results / Impacts:</b></p> <p>Annual reporting on GHG emissions to EEA and subsequently to UNFCCC</p>		
<p><b>Responsibilities:</b></p> <ul style="list-style-type: none"> <li>• Ministry of Environment and Physical Planning</li> <li>• Kosovo Environment Protection Agency</li> </ul>		
<p><b>Expected co-benefits:</b></p> <p>A basis for setting GHG emission reduction objectives and for future climate policy formulation</p>		
<b>Preparatory cost:</b> 100 000 EUR	<b>Investment Cost:</b> 1,5 million EUR	<b>Investment period:</b> 2014 - 2020
<p><b>Expected sources of funding:</b></p> <ul style="list-style-type: none"> <li>• Ministry of Environment and Physical Planning</li> <li>• Kosovo Environment Protection Agency</li> <li>• International Donors: EU TAIEX, IPA,</li> </ul>		

## LEDC Intervention Sheet No.2

## Implementing Kosovo Energy Efficiency Action Plan 2010-2018

**Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):**  
Around 0,7 Mt

**Location:**  
Kosovo wide

**Type of intervention:**  
Regulatory  
Legal and planning instruments  
Financing mechanism

**Objective:**

81,89 ktoe of energy saved by 2018, or 9% compared to the average consumption 2003 – 2007 in accordance with the directive 2006/31/EC

**Description of Action:**

The Action plan includes measures in the following sectors:

Sector	Estimated costs EUR	Contribution to energy savings 2010 – 2012 %
Households	10 385 000	40
Services	7 239 125	30
Industry	Included in households budget	25
Transport	Included in households budget	4,5
Agriculture	Included in households budget	0,5
Total	17 624 125	100

In the households sector includes regulatory, capacity building, communication and financing the following measures are envisaged:

- Thermo-renovation,
- Introduction of LPG for cooking and heating,
- Promotion of efficient cogeneration of heat and power.
- Promotion of central and district heating
- Promotion of new, efficient boilers
- Solar panels for hot water preparation
- Use of efficient household equipment

For the services sector, the following areas of intervention are planned:

- Enforcement of electricity payment
- Introduction of heating oil and LPG for space heating and cooking
- Improvement of thermal insulation in private and public buildings
- Solar panels for hot water preparation
- Introduction of combined heat and power scheme from Kosovo B TPP
- Introduction of small scale combined heat and power and central heating systems
- Energy Audits in public and private buildings
- Improved electric and electronic equipment and energy management

In industry, it is expected that the renewed investment in industry will also bring energy efficiency gains. In addition to this, the following measures are planned:

- Promotion of EE in SMEs
- Energy audits

Transport and agriculture will be tackled mainly through awareness raising and studies into possible energy efficiency measures.

<p><b>Expected Results / Impacts:</b></p> <ul style="list-style-type: none"> <li>• Capacity building programmes implemented</li> <li>• Administrative instructions and other regulations adopted and implemented</li> <li>• Energy auditing system in place</li> <li>• Financial instruments such as loans in place</li> </ul>		
<p><b>Responsibilities:</b></p> <ul style="list-style-type: none"> <li>• Ministry of Economic Development (MED)</li> <li>• Energy Regulatory Office (ERO)</li> <li>• Ministry of Environment and Spatial Planning (MESP)</li> <li>• Municipal Authorities</li> <li>• Banks</li> </ul>		
<p><b>Expected co-benefits:</b></p> <ul style="list-style-type: none"> <li>• Reduced energy poverty</li> <li>• Improved quality of electricity supply</li> <li>• Reduced air pollution</li> </ul>		
<p><b>Preparatory cost:</b> Done</p>	<p><b>Investment Cost:</b> 17,6 million EUR</p>	<p><b>Investment period:</b> 2010 - 2018</p>
<p><b>Expected sources of funding:</b></p> <ul style="list-style-type: none"> <li>• Government budget</li> <li>• Local authority budget</li> <li>• International Donors: EU, KfW, WB, EBRD, GIZ</li> <li>• Banks: Pro-Credit, Raiffeisen,</li> <li>• Business sector (domestic, international)</li> <li>• Households</li> </ul>		

LEDC Intervention Sheet No.3		
<p><b>Implementing National Renewable Energy Action Plan (NREAP) 2011 - 2020</b></p>		
<p><b>Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):</b> n.a.</p>	<p><b>Location:</b> Kosovo wide</p>	<p><b>Type of intervention:</b></p> <ul style="list-style-type: none"> <li>• Regulatory</li> <li>• Financial</li> </ul>
<p><b>Objectives:</b></p> <p>The NREAP defines targets for three sectors: electricity generation, transport and heating and cooling sector.</p> <ul style="list-style-type: none"> <li>• 25.64 % of RES in gross final consumption of electricity</li> <li>• 10 % of RES in final consumption of energy in transport</li> <li>• 45.65 % of RES in gross final consumption for heating and cooling</li> </ul>		

**Description of Action:**

The achievement of annual RES energy targets is envisaged to come from the development of new energy generation capacities that use different RES technologies, in all three sectors: electricity; thermal energy for cooling and heating, and transport. The following new generation capacities are also envisaged to support the fulfillment of the RES energy target for 2020:

- 25.64 % of RES in gross final electricity consumption shall be achieved through the construction of the following generation capacities:
- In the electricity sector, RES generation increases are based on the development of small and large hydro power plants: 240 MW from small hydro power plants; 305 MW from HPP Zhuri, 150 MW from wind, 14 MW from Biomass, and 10 MW from photovoltaic plants. The electricity sector contributes to the overall RES target with 10.1 %.
- 10 % of RES in the final consumption in transport shall be achieved through the use of bio-fuels, as determined in the AI on the use of biofuels in transport.
- The sectorial RES target in transport is calculated in accordance with Article 3(4) of the Directive 2009/28/EC is 10 %. However, the actual rate in the overall energy consumption in transport (which is higher than the amount calculated in Accordance with Article 3 (4), due to the use of kerosene, jet fuel and transport oil), is at the level of 9.24 %. The contribution of this sector in the overall target is set at 2.1 %.
- 45.65 % of RES in the final consumption for heating and cooling shall be achieved through the development of the new generation capacities, as follows:

Solar energy of 70 MWth, 10 MWth from thermal pumps.

Heating and cooling sector contribute to overall RES target in 2020 with 17.2 percent points. The main contribution is from use of biomass in the form of traditional logwood, which will continue to be the most important heating source in Kosovo.

**Expected Results / Impacts:**

- Regulatory Framework in line with the relevant EU directives for the promotion and attraction of investments for the production of electricity from renewable sources.
- Potentials of renewable energy based on advanced research and measurements methodologies for each of the above sources.

**Responsibilities:**

- Ministry of Economic Development (MED)
- Energy Regulatory Office (ERO)
- Ministry of Environment and Spatial Planning (MESP)
- Municipal Authorities
- Kosovo Forestry Agency
- KOSTT
- KEDS

**Expected co-benefits:**

- Capacity building in the field of renewable energy
- Development of businesses and workplaces in the renewable energy sector
- Approach to energy and environmental policy of EU
- Less import of fossil fuels

**Preparatory cost:**

N.a.

**Investment Cost:**

N.a.

**Investment period:**

2011 - 2020

**Expected sources of funding:**

Kosovo is planning to achieve the overall target with domestic sources; hence the usage of cooperation mechanisms is not envisaged.

## LEDC Intervention Sheet No.4

**Increasing the efficiency of production of electricity through replacement of TPP Kosovo A with Kosovo Re Power Plant****Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):**

There will be specific reduction of CO<sub>2</sub> (ca. 37%), but due to increased production with the construction of new PP (approximately 50%) the total CO<sub>2</sub> emission will increase by ca. 22%.

**Location:**  
Obiliq

**Type of intervention:**  
Infrastructural project

**Objectives:**

Reducing carbon intensity by increasing the conversion efficiency and co-generation.

**Description of Action:**

According to strategic documents, Kosovo plans to construct new capacity for the production of electricity from coal (2x300 MW).

Construction of new capacity should be viewed in the context of replacing the capacity of TPP Kosovo A (Units A3, A4, A5, constructed during 1970-75) with new one, but with higher efficiency and advanced co-generation technology. This project was also included on the list of Projects of Energy Community Interest by the EnCT Ministerial Council in October 2013.

**Expected Results / Impacts:**

- CO<sub>2</sub> emissions from TPP Kosovo A range 1.4 - 1.5 tons/MWh, while it is estimated that the new TC will emit 0.92 tons/MWh, or ca. 37% less than the TPP Kosovo A
- Through the application of co-generation technology (combined production of electricity and thermal energy), it would be possible to greatly reduce the use of electricity for heating in Prishtina. Ca. 1800 GWh/year of electricity is consumed for heating only!

**Responsibilities:**

- Kosovo Government
- Ministry of Economic Development/Ministry of Environment and Spatial Planning

**Expected co-benefits:**

- Higher safety in electricity production,
- Quality supply,
- Rational use of mineral resources,
- Lower emission of fly ash and other environmental harmful gases,
- Higher economy development stability.

**Preparatory cost:**

It is part of the cost of studies for the construction of the new TPP.

**Investment Cost:**

1,2 – 1,5 billion EUR  
The capacity planned for construction: 2x300 MW

**Investment period:**

2014 - 2019

**Expected sources of funding:**

- Government budget
- International Donors
- Business sector (domestic, international)

LEDC Intervention Sheet No.5		
<b>Prevention of lignite self-ignition in Kosovo coal mine</b>		
<p><b>Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):</b> There is no data about the quantity of the gas emissions from lignite self-ignition, but it is estimated that there is a significant amount of CO<sub>2</sub> and NH<sub>4</sub> emissions. Through the proposed measures emission can be reduced by 90%.</p>	<p><b>Location:</b> Lignite opencast mines</p>	<p><b>Type of intervention:</b> Human capacity building and provision of necessary additional equipment.</p>
<p><b>Objectives:</b> Preventing emission of CO<sub>2</sub> and NH<sub>4</sub> from lignite self-ignition</p>		
<p><b>Description of Action:</b> In the context of environmental management and operational aspects, mines will develop special training teams for fighting fires and avoid lignite self-ignition. Additional equipment needed for this purpose will be acquired.</p>		
<p><b>Expected Results / Impacts:</b> Cessation and prevention of lignite self-ignition and therefore prevention of the emission of CO<sub>2</sub> and NH<sub>4</sub>.</p>		
<p><b>Responsibilities:</b></p> <ul style="list-style-type: none"> <li>• Implementation: KEK, respectively Division of coal production</li> <li>• Supervision: MESP, respectively environmental inspectorate</li> </ul>		
<p><b>Expected co-benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved air quality, with particular importance for workers but also for surrounding residents.</li> <li>• Increased stability of slopes and safety.</li> <li>• Avoiding losses of a considerable quantity of coal through self-ignition.</li> </ul>		
<p><b>Preparatory cost:</b> Training costs: 50.000 – 100.000 (€)</p>	<p><b>Investment Cost:</b> With a donation of EC, in 2005/06 were purchased equipment for fighting fires in mines.</p>	<p><b>Investment period:</b> Continuous investment in framework of environmental management.</p>
<p><b>Expected sources of funding:</b> Kosovo Energy Cooperation – Coal production division</p>		

## LEDC Intervention Sheet No.6

## Using non-hazardous solid waste (municipal, tires,...) as alternative fuel in industrial production

**Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):**  
To be determined

**Location:**

- Kosovo wide
- Cement industry

**Type of intervention:**

- Policy framework
- Feasibility study
- Investment

**Objectives:**

Develop a financially and environmentally sustainable system of using non-hazardous solid waste as renewable energy source in the cement industry for and waste management that will respond to present and future needs of the people and to the economy of Kosovo.

**Description of Action:**

Municipal solid waste (MSW), when landfilled is an important source of methane emissions. This can be avoided using higher recycling rates and composting, or by using waste as energy source. Cement kilns, due to long retention time, represent the most environmentally acceptable and economic method of energy use of waste. Kosovo cement industry could use all the residual municipal waste and other non-hazardous waste such as car tyres arising in Kosovo as a source of energy without major investment. The action includes:

- Development of a strategic plan for waste management
- Development of local plans for waste management
- Optimization of the collection system for municipal waste
- Improvement and expansion of waste management infrastructure
- Feasibility study for waste co-processing in the industry and waste incineration condition

**Expected Results / Impacts:**

Emission reduction due to replacement of fossil fuels (heavy fuel oil) with renewable energy source (waste)

Reduced volume of residual waste and of demand for landfill space.

**Responsibilities:**

- Ministry of Environment and Spatial Planning
- Ministry of Economic Development
- Ministry of Finance
- Industry sector (cement industry )
- Public private partnership

**Expected co-benefits:**

- Reduction of energy consumption and import of fossil fuels in cement industry.
- Avoidance of investment in landfills.
- Saving resources and reduction of emissions and waste.
- Increased competitiveness of the cement industry

**Preparatory cost:**

Feasibility studies and preparation of plan for AF (RDF) production plant from municipality waste

**Investment Cost:**

Total production costs of municipality waste using for cement production : 1.621.050 €

**Investment period:**

2014-2017

**Expected sources of funding:**

- Government budget
- Local authority budget
- International Donors
- Industrial sector

<b>Sustainable mobility concepts in the cities and towns of Kosovo</b>		
<b>Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):</b> Enabling action	<b>Location:</b> • - Prishtina and other major towns	<b>Type of intervention:</b> • Capacity building • Legal and planning instruments • Pilot infrastructure projects
<b>Objectives:</b> Initiate sustainable mobility planning and promotion in major population centres of Kosovo		
<b>Description of Action:</b> Building local and national level capacity for mobility planning.  Development and implementation of a sustainable transport concepts for Prishtina and other towns in line with the EU CIVITAS programme based on the positive experience with the establishment of pedestrian zones. Promotion of walking, cycling and public transport.		
<b>Expected Results / Impacts:</b> At least one pilot action per city or town implemented.		
<b>Responsibilities:</b> • Municipalities • Ministry of Environment and Physical Planning • Ministry of Transport		
<b>Expected co-benefits:</b> • Reduced air pollution in the cities, reduced number of deaths and disease caused by pollution in line with the EU Air Quality Directive • Increased quality of life and attractiveness of urban areas • Improved traffic safety		
<b>Preparatory cost:</b> 100 000 EUR	<b>Investment Cost:</b> 2 million EUR	<b>Investment period:</b> 2014 - 2020
<b>Expected sources of funding:</b> • Local authority budget • International Donors: EU		

### LEDC Intervention Sheet No.7

#### Manure storage, preparation and application methods

<b>Estimated emission reduction potential (Mt CO<sub>2</sub> eq/annum):</b> To be determined	<b>Location:</b> - Kosovo wide (new and existing Livestock farms)	<b>Type of intervention:</b> • Financing mechanism • Infrastructural project • Feasibility study
<b>Objective</b> • Implement modern the manure storage at the livestock farms. • Improve manure management contributing to reduction of NOx and methane emissions • Enable biogas capture at farms		

**Description of Action:**

Livestock manure handling, storage and management are very important part of every livestock operation. The benefits of manure storage include protect/improve ground and surface water, improve nutrient management, and eliminate spreading of it as well as improved nutrient management and risk of the nutrient run-off.

Nutrient composition of the manure varies with the number of the factors one of the important factor is storage and handling of the manure. Because of that, proper design and management of the manure storage is required for any livestock production system. Manure storage structures have important role in reduction of the leakage of minerals from animal housing and manure storage into ground water and surface water as well as reduction of the evaporation of ammonia. Training/ capacity building on use of livestock manure and slurries as a valuable asset and applying to agricultural land in accordance with principles (timely, with proper quantity and quality). Adequate manure storage is a necessary precondition for capture and use of biogas at the farms. Activity includes:

- Establishing of the new modern manure storage at the level of livestock farm.
- Capacity building training in the proper use of facilities and associated equipment for manure handling.
- Feasibility study - Potential for using of the manure for production of the biogas.
- Pilot biogas capture systems

**Expected Results / Impacts:**

- Increased number of the new modern manure storage – number / monitoring
- Increased number of biogas capture systems contributing to methane emission reduction
- Reduced point pollution of land and ground and surface water through the leakage of minerals from manure. – reduce number of the polluted points
- Manure storage allows more timely application of manure according to the requirements of the crop. – quantity and quality of the manure
- Increased possibility to introduce and control a system of balanced application of manure to land.

**Responsibilities:**

- Ministry of Agriculture, Forestry and Rural Development,
- Advisory Services,
- Ministry of Environment and Spatial Planning Municipalities,
- Households.

**Expected co-benefits:**

- Environmental and nature conservation
- Proper storage and handling of animal manure with reduce significantly effect at the environment (particularly emission of ammonia, greenhouse gasses and odour).
- Choice of technology for handling the animal manure is therefore crucial in the attempt to limit the environmental effects and loss from animal manure.
- Economic development

**Preparatory cost:**

Feasibility study - Use of the manure for production of the biogas – 200 000 euro

**Investment Cost:**

Investment cost for building of the manure storage for the average 15 dairy cows it around 4.000 euro  
Total 3 000 000 euro

**Investment period:**  
2014 -2020

**Expected sources of funding:**

- Government budget - estimation
- IPA Rural development programme
- International Donors
- Households

## LEDC Intervention Sheet No.8

## Implementing Climate Protection Strategy in the Forest Sector in Kosovo

**Estimated emission reduction potential(Mt CO<sub>2</sub> eq/annum):**

Full potential: 2,4 - 3,2 Mt

20% reduction target: 0,3 - 1,3 Mt

**Location:**

Kosovo wide

**Type of intervention:**

- Capacity building
- Legal and planning instruments
- Enforcement
- Financing

**Objective**

To ensure long-term increase in growing stock and forest productivity, conservation of forest resources through preventing illegal logging, silviculture, afforestation, reforestation, soil conservation, and to promote the efficient use of forest resources.

**Description of Action:**

Mitigation activities are to be identified in the fields of:

- Preventing illegal logging
- Silviculture (restore degraded coppice forest for bio-energy use, forest conversion to middle and high forest, timely pre-commercial thinning, improved success rate of regeneration, mixed species to improve stand stability and diversify income)
  - Shift of production of fuelwood from all forest types with environmental functions to designated bioenergy forests, preferable coppice forests nearby infrastructure, on good soils (ALS high) with long term conversion to coppice with standards forest for joint timber production
  - Increase carbon sequestration rate in commercial forest for timber production by silvicultural treatment towards long-term wood products (HWP)
  - Increase carbon storage in soils in conservation/protection forests through restoration of these forests
- Forest protection (remove wood residues after calamities, good practice in wood harvest (not at dbh height), more effective monitoring and combating of pest and diseases, more effective monitoring and combating of wildfires)
- Promote AR activities
- Avoid deforestation
- Outside the forest sector:
  - Improve fuelwood use efficiency (no fresh wood burnt)
  - Improve land use efficiency remaining land for timber, reduce imports)

**Expected Results / Impacts:**

- Emission reduction between 0,3 and 1,3 Mt CO<sub>2</sub> eq. annually by 2020
- Increased forest area
- Increased standing volume of forests
- Less illegal logging
- Reduced area affected by forest fires

**Responsibilities:**

- Ministry of Agriculture, Forestry and Rural Development,
- Kosovo Forest Agency,
- Kosovo Police,
- Emergency Management Agency,
- Advisory Services,
- Ministry of Environment and Spatial Planning
- Municipalities and Households.

