1 Executive Summary

Kosovo faces very substantial challenges in the water sector arising from:

- Relatively low water resources
- Relatively low water storage
- Comparatively low efficiency of water use (high rates of losses)
- Maintenance backlog for existing assets in the water services sector
- Insufficient wastewater collection and treatment infrastructure
- Relatively low coverage with modern efficient irrigation systems
- Some areas of high flood risk and erosion
- Affordability constraints:
  - Limited capital investment capacity
  - Low household incomes
- Low revenue collection rates by both Regional Water Companies and Irrigation Companies

The investment costs required to achieve full compliance with long term development goals in respect of all elements of the water sector including water use, protection of water and protection of water, and with the requirements of European Union legislation are very substantial and have been estimated above to be in the region of €1,500 million.

This level of investment will clearly require many years to complete, and will also require substantial foreign assistance. In order to plan, prepare and implement such a programme and to ensure the efficient and effective operation and maintenance of the infrastructure in the sector will also require significant improvements in governance.

The Strategic Objectives defined for the sector re:

**Strategic Objective 1 – Use of Water**

Sustainably allocate and oversee the right to exploit the water resources of Kosovo among water users so as to guarantee access to health-safe drinking water for all and maximise the economic benefits from other water uses whilst taking into account changing hydrologic regimes, eliminating water scarcity and respecting the principles of sustainable management.

**Strategic Objective 2 – Protection of Water**

Regulate and oversee activities that give rise to pressures on the water environment in a proportionate, efficient and effective manner so as to attain economically justified environmental objectives for surface water and groundwater bodies whilst respecting the principles of sustainable management.

**Strategic Objective 3 – Protection from Water**

Achieve acceptable levels of protection of population and property from the adverse effects of water including flood, torrent and erosion in an economically balanced and cost effective manner.

**Strategic Objective 4 - Governance**

Establish and maintain a system of water governance that is equitable, transparent, efficient, coordinated and of such professional and technical capacity as to be able to effectively support the achievement of the strategic objectives for water use, water protection and protection from water.
including the implementation of a water information system to monitor, assess, interpret and inform stakeholders on all aspects of this Strategy.

Horizontal Objective – EU Harmonisation

Achieve long-term compliance with the requirements of European Union legislation in the water sector, initially through the introduction of compatible systems of legislation and planning, and then through the stepwise application of practical implementation measures.

The recommended course of action comprises:

- A balanced approach whereby significant progress is made in addressing all issues throughout the Strategy period including water resources, urban water services, irrigation, pollution prevention, flood defence, rule of law and governance
- Four action plans, each of five years duration, spanning the twenty years of the Strategy
  - 1st: 2015 – 2019 inclusive
  - 2nd: 2020 – 2024 inclusive
  - 3rd: 2025 – 2029 inclusive
  - 4th: 2030 – 2034 inclusive
- Each Action Plan shall embody the two-track approach:
  - Continuing investment in infrastructure improvements
  - Improvements in efficiency and effectiveness of infrastructure management and regulatory implementation
- The first Action Plan will have a balanced focus on both tracks
- If the anticipated improvements in management and regulation are achieved, subsequent Action Plans will be able to adopt an increasingly strong focus on investment
- Substantial increases in government expenditure in the sector
- Continued and enhanced support from the Donor Community

In the short to medium term (Action Plans 1 and 2) the approach to be taken to each of the Key Strategic Objectives is:

**Use of Water**

**Water Resources**

- Preparation of National Water Resource Storage Investment Programme
- Implementation of Priority Investments to increase water resource storage by up to 50%

**Urban Water Supply**

- Continued investment in refurbishment and extension of water supply systems
- Prioritisation of cost saving measures and measures leading to achievement of reliable 24-hour supply of health safe water at adequate pressure
- Reductions in theft and losses

**Irrigation**

- Improvements in the efficiency of irrigation water use – greater added value
- Gradual extension of irrigation coverage leading to a total coverage of 30,000 hectares
• Reductions in theft and losses

Hydropower
• Continued implementation of energy strategy
• Private sector participation with minimal public sector expenditure

Protection of Water

Urban Wastewater
• Continued investment in improvements of wastewater collection systems
• Short-term investment in pilot demonstration wastewater treatment plant in Prizren

Industrial Waste Water
• Improved enforcement of existing legal provisions

Protection from Water
• Development of National Flood Risk Management Plan
• Investment in Priority Flood Protection Measures

Governance

Improved Enforcement of Existing Legislation
Institutional Strengthening of Regulatory and Monitoring Bodies
Improved Education and Awareness of Water Issues and the Value of Water

The overall investment demands of the first two Action Plans are substantial as shown in the following table:

<table>
<thead>
<tr>
<th>Table 1 Indicative Investment Needs for Strategy Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
</tr>
<tr>
<td>Donor</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

In addition to the investment needs, ongoing regular public sector expenditure on water management will need to increase.

<table>
<thead>
<tr>
<th>Table 2 Incremental Changes in Budget Allocation Relative to 2014 – Institutional Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MESP WD</td>
</tr>
<tr>
<td>MESP WI</td>
</tr>
<tr>
<td>KHMI</td>
</tr>
<tr>
<td>WWRO</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>
2 Introduction

The National Water Strategy of the Republic of Kosovo (hereinafter “the Strategy”) is made pursuant to Article 31 of the Law on Waters of Kosovo in accordance with which:

- The Strategy is valid for a twenty year period: 2015 – 2034 (inclusive)
- Is accompanied by the Water Action and Investment Plan (hereinafter “the Plan”)
- Is proposed by the Government of the Republic of Kosovo and is adopted by the Assembly of the Republic of Kosovo
- Shall be subject to review every five years

The National Water Strategy has been prepared in line with the Program of the Government of the Republic of Kosovo 2011 – 2014 wherein it is specified that the Government will focus on, inter alia, drafting planning documentation including the National Water Strategy (p.39).

As outlined in the Program of the Government the National Water Strategy and the associated Water Action and Investment Plan will contribute to:

- Securing of Water for Use and Utilisation
- Water Resource Development
- Protection from Water Damaging Acts
- Regulation of Rivers and Prevention of Erosion

Achieving the priorities through the measures included in the Strategy contributes to two of the four main pillars of the Program of the Government:

- **Sustainable Economic Development** – water management is a key aspect of development
- **Social Welfare** – water services and protection from floods are basic needs

The Strategy also addresses the priorities in the Declaration of Medium Term Policy Priorities 2014-2016, in particular:

- **… to improve water supply, increasing accumulating and production capacities for water supply through investment in the regional water system supported by development partners and the Government, supporting regional public companies to build technical capacities providing services through direct investment**

The Strategy is also a key step towards the achievement of harmonisation with European Union standards and practices. The achievement of these standards will require substantial investment. This investment can only be made with the continued assistance of the international community including the European Union and all the other donors in the sector.

The Strategy and the Plan demonstrate the commitment of the Government of the Republic of Kosovo to progressively achieve compliance with European Union standards through an efficient, effective and realistic programme of actions and investments.
3 Methodology

Following the provisions of Article 31 of the Law on Waters this National Water Strategy:

- Has been prepared by the Ministry of Environment and Spatial Planning in cooperation with the competent bodies of state administration (as provided in paragraph 3 of Article 31):
  - Ministry of Economic Development
  - Ministry of Finance
  - Ministry of Agriculture, Forestry and Rural Development
  - Ministry of Trade and Industry
  - Health – Ministry of Health
  - Transport, Communication – Ministry of Infrastructure
  - Energy – Ministry of Economic Development
  - Cultural Heritage – Ministry of Culture, Youth and Sport

- Has been the subject of consultation with these bodies and with:
  - Municipal Assemblies and Authorities
  - Regional Water Companies
  - Municipal Water Utilities
  - Public and private enterprises,
  - Civil society and
  - Other bodies from the field of environment

The Strategy has been developed based on a detailed review and analysis of all the documentation relevant to the development of water management in the Republic of Kosovo, and has in particular assessed:

- The existing infrastructure provisions and future investment needs in the sector
- Legislative provisions and the need for development of the legal framework
- The institutional arrangements and the needs for future capacity building
- The economic and financial characteristics of the sector and means for their improvement
- The continuing affordability of services for the citizens of Kosovo
- The relations with other plans and programmes including:
  - The Spatial Plan for Kosovo 2010 – 2020+
  - Environmental Strategy and Action Plan 2011 - 2021

The Strategy is accompanied by the Water Action and Investment Plan. The Strategy and Plan have been developed with the Technical Assistance of the EU Funded Project: “Support for the Ministry of Environment and Spatial Planning (MESP) in water management and monitoring of water resources”.
4 Background

4.1 Introduction

The many aspects of water management are placed into four groups:

- Use of Water – meeting the demands for water services
  - Public water supply to households, commercial and institutional consumers
  - Water for irrigation
  - Water for hydropower

- Protection of Water – Ensure water bodies are fit for use
  - Pollution from urban areas
  - Pollution by industrial entities
  - Diffuse pollution from extensive land uses and contaminated land

- Protection from Water – Minimising the Adverse Effects of Water
  - Flooding due to high levels of precipitation
  - Risk of flooding as a result of dam failure
  - Erosion of sloping and riparian land

- Governance – Operating Effective and Efficient Administration of water management issues
  - Legislation and Enforcement
  - Institutional provisions
  - Monitoring and Information Management, Education

4.2 Water Resources Management

4.2.1 Available Water Resources

The majority of Kosovo’s water resources are internal, with the exception of the upper part of the Ibriri River which is in Montenegro and flows into the Gazivoda Lake. Kosovo can be separated into three climatic areas.

**Table 3 Climatic Areas and Annual Average Precipitation**

<table>
<thead>
<tr>
<th>Climatic Area</th>
<th>Average Precipitation: mm per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kosovo: Rrafshi i Kosovës</td>
<td>600</td>
</tr>
<tr>
<td>Dukagjini: Rrafshi i Dukagjinët</td>
<td>700</td>
</tr>
<tr>
<td>Mountains and forest parts</td>
<td>900-1300</td>
</tr>
</tbody>
</table>

On average Kosovo receives about 760 mm per year of precipitation. This is equivalent to about 4,400 m³ per person per year. Of this about 40% is “available”. It is estimated² that Kosovo has about 1,600 m³ total renewable water resources per person per year⁴. Compared with other countries in the region the levels of rainfall and the renewable resources per person are much lower:

- Precipitation (m³ per person per year): 41% of regional average

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³ As is typical of the region as a whole, available renewable resource is about one third of the total precipitation
⁴ *The State of Waters in Kosovo, Pristina, 2010, Ministry of Environment & Spatial Planning, Kosovo Environmental Protection Agency*
Renewable resources (m³ per person per year): 16% of regional average

<table>
<thead>
<tr>
<th>Country</th>
<th>Precipitation m³/person/year</th>
<th>Renewable Resources m³/person/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>14,135</td>
<td>12,116</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>18,182</td>
<td>8,881</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>10,264</td>
<td>3,125</td>
</tr>
<tr>
<td>Croatia</td>
<td>14,129</td>
<td>15,448</td>
</tr>
<tr>
<td>FYRo Macedonia</td>
<td>8,744</td>
<td>3,084</td>
</tr>
<tr>
<td>Romania</td>
<td>8,305</td>
<td>9,882</td>
</tr>
<tr>
<td>Serbia with Montenegro</td>
<td>8,305</td>
<td>18,392</td>
</tr>
<tr>
<td>Average for the above</td>
<td>10,705</td>
<td>10,252</td>
</tr>
<tr>
<td>Kosovo</td>
<td>4,400</td>
<td>1,600</td>
</tr>
<tr>
<td>Kosovo: % of regional average</td>
<td>41%</td>
<td>16%</td>
</tr>
</tbody>
</table>

However, the patterns of rainfall and water use are markedly different within the territory of Kosovo and water shortages are far more likely to arise in the East of the country than in the West. The following table shows key water resource indicators for each of the River Basins of Kosovo.

<table>
<thead>
<tr>
<th>River Basin</th>
<th>Drini i Bardhë</th>
<th>Plava</th>
<th>Lepenci</th>
<th>Morava e Binçës</th>
<th>Ibru</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>(km²)</td>
<td>4,519</td>
<td>252</td>
<td>582</td>
<td>1,546</td>
</tr>
<tr>
<td>Population</td>
<td>no.</td>
<td>670,000</td>
<td>35,000</td>
<td>160,000</td>
<td>190,000</td>
</tr>
<tr>
<td>Population Density</td>
<td>/km²</td>
<td>148</td>
<td>139</td>
<td>275</td>
<td>123</td>
</tr>
<tr>
<td>Water Budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual precipitation</td>
<td>(mm/y)</td>
<td>839</td>
<td>1,076</td>
<td>842</td>
<td>677</td>
</tr>
<tr>
<td>Annual precipitation, P</td>
<td>(Mio m³/y)</td>
<td>3,791</td>
<td>271</td>
<td>490</td>
<td>1,046</td>
</tr>
<tr>
<td>Mean annual outflow²</td>
<td>(m³/s)</td>
<td>61.01</td>
<td>4.71</td>
<td>8.70</td>
<td>10.80</td>
</tr>
<tr>
<td>Runoff, Q</td>
<td>(Mio m³/y)</td>
<td>1,924</td>
<td>149</td>
<td>274</td>
<td>341</td>
</tr>
<tr>
<td>Runoff/Precipitation Q/P</td>
<td>%</td>
<td>51%</td>
<td>55%</td>
<td>56%</td>
<td>33%</td>
</tr>
<tr>
<td>Minimum Flow Requirement¹</td>
<td>(Mio m³/y)</td>
<td>443</td>
<td>34</td>
<td>63</td>
<td>78</td>
</tr>
<tr>
<td>Available Resources per person</td>
<td>m³/c/a</td>
<td>2,211</td>
<td>3,268</td>
<td>1,320</td>
<td>1,380</td>
</tr>
</tbody>
</table>

The boundaries and locations of the four main river basins of Kosovo (excluding Plava, which is very small and is usually included into Drini i Bardhë).

5 The World Bank assessment from which data was obtained was prepared prior to the separation of Serbia and Montenegro
6 Approximate values based on Census Results 2011
7 Values from monitoring stations at downstream boundary of basin: KHMI and State of Water Report 2010
8 Calibrated to correlate with national estimate of available resources of 1,600 cubic metres per person per annum
Figure 1 River Basins of Kosovo
The available resources are compared in the following table with the water availability index developed by Falkenmark\(^9\).

**Table 6 Estimated Water Resource Indices**

<table>
<thead>
<tr>
<th>River Basin</th>
<th>Drini I Bardhë</th>
<th>Plava</th>
<th>Lepenci</th>
<th>Morava e Binçës</th>
<th>Ibri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falkenmark Indicator Estimates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Stress, &gt; 1700</td>
<td>m3/c/y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress, &gt; 1000 - 1700 &lt;</td>
<td>m3/c/y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarcity, &lt; 1000</td>
<td>m3/c/y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Exploitation Index Estimates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exploitation per person</td>
<td>m3/c/y</td>
<td>237</td>
<td>-</td>
<td>185</td>
<td>154</td>
</tr>
<tr>
<td>Water Exploitation Index</td>
<td>%</td>
<td>11%</td>
<td>0%</td>
<td>14%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Whilst adequate resources appear to be available in the Drini I Bardhë and Plava basins, the other three basins indicate some water stress. This stress is most severe in the Ibri basin, where available resources are close to the scarcity level.

Groundwater reserves are limited and are founded mainly in the Western part of Kosovo, where surface water reserves are larger compared to the Eastern part.

**4.2.2 Water Storage Capacity**

Kosovo possesses a number of water storage reservoirs (accumulations).

**Table 7 Main Water Storage Reservoirs**

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Water flow (River)</th>
<th>Catchment</th>
<th>Volume Million m(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>km(^2)</td>
<td>Upper</td>
</tr>
<tr>
<td>Gazivoda</td>
<td>Ibër</td>
<td>1,060.0</td>
<td>350.0</td>
</tr>
<tr>
<td>Batllava</td>
<td>Batllavë</td>
<td>226.0</td>
<td>25.1</td>
</tr>
<tr>
<td>Badovci</td>
<td>Graçankë</td>
<td>103.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Livoçi</td>
<td>Livoç</td>
<td>53.6</td>
<td>3.3</td>
</tr>
<tr>
<td>Radoniqi</td>
<td>Lumëbardhi i Deçanit</td>
<td>130.0</td>
<td>102.0</td>
</tr>
<tr>
<td></td>
<td>1,572.6</td>
<td>500.4</td>
<td>563.6</td>
</tr>
</tbody>
</table>

The total volume of the accumulations is approximately 540 million cubic metres. This equates to a volume of about 290 m\(^3\) per person. This level of storage is low when compared with other countries in the region. As shown in the following table the level of resource storage in Kosovo is about 42% of the regional average.

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\(^9\)See for example Brown and Matlock, A Review of Water Scarcity Indices and Methodologies, April 2011, The Sustainability Consortium
### Table 8 Comparison of Water Storage Capacity

<table>
<thead>
<tr>
<th>Country</th>
<th>Reservoir Capacity Million m³</th>
<th>Reservoir Capacity m³/person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>4,394,404,095</td>
<td>1,455</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>3,747,750,424</td>
<td>968</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>4,632,314,530</td>
<td>629</td>
</tr>
<tr>
<td>Croatia</td>
<td>1,409,731,771</td>
<td>329</td>
</tr>
<tr>
<td>FYRo Macedonia</td>
<td>1,720,938,604</td>
<td>836</td>
</tr>
<tr>
<td>Romania</td>
<td>12,555,903,984</td>
<td>624</td>
</tr>
<tr>
<td>Serbia with Montenegro</td>
<td>5,296,717,294</td>
<td>737</td>
</tr>
<tr>
<td>Average for the above</td>
<td>33,757,760,702</td>
<td>696</td>
</tr>
<tr>
<td>Kosovo</td>
<td>539,168,870</td>
<td>290</td>
</tr>
<tr>
<td><strong>Kosovo: % of regional average</strong></td>
<td></td>
<td>42%</td>
</tr>
</tbody>
</table>

As reported in the State of Water in Kosovo (2010), up to 20 further large accumulations have been identified in earlier plans for future development, but none of these have been implemented yet.

