**About.html**

**<html>**

**<head>**

**<title>urban water supply</title>**

**<style>**

**video{**

**background-color:white;**

**}**

**table{**

**background-color:white;**

**}**

**p{**

**background-color:orange;**

**}**

**ul {**

**list-style-type: none;**

**margin: 0;**

**padding: 0;**

**overflow: hidden;**

**background-color: Orange;**

**}**

**li {**

**float: left;**

**}**

**li a {**

**display: block;**

**color: white;**

**text-align: center;**

**padding: 14px 16px;**

**text-decoration: none;**

**}**

**li a:hover {**

**background-color: #111;**

**}**

**h2,h1**

**{**

**background-color:Black;**

**color:white;**

**}**

**body**

**{**

**background-color:orange;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>**

**<h2><center><b>BWSSB</b></center></h2>**

**<nav>**

**<ul>**

**<li><a href="about.html">About</a></li>**

**<li><a href="dhome.html">Home</a></li>**

**<li><a href="homee.html">Zones</a></li>**

**<li><a href="overview.html">Overview</a></li>**

**<li><a href="photo.html">Photo gallery</a></li>**

**<li><a href="contact.html">Contact us</a></li>**

**</ul>**

**</nav>**

**<artical>**

**<center><p>**

**<div class="content">**

**<div class="field field-name-body field-type-text-with-summary field-label-hidden"><div class="field-items"><div class="field-item even" property="content:encoded"><div class="content\_block">**

**<div class="content\_heading"></div>**

**<p>&nbsp;</p>**

**<h1><b>Preamble</b></h1>**

**<p>Bangalore Water Supply and Sewerage Board is an autonomous body formed by the State legislature under Bangalore Water supply and Sewerage Board Act on 10-09-1964 for Water Supply &amp; Sewage disposal. It is one of the first Water supply &amp; Sanitation Utilities in India with jurisdiction of entire Bruhat Bengaluru Mahanagara Palike Area of 800 Sqkm, (Bengaluru Core area of 245 Sqkm, 8 Urban Local Bodies of 330 Sqkm ( 7 City Municipal Corporation and 1 Town Municipal Corporation and 110 Villages of 225 Sq kms.) It has the following mandates: adequate water supply to meet demand; creation of sewerage network &amp; safe disposal of sewage; Preparation, implementation of plans &amp; schemes for augmenting water supply &amp; safe disposal of sewage; Levy and collection of water charges on ‘no loss no profit basis’ for sustainability of the system.</p>**

**<p>Since its inception in the year 1964, BWSSB has executed several water supply and sewage schemes for the city, including the prestigious Cauvery Water Supply Scheme (CWSS) Stages - I, II, III &amp; Stage IV Phase - I, Phase - II and sewerage system improvement projects concentrating on sewage collection, conveyance and treatment works. The existing sewerage system covers an area of 265 km2 of core area of the city, in which three major Sewage Treatment Plants (STP) are constructed at Vrishabhavathi, K&amp;C and Hebbal Valleys (major and minor). The sewerage system for newly added areas mainly the erstwhile CMC’s is nearing completion.</p>**

**</p>**

**<b><h2> BWSSB jurisdictional area</h2></b>**

**<p><b>Overview of Water supply and sewerage System </b></p>**

**<p><span style="line-height: 1.6;">Bangalore, the capital city of Karnataka is the third largest city and the fifth largest metropolitan area in India and is one of the fastest growing metropolitan cities. It is a centre for education, IT &amp; BT industries, sophisticated high tech health care and many MNC industries which are attracting people to the city. As per Census 2011, the population of Bangalore city was about 8.5 million. The Bangalore Water Supply and Sewerage Board (BWSSB) is responsible for providing water supply to BBMP area of 800 sq. km.</span></p>**

**<p><span style="line-height: 1.6;">Government of Karnataka allocated 19 TMC of water from Cauvery River for the water supply requirements of Bangalore City. In the year 2012, with the commissioning of the CWSS Stage IV, Phase II, the allocated water from Cauvery River has been exhausted. At present BWSSB is supplying treated Cauvery Water to Bangalore City under the Cauvery Water Supply Scheme (CWSS) Stage I, II, III &amp; Stage IV Phase I &amp; II with total installed capacity of 1310 MLD. This quantity of water provided to the core areas of BBMP including the erstwhile 7 CMC’s and 1 TMC area covering total area of 575 sq.km but excluding 110 village areas of BBMP covering 225 sq.km. In order to provide water supply to the newly added 110 villages which are part of BBMP, BWSSB is finding it difficult to meet the water requirements even after implementation of CWSS Stage IV, Phase II scheme.</span></p>**