**Expected co-benefits:**

List the expected benefits other than emission reduction, in areas such as adaptation, economic development, poverty reduction, workplaces, social security, gender equality, environmental protection, nature conservation

- Improved environment protection
- Improved nature conservation
- Increased availability of wood and other forest products
- Improved rural economy

**Preparatory cost:**

No

**Investment Cost:**

2,700,000 euro

**Investment period:**

2013 -2015

**Expected sources of funding:**

- Government budget
- Private sector
- International donors including: Bio Carbon Fund of the World Bank (BIOCF), German Climate Protection Fund, GEF Small Grants Program: Climate Change

## ANNEX 3: NAC INTERVENTION SHEETS

NAC Intervention Sheet No. 01		
<b>Name:</b> <b>Restriction of settlement/            building in risk-prone areas</b>	<b>Location: Kosovo</b> <b>Vulnerable areas from erosion            and flooding</b>	<b>Type of intervention:</b> 1. <b>Preparing of Urban            Development Plans</b> 2. <b>Draft and Implementation            of Laws</b> 3. <b>Physical intervention</b>
<b>Objective:</b> To restrict building of the settlements at the vulnerable areas from flooding and erosion.		
<b>Rationality</b> Natural resources, private and social assets created and planned in different areas of Kosovo are threatened by erosion and flooding. Erosion as well as flooding are manifested by degradation and floods of agricultural land , forest, road and rail network and facilities construction and settlements Based on the existing data almost whole territory of Kosovo is under the threats from erosion, about 55% of the entire territory belongs to the categorise I, II and III and the rest 45% belongs to categories IV and V which categories are less endangers from the erosion. Regarding to floods, they occur at the river basins. Based on the data from surveys about 491 km of the length of rivers are at risk of flooding, so far only 140km or 28% are fixed from the total length of the rivers which are at risk of flooding. Considering the current status of rivers banks, it is estimated around 34,000 ha are vulnerable from possible floods.		
<b>Intervention:</b> From the data that was presented at the rationality of the objective of this intervention sheet, it is very clear that the huge territory of Kosovo is under the threat from different categories of the erosion as well as from flooding particular the places which are near the rivers basins. In order to prevent establishing the new settlements and to protect the existing settlements from erosion and flooding is needed to take some interventions. At this stage should focus on in two directions, which include both adequate policies as well as implementation of pilot projects. <ul style="list-style-type: none"> <li>• Completion of all urban development plans, in order to use more rational and functional the urban areas as well as stopping the uncontrolled construction and development of the settlements (by 2020)</li> <li>• Creating registry database for river flows.</li> <li>• Review maps of vulnerable areas along the river beds</li> <li>• Alarm system and flood forecasting</li> <li>• At the national level to increase the professional staff prediction, monitoring and alarm constant.</li> </ul> General <ul style="list-style-type: none"> <li>• Cooperation between government institutions</li> <li>• Establishing of proper monitoring system</li> <li>• Financial support</li> </ul>		
<b>Results / Impacts:</b> Implementation of the urban plans as well as Law for on Construction land: <ul style="list-style-type: none"> <li>• Will reduce expansion of uncontrolled development of settlements</li> <li>• Will reduce/ stop with constructions at the risk prone areas.</li> </ul> Technical intervention : <ul style="list-style-type: none"> <li>• Reduce damages from flooding, less number of floods, less damages at the level of settlements, less damages for agriculture (crops cultivate near the rivers)</li> <li>• Reduce erosion, reduce loss of the soils (use for agriculture )</li> <li>• Reduce damages for landscapes, biodiversity, etc.</li> </ul>		
<b>Responsibilities:</b> Government, MESP, MAFDR / KFA/ Advisory Services as well as municipalities		
<b>Investment Cost:</b> <ul style="list-style-type: none"> <li>• 10,000</li> <li>• 4,560,000</li> </ul>	<b>Investment period:</b> Timeline: 2015 / Law on construction Timeline:2020 / Urban plan for developments Timeline: Technical intervention	

**NAC Intervention Sheet No. 02****Name:**  
**Rehabilitation of river banks****Location: Kosovo wide****Type of intervention:**  
**Non-structural and structural measures****Objectives:**

Floods have been a major natural hazard in many regions of the world. Changes in precipitation patterns are forecasted by all climate model simulations, meaning that the frequency and the intensity of rains will vary over time.

Flood frequency is directly affected by changes in year-to-year variability in precipitation and by changes in short-term rainfall properties (such as storm rainfall intensity). According to the Law on Water, municipalities and river basin authorities are primary responsible institutions in case of floods, and are obliged to maintain and regulate necessary infrastructure for protection against floods. Development and implementation of programmes for protection against floods is responsibility of the municipalities and river basin authorities. Same as other regions in Balkans, Kosovo is vulnerable to the extreme natural disasters, however, risks associated with floods, landslides and erosion are not considered to be critical. Based on the feedback from the relevant institutions the main reasons causing floods are listed below:

From the interview with the municipal authorities/ ministerial officials it appears that the main reasons causing flood events are:

- Lack of permanent programmes and projects for maintenance and clean out of river beds from debris, eroded earth and other wastes disposed to the rivers.
- Over exploitation of gravel material from the rivers and change of river courses.
- Deforestation and loss of vegetation.
- Illegal construction near the river bodies and narrowing the river beds.
- Damage of protection walls along the rivers and lack of appropriate ditches/ dykes along the rivers/ streams.
- In the urban centers, floods are mainly caused due to lack of storm water network, under-dimensioned and not properly maintained of the main sewerage collectors.

Therefore, development of national program to address floods, including mapping of all flood prone areas and development of national program's for river maintenance is both necessary and urgent.

**Intervention:**

Institutions in charge for floods, municipalities and central government, shall develop flood management systems, which should comprise of non-structural and structural measures.

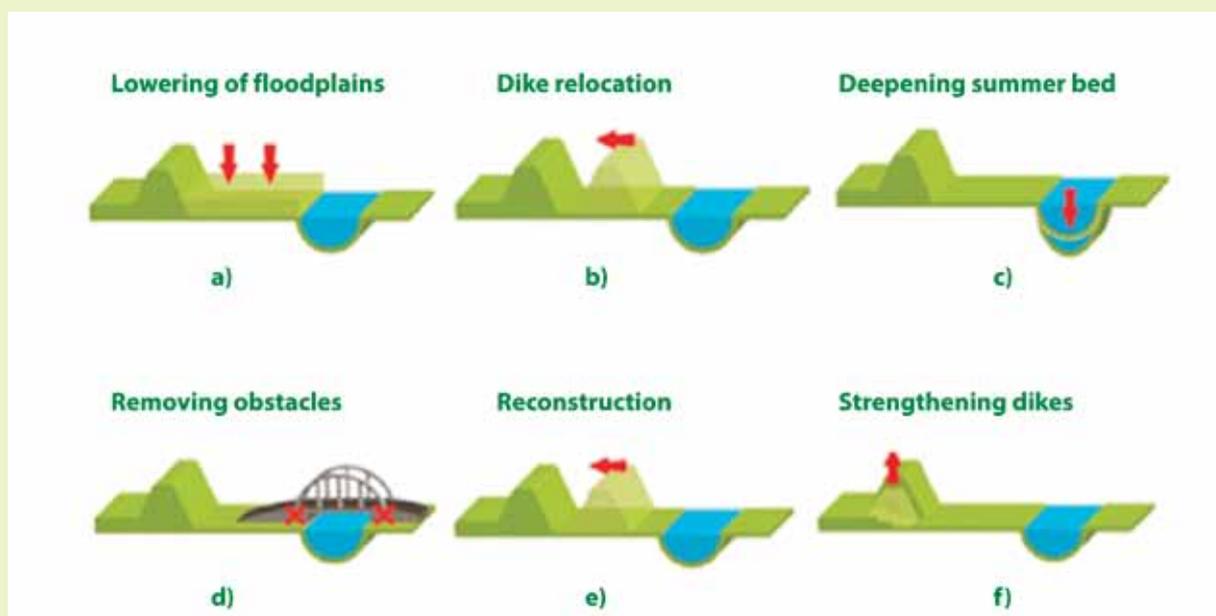
Under non-structural interventions following activities are proposed:

- Assessment of flood associated risks, mapping of all flood prone areas and development of appropriate plans for flood risks management, including plans for protection and rescue.
- Development of hydraulic flood models under various extreme scenarios, a 20, 50 and 100 years flood event occurrence, flood frequency analysis, flood discharges and delineation of borders of the flooded areas.
- Strengthening the local capacities to establish early warning system / disaster warning system.
- Development of flood risk management plans – Kosovo wide
- Develop a national action plan and programme for construction of new and rehabilitation of the existing river dykes and river beds, including regular maintenance plan for rivers.

The structural interventions are to be designed based on specific condition of the river bodies, which pose major threats to the human lives, property and to the agricultural land. Measures need to have EIA first done in order to evaluate whether this can be considered as an option. The interventions shall implement one or a combination of measures that are listed below:

- Lowering floodplains: lowering an area of the floodplain increases the space for the river at high water levels (fig a)
- Dike relocation: relocating a dike land inwards increases the width of the floodplains and provides more room for the river (fig b)
- Deepening of summer bed: deepened river bed provides more room for the river discharge (fig c)
- Adjustment or removal of hydraulic obstacles: removing or modifying obstacles in the river bed where possible, or modifying them, increases the flow rate of the water in the river (e.g. sediments - eroded material, trees, trash, etc.) (fig d)

- Depoldering: The dike on the river side of a polder is relocated land inwards. The polder is depoldered and water can flood the area at high water levels (fig e)
- Construction of new and strengthening the existing dykes: raising new dykes and strengthening the existing in the areas which pose direct risk of flooding and in the areas where there is no more space to widen the river bed (fig f)
- Construction of drain channels to discharge the accumulated flood water where necessary
- Construction of by-pass channels to link the rivers, the so called green river strips, which could divert or direct water from one to the other river.



#### Results / Impacts:

Implementation of above-mentioned measures will aim at reducing the threats from floods to the maximum extent possible.

#### Responsibilities:

The main responsible partners for implementation of these interventions:  
 Ministry of Environment and Spatial Planning;  
 Inter-ministerial water council (IMWC);  
 Ministry of Internal Affairs;  
 Ministry of Security Force;  
 Ministry of Agriculture, Forestry and Rural Development (MAFRED);  
 Municipalities;

#### Investment Cost:

The costs for implementation of the above mentioned intervention is estimated as follows:

Short term measures:

Non-structural interventions-researches, feasibility studies, flood management plans, flood modeling:

Cost estimate: approx. 1.2-1.7 million of Euros.

Mid and long term measures:

Structural interventions depend on the scale and size of intervention based on the flood risk management plan and programme of action.

Cost estimate: 10-20 million of Euros

#### Investment period:

Short term measures: 2015 –2017.

Mid and long term measures:  
 2016 –2030.

**NAC Intervention Sheet No. 03****Name:**

**Construction of retention areas for capturing and retaining the storm water**

**Location: Kosovo wide**

**Type of intervention:**

**Non-infrastructurel and infrastructurel project**

**Objectives:**

Storm water retention basins (areas) are a conventional method to collect and store storm water and to slowly release water at a controlled rate so that downstream areas are not flooded. The release of water is regulated at flow rates similar to those that existed under natural conditions. Retention basins are typically large regional facilities, which may cover a surface of up to several hundred hectares in size. When full with water, retention basins look like lakes. Lately the basins are designed to have a permanent water level in the bottom of the basin, and the flood storage is provided above the normal surface of the lake.

By capturing and retaining runoff during storm events, detention basins control both storm water quantity and quality. After water is captured in the basin the physical, biological, and chemical processes then work to remove pollutants. Sedimentation processes remove particulates, organic matter and metals, while dissolved metals and nutrients are removed through biological uptake.

In addition to flood control and removing pollutants, many ponds are designed to be used as recreational area, the site for wildlife habitat, etc.

**Intervention:**

Construction of storm water retention basins represents a most appropriate solution for flood control. Another benefit of constructing the retention basins is to reduce the concentration of pollutants, which are in excess of those typically found in storm water.

Selection of the location and the capacity of retention basins shall be based on the risk assessment of flood prone areas, hydraulic flood model calculation, flood discharges assessment and on the contaminant concentration. The design of a retention basin shall incorporate all relevant safety measures; consider local terrain circumstances and site constraints.

Another aspect to consider while designing the storm water retention basin is the access to the site for the operation and maintenance of the retention basin.

**Results / Impacts:**

Retention basins are constructed in the areas where the floods pose permanent risks to human lives, property and avoid erosion.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ministry of Environment and Spatial Planning;
- Inter-ministerial water council (IMWC);
- Ministry of Agriculture, Forestry and Rural Development;
- Municipalities;
- Regional Water Companies;

**Investment Cost:**

The cost for implementation of one (1) pilot project for retention basins, including: feasibility study, main design, civil & mechanical works, landscaping, and other associated works for the retention basin is estimated approximately 1.5 – 3.0 million Euro.

**Investment period:**

Long term Investment: 2025-2030.

<b>NAC Intervention Sheet No. 04:</b>		
<b>Name:</b> <b>Development of innovative standards for buildings</b>	<b>Location:</b> <b>Kosovo wide</b>	<b>Type of intervention: Policy framework, develop new construction norms and Infrastructure project (pilot project)</b>
<p><b>Objectives:</b> In recent years there is an increasing trend of developing building/construction standards that pay a lot of attention to the environment and that are environmentally friendly. The most important driving factor for design and construction is that the green roofs are recognized to delay the rainwater run-off entering the storm water system or are generally used as retention structures of rainwater. Depending on the Green Roof system and the depth of the growing medium, the immediate water run-off can be reduced by 50-90%.</p>		
<p><b>Intervention:</b> The measures planned within this intervention are divided into non-infrastructure and infrastructure projects, as summarized below: <u>Non-infrastructure intervention (short term):</u></p> <ul style="list-style-type: none"> <li>• Development of new construction standards that promote the green building concepts, in particular the green roof concept &gt; it is recommended to mainstream green roof concept in the related legislation</li> <li>• Develop guidelines for green roofs construction</li> <li>• Promotion of green buildings concept, with special focus on green roofs, conduct awareness campaigns</li> <li>• Incentive schemes for individuals/institutions implementing green roofs for reduced storm water and for protection of environment</li> </ul> <p><u>Infrastructure intervention (short to mid-term):</u></p> <ul style="list-style-type: none"> <li>• Implementation of pilot 'green buildings' and 'green roofs' projects (in governmental/ municipal buildings, schools, hospitals, etc.) and replicate the same in the residential sector by applying incentive schemes.</li> </ul> <p>Note: Currently the most complete system of standards for green roof design is the German Landscape Development and Landscape Construction Research Facility's.</p>		
<p><b>Results / Impacts:</b> Beside the benefit for delaying the rainwater run-off other environmental benefits of green roofs are as follows:</p> <ul style="list-style-type: none"> <li>• Improved thermal insulation of buildings and heat shield</li> <li>• Provision new space for wild life habitat</li> <li>• Improved conservation of biodiversity, additional space for garden</li> <li>• Reduction of airborne particulates, dust and smog levels</li> <li>• Reduced noise levels</li> </ul>		
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Ministry of Environment and Spatial Planning (department of housing and construction shall facilitate required legal and procedural activities for drafting, construction standards, drafting guidelines for green roofs) and the Inter-ministerial water council</li> </ul>		
<p><b>Investment Cost:</b> <u>Short term:</u></p> <ul style="list-style-type: none"> <li>• Drafting construction standards and guidelines for green buildings, and green roofs are cost free.</li> <li>• Costs for awareness campaign and promotion of green roofs are calculated to 15'000 Euros.</li> </ul> <p><u>Mid-term:</u></p> <ul style="list-style-type: none"> <li>• Costs for implementation of one pilot project for a green roof building, in addition to the cost of conventional standard building, is estimated up to 0.15- 0.2 million Euros (depending on the size of the building).</li> </ul>	<p>Investment period: Short term: 2014 - 2016.</p> <p>Mid-term: 2016 - 2018</p>	

**NAC Intervention Sheet No.05:**

**Name:**  
**Enlarge reservoirs to increase buffer capacity**

**Location:**  
**Kosovo wide**

**Type of intervention: Policy framework + Infrastructure project**

**Objectives:**

Lakes are considered to be enclosed bodies of freshwater surrounded by land. There are distinguished natural lakes which are formed by natural processes, and artificial lakes that are constructed by man and called reservoirs.

Lakes and/ or reservoirs represent a strategic infrastructure of each country, and are used for a different purposes, including:

- Water supply for drinking water, irrigation, industry;
- Fisheries, in the commercial sense;
- Recreation, including water sports, tourist attractions and fishing;
- Nature conservation areas;
- Disposal of wastewater effluents.

Major reservoirs are a key element in the water resources management for public water supply and economic development in many countries, which is the case for Kosovo as well. Kosovo possesses six (6) reservoirs with a total storage capacity of  $539.53 \times 10^6 \text{ m}^3$ . When comparing the data of the total perennial average flow of river basins in Kosovo ( $3'608 \times 10^6 \text{ m}^3$ ) and the total water storage capacity of 6 accumulation lakes ( $563.69 \times 10^6 \text{ m}^3$ ), one can conclude that the percentage of water accumulations is about 15.0%. These reservoirs serve primarily for water supply (drinking water), irrigation, industry and recreational purposes.

Objective of this intervention is to establish appropriate management practices and reservoir prevention measures which control human activities in and up-stream of the reservoir, control of discharges in the reservoirs catchment area, water quality monitoring, dam safety monitoring and controlling the sediment influx to the reservoir that can result in significant reduction of its useful capacity.

**Intervention:**

Unlike rivers which transport sediment along the water course, reservoirs trap a large proportion of the sediment influx, which can result in a significant reduction in useful capacity. Coarse sediments tend to be deposited close to the inflow location, whereas fine sediments are transported for a longer distance. This is a concern in the reservoir operation and maintenance. Sediment reduction in reservoirs is problematic. If the reservoir has a bottom outlet, sediment flushing (requiring near emptying of the reservoir) may be able to clear some of the stock, but this is not always possible due to the incoming and outgoing water volumes and possible downstream effects.

Because of their tendency to trap sediments and organic matter, reservoirs tend to accumulate pollutants such as heavy metals, pesticides and other organic compounds in certain areas. Such pollution, could pose serious problems to certain uses, particularly public water supply.