#### 4.2.3 Current Water Exploitation

Estimates of water consumption by sector are shown in the table below.

### Table 9 Estimated Water Resources Consumption by Sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Volume 000 m³ per annum</th>
<th>Proportion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban &amp; Rural Water Supply (including unaccounted for water)</td>
<td>178,118</td>
<td>52</td>
</tr>
<tr>
<td>Irrigation</td>
<td>140,193</td>
<td>41</td>
</tr>
<tr>
<td>Industry</td>
<td>25,916</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>344,227</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The predominant use of water is for urban and rural supply. The agricultural sector, uses less than the urban water supply sector on an annual average basis, is by far the largest consumer during the growing season (summer / autumn).

In terms of exploitation per person, the current rate represents about 200 m³ per person per annum. The reported specific use in other countries in the region ranges from about 200 m³ per person per annum at the lower level, to as much as 800 m³ per person per annum at the upper level. The rate of water use per person in Kosovo is at the lower end of the range seen in the region.

#### 4.2.4 Future Prospects – Key Factors and Implications

The key independent factors that may influence the future availability and adequacy of water resources are climate and population.  

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10 The World Bank assessment from which data was obtained was prepared prior to the separation of Serbia and Montenegro.  
11 European Environment Agency
Climate projections to 2050\textsuperscript{12} indicate that by 2050:

- Average annual temperature will increase by approximately 2 degrees centigrade
- Average annual precipitation will decrease by approximately 15%

These changes are expected to reduce the annual available water resources by about 20%.

Population projections for Kosovo\textsuperscript{13} indicate future populations by 2051 in the following range:

- High Variant: 2,383,523
- Medium Variant: 1,859,447
- Low Variant: 1,398,626

The average of these projections indicates a likely population increase by mid-century of +6% from the currently population estimate (2014) of 1.78 million.

These two projections are used to provide an estimation of the likely future availability of water resources\textsuperscript{14}.

Table 10 Estimated Future (2050) Water Resources by Basin

<table>
<thead>
<tr>
<th>River Basin</th>
<th>Drini I Bardhe</th>
<th>Plava</th>
<th>Lepenci</th>
<th>Morava e Binçës</th>
<th>Ibri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>(km\textsuperscript{2})</td>
<td>4,519</td>
<td>252</td>
<td>582</td>
<td>1,546</td>
</tr>
<tr>
<td>Population\textsuperscript{15}</td>
<td>no.</td>
<td>707,841</td>
<td>36,977</td>
<td>169,037</td>
<td>200,731</td>
</tr>
<tr>
<td>Population Density</td>
<td>/km\textsuperscript{2}</td>
<td>157</td>
<td>147</td>
<td>290</td>
<td>130</td>
</tr>
<tr>
<td>Water Budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual precipitation</td>
<td>(mm/y)</td>
<td>713</td>
<td>914</td>
<td>716</td>
<td>575</td>
</tr>
<tr>
<td>Annual precipitation, P</td>
<td>(Mio m\textsuperscript{3}/y)</td>
<td>3,222</td>
<td>230</td>
<td>417</td>
<td>889</td>
</tr>
<tr>
<td>Mean annual outflow\textsuperscript{16}</td>
<td>(m\textsuperscript{3}/s)</td>
<td>48.81</td>
<td>3.77</td>
<td>6.96</td>
<td>8.64</td>
</tr>
<tr>
<td>Runoff, Q</td>
<td>(Mio m\textsuperscript{3}/y)</td>
<td>1,539</td>
<td>119</td>
<td>219</td>
<td>272</td>
</tr>
<tr>
<td>Runoff/Precipitation Q/P</td>
<td>%</td>
<td>48%</td>
<td>52%</td>
<td>53%</td>
<td>31%</td>
</tr>
<tr>
<td>Minimum Flow Requirement\textsuperscript{17}</td>
<td>(Mio m\textsuperscript{3}/y)</td>
<td>354</td>
<td>27</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>Resources per person</td>
<td>m\textsuperscript{3}/c/a</td>
<td>1,674</td>
<td>2,474</td>
<td>1,000</td>
<td>1,045</td>
</tr>
</tbody>
</table>

Falkenmark\textsuperscript{18} Indicator Estimates

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Stress, &gt; 1700</td>
<td>m\textsuperscript{3}/c/y</td>
</tr>
<tr>
<td>Stress, &gt; 1000 - 1700 &lt;</td>
<td>m\textsuperscript{3}/c/y</td>
</tr>
<tr>
<td>Scarcity, &lt; 1000</td>
<td>m\textsuperscript{3}/c/y</td>
</tr>
</tbody>
</table>

\textsuperscript{12} \url{www.climatewizard.org}
\textsuperscript{13} Kosovo Population Projection 2011 – 2060, Kosovo Agency of Statistics, Pristina, December 2013
\textsuperscript{14} The estimation assumes that the changes are evenly distributed between the river basins i.e. the percentage reduction in precipitation, the increase in temperature and the percentage change in population is the same in each basin.
\textsuperscript{15} Approximate values based on Census Results 2011
\textsuperscript{16} Values from monitoring stations at downstream boundary of basin: KHMI and State of Water Report 2010
\textsuperscript{17} Calibrated to correlate with national estimate of available resources of 1,600 cubic metres per person per annum
\textsuperscript{18} See for example \textit{Brown and Matlock}, A Review of Water Scarcity Indices and Methodologies, April 2011, The Sustainability Consortium
The implications of the changes in climate and population are shown as significantly increased levels of water stress, with both the Lepenc and Ibri basins falling into the “water scarcity” classification according to the Falkenmark indicator, with the situation being most severe in the Ibri.

The impact of this reduction in naturally available water resources on the actual availability of resources and services for end users will be dependent on:

- The demand for water from households, institutions and industry
- The efficiency with which water is utilised
- The development of new water resource storage facilities (accumulations)

The demand for water services from each of the sectors can be influenced by policies, standards and technology choices. Major infrastructure investments are not required to specifically address this issue, but substantial efforts are needed to encourage changes in behaviour.

The achievement of substantial improvements in the efficiency of water use will require major investments in the two main supply systems: urban water supply and irrigation. The investment needs to achieve these improvements are discussed below.

The development of new water resource storage facilities will entail substantial investments in the preparation and implementation of medium and large infrastructure projects. The specific (per unit of storage) costs of accumulation construction are highly variable. Applying a benchmark cost for constructing a storage reservoir of €1 per cubic metre of storage, increasing the reservoir storage capacity in Kosovo by 50% would entail investment in the region of €250 million.

### 4.2.5 Water Supply Services

The Census results, as summarised in the following table, show that over 97.8% of the population has access to piped water supply inside their dwellings.

**Table 11 Availability of Piped Water Supply (Census 2011)**

<table>
<thead>
<tr>
<th>Nature of Supply</th>
<th>Housing Units</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piped water from a public service</td>
<td>204,365</td>
<td>69.6%</td>
</tr>
<tr>
<td>Piped water from other sources</td>
<td>82,609</td>
<td>28.2%</td>
</tr>
<tr>
<td>Piped water within the building outside the housing unit</td>
<td>899</td>
<td>0.3%</td>
</tr>
<tr>
<td>Piped water outside the building</td>
<td>3,413</td>
<td>1.2%</td>
</tr>
<tr>
<td>No piped water available</td>
<td>2,157</td>
<td>0.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>293,443</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

The majority of these properties are supplied through public systems managed by the Regional Water Companies. About 10% are supplied by water supply systems not managed by the RWCs. About 18% have their own individual supplies. There is a large variation between the level of connection to public supply systems in urban areas (almost 99%) and rural areas (61%). Many of the properties not connected to public supply systems are remote.

The standard of operation of the majority of water supply systems is moderate. It does not yet meet the targets set by the Water and Wastewater Regulatory Office. Moreover a significant number of...
small rural supply systems covering almost 3% of the population are currently not functioning properly\textsuperscript{20}.

In view of the difficulties faced by smaller supply schemes, they are being incorporated into the operational remit of the 7 Regional Water Companies. This is currently being addressed with project assistance from the Swiss Government.

The levels of coverage with centralised drinking water supply is Europe is shown below.

\textit{Figure 2 Drinking Water – Centralised Supply Coverage in Europe (EUREAU 2009)}

In terms of specific performance indicators:

- For those systems operated by the Regional Water Companies compliance with the drinking water quality requirements for both microbiological and physic-chemical parameters is generally high (over 95%), but some areas still experience problems
- Almost all water supply connections are metered (over 89% and increasing)
- The public water supply systems operated by the Regional Water Companies achieve 24-hour supply in some, but not all cases
- The levels of water loss\textsuperscript{21} in most systems are high, with around 60% of water that is abstracted, treated and pumped into supply systems being unaccounted for (lost or stolen)
- The collection rate for water and wastewater service bills as sector average is about 70%

A summary of overall performance is provided in the following figure\textsuperscript{22}:

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\textsuperscript{20} As indicated in the Coverage Study undertaken on behalf of the Swiss Cooperation Office.

\textsuperscript{21} Unaccounted for water (UfW)

\textsuperscript{22} Table 27 – WWRO Annual Performance Report 2013, September 2014
Some Regional Water Companies are performing better than others. However, cost efficiency is a major issue for all companies. The low revenue collection rate is a key factor in this weak financial performance. This weak performance means that Regional Water Companies are unable to fully implement their investment programmes for maintenance and improvement of the supply systems.

**Investment needs**

The investment needs to address the key requirements in the water supply sector have been examined at both the local and the national level. The approximate scale of investment needs are:

- Renovation of the existing drinking water network: €120 - €150 million
- Investments in Drinking Water Treatment: €90 – 100 million
- Investments in extension of centralised water supply:
  - Overall 93% coverage excluding small remote settlements: €125 million

In conclusion, the overall investment needs are estimated to be in the range of €335 million to €375 million depending on the objectives set for network renewal, the objective set for system coverage and the future changes in population and urban development patterns. Continuing urbanisation would tend to result in slightly lower total costs.

---

23 The achievement of 93% coverage with centralised water supply is comparable with the levels of coverage achieved in Europe as shown in the figure above.
4.2.6 Irrigation

Agriculture is a key element of the economy (13% of GDP) and of employment (at least 4.6%)\textsuperscript{24}. However, Kosovo remains a net importer of food and live animals\textsuperscript{25}. As indicated in the Agricultural and Rural Development Programme for 2009–13, improved competitiveness (Axis 1) is a key objective. One of the bottlenecks identified for the development of agriculture is the poor irrigation system, limited in coverage and technology.

Reports of the main irrigation providers indicate that in recent years the area irrigated through their schemes has been in the region of 7,000 to 8,000 hectares.

\textit{Table 12 Reported Areas Irrigated by three Public Enterprises\textsuperscript{26}(hectares)}

<table>
<thead>
<tr>
<th>Irrigation Company</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC “Radoniqi – Dukagjini” JSC</td>
<td>5,176</td>
<td>5,216</td>
<td>5,012</td>
</tr>
<tr>
<td>IC “Drini i Bardhe”</td>
<td>955</td>
<td>918</td>
<td>750</td>
</tr>
<tr>
<td>HS Ibër - Lepenci</td>
<td>1,860</td>
<td>1,647</td>
<td>1,271</td>
</tr>
<tr>
<td>Total</td>
<td>7,991</td>
<td>7,781</td>
<td>7,033</td>
</tr>
</tbody>
</table>

Additional irrigation through other smaller schemes is estimated to provide irrigation for about an additional 4,000 hectares, giving a total irrigated area of about 12,000 hectares.

The level of irrigation use is far lower now than in the past, and considerable potential exists for increased use of irrigation to support production of high value crops, with the beneficially irrigable area being more than twice the currently irrigated area, as shown in the following table.

\textit{Table 13 Irrigation Scheme Coverage by Scheme}

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Irrigated area in 2004-2012 (ha)</th>
<th>Irrigable area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iber Lepenc</td>
<td>2,500</td>
<td>14,500</td>
</tr>
<tr>
<td>Radoniqi</td>
<td>4,700</td>
<td>5,000</td>
</tr>
<tr>
<td>Dukagjini</td>
<td>800</td>
<td>2,500</td>
</tr>
<tr>
<td>Drini Bardhe Peja</td>
<td>1,300</td>
<td>2,500</td>
</tr>
<tr>
<td>Istog</td>
<td>1,350</td>
<td>2,000</td>
</tr>
<tr>
<td>Lumi Bardhe</td>
<td>1,650</td>
<td>3,000</td>
</tr>
<tr>
<td>Total</td>
<td>12,300</td>
<td>29,500</td>
</tr>
</tbody>
</table>

Irrigation indicators for the most intensively irrigated countries in the South of Europe\textsuperscript{27} show that about 7% of their total land area is equipped for irrigation. The six countries shown in the table below account for about 84% of the irrigated land in the European Union. For Kosovo, with a land area of almost 11,000 km\textsuperscript{2}, 7% would represent an area of about 80,000 hectares; this is vastly more than the estimated irrigable area. On a per capita basis, the irrigation of 29,500 hectares in Kosovo would

\textsuperscript{24} Results of the Kosovo 2012 Labour Force Survey – Kosovo Agency of Statistics, September 2013, Table 1.6B. However, it is known that a large proportion of agricultural employment is “informal” as stated in section 5 of the Survey.

\textsuperscript{25} External Trade Statistics by SITC – Kosovo Agency of Statistics

\textsuperscript{26} Annual Performance Reports of Central Publicly-Owned Enterprises, Ministry of Economic Development

\textsuperscript{27} EEA Report No 2/2009 Water resources across Europe — confronting water scarcity and drought, p.40
represent about 0.017 hectares per inhabitant, which is considerably less than that estimated below for the most intensively irradiated countries in Southern Europe.

Irrigation intensity is also expressed in terms of the proportion of agricultural land that is equipped for irrigation. The average proportion of cultivated land (excluding forests) that is subject to irrigation in the main irrigation users in the EU is almost 20%. Cultivated land in Kosovo is reported as being approximately 250,000 hectares. Irrigation coverage of 25,000 hectares would represent a proportion of 10%, well below the average value for the countries considered here.

In conclusion, renovation and expansion of irrigation systems in Kosovo to all irrigable areas (29,000 hectares), would result in irrigation intensity in Kosovo still being a long way below that in major irrigation countries in Europe, and therefore can be considered a realistic objective.

Table 14 Irrigated Areas - EEA 2009

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>Land Area</th>
<th>Irrigated</th>
<th>Proportion</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million</td>
<td>km2</td>
<td>hectares</td>
<td>% irrigated</td>
<td>ha / person</td>
</tr>
<tr>
<td>France</td>
<td>63.7</td>
<td>543,965</td>
<td>2,710,000</td>
<td>5%</td>
<td>0.0425</td>
</tr>
<tr>
<td>Greece</td>
<td>11.2</td>
<td>131,957</td>
<td>1,590,000</td>
<td>12%</td>
<td>0.1420</td>
</tr>
<tr>
<td>Italy</td>
<td>59.6</td>
<td>301,338</td>
<td>3,970,000</td>
<td>13%</td>
<td>0.0666</td>
</tr>
<tr>
<td>Portugal</td>
<td>10.6</td>
<td>92,345</td>
<td>620,000</td>
<td>7%</td>
<td>0.0585</td>
</tr>
<tr>
<td>Spain</td>
<td>45.2</td>
<td>505,988</td>
<td>3,770,000</td>
<td>7%</td>
<td>0.0834</td>
</tr>
<tr>
<td>Romania</td>
<td>21.5</td>
<td>237,500</td>
<td>810,000</td>
<td>3%</td>
<td>0.0377</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>1,813,093</td>
<td>13,470,000</td>
<td>7%</td>
<td>0.0636</td>
</tr>
</tbody>
</table>

Currently it is reported that 140 million m³ are used to irrigate about 12,000 hectares through the large irrigation companies. This represents an application rate of about 11,500 m³/hec. Application rates in EU Member States are generally in the region of 5,000 – 7,000 m³/hec. If Kosovo is able to increase the efficiency of irrigation and thereby decrease the gross application rate to a value closer to that shown for EU Member States, this will to a large extent offset the increase in consumption resulting from the increased coverage in irrigated area. Reduction in the application rate to about 7,000 m³/hec whilst at the same time increasing coverage from 12,300 hectares to 29,000 hectares would result in an increase in consumption of about 45%. This represents an additional 60 million m³ per annum. This volume is about one third of the current consumption for urban supply services. In other words, this volume is about one half of the level of unaccounted-for-water reported for urban water supply systems. This country-wide estimation does not take account of the specific situations in individual basins, and care will clearly need to be taken regarding increases in irrigation in the more stressed basins, notably Ibri and Lepenci.

The efficiency of use of irrigation water in terms of value-added per unit consumption is not formally estimated due to data limitations. However, based on consideration of the nature and age of the equipment in use, and the estimated application rates, it would appear that there is considerable potential for improvement in the efficiency of use in this sector.