**<p><span style="line-height: 1.6;">Subsequently, the Urban Development Department, Govt. of Karnataka (GoK) allocated an additional 10 TMC (775 MLD) of Cauvery Water for Bangalore city. It is now necessary to formulate the CWSS Stage V scheme for Bangalore City and Detailed Project Report (DPR) has been prepared for getting the financial assistance from funding agencies, such as JICA (Japan International Co-operation Agency). Considering the technical aspects and water demand it is proposed to take up the Stage V Scheme in two Phases i.e., Phase I of 500 MLD (6.45 TMC) capacity and Phase II of 275 MLD (3.55 TMC) capacity.</span></p>**

**<p>&nbsp;</p>**

**<h2><b>EXISTING WATER SUPPLY SYSTEM SCENARIO</b></h2>**

**<p>Till the year 1896, unfiltered water was supplied to Bangalore city in the Kalyani system from a number of tanks such as Dharmambudhi, Sampangi, Ulsoor, Sankey etc., supplemented by local wells and stepped ponds. The supply was inadequate from these tanks, hence, Arkavathi river was identified as the first large reliable source in the year 1884 and filtered water supply was started in the year 1896. Due to the continuous expansion of the city and the rapid growth of population, it became necessary to find and develop new sources. Cauvery River was identified for water supply and allocation of water from Cauvery river was done by Government of Karnataka (GoK). Since 1974, the Cauvery source has been developed in stages for water supply. This chapter discusses the schemes of river Arkavathi and River Cauvery which are the present sources of water.</p>**

**<p><span style="line-height: 1.6;">To supply filtered water to Bangalore City, Arkavathi source was identified in the year 1884. A reservoir was created at Hessarghatta about 18 kms to the North West of the city. An open masonry duct, 7 km long conveyed 29.5 Mld of raw water from source to Tarabanahalli and Soladevanahalli. From Tarabanahalli 7 Mld of water is supplied to Military. From Soladevanahalli 22.5 Mld water was pumped to city at a head of 125 m through, two 375 mm CI rising mains to Combined Jewel Filters (CJF), Malleshwaram where the water was treated. Treated water was first supplied after completing treatment plants at CJF on 7th August 1896.</span></p>**

**<p><span style="line-height: 1.6;">Modification took place at Hessarghatta source by replacing masonry duct by 1050 mm diameter RCC Hume Pipe with a carrying capacity of about 36 Mld. One more rising main of 375 mm diameter was laid from Soladevanahalli. These three pipelines can carry 22.5 Mld water under normal conditions, out of which 13.5 Mld was supplied to the city and the balance water was supplied to enroute industries. Due to failure of monsoon, there is scarcity of water at source, only about 4 mld of water available was supplied to Military and Industries enroute in Peenya layout. This water is supplied as raw water because the treatment plant at CJF is not functioning and the receiving units such as HMT, Peenya layout and Defence establishments are having their own treatment facilities to treat this raw water. However, no water is being drawn at present from this source.</span></p>**

**<p>&nbsp;</p>**

**<h2><b>Thippagondanahalli (T.G.Halli)</b></h2>**

**<p><span style="line-height: 1.6;">With the growth of the city the supply fell short of demand hence a new reservoir 'Chamaraja Sagar' near Thippagondanahalli (TG halli) was constructed in the year 1933 across the river Arkavathi, downstream of Hessarghatta reservoir about 26 km to the west of Bangalore. Water Treatment Plant is situated at the foot of the dam at T G halli. The first phase of the scheme was completed during March 1933 to augment the then supply by about 28 Mld. Subsequently, the abstraction was increased to 149 Mld by providing additional infrastructure such as increasing the capacity of the dam, providing additional treatment and pumping facility.</span></p>**

**<p><span style="line-height: 1.6;">This improvement is done by providing two stage pumping, the pumping head being 158 m at T G Halli and 168 m at Tavarekere which is the intermediate pumping station. Transmission system consists of 3 pumping mains of 600, 675 and 900 mm diameter CI pipes from T.G.Halli to CJF. Due to failure of monsoons and constraints in the existing pumping system only about 117 Mld is available most of the times and is supplied to West of Chord Road, Beggars Colony, Kethamaranahalli (KMH) and CJF after implementation of Cauvery stage III project. Due to continuous failure of monsoon, the reservoir last got filled in the year 1988. Presently there is no flow available. Because of these reasons Arkavathi zone reservoirs are also being fed with Cauvery water.</span></p>**