As such, within this intervention, all the above mentioned concerns shall be addressed:

- Design plans and programmes to maintain vegetated buffer strips, control stream bank erosion by keeping strips of natural vegetation along stream corridors, employ strict erosion protection measures along the stream. Vegetated buffer strips prevent soil transport and also intercept runoff, thereby removing sediment and phosphorus (main element causing eutrophication).
- Enlarge reservoirs to increase buffer capacity by removing the sediments from the bottom of reservoir.
- Develop programmes to monitor water quality in the reservoir, including measures and activities to mitigate the problems such as eutrophication, chemical pollution and sedimentation.

**Results / Impacts:**

Negative impacts in the reservoirs resulting from erosion processes and water quality aspects are addressed. In addition the reservoir buffer capacity is increased.

**Responsibilities:**

- Ministry of Environment and Spatial Planning;
- Inter-governmental Water Council;
- Ministry of Economic Development;
- RWCs;

**Investment Cost:**

Short term:  
 10-15 million of Euros

**Investment period:**

Short- to long term: 2015 - 2030.

<b>NAC Intervention Sheet No.06</b>		
<b>Name:</b> <b>Landscape planning measures to improve water balance (e.g. change of land use, reforestation, reduced sealing of areas)</b>	<b>Location: Kosovo</b>	<b>Type of intervention:</b> 4. <b>Forestation, reforestation</b> 5. <b>Landscape, agricultural land protection from degradation;</b> 6. <b>Awareness raising;</b>
<b>Objective:</b> To reduce water lost and improve water balance through landscape measures – forestation, reforestation, reducing of sealing of soils, protection of the natural landscape, balance use of the water from agriculture, awareness raising etc.		
<b>Rationality</b> Climate change as well as further economic development and living standards increase the demand for water. In this regard, it is important that water is used rationally and to take the necessary measures in order save it. Based on estimation of MAFRD it is account that around 400 hectares of agricultural land each year is changing the destination to the construction land. There is informal estimation that approximately 100,000 m <sup>3</sup> per year wood are cut illegally. About 30,000 ha are bare forest land and have small layer of soil, a significant part of this forest land is suitable for forestation. About 40% of public forest lands and 29% of private forest land are subject to uncontrolled or illegal exploitation. Compared with all applicable standards, these figures are quite high Illegal loggings have interference as well as on damages /destruction on natural landscapes. Activities of uncontrolled gravel use have a negative impact on landscapes as well as on biodiversity through the destruction of natural landscapes.		
<b>Intervention:</b> In order to prevent this situation improved water balance and protect landscape is needed to take some intervention. At this stage should focus on directions, which include adequate policies as well as implementation of projects. <ul style="list-style-type: none"> <li>• Prepare spatial plan for nature conservation areas, initially for national parks later on the protected area;</li> <li>• Establishing the controlling system for protection of diversity of the landscape.</li> <li>• Protection of agricultural land from changing the destination</li> <li>• Forest protection from illegal logging</li> <li>• Forestation and reforestation</li> <li>• Educating people about the benefits of forest</li> <li>• Good management of forest exploitation</li> <li>• Support policy for forest protection officers</li> <li>• Strengthening forest protection</li> <li>• Landscape protection</li> </ul> <b>General</b> <ul style="list-style-type: none"> <li>• Cooperation between government institutions</li> <li>• Establishing of proper monitoring system</li> <li>• Financial support</li> </ul>		
<b>Results / Impacts:</b> <ul style="list-style-type: none"> <li>• Reduced water lost and improves water balance.</li> <li>• Protected natural landscapes</li> <li>• Reduced sealing of areas</li> <li>• Increased forest area</li> <li>• Reduce illegal logging</li> <li>• Raised awareness on benefit from forest etc</li> </ul>		
<b>Responsibilities:</b> Government, MESP, MAFDR, KFA/ Advisory Services/ MEST as well as municipalities		
<b>Investment Cost:</b> <ul style="list-style-type: none"> <li>• 2, 700, 000 Forestation and forest management</li> <li>• 80, 000 awareness raising</li> </ul>	<b>Investment period:</b> 2013-2015 2013 -2015	

NAC Intervention Sheet No. 07		
<b>Name:</b> Leakage reduction in drinking water distribution network	<b>Location:</b> For each of the seven Regional Water Companies (RWCs)	<b>Type of intervention:</b> Infrastructure project
<p><b>Objectives:</b>            Drinking water supply and wastewater services in Kosovo are provided by seven licensed Regional Water Companies (RWC's) within their service area. Except the RWC Bifurkacioni (Ferizaj), which is local POE and accountable to the Municipality of Ferizaj, the other six RWCs, Prishtina (Prishtinë), Mitrovica (Mitrovicë), Hidroregjioni Jugor (Prizren), Hidrodrini (Pejë), Radoniqi (Gjakovë) and Hidromorava (Gjilan), belong to central POE's and are accountable to the Ministry of Economic Development.            Based on the Annual Performance Report of Water Service Providers in Kosovo for the year 2012, the water industry in Kosovo is still weak; showing deficiencies in most of performance indicators.  <u>Service coverage</u> (defined as: as the percentage of the population within the service area receiving water supply) is reported to be at the level of 78%. The other 22% of population is supplied with water (of un-known quality) from its own shallow wells or other ground- or surface water sources.  <u>Non-revenue water</u> (defined as: the difference between the quantity of water produced and the amount of billed-invoiced water, i.e. water that does not bring revenues to the company) is very high in percentage and accounts for 58%.  <u>Revenue collection</u> for water and wastewater sector is reported to be 70%, which is insufficient for the RWCs to dedicate financial resources for capital investment. Investments on water &amp; wastewater infrastructure depends still a lot on foreign donors.            It is to emphasize that quite a lot of rural villages are not covered by the regional water supply schemes. Villages are still using ground water from shallow wells of deteriorated quality.</p>		
<p><b>Intervention:</b>            Interventions would consists on rehabilitation/replacement of deteriorated network segments leak detection and repair measures, installation of district WM and costumers WM to be able to make the water balance within the given districts. Measures shall be implemented district by district. After rehabilitation in one district, end results shall be evaluated and compared with the "original condition" and lessons learnt shall be drawn, in order to replicate the same measures to other districts.            Common water conservation measures, except direct infrastructure projects, shall be complemented with other measures such: customer education about water use and water-efficient fixtures, water-efficient landscaping, economic incentives, and water-use restriction programs.</p>		
<p><b>Results / Impacts:</b>            The first direct impact of the implemented measures is reduction of water loses, which is reflected in the lower operational costs for the RWCs. These benefits include reduced energy and chemical inputs for water treatment, downsized or postponed expansions of water facilities, and reduced costs and impacts of wastewater management.            Energy consumption to run the treatment plants and pumping stations constitutes one of the major operational expenses in the water production. Therefore, reducing the energy costs will be translated in lower emissions of GHG.            "Saved water" from the interventions above could be used to extend the service coverage to the districts that do not receive drinking water from RWC's.</p>		
<p><b>Responsibilities:</b>            The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• 7 RWCs in Kosovo</li> <li>• Municipalities within the service area of the 7 RWCs</li> <li>• Ministry of Economic Development and</li> <li>• Ministry of Finances</li> <li>• Inter-Ministerial Water Council</li> <li>• Active water sector donors in Kosovo</li> </ul>		
<p><b>Investment Cost:</b>            The costs for implementation of the above mentioned intervention is estimated at around 90-100 million of Euros (approx. 10-15 millions per year for the 7 Regional Water Companies).</p>	<p><b>Investment period:</b>            Long term intervention: 2015 – 2025 (to reduce the leakage rate from 58 to 25% in 10 years.            Assumption: leakage rate reduction of 2.5-3.0% per year).</p>	

## NAC Intervention Sheet No. 08

**Name:**

**Water reclamation, reuse and recycling**

**Location: Kosovo wide**

**Selection of pilot project by MESP**

**Type of intervention:**

**Infrastructure project**

**Objectives:**

The implementation of water reuse and recycling projects is driven mainly by projected water shortages in the countries. The water resources are expected to face pressures in the coming years and decades as a result of continuous population growth and uneven distributions of population and water. Treatment of wastewater to make it reusable with definable treatment reliability and meeting water quality criteria, to reuse for beneficial non-potable uses becomes attractive and applied worldwide. The most important non-potable usage of reclaimed waters is the irrigation sector, landscape irrigation (parks, school yards), industrial processes (cooling water, process water, heavy construction), groundwater recharge (groundwater replenishment), other environmental uses for eco-system services, non-potable urban uses (fire protection, toilet flushing), car washing, etc.

Rationale for water reuse

Water is a limited resource; the human society no longer has the luxury of using water only once. The quality of reclaimed water is appropriate for many non-potable applications such as irrigation and industrial cooling and for cleaning purposes. Water reuse allows for more efficient use of energy and resources by tailoring treatment requirements to serve the end-users of the water.

Factors driving the implementation of water reuse

Reclaimed water is readily available in the vicinity of the urban environment, where water resources are most needed, provides a reliable water source, even in drought years, as production of wastewater remains nearly constant.

**Intervention:**

Today there are available proven wastewater treatment processes and technologies that can provide water for non-potable applications of a quality that meets relevant standards. While constructing a wastewater treatment, the most important factor to consider is the point of use of reclaimed water and the purpose of use.

The interventions would include following activities:

- Mapping and selection of industrial sites, institutional and/or residential buildings or complexes which are appropriate for implementation of pilot projects for water reclamation and/or water recycling.
- Develop feasibility studies and main design for implementation of water reclamation or so called up-stream wastewater treatment plants at the industrial plants or institutional/ residential buildings (with many offices or apartments) and/or recycling projects in appropriate industrial sites.
- Construction of small scale wastewater treatment plants, including retention basins, transport equipment (pumps, piping, etc.) to transport water to the point of use (irrigation of yards, in-door and/or out-door cleaning, toilet flushing, car washing, etc.).
- Implementation of appropriate recycling technologies for selected industrial sites as pilot project.
- Replicate the above projects to other industrial sites or buildings.
- Awareness campaign for re-use of reclaimed water or recycling technologies

**Results / Impacts:**

Utilization of reclaimed water and/or recycling technologies would have the following advantages/ impacts:

- Reduced pressure to the fresh water resources.
- Raised awareness among institutions, industries and residential sector to undertake such measures and contributing to conserve water.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ministry of Environment and Spatial Planning,
- Ministry of Economic Development (for water services related to RWCs)
- Ministry of Education and Technology
- Ministry of Trade and Industry
- IMWC
- Municipalities
- Industrial sector
- Active water sector donors in Kosovo

**Investment Cost:**

The costs for implementation of projects / systems for water reclamation & reuse and water recycling technologies requires additional studies to define location, type of system best fitting to specific place, treated (waste) water point of use.

However, implementation of ONE pilot project or system for water reclamation & reuse of water or recycling technology (of small to medium size) either in institutional building or in one industrial site would cost approximately 0.35-0.5 million Euro, consisting of treatment system of wastewater and water transport equipment to the point of use (irrigation parks, school yards, industrial parks, etc.).

**Investment period:**

Medium-term: 2016-2017.

**NAC Intervention Sheet No. 09****Name:**

**Point-of-use conservation**

**Location: Kosovo wide**

**Type of intervention:**

**Education and awareness campaign programs**

**Objectives:**

Water is a finite resource and the people must realize the value of one of its most pivotal yet scarce resource. Competition for water poses a growing risk to the economy, communities and the ecosystems services. Adding to this the climate change impacts that keeps raising average temperatures of the globe, water is expected to become even scarcer in many areas, so it is very important to find solutions to protect and better manage water resources. Considering the in-efficient way the water is utilized, conservation of water at the point of use is crucially important to reduce the amount of water applied for whatever purpose.

By changing only the human behaviour or attitude in using water through education and awareness raising programmes represents a huge potential to conserve an incredible amount of fresh water, which in the end will be reflected cheaper water bills. Conservation of water can applied in all sectors, such: residential (use of water for drinking and sanitation purpose), agriculture, industry and energy sector.

Considering the situation in Kosovo, the biggest users of water are the residential, agricultural and energy sector. The water abstracted for cooling purposes in electricity generation is nearly all returned to a river, a bit warmer than it was originally. Contrastingly, most of water abstracted for agriculture is consumed. This means that it is not returned to the river because it is used for irrigation so it is either evaporating or is being bound up in the crops. The water used for residential purposes is consumed (drinking water and food preparation) or it is heavily polluted that the water returned to the river cannot be used for other purposes without appropriate previous treatment. Therefore, this intervention aims on the point-of-use water conservation.

**Intervention:**

Implementation of education and awareness programs to save water applied for in-door and out-door purposes shall focus on fostering a water-saving culture: information, education and training to raise awareness among both businesses and consumers. The education and awareness programs shall be illustrated with real-life examples and communicated to the people via Environment Newsletters, written and spoken media, flyers, direct interaction with pupils and students in the schools. The awareness shall focus on opportunities for water conservation as listed in the text below, using tips that attract people. and demonstrating in the practical way to the people the opportunities for reduce and rationalize.

Water conservation opportunities in bathroom:

- About one-third of water for domestic use goes down the toilet. Therefore, major water savings may be reached in the bathroom, e.g. using short flush whenever possible, or reduce the toilet cistern capacity by putting an empty bottle inside.
- Take shower rather than baths, installing water saving shower head,
- Check valves, taps and pipes for drips and leaks replacing leaking valves and other fittings
- Do not leave the water running when brushing teeth, while shaving or washing the face

**Water conservation opportunities in kitchen:**

- Rinse dishes, vegetables and fruits in a filled basin, rather than under running water
- Wash only full loads in the dishwasher, consider replacing old dishwasher with new high efficiency dishwasher that will save water and energy
- Consider installing an instant water heater on your kitchen sink so you don't have to let the water run until it heats up

**Water conservation opportunities in laundry**

- Wash only full loads of clothing, consider replacing old washing machine with high efficiency washing machine that will save water and energy
- Hand wash single cloths

**Water savings opportunities in the yard/ garden:**

- Collect rainwater for the garden and for washing the car. This can save up to 50% of household water
- Water the garden only during cool parts of the day to minimize evaporation
- Use native plants that are used to adjust to the area's normal rainfall, soil, and climate and require less water
- Bigger plants require more water
- Mulching around plants is a great way to reduce water loss. It keeps the soil moist, reducing the need for constant watering. Mulch will enrich the existing soil and will prevent rain and other elements from washing it away
- New plants need far less water if you put them in the ground in early fall or early spring when it's cooler. By summer, they'll have established a deep, healthy root system that needs less watering
- Install sprinklers that are the most water-efficient for each use. Micro and drip irrigation and soaker hoses are examples of water-efficient methods of irrigation
- Buy a trigger nozzle for your hose rather than leaving the water running between uses

**Other opportunities to promote saving water:**

- Avoid the purchase of recreational water toys which require a constant stream of water
- Encourage your employer to promote water conservation at the workplace. Suggest that water conservation be put in the employee orientation manual and training program
- Do the businesses which practices and promotes water conservation
- Report all significant water losses (broken pipes, open hydrants, errant sprinklers, etc.) to the property owner or to the water company
- Encourage your school system and local government to help develop and promote a water conservation ethic among children and adults
- Support projects that will lead to an increased use of reclaimed waste water for irrigation and other uses
- Promote water conservation in community newsletters, on bulletin boards, etc.
- Try to do one thing each day that will result in a savings of water. Don't worry if the savings is minimal. "Every drop counts"

**Results / Impacts:**

Increased awareness to use water in a more rational way by educating all categories of costumers.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ministry of Environment and Spatial Planning;
- Ministry of Education and Technology;
- RWC's;
- Municipalities;
- Industrial sector;

**Investment Cost:**

- The costs for 0.4-0.5 million of Euros.

**Investment period:**

2014-2020

## NAC Intervention Sheet No. 10

### Name:

**Water transfer** (from one river basin to other one or within the same river basin)

### Location:

**Selection of priority measures to be arranged with MESP**

**Type of intervention: Policy framework + feasibility study + Infrastructure project**

### Objectives:

Water transfer means development of adequate man-made conveyance schemes which move/transport water from one river basin where it is available, to another basin where water is less available or could be utilized better for human development. Similar water transport infrastructure can be constructed to transfer water resources within same river basin.

Kosovo has relatively limited amounts of fresh water resources. Furthermore, the population and the available water resources are unevenly distributed throughout the territory. The western and southern parts of Kosovo are rich in water, while the north and eastern parts have less fresh water resources. To meet increasing demands for water in the regions with less water resources, the water transfer infrastructure shall be appropriately planned and implemented. The surface water resources in Kosovo are not efficiently utilized, due to low capacity of accumulation lakes. Actually there are only 6 accumulation lakes that store about 15.0% of the average renewable annual water flow.

Rationale for water transfer

Having into consideration that the water availability differs from one river basin to other, there is a need to establish appropriate infrastructure to transport water between river basins. Establishing infrastructure for water transport would increase the flexibility for water supply to the regions lacking sufficient water resources, which represents a limiting factor for their social and economic development.

Factors driving the implementation of water transfer infrastructure (legal framework and physical)

Provide equal opportunities for socio- and economic development of regions within river basins, provide adequate water resources to the northern and eastern part of the country to meet the demands for water assessed of the vital importance for Kosovo (drinking water supply, agriculture, industry, energy production facilities, etc.) and increase flexibility of water delivery between regions (river basins) and different user categories.

### Intervention:

Implementation of water transfer projects shall be implemented in two phases. First phase shall focus on developing and adoption of necessary legislation required for water transfer, including the researches and feasibility studies. Second phase shall focus on the implementation of water transfer infrastructure project, as prioritized by feasibility studies and other conducted researches.

Short- to mid-term measures:

- i) Development of appropriate policy/ legal framework for water transfer.
- ii) Development of researches and studies related to river basin water balance, defining the water needs for each costumer category within each river basin, make projections for future water needs, water allocation and prioritizing the water delivery to the costumers, addressing the drought situations and restriction of water use.
- iii) Conduct environment impact assessment reports, land use change assessment, assessment of habitat and social disturbances related to the implementation of water transfer infrastructures (conveyance channels, accumulation lakes, etc.).
- iv) Development of feasibility studies and researches analysing viability of water transfer options between the following river basins:
  - North to south-east: continuation of former World Bank Ibër Lepenci project (dating back in 80's), linking Ibër with Lepenci river basin, including the transport infrastructure and the accumulation lake in Lepenci river
  - South-east to east: linking Lepenci with Morava e Binçës river basin, including water conveyance / transport infrastructure and accumulation lake/s
  - West to north: linking Drini i Bardhë with Ibër river basin and the river basins in south-east).

Long term measures:

- v) Prepare main design for implementation of water transfer infrastructures between river basins.
- vi) Implementation/construction of water transfer infrastructure: accumulation lakes, conveyance channels for transporting water from one river basin to other river basin.