Rehabilitation of the irrigation is to be supported through, inter alia, improved management of water resources for agriculture (Measure 3) as reinforced in the Action Plan of the Economic Vision of Kosovo 2011 – 2014 (Action 4.4.3).
The Medium Term Expenditure Framework 2013 – 2015 specifies “increased land area under irrigation” as an objective:

In order to realize the objective "Increase of land surfaces under irrigation system" MAFRD plans to allocate a budget of €5 million to perform the following actions:

- Rehabilitation of the primary, secondary and tertiary irrigation system, and
- MAFRD will finance new irrigation systems according to requirements that municipalities have submitted to MAFRD. During the planning period, around 15,000 ha of arable land are expected to be rehabilitated.

Further investment needs for the renovation of the existing irrigation systems, for extension of the systems so as to achieve higher levels of coverage and for improvements in the efficiency of the application systems have not yet been developed in detail. However an indicative upper estimate can be obtained by applying a per hectare investment cost rate\(^{30}\) of €15,000 for efficient drip irrigation, excluding the investments in storage referred to above, and assuming a doubling of the currently irrigated area to a total of about 25,000 hectares. This very approximate estimation would suggest that a value in the region of €150 million. However, this estimate does not take account of the existing infrastructure or the investments that are being made in the short term. A considerably lower value of less than half of this upper estimate could reasonably be foreseen, and therefore for the purposes of strategic financial planning an investment need of €70 million.

4.2.7 Hydropower

Kosovo generates over 5,000 GWh of electricity, almost entirely from coal-fired power stations. A small proportion of this energy is generated from hydropower.

**Table 15 Electricity Generation by Hydro-Power Plants (HPP)**\(^{31}\)

<table>
<thead>
<tr>
<th>GWh</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPP</td>
<td>93.2</td>
<td>75.7</td>
<td>88.7</td>
<td>115.5</td>
<td>75.4</td>
</tr>
<tr>
<td>Total</td>
<td>4,309.5</td>
<td>4,505.8</td>
<td>5,260</td>
<td>5,481</td>
<td>5,696.4</td>
</tr>
<tr>
<td>HPP/Total</td>
<td>2.2%</td>
<td>1.7%</td>
<td>1.7%</td>
<td>2.1%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Hydropower production comes mainly from:

- Ujmani Hydropower Plant (HPP) with installed capacity of (2 x 17.5) 35 MW and
- Lumbardhi HPP with installed capacity of 8.8 MW.
- Small hydropower schemes have a capacity of about 2 MW in total.

The Ujmani HPP is operated by HS Iber-Lepenc. The Lumbardhi HPP is operated by Kelag International\(^{32}\).

Kelag are also participating in the development of further hydropower plants through KelKos:

- Peja cascade (5 HPPs) for €120 million (60 MW capacity)
- Deçan Cascade (3 HPPs) for €55 million (23 MW capacity)

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\(^{30}\) See for example: [http://www.fao.org/docrep/W7314E/w7314e0h.htm](http://www.fao.org/docrep/W7314E/w7314e0h.htm)

\(^{31}\) Energy Balance in Kosovo (Q4 – 2011), Kosovo Agency of Statistics

\(^{32}\) [http://www.kelag-international.com/content/page_eng_224_ENG_HTML.jsp](http://www.kelag-international.com/content/page_eng_224_ENG_HTML.jsp)
There is the potential for further expansion of hydropower generation, with key opportunities being set out in the Energy Strategy:

- Zhur Hydro Power Plant (300 MW): €300 - €350 million
- An additional 16 Small HPPs with a total installed capacity of over 60 MW: €70 – 75 million

The precise investment needs will depend on whether agreement is reached on the implementation of the Zhur scheme, on which international agreement has not yet been reached, and on the outcome of the planned concessions for the smaller schemes.

4.2.8 Summary of Issue – Use of Water

The issues that arise in respect of the strategic theme “use of water” are, in summary:

- Increasing risk of drought particularly in Ibra basin
- Low water storage capacity
- Increased coverage with public water supply services still needed
- Increases in efficiency of water service provision needed, particularly reduction in losses
- Increased irrigation coverage and efficiency of use needed for rural development
- Increased hydropower generation needed to increase security of supply and reduce reliance on imports of electricity during periods of high demand

The investment needs associated with the full achievement of the long-term objectives in these areas are very large, and can be summarised as:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Long Term Goal</th>
<th>Approximate Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water storage - reservoirs</td>
<td>Increase by 50%</td>
<td>€250 million</td>
</tr>
<tr>
<td>Extend public water supply services</td>
<td>Increase coverage to 93%</td>
<td>€120 million</td>
</tr>
<tr>
<td>Renovate existing water supply infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water supply network</td>
<td>€120 million</td>
</tr>
<tr>
<td></td>
<td>Water treatment works</td>
<td>€90 million</td>
</tr>
<tr>
<td>Increase irrigation coverage</td>
<td>Double current coverage</td>
<td>~€70 million</td>
</tr>
<tr>
<td>Increase hydropower</td>
<td>Implement Zhur &amp; small schemes</td>
<td>€400 million</td>
</tr>
<tr>
<td>TOTAL Potential Need</td>
<td>All Objectives</td>
<td>~€1,050 million</td>
</tr>
</tbody>
</table>

4.3 Protection of Water

The protection of water in this context is largely concerned with pollution control. The main pollution sources to be considered are:

- Urban wastewater discharges
- Direct industrial discharges from large industrial installations
- Diffuse pollution from:
  o agriculture,
  o waste management,
  o contaminated land,
  o mining and
  o other extensive land uses
4.3.1 Urban Wastewater Management

The collection of urban wastewater is, as with water supply, a public service managed through the Regional Water Companies and a number of other smaller local operators.

**Table 16 Availability of flush toilet – Census 2011**

<table>
<thead>
<tr>
<th>Provision</th>
<th>Total</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flush toilet in the housing unit</td>
<td>257,428</td>
<td>87.7%</td>
</tr>
<tr>
<td>Flush toilet outside the housing unit but in the building</td>
<td>6,327</td>
<td>2.2%</td>
</tr>
<tr>
<td>Flush toilet outside the building</td>
<td>15,147</td>
<td>5.2%</td>
</tr>
<tr>
<td>No flush toilet</td>
<td>14,541</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>293,443</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

As shown above the vast majority of dwellings are provided with flush toilets of one form or another. Only 5% of the population do not have such a facility.

However, the level of connection to public wastewater collection services is considerably lower. As shown by the Annual Performance Reports on the Regional Water Companies only about 56% of households in the service areas of the RWCs are provided with connection to public wastewater collection (sewerage).

**Table 17 Wastewater Coverage Estimates - 2012 Performance Reports**

<table>
<thead>
<tr>
<th>RWC</th>
<th>HH in Service Area</th>
<th>HH Connected</th>
<th>Coverage</th>
<th>HH in Service Area</th>
<th>HH Connected</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferizaj</td>
<td>18,250</td>
<td>10,950</td>
<td>60%</td>
<td>18,265</td>
<td>11,872</td>
<td>65%</td>
</tr>
<tr>
<td>Gjakove</td>
<td>25,022</td>
<td>12,511</td>
<td>50%</td>
<td>25,216</td>
<td>12,860</td>
<td>51%</td>
</tr>
<tr>
<td>Gjilan</td>
<td>30,521</td>
<td>13,124</td>
<td>43%</td>
<td>31,014</td>
<td>13,026</td>
<td>42%</td>
</tr>
<tr>
<td>Mitrovica</td>
<td>32,595</td>
<td>14,016</td>
<td>43%</td>
<td>32,393</td>
<td>14,577</td>
<td>45%</td>
</tr>
<tr>
<td>Pejë</td>
<td>30,459</td>
<td>11,270</td>
<td>37%</td>
<td>30,959</td>
<td>12,693</td>
<td>41%</td>
</tr>
<tr>
<td>Prishtinë</td>
<td>88,945</td>
<td>56,925</td>
<td>64%</td>
<td>89,145</td>
<td>63,293</td>
<td>71%</td>
</tr>
<tr>
<td>Prizren</td>
<td>50,605</td>
<td>21,760</td>
<td>43%</td>
<td>50,257</td>
<td>28,144</td>
<td>56%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>276,398</strong></td>
<td><strong>140,556</strong></td>
<td><strong>51%</strong></td>
<td><strong>277,249</strong></td>
<td><strong>156,465</strong></td>
<td><strong>56%</strong></td>
</tr>
</tbody>
</table>

As with drinking water supply, there are also a number of systems providing wastewater collection services that are not operated by the RWCs. The Coverage Study\(^\text{33}\) estimates that these systems provided services to about 10% of the population, giving a total coverage with wastewater collection systems of about 65%.

As with water supply, the situation in urban and rural areas is markedly different:

- Urban wastewater collection coverage: 72%
- Rural wastewater collection coverage: 42%

\(^{33}\) Swiss Cooperation Office, 2012
The overall performance of the Regional Water Companies in wastewater management is summarised in the following figure:

**Figure 4 Overall Performance of Regional Water Companies – Wastewater management (20xx)**

As shown in this figure, there is a widespread and near total failure to achieve the required standards of wastewater treatment (discharge quality and reliability). As is the case for water supply, cost efficiency levels for wastewater management are also highly problematic.

Compliance with the requirements of European Union legislation will entail a considerable increase in the levels of coverage such that at least 80% of the population are provided with centralised wastewater collection. In addition to the requirements for collection of wastewater, EU legislation also requires that collected wastewater be treated to an adequate standard.

Currently there is only one sizable urban wastewater treatment plant operating in Kosovo, that in Skenderaj with a capacity of about 8,000 p.e. A number of other small rural treatment facilities are also in operation.

Feasibility studies have been prepared for the implementation of wastewater treatment in all the major cities including Prishtinë, Gjakova, Gjilan, Pejë, Prizren, Ferizaj and Mitrovica.

**Investment needs**

The overall costs for the implementation of wastewater collection and treatment have been estimated for all the major conurbations in Kosovo, as shown in the table below. In addition to these investments it is estimated that additional investments in the order of €125 million would be required to address wastewater collection and treatment requirements in other areas.

As such the total estimated cost for implementation of the urban wastewater collection and treatment requirements are approximately €680 million. This represents an investment cost of approximately €680 million.

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34 Water and Wastewater Regulatory Office, Performance Report 2013, September 2014
€350 per inhabitant. This is comparable with the costs experienced by new Member States of the European Union.35

**Table 18 Summary of available Wastewater Feasibility Study Estimates**

<table>
<thead>
<tr>
<th>Agglomeration</th>
<th>Long Term Coverage Population Equivalent</th>
<th>Estimated Cost (ex. VAT) € million</th>
<th>Specific Cost €/person equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prizren</td>
<td>140,000</td>
<td>74</td>
<td>529</td>
</tr>
<tr>
<td>Prishtinë Conurbation</td>
<td>625,000</td>
<td>160</td>
<td>256</td>
</tr>
<tr>
<td>Glogoc</td>
<td>70,000</td>
<td>26</td>
<td>371</td>
</tr>
<tr>
<td>Podujevë</td>
<td>94,000</td>
<td>30</td>
<td>319</td>
</tr>
<tr>
<td>Shtime</td>
<td>27,000</td>
<td>11</td>
<td>407</td>
</tr>
<tr>
<td>Mitrovica-Vushtrri</td>
<td>185,000</td>
<td>59</td>
<td>319</td>
</tr>
<tr>
<td>Gjakovë</td>
<td>80,000</td>
<td>54</td>
<td>675</td>
</tr>
<tr>
<td>Pejë</td>
<td>100,000</td>
<td>64</td>
<td>640</td>
</tr>
<tr>
<td>Dragash</td>
<td>30,000</td>
<td>18</td>
<td>600</td>
</tr>
<tr>
<td>Gjilan</td>
<td>140,000</td>
<td>34</td>
<td>243</td>
</tr>
<tr>
<td>Ferizaj</td>
<td>89,000</td>
<td>27</td>
<td>303</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,580,000</strong></td>
<td><strong>557</strong></td>
<td><strong>353</strong></td>
</tr>
</tbody>
</table>

4.3.2 Storm Water Drainage

The current situation concerning the collection, transfer and discharge of storm water (urban run-off) is not well documented. However, it is clear that there are a number of significant problems with existing systems including:

- Localised flooding in urban areas during high rainfall events due to lack of drainage capacity
- High proportion of drainage is combined with wastewater

Assessments of the investment needs to rectify these issues have only been made in a small number of municipalities. Extrapolation of the values obtained in these areas would tend to indicate an approximate need for the whole of Kosovo of approximately €100 - €125 million.

4.3.3 Industrial Wastewater

Many smaller industries discharge their wastewater into public wastewater collection systems. Some larger industries also discharge their wastewater to sewer, but many also discharge directly to the environment. Under the provisions of the Urban Wastewater Treatment Directive discharges to sewer from industries are subject to regulation and where necessary subject to pre-treatment so as not to jeopardise the achievement of the established discharge standards by the wastewater treatment plant.

Larger industrial installations are governed under EU law by the Industrial Emissions Directive (2010/75/EU). This requires such installations to apply best available technology throughout their operations including water consumption and wastewater generation and treatment.

As such, costs will be incurred in meeting the requirements of EU legislation, but these costs will fall on the private sector entities which discharge to sewer or to the environment.

4.3.4 Diffuse Pollution

The term diffuse pollution refers to the presence of contamination arising from widespread (as opposed to “point”) sources. The most common sources of diffuse pollution of water are:
• Agriculture, including animal manure, fertilisers, pesticides, silt (from erosion)
• Drainage of urban areas
• Deposition of airborne pollutants
• Industrial activities including mining and waste disposal (both may also arise as point sources)
• Other contaminated land (abandoned industrial sites, military installations)

Detailed information concerning the level of diffuse pollution is not currently available for all sources. Concerning contaminated land, the Ministry of Environment and Spatial Planning indicates in its Report on Environmental Hotspots in Kosovo (Prishtina, 2012) that 28 potential environmental hotspots are evidenced and that very few investments have been made in the remediation of these sites. The Report does not indicate the expected total costs of remediation.

4.3.5 Environmental Water Quality

Monitoring of surface water quality is undertaken on a regular basis by the Hydrometeorological Institute of Kosovo at about 40 sites. The current monitoring programme includes monthly analysis of basic quality parameters and some metals. HMIK’s laboratory has equipment that can be used for more complex analysis including pesticides and heavy metals. However, this equipment is not currently used due to a shortage of expertise, chemicals and consumables.

Hydrological monitoring has been highly variable in recent years, with periodic improvements being funded by foreign donors. Recent investments should result in the monitoring system achieving a reasonable standard of operation.

The quality and quantity of groundwater is not properly monitored at present.

River water quality, as published on the Kosovo Environmental Database\textsuperscript{36} is shown here.

\textsuperscript{36} http://ked.rks.gov.net/
The river water quality monitoring results shown above indicate good quality waters in the upper areas of the catchments, moderate quality in the middle reaches and poor quality in the lower reaches. This deterioration in quality in the lower reaches is clearly due to the influence of untreated wastewater being discharged into the environment, mostly from urban settlements.
4.4 Protection from Water

The damaging impacts of water flows arise from flooding and erosion.

4.4.1 Flood Risk

According to the assessment contained in the Water Master Plan of 1983, a 100 year flood event could have substantial impacts:

- Drini i Bardhë River basin 50%
- Ibri River basin 24%
- Lepenci Basin 20%
- Morava e Binçës basin 6%

This earlier assessment concludes that the length of rivers threatened by flooding in Kosovo is about 491 km. Approximately 140 km has been regulated (28%). A more recent assessment of flood risk has been undertaken: Vulnerability Risk Analysis and Mapping (VRAM), Flash Flood Risk Assessment over Kosovo, November 2012, World Health Organization, and Luxembourg Government Funds, the results of which are shown in the figure below.

The Climate Change Framework Strategy adopted in 2014 by the Ministry of Environment and Spatial Planning also examines the future risk of flooding in Kosovo in the light of anticipated climate change, and concludes that the frequency and intensity of climate events is likely to increase the risk of flooding in vulnerable areas.

The levels of flood risk and the level of economic damage arising from flooding are exacerbated by anthropogenic factors including:

- Poor condition of river channels arising from:
  - Insufficient maintenance of flood channels
  - Dumping of waste into flood channels
  - Unauthorised gravel extraction
- Poor condition of flood embankments
  - Damage to flood embankments
  - Insufficient maintenance
- Construction in the flood risk area

Measures to rectify these problems can clearly be identified in general, but the extent of need in each flood risk area has not yet been fully assessed. Therefore it remains difficult to estimate the likely investment need to achieve acceptable levels of flood risk management.

A recent study (funded by the European Commission) provided a preliminary estimate of basic flood risk investment needs in parts of the Morava I Binces basin of approximately €10 million.

Given the size of the basin in relation to the country as a whole, and the level food risk identified in that basin, as shown in the figure below, it is reasonable to postulate that flood risk investment cost needs could be of a similar order of magnitude to those for storm water drainage, i.e. about €100 million. However, this value only provides “an indication of scale”. Further detailed examination of
this issue must be undertaken through the preparation of flood risk management plans as required under the European Union Directive on Flood Risk Management (2007/60/EC).

*Figure 6 Flash Flood Hazard Level Distribution Map for Kosovo*[^38]

[^38]: VRAM Flash Flood Risk Assessment – Figure 22
4.4.2 Dam Safety

Risk of flooding also arises from potential dam failures. The Water Task Force published an assessment of Dam Safety in October 2012\(^\text{39}\), which concluded that:

- The legal framework does not adequately define roles and responsibilities
- There is no monitoring of the dams since 1997
- The database of the design is in the order of 40 to 50 years old – it is outdated
- Some dams have individual safety related deficits which have to be corrected

Further efforts as specified in the WTF Review are required in order to meet the requirements of safety monitoring and safety standards embodied in the recommendations of the International Commission on the Operation of Large Dams (ICOLD).