**<p>&nbsp;</p>**

**<h2><b>CAUVERY WATER SUPPLY SCHEME</b></h2>**

**<p><span style="line-height: 1.6;">A total supply of about 185 mld from the Arkavathi scheme was grossly inadequate to meet the demand of about 16 lakh population in the late sixties. Due to the continuous expansion of the city and the rapid growth of population it was necessary to identify new water supply sources. Cauvery River, which is about 86 km South of the city, is perennial and Government of Karnataka (GoK) allocated drinking water to BWSSB. Cauvery source is being developed in stages since 1974. Cauvery water supply scheme (CWSS) stage-I was commissioned in the year 1974 to augment the supply by 135 Mld. CWSS Stage-II followed and was commissioned in 1982 to further augment the supply by 135 Mld. CWSS Stage-III was commissioned in 1994-95, this stage augmented supplies by 270 mld. Cauvery water supply scheme (CWSS) stage-IV Phase I was commissioned in 2002 to augment supply by 270 Mld. CWSS Stage- IV Phase II followed and was commissioned in 2012 to further augment supply by 500 Mld. The salient features of the complete water supply system is shown in the tables below:</span></p>**

**</center>**

**</ul>**

**</body>**

**</html>**

**Home.html**

<html>

<head>

<title>urban water supply</title>

<style>

video{

background-color:white;

}

table{

background-color:white;

}

p{

background-color:white;

}

ul {

list-style-type: none;

margin: 0;

padding: 0;

overflow: hidden;

background-color: Orange;

}

li {

float: left;

}

li a {

display: block;

color: white;

text-align: center;

padding: 14px 16px;

text-decoration: none;

}

li a:hover {

background-color: #111;

}

h2,h1

{

background-color:Black;

color:white;

}

body

{

background-color:orange;

}

</style>

</head>

<body>

<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>

<h2><center><b>BWSSB</b></center></h2>

<nav>

<ul>

<li><a href="about.html">About</a></li>

<li><a href="dhome.html">Home</a></li>

<li><a href="homee.html">Zones</a></li>

<li><a href="overview.html">Overview</a></li>

<li><a href="photo.html">Photo gallery</a></li>

<li><a href="contact.html">Contact us</a></li>

</ul>

</nav>

</p>

<img src="C:\Users\Vinay Kumar\Desktop\New folder (2)\photos\river.jpg" height="500px" width="1400px">

<p>

#6, Jalabhavan 1st Stage, 1st Phase, BTM Layout, Bannerghatta Road, Bangalore - 560 029</P>