**Results / Impacts:**

Implementation of adequate water resources transfer schemes would help and support the receiving basins to alleviate water shortages and utilize supplemental water availability for improved social and economic development. In addition, this would improve the flexibility of water transfer within watersheds, and supply with water population, key industrial sites, energy production plants in case of emergency situations. It also contributes to easy let flow the stream for 'minimum environmental flow'.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Inter-Ministerial Water Council;
- Ministry of Environment and Spatial Planning (shall facilitate required legal and procedural activities for water transfer)
- Ministry of Agriculture, Forestry and Rural Development;
- Ministry of Economic Development;
- Ministry of Finance;
- Municipalities;
- RWC's;
- Active water sector donors in Kosovo;

**Investment Cost:**Short term:

The cost for implementation of first phase is estimated at 4.0-5.0 million of Euros.

Long term:

The cost for implementation of this intervention requires additional studies. At this stage it is difficult to estimate the cost.

**Investment period:**

Short- to mid-term measures:  
2014 - 2018.

Long term: 2017 - 2030.

**NAC Intervention Sheet No. 11****Name:**

**Securing minimum flows in dry periods**

**Location:**

**Kosovo wide**

**Type of intervention:**

**Develop policy & scientific research papers**

**Objectives:**

Historically, water resources were managed to fulfil only the needs of the out-of-stream development. Water not withdrawn from a stream for economic development was generally considered as wasted water. The change of social values with respect to water quality, environment and ecosystem services has gained greater influence on water-resources management. This approach has marked an evolution of the original opinion. Minimum stream flow management focuses primarily on the need for a minimum amount of water to be left in a stream to provide multiple in stream benefits. Environmental flows will likely play an increasingly important role in the on-going struggle among competing water demands. Changing societal values have focused greater attention on water resources to meet the needs for water quality, fish and wildlife habitat, and other ecosystem services.

**Intervention:**

Drafting and adoption of appropriate policies to address environmental flows, with particular focus during dry periods is highly important. This intervention includes drafting of policies and research papers, as indicated below:

- Develop methodologies that produce credible flow recommendations within suitable time-frames, considering: drinking water requirements, irrigation water requirements, flow required to maintain water quality and flow required to sustain riverine ecology.
- Develop an inclusive process, which builds up on a consensus rather than on a competing process, which involves scientific researchers from different disciplines, planners, engineers, and decision makers at each step.
- Make the recommendations for the minimal flow to sustain the environment and ecosystem services for the rivers.
- Recognise the importance of low (or even no) flows as contributing to the maintenance of the natural community structure of riverine ecosystems.
- Develop a research and assessment about the habitat integrity and sensitivity.
- Determine the hydrological regime in rivers; river flow assessment and modelling, water quality modelling considering various scenarios.

<p><b>Results / Impacts:</b> The environmental flow of the rivers has been determined based on a scientific research, considering the requirement for drinking water, for irrigation, flow required to maintain water quality and flow required to sustain riverine ecology.</p>	
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Ministry of Environment and Spatial Planning, River Basin Authorities;</li> <li>• Ministry of Agriculture, Forestry and Rural Development;</li> <li>• Municipalities</li> </ul>	
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated to approximately - 2.5 million of Euros</p>	<p><b>Investment period:</b> 2020 – 2025</p>

NAC Intervention Sheet No. 12		
<p><b>Name:</b> <b>Crop adaptations:</b> <b>Selection of high resilient crop seeds (crops with more efficient water use)</b></p>	<p><b>Location: Kosovo</b></p>	<p><b>Type of intervention:</b> <b>Develop policy &amp; research papers, awareness programs that promote the use of “efficient technologies in irrigation”</b></p>
<p><b>Objective:</b> To adapt the Kosovo agriculture with the current worldwide and regional climate change</p> <p>Rationality The current climate changes that are occurring world widely and in region have also affected Kosovo. Droughts have occurred historically in Kosovo, and there is increasing evidence that climate change is creating enhanced susceptibility to drought in the south-eastern Mediterranean. In the Southern European countries around Kosovo has encountered a reduction in annual rainfall over the last 45 years of up to 150mm every 10 years, or 15mm per year. Such enormous reductions will have impacts on all aspects of the hydrological cycle in future years. Groundwater levels will progressively reduce, as will river flows and soil moisture levels In support to this, respectively to create an adaptive situation Kosovo farmers need to adapt their crops patterns and cropping systems to the conditions, quicker than ever before. Resilient crop seed/varieties that can tolerate heat, flooding, drought and other problems will be key to helping ensure food supplies in the face of the growing climate change pressures Crops with more efficient water use and crop rotation can be foreseen as other methods for adoption.</p>		
<p><b>Intervention:</b> Taking into consideration current situation and the climate changes that are occurs in the region and in Kosovo. It is very clear that agriculture and forestry in Kosovo must adapt to these climate change In order to be adapted to the climate changes is needed to take some interventions. In this phase shouldbe focus on different directions, researches, proper policies as well as introducing high resilient crop seeds, crops with more efficient water and crop rotation.</p> <ul style="list-style-type: none"> <li>• Feasibility study regarding of the high resilient crops, crops seed</li> <li>• Prepare Draft National Drought Management Plan (NDMP)</li> <li>• Developing of adequate institution for drought monitoring;</li> <li>• Vulnerability assessment of drought;</li> <li>• Awareness raising programs to the farmers for:</li> <li>• Planting of the plant varieties adapt to the drought:</li> <li>• Short-stemmed varieties with limited leaf surface minimize transpiration;</li> <li>• Deep, prolific root systems enhance moisture utilization;</li> <li>• Quick-maturing varieties are important in order that the crop may develop prior to the hottest and driest partof the year and mature before moisture supplies are completely exhausted.</li> <li>• Pest control, weed control, less tillage</li> </ul>		

<p><b>Results / Impacts:</b> Implementation of Crop adaptations have following advantages:</p> <ul style="list-style-type: none"> <li>• Vulnerability assessment will help to minimize the impacts of drought by good planning;</li> <li>• Appropriate understanding from the farmers use of high resilient crops, crops seed;</li> <li>• Researches studies with help farmers to use the adequate resilient crops seeds, crops with more efficient water use for Kosovo condition.</li> <li>• Reduce lost of the crop yield.</li> </ul>	
<p><b>Responsibilities:</b> Agricultural faculty/ researcher, KAI, MESP, MAFDR, KFA, KFI, Advisory Services and farmers.</p>	
<p><b>Investment Cost:</b> 500 000 euro</p>	<p><b>Investment period:</b> 2015 - 2018</p>

NAC Intervention Sheet No. 13		
<p><b>Name:</b> <b>Water saving technologies in irrigation systems</b></p>	<p><b>Location:</b> <b>Kosovo wide – implementation of pilot project</b></p>	<p><b>Type of intervention:</b> <b>Develop policy &amp; research papers, awareness programmes that promote the use of “efficient technologies in irrigation”</b></p>
<p><b>Objectives:</b></p> <p>Worldwide irrigation of agricultural land represents the bigger water user accounting for more than 70% of total global water withdrawals. Based on available statistical data, the official irrigation schemes in Kosovo are in very poor condition and cover only 17.4% of total agricultural land in Kosovo. As such the agricultural sector is still not yet fully developed and requires further investments.</p> <p>Before the 1999-conflict 70,000 ha of land was irrigable, through utilization of traditional and use of sprinkler systems. This dropped to 23,000 ha after 1999, due to conflict and lack of proper maintenance of irrigation infrastructure. Approximately around 33,000 ha can be irrigated through sprinkling and another 26,000 can be irrigated through surface irrigation.</p> <p>The existing irrigation schemes are highly inefficient in terms of water delivery, conveyance channels as well as the irrigation piped system is deteriorated. Water losses in the Ibër-Lepenci channel, according to reports from Ibër-Lepenci Hydro-system, are estimated to about 50%.</p> <p>Rationale for introduction of water saving technologies in irrigation</p> <p>Agricultural sector represents an important pillar for Kosovo social and economic development, one of key sectors in terms of generating employment. Adding to this incentive payment schemes of the Government stimulating the farmers, the agricultural sector is becoming more and more important. To respond to the increasing demands for water in agricultural sector in one hand, and water scarcity on the other hand, introducing of “water saving technologies in irrigation” is highly important.</p> <p>Factors driving introduction of water saving technologies in irrigation</p> <p>Improved irrigation technology and advanced farm management practices offer an opportunity for agriculture to use water more efficiently. Implementation of institutional water management programmes and practices to conserve water without sacrificing crop yields, and promoting the implementation of “water saving technologies in irrigation” would contribute to conserve water that may be used for other environmental purposes.</p>		

**Intervention:**

At present in Kosovo most of the official irrigation systems are based on gravity, which are highly inefficient in terms of water delivery and water conservation. Therefore, a shift from gravitational schemes to more efficient pressure schemes such: dropping systems or sprinkler systems is an opportunity to conserve considerable amounts of fresh water resources used for irrigation. Implementation of efficient irrigation technologies alone may not be enough, therefore, the intervention at this stage should focus on in two directions, which include both adequate policies as well as implementation of pilot projects.

- Developing adequate policies for water irrigation and water allocation for agriculture, based on the scientific researches, specific river basin conditions and specific water requirements of the agricultural plants/ crops to be planted.
- Developing institutional water management programs and initiatives that encourage farmers adopt and implement efficient "irrigation systems" and promotion of new irrigation technologies.
- Restriction, to the extent possible, the use of groundwater for irrigation purposes.
- Implementing incentives for farmers and allocating funds for implementation of pilot projects of "efficient water saving technologies in irrigation", including 'smart' sensors for measuring soil moisture.
- Establishing irrigation schedule and monitoring system
- Cultivation of new varieties of the crops which are more resistant to the drought

**Results / Impacts:**

Implementation of efficient irrigation schemes have following advantages:

- The new irrigation schemes allow the farmer to reduce the quantity of water applied to a field; improve uniformity of field water distribution, which may results to improved crop yield.
- High water application efficiency ~ 85% - prevent losses due to evaporation or run-off of the water.
- Precise and more timely application of fertilizer and pesticide result in a higher efficacy, and may also reduce their use
- Water conservation from irrigation efficiency improvements on one field may be used to extend the irrigation to additional areas of land.
- Enhanced irrigation efficiency and water conservation will also reduce farm water costs.
- Reduce the amount of groundwater withdrawal for irrigation purposes.
- On-farm water conservation programs with institutional water management mechanisms can encourage the reallocation of conserved water to meet off-farm uses for environmental flows and other higher valued water demands for agricultural and non-agricultural purpose.

The US Department of Agriculture report: Water Conservation in Irrigated Agriculture: Trends and Challenges in the Face of Emerging Demands (USDA, 2012), confirms that application of efficient irrigation technologies results in following improvements:

- Improved crop yield between 58-67%
- Reduced energy costs up to 43-56 %
- Reduced water quantity applied 54-60%
- Reduced fertilizer/ pesticide loss 16-18%
- Reduced soil erosion 25-29%

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ministry of Environment and Spatial Planning, River Basin Authorities;
- Ministry of Agriculture, Forestry and Rural Development, Advisory services;
- Farmer associations;
- Municipalities

**Investment Cost:**

The costs for implementation of the above mentioned intervention requires additional studies for the areas to be covered with irrigation, mapping the agricultural land, requirement for water of different crops, etc.

The costs for implementation of drip irrigation system per ha of irrigated land is estimated to 1.500 -2.500 Euro/ha.

The costs for rehabilitation of irrigation channels, except the Ibër-Lepenci channel which is addressed within the ISH 40, and increase the coverage rate of irrigated land by official schemes, it is difficult to assess at this stage. Additional studies are required for this activity.

**Investment period:**

2015 – 2020.

<b>NAC Intervention Sheet No. 14</b>		
<b>Name:</b> <b>Rainwater harvesting</b>	<b>Location:</b> <b>Kosovo wide, households, industries, institutions, etc.</b>	<b>Type of intervention:</b> <b>Develop policies, awareness and incentive programmes for rainwater harvesting</b>
<p><b>Objectives:</b>            Fresh water resources are limited, therefore, development of variety and inventive programs and techniques promoting water conservation could help to increase the awareness of people to conserve and rationalize water usage and implement systems to harvest rainwater.            Rainwater is free; the only cost for rainwater harvesting is associated with the purchase and installation of the system for collection and storage of rainwater. Once collected, rainwater can be used for various purposes, such: irrigation (for parks and yards), out-door cleaning, and even for recharge/ replenishment of ground water aquifers, etc. Replacing the treated water with rainwater for these uses alleviates pressure on water resources and sensitive ecosystems. Different researchers suggest the rainwater harvesting could reduce the overall water consumption up to 20-40%. Stored rainwater provides an ideal source of readily available water, particularly during the long dry summers in the regions facing water shortages.</p>		
<p><b>Intervention:</b>            A rainwater harvesting represents a simple system consisting on collection and storing the rain water from the roof and delivers to a storage tank (being that concrete or plastic tank). Utilization of rainwater harvesting techniques requires intensive educational and awareness raising campaigns, emphasizing the environment benefits of rainwater harvesting. Implementation of incentives for households, industry, institution and allocating funds for implementation of a pilot systems for rainwater harvesting would beneficial to show the potential for rain harvesting and the impact of savings in water as well as the total bills for water consumption.</p>		
<p><b>Results / Impacts:</b>            Benefits from rainwater harvesting may be listed as follows:</p> <ul style="list-style-type: none"> <li>• It reduces the overall demand for treated water (from the municipal water supply), which could be translated in lower pumping costs, lower GHG emissions</li> <li>• It reduces the potential of floods, erosion, and the flow to sewage lines</li> <li>• It reduces the contamination of surface waters with sediments of various origin, fertilizers and pesticides from rainwater run-off</li> <li>• It can be utilized for groundwater replenishment</li> </ul>		
<p><b>Responsibilities:</b>            The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Ministry of Environment and Spatial Planning</li> <li>• Ministry of Agriculture, Forestry and Rural Development;</li> <li>• Inter-Ministerial Water Council;</li> <li>• Municipalities;</li> <li>• Governmental and Municipal Institutions;</li> </ul>		
<p><b>Investment Cost:</b>            The costs for implementation of one medium size pilot project for rainwater harvesting in public institutions, such: schools, government/ municipal buildings, etc., which includes costs for collection infrastructure, storage infrastructure and transport equipment to the point of use, is estimated at 40'000-60'000 of Euros.</p>	<p><b>Investment period</b> (short to mid-term interventions):            2017 –2020.</p>	

**NAC Intervention Sheet No. 15**

**Name:**  
**Sustainable groundwater management** (including aquifer replenishment)

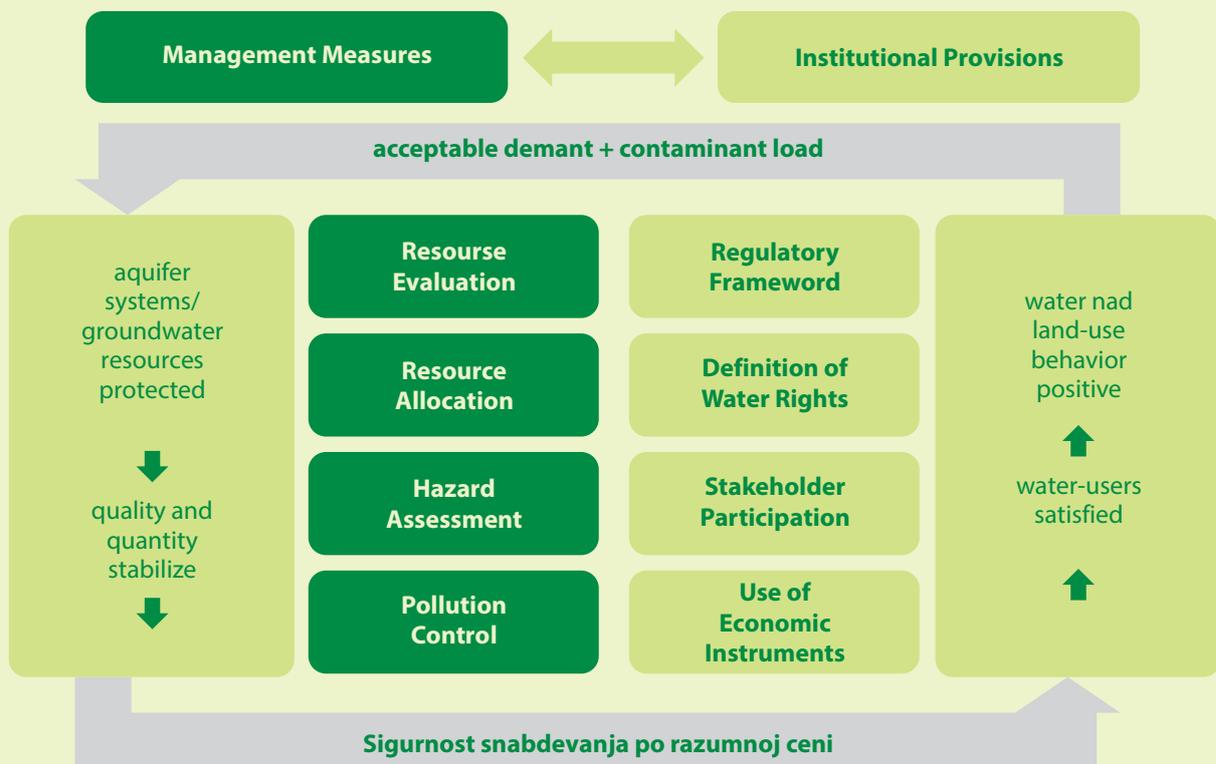
**Location:** Kosovo wide

**Type of intervention:**  
**Policy paper, feasibility studies and infrastructure project**

**Objectives:**

Groundwater is a strategic resource due to its usually high quality and constant perennial availability. However, groundwater management often lacks sustainability, as consequence the water table drops and often due to lack of appropriate management practices the water quality is deteriorated.

As illustrated in the figure below, groundwater resources management is about balancing the social and economic dimension "demand side management" with the hydrological dimension "supply side management".



Sustainable ground water management shall deal with balancing the exploitation of a complex groundwater resource (in terms of quantity, quality and interactions with surface waters) with the increasing demands of water and land users (who can pose a threat to resource availability and quality).

Note: An EU twinning project to support MESP is going on and has the task to prepare an assessment related to the condition of monitoring network of water resources, needs for establishing the monitoring network, assessment of water resources, assessment of the contamination of water resources, and inspection of water resources.

**Intervention:**

Measures to be implemented within this intervention are listed below:

- Development of Groundwater Legislation & Regulatory Provisions from customary rules to integrated catchment planning with the ultimate goal to regulate groundwater development and to constrain activities that might compromise groundwater availability and quality. Comprehensive water legislation offers considerable advantages, since it provides a legal basis for the effective and sustainable management of groundwater through:
- Provision for quantification, planning, allocation and conservation of groundwater resources
- A system of wastewater discharge licenses, helping to protect groundwater against pollution
- Provisions for groundwater monitoring (quantity and quality) for managing aquifer response and quality threats
- Provisions for aquifer replenishment/ recharge
- Provision vulnerability assessment and formulating mitigation strategies
- Design and implementation of national and river basin groundwater policies
- Definition of the rights and duties of groundwater users
- Mandate for drought or emergency ground water exploitations
- Establishment and delineation of groundwater protection zones, incl. implementation of such measures
- Requirements for the registration and qualification of well drillers
- Possible administrative intervention in critical situations (aquifer depletion or pollution)
- Provision for cooperative interaction between water administrators and water users
- Stakeholders participation in groundwater management
- Establishing institutional interaction in participatory groundwater resource management depending on the geographic location, scale of the aquifer, etc.
- Economic Instruments for groundwater management using incentives to improve sustainability.
- Establishment of system for groundwater monitoring for whole Kosovo territory.