Initial remedial actions of at least €1 million are required and significant additional investment in repair works are needed to implement the recommendations from the WTF 2012 Report. Thereafter additional allocations need to be made for regular ongoing work including:

- Dam safety inspection and monitoring: under the control of the Competent Authorities
- Regular maintenance of dam structures and facilities: under the responsibility of the owners and operators

Estimates for the costs of such ongoing work must be made in the course of the initial remedial programme and appropriate budgetary allocations made.

4.4.3 Erosion

Significant areas of Kosovo are also subject to the risk of erosion as shown in the figure below. As reported by the World Bank, illegal logging and the lack of a forest renovation strategy exacerbates soil erosion. Provisions to designate erosion protection zones and enforce measures within these zones are included in the Water Law, but have not yet been fully applied.

A number of the measures that will be required to arrest erosion will have significant costs. However, until further information is available from inspection and monitoring, any estimate of these costs would be speculative.

Figure 7 Map of Erosion Risk – (State of Waters Report 2010)
4.5 Governance

Governance of water addresses the issues of:

- Legislation and Enforcement
- Institutional Design and Capacity
- Information Collection and Management
- Education

4.5.1 Legislation and Enforcement

Kosovo has already enacted a large body of legislation in the field of water. However, further secondary legislation is needed in order to complete the legal framework and to transpose a number of requirements of European Union legislation. In particular a number of items of secondary legislation pursuant to the Law on Waters need to be developed and promulgated including that listed in the following table. This legislative process is due to be completed in 2015.

<table>
<thead>
<tr>
<th>Administrative instructions foreseen/ref. article water law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 8 - Artificial water asset</td>
</tr>
<tr>
<td>Article 20 - Establishment of the Kosovo Institute of Water</td>
</tr>
<tr>
<td>Article 22 - Duties and responsibilities of river basin Authority</td>
</tr>
<tr>
<td>Article 31 - Essential planning documents National Water Strategy River Basin Management Plan</td>
</tr>
<tr>
<td>Article 34 - Measures Program</td>
</tr>
<tr>
<td>Article 42 - Dams and Storage</td>
</tr>
<tr>
<td>Article 47 - Protection Program of harmful water actions</td>
</tr>
<tr>
<td>Article 48 - Protection of the coast and water-flow accumulation</td>
</tr>
<tr>
<td>Article 54 - Announcement of erosive zone</td>
</tr>
<tr>
<td>Article 58 - Classification of surface water bodies</td>
</tr>
<tr>
<td>Article 59 - Classification of underground water bodies</td>
</tr>
<tr>
<td>Article 60 - Release of wastewater</td>
</tr>
<tr>
<td>Article 65 - Acceptable ecological bearing</td>
</tr>
<tr>
<td>Article 66 - Water protected zones</td>
</tr>
<tr>
<td>Article 66 - Determine the criteria for the protected zones for strategic purposes</td>
</tr>
<tr>
<td>Article 68 - Zone of washing</td>
</tr>
<tr>
<td>Article 71 - Procedures for the issuance of water permit</td>
</tr>
<tr>
<td>Article 72 - Water Permit</td>
</tr>
<tr>
<td>Article 77 - The procedure of obtaining and the abolition of water permit</td>
</tr>
<tr>
<td>Article 81 - Water Information System</td>
</tr>
<tr>
<td>Article 92 - Determination of the payment elevation for water exercise</td>
</tr>
<tr>
<td>Article 95 - Presentation of the Inspector</td>
</tr>
</tbody>
</table>

The implementation and enforcement of existing legislation is not the subject of regular assessment and reporting. However, a number of problems can be identified including:

- Absence of River Basin Management Plans and Flood Risk Management Plans
- Small number of wastewater discharges are subject to water permits
- Unauthorised extraction of mineral aggregates from river beds
- Breaching of and damage to flood defence infrastructure

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40 Law No. 04/L-147 “on waters of Kosovo, Official Gazette of the Republic of Kosovo No.10/ 29 April 2013, Pristina
### 4.5.2 Institutions

Governance responsibilities in the water sector are distributed across a number of entities, as summarised in the following table.

**Table 20 Summary of Institutional Responsibilities in the Water Sector**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Key Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-ministerial Council for Waters</td>
<td>Oversight of water sector as a whole</td>
</tr>
<tr>
<td></td>
<td>Key decision making forum for the sector</td>
</tr>
<tr>
<td>Ministry of Environment and Spatial Planning</td>
<td>Environmental Regulation</td>
</tr>
<tr>
<td></td>
<td>River Basin Management Planning</td>
</tr>
<tr>
<td></td>
<td>Flood risk management planning</td>
</tr>
<tr>
<td>Ministry of Economic Development</td>
<td>Water Management Infrastructure Owner</td>
</tr>
<tr>
<td></td>
<td>Publicly Owned Enterprise Sponsor and Monitor</td>
</tr>
<tr>
<td></td>
<td>Water services sector enterprises</td>
</tr>
<tr>
<td></td>
<td>Irrigation services enterprises</td>
</tr>
<tr>
<td></td>
<td>Energy sector strategy and policy</td>
</tr>
<tr>
<td>Ministry of Agriculture, Forestry and Rural Development</td>
<td>Agriculture and irrigation strategy and policy</td>
</tr>
<tr>
<td></td>
<td>Forestry strategy and policy</td>
</tr>
<tr>
<td>Water and Wastewater Regulatory Office</td>
<td>Economic regulator of water services sector</td>
</tr>
<tr>
<td>Hydro-meteorological Institute of Kosovo</td>
<td>Environmental Monitoring</td>
</tr>
<tr>
<td></td>
<td>Flood warning</td>
</tr>
<tr>
<td>Public Health Institute</td>
<td>Drinking Water Quality monitoring and regulation</td>
</tr>
<tr>
<td>Environmental Inspectorate</td>
<td>Inspection and enforcement of environmental legislation</td>
</tr>
<tr>
<td>Kosovo Environmental Protection Agency</td>
<td>Environmental reporting</td>
</tr>
<tr>
<td>Kosovo Institute for Waters</td>
<td>Not yet defined (Article 20 of the Law on Waters)</td>
</tr>
<tr>
<td>Regional Water Companies (7)</td>
<td>Delivery of water services</td>
</tr>
<tr>
<td></td>
<td>Business planning and development (with LSGUs)</td>
</tr>
<tr>
<td>Irrigation Business Units (3)</td>
<td>Management &amp; operation of bulk irrigation infrastructure</td>
</tr>
<tr>
<td></td>
<td>Electricity generation from hydropower (only 1)</td>
</tr>
<tr>
<td>Municipalities (LSGUs)</td>
<td>Owner of some water service infrastructure</td>
</tr>
<tr>
<td></td>
<td>Development planning</td>
</tr>
<tr>
<td></td>
<td>Flood risk management (shared)</td>
</tr>
</tbody>
</table>

The allocation of responsibilities between the institutions is reasonably clear and provides for a suitable division between “the regulators” and “the regulated”. Two issues have been noted in recent analyses:
The role of Municipalities in the water services sector – as examined in the Water Task Force report (June 2011) – this has been addressed through recent amendments concerning the constitution of the Boards of Regional Water Companies.

The role of the Ministry of Agriculture, Forestry and Rural Development in irrigation infrastructure management and development – this is currently under the competence of the Ministry of Economic Development – this is to be addressed in the context of the revised Agricultural and Rural Development Programme 2014-2020\(^1\).

Since these issues are now being addressed no further amendment of the institutional structure is considered necessary, although the potential role of the Water Institute (as set out in Article 20 of the Law on Waters) needs to be considered.

In terms of institutional capacity, some areas of need have been identified:

- Additional capacity within the Water Department of the Ministry of Environment and Spatial Planning in order to take on the functions assigned to it under the Law on Waters in particular the River Basin Management and Flood Risk Management Planning processes.
- Additional inspection and enforcement provision through strengthening of the environmental inspectorate.
- Considerable additional effort for the monitoring of the water environment, including flood risk monitoring and early warning, with institutional strengthening of the Hydrometeorological Institute being undertaken over the short and medium term.
- Additional staff for the Water and Wastewater Regulatory Office to take account of the growing need to address wastewater management activities by the Regional Water Companies.

### 4.5.3 Monitoring

The current monitoring of the water environment, including recent improvements supported by the international community, satisfies the basic requirement. However, it is insufficient for:

- River Basin Management Planning.
- Assessment of compliance with nationally set objectives.
- Compliance with the requirements of European Union legislation.

Extensive improvements in the frequency and intensity of environmental monitoring are needed including:

- Meteorological monitoring.
- Surface water flow monitoring.
- Surface water quality monitoring.
- Groundwater quality monitoring.
- Groundwater level (quantity) monitoring.

### 4.5.4 Information Management

Information management systems in the water management sector, particularly in the Ministry of Environment and Spatial Planning, and in the Kosovo Environmental Protection Agency have recently...

\(^{1}\) [http://www.ardp-kosovo.eu/](http://www.ardp-kosovo.eu/)
been updated with the introduction of the Kosovo Environmental Database (K.E.D.) supported by technical assistance from the European Union.

Provisions for the maintenance and updating of the K.E.D. need to be put in place and sustained in order to ensure that the database continues to function correctly and is able to support:

- Environmental regulation
- River Basin Management Planning
- Reporting
- Public access to environmental information as required by Law

4.5.5 Education

Education in the field of water management was examined by the Water Task Force (2010). The recommendations and proposals contained in the assessment remain valid and need to be implemented.

In particular the Task Force Report identified the need to considerably strengthen the provision of academic facilities and teaching in the field integrated water management, hydrology and water engineering. Costs associated with the implementation of such improvements were estimated to be in the region of €1.3 million over an extended period, equating to an additional annual allocation of approximately €65,000.

4.6 Financial and Economic Considerations

The capacity to resolve the issues identified here needs to be considered in terms of:

- The capacity to invest – using both national and international resources
- The capacity to operate and maintain infrastructure and systems – predominantly using revenues from charges

4.6.1 General Economic Indicators

Key economic statistics for Kosovo of relevance are cited here for ease of reference:

- Gross domestic product by expenditure approach, 2013: €5.5 billion per annum
- Gross domestic product per capita, 2013: €2,935 per annum
- Household consumption participation in GDP: ~84%
- Government consumption participation in GDP: ~16%
- Total revenues of general government, 2013: €1.36 billion per annum
- Total government expenditure, 2013: €1.49 billion per annum
- Gross fixed capital formation, 2013:
  - €1.47 billion: all expenditure (~26.5% of GDP)
  - 35% of government expenditure: €528 million per annum
- Government expenditure on environmental protection, 2013: €3 million per annum

Indications of household resources are provided by the annual Household Budget Survey undertaken by the Agency of Statistics of Kosovo:

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42 Agency of Statistics of Kosovo: GDP 2008 - 2013
43 Agency of Statistics of Kosovo: Government Accounts 2008 - 2013
• Consumption per capita 2013
  o Average: €1,402 per annum
  o Urban: €1,618 per annum
  o Rural: €1,248 per annum

The affordability of water services is ordinarily judged in relation to a fixed percentage of household income, with the threshold of affordability usually being set at between 3 and 5% of average income. Given the comparatively low level of GDP per person compared with the EU (€25,700), a lower value of 3% is used hereafter.

4.6.2 Investment in the Water Sector

Investment in the water sector in recent years was examined in the Water Task Force Report of 2012. The level of investment in water service infrastructure over a ten year period is summarised in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Kosova (€m)</th>
<th>Donor (€m)</th>
<th>Total (€m)</th>
<th>Cumulative (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>2.2</td>
<td>17.9</td>
<td>20.2</td>
<td>65.7</td>
</tr>
<tr>
<td>2003</td>
<td>0.6</td>
<td>17.5</td>
<td>18.2</td>
<td>83.9</td>
</tr>
<tr>
<td>2004</td>
<td>1.0</td>
<td>10.6</td>
<td>11.6</td>
<td>95.5</td>
</tr>
<tr>
<td>2005</td>
<td>3.1</td>
<td>7.7</td>
<td>10.8</td>
<td>118.6</td>
</tr>
<tr>
<td>2006</td>
<td>4.5</td>
<td>7.9</td>
<td>12.3</td>
<td>131.3</td>
</tr>
<tr>
<td>2007</td>
<td>4.2</td>
<td>8.5</td>
<td>12.7</td>
<td>156.7</td>
</tr>
<tr>
<td>2008</td>
<td>6.1</td>
<td>19.3</td>
<td>25.4</td>
<td>181.2</td>
</tr>
<tr>
<td>2009</td>
<td>14.6</td>
<td>9.8</td>
<td>24.5</td>
<td>207.9</td>
</tr>
<tr>
<td>2010</td>
<td>14.2</td>
<td>12.6</td>
<td>26.7</td>
<td>231.7</td>
</tr>
<tr>
<td>2011</td>
<td>12.7</td>
<td>11.0</td>
<td>23.8</td>
<td></td>
</tr>
</tbody>
</table>

In summary, investment in the water services sector in recent years has been about €25 million per annum. Of this approximately one half was provided by donors and one half was provided from Kosovo’s own resources.

During 2013 the WWRO reports that investments by the Regional Water Companies were as follows:

• Water supply services 2013
  o Planned total investment €25.7 million
  o Actual total investment €14.8 million
  o Actual as percentage of planned: 57%
  o Grants received: €12.8 million (86.5% of total investment)
  o Water company own revenues investment: €2 million (13.5% of total investment)

• Wastewater Services
  o Planned total investment €5.5 million
  o Actual total investment €0.11 million
  o Actual as percentage of planned: 2%
  o Grants received: €0.085 million (78% of total investment)
  o Water company own revenues investment: €0.024 million (22% of total investment)

The 2013 investments indicate:

• Substantially lower investment than planned
• Moderate investment in water supply

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44 Water and Wastewater Regulatory Office (WWRO) Annual Performance Report 2013, September 2014
• Very little investment in wastewater management
• High proportion of funding from donor sources

This clearly indicates that the operational and financial sustainability has not been fully secured.

4.6.3 Water Service Prices

The current prices for water services as published by the Water and Wastewater Regulatory Office (WWRO) are shown below.

Table 22 Water Services Tariff Statement 2014

<table>
<thead>
<tr>
<th>2014</th>
<th>Unit</th>
<th>RWC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Households</td>
<td></td>
</tr>
<tr>
<td>Water supply monthly charge</td>
<td>€/month</td>
<td>PR 1.00</td>
</tr>
<tr>
<td>Wastewater supply volume charge</td>
<td>€/m³</td>
<td>PZ 0.38</td>
</tr>
<tr>
<td>Wastewater charge</td>
<td>€/m³</td>
<td>PE 0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MIT 0.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GJA 0.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FE 0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GJI 0.33</td>
</tr>
<tr>
<td>Commercial and Institutional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water supply monthly charge</td>
<td>€/month</td>
<td>PR 3.00</td>
</tr>
<tr>
<td>Wastewater supply volume charge</td>
<td>€/m³</td>
<td>PZ 0.70</td>
</tr>
<tr>
<td>Wastewater charge</td>
<td>€/m³</td>
<td>PE 0.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MIT 0.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GJA 0.64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FE 0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GJI 0.63</td>
</tr>
</tbody>
</table>

For a household of average size consuming water and wastewater services at the average rate, the average monthly charge for water services is:

• €10.16 without tax per household per month
• €1.72 without tax per household member per month
• 1.47% of average per capita consumption expenditure as a national average
• 1.28% of average per capita consumption expenditure in urban areas
• 1.66% of average per capita consumption expenditure in rural areas

The values of these indicators vary between Regions due to significant variations in income and in the prices charged by the Regional Water Companies.

On average the charges levied by regional water companies for water services represent about 1.5% of average income. This is well below the threshold of 3%. The rate of payment for water services by consumers is about 70%, i.e. about 30% of households do not pay the invoices for water, and the levels of unaccounted for water indicate that water is also being taken from supply system without invoice or payment.

Considering the development of prices in the period 2009-2014:

• The average water services price for households has increased by about 30% in nominal terms
• The average water services price for others has increased by about 23% in nominal terms
• Inflation over the same period has been about 17%
• Real terms increases in water service prices have on average been:

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45 Annual Performance Report 2013, September 2014
46 Weighted average based on the volume of sales by each Regional Water Company
About 11% for households (2.2% per annum real terms increase for five years)

About 5% for others (1% per annum real terms increase over five years)

Water price increases have exceeded inflation, but as indicated above, the Regional Water Companies continue to experience financial difficulties.

4.6.4 Publicly Owned Water Companies – Financial Performance

The financial performance of publicly owned enterprises in the water sector is summarised below.