</p>

</body>

</html>

**Zones.html**

**<html>**

**<head>**

**<title>urban water supply</title>**

**<style>**

**background-color:white;**

**table{**

**background-color:white;**

**}**

**p{**

**background-color:orange;**

**}**

**ul {**

**list-style-type: none;**

**margin: 0;**

**padding: 0;**

**overflow: hidden;**

**background-color: Orange;**

**}**

**li {**

**float: left;**

**}**

**li a {**

**display: block;**

**color: white;**

**text-align: center;**

**padding: 14px 16px;**

**text-decoration: none;**

**}**

**li a:hover {**

**background-color: #111;**

**}**

**h2,h1**

**{**

**background-color:Black;**

**color:white;**

**}**

**body**

**{**

**background-color:orange;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>**

**<h2><center><b>BWSSB</b></center></h2>**

**<nav>**

**<ul>**

**<li><a href="about.html">About</a></li>**

**<li><a href="dhome.html">Home</a></li>**

**<li><a href="homee.html">Zones</a></li>**

**<li><a href="overview.html">Overview</a></li>**

**<li><a href="photo.html">Photo gallery</a></li>**

**<li><a href="contact.html">Contact us</a></li>**

**</ul>**

**</nav>**

**<artical>**

**<center><h2><p>Zones</p></h2></center>**

**<center>**

**<div class="content">**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<th scope="col">ZONES</th>**

**<th scope="col">NAME</th>**

**<th scope="col">OFFICE ADDRESS</th>**

**<th scope="col">OFFICE</th>**

**<th scope="col">MOBILE</th>**

**</tr>**

**<tr>**

**<td>Maintenance Zone</td>**

**<td>Kemparamaiah, EIC</td>**

**<td>2nd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945105</td>**

**<td>985415788</td>**

**</tr>**

**<tr>**

**<td>Maintenance Zone</td>**

**<td>H M Ravindra, CE(M)</td>**

**<td>9th Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>2587458</td>**

**<td>874562255</td>**

**</tr>**

**<tr>**

**<td>Wastewater Management Zone</td>**

**<td>Sri. Ramakrishna S. M CE(WWM)</td>**

**<td>5th Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945106</td>**

**<td>9845444002</td>**

**</tr>**

**<tr>**

**<td>Cauvery Zone</td>**

**<td>Mahesh. V, CE(K)</td>**

**<td>5th Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945103</td>**

**<td>9845444095</td>**

**</tr>**

**<tr>**

**<td>Project Zone</td>**

**<td>Narsima Murthy CE(P)</td>**

**<td>3rd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945108</td>**

**<td>9845444003</td>**

**</tr>**

**<tr>**

**<td>Quality Assurance Zone</td>**

**<td>Narsima Murthy CE(QA)</td>**

**<td>9th floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945253</td>**

**<td>9845444009</td>**

**</tr>**

**<tr>**

**<td>New Initiative &amp; New Water Zone</td>**

**<td>Narasimhamurthy. N CE(NI&amp;NW)</td>**

**<td>7th Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945116</td>**

**<td>9880335578</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**</div>**

**</div></div></div> </div>**

**</div>**

**</div>**

**</div>**

**</div>**

**</div>**

**</div>**

**<h2>Vision Statement:</h2>**

**</div>**

**<p>The Bengaluru Water Supply and Sewerage Board (BWSSB) is committed to providing drinking water of unquestionable quality in sufficient quantity and also to treat the generated sewage to the required quality parameters. As the leader in providing water and sanitation services, BWSSB is recognized as an effective instrument of change through adopting state-of-the-art technologies for improving the quality of its services to the general public.</p>**

**<p>&nbsp;</p>**

**<div class="content\_heading">**

**<h2>Mission Statement:</h2>**

**</div>**

**<p>BWSSB’s vision rests on its unwavering commitment to providing value added quality services using innovative and cost effective solutions to achieve customer satisfaction, by remaining ever sensitive to their needs by anticipating their requirements, keeping public interface always open and staying in the forefront in all endeavors.</p>**