**Results / Impacts:**

- Groundwater resources are managed and exploited in a sustainable way in full accordance to the principles of Integrated Water Resources Management.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Inter-ministerial Council on Water
- Ministry of Environment and Spatial Planning
- Ministry of Agriculture, Forestry and Rural Development
- Municipalities
- Active water sector donors in Kosovo

**Investment Cost:**

The costs for implementation of this intervention, including the costs for establishing the network for monitoring of groundwater resources is 4.5-5.0 million Euros.

**Investment period:**

2014-2018.

## Intervention Sheet No. 16

**Name:**

**Strengthening forest protection policy, including a) Strictly handling cases of illegal cutting deforestation, b) Educating people about the benefits of forest & the harmful effects of deforestation, c) Removal of fuel wood in order to decrease vulnerability to forest fires, d) Choosing tree species and forestry practices less vulnerable to storms and fires, e) also related to interventions mentioned under information management and cooperation structures**

**Location: Kosovo  
- forest areas**

**Type of intervention:**

**Develop and implement policies, awareness and education programmes, capacity building for forest management and stronger cooperation between institution responsible for forest protection**

**Objectives:**

To reduce the illegal logging of the forest through strictly handling cases at the court and education and awareness raising of the local people regarding of the importance and benefits from forest use and protection.

**Rationality**

41% of Kosovo's land area is covered by forests or (464,800 ha), of which 60% are state-owned forests (278,880 ha) and 40% are private forests (185,920 ha).

During inventory is estimated that about 40% of public forests and 29% of private forests affected by the activities of illegal cutting of forests.

Many young and middle-aged forests urgently need interventions including cleaning and thinning.

In 2010 were "only" 1,203 criminal charges while in 2011 increased to 7,871 criminal charges, in 2012 were slight increase 7,586 were sent to the competent courts respectively to the basic court.

Based on some researches demand of firewood as an energy source is higher than the sustainable firewood quantities available from the forest. Because of that Kosovo has to solve the upcoming shortage of firewood resources to be able to guarantee a sustainable forest management and the economic development of the country.

To guarantee a stable development these problems have to be solved by forest management and reduced energy consumption from fire wood.

Based on information annual firewood consumption in Kosovo is around 2,350,000 m<sup>3</sup> Considering this The fact that in Kosovo 2.5 million m<sup>3</sup> of wood were consumed in 2008 (87% from the household sector), if this trend is to be continued then it can theoretically be concluded that in 2028 Kosovo will have no forest left. Source: "ENERGY CONSUMPTION IN HOUSEHOLDS SECTOR IN KOSOVO – FUTURE DEVELOPMENTS" 2011

**Intervention:**

In order to stop this tendency of uncontrolled use of forest and destruction of the forest, interventions which are needed to take are multi sectorial :

1. To establish an inter – governmental task group of responsible institutions regarding of the forest protection;
2. To establish special line/judges at the court this will deal with the priority with the forest fines.
3. Media campaign aiming to raise public awareness on forest protection, especially targeting people in mountainous areas (activities include education, distribution of different flyers, TV radio and press advertisements;
4. Capacity building of forest management
5. Strengthen the monitoring system

**Results / Impacts:**

- Reduced illegal logging
- Reduced use of wood for fire/heating
- Better management of forest resources
- Raised awareness regarding of the other benefits from forest.

**Responsibilities:**

Government, MAFRD, KFA, MEST, MESP, courts, policy, municipalities, private owner of the forest as well as civil society.

**Investment Cost:**

500 000 euro

**Investment period:**

2013-2015

### NAC Intervention Sheet No. 17

**Name:**

**Planting trees reforestation, also for dealing with water scarcity and floods**

**Location:**

**Kosovo wide – bare forest**

**Type of intervention:**

**Forestation and reforestation**

**Objectives:**

To protect goods (properties, natural goods, agricultural lands etc) from flooding and to increase efficiency of water use (households, industry, agriculture etc) order to overcome the water scarcity.

**Rationality**

Climate change is putting more and more emphasize on forest role in regulating water flows and influencing the availability of water resources.

Therefore, the relationship between forests and water is a critical issue that must be accorded high priority. It is well known that uncontrolled use ore removal of tree cover may accelerate water discharge and increase flood risk during the rainy season and may reduce river flow or even cause river beds to dry out in the dry season. However, the importance of forest cover in regulating hydrological flows has often been overestimated.

Taking in consideration the current situation of the forest in Kosovo, it is very important to put as a priority the forest protection against the illegal logging, not just for reducing of the discharge of the water but as well protection and from the erosion.

Kosovo is potentially at risk from all three principal types of flooding, major lowland flooding, flash flooding in upland areas, and catastrophic flooding from 'dam-break'situation.

Floods at the Kosovo occur at the river basins. Based on the data from surveys about 491 km of the length of rivers are at risk of flooding, so far only 140km or 28% are fixed from the total length of the rivers which are at risk of flooding.

There have been many periods of short-term flooding in Kosovo, and a significant flood year occurs once every six years on average.

Due to existing situation unfixed (regulation) river basins, according to the existing data around 34,000 ha are vulnerable from possible floods.

Many regions of Kosovo suffer from water scarcity and poor drinking water quality respectively.

The relatively high population density, traditionally irrigated agriculture, warm and dry summers are additional factors for water scarcity in Kosovo.

Although the average annual renewable water supply per person in Kosovo is about 1'987 m<sup>3</sup>/year, and is classified as sufficient. According to UNEP the following classification is used:

Water scarcity	> 1'000 m <sup>3</sup> /person/year
Stress	1'000 – 1'700 m <sup>3</sup> /person/year
Sufficient	> 1'700 m <sup>3</sup> /person/year

**Intervention:**

In order to overcome the possible situations from flood or with scarcity of water because of the impact of the climate change.

**Intervention**

- Afforestation and reforestation of degraded areas
- Planting/growing the trees the best way to prevent the soils being washed away, especially those with big sturdy roots, can hold the soils intact
- Do not till /or till when is not necessary.
- Use Agricultural practices that can produce a good crop without necessitating tilling.
- General
- Cooperation between government institutions
- Establishing of proper monitoring system
- Financial support
- Prepare Flood Frequency statistical analysis
- Prepare Flood Frequency statistical analysis MESP
- Monitor and report monthly the regional flood forecasts from (KHMI)
- Monitor Monthly Bulletins and forecastsfor4 river basins, declare flood warnings and convene
- Flood Management Committee

<p><b>Results / Impacts:</b> Implementation of forestation and planting of the trees have following impacts:</p> <ul style="list-style-type: none"> <li>• Forestation protect soils and reduce erosion rates and sediment delivery to rivers;</li> <li>• Forestations reduce water flows as well reduce erosion;</li> <li>• Well magnet natural forests as well can protect drinking-water supplies</li> <li>• Reduce damages from flooding, less number of floods, less damages at the level of settlements, less damages for agriculture (crops cultivate near the rivers)</li> </ul>	
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• MAFRD, KFA, MESP, KIHM, NGO-s, Donors/municipalities</li> </ul>	
<p><b>Investment Cost:</b> 2 7 00 000 euro</p>	<p><b>Investment period:</b> 2013-2015</p>

NAC Intervention Sheet No. 18		
<p><b>Name:</b> Ecological corridors to help species migrate</p>	<p><b>Location: Kosovo -</b></p> <ul style="list-style-type: none"> <li>- Bjeshkët e Nemuna</li> <li>- Shala e Bajgores;</li> <li>- Anamorava;</li> <li>- Sharri Mountain and</li> <li>- Drenica region</li> </ul>	<p><b>Type of intervention:</b></p> <ul style="list-style-type: none"> <li>• Develop institution for biodiversity protection;</li> <li>• Build the human capacity of this institution</li> <li>• Establish long corridors with uninterrupted strips of vegetation ;</li> <li>• Small stone corridors; a series of small, non-connected habitats.</li> <li>• Landscape corridors;</li> </ul>
<p><b>Objectives:</b> To help species to move from one habitat to another to enlarging habitats, to search for food, movement of young animals in order to help in protection of the biodiversity.</p> <p>Rationality</p> <p>Ecological corridors are proposed as a means to moderate some of the adverse ecological effects of habitat fragmentation.</p> <p>Ecological corridors with careful planning and design can help reduce the negative effects of habitat fragmentation</p> <p>Many natural areas are critical for core habitat. Biodiversity presents unique value; Kosovo is rich with plant and animal species, considering its relatively small surface.</p> <p>In Kosovo there are 13 identified species of plants that grow only in Kosovo and approximately 200 species grow in Balkan. This diversity is a result of complex activities of physical factors, as the soil and climate that create diversity of habitats and conditions for growth of plants. In territory of Kosovo there are around 24 species of threatened plants as a result of human and natural activities. These are mainly concentrated in mountain areas but also in field areas.</p> <p>From total Kosovo surface 10.908.000, 00 ha, as Nature Protected Areas are declared 119.933,40 ha or about 11% .</p>		

<p><b>Intervention:</b> In order to protect and to create better condition for such biodiversity it is needed to undertake necessary measures for inventory, conservation and create better condition to the all species that lives. First the institutional interventions</p> <ul style="list-style-type: none"> <li>• Functionalization and requirement of professional staff of Kosovo Institute for Nature Protection</li> <li>• Institutionalize collection, maintain and processing of data's for biodiversity;</li> <li>• Second the objective interventions</li> <li>• Require maintenance or restoration of native vegetation, and long-term management.</li> <li>• Provide an adequate endowment for restoration and management of the corridor.</li> <li>• Plant native trees, shrubs, and other plants to provide food and cover, as well as</li> <li>• nesting opportunities for birds.</li> <li>• Establish corridors, uninterrupted strips of vegetation, such as hedges, strips of forest, and the vegetation growing on banks of rivers and streams;</li> <li>• Establish stepping stone corridors; a series of small, non-connected habitats which are used to find shelter, food, or to rest;</li> <li>• Establish Landscape corridors; these consist of diverse, uninterrupted landscape elements which offer sufficient cover for a safe journey from one core area to another.</li> </ul>	
<p><b>Results / Impacts:</b></p> <ul style="list-style-type: none"> <li>- Functional and recruited professional staff for Nature Protection Institute</li> <li>• Regularly monitoring and data on biodiversity</li> <li>• Safety conditions for movement of habitants from one place to another</li> <li>• Greater opportunities for maintaining and protection of diversity of the species</li> <li>• Less impact of climate changes on biodiversity etc</li> </ul>	
<p><b>Responsibilities:</b> MESP, Faculty of Natural Science, MAFRD, KFA environmental NGO-s</p>	
<p><b>Investment Cost:</b> 1 500 000 -2 000 000</p>	<p><b>Investment period:</b> 2011-2015</p>

### NAC Intervention Sheet No. 19

<p><b>Name:</b> <b>Incorporating local biodiversity objectives into the planning, delivery and management of green infrastructure measures</b></p>	<p><b>Location:</b> Kosovo <b>Pilot project</b></p>	<p><b>Type of intervention:</b></p> <ul style="list-style-type: none"> <li>- Develop legal and institutional frame work &amp; awareness programmes that promote green infrastructure measures.</li> <li>- Pilot project</li> </ul> <p><b>Provide a green space to local people</b></p> <ul style="list-style-type: none"> <li>- Conservation and enhancement of cultural and landscape heritage</li> </ul>
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**Objective**

In terms of adaptation, green infrastructure increases ecosystem resilience. Green infrastructure can maintain and create landscape features which guarantee that ecosystems continue to deliver services such as clean water, productive soils and attractive recreational areas.

One of the most effective ways to build up green infrastructure is to adopt an integrated spatial planning approach to improve spatial interactions over a large geographical area, from local to the wider.

MESP has the "Strategy and Action Plan for Biodiversity 2011 – 2020" with the fourth strategic objectives which can help on delivery and management of possible green infrastructure measures.

Strategic Objective 1: To development of legal and institutional framework in line with EU standards and its effective implementation.

Strategic Objective 4: To promotion of effective education and communication for biodiversity

Strategic Objective 2: To conservation, protection and improvement of state for plant and animal species, natural habitats and represented landscapes in natural balance.

Strategic Objective 3: To ensuring integrated protection of nature through cooperation with other sectors, sustainable use of biodiversity and equal sharing of benefits.

**Rationale**

Green infrastructure is often more cheaper and more durable than alternatives provided through conventional civil engineering. Parks, green spaces can mitigate the negative effects of summer heat waves.

"The contribution of green infrastructure to the sustainable development of urban areas is particularly significant. We live on an urban planet – more than half of the world population is made of city dwellers and this proportion is expected to reach 70% by 2050. Cities need to start preparing if they intend to live in a sustainable tomorrow" said van Ham.

**Intervention:**

In order to halt the loss of biodiversity and degradation of ecosystems, the introduction of green infrastructure measures will have positive effect.

- Development of legal and institutional framework in line with EU standards and its effective implementation;
- Awareness raising through promotion of effective education and communication for biodiversity
- Adaptation of the green routes for walking and cycling; (Eco Path Germia Park)
- Conservation and enhancement of cultural and landscape heritage

**Results / Impacts:**

- Developed institutional and legal framework
- Better information regarding of the benefits from biodiversity as well from introduction and implementing of the green infrastructure
- More green routs / green infrastructural measures for walking, cycling and improved recreational opportunities
- Better protection of the cultural and landscape heritage

**Responsibilities:**

MESP, Municipalities, MAFRD, KFA, MTI, Communities Local NGO-s etc.

**Investment Cost:**

700 000 -1 000 000 Euro

100 000 Euro Eco Path Germia Park

**Investment period:**

2012 - 2015

2012 – 2013

<b>NAC Intervention Sheet No. 20</b>		
<b>Name:</b> <b>Creating micro-climatic variation and ecologically resilient landscapes through varied topology to help species respond to changes in temperature and increase the chance that species will be able to migrate locally into newly favourable habitat</b>	<b>Location:</b> <b>Accursed Mountains (Albanian Alps);</b> - Shala e Bajgores; - Anamorava; - Sharri Mountain and - Drenica region	<b>Type of intervention:</b> - Gap analysis of the protected areas system in terms of representative coverage of habitats and species -Establishing new corridors and maintaining of already exiting of the corridors, - Create the network of these this corridors
<b>Objectives:</b> To create better micro climate condition and resilient landscape in order to facilitate species to migrate into new favourable habitat.  Rationality Climate change is happening and the diversity of impacts is increasing day to day Some climate change is unavoidable, including increased exposure to higher temperatures, heat-waves, flooding and drought, so biodiversity (plant and animals ) need to be prepared adapted and resilient to future climate impacts In order to challenge with the climate change to adapt to those changes it very important to take some measures which can help to protect diversity of habitats		
<b>Intervention:</b> <ul style="list-style-type: none"> <li>Gap analysis of the protected areas system in terms of representative coverage of habitats and species;</li> <li>Development of a Centralized Informative System for biodiversity</li> <li>Establishing of the corridors / different corridors in (planting the trees) in order to reduce impact of the heat waves, to keep humidity of the habitat</li> <li>Natural dams</li> </ul>		
<b>Results / Impacts:</b> <ul style="list-style-type: none"> <li>Maintain of the population size ( plants and animals)</li> <li>Maintaining reproductive potential (plants and animals )</li> </ul>		
<b>Responsibilities:</b> MESP, MAFRD, municipalities, Local environmental NGO-s etc.		
<b>Investment Cost:</b> 200,000 -500,000 euro	<b>Investment period:</b> 2013-2015	

<b>NAC Intervention Sheet No. 21</b>		
<b>Name:</b> <b>Public health programs</b>	<b>Location: Kosovo</b>	<b>Type of intervention:</b> <b>Resource and strategic project</b>
<b>Objectives:</b> For the health sector is essential to undertake actions to strengthen preparedness, including: <ol style="list-style-type: none"> <li>(a) strengthening primary health care;</li> <li>(b) strengthening health security;</li> <li>(c) strengthening monitoring, surveillance and early warning;</li> <li>(d) assessing capacity, impacts and developments</li> </ol>		

**Intervention:**

Conducting Vulnerability Health impact assessment. The results of one assessment should provide a baseline of current vulnerability, impacts, adaptation policies and programs, and identify actions to inform future assessments. The basic steps of an assessment are:

1. Frame and scope the assessment;
2. Vulnerability assessment: Describe the human health risks of current climate variability and recent climate change, and the public health policies and programs to address the risks;
3. Impact assessment: Project future health risks and impacts under climate change;
4. Adaptation assessment: Identify and prioritize policies and programs to address current and projected health risks.
5. Establish an iterative process for monitoring and managing the health risks of climate change;
  - Development of Heat Health Action Plan and raise awareness for heat exposure.
  - Strengthening the surveillance system that will be comprehensive and sensitive to detect potential effects of climate change on health.
  - Strengthening of infectious disease surveillance system.
  - Launch an awareness of climate change and health among health and medical practitioners.

**Results / Impacts:**

The main impact would be development of effective health policies and allocation of public health resources with aim to improve public health and minimize the health risk due to climate change

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ministry of Health / National Institute of Public Health
- Central governance - Ministries
- Local governance - Municipalities
- Non-government organizations
- Active donors in Kosovo and other stakeholders
- etc.

**Investment Cost:**

The costs for implementation of the above mentioned intervention is estimated at 1.7 million of Euros.

**Investment period:**

2014 – 2018

**NAC Intervention Sheet No. 22****Name:**

**Programs for raising the awareness and information for medical practitioners about negative impacts of climate change for public health**

**Location: Kosovo**

**Type of intervention:**

**Resource and strategic project**

**Objectives:**

Addressing the effects of climate change on human health is especially challenging because both the surrounding environment and the decisions that people make influence health. For the health sector is essential to undertake actions to assessing capacity including building capacity in the workforce. Hence it is needed an awareness program for medical practitioners on climate change and health among public health and medical practitioners, e.g. alert practitioners to the potential for changes in patterns of exposure to aeroallergens or vectors.