Table 23 Consolidated Financial Performance of Publicly Owned Enterprises in the Water Sector

<table>
<thead>
<tr>
<th>Public Enterprise</th>
<th>2011 Revenues (000€)</th>
<th>2011 Costs (000€)</th>
<th>2011 Profit/Loss (000€)</th>
<th>2012 Revenues (000€)</th>
<th>2012 Costs (000€)</th>
<th>2012 Profit/Loss (000€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS Ibër-Lepenc</td>
<td>3,791</td>
<td>-7,781</td>
<td>-3,990</td>
<td>3,808</td>
<td>-7,978</td>
<td>-4,170</td>
</tr>
<tr>
<td>Irrigation Drini i Bardhë</td>
<td>227</td>
<td>-244</td>
<td>-17</td>
<td>303</td>
<td>-337</td>
<td>-34</td>
</tr>
<tr>
<td>Irrigation Radoniqi-Dukagjini</td>
<td>887</td>
<td>-885</td>
<td>2</td>
<td>891</td>
<td>-880</td>
<td>11</td>
</tr>
<tr>
<td>RWC Prishtina</td>
<td>12,941</td>
<td>-13,265</td>
<td>-324</td>
<td>13,514</td>
<td>-13,341</td>
<td>173</td>
</tr>
<tr>
<td>RWC Mitrovica</td>
<td>3,775</td>
<td>-3,713</td>
<td>62</td>
<td>3,875</td>
<td>-3,282</td>
<td>593</td>
</tr>
<tr>
<td>RWC Hidromorava</td>
<td>1,716</td>
<td>-2,068</td>
<td>-352</td>
<td>1,882</td>
<td>-1,915</td>
<td>-33</td>
</tr>
<tr>
<td>RWC Hidrodrini</td>
<td>3,067</td>
<td>-3,220</td>
<td>-153</td>
<td>3,578</td>
<td>-3,592</td>
<td>-14</td>
</tr>
<tr>
<td>RWC Radoniqi</td>
<td>2,924</td>
<td>-3,601</td>
<td>-677</td>
<td>3,233</td>
<td>-3,790</td>
<td>-557</td>
</tr>
<tr>
<td>RWC Hidroregjioni Jugor</td>
<td>3,579</td>
<td>-4,075</td>
<td>-496</td>
<td>4,069</td>
<td>-4,417</td>
<td>-348</td>
</tr>
</tbody>
</table>

As noted above, the Regional Water Companies are not as a whole, profitable. In most instances RWCs are not completing their planned investment programmes.

The financial position of the three water resource enterprises is also not strong, although the economics in the case of HS Ibër-Lepenc are more heavily influenced by the energy component of its business than by the water supply aspect. It is noted in recent performance reports for publicly owned enterprises that the revenue collection rates are low:

Table 24 Revenue Collection Efficiency of Irrigation Enterprises

<table>
<thead>
<tr>
<th>Collection / Billed</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation Drini i Bardhë</td>
<td>56%</td>
<td>55%</td>
</tr>
<tr>
<td>Irrigation Radoniqi-Dukagjini</td>
<td>23%</td>
<td>31%</td>
</tr>
</tbody>
</table>

4.7 Background – Summary Conclusions

Kosovo faces very substantial challenges in the water sector arising from:

- Relatively low water resources
- Relatively low water storage
- Comparatively low efficiency of water use (high rates of losses)
- Maintenance backlog for existing assets in the water services sector
- Insufficient wastewater collection and treatment infrastructure

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47 DEKLARATA E KONSOLIDUAR VJETORE FINANCIARE 2012 PËR NDERMARRJET PUBLIKE QENDRORE, Ministry of Economic Development
48 Revenues includes grants, Costs include depreciation and bad debts, Profit / Loss is shown after tax
• Relatively low coverage with modern efficient irrigation systems
• Low hydropower utilisation, although this is being addressed with ongoing investments
• Some areas of high flood risk and erosion
• Affordability constraints at both the national and household levels
• Low revenue collection rates by both Regional Water Companies and Irrigation Companies

The investment costs required to achieve full compliance with long term development goals in respect of all elements of the water sector including water use, protection of water and protection of water, and with the requirements of European Union legislation are very substantial and have been estimated above to be in the region of €1,500 million.

This level of investment will clearly require many years to complete, and will also require substantial foreign assistance. In order to plan, prepare and implement such a programme and to ensure the efficient and effective operation and maintenance of the infrastructure in the sector will also require significant improvements in governance.
5 Objectives

5.1 High Level Strategic Objectives

High level strategic objectives for the sector are presented here. The specific objectives of this Strategy have been derived from these high level strategic objectives, taking account of the prevailing resource constraints. Indicators for the assessment of progress in achieving the objectives are presented in respect of each measure included in the Recommended Course of Action.

Strategic Objective 1 – Use of Water

Sustainably allocate and oversee the right to exploit the water resources of Kosovo among water users so as to guarantee access to health-safe drinking water for all and maximise the economic benefits from other water uses whilst taking into account changing hydrologic regimes, eliminating water scarcity and respecting the principles of sustainable management.

Strategic Objective 2 – Protection of Water

Regulate and oversee activities that give rise to pressures on the water environment in a proportionate, efficient and effective manner so as to attain economically justified environmental objectives for surface water and groundwater bodies whilst respecting the principles of sustainable management.

Strategic Objective 3 – Protection from Water

Achieve acceptable levels of protection of population and property from the adverse effects of water including flood, torrent and erosion in an economically balanced and cost effective manner.

Strategic Objective 4 - Governance

Establish and maintain a system of water governance that is equitable, transparent, efficient, coordinated and of such professional and technical capacity as to be able to effectively support the achievement of the strategic objectives for water use, water protection and protection from water including the implementation of a water information system to monitor, assess, interpret and inform stakeholders on all aspects of this Strategy.

Horizontal Objective – EU Harmonisation

Achieve long-term compliance with the requirements of European Union legislation in the water sector, initially through the introduction of compatible systems of legislation and planning, and then through the stepwise application of practical implementation measures.

5.2 Specific Objectives

The specific objectives set out here represent long-term goals. Intermediate targets are established following the options analysis and recommended actions.

5.2.1 Use of Water

- Water Resource Management
  - Increase the level of water resource storage
  - Increase the efficiency of water utilisation in all sectors
- Water Supply Services
  - Increase coverage with centralised drinking water supply to achieve over 90% coverage with only small and isolated settlements not being connected to centralised supply
Increase the reliability of supply so as to achieve 24 hour supply of adequate pressure and health safe quality in all public water supply systems
Increase the financial sustainability of water service supply
Ensure water is affordable for all

- **Irrigation**
  - Increase the coverage of irrigation systems
  - Increase the economic return from irrigation
  - Increase the financial sustainability of irrigation service providers

- **Hydropower**
  - Increase the proportion of electricity generated from hydropower

### 5.2.2 Protection of Water

- **Urban Wastewater** – reduce pollution impact
  - Implement wastewater collection networks in all settlements of more than 2,000 p.e.
  - Implement wastewater treatment in all settlements of more than 2,000 p.e.

- **Diffuse Pollution**
  - Reduce pollution from agriculture
  - Remediate contaminated land

- **Pollution from industrial installations**
  - Implement the requirements of the Industrial Emissions Directive of the European Union including best available technology so as to concurrently increase the efficiency of industrial production and reduce the level of environmental impact

### 5.2.3 Protection from Water

- **Flood Protection**
  - Achieve levels of protection from flood that are comparable with those of European Union Member States

- **Erosion**
  - Reduce the levels of erosion of land and river banks to an economically optimal level

- **Dam Safety**
  - Achieve levels of dam safety in accordance with the requirements of the International Commission on Large Dams (ICOLD) and accepted best practice in the European Union

### 5.2.4 Governance

- **Legislation and Enforcement**
  - Complete transposition of EU legislation including transitional provisions
  - Develop Integrated River Basin Management Plans to ensure effective governance of water resource allocation, pollution control, flood risk and erosion control
• Institutions
  o Strengthen and optimise the existing institutions in order to provide effective and efficient governance at least cost

• Monitoring and Information Management
  o Strengthen and optimise monitoring and environmental information management so as to achieve compliance with EU requirements at least cost

• Education
  o Provide adequate higher education opportunities to support development of a sustainable body of technical expertise within the country
  o Improve the understanding and awareness of water related issues within all levels of government and the public
6 Alternatives Considered

The factors that define the alternatives considered in the development of this Strategy:

- The scale of investment – optimising the ambition of the objectives
- The timing of investment – managing the speed of implementation
- The sources of funding:
  - Revenues from user charges
  - Government central revenues
  - Donor finance
- Private sector participation – the potential for varying degrees of privatisation
- Prioritisation of measures both between and within strategic themes

The criteria used in consideration of alternatives:

- Timely contribution to achievement of the objectives
- Practicality and feasibility
- Financial and economic return

6.1 Private Sector Participation

The potential for private sector participation is examined first since the involvement of the private sector could substantially reduce the burden on the public sector and thereby broaden the options for public sector intervention. However, it must also be recognised that there has been a strong role for donor finance in the sector. This is expected to continue. Donor finance, both preferential loans and grants, may be combined with private sector participation. However, it should be noted that the vast majority of grant finance provided by the EU and others has been to public sector enterprises without significant private sector contributions to the capital investment.\(^{50}\)

The main investment burdens arise in:

- Urban water supply and wastewater management services – Urban water services
- Irrigation services
- Flood risk management
- Energy generation from hydropower
- Water storage facilities

6.1.1 Urban Water Supply and Wastewater Management Services

Private sector participation in urban water services was recently examined in detail.\(^{51}\) The report concludes:

*At this stage of development of the water services sector two options can be encouraged:*  
- management contracts and  
- service contracts;

\(^{50}\) The Private Sector is heavily involved in the construction process, but is not often “and investor”  
\(^{51}\) See report “Public-Private Partnership in Drinking Water Sector” May 2014, EuropeAid / 130896/ C/ SER/ XK
These will lead to other more advanced option of lease contracts and concessions, although these are probably only realistic in Prishtina, and only in the medium term. Other PPP options such as divestiture of assets i.e full privatisation are not considered realistic.

The majority of the burden for investment in the short to medium term will therefore remain with the public sector in the area of urban water services

6.1.2 Irrigation Services

The privatisation of the existing irrigation enterprises could be considered. However, any private investor considering the purchase and the development of these businesses would probably only consider investing if the businesses were demonstrating at least short-term profitability. As discussed above, the current irrigation businesses are not profitable. Until such time as measures to achieve financial sustainability have been made effective, privatisation is not a realistic option.

6.1.3 Flood Risk Management

The private sector construction and operation of flood risk management infrastructure is extremely rare in Europe, although some land drainage enterprises can be considered in this category.

One of the difficulties in considering privatisation of flood defence provision is the question of revenue generation. Whilst the provision of flood defence can be considered a service, it is generally not subject to any form of direct charging scheme and as such does not present a business model amenable to privatisation. As such the burden of investment is expected to remain with the public sector. However, as with urban services, some degree of private sector participation could be introduced through maintenance and repair service contracts.

6.1.4 Energy Generation

As demonstrated by the KelKos investments in the hydropower cascades in north-western Kosovo52, the potential for full private sector participation including capital investment in the area of hydropower generation can be realised.

Therefore it is recommended that this approach to hydropower generation is continued and is pursued through the concession contracts for small hydropower, as specified in the Energy Strategy.

6.1.5 Water Storage facilities

Given that water storage will ordinarily be for one of the purposes listed above, the investment in such facilities needs to be considered in the light of the conclusions above.

Water storage for the purpose of energy generation will ordinarily be managed to optimise generation potential, but may of course be managed for the fulfilment of multiple purposes including water resource storage for urban and irrigation uses, and flood defence. If, as is concluded above, hydropower generation is a private sector matter, then the attractiveness of any given concession will be reduced if extensive constraints on the operation of the facility are imposed in order to meet objectives other than energy generation. As such this “multi-functional” approach to hydropower reservoir management may present problems.

Therefore the most likely approach will be the construction and operation of facilities in a similar manner to the current publicly owned enterprises that fulfil this function.

6.1.6 Overall Conclusion

Full private sector participation in the construction and operation of hydropower facilities is envisaged. However, private sector investment in the areas of urban water services, irrigation and flood defence is unlikely to be practicable in the short to medium term. However, as indicated in the report on Public Private Partnership in the water supply sector, opportunities exist for increased private sector participation in the operation and maintenance of the infrastructure through competitively tendered service contracts.

6.2 Scale of Investment

Consideration has been given to the precise quantitative specification of the objectives above and the impact that such changes in specification would have on the costs of investments and of ongoing operation and maintenance.

6.2.1 Drinking water supply

Three key elements of the objective specification have a major influence on costs:

- The level of coverage
- The level of leakage reduction
- The standards of service delivery

European Union legislation does not specify the level of coverage with centralised water supply services that must be achieved. This is a matter for Member States to decide. Two basic options can be characterised as:

- Complete coverage: 100% of properties are supplied with drinking water from centralised supply systems
- Current coverage: the existing levels of coverage are maintained or even allowed to decline slightly

The first option will entail considerable additional expense to the public sector since it will require the provision of water supply services to all settlements and properties including those that are small and remote from other towns and settlements. The provision of these services to small remote settlements is usually more expensive per person than in the larger settlements.

It could be argued that the provision of water supply services to these remote settlements would be an important means of support to the households there, who often have low incomes. However, as has been shown in a number of cases of such water supply systems, support is required both for the construction of these systems and their operation, since households are rarely willing or able to pay for conventional centralised water services as provided by the Regional Water Companies, preferring to rely on private supplies.

Therefore a balanced approach is to be taken whereby:

- All existing centralised supply systems are operated and maintained, including repair of the smaller rural systems that have recently fallen into disrepair.
- Centralised supply systems are expanded to include satellite settlements where it is economic to do so
- Centralised supply systems are not extended in the near term to smaller and more remote settlements, provided that such settlements have reasonable access to water from which to develop a private supply on an individual household or collective basis
• The decision as to whether to provide centralised water supply to each settlement needs to be made by the Municipality and the Regional Water Company on a case-by-case basis.

Overall the benchmarks for this objective are:
• Centralised water supply to all settlements with more than 500 population
• Overall coverage with centralised water supply of 95% (consistent with the EU average)

6.2.2 Wastewater Collection and Treatment Coverage

Similar considerations apply to the question of wastewater collection and treatment. However, in this case EU legislation does specify the level of coverage that must be achieved, with all agglomerations of more than 2,000 population equivalent being subject to the requirements of the Directive\(^53\).

Considering the settlement size distribution in Kosovo, the requirement of the Directive would entail provision of wastewater collection and treatment to 82% of the population. This is also close to the average level of coverage achieved in the EU.

As with drinking water supply services, the provision of wastewater collection and treatment in smaller communities is more expensive per person than in larger settlements. Moreover, the environmental benefit is usually less. For this reason the provision of centralised wastewater treatment for small settlements should only be considered when such settlements are very close to other large urban areas, such that wastewater can be conveyed cheaply and treated centrally.

Again the decision as to whether to include such smaller settlements shall be a matter for the Municipal authorities and the Regional Water Companies, but the general presumption shall be against the provision of centralised wastewater collection and treatment for smaller settlements unless they are close to large urban areas, or are causing significant environmental problems for the local population or downstream users.

Overall the benchmarks for this objective are:
• Centralised wastewater collection and treatment for all settlements with more than 2,000 population
• Overall coverage with centralised wastewater collection and treatment of about 82% (consistent with the EU average)
• Tertiary treatment of wastewater only considered for very large settlements and only implemented where economically justified\(^54\)

6.2.3 Irrigation

The level of irrigation coverage that is economically optimal for Kosovo is dependent on a number of factors including the nature of the crops produced on irrigated land and the behaviour of the agricultural produce markets. Detailed examination of these factors is beyond the scope of this Strategy. However, as discussed above, the current level of irrigation coverage is well below that of the major irrigation users in Europe in terms of the proportion of the country’s land area and the proportion of cultivated land that is subject to irrigation. Expansion of the irrigation system to the proposed level (25 - 30,000 hectares) would still result in lower levels of irrigation intensity than found in these countries. Therefore, provided there is demand from agricultural producers for the expansion

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\(^{53}\) Urban Waste Water Treatment Directive, 91/271/EC

\(^{54}\) Tertiary treatment to remove nutrients from wastewater is an obligation under the Urban Wastewater Treatment Directive. However, it is expensive to implement and therefore is considered for implementation after the term of this Strategy
of irrigation coverage, the proposed enlargement of irrigation coverage to between 25,000 and 30,000 hectares appears the most appropriate scale of objective.

The provision of the existing and extended irrigated areas with delivery systems also needs to be considered. In areas where there is a low level of water stress, the implementation of more efficient irrigations (e.g. drip as opposed to spray) is unlikely to be justified in the short to medium term. However, in the case of basins subject to greater levels of stress, notably the Ibr, the installation of more efficient delivery systems must be seen as a priority given the level of water stress already existing in the basin.

6.2.4 Flood Defence

As stated in EU Guidance55.

- Flood protection is never absolute. It is neither technically feasible nor economically affordable to prevent all properties from flooding. Therefore, a risk-based approach is taken to achieve the best results possible using the budget and resources available. Flood management should seek to limit flood risk, but not at all costs. The costs should be reasonable compared to the expected benefits.

The European Flood Risk Management Directive (2007/60/EC) does not contain numerical standards for the level of flood protection that should be achieved, nor does it prescribe specific flood protection measures. However, the Directive does require the Member States of the European Union to review their system of flood risk management and to set “adequate objectives” for flood protection.

In order to make a balanced judgement in line with this risk based approach and to set such adequate objectives knowledge is required of at least the two main quantitative aspects:

- The risk to each parcel of land of being flooded to a specific severity (depth and duration)
- The cost of repairing the damage associated with flood

At present detailed analysis of these values, taking into account both future climate change and economic development, have not been made. Therefore only qualitative objectives can be set at the present time, and the short-term imperatives must be:

- Short-term implementation of “no regret” flood prevention measures in localities for which detailed information is available and suitable measures have been designed
- The preparation of flood risk management plans for all basins in the country based on the application of the EU Flood Risk Management Directive, with the most urgent steps being the completion of risk assessments and economic valuations

This will allow a cost-benefit approach to be taken in defining the levels of protection set as objectives for given areas. In achieving these objectives cost-effectiveness analysis will also be required to determine the optimal combination of measures.