**</div>**

**</div></div></div> </div>**

**</body>**

**</html>**

**Overview.html**

**<html>**

**<head>**

**<title>urban water supply</title>**

**<style>**

**video{**

**background-color:white;**

**}**

**table{**

**background-color:white;**

**}**

**p{**

**background-color:orange;**

**}**

**ul {**

**list-style-type: none;**

**margin: 0;**

**padding: 0;**

**overflow: hidden;**

**background-color: Orange;**

**}**

**li {**

**float: left;**

**}**

**li a {**

**display: block;**

**color: white;**

**text-align: center;**

**padding: 14px 16px;**

**text-decoration: none;**

**}**

**li a:hover {**

**background-color: #111;**

**}**

**h2,h1**

**{**

**background-color:Black;**

**color:white;**

**}**

**body**

**{**

**background-color:orange;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>**

**<h2><center><b>BWSSB</b></center></h2>**

**<nav>**

**<ul>**

**<li><a href="about.html">About</a></li>**

**<li><a href="dhome.html">Home</a></li>**

**<li><a href="homee.html">Zones</a></li>**

**<li><a href="overview.html">Overview</a></li>**

**<li><a href="photo.html">Photo gallery</a></li>**

**<li><a href="contact.html">Contact us</a></li>**

**</ul>**

**</nav>**

**<artical>**

**<center><h3><b>Table 1: Water supply System </b></h3></center>**

**<p>&nbsp;</p>**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<td>Present Supply from Cauvery source</td>**

**<td>1350 MLD</td>**

**</tr>**

**<tr>**

**<td>Present population served</td>**

**<td>8.5 Millions</td>**

**</tr>**

**<tr>**

**<td>Area&nbsp; of water supply&nbsp; served</td>**

**<td>570 sq. kms</td>**

**</tr>**

**<tr>**

**<td>House service connections</td>**

**<td>8.65 lakhs</td>**

**</tr>**

**<tr>**

**<td>Total length of water supply pipelines</td>**

**<td>8,746 kms</td>**

**</tr>**

**<tr>**

**<td>Pipe diameters’ range</td>**

**<td>100 to 1800 mm</td>**

**</tr>**

**<tr>**

**<td>Number of Ground Level Reservoirs</td>**

**<td>57 ( 885 ML)</td>**

**</tr>**

**<tr>**

**<td>Number of Over Head Tanks</td>**

**<td>36&nbsp; (33 ML)</td>**

**</tr>**

**<tr>**

**<td>Booster pumping stations</td>**

**<td>62 nos</td>**

**</tr>**

**<tr>**

**<td>Public taps providing free water</td>**

**<td>7,477 nos</td>**

**</tr>**

**<tr>**

**<td>Water tanker lorries</td>**

**<td>62 nos</td>**

**</tr>**

**<tr>**

**<td>Quantity of water supplied/month</td>**

**<td>42,200 ML</td>**

**</tr>**

**<tr>**

**<td>Average per capita consumption</td>**

**<td>65 L/day</td>**

**</tr>**

**<tr>**

**<td>Average cost of water</td>**

**<td>28 Rs/kL</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**<p>&nbsp;</p>**

**<center><h3><b>Table 2: Consumption category wise water consumption and revenue generation </b></h3></center>**

**<p>&nbsp;</p>**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<th style="width: 123px;">Consumption Type</th>**

**<th style="width: 124px;">No of Connections</th>**

**<th style="width: 112px;">Consumption ML</th>**

**<th style="width: 118px;">Water accounted %</th>**

**<th style="width: 70px;">Demand,Lakhs</th>**

**<th style="width: 97px;">Revenue share%</th>**

**<th style="width: 115px;">Revenue yield,per ML</th>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Domestic</td>**

**<td style="width: 124px;">7,40,000</td>**

**<td style="width: 112px;">16,992</td>**

**<td style="width: 118px;">44.67</td>**

**<td style="width: 70px;">4,718</td>**

**<td style="width: 97px;">53.98</td>**

**<td style="width: 115px;">0.28</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Non Domestic</td>**

**<td style="width: 124px;">42,100</td>**

**<td style="width: 112px;">1,623</td>**

**<td style="width: 118px;">3.84</td>**

**<td style="width: 70px;">1,961</td>**

**<td style="width: 97px;">22.44</td>**

**<td style="width: 115px;">1.21</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Partial Non Domestic</td>**

**<td style="width: 124px;">36,300</td>**

**<td style="width: 112px;">2,194</td>**

**<td style="width: 118px;">5.20</td>**

**<td style="width: 70px;">1,291</td>**

**<td style="width: 97px;">14.78</td>**

**<td style="width: 115px;">0.59</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Industries, BIAL, and others</td>**