<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>• Preparedness and response to emergency situations, ranging from improved capacity within the Ministry of Health to the preparation of hospital contingency plans and rapid assessment protocols connected with climate change events.</li> <li>• Integration of adaptation measures within a comprehensive approach to strengthening health systems to protect populations from the impacts of climate change.</li> <li>• Utilize health impact assessments to evaluate social and economic costs of threats and prioritize action and investment areas.</li> <li>• Establishing the system for collection the timely information, carry out research and regularly update assessments, including on current, future and emerging environment and health hazards and risks resulting from climate change; the identification of vulnerable groups and subregions; current national and subnational capacities for addressing the health and environmental risks; costing of the risks and opportunities, including the health costs of inaction; and trends in adaptation effectiveness.</li> <li>• Tools to support the use of science in understand disease risks and of developing effective risk communication and aiming the messages to vulnerable populations</li> <li>• In particular, assessment of the existing pathogen/vector control infrastructure, waterborne diseases, weather-related morbidity and mortality, food-borne diseases and nutrition, neurological diseases and disorders, mental health and stress related disorders etc</li> </ul>	
<p><b>Results / Impacts:</b></p> <p>Awareness raising to support greater health sector engagement in climate-change adaptation programming. Common information and shared understandings are important for mobilizing public support, and awareness is a introduction to informed action and in democratic societies action towards sustainable development.</p>	
<p><b>Responsibilities:</b></p> <p>The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• National Institute of Public Health</li> <li>• Central governance - Ministries</li> <li>• Local governance - Municipalities</li> <li>• Non-government organizations</li> <li>• Active donors in Kosovo and other stakeholders</li> </ul>	
<p><b>Investment Cost:</b></p> <p>The costs for implementation of the above mentioned intervention is estimated at 0.75 million of Euros.</p>	<p><b>Investment period:</b></p> <p>2014 – 2015</p>

NAC Intervention Sheet No.23		
<p><b>Name:</b></p> <p><b>Public health surveillance systems</b></p>	<p><b>Location:</b> Kosovo</p>	<p><b>Type of intervention:</b></p> <p><b>Resource and strategic project</b></p>
<p><b>Objectives:</b></p> <p>Avoided potential health impact of climate through a combination of strengthening key health system functions and improved management of the risks presented by a changing climate. For authorities: Strengthening public health surveillance systems towards sufficiently comprehensive and sensitive to detect potential effects of climate change on health,</p>		

<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>• Strengthen health system adaptive capacity: Many of the projected impacts of climate change on health are avoidable or controllable through application of well-known and well-tested public health and health service interventions, such as public education, disease surveillance and communicable diseases in particular, disaster preparedness, mosquito control, food hygiene and inspection, nutritional supplementation, vaccines, primary and mental health care, and training. Improvement/development of action plans and maintenance of the control resources and personnel capacity needed to go up to successful responses</li> <li>• Enhance/development of response systems for infectious disease outbreaks</li> <li>• Enhance/development of response systems for infectious disease outbreaks</li> </ul>	
<p><b>Results / Impacts:</b></p> <p>The current and future natural disasters impact could be reduced by the health sector defining incorporated mechanisms that address the origin causes of vulnerability and planning for effective responses after such event. It helps health sector improve climate risk management and makes climate services an essential public health service. The strengthening of health systems should be named as one of the priority areas for adaptation to climate change</p>	
<p><b>Responsibilities:</b></p> <p>The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Ministry of Health / National Institute of Public Health</li> <li>• Central governance - Ministries</li> <li>• Local governance - Municipalities</li> <li>• Non-government organizations</li> <li>• Active donors in Kosovo and other stakeholders</li> </ul>	
<p><b>Investment Cost:</b></p> <p>The costs for implementation of the above mentioned intervention is estimated at 0.6 million of Euros.</p>	<p><b>Investment period:</b></p> <p>2014 – 2016</p>

NAC Intervention Sheet No. 24		
<p><b>Name:</b> Strengthening joint/participative information production</p>	<p><b>Location:</b> Kosovo</p>	<p><b>Type of intervention:</b> Resource and strategic project</p>
<p><b>Objectives:</b></p> <p>Research, together with other sophisticated tools for data collecting and analyze, will provide essential knowledge to central and local governance, multiple businesses, and communities as they plan for further development. Researches in regards to climate, land productivity, rivers and other water resources, ecological systems, demographic and socioeconomic trends etc.</p> <p>Therefore strengthening joint/participative information production it is needed, including</p> <ul style="list-style-type: none"> <li>• Different government bodies and non- governmental organisations are involved in setting the TORs and supervising the search, or at least consulted (interviews, surveys etc.),</li> <li>• Multi-disciplinarily: Different disciplines are involved in defining and executing the research: in addition to technical and engineering sciences also for instance ecology and the social sciences,</li> <li>• Researchers allow their research to be challenged by stakeholders and present their own assumption in as far as they are aware of them,</li> <li>• Research results are not presented in an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want,</li> <li>• Uncertainties are not glossed over but communicated (in final reports, orally),</li> <li>• Researchers are willing to talk with stakeholders about uncertainties</li> </ul>		

<p><b>Intervention:</b> In national research programmes and initiatives with aim to create tools for climate change mitigation and adaptation, developing a model procedure would be considered as an intervention. This model procedure will include diverse expertise, capabilities, government bodies and stakeholders who will contribute in strengthening joint/participative information production. The model procedure will be open for use and access to all involved stakeholders in a web base maintained by govern.</p>	
<p><b>Results / Impacts:</b> The result of this intervention will help productivity of the specific research to reach its best performance while involving all necessary structure of people and recourses.</p>	
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Central governance - Ministries</li> <li>• Local governance - Municipalities</li> <li>• Non-government organizations</li> <li>• Active donors in Kosovo and other stakeholders, etc.</li> </ul>	
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.9 million of Euros.</p>	<p><b>Investment period:</b> 2014 – 2015</p>

### NAC Intervention Sheet No. 25

<p><b>Name:</b> <b>Modernizing the hydrometeorology sector</b></p>	<p><b>Location:</b> <b>Kosovo Hydro-meteorological Institute Prishtina Kosovo</b></p>	<p><b>Type of intervention:</b> <b>Infrastructure project</b></p>
<p>Important note: Harmonize with Water Strategy team and/or the existing Environmental Strategy and Action Plan so as to avoid duplication and reduce costs.</p> <p><b>Objectives:</b> Kosovo is exposed to natural hazards like flood, drought, heavy rainfall or snowfall, wind storms, heat waves, landslides, avalanches, forest fires, and some epidemics which are directly or indirectly related to hydrology, meteorology and weather conditions.</p> <p>The aim of this intervention is to modernize the hydrometeorology sector, including strengthening forecast &amp; early warning or disaster warning system, monitoring climate parameters and long term monitoring of surface &amp; groundwater.</p> <p>It is very important to generate more accurate, timely and reliable forecasts and warnings of weather, climate, water and related environmental elements. Also, improvement of deliverance of weather, climate, water and related environmental information and services to the public, governments and other users. With significant importance is educating the public and government of the risks associated with weather, climate &amp; water hazards, furthermore advising user groups on how they can make better use of weather, climate and water information for social and economic benefits.</p> <p>Therefore it is essential to modernize the hydrometeorology sector, including a) strengthening forecast &amp; early warning or disaster warning system, b) Long term monitoring of surface and groundwater (quality and quantity)</p>		

**Intervention:**

Modernizing the hydrological and meteorological infrastructure for collecting and processing hydro meteorological data can be attained through the following lines of action:

- Modernize existing water resources monitoring network (groundwater and surface water) and the network for other climatic parameters (stations to monitor temperature, precipitation, evaporation, transpiration, solar radiation, etc.) and establish network where it does not exist to cover the whole area of Kosovo, including supply, delivery, installation and configuration of all necessary infrastructure, equipment, instrumentation, etc.; Improve the reliability and availability of hydro meteorological data, automate measuring processes in selected locations and transmission of real - time data to the HQ of Hydro-meteorological Institute;
- Improve operations and maintenance of all above installed instrumentation;
- Strengthening the capacities of local institution officials to permanently obtain recorded data, to analyse the data, to use numerical models and software's for simulation and projection of climate change impact on water resources and eco-system services, sharing the information between different institutions within Kosovo and on the regional level.
- Facilitate country access to best available data and information on climate impacts.
- Providing decision makers with an early warning signal about the need to monitor meteorological and hydrological variations to leverage finance for climate change mitigation and adaptation, including coordination with international finance institutions.
- Identify, assess and monitor disaster risks and enhance early warning;
- Better communication and dissemination of warnings and using new techniques to alert the public
- Establish adequate structures to properly operate and maintain the networks across the country.

**Results / Impacts:**

One of the first impacts is integration of weather, water and climate related activities within the region. Secondly preparedness and awareness to meet global and regional concerns including warning of high impact weather, climate and water conditions, disaster prevention and mitigation, climate change and water resources management.

Other impacts include awareness of the benefits of weather, water and climate-related services to all sectors of society, including here decision makers. Furthermore, links between relevant organizations within the region, other state authorities, the private sector, academia, users etc.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Kosovo Hydrometeorological Institute
- Meteorological stations in Prishtina, Peja dhe Ferizaj
- Kosovo Environmental Protection Agency KEPA
- Municipalities within the service area of the meteorological stations
- Ministry of Environment and Spatial Planning
- Ministry of Economic Development and
- Ministry of Finances
- Active donors in Kosovo.

**Investment Cost:**

Approximate costs for implementation of the above mentioned intervention is estimated at 20-30 million of Euros.

**Investment period:**

2014 – 2025

**NAC Intervention Sheet No. 26****Name:**

Improving communication

**Location:**

Kosovo

**Type of intervention:**

Development project

**Objectives:**

Kosovo like many several national governments has created government web sites to distribute a portion of the data they collect. Hence improving communication it is needed (exchange of data and produced information), including:

- Governments exchange information and data with other governments,
- Open shared information sources that fills gaps and facilitate integration, e.g. an open shared database for data about long term monitoring of surface water (quality and quantity),
- Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, through the media, etc.

<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>Increasing numbers of datasets available to the public by means of national, regional, local or thematic portals, supported by political commitments towards open government and open data.</li> <li>Concept for a collaborative project in local government to create and organize Culture for Open Data or Open government data. A list of over 200 local, regional and national open data catalogues is available on the open source datacatalogs.org project, which aims to be a comprehensive list of data catalogues from around the world.</li> <li>Conception of open shared database for data about long term monitoring of surface water (quality and quantity), and connecting with similar departments in region countries.</li> <li>Awareness campaigns, research and other tools for data collection and analyze.</li> </ul>	
<p><b>Results / Impacts:</b></p> <p>Through extending improving and access to Information and Communication Technologies ICT and encouraging the more frequent use of ICTs, the aim is to stimulate sustainable economic growth, improve service delivery, and promote good governance and social accountability.</p>	
<p><b>Responsibilities:</b></p> <p>The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>Government of Kosovo</li> <li>Central Governance - Ministries</li> <li>Local Governance - Municipalities</li> <li>Active donors in Kosovo.</li> </ul>	
<p><b>Investment Cost:</b></p> <p>The costs for implementation of the above mentioned intervention is estimated at 0.7 million of Euros.</p>	<p><b>Investment period:</b></p> <p>2014 - 2015 (inception phase) 2014 - 2024 (maintaining)</p>

NAC Intervention Sheet No. 27		
<p><b>Name:</b> Improving utilization of information</p>	<p><b>Location:</b> Kosovo</p>	<p><b>Type of intervention:</b> Improvement project</p>
<p><b>Objectives:</b></p> <p>Information utilization is the transfer of information along a series of pathways that connect groups and individuals in a variety of roles and settings. We can look at the system of information utilization and identify barriers to it. But to eliminate those barriers, we need too address the process of information utilization or how we communicate information.</p> <p>Therefore, it is required improving utilization of information, including</p> <ol style="list-style-type: none"> <li>New information is used in public debates (and is not distorted),</li> <li>Decision support systems, e.g. hydro meteorological information systems are up to standards,</li> <li>Adoption of an M&amp;E plan during project preparation that includes establishment of process indicators, stress reduction indicators, and environmental status indicators</li> </ol>		
<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>Specific IT components and development of IT products</li> <li>Establishment of other information resources, and improve providers training to reduce errors</li> <li>Build capacities to further reduce errors</li> <li>Maintenance and frequently update of hydrometeorological information systems</li> <li>Small innovative research program's and network's</li> <li>Development of innovative technology</li> </ul>		
<p><b>Results / Impacts:</b></p> <p>Information technology in years to come will take a central role in redesigning of sustainable improvements of services, knowledge, communication, outcomes, quality and efficiency. A significant progress will be achieved with changes in technical, sociological, cultural, educational, financial and other important factors.</p>		

<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo</li> <li>• Central Governance - Ministries</li> <li>• Local Governance - Municipalities</li> <li>• Active donors in Kosovo, etc.</li> </ul>	
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.75 million of Euros.</p>	<p><b>Investment period:</b> 2014 – 2015</p>

Intervention Sheet No. 28		
<p><b>Name:</b> Public awareness programs on climate change</p>	<p><b>Location:</b> Kosovo</p>	<p><b>Type of intervention:</b> Socio-economic project</p>
<p><b>Objectives:</b> As many governments and non-governmental organizations are already working actively to raise awareness in regards to climate change and its effects, Kosovo's national government will have to work towards the same directions while encourage local authorities, educators, the media, to play a role in raising awareness on impact's of climate change. Public awareness programs on climate change and how to deal with its impacts will be developed, including a) Awareness campaign on the risks of building, living and working in vulnerable areas, b) Awareness campaign on saving water for citizens, companies, factories, etc.</p>		
<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>• Tools for awareness raising will include capacity building such as education, training, &amp; preparation of materials on climate change, explaining what is climate change and how it will effect our life's, changes that will bring to the economy, our health, and how we can work toward a better environment for our benefit and better future.</li> <li>• This tools will be adjusted for the use and consumption of the common man, communitie's, civil society, school curriculum, policy makers, etc.</li> <li>• Workshops and seminars will be organized at national and local level, beginning with process of education and training for officials, professional and schoolteachers who will share further their knowledge and experience.</li> <li>• Communication media like television, radio, pamphlets, newspapers will be active in such campaigns</li> </ul>		
<p><b>Results / Impacts:</b> There are many benefits of building awareness of possible climate change impacts. Starting with: encouragement for better planning; production of scenarios of vulnerabilities and summaries of the actions that could be taken to enhance resilience to stressors or impacts in specific communities; better understanding of how a changing climate will affect their communities, economy, agriculture, lifestyle. To address issues related to adaptation it is essential to assess awareness regarding climate change in the general population.</p>		
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo</li> <li>• Central Governance - Ministries</li> <li>• Local Governance - Municipalities</li> <li>• Active donors in Kosovo.</li> </ul>		
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.8 million of Euros.</p>	<p><b>Investment period:</b> 2014 – 2016</p>	

NAC Intervention Sheet No. 29		
<b>Name:</b> Training for professionals	<b>Location:</b> Kosovo	<b>Type of intervention:</b> Educational project
<p><b>Objectives:</b> Establishment of irrigation centers with programmes to introduce improved district management and regional water planning with training for professionals, including:</p> <p>a) Training on efficient irrigation management for farmers, b) Training on climate change adaptation for advanced professionals in water, agriculture, forestry, land use planning, public health, etc</p> <p>Training workshops focused on irrigation efficiency with topics: soil, irrigation scheduling equipment, drip irrigation evaluation, weather data interpretation, salinity management in irrigated horticulture etc.</p>		
<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>• Educational services and technical assistance for irrigation districts</li> <li>• Technical assistance, design and training in GIS implementation and database system integration, including the optimization of water distribution network and in-field irrigation systems</li> <li>• Applied research in GIS-based management systems and rapid assessment methods for prioritized rehabilitation projects based on water saving potential.</li> <li>• Geographical Information System for irrigation district mapping and management</li> <li>• Water measurement and metering in irrigation districts</li> <li>• Customized individual and group training</li> <li>• Irrigation management programs</li> </ul>		
<p><b>Results / Impacts:</b> Analyzing the water supply situation in district and their capability to distribute satisfactory water and head at the farm turnout to allow for efficient on-farm irrigation. Evaluation of water losses in districts through seepage loss tests, spill measurement, etc, prioritizing and determining water savings in proposed rehabilitation/treatment projects. Rating the conditions of district infrastructure to identify water distributing network components and structures needing renovation. GIS mapping and integration within district accounting and database systems.</p>		
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo</li> <li>• Central Governance - Ministries</li> <li>• Local Governance – Municipalities.</li> </ul>		
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.9 million of Euros.</p>		<p><b>Investment period:</b> 2014 – 2018</p>

NAC Intervention Sheet No. 30		
<b>Name:</b> Financial and economic measures	<b>Location:</b> Kosovo	<b>Type of intervention:</b> Socio-economy project

**Objectives:**

The importance of the relationship between financial development and economic growth has been well recognized and emphasized in the field of economic development. It is said that financial development is crucial for successful economic growth

Financial and economic measures need to be taken including:

- a) Financial resources are diversified by using a broad set of private and public financial instruments,
- b) Costs are recovered from the 'users' by public and private financial instruments (charges, prices, insurance etc.),
- c) Authorities can take loans and depreciate their assets, to facilitate efficient use of resources and replacement of assets,
- d) Improving private sector participation in water and natural resources management, e.g. by public-private partnerships.

**Intervention:**

- Help companies especially small and medium sized business export to global markets, establishment of export programs and resources for businesses so they can easily access the supports they need to go global
- Reduction of administrative cost for exporting companies reduce risk in the financing cycle by increasing the likelihood of a project reaching financial close and/or decreasing the cost of capital
- Policy insurance for renewable fee-in tariff
- Clean energy loan guarantee
- Flexible management of economic and fiscal policy
- For stronger development stimulating private investment and those for promoting renewable energy and energy saving
- Through aggressive promotion improving the competitiveness of agriculture, forestry and economy
- Revitalizing the regional economies through making use of local assets and accelerating the construction of resident friendly communities.
- Promotion of tourism, agriculture, increasing jobs and labor income distribution through taxation and other measures
- Promotion of structural modification to accomplish domestic demand-oriented growth led by private sector
- Identifying performance indicators to measure and prioritize issues for environmental and social management response
- Identifying relevant socio-economic indicators to measure impact in specific sectors
- Identifying socio-economic impact indicators for measurement, and prioritize issues for management response
- Measuring socio-economic impact which will help comprehend the needs, aspirations, resources, and incentives.

**Results / Impacts:**

Multiple techniques and tools are available to address the challenges of socio-economic impact measurement which can help businesses, government, and civil society. The main impact/ result with implementation of proposed financial and economic measures is more stabilized financial system and economy.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Kosovo government, Central government - Ministries
- Local government - Municipalities
- Ministry of Economic Development and
- Ministry of Finances
- Active donors in Kosovo

**Investment Cost:**

The costs for implementation of the above mentioned intervention is estimated at 1.7 million of Euros.