The components of flood risk management that make up this combination include:

- **Prevention**: preventing damage caused by floods by avoiding construction of houses and industries in present and future flood-prone areas; by adapting future developments to the risk of flooding; and by promoting appropriate land-use, agricultural and forestry practices;

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• **Protection**: taking measures, both structural and non-structural, to reduce the likelihood of floods and/or the impact of floods in a specific location;

• **Preparedness**: informing the population about flood risks and what to do in the event of a flood;

• **Emergency response**: developing emergency response plans in the case of a flood;

• **Recovery and lessons learned**: returning to normal conditions as soon as possible and mitigating both the social and economic impacts on the affected population.

6.2.5 Water Resource Storage

The potential need for additional water resource storage needs to be analysed in detail for each river basin. With the exception of the Ibri basin, for which a study has already been undertaken\(^{56}\), detailed resource assessments need to be made, and water resource management plans developed.

Only on the basis of such studies can optimised objectives be defined and the most cost-effective combination of measures determined. However, there can be no doubt that substantial increases in water use efficiency will be required as one of these measures, and therefore implementation of measures to decrease loss and leakage can generally be considered as “no regret”.

6.3 The Rate and Timing of Investment

The question of how quickly and when investments can and should be made is primarily considered in terms of affordability. Affordability is addressed in two respects:

• **Capital Investment Costs** – considered in terms of the government’s capacity, with the assistance of donors, to meet these costs

• **Operation, maintenance and periodic replacement costs** – considered predominantly in terms of the consumers ability and willingness to pay sufficient user charges to make the provision of services financially sustainable

6.3.1 Capital Investment Costs

Kosovo continues to pursue development in many areas and there are a wealth of competing needs for the limited financial resources of the private sector. As noted above:

• **Government annual expenditure**: about €1.5 billion per annum, of which
  
  o **Public Sector Capital Expenditure**: about €0.5 billion per annum

• **Investment in urban water services** has reached a level of about €25 million per annum, including donor contributions of about 50%; additional investment is also made in irrigation and other aspects of water management, with the planned investments in agriculture being about €5 million per annum

• **Government spending on water infrastructure** is about 1.3% of total spending

• **The level of investment burden on the public sector** in order to achieve all of the long term objectives in the water sector is about €1.5 billion as shown in the following table

\(^{56}\) Water Security in Central Kosovo, OSCE, March 2011
Table 25 Summary of Potential Investment Needs requiring Public Sector Intervention

<table>
<thead>
<tr>
<th>Issue</th>
<th>Long Term Goal</th>
<th>Approximate Investment Millions Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water storage - reservoirs</td>
<td>New reservoirs</td>
<td>250</td>
</tr>
<tr>
<td>Water Supply Services</td>
<td>Renovation and extension</td>
<td>430</td>
</tr>
<tr>
<td>Increase irrigation coverage</td>
<td>Increase coverage and efficiency</td>
<td>70</td>
</tr>
<tr>
<td>Wastewater collection and treatment</td>
<td>Renovation and introduction</td>
<td>680</td>
</tr>
<tr>
<td>Flood defence</td>
<td>Renovation and extension</td>
<td>100</td>
</tr>
<tr>
<td>TOTAL Potential Need</td>
<td>All Objectives</td>
<td>1,530</td>
</tr>
</tbody>
</table>

At the present level of investment in the water services sector (€25 million per annum), and the burden for that part of the sector (in excess of €1 billion), the investment programme would take up to 40 years to complete. This is clearly not acceptable.

Given the 20 year timescale of the Strategy, simple estimation would suggest that achievement of the full investment programme during the lifetime of the Strategy would require an average annual investment of €75 million per annum over the 20 year period, of which €50 million would be in the urban water services sector.

This level of investment represents a very substantial burden for the public sector. The potential for achieving this level of investment has been examined by making a simple financial projection over the period of the Strategy. The projection is based on moderately optimistic assumptions:

- Gross Domestic Product in Purchasing Power Parity terms will grow by 3.5% per annum in Real Terms (excluding inflation) for the 20 year period of the Strategy
- Government Budget will grow in two respects:
  - In line with the growth in GDP
  - Increasing participation of Government Sector expenditure in GDP57 from the current level of 16% in 2014 to 20% in 2034 - the level found in many EU Member States58
- Participation of donors in the investment programme will be 50:50 for the first half of the Strategy period, and will increase to 65% the latter period of the Strategy as the EU perspective of Kosovo deepens, and access to loan finance options improve with the growing creditworthiness of central government, local government and operational entities
- The proportion of government expenditure on water sector infrastructure averages the current value (1.3%) over the period of the Strategy.

Applying these assumptions and further assuming that the use of PPP growth rates accounts for the real terms increases in the costs of the infrastructure59, the scenario as set out in the following table can be envisaged.

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57 General government final consumption expenditure (% of GDP)
58 See for example: [http://data.worldbank.org/indicator/NE.CON.GOVT.ZS](http://data.worldbank.org/indicator/NE.CON.GOVT.ZS)
59 This assumption must be considered as very optimistic
Table 26 Moderately Optimistic Capital Investment Scenario (selected years)

<table>
<thead>
<tr>
<th></th>
<th>Base Year</th>
<th>2015</th>
<th>2019</th>
<th>2023</th>
<th>2027</th>
<th>2031</th>
<th>2034</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (real terms PPP)</td>
<td>million €</td>
<td>5,500</td>
<td>5,555</td>
<td>5,881</td>
<td>6,719</td>
<td>7,970</td>
<td>9,459</td>
</tr>
<tr>
<td>GDP Growth Rate</td>
<td>% p.a. Real</td>
<td>1.0%</td>
<td>0.5%</td>
<td>2.8%</td>
<td>4.2%</td>
<td>4.5%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Government Spending</td>
<td>% of GDP</td>
<td>16.0%</td>
<td>16.2%</td>
<td>17.0%</td>
<td>17.8%</td>
<td>18.6%</td>
<td>19.4%</td>
</tr>
<tr>
<td>Government Budget</td>
<td>million €/a</td>
<td>1,500</td>
<td>1,534</td>
<td>1,704</td>
<td>2,039</td>
<td>2,527</td>
<td>3,128</td>
</tr>
<tr>
<td>Spending on Water</td>
<td>% Budget</td>
<td>1.33%</td>
<td>1.33%</td>
<td>1.33%</td>
<td>1.33%</td>
<td>1.33%</td>
<td>1.33%</td>
</tr>
<tr>
<td>Gov’t Capital on Water</td>
<td>million €/a</td>
<td>20.00</td>
<td>20.45</td>
<td>22.72</td>
<td>27.18</td>
<td>33.69</td>
<td>41.71</td>
</tr>
<tr>
<td>Donor participation</td>
<td>% of total</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>65%</td>
<td>65%</td>
</tr>
<tr>
<td>Total Investment</td>
<td>million €/a</td>
<td>40.00</td>
<td>40.91</td>
<td>45.44</td>
<td>54.36</td>
<td>96.26</td>
<td>119.16</td>
</tr>
<tr>
<td>Cumulative Investment</td>
<td>million €</td>
<td>41</td>
<td>214</td>
<td>417</td>
<td>744</td>
<td>1,185</td>
<td>1,580</td>
</tr>
</tbody>
</table>

As shown in the table above the application of moderately optimistic assumptions leads to a projection of capital infrastructure spending in the water sector consistent with the completion of the required investments by the end of the Strategy, i.e that the total sector investment by 2034 is in the region of €1.5 billion.

It must be recognised that completion of the programme in this manner is heavily reliant on:

- Economic growth being achieved
- Government’s commitment to provide investment in the sector
- Continuing and expanding donor support

### 6.3.2 Operation, Maintenance and Periodic Replacement Costs

Whilst, as discussed above, the investments needs could possibly be met under given circumstances, the Strategy will not be “affordable” unless the full costs of operation and maintenance can also be met. As discussed earlier in the Strategy the current cost coverage of the publicly owned enterprises in the water sector is not complete, and the enterprises have experienced difficulties in implementing the planned capital investments (included in their business plans) for both development and period replacement.

The potential for these costs to be met is considered for each of the three sub-sectors individually since the cost recovery mechanisms are significantly different in each case.

**Urban Water Services**

The key aspect of affordability for urban water services concerns the ability of “the average household” to meet the cost of water services. The threshold usually used to judge whether water services are affordable is 3 to 4% of average household income. The lower value of 3% is used here.

The costs of services varies quite considerably from one region to another, depending number of factors including the availability of water, its quality, economies of scale applicable to the operations and the settlement patterns. The situation for each regional water company has been examined in recent feasibility studies. A simplified country-wide assessment is given here.

The assessment is based on the following base year data and assumptions:
• The current base modern equivalent asset value of urban water and wastewater infrastructure in Kosovo is about €400 million, based on the Regulatory Asset Base assumptions of the WWRO\textsuperscript{60} and on historical investment trends\textsuperscript{61}

• The costs for operation and maintenance are approximately
  o Regular replacement (capital maintenance) of 3% asset value per annum
  o Operation and maintenance of 6% of asset value per annum
  o Total costs of sustainable operation of approximately 9% of the asset value

• Non-household consumption is about 20% of the total consumption, but will increase with economic development to about 30%

• The price ratio of non-household to household charges is currently about 2.2 but will decrease to close to 1 over the Strategy period in line with the requirements of EU legislation\textsuperscript{62}

• The revenue collection rate:
  o Is currently about 90% for non-household consumers and will increase to at least 95% over the Strategy period
  o Is currently about 70% for household consumers and will increase to about 80% over the Strategy period

• The total number of household consumers is constant at a value of 80% of the population

Under these assumptions the scenario shown in the following table would achieve cost recovery by the urban water services providers\textsuperscript{63}.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Base Year</th>
<th>2015</th>
<th>2019</th>
<th>2023</th>
<th>2027</th>
<th>2031</th>
<th>2034</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset value</td>
<td>Mio €</td>
<td>400</td>
<td>430.68</td>
<td>560.87</td>
<td>712.92</td>
<td>957.81</td>
<td>1,288.81</td>
<td>1,584.65</td>
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<tr>
<td>Total Costs</td>
<td>Mio €</td>
<td>35.20</td>
<td>37.90</td>
<td>49.36</td>
<td>62.74</td>
<td>84.29</td>
<td>113.42</td>
<td>139.45</td>
</tr>
<tr>
<td>Non-HH % total</td>
<td></td>
<td>20%</td>
<td>20%</td>
<td>22.0%</td>
<td>24.0%</td>
<td>26.0%</td>
<td>28.0%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Price Non HH/HH</td>
<td>#</td>
<td>2.22</td>
<td>2.17</td>
<td>1.97</td>
<td>1.77</td>
<td>1.57</td>
<td>1.37</td>
<td>1.22</td>
</tr>
<tr>
<td>Non-HH RCR %</td>
<td></td>
<td>90%</td>
<td>91%</td>
<td>92%</td>
<td>93%</td>
<td>93%</td>
<td>94%</td>
<td>95%</td>
</tr>
<tr>
<td>HH RCR %</td>
<td></td>
<td>70%</td>
<td>70%</td>
<td>74%</td>
<td>78%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Cost to HH €/c/a</td>
<td>€/c/a</td>
<td>20.38</td>
<td>22.05</td>
<td>27.42</td>
<td>33.58</td>
<td>44.50</td>
<td>60.50</td>
<td>75.42</td>
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<tr>
<td>Affordability % HHI</td>
<td>%</td>
<td>48%</td>
<td>52%</td>
<td>60%</td>
<td>63%</td>
<td>71%</td>
<td>81%</td>
<td>91%</td>
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<tr>
<td>Service Price €/m3</td>
<td>€/m3</td>
<td>€0.45</td>
<td>€0.48</td>
<td>€0.60</td>
<td>€0.74</td>
<td>€0.98</td>
<td>€1.33</td>
<td>€1.65</td>
</tr>
<tr>
<td>Yearly Increase % real</td>
<td>%</td>
<td>8.2%</td>
<td>5.3%</td>
<td>5.2%</td>
<td>8.3%</td>
<td>7.8%</td>
<td>7.5%</td>
<td></td>
</tr>
</tbody>
</table>

HH = Household, RCR = Revenue Recovery Rate, €/c/a = Euros per capita per annum

As shown in the table above, to achieve cost recovery over the period of the Strategy will:

• Require average annual increases in the price of water services of about 7% in real-terms throughout the Strategy period

• Increase the burden on households from the current level of about 50% of the affordability limit to about 90% of the affordability limit

\textsuperscript{60} €200 per consumer for water supply and €100 per consumer for wastewater collection

\textsuperscript{61} Water Task Force Investment Trends, plus recent investment and legacy value

\textsuperscript{62} Article 9 of the Water Framework Directive

\textsuperscript{63} This scenario recovers costs for operation and maintenance, but does not include contributions to the capital investments
It is of note that:

- The real terms rate of tariff increase required to achieve cost recovery (7%) is considerably higher than the rates of tariff increase in recent years (2.2%)
- Increasing the burden on households is unlikely to be popular and may have a negative impact on the Revenue Collection Rate, thereby reducing the income received by the Regional Water Companies and reducing their ability to achieve cost recovery and financial sustainability

In conclusion:

- The implementation of a full investment programme to achieve compliance with all objectives in the urban water services sub-sector will result in substantial increases in the costs of the Regional Water Companies. If these costs are recovered from the charges paid by consumers for the services, then the price of water services will need to triple in real terms (from about €0.5/m³ to about €1.5/m³) over the twenty year period of the Strategy.
- A substantial change in the willingness of households to pay for water services will be needed, and short term transitional subsidies to Regional Water Companies may be needed in the period before such changes are realised

**Irrigation Service Providers**

As noted above, the Publicly Owned Enterprises that deliver irrigation services also face financial problems. They are not profitable and the revenue collection rates are low. In addition there are informal irrigation schemes in operation which obtain their water from the facilities of the POEs but pay no charge to the POEs.

The investments in the refurbishment in the irrigation systems will help reduce the operational costs of the irrigation POEs. However, the extension of the irrigation systems will clearly increase the operational costs of the irrigation POEs. On balance it is likely that the irrigation POEs will be faced with similar problems to those that already exist.

Options to address these issues include:

- Stronger enforcement of the existing provisions for charging for irrigation water in order to increase the revenue collection rate
- Increasing irrigation charges in order to recover more from those who do pay
- Providing subsidies to the irrigation POEs to cover the shortfall in costs

In this context it is of note that:

- Agricultural development is a key economic priority
- Punishing those who do pay by increasing the price is anti-competitive and inequitable
- EU water legislation requires that all users should pay for water services
- The European Union heavily subsidises agriculture in the EU through the Common Agricultural Policy, which consumes approximately one half of the budget of the EU institutions

Considering the goals to be achieved of increased economic value in agriculture, financial sustainability of the irrigation POEs, and equity between users, the following elements could be the most effective:

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64 Water Framework Directive (2000/60/EC) Article 9
• Decrease price paid by users for irrigation water in the interests of encouraging more consumers to obtain water legally and to pay for the service
• Increase the proportion of users who are billed (i.e. capture the informal users)
• Increase the proportion of users who pay their bills
• Implementing support schemes to assist consumers in maximising the efficiency of water use through both advisory services and investment subsidy
• Subsidise the POEs in order to ensure that they are financially sustainable

The last two actions in the list can be considered as being contrary to the general policy of government of making each publicly owned enterprise financially self-sufficient. However, it must be recognised that the irrigation service providers are part of an economic sector (agricultural production) that needs support and that is subject to considerable subsidy in Europe. Therefore it is considered justified to provide support to the sector in Kosovo.

Flood Defence
As discussed above, the “flood defence service” is not generally considered as being revenue – generating since it is not usually possible to impose a tariff on the beneficiaries of the service other than through local or national taxation. There are exceptions to this in countries with extensive flood defence provisions, such as the Netherlands, but Kosovo is not comparable in terms of flood defence needs or provision.

Therefore the costs of maintaining and in due course replacing flood defence structures and of operating and maintaining flood warning and emergency response facilities needs to be met from the public sector budget.

The current legal provisions are such as to impose this burden on the Municipalities. However, there is evidence to indicate that Municipalities are not able to undertake the required maintenance in all cases, or to restrict breaches of the law including damage to flood defence structures or construction in high flood risk areas.

Strengthening of Municipal capacities, financial and enforcement, are required in a number of cases.

6.3.3 Conclusions
The full range of public sector investments needed in the water sector could potentially be achieved in the twenty year period covered by the Strategy. However, to do this will require:

• Increased public spending on capital works in the water sector
• Continued commitment from donors to match government funding with their own contributions
• Strong economic growth in Kosovo

In order for the water sector to be financially and operationally sustainable on the same timescale:

• Considerable increases (triple over 20 years) in urban water service prices will be required
• Increases in the proportion of households and commercial entities who pay their water bills will be required
• Subsidies will need to be provided to the irrigation sector

In short, achievement of the full programme in the twenty year period of the Strategy requires:

• Very strong commitment from Government and other stakeholders
6.4 Prioritisation of Measures

Clearly there are a very large number of measures to be undertaken and they cannot all be completed in the short term as “priority measures”. Difficult choices have to be made about the order in which measures should be undertaken. Criteria for the selection of measures can clearly be derived in the basis of economic cost-benefit analysis and cost-effectiveness analysis. However such approaches do not necessarily reflect a number of “real world” constraints.