**<td style="width: 124px;">2641</td>**

**<td style="width: 112px;">618</td>**

**<td style="width: 118px;">1.56</td>**

**<td style="width: 70px;">715</td>**

**<td style="width: 97px;">8.18</td>**

**<td style="width: 115px;">1.16</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Sanitary Connections</td>**

**<td style="width: 124px;">49,100</td>**

**<td style="width: 112px;">0</td>**

**<td style="width: 118px;">0</td>**

**<td style="width: 70px;">54</td>**

**<td style="width: 97px;">0.62</td>**

**<td style="width: 115px;">-</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Total</td>**

**<td style="width: 124px;">8,70,141</td>**

**<td style="width: 112px;">21,427</td>**

**<td style="width: 118px;">50.75</td>**

**<td style="width: 70px;">8,740</td>**

**<td style="width: 97px;">100.00</td>**

**<td style="width: 115px;">0.41</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Total Water Receipts</td>**

**<td style="width: 124px;">&nbsp;</td>**

**<td style="width: 112px;">42,223</td>**

**<td style="width: 118px;">&nbsp;</td>**

**<td style="width: 70px;">&nbsp;</td>**

**<td style="width: 97px;">&nbsp;</td>**

**<td style="width: 115px;">&nbsp;</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">Gap</td>**

**<td style="width: 124px;">&nbsp;</td>**

**<td style="width: 112px;">20,796</td>**

**<td style="width: 118px;">&nbsp;</td>**

**<td style="width: 70px;">&nbsp;</td>**

**<td style="width: 97px;">&nbsp;</td>**

**<td style="width: 115px;">&nbsp;</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">NRW%</td>**

**<td style="width: 124px;">&nbsp;</td>**

**<td style="width: 112px;">49.25</td>**

**<td style="width: 118px;">49.25</td>**

**<td style="width: 70px;">&nbsp;</td>**

**<td style="width: 97px;">&nbsp;</td>**

**<td style="width: 115px;">&nbsp;</td>**

**</tr>**

**<tr>**

**<td style="width: 123px;">&nbsp;</td>**

**<td style="width: 124px;">&nbsp;</td>**

**<td style="width: 112px;">&nbsp;</td>**

**<td style="width: 118px;">100.00</td>**

**<td style="width: 70px;">&nbsp;</td>**

**<td style="width: 97px;">&nbsp;</td>**

**<td style="width: 115px;">&nbsp;</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**<p>&nbsp;</p>**

**<center><h3><b>Overview of the Sewerage System </b></h3></center>**

**<p><span style="line-height: 1.6;">Bangalore is located on the water shed of two principal river basins, Arkavathi to the west and South Pennar to the East. The local topography is characterised by a series of well defined valleys which radiate from a ridge of High Ground to the north of the city and fall in a gradual manner towards wide belt of flat land extending beyond the limits of the metropolitan area to the South. The Three principal valleys are known as Vrishabhavathi, Koramangala and Chellaghatta and the three valleys run generally in a north to the south direction and divide the greater part of the metropolitan area which lies to the south of the ridge into three separate and distinct drainage zones. A fourth valley system referred to as the Hebbal series forms drainage zone to the north of the ridge and runs in north easterly direction. Five minor valleys, the Kathriguppa and Tavarekere to the south, the Arkavathi and Kethamaranahally to the north west and Marathhally to the east, lie outside the tributary area of the major valleys and they drain independently to the fringe areas which form the remainder of the metropolitan area. The configuration of valleys in well graded side slopes of their tributary areas has provided Bangalore with a natural system of drainage without recourse to pumping. Both sewerage and storm water flow by gravity beyond the city.</span></p>**

**<p><span style="line-height: 1.6;">The system of sewers for the conveyance of domestic and industrial waste water through underground drainage system was introduced in the year 1922. The system introduced initially was confined to heavily populated area in the heart of the city and although a gradual extension took place then onwards it was not until 1950 that a major programme of sewer construction was commenced. With the formation of the Board (BWSSB) in 1964, the programme to provide Sewerage system in the unsewered areas was taken up in a phased manner and the treatment of sewage before it is led into the natural valleys was also tackled. It is estimated that roughly 1,400 MLD of wastewater flows through its three valleys – the Vrishabhavathi, the Koramangala - Challaghatta, and the Hebbal. The actual amount of sewage generated would be higher since a large number of private bore wells exist and there is no scientific estimate of the quantity of water withdrawn from them. Sewage flow in the city follows the regional topography and flow down along the three principal valleys and five minor valleys ensuring free flow of sewage without any major pumping requirement.</span></p>**

**<p><span style="line-height: 1.6;">The core area of Bengaluru was of 245 Sq. Kms which is the older part of the city. BWSSB has the jurisdiction in this area to supply potable water to the citizens and to collect, convey and treat the wastewater generated. Several schemes were implemented to supply water to the city. For collection of wastewater generated in the city about 3300 KMs of smaller diameter pipelines were laid. To convey the collected wastewater to the treatment plants, 300 KMs of higher diameter pipes were laid. Some of the pipelines were laid about 40 to 50 years back. Due to various reasons, viz. ageing of sewers, encroachment of sewers, damages in the sewerage system, crown corrosion of sewers, abuse of sewers, direct discharges from the houses built on the side of Storm Water Drain, direct discharges from Apartments, new layouts etc., a part of wastewater is flowing through Storm Water Drains and entering lakes and due to this the lakes are being polluted. Following are the details with regard to the existing sewerage system</span></p>**

**<p>&nbsp;</p>**

**<div class="content\_list">**

**<ul>**

**<li>Total length of sewer system - 6,800 Kms</li>**

**<li>Number of manholes - 2.25 lakhs</li>**

**<li>Sanitary house service connections - 9 lakhs</li>**

**<li>Number of sewer cleaning combination (Jetting &amp; Sucking machines) for cleaning &amp; maintaining of sewer system - 125 nos</li>**