**Investment period:**

2014 – 2018

NAC Intervention Sheet No. 31		
<b>Name:</b> Improving risk (emergency) management	<b>Location:</b> Kosovo	<b>Type of intervention:</b> Socio-economic project
<p><b>Objectives:</b> Risk management systems need to be more adaptive rather than static. Financial and economic institutions must address their over-dependence on credit ratings, and supplement ratings with their own analysis, which should be intermittently updated over the whole period of the investment. Improving risk management, including:</p> <ul style="list-style-type: none"> <li>a) Risk perception by formal expert judgment and risk perception by the stakeholders,</li> <li>b) Both governmental and non-governmental stakeholders are involved in decisions on what are acceptable risks,</li> <li>c) Harvest insurance mechanisms are available,</li> <li>d) Insurance against housing and property damage is available</li> </ul>		
<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>• Development of platforms, integrated structures and components for enhanced risk and green management.</li> <li>• Development of a framework for improving risk management</li> <li>• Typical procedures of risk management such as: identifying, assessing, responding, monitoring and reporting to be carried out with greater coordination, fewer duplication, improved effectiveness and minor cost.</li> <li>• Include systems for internal enlargement of risk data and also for sharing that data with and across many agencies.</li> <li>• It is important to discuss all possible risk scenarios and identifying specific risks that could destabilize accomplishments and develop optimal ways to respond to them.</li> </ul>		
<p><b>Results / Impacts:</b> Socio-economic impacts are closely connected with business success, and we need to integrate them into business performance management</p>		
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo, Central Government - ministries</li> <li>• Local government - Municipalities</li> <li>• Ministry of Economic Development and</li> <li>• Ministry of Finances</li> <li>• Active donors in Kosovo</li> </ul>		
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.6 million of Euros.</p>		<p><b>Investment period:</b> 2014 – 2018</p>

NAC Intervention Sheet No. 32		
<b>Name:</b> Strengthening the level of, or provisions for, stakeholder participation	<b>Location:</b> Kosovo	<b>Type of intervention:</b> Socio-economy project

**Objectives:**

Strengthening the level of, or provisions for, stakeholder participation, including:

- a) Legal provisions concerning access to information, participation in decision-making (e.g. consultation requirements before decision-making) and access to courts,
- b) Co-operation structures include non-governmental stakeholders (e.g. environmental NGO's, user groups, citizen groups or private sector),
- c) Non-governmental stakeholders actually contribute to agenda setting, analysing problems, developing solutions and taking decisions ("coproduction"),
- d) Non-governmental stakeholders are enabled or allowed to undertake parts of natural resources management themselves, e.g. through water users' associations.

**Intervention:**

- To provide numerous and unlimited technique of stakeholder identification and analysis
- Using numerous types of communication and also problem solving
- Addressing multiple levels of policymaking, including interdependencies among institutions and organizations.
- Accommodating miscellaneous characteristics, interests, and communication. Be receptive to multiple sources and types of information.
- Accept the inevitability of conflict and identifying the impossibility of complete and final resolution.
- Create capacity to contend with additional perturbations, shocks, and issues that will result from the impacts of global change.
- Recognize a multiplicity of problems originating from the same source.
- Address the underlying sources of conflict while addressing specific disagreements.
- Gather, exchange, and communicate knowledge of the worldviews and histories of participants and apply them to institutional processes and design

**Results / Impacts:**

Good governance, well designed promotion of democratization and also the intelligibility of decision-making development, is the perspective for involvement of stakeholders in policy making. Such involvement was regarded with the benefits of economic and social development.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Central Governance - Ministries
- Local Governance - Municipalities
- Ministry of Economic Development and
- Ministry of Finances
- Active donors in Kosovo

**Investment Cost:**

The costs for implementation of the above mentioned intervention is estimated at 0.6 million of Euros.

**Investment period:**

2014 – 2016

**NAC Intervention Sheet No. 33**

**Name:**  
Improving cross-sectoral cooperation

**Location:**

**Type of intervention:**  
Capacity building project

**Objectives:**

Today we confront mismatched resources, capabilities and expertise levels of organisations, therefore cross-sectoral cooperation is an increasingly popular way developed all across Europe of addressing common concerns and interesting collaboration methods.

While the roles and relations of public authorities, private sector and civil society organisations are changing, actors are looking for new ways to achieve their goals, discussing how collaborations between business, civil society and governments could be leveraged to find solutions to the many challenges we face.

For that reason we need improvement of cross-sectoral cooperation, including:

- a) Sectoral governments actively involve other government sectors (e.g. agriculture, nature, environment, tourism, forestry, health, navigation, spatial planning),
- b) Co-operation structures include government bodies from different sectors; many contacts generally,
- c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process).

**Intervention:**

- Adapt models for cross-sectoral cooperation bringing together the public sector, private sector and social enterprises. Promotion of new models for cross-sectoral cooperation to cultivate social inclusion, cohesion and innovation and a particular emphasis on strengthening the role and capacity of social enterprises with primary target groups such as: policy makers, private business representatives, social enterprises, organizations & initiatives, general public, and other relevant stakeholders.
- Developing new instruments and operating methods - Integration of technical systems: public and private stakeholders, water supply and sanitation; landscape planning, waste management, architecture, urban functions, energy, traffic and transport
- Reinforcing the strategic position of guidance and research and providing more training for those giving guidance
- Guarantee accessibility, availability and sufficiency of guidance and counselling services for all citizens, to develop cooperation and work in regional cross-sectoral networks.
- Identify and analyze good practices of effective and innovative models for cross-sectoral cooperation and partnership, specifically focusing on the role and needs of social enterprises.
- The development policy will require co-operation and networking raise awareness and inform on the social economy.

**Results / Impacts:**

People expect that measures taken by their government and public administrations are effective and efficient, and want politics and laws to be transparent and responsive to their needs. They also demand to have more information on economic and ecological concerns and ask for more involvement in policy formulation and implementation. Policy-makers and civil servants need to take into account important linkages between different public policies as well as their local, national and international dimensions. While, policy development and implementation need to be based on substantial and flexible relations between government and the stakeholders concerned, such as land users and land managers, private companies and community organizations.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Government of Kosovo
- Central Governance - Ministries
- Local Governance – Municipalities, etc.

**Investment Cost:**

The costs for implementation of the above mentioned intervention is estimated at 0.8 million of Euros.

**Investment period:**

2014 – 2025

## NAC Intervention Sheet No. 34

<b>Name:</b> <b>Improving cooperation between administration levels</b>	<b>Location:</b>	<b>Type of intervention:</b> <b>Capacity building project</b>
<b>Objectives:</b> <p>The relations between central and local government operates on a number of district levels. National government and local government need to work closely day-to-day to achieve mutual goals. Hence improving cooperation between administration levels it is necessary, including:</p> <p>a) Lower level governments are involved in decision-making by higher level governments,</p> <p>b) Co-operation structures include government bodies from different hierarchical levels; many contacts generally,</p> <p>c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)</p>		
<b>Intervention:</b> <ul style="list-style-type: none"> <li>• Mutual programs, trainings, and capacity building in/with both levels.</li> <li>• A method for objective oriented planning - a management tool which facilitates planning, execution and evaluation of mutual projects.</li> <li>• Coordination of mechanism between the different levels to produce quality regulation</li> <li>• More effective allocation of regulatory responsibilities, tendering, decision making and monitoring processes</li> <li>• Increased good governance perspectives and local government management</li> <li>• Central government give their full support to local government in promoting and development of multiple projects, management, technology and finance/investment</li> </ul>		
<b>Results / Impacts:</b> <p>As result of this intervention will be strengthening existing relationships between central and local government and other agencies while finding better ways to work together. While it's considered with great importance trust in local government to make local decisions and deliver services, advices and researches. Working together can be more effective and more rewarding for all involved parties.</p>		
<b>Responsibilities:</b> <p>The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo</li> <li>• Central Governance - Ministries</li> <li>• Local Governance – Municipalities</li> </ul>		
<b>Investment Cost:</b> <p>The costs for implementation of the above mentioned intervention is estimated at 0.5 million of Euros per year</p>	<b>Investment period:</b> 2014 – 2025	

## NAC Intervention Sheet No. 35

<b>Name:</b> <b>Improving cooperation across administrative boundaries</b>	<b>Location:</b> <b>Kosovo</b>	<b>Type of intervention:</b> <b>Infrastructure project</b>
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<p><b>Objectives:</b> The main aim is to reduce the negative effects of borders across administrative borders, while tackling common problems and exploit untapped potential. Improving cooperation across administrative boundaries, including:</p> <ul style="list-style-type: none"> <li>a) Downstream governments are involved in decision-making by upstream governments,</li> <li>b) International/ transboundary co-operation structures exist (e.g. river basin commissions); many contacts generally,</li> <li>c) Conflicts are dealt with constructively, resulting in inclusive agreements to which the parties are committed (i.e. Conflicts are at least reduced, or resolved, in order to prevent stalling of the decision-making process)</li> </ul>	
<p><b>Intervention:</b> Cooperation process is enhanced through joint management of programmes and project, mutual trust and understanding. Establishing well-defined, consistent boundaries minimizes legal irregularities Mapping and correcting public information on district boundary legal description and their corresponding maps.</p>	
<p><b>Responsibilities:</b> The main responsible partners for implementation of these interventions:</p> <ul style="list-style-type: none"> <li>• Government of Kosovo</li> <li>• Central Governance - Ministries</li> <li>• Local Governance – Municipalities, etc.</li> </ul>	
<p><b>Investment Cost:</b> The costs for implementation of the above mentioned intervention is estimated at 0.5 million of Euros.</p>	<p><b>Investment period:</b> 2014 – 2015</p>

### NAC Intervention Sheet No. 36

<p><b>Name:</b> <b>Management plan &amp; rehabilitation measures for Ibër-Lepenci Hydro-system</b></p>	<p><b>Location:</b> <b>Gazivoda Lake and Ibër Lepenci Channel</b></p>	<p><b>Type of intervention:</b> <b>Non-infrastructurel and infrastructure project</b></p>
<p><b>Objectives:</b> Gazivoda artificial lake and the water conveyance channel (aqueduct) represent the most important water resource in Kosovo. Water from Gazivoda lake, transported via Ibër-Lepenci channel, is used for different purposes by different costumers:</p> <ul style="list-style-type: none"> <li>• Drinking water supply: RWC Mitrovica receives water and plans to double its treatment capacities to satisfy increased water demand (two additional WTP's are under construction), RWC Prishtina plans to construct new WTP (the new WTP is in design phase, with implementation planned to start soon).</li> <li>• Energy: Hydropower generation ~30 MW and for cooling of the two existing power plants 'Kosovo A and B'; in addition the new planned power plant 'Kosova e Re' will receive water from Ibër-Lepenci channel,</li> <li>• Industry: Ferronikeli metallurgical plant, receive water from the Ibër-Lepenci channel</li> <li>• Irrigation of agricultural land in Mitrovica and Prishtina region.</li> <li>• Considering its importance for water supply, energy generation, industry and irrigation, a comprehensive rehabilitation and management plan for Ibër-Lepenci channel shall be developed to address physical integrity and management of Ibër-Lepenci channel.</li> </ul>		
<p>Note: The Word Bank has started implementation a project to address the Ibër-Lepenci</p>		

**Intervention:**

Intervention shall incorporate non-structural and structural measures, such:

- i) Development of operational and management plan for Ibër Lepenci channel, and
- ii) Develop design and implementation of rehabilitation measures to secure structural integrity of Ibër Lepenci channel.
  - i) Operational & management Plan, includes:
    - Reasonable prioritization, restriction and water allocation for each costumer category withdrawing water from Ibër-Lepenci channel to consider both "supply" and "demand" side.
    - Sustainable water resource management, including the tariff policy.
    - Developing programme of protection measures addressing illegal water extraction, discharge of wastewater and minimization of other related risks.
    - Developing plans for water supply to costumers in case of emergency situations, connection to other key water infrastructure elements to increase the flexibility of supply.
  - ii) Rehabilitation of existing structure of the channel to improve water delivery efficiency
    - Implementation of rehabilitation measures to reduce the channel leakages, disconnection of illegal water withdrawal.
    - Implementation of protection measures (construction of walls) to prevent flow of run-off and leaching water to the channel.

**Results / Impacts:**

Implementation of the above measures will lead to:

- i) Operational and management plan for Ibër-Lepenci channel will be developed, water allocation and prioritization of costumer categories considering different scenarios addressed.
- ii) Structural integrity of the Ibër-Lepenci channel will be secured,
- iii) Vulnerabilities related to water contamination, illegal withdrawal are minimized.
- iv) Water transport delivery of channel improved.

**Responsibilities:**

The main responsible partners for implementation of these interventions:

- Ibër-Lepenci Hydro system
- RWCs of Mitrovica and Prishtina
- Ministry of Environment and Spatial Planning
- Ministry of Economic Development and
- Ministry of Finances
- Donor agencies

**Investment Cost:**

The costs for development and implementation of non-structural and structural measures are estimated at 15 - 17 million of Euros.

**Investment period:**

2015 – 2018

**NAC Intervention Sheet No. 37****Name:**

**Design and construction of a treatment plant for Novobërdë mine acidic discharge water**

**Location:**  
**Novobërdë**

**Type of intervention:**  
**Infrastructure project**

**Objectives:**

Acidic drainage water from the mine of Novobërdë is discharged directly to the river Marevc. The quality of water from this stream is characterized by low pH (6.25), high levels of sulphate ions (163 mg/L), iron (62.5 mg/L), zinc (22.1 mg/L) and manganese (17.9 mg/L). Heavy metals (known as highly toxic to the human health) such as As, Cd, Cu, Pb, Ni, Co and Cr are present in high concentration, exceeding the prevailing environmental limits in Kosovo, EU and internationally applicable standards for effluent water.

These acidic discharges have a serious adverse impact on the quality of Marevc river for a significant distance downstream the mine. Environmental degradation becomes even more significant taking into account that this river, whose quality upstream the mine represents a healthy aquatic habitat and meets the most stringent environmental standards, affects the drinking water and irrigation water of the downstream towns and population living in the municipalities of Novobërdë and Kamenica. Moreover, there is a transboundary impact of the contamination, because the Marevc river flows to the Morava e Binçës river basin, which is tributary to the Danube river.

Therefore, main objective of this intervention / measure is to treat acidic discharged water from the Novobërdë mine and reduce the load of contaminants to the concentration that do not pose risk to the environment, aquatic habitat and the health of population living downstream the mine.

Note: UNDP conducted a feasibility study for the treatment acid mine drainage water for Novobërdë.

**Intervention:**

Develop final design and construction of active treatment plant for Novobërdë acidic discharged water, consisting of agitated and aeration tank, neutralization basin, settler and sludge thickener.

**Results / Impacts:**

Construction of the plant for treatment of acidic discharge water would be reflected in reduced contamination load and improvement of water quality and less harm to the human health and environment degradation for the towns downstream the mine location.

**Responsibilities:**

The main responsible partners for implementation of the treatment plant are:

- Trepça Company
- Municipality of Novobërdë
- Ministry of Environment and Spatial Planning
- Ministry of Economic Development
- Ministry of Trade and Industry and
- Ministry of Finances

**Investment Cost:**

The cost for developing the design and construction of treatment plant is estimated at 0.85 – 1.0 million Euro.

**Investment period:**

Short term 2015 – 2016

**NAC Intervention Sheet No. 38****Name:**

Re-cultivation of industrial tailing sites and treatment of acid mine drainage

**Location:**

Mitrovica Industrial Park  
Stari Trg/ Kelmendi Tailing  
Zveçan Tailing and  
Metallurgical Waste

**Type of intervention:**

Non-infrastructurel and  
infrastructurel

**Objectives:**

Mitrovica is centred on part of the Trepca Mining Complex, which was once the most important industrial and mining site in Kosovo. The Stari Trg mines are located around 6 km northeast of Mitrovica, and the Zvečan Pb-Zn Smelter and Mitrovica Industrial Park on the outskirts of the town itself. Over a decades intensive mining and smelting produced huge quantities of industrial waste, both in the form of particulate and gaseous chimney emissions and large volumes of slag and tailings. It is estimated that around 50 millions of tons of toxic industrial wastes are deposited near or around these mining sites, near urban towns and in vicinity of rivers (Sitnica and Ibër river) generating ubiquitous environmental problems. Population in the Mitrovica region was exposed for several decades to the extremely high concentrations of heavy metals in air, water and soils.

Therefore, the objective of this intervention is to mitigate the negative impacts of the tailing to the environment and human health.

**Intervention:**

To mitigate the negative environment impacts of the tailings in Mitrovica region there is a need a need for development and implementation of rehabilitation measures comprising of non-infrastructural and infrastructural components. Measures to implement range from developing feasibility studies and re-cultivation of industrial waste material that is posing an extreme risk for human health and environmental eco-system downstream the contaminated sites. Interventions are listed in the following text:

- Develop a feasibility study and comprehensive plan for reprocessing and/ or remediation of the tailing sites in Mitrovica Industrial Park, Kelmendi/ Stari tailing and Zvečan metallurgical slug
- Develop a feasibility study for treatment of acid mine water from Tuneli i Parë prior to discharge into the Trepca River and management of run-off
- Implementation of remediation measures for Mitrovica Industrial Park, Starn Tërg/ Kelmendi tailing and Zvečan tailings.
- Construction a treatment plant for acid mine water existing from Tuneli i Parë
- Develop a comprehensive plan for delineation of groundwater contamination plume and develop measures for groundwater treatment in the Mitrovica Industrial Park.
- Develop measures for remediation of agricultural land in the areas where the concentration of heavy metals represents risk for human health.

**Results / Impacts:**

Implementation of measures above would mitigate the environment degradation, would be reflected in the improvement of human health in the Mitrovica region and wider, as these the water from Ibër discharges to Serbia, which has trans boundary effects.

**Responsibilities:**

The main responsible partners for implementation of the treatment plant are:

- Trepça Company
- Municipality of Mitrovicë and Zvečan
- Ministry of Environment and Spatial Planning
- Ministry of Economic Development and
- Ministry of Finances

**Investment Cost:**

The cost for developing the feasibility studies and main design for the above interventions and implementation of remediation measures of industrial sites and construction of treatment plant is estimated at 12.0 – 15.0 million Euro.

**Investment period:**

Long term intervention 2015 – 2025

## ANNEX 4: NAC INVESTMENT PLANNING AND IMPLEMENTATION

After ratification of the strategy, one of the next challenges will be how to prepare for financing and implementation. Below section provides a brief overview in terms of investment planning, financing, project preparation and project implementation.

### *Investment Planning*

The aim of an investment plan is to present the projects to be implemented in terms of objective; content; time schedules; disbursement schedules; revenues; environmental and social impacts; and legal and institutional issues. A good investment plan may attract potential financiers and partners, and helps towards good implementation. It could help to raise the following questions during the preparation of an investment plan:

**What is the purpose of the investment?** The overall objective of the investment, as well as its direct purpose should be well described. The purpose is preferably linked to specific performance indicators, to enable monitoring of the impacts of the investment. The investment might also have some secondary impacts, which are positive and worthwhile to formulate.