The economic and financial benefits that are included in cost benefit assessments include:

- Improvements in public health
- Disaster prevention
- Other support to economic development
- Environmental improvement

However, the real world constraints also need to be included

- Affordability to Government, the population and donors
- Practicality including consideration of:
  - Public opinion,
  - Administrative processes and
  - Technical barriers

Whilst “theoretical” prioritisation would focus on maximising the benefit-cost ratio in economic terms, the approach taken here is to focus on direct financial benefits. Moreover, prioritisation on this basis is adjusted through consideration of the practical issues and the need for these to also be addressed.

This leads to a two-track approach during the first phase of Strategy implementation which can be summarised as:

- Continued development of infrastructure focussing on high priority projects that are ready for implementation (i.e. are not likely to be subject to delay) and will he
- Preparation of further priority projects for future implementation including improvements in Governance and Public Awareness in order to reduce the practical barriers to implementation

Major areas of investment are considered in turn.

6.4.1 Water Resource Storage

Water resource storage is of high importance in order to reduce the potential for catastrophic drought events, which would have very negative impacts on human health, economic entities and on public opinion. Therefore this must be considered a high priority.

In line with the two track approach the first phase of implementation would most logically entail:

- Completion of ongoing and implementation ready projects for increases in water resource storage, particularly in the Ibri basin
• Re-assessment through a detailed study and project preparation initiative of the water resource storage projects identified in previous planning documents and appraisal of other potential measures
• Implementation of priority measures identified through the re-assessment during the first action plan
• Continued development of water resource storage measures in the second and subsequent action plans in order to increase security of supply and support further development of irrigation expansion

6.4.2 Water Supply Systems: Renovation and Extension

The provision of reliable and health safe drinking water is clearly important for reasons of both health and economy. However, there are a large number of projects to be completed, and prioritisation of these is needed. Preference needs to be given to:

Cost effective projects that are:
• Ready for implementation
• Result in substantial improvements in service provision,
• Provide significant reductions in operating costs
• Provide significant increases in revenues
• Achieve reductions in wastage or loss

It is of note that projects to extend the provision of service, particularly to settlements close to existing service areas, will increase the revenue base of the Regional Water Companies and thereby increase the potential for achieving economies of scale.

6.4.3 Wastewater Collection and Treatment

Considerable effort has been made in recent years to prepare “bankable” wastewater collection and treatment projects in all the major conurbations in Kosovo. In particular, detailed Feasibility Studies have been prepared for the implementation of wastewater treatment facilities to be constructed with the financial support of donors including Germany (KfW), Switzerland (SDC) and European Union donors more generally (via the Western Balkans Investment Framework and its Infrastructure Preparation Facility).

The financial analyses included in the Feasibility Studies conclude that the implementation of wastewater treatment in these conurbations is affordable. These conclusions are based on the application of the conventional household income thresholds – the cost of water services should not exceed 4% of average household income. This is an objective criterion that assesses the “ability to pay”. It does not directly assess the willingness of consumers to pay or the likelihood that they will pay when tariffs are substantially increased to meet the costs of operating wastewater treatment facilities.

65 Table 11, Page 39, State of Waters in Kosovo, 2010, Ministry of Environment and Spatial Planning
66 http://wbif.eu/
67 http://www.wbif-ipf.eu/
68 Donor assistance is usually focussed on support for investment, not for operation. Therefore the costs of operation need to be met with domestic resources, predominantly user charges – whether user charges to cover costs are affordable is judged in relation to household income
69 Values for affordability thresholds range from 3 – 5% of average household income
This is a very serious concern. As discussed above, the revenue collection rates (the proportion of people who pay their bills) are relatively low and it is generally accepted that increases in prices lead to reductions in revenue collection rates, at least in the short term.

The benefits arising from wastewater collection and treatment projects are considered here.

Improvements in wastewater collection can lead to substantial benefits in terms of:

- Human health – lower exposure to contaminated water
- Economic development – lower costs associated with centralised wastewater collection versus individual systems (septic tanks), better facilities for economic agents

It is also of note that:

- Wastewater collection systems entail high investment costs, but are relatively cheap to operate, especially if the systems are designed to operate predominantly by gravity
- Improvements in wastewater collection systems provide visible and tangible improvements to consumers in the removal of wastewater
- Improvements to storm-water removal and hence a reduction in the likelihood of local flooding are included in most wastewater collection projects and so provide further visible benefits
- Extension of wastewater collection systems increases the customer and revenue base of the Regional Water Companies

Improvements in wastewater treatment:

- Entail high operational costs
- Do not provide “apparent” improvements in service for most consumers – customers with existing sewer connections will not see any change in the main service (wastewater removal), but they will see a substantial increase in their bills
- May provide substantial benefits for downstream water users\(^70\), depending on what the downstream waters are used for – this is clearly an issue for the use of water for irrigation of directly consumed food crops
- Are often justified on the basis of improvements in environmental protection, which are in turn often justified in terms of the “willingness of the public to pay” for such improvements – given the known reluctance of many consumers to pay for the direct service of drinking water provision, there must be some doubt about the willingness of consumers to pay for an indirect benefit arising from wastewater treatment

It should also be noted that the treatment of wastewater to remove organic pollution is the main objective but it is not the only process. Wastewater treatment processes generate wastewater treatment sludge, which has to be treated and then either used on land as a soil conditioner, or safely disposed of. At present the capacities for treatment, beneficial use and safe disposal are limited. Indeed it is of particular note that a number of operational solid waste disposal sites (landfills) in Kosovo are identified in the Environmental Hotspots report as serious sources of water pollution.

In conclusion, Kosovo is under a number of obligations to implement urban wastewater treatment including the protection of its own waters for beneficial use, the prevention of trans-boundary pollution and compliance with the requirements of EU legislation, given Kosovo’s EU perspective.

\(^70\) These users are often not responsible for paying for the wastewater treatment
However, despite the considerable effort that has been made in recent years to prepare projects for the construction of wastewater treatment plants, it is not clear that the implementation of these projects is a priority at the present time in terms of benefits, or entirely practicable given the affordability constraints applicable to both capital spending and operational cost recovery.

Therefore the approach to wastewater collection and treatment proposed here is:

- Investments to be spread over the whole duration of the Strategy
- Priority given to initiatives with lower overall cost (and hence tariff) implications
- Priority given to projects that have greater direct benefits for downstream users

These priorities would tend to favour wastewater collection projects over wastewater treatment projects. However, given the intensive activity in the field of wastewater treatment project preparation in recent times, the apparently high level of donor interest and the need to make staged progress in all aspects of water management, it would clearly be unwise to postpone all wastewater treatment projects to the latter stages of the Strategy. Therefore the proposed approach is to commence implementation of wastewater treatment with a “pilot project” in one of the major conurbations: Prizren being a good candidate in view of the advanced stage of project preparation.

In view of the concerns raised above about the financial sustainability implications of wastewater treatment, the following transitional measure is proposed.

- Provision made for operational cost subsidies for wastewater treatment projects undertaken in the earlier stages of the Strategy in order to assist Regional Water Companies and their customers in meeting the costs

6.4.4 Irrigation

Expansion of the irrigation services network (increased coverage) is clearly a priority for the improvement in the economic welfare of the sector and of the country more broadly. Implemented in an optimised manner the expansion and modernisation of irrigation in Kosovo can bring substantial benefits.

However, the implementation of such expansion is clearly dependent on the presence of sufficient water of suitable quality. This in turn is dependent on the implementation of the water resource storage provisions and the wastewater treatment provisions highlighted above.

Given the need for staged approach to both aspects, there must therefore be a staged approach to the development of the irrigation system with priority being given to:

- Increasing coverage in areas where this is sufficient water of adequate quality
- Improving efficiency in other areas
- Preparing designs and implementation projects for projects to be implemented in a coordinated manner with the developments in resource storage and wastewater treatment, thereby capitalising on those developments and maximising the economic benefit deriving from them

The development of the irrigation systems will, as with other aspects, need to be spread across the duration of the Strategy as a consequence of the reliance on developments in other areas.

6.4.5 Flood Defence

Flood defence implementation is not a measure that gives rise to direct benefits from “new” economic development, but rather prevents damage to lives and existing property. Whilst the level of risk to which flood prone areas are subject can be estimated, the prediction of precisely when such floods
will occur is considerably more difficult. In short we can tell that an area will flood at some time in the coming decades, but we cannot tell when in that timespan it will be, or the severity of the flooding.

The principles upon which to prioritise the implementation of flood defence measures are clear, namely the level of risk to an area and the severity of the damage caused. However, as with the water resources issue, the precise prioritisation of actual projects is difficult to make at this time because the flood risk assessments for many areas of Kosovo are incomplete.

Therefore in line with the two track approach the prioritisation approach is:

- Implementing projects to improve the situation
  - Undertake flood defence investment projects that have already been identified as high priority
  - Undertake simple low-cost no-regret measures in all areas (such as removal of obstructions such as vegetation and waste deposits from existing flood channels, and repairing earth embankments)

- Develop optimised plans for the implementation of future projects:
  - Complete flood risk assessments in those areas that are already known to be high risk (see map of flood risk above)
  - Develop measures and implementation ready documentation for investments to mitigate the worst risks

6.4.6 Governance

In considering the prioritisation of measures for the specific issues above, a number of governance topics have arisen:

- Improvements in the allocation of water resources and the optimisation of use
- Improvements in the assessment of the benefits of pollution reduction measures and their prioritisation
- Improvements in the assessment of flood risks and the required measures

All of these issues are part of “Integrated River Basin Management Planning”. Care should be taken not to confuse this with the requirements of the Water Framework Directive, which predominantly relate to the protection of the environment. Integrated River Basin Management Planning is a broader process and addresses not only environmental objectives, but also directly addresses the management of water resources and protection from water – in other words Integrated River Basin Management Planning is applicable to all of the three themes of this Strategy: Use of Water, Protection of Water and Protection from Water.

Support to the key institutions, predominantly the Water Directorate of the Ministry of Environment and Spatial Planning, is needed to ensure this approach can be taken in the future.

The current Law on Waters does not adopt this integrated approach and instead adopts the narrower approach as found in the Water Framework Directive. Amendment of the Law in order to facilitate a more integrated approach in later River Basin Management Plans is needed.

In addition to the development of the integrated river basin management planning, there are a number of other aspects of governance that need to be addressed, the most important of which is the enforcement of existing legislation.

There is little or no benefit in introducing new Laws unless they will actually be implemented. This critical issue needs to be addressed through:
Ensuring that all new legislation in the sector is:

- **Enforceable** – those who do not comply can be subject to sanctions so as to ensure compliance
- **Realistic** – capable of being implemented in reality
- **Proportionate** – the legislation is of such force and the level of enforcement applied that they are proportionate to the scale of the problem being addressed

The continued transposition of EU legislation into the Laws of Kosovo is clearly a valid objective, considering the EU perspective. However, as highlighted in a number of respects above, there are a number of areas in which Kosovo cannot comply with EU legislation in the short term, such as the Urban Waste Water Treatment Directive. Therefore it is important that when EU standards are transposed in the Law of Kosovo, there are also transitional provisions included which take account of the time that it will take to achieve the standards.

Finally, given the overall EU perspective it is important to recognise that in order to achieve Accession to the European Union, Kosovo will need to be able to accept “the obligations of Membership” including approximation of legislation, which in itself requires transposition, enforcement and practical implementation.
7 Recommended Course of Action and Implementation

The recommended course of action comprises:

- A balanced approach whereby significant progress is made in addressing all issues throughout the Strategy period including water resources, urban water services, irrigation, pollution prevention, flood defence, rule of law and governance
- Four action plans, each of five years duration, spanning the twenty years of the Strategy
  - 1st: 2015 – 2019 inclusive
  - 2nd: 2020 – 2024 inclusive
  - 3rd: 2025 – 2029 inclusive
  - 4th: 2030 – 2034 inclusive
- Each Action Plan shall embody the two-track approach:
  - Continuing investment in infrastructure improvements
  - Improvements in efficiency and effectiveness of infrastructure management and regulatory implementation
- The first Action Plan will have a balanced focus on both tracks
- If the anticipated improvements in management and regulation are achieved, subsequent Action Plans will be able to adopt an increasingly strong focus on investment

The following sections consider the short term priorities for each sub-sector.

7.1 Water Resources Storage

The recommended course of action for the first action plan in respect of water resources storage comprises:

i. Continued implementation of ongoing initiatives to improve storage in the Ibri basin
ii. Country-wide assessment of water resources needs and re-evaluation of previously planned reservoir projects
iii. Development of investment ready projects for reservoir development

During the final stages of the first action plan and the whole of the second action plan:

iv. Implementation of Priority Developments

The first action (i) is a continuation of existing work and is not addressed further here.

7.1.1 Countrywide Resource Assessment

This initiative can be undertaken as a single action for the whole country or as five individual actions, one for each basin and a collation of the four basin actions in an overall countrywide assessment.

This assessment will:

- Be undertaken for each of the four main River Basins and thereby for the country as a whole
- Take about 2 years to complete
- Build on existing assessments, particularly the study of Water Security for Central Kosovo

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71 This Chapter combines the requirements of Chapters 7 and 8 as specified in the Administrative Order
• Assess existing and future demands for resources including in particular urban supply and irrigation
• Assess the adequacy of existing storage particularly in light of projected climate change
• Assess previously developed proposals (1980s Master Plan) for increased water resource storage
• Identify other potential options for increased storage
• Options analysis and selection of most cost-effective combination of measures
• Develop a detailed plan for implementation of investments
• Prepare or adapt conceptual designs for priority investments

The assessment will:
• Be undertaken through a donor-funded technical assistance project
• Be managed by the Inter-Ministerial Council for Water
• Be supported by the key Ministries:
  o Ministry of Environment and Spatial Planning (Environmental Regulator)
  o Ministry of Economic Development (Urban Water Supply, Energy)
  o Ministry of Agriculture Forestry and Rural Development (Irrigation)
• Cost about €2 million, with the bulk of this being subject to donor finance

The project:
• Will deliver a rational cost effective plan for water resources for the duration of the Strategy
• Is required in order to optimise investment
• Will help to safeguard water resources in Kosovo

A project of this specification is under discussion with the Western Balkans Investment Framework.

NOTE: The improvements in data collection by KHMI specified below under Institutional Reinforcement are essential for both this action and the following action.

7.1.2 Development and Oversight of Priority Projects for Water Storage

This action is intended to help “bridge the gap” between the identification of priority projects under the Action above, and the actual construction and commissioning of the priority projects.

The project will:
• Last up to three years
• Assist in obtaining the necessary permits for construction of new water resources facilities
• Prepare design and tender documentation for the new water resources facilities
• Assist the competent authorities of the government in procurement of the works, supplies and services

The assessment will:
• Be undertaken through a donor-funded technical assistance project
• Be managed by the Inter-Ministerial Council for Water
• Be supported by the key Ministries:
  o Ministry of Environment and Spatial Planning (Environmental Regulator)
  o Ministry of Economic Development (Urban Water Supply, Energy)
Cost about €2 million, with the bulk of this being subject to donor finance

7.1.3 Implementation of Priority Projects for Water Storage

This action entails the construction and commissioning of the priority water storage projects and will therefore entail large capital expense. It will be subject to implementation support through the action described above.

Ownership of the water storage facilities, dams and reservoirs needs to be clearly assigned and the owner must take on the responsibilities of safety, operation and maintenance. This may either be one of the irrigation companies or one of the regional water companies, depending on the function of the water storage facility. Single function facilities designed to provide security of urban supply should be vested with the relevant Regional Water Company\(^{72}\) who will take on the responsibility of managing and maintaining the facility including the application of water protection zone measures, in cooperation with the Ministry of Environment and Spatial Planning. In the case of dual or multi-function facilities intended to provide resources for both urban supply and irrigation (and possibly small hydro-electric) the facility shall be vested with the relevant irrigation company\(^{73}\) and subject to operating agreement with the relevant Regional Water Company in order to ensure the prioritisation of security of urban supply.

The precise capital investment need for priority projects cannot be specified at this time, but will become known through the first action described above. For macro-financial planning purposes an investment volume of approximately €150 million over ten years should be foreseen.

A detailed financial strategy shall be developed for this initiative as part of the preparatory actions described above.

Budgetary allocation needs to be made accordingly and donor support for this initiative needs to be sought.

An indicative flow of investment for this initiative is shown below.

<table>
<thead>
<tr>
<th></th>
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<td>17.21</td>
<td>20.14</td>
<td>152.21</td>
<td></td>
</tr>
</tbody>
</table>

The relatively low expenditure in the first two years of the period reflects the need for the preparatory actions described above to be undertaken prior to the major investments.

The lead Ministry for this Action shall be the Ministry of Economic Development assisted by:

- Ministry of Environment and Spatial Planning
- Ministry of Agriculture, Forestry and Rural Development

\(^{72}\) Under the Ministry of Economic Development

\(^{73}\) Also under the Ministry of Economic Development
7.2 Water Supply Services

Despite the considerable investments and improvements made in recent years, there remain substantial problems. Given the crucial contribution of water supply services to basic human needs, to health and to economic development, a concerted effort is needed to resolve these problems, to improve the standard of services and to place the Regional Water Companies in a more financially sustainable position.

A system for the planning of investments in water supply services is already in operation and is managed by the Regional Water Companies, overseen by the Water and Waste Water Regulatory Office (WWRO). The WWRO indicates that investments have been less than planned, and attributes this shortfall to a shortage of internal resources within the Regional Water Companies. This shortage is reported by the WWRO as arising from both inefficiencies in operation and in revenue collection.