**<li>Total no. of desilting machines - 6 nos.</li>**

**<li>Sewerage network Laterals (&lt; 300 mm dia) – 3367 Kms</li>**

**<li>Trunk Sewers (&gt;300 mm dia) – 302 Kms Number of plants – 14</li>**

**<li>Sewage generation – 1400 MLD</li>**

**<li>Sewage treatment capacity – 721 MLD</li>**

**<li>Average treatment – 520 MLD</li>**

**</ul>**

**</div>**

**<center><h3>Core Area Sewage Network</h3></center>**

**<p>The lateral collection system starts from the houses and connected to sub mains. The problems in these networks will be addressed as and when required out of the Board funds. Whereas the problems of the higher diameter sewers involves huge costs and hence the projects are being prepared. After obtaining financial assistance, the works will be taken up. For treating the wastewater BWSSB has established 14 Wastewater treatment plants of 721 MLD capacity and the details are as under.</p>**

**<b>Table 3: Existing sewage treatment plants;</b><br />**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<th>Plant</th>**

**<th>Capacity in MLD</th>**

**</tr>**

**<tr>**

**<td>Vrishabhavathi Valley</td>**

**<td>180</td>**

**</tr>**

**<tr>**

**<td>K &amp; C Valley</td>**

**<td>248</td>**

**</tr>**

**<tr>**

**<td>Hebbal Valley</td>**

**<td>60</td>**

**</tr>**

**<tr>**

**<td>Madivala</td>**

**<td>04</td>**

**</tr>**

**<tr>**

**<td>Kempambudhi</td>**

**<td>01</td>**

**</tr>**

**<tr>**

**<td>Yelahanka</td>**

**<td>10</td>**

**</tr>**

**<tr>**

**<td>Mylasandra</td>**

**<td>75</td>**

**</tr>**

**<tr>**

**<td>Nagasandra</td>**

**<td>20</td>**

**</tr>**

**<tr>**

**<td>Jakkur</td>**

**<td>10</td>**

**</tr>**

**<tr>**

**<td>K. R. Puram</td>**

**<td>20</td>**

**</tr>**

**<tr>**

**<td>Kadabeesanahalli</td>**

**<td>50</td>**

**</tr>**

**<tr>**

**<td>Rajacanal</td>**

**<td>40</td>**

**</tr>**

**<tr>**

**<td>Cubbon Park</td>**

**<td>1.5</td>**

**</tr>**

**<tr>**

**<td>Lalbagh</td>**

**<td>1.5</td>**

**</tr>**

**<tr>**

**<td>Grand Total</td>**

**<td>721</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**<p>&nbsp;</p>**

**<div class="content\_heading"><b>Ongoing Water Supply projects.</b></div>**

**<p>&nbsp;</p>**

**<p><b>1. Water treatment plants </b></p>**

**<p>Construction of 300 MLD Water Treatment Plant (WTP) at T.K.Halli In lieu of old I &amp; II Stage water treatment plants which includes Complete overhauling of stage III 300 MLD treatment works, converting to fully automated plant at a cost of project Rs.148 crore to be completed in 2017</p>**

**<p>&nbsp;</p>**

**<p><b>2. Greater Bengaluru Water Supply &amp; Sanitation Project (GBWASP) </b></p>**

**<p>For providing water supply and sewerage facilities to erstwhile 8 ULBs, Government of Karnataka approved this project in December 2003. Under this project water supply to 256 sq km area of erstwhile 8 ULBs are provided covering a population of more than 27 lakhs at a project cost of Rs 500 crores. The distribution network provided is 2713 km (Dia 100mm to 150mm) with feeder mains of 195 km (Dia 200mm to 450mm) and Trunk Mains of 85 km (Dia 600mm to 1300mm). The number of house service connections provided are more than 1.35 lakhs and much of the Project was completed in 2012.</p>**

**<p>&nbsp;</p>**

**<p><b>3. Water supply improvement works </b></p>**

**<p>For proper water accounting and loss reduction with the aims of improvement in water distribution system, reduction in unaccounted for water and leakage control three major works are taken covering about 50% of the core area (133 sqkm) wherein it is envisaged to reduce the overall water losses to 16%. The number of connections that will be attended are more than 3.0 lakhs covering a total length of 3325 kms at a total project cost of Rs 655 crores. Works are expected to be completed by 2017. The benefits of these works are: improvement in supply hours, pressure and assets condition; improvement in water quality; reduction in customer complaint; total water accountability and increase in revenue</p>**