**Has the investment been designed optimally?** A feasibility study will be required for most investments, describing various alternative solutions and their impacts in terms of technical feasibility; environmental and social impacts, institutional setting, legal and institutional requirements and possibly more. Once the preferred alternative has been selected, more detailed feasibility aspects could be elaborated and optimized, for instance through a conceptual design of all project components, prior to preparing the detailed designs and tender documents.

**What is the timeframe of the investment?** Generally a physical intervention required three types of investment periods: (1) preparation costs; (2) capital expenditures (CAPEX) and, after completion of the construction works: (3) the operational expenditures (OPEX). In some cases the investment could also require closure costs after completion of the operational phase, for instance in case of a sanitary landfill with a limited life span. It is important to make realistic assessment for each, including their timeframes.

**What are the revenues of the investment?** If the project would generate direct revenues, such as from wastewater fees, it is important to understand to what extent these revenues have been secured, when and how these revenues will be generated, and how to manage an adequate and reliable collection of these revenues.

**What are the investment and financial risks?** It is important to make an adequate risk assessment related to the foreseen investment. These risks may relate to external environmental events that could prevent or reduce the foreseen outputs of the investment; to financial or legal risks such as withdrawal or bankruptcy of critical investors; to construction related risks, and to operations / revenues related risks. It is important to understand the size of these risks and their impacts, as well as their potential mitigation measures and related costs.

**What is the required cash flow?** The difference over time between the expenditures and revenues of the investment determines the cash flow that is needed to prepare, realize and implement the project. Typical expenditures can be: preparation and TA costs; CAPEX; OPEX; taxes; interests on loans, repayment of loans. Incoming cash flows may relate to project revenues; loans; subsidies and grants. The cash flow could be generated from one's own financial resources, and / or through external financiers. External finance could be generated for instance through governmental budgets; private sector (co-)finance; IFI or Donor funds; subsidies or grants; or commercial loans. Generally, commercial loans require a financial viable plan with sufficient revenues and relative low risks levels. Taking account of interest rates and inflation could further optimize and fine tune the required cash flow and financing plan.

### Internal Rates of Return

The Internal Rate of Return (IRR) of an investment is defined as the discount rate at which the net present value of costs (negative cash flows) of the investment equals the net present value of the benefits (positive cash flows) of the investment. IRR calculations are commonly used to evaluate the desirability of investments or projects. The higher a project’s IRR, the more desirable it is to undertake the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first.

**Figure 1 - Positive Internal Rate of Return**

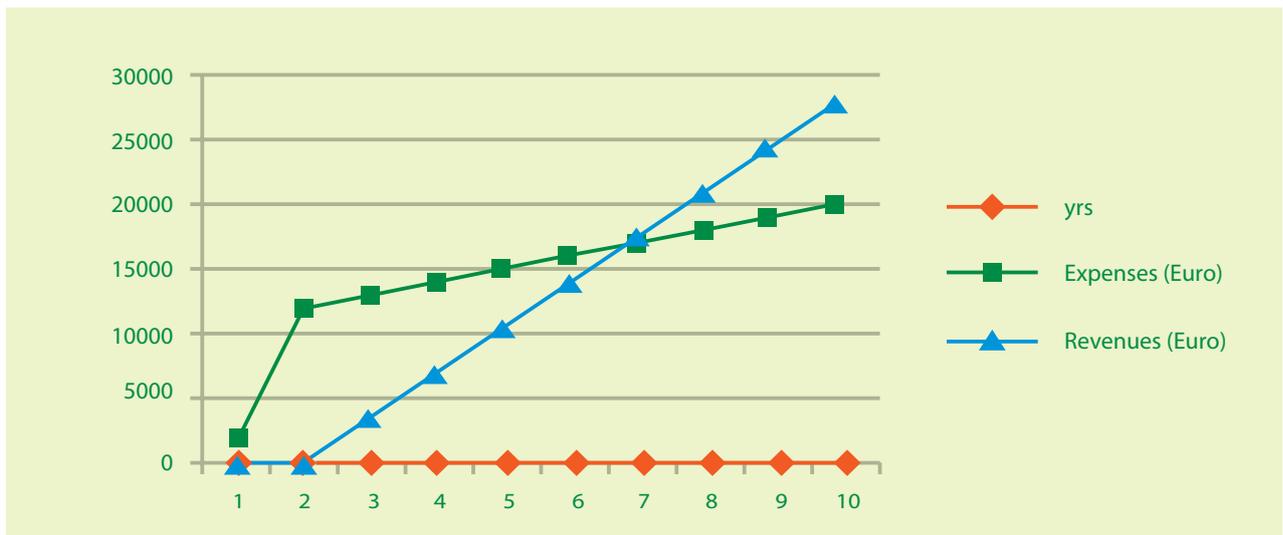


Figure 1 provides an example of a project that generates an internal rate of return of 12.4%, which is reflected by the fact that after a certain period of time the cumulative revenues are exceeding the cumulative expenses. In this case the project financing requirement is 12,000 Euro, being the maximum difference between the cumulative expenses and the revenues after year 2.

**Figure 2 - Negative Internal Rate of Return**

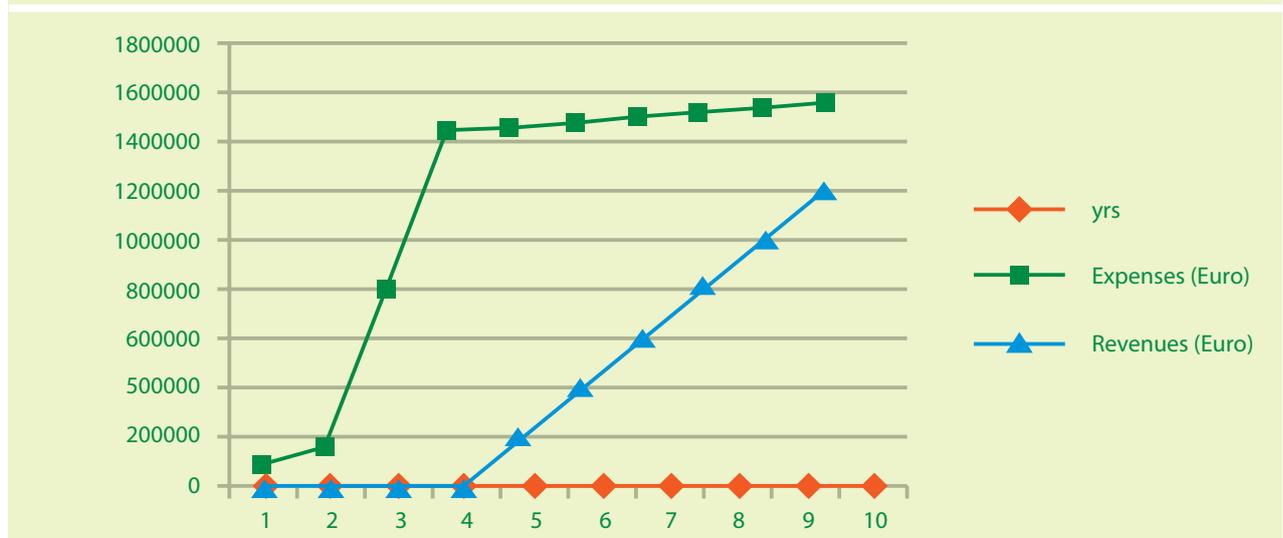


Figure 2 provides an example of a project that generates a negative internal rate of return of -6.5%, which is reflected by the fact that the cumulative revenues will not exceed the cumulative expenses during the foreseen project period (10 years in this case). In this project the required finance (negative cash flow) by the end of the project period is 360,000 Euro (year 10), and in addition an amount of 1,080,000 Euro is required to bridge the gap between the cumulative expenses and the revenues after year 4 (totally 1,440,000 Euro).

## ANNEX 5: OVERVIEW NAC SECTORIAL STRATEGIES

Sectoral strategy/ plan/law	Vision & mission statements
Spatial Plan of Kosovo 2010 - 2020 (MESP)	To ensure sustainable social and economic development, infrastructure and modern technology, education opportunities for all and qualified labor force, a country which respects environment, natural and cultural heritage of its own territory and neighbors, with an open society promoting diversity and idea exchange, having respect for the rights of others
Agriculture and Rural Development Plan, 2009 -13 (MAFRD)	To make a balanced contribution to the economic, environmental, social and cultural wellbeing of rural areas, and Kosovo as a whole, through effective and profitable partnerships between the private sector, central/ local government and local communities within the European context
Development of Forest 2010 - 2020	To increase the contribution of the forest sector to the national economy through sustainable use of the forest resources, taking into consideration as well the multi-functional role of forestry
Strategy and Action Plan for Biodiversity 2011 - 2020	Conservation (preservation) of biodiversity; Sustainable development based on sustainable use of natural recourse; Creation of revenue and Share of benefits from the use of biodiversity in equal manner
Mining Strategy Of The Republic Of Kosovo 2012 – 2025	Development of mineral resources and expansion and modernization of mineral processing industry, to guarantee sustainable economic development, new employment possibilities and improved welfare for the citizens of the Republic of Kosovo. Provision of all legal and institutional prerequisites for prompt enhancement of investments in the mining sector, strengthening of human resource capacities, improved interest of the community and provision of environmental sustainability.
Republic of Kosovo Heating Strategy 2011 – 2018	The heating sector shall meet the indoor and water heating demands taking into account the use of RES, alternative energy sources, and efficient appliances, with a view to preserving the environment. The mission of the Strategy is to contribute the sustainable development of the heating sector, in line with European standards,
Kosovo Environmental Strategy (KES) 2011-2021	Our right is to pursue development in a clean and safe environment. And our responsibilities are to make sure we keep it that way
Law No. 04/L-147 on Waters of Kosovo	To ensure sustainable development and utilization of water resources, which are necessary for public health, environmental protection and socio-economic development of Kosovo; optimal allocation of water resources; protection of water resources from polluting, misuse and overuse
Law on Hydro-meteorological Tasks No. 02 / I-79	This law shall regulate the hydro-meteorological works and the manner of their accomplishment.

Law on Public Health No. 02/L-78	Public Health: is an independent discipline dealing with identification and solving of all community problems from every health aspects, prevention of diseases, research on the etiology of the diseases, health promotion, rehabilitation and re-adaptation of the handicapped, health education and social issues.
Law on providers of waste, water, and sewage services No. 03/L-086	Law establishes the Water and Waste Regulatory Office (WWRO) as an independent economic regulator for water and wastewater services in Kosovo. The WWRO role is to ensure non-discrimination and provision of qualitative, efficient, and reliable services at a fair and reasonable price for customers with respect for environment and public health.
Law on Irrigation of Agricultural Land No. 02/L-9	The purpose of this Law is to establish legal infrastructure for setting up and functioning of bodies offering services, and users of services as well as their authentic organization in order to create optimum conditions for irrigation of agricultural land in Kosovo and its protection against excessive waters, aiming at increased yields of agricultural products.
Law on Local Self Governance No. 03/L-040	This law establishes the legal basis for a sustainable local self-government system in Kosovo
Law Of Nature Protection No.03/L-233	Nature and natural heritage are of the interest for Republic of Kosovo and acquired special protection.
Law On Environmental Impact Assesment No. 03/L-214	The aim of this Law is to prevent or mitigate adverse impacts of proposed public and private projects and thereby contribute to the safeguarding and improvement of the environment, the protection of human health, and the improvement of the quality of life.
Law On Environmental Protection No. 03/L-025	This law shall harmonize economical development and social welfare with basic principles for environmental protection according to the concept of sustainable development.
Law On Waste No.04/L-060	This law regulates waste management, plans for environmental management, rights and obligations of licensed persons who deal with waste management, manner and conditions of waste collection, transport, treatment, processing, storage and final disposal, import, export and waste transit, monitoring, information system and financing
Law on Spatial Planning No 04 - L - 174	For the purpose of ensuring national spatial planning and development, achieving balance between development and preservation of open space and protection of the environment, and bringing the spatial planning regime of Kosovo into consistency with European and international standards
Law No. 04/L-027, Law for protection against natural and other disasters.	This law regulates protection and rescue of people, animals, property, cultural heritage and environment against natural and other disasters.

## ANNEX 6: LEDC AND NAC DEVELOPMENT PROCESS

The preparation process involved a series of roundtables and workshops involving members of the IMWG, representatives of key ministries and of the civil society.

LECRDS Process according to UNDP Guidebook		Actual steps taken
Step 1	Develop a Multi-Stakeholder Planning Process	Establishment of the Inter-Ministerial Working Group on Climate Change (IMWG) – March 2013
Step 2	Prepare Climate Change Profiles and Vulnerability Scenarios	Feasibility study of greenhouse gas inventory system for Kosovo – 2012
Step 3	Identify Strategic Options Leading to more Equitable LOW-Emission Climate-Resilient Development Trajectories	First Roundtable for Low Emission Development Strategy – February 2013
Step 4	Identify Policies and Financing Options to Implement Priority Climate Change Actions	Second Roundtable for Low Emission Development Strategy – June 2013 MCA Workshop - September 2013
Step 5	Prepare Low-Emission Climate-Resilient Development Roadmap	Third Roundtable for Low Emission Development Strategy – October 2013

The first Roundtable for development of CCFS was held on 28 February 2013. The purpose of the roundtable was to present the process of strategy development to key stakeholders, determine the key thematic areas to be addressed by the strategy and to discuss the main possible mitigation and adaptation alternatives to be considered. The discussion was based on the initial concept developed by the international expert of the UNDP.

The second draft concept was developed based on the inputs of stakeholders during the first roundtable based and served as a basis for the second roundtable that was held on 26 June 2013. It focused on the vision and overall objectives as well as on prioritising the list of proposed actions in the thematic areas agreed in the first workshop.

After the second roundtable, national experts prepared their sector reports that were presented and discussed at an IMWG workshop on September 11. After this, the national experts finalised their contributions that were integrated into the Draft Strategy.

The Draft Strategy was discussed at the third roundtable on October 21, after which it was finalised taking into account the comments and conclusions of the roundtable and presented to the government.

## **ANNEX 7: INTER MINISTERIAL WORKING GROUP (IMWG) AND CONSULTATION TEAM RESPONSIBLE FOR DEVELOPING OF THE CCFS**

### **Climate Change Strategy - List of three subworking groups**

**a) Subgroup for Greenhouse Gas Inventory** - which will be led by Kosovo Environmental Protection Agency (KEPA)

- Riza Hajdari, group leader Kosovo Environmental Protection Agency (KEPA)/Ministry of Environment and Spatial Planning (MESP)
- Mimoza Hyseni member KEPA/MESP
- Abdullah Pirçe – member Division of Nature Protection (DNP)/ MESP
- Lulzim Korenica, member Ministry of Economic Development (MED)
- Bedri Millaku, member Ministry of Trade and Industry (MTI)
- Ramadan Mazrekaj, member Ministry of Infrastructure (MI)
- Fidaim Sahiti , member Water Department/Ministry of Environment and Spatial Planning (MESP)
- Ibrahim Balaj, member Department of Environmental Protection / MESP
- Vjosa Beqaj, member Ministry of European Integration (MEI)
- Letafete Latifi, member Hydrometeorology Institute of Kosovo/KEPA/ MESP
- Fisnik Sadikaj, member Ministry of Agriculture, Forestry and Rural Development (MAFRD)
- Bajram Kafexholli, member KEPA/ MESP
- Vebi Ejupi, member MESP

**b) Subgroup for greenhouse gases reduction** - led by Ministry of Economic Development (MED)

- Lulzim Korenica, group leader MED
- Nezakete Hakaj, member DNP/MESP
- Abdullah Pirçe, member DNP/MESP
- Azra Krasniqi, member MEI
- Ramadan Mazrekaj, member MI
- Bedri Millaku, member MTI
- Adriana Pllana, member KEPA/MESP
- Letafete Latifi, member HI/KEPA/ MESP
- Fisnik Sadikaj, member MAFRD
- Leonora Durmishi, member WD/MESP
- Florije Kqiku, member /MESP

**c) Subgroup for adaptation** - led by MESP - Department of Environment Protection (DEP)

- Ismail Hetemaj, group leader DEP/ MESP
- Zymer Mrasori, member DEP/ MESP

- Merita Mehmeti, member KEPA/ MESP
- Sami Behrami, member KEPA/ MESP
- Enver Tahiri, member DEP/ MESP
- Erëza Abrashi, member MEI

The following consultants were contracted by UNDP for developing the Climate Change Frameworks Strategy:

**International Consultant / Team Leader:**

- Dr. Patrick Huntjens (Netherlands), NAC lead author
- Jernej Stritih (Slovenia), LEDC lead author

**National Consultants:**

- Jehona. Grapci (Kosovo), National Coordinator & Institutional and Socio-economic expert
- Abedin Azizi (Kosovo), Water Resources, author for drafting adaptation interventions for water sector.
- Nysrete. Doda-Gashi (Kosovo), Agricultural, Forestry and Land use Planning expert, author for sections on agriculture, forestry, biodiversity and land use planning.
- Behxhet. Shala, Electricity Generation expert
- Mustafe. Muhaxheri, Building sector and district heating expert
- Nol. Dedaj, Transport sector expert
- Halil. Berisha Industry sector expert

## ANNEX 8: BILATERAL STAKEHOLDERS

The following persons provided contributions and comments to the Strategy Development:

- Daniela Zampini, Inclusive growth coordinator, UNDP Kosovo
- Shkipe Deda-Gjurgjiali, Environment and Energy Portfolio Manager UNDP Kosovo
- Daniela Carrington, Climate Change Policy Advisor, UNDP RBEC
- Zana Hoxha–Edip, Disaster Risk Reduction Specialist, UNDP Kosovo
- Muhamet Malsiu, Director of Department for Environment, MESP
- Gazmend Selimi, Task Manager Agriculture and Environment, European Commission Liaison Office to Kosovo
- Baton Begolli, Water Policy Advisor, Inter-Ministerial Water Council Secretariat, Office of the Prime Minister
- Aleksandar Nikolovski, Chief technical Adviser, FAO team Kosovo
- NACer Krasniqi, National Team Leader GCP/KOS/005/FIN, FAO team Kosovo
- Lura Rexhepi, Regional Environmental Centre (REC), Kosovo
- Mustafë Gashi, Emergency Management Agency (EMA), Kosovo
- Fadil Kodra, Emergency Management Agency (EMA), Kosovo
- Ardita Tahirukaj, World Health Organization (WHO), Kosovo
- Ismail Hetemaj, Department of Environmental Protection/ Ministry of Environment and Spatial Planning
- Anna Kaplina, Climate Change Programme Analyst, UNDP
- Traute Koether, European Commission TAIEX
- Vanya Grigorova, European Commission TAIEX
- Detelina Petrova, European Commission TAIEX
- Rositsa Karamfilova, European Commission TAIEX
- Hazir S. Çadraku, Head, Water Policy Division, Water Department, MESP
- Merita Meksi, Regional Coordinator for Climate Change Adaptation Program in Western Balkans/ GiZ
- Rhedon Begolli, Operations Officer, World Bank
- Andre Jol, Head of Group Vulnerability and Adaptation, European Environment Agency (EEA)

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