Clearly improvements are needed in both these areas, and measures are included in this Strategy for these purposes. However, there is a danger that these improvements will not lead to increased net revenues sufficiently quickly to prevent deleterious deterioration of key infrastructure components. Therefore it is proposed that additional support be provided to the RWCS in the first action plan period to make up the shortfall in their own revenues.

This injection of capital is contrary the general approach of achieving full cost recovery for the water supply service, but is essential for the health of the supply systems. This subsidised approach should NOT be continued indefinitely, but should be seen as a transitional measure that MUST be accompanied by strenuous efforts to resolve the underlying problems of inefficiency, losses and non-payment so that continued progress can be made towards full cost recovery and financial self-sustainability of water services.

The indicative investment flows are shown below.

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<tbody>
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<td><strong>Government</strong></td>
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<tr>
<td>11.14</td>
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<td>11.61</td>
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<td>12.87</td>
<td>13.44</td>
<td>14.08</td>
<td>14.80</td>
<td>15.59</td>
<td>129.17</td>
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<tr>
<td><strong>Donor</strong></td>
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<td>132.63</td>
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<tr>
<td>11.14</td>
<td>11.33</td>
<td>11.61</td>
<td>11.95</td>
<td>12.37</td>
<td>12.87</td>
<td>13.44</td>
<td>14.08</td>
<td>14.80</td>
<td>19.05</td>
<td>132.63</td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td>22.27</td>
<td>22.66</td>
<td>23.21</td>
<td>23.90</td>
<td>24.74</td>
<td>25.73</td>
<td>26.88</td>
<td>28.17</td>
<td>29.60</td>
<td>34.64</td>
<td>261.80</td>
</tr>
</tbody>
</table>

Implementation measures that need to be taken include:

- Allocation of Central Government Budget
- Adjustment of Regional Water Company Business Plans
- Coordinated oversight by the Ministry of Economic Development and the WWRO

In preparing the revised business plans and investment schedules, the Regional Water Companies should be instructed to prioritise measures that reduce the unit costs of operation and thereby increase the financial sustainability of the RWC whilst contributing to the achievement of the essential standards of service, namely reliable 24 hour supply of health safe water at adequate pressure.

7.3 Wastewater Collection and Treatment

By definition prioritisation means that some initiatives are postponed until later in the Strategy. Despite the considerable effort that has been expended in recent times in the preparation of projects for wastewater treatment, there are strong arguments leading to the conclusion that the implementation of the treatment aspects of these projects could exacerbate the already weak
financial position of the RWCs, whilst not delivering substantial direct economic benefits to the Country.

It must be borne in mind that there are severe limitations not only to the capacity for investment, but also on the ability to recover the full costs of operation and maintenance.

In particular the question of the revenue collection rate, as referred to above, needs to be critically considered. The difficulties experienced by RWCs in recovering payment for the existing services are likely to be increased and prolonged by the introduction of the substantial tariff increases required to cover the costs of operating a plant providing secondary wastewater treatment.

Therefore a cautious approach to investment in wastewater treatment is proposed, whereby:

- Regional Water Companies are directed to adjust their Business Plans to focus on wastewater collection investments and in particular those that will reduce unit costs and/or increase revenue generation
- One large wastewater treatment plant is constructed in the first action plan period, and that this project is subject to close monitoring and evaluation in order to serve as a “pilot” and “demonstration” project for future investments of this type

An indicative investment allocation for wastewater collection and treatment is shown in the following table.

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</thead>
<tbody>
<tr>
<td>Government</td>
<td>4.40</td>
<td>4.48</td>
<td>4.59</td>
<td>4.72</td>
<td>4.89</td>
<td>5.09</td>
<td>5.31</td>
<td>5.57</td>
<td>5.89</td>
<td>6.16</td>
<td>51.07</td>
</tr>
<tr>
<td>Donor</td>
<td>4.40</td>
<td>4.48</td>
<td>4.59</td>
<td>4.72</td>
<td>4.89</td>
<td>5.09</td>
<td>5.31</td>
<td>5.57</td>
<td>5.89</td>
<td>7.53</td>
<td>52.44</td>
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</tbody>
</table>

The question as to which treatment plant project should be implemented as a priority has been considered and it is determined that the Prizren wastewater collection and treatment project be used as the pilot demonstration project since it is mature in preparation.

7.4 Flood Defence

As with water resources storage improvements, a number of improvements in flood protection provisions are known to be needed, but the precise nature, location and costs of the required investments are not well defined in most catchments. Therefore as with water resource storage there is urgent need to undertake preparatory studies and analyses. These should follow the EU model as set out the in the Flood Risk Management Directive (2007/60/EC) and thereby reinforce Kosovo’s EU perspective.

7.4.1 Flood Risk Management Planning Project

The preparatory project will provide technical support to the Competent Authorities, namely the Ministry of Environment and Spatial Planning, and the Municipalities.

The technical assistance shall entail:

- Preparation of a National Plan for flood prevention and protection
- Conceptual design for priority flood prevention and protection measures
- A capacity building component

The National plan for flood prevention and protection comprises the following elements:

- Preliminary flood risk assessment including an institutional assessment,
- Hydraulic Modelling and preparation of Flood Hazard Maps
- Flood Risk Assessment
- Phased Investment Program for Flood risk management
- Short term Investment plan (STIP) for flood risk management

The STIP is to be financed from a combination of international and local funds, and would complement investments already made in this field in Kosovo.

The second component will prepare conceptual designs for the Short Term Implementation Programme in order to facilitate its early implementation.

The final component is aiming to strengthen capacity in conducting hydraulic modelling and flood risk assessment in order to ensure sustainability of the TA operation.

The project is intended to:
- Last for two years
- Cost about €2 million
- Be predominantly funded by donors

**NOTE:** The improvements in data collection by KHMI specified below under Institutional Reinforcement are essential for both this action and the following action.

### 7.4.2 Flood Risk Management Project Preparation Support

As with the water resources measure, a second phase of technical assistance is envisaged to again “bridge the gap” between planning and practical implementation.

The project will:
- Last up to three years
- Assist in obtaining the necessary permits for construction of flood protection facilities
- Prepare design and tender documentation for the new flood protection facilities
- Assist the competent authorities of the government in procurement of the works, supplies and services (below)

The assessment will:
- Be undertaken through a donor-funded technical assistance project
- Be managed by the Inter-Ministerial Council for Water
- Be supported by the key Ministries:
  - Ministry of Environment and Spatial Planning (Environmental Regulator)
  - Ministry of Economic Development (Urban Water Supply, Energy)
  - Ministry of Agriculture Forestry and Rural Development (Irrigation)
- Entail substantial involvement of relevant Municipalities in all respects
- Cost about €2 million, with the bulk of this being subject to donor finance

### 7.4.3 Flood Risk Management Investment

This action entails the construction and commissioning of the priority flood protection projects and will therefore entail large capital expense. It will be subject to implementation support through the action described above.
Ownership of the flood protection and management assets needs to be clearly assigned. The owner will usually be the Municipality, and the Municipality must therefore take on the responsibilities of maintaining flood protection provisions. Budgetary provisions need to be made by all relevant Municipalities in order to meet these responsibilities.

The precise capital investment need for priority projects cannot be specified at this time, but will become known through the first action described above. For macro-financial planning purposes an investment volume of approximately €50 million over ten years (first and second action plan) should be foreseen.

A detailed financial strategy shall be developed for this initiative as part of the preparatory actions described above.

Budgetary allocation needs to be made accordingly and donor support for this initiative needs to be sought.

An indicative flow of investment for this initiative is shown below.

**Table 31 Indicative Investment for Flood Protection Measures: 2015 - 2024**

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<tbody>
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<td>2.46</td>
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<td>1.00</td>
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<td>2.24</td>
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<td>4.91</td>
<td>5.16</td>
<td>6.04</td>
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The relatively low expenditure in the first two years of the period reflects the need for the preparatory actions described above to be undertaken prior to the major investments.

7.5 Irrigation

The development of irrigation systems in Kosovo is a key element of Agricultural and Rural Development. Its potential contribution to economic development is clearly high. Therefore investment in irrigation systems is seen as a priority. However, it must be born in mind that:

- Water resources are limited in Kosovo
- Resources for water supply to the population must take precedence over supply for irrigation
- The efficiency of water use for irrigation needs to be improved

Bearing in mind these considerations and the progress that must be made in water resource storage as described above, measures for irrigation development should focus initially on improvements to existing systems and extension of coverage where there are less resource limitations, namely in the West of the country. Later investments can capitalise on the improved water storage provisions in other areas of the Country.

The details of the precise investments to be made are specified in the new Irrigation Strategy developed by the Ministry of Agriculture, Forestry and Rural Development. Indicative estimates of the costs of investments are provided in the following table.

**Table 32 Indicative Investment for Irrigation Measures: 2015 - 2024**

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<tbody>
<tr>
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<td>2.41</td>
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<tr>
<td>Donor</td>
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<td>1.89</td>
<td>1.95</td>
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<td>2.41</td>
<td>3.10</td>
<td>21.59</td>
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<tr>
<td>Total</td>
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<td>4.38</td>
<td>4.59</td>
<td>4.82</td>
<td>5.64</td>
<td>42.62</td>
</tr>
</tbody>
</table>
Whilst earlier completion of the irrigation system development might be economically beneficial, the limitations of water resource storage are such that this is not considered wholly feasible. As such the investment process is to be completed, in line with the water resource investments, over a period of up to 15 years.

7.6 Governance

7.6.1 Legislation and Enforcement

Three broad objectives arise in this context:

- Aligning legal provisions with those of the EU
- Making legislation realistic and enforceable
- Ensuring legislation is respected as much as practicable

The alignment of provisions with those of the European Union is ongoing. Of critical importance in the short term are the following actions to be undertaken by the Ministry of Environment and Spatial Planning pursuant to the Law on Waters:

- Transpose Water Management Planning Process
- Transpose Long Term Water Management Objectives

In order that legislation is realistic and enforceable it is essential that the Ministry of Environmental and Spatial Planning undertakes evaluation of proposed legislation, particularly targets and standards, but also procedures to ensure that they are realistic and workable in practice. In order to facilitate this approach the Ministry shall introduce the following procedures:

- Compliance Cost Assessment of proposed legislation to determine the costs entailed in practical implementation, the distribution of those costs, and a realistic time period in which these costs can be met
- Regulatory Assessment of proposed legislation to determine the additional requirements for the public sector competent authorities including additional staff, equipment and training

These assessments shall be used in the establishment of long-term deadlines for the achievement of EU targets and the establishment of interim transitional objectives.

The enforcement of existing provisions is incomplete. Additional effort is needed to increase the force of “the rule of law”. Two approaches will be taken:

- Implementation Support for Water Management Legislation
  - Increased dissemination of legislation and publicity
  - Guidance documents on implementation, technologies and support
  - MESP water management “helpdesk”
- Increased inspection and enforcement effort
  - Increased awareness (see below)
  - Increased staff (see below)

Institutional reinforcement is required and is itemised below.
7.6.2 River Basin Management Planning

Water is a resource for all, and as such mechanisms for the sharing of the resource need to be implemented. The key mechanism is River Basin Management Planning. The preparation of River Basin Management Plans is led by the Ministry of Environment in co-operation with other key Ministries and ultimately is overseen by the Inter-Ministerial Council for Waters.

In the short term the first River Basin Management Plans shall be prepared on a simplified basis reflecting the limitations in both data and capacity, and shall predominantly address water quality issues in line with the environmental focus of the Water Framework Directive. These shall be completed by the end of 2015 and shall reflect both this Strategy and the associated Action Plan.

Subsequently preparations shall commence for the Second River Basin Management Plans. These shall be more detailed and shall be made on an integrated basis dealing not only with environmental objectives but also with questions of water quantity, coordinated with the measures above concerning water resource storage, and with questions of flood risk management, in line with the measures above concerning flood protection.

The second iteration of the River Basin Management Plans shall be prepared until the end of 2018, subject to consultation during 2019 and commence implementation in 2020.

Institutional reinforcement is required and is itemised below.

7.6.3 Institutional Reinforcement

The following institutional reinforcement measures are needed:

- Reinforce the Water Directorate of the Ministry of Environment and Spatial Planning: 5 posts to support River Basin Management Planning
- Reinforce the Water Division of the Environmental Inspectorate of the Ministry of Environment and Spatial Planning: 5 posts to support improved enforcement
- Major strengthening of Hydro-meteorological Institute of Kosovo – staff, equipment, operational budget – particularly in the area of water resource monitoring
- Reinforce the Water and Waste Water Regulatory Office – 4 posts to support continued and enhanced guidance and oversight of Regional Water Company business planning

<table>
<thead>
<tr>
<th>Table 33 Incremental Changes in Budget Allocation Relative to 2014 – Institutional Reinforcement</th>
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<tbody>
<tr>
<td>MESP WD</td>
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<td>MESP WI</td>
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<td>KHMI</td>
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<td>WWRO</td>
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<td>TOTAL</td>
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</table>

MESP WD = Ministry of Environment and Spatial Planning, Water Directorate
MESP WI = Ministry of Environment and Spatial Planning, Water Inspectorate
KHMI = Kosovo Hydro-Meteorological Institute

Over the ten-year period shown here the overall increase in budget allocation for regulatory public institutions undertaking water management would be in the region of €375,000 in order to complete the institutional reinforcement, including the capital expenditure on equipment for KHMI. Following the completion of this phase of development, the budget allocation would remain static, reflecting the need for continued operation, regular maintenance and periodic replacement.
Monitoring of Precipitation, River Flows and Groundwater Quantities

Up to date information on precipitation, water resource consumption, river flows and groundwater quantities is essential for a number of aspects of the recommended actions including:

- Water resource development
- Flood protection
- River Basin Management Planning

Development of implementation-ready projects for the first two items are in particular dependent on the availability of such data.

Whilst a good time-series of data is available for the period prior to 1990, more recent data is very limited due to deterioration in the monitoring networks for these variables. Whilst the older data provides a useful historical basis, more up to date information reflecting the changes in population and in water use are urgently needed. Despite a number of donor initiatives to renovate these networks, they still do not operate to the required standard. Donor willingness to contribute to further projects in this area is likely to be limited unless a significant and sustained contribution is made by the Government of Kosovo to repair, operation and maintenance. Such contributions are vital to the successful implementation of major investments as described above.

7.6.4 Information Management

The recently developed Kosovo Environmental Database needs to be maintained and enhanced in order to ensure:

- Data is reliably collated and stored
- Data of common interest is made available to all relevant institutions
- Information is made available to the public in accordance with Legal and Constitutional provisions

An “Inter-Institutional Information Exchange Agreement and Procedure” needs to be urgently agreed and implemented in order to support the KED and the Water Information System (as required by Law).

As the Competent Authority for River Basin Management Planning this matter shall be addressed by the Ministry of Environment and Spatial Planning Water Directorate.

No additional financial allocation is required.

7.6.5 Education and Awareness

The most crucial short-term issue concerns the willingness of consumers to pay for urban water services. Payment rates for irrigation services are also low, and of concern, but as discussed above, subsidies to the agricultural economy may be used to address this problem.

Regional Water Companies lose justifiable revenue for their services through two main mechanisms:

- Illegal connections
- Non-payment

As discussed above, non-revenue water is reported as being in the range of 60-70% of water production. Whilst a significant proportion of this non-revenue water is undoubtedly caused by leakage from damaged infrastructure, a significant proportion also arises from theft, either in the form of unregistered connections (properties without contracts) or “altered connections” (properties with...
contracts, but with by-pass loops or other means by which the meter reading is substantially lower than actual consumption). Both instances of theft may be difficult to identify in practice.

Non-payment is simpler to identify, but remains a very significant problem.

There can be little doubt that there are instances of both mechanisms that involve households facing genuine hardship for whom payment for water services represents a financial difficulty. Support needs to be provided to these households.

However, there can also be little doubt that there are a large number of instances where such theft is perpetrated by those who can reasonably afford to pay a fair price for the services they consume. Their failure to pay results in a greater burden on those who are law-abiding and do pay.

Approaches to this problem entailing disconnection from services as the main means are unlikely to be acceptable. Therefore substantial efforts need to be made to encourage those who are currently not paying to accept the rule of law, and to recognise their social responsibility. A concerted awareness campaign over a prolonged period will be undertaken using national and local media and will focus on two issues:

- Ensuring that households and businesses have legal, metered connections
- Encouraging efficiency in water use

The balance of the campaign will initially be towards the first of these and will gradually shift to the latter.

The campaign will need to be accompanied by increased efforts by Regional Water Companies to legalise connections, install meters, read meters, issue bills efficiently and to generally ensure that anyone willing to pay for water services receives prompt and professional attention from both a technical and customer relations perspective.

A technical assistance project to design, implement, monitor and refine the campaign will be instituted. This will be subject to both Donor and Government support.

Longer-term concerns also need to be addressed, in particular:

- Ensure school curriculum includes appropriate content regarding water
- Implementation of key recommendations of WTF study on academic development

The first of these items can be addressed through existing provisions.

Development of suitable provisions for University level education will require additional support. During the first Action Plan an additional allocation of approximately €50,000 per annum shall be made to the University of Pristina for the development and implementation of Masters level modules in all aspects of water management as specified in the WTF recommendations.

7.7 Basic Implementation Provisions

The implementation of this Strategy and the associated Action Plans shall be undertaken by the specified Ministries and competent authorities as for each Measure and Action.

The implementation of this Strategy shall be overseen by the Inter-Ministerial Council for Waters. Inter-Ministerial Working Groups shall be established – at least one for each of the four Themes. These shall meet at least once every six months in order to exchange information, resolve difficulties and prepare regulator reports to the Inter-Ministerial Council for Waters.