**<p>&nbsp;</p>**

**<p><b>4. Exclusive leak detection works </b></p>**

**<div class="content\_list">**

**<ul>**

**<li>Disseminating Japanese Technologies for Water Leakage Detection and Monitoring Technology in Bengaluru (E-1) .</li>**

**<li>Taken up under MRI technology and JICA grant .</li>**

**<li>Necessary equipments arrived from Japan (free of cost).</li>**

**<li>L-sign leakage detection and monitoring system by Suido Technical Services.</li>**

**<li>Work going from last one year.</li>**

**<li>Helium Gas Based Hidden Leak Detection Technology in Four subdivisions which are not covered under current UFW projects.</li>**

**<li>Work started in 4 subdivisions at a cost of Rs 25 crores.</li>**

**<li>Results are encouraging with detecting leaks being detected precisely.</li>**

**</ul>**

**</div>**

**<p>&nbsp;</p>**

**<p><b>5. KMRP: UGD Facilities to erstwhile 8 ULBs</b></p>**

**<p>Providing UGD infrastructure, taken up under the World Bank Funded KMRP and with JnNURM to the newly added areas i.e., erstwhile 8 ULBs. The works started in February 2010 at a project cost of Rs 1192 crores. The Sewerage system comprises 2000 Km of lateral network and 300 Km of Sub-mains/ main sewers. The component of Road restoration of the cut / damaged portion is also included. Works are taken up in 24 packages and 95% work is completed. The works will be completed by March 2016.</p>**

**<p>&nbsp;</p>**

**<p><b>6. Slum Development Component</b></p>**

**<p>Implementation of Water Supply and Sanitation Facilities to slums were taken up in two phases under JICA Funds. Under this project total number of slums identified are 362. The number of Slums taken up under Phase-1 and Phase-2 are 96 and 68 respectively at a total cost of Rs 91 crores. Providing individual house service connections water supply with MDPE pipes and sanitary connections with HDPE pipes were also the part of the programme apart from bulk supply and disposal of sewage. Phase I component is 100% completed and Phase II is 92% complete.</p>**

**<p>&nbsp;</p>**

**<p><b>7. Sewerage Works </b></p>**

**<p>Under Cauvery stage IV Phase II Construction of 11 Sewage Treatment Plants at different places under 7 Contract Packages to treat 339 MLD of Sewage Water. Replacement / rehabilitation of existing sewer lines in the city (10 Packages – 45 Kms). The 2 ISPS are proposed under CWSS Stage –IV Phase-2. ISPS of 20 MLD at Sarakki &amp; 120 MLD at Agaram are under Progress. The works are planned to be completed in 2016. At K &amp; C Valley 60 MLD treatment plant is under construction. The plant is proposed to be completed in 2016. 90 MLD Treatment Plant is under construction at Bellandur. The plant is proposed to be commissioned in 2016. Bommanahalli CMC area UGD Networks are taken up under KMRP project funded by World Bank.</p>**

**<p>&nbsp;</p>**

**<p><b>Environmental Action Plans (EAPs)</b> to avoid waste water flowing into storm water drains. The Board has taken up the following projects:</p>**

**<p>&nbsp;</p>**

**<p><b>a) Environmental Action Plan (EAP) – A: </b>This plan was initiated during 2001. 33 Kms of existing trunk sewers were replaced/ rehabilitated at a cost of Rs.54.00 crore. There was an increase of 40 MLD of sewage inflow into the STPs there by, reduction in wastewater flow in the SWD.</p>**

**<p>&nbsp;</p>**

**<p><b>b) Hebbal STP Zero flow scheme:</b> In this scheme 18 Kms of trunk sewers were replaced/ rehabilitated at a cost of Rs. 45.00 Crore. The benefits of the scheme would be zero flow in the SWD upto Nagavara Lake. There is no entry of sewage to Hebbal and Nagavara Lakes from core area. The STP at Hebbal would be completely utilised. The increase in flow is 40 MLD.</p>**

**<p>&nbsp;</p>**

**<p><b>c) Environmental Action Plan–B:</b> The project consists of replacement/ rehabilitation of 70 Kms of trunk sewers at a cost of Rs.176.00 Crore. It is estimated that 150 MLD of wastewater will be diverted into STPs after the completion of the project. The revised project cost is Rs.495 Crore. The work is expected to be completed by end of 2016.</p>**

**<p>&nbsp;</p>**

**<p><b>Proposed Water Supply works </b></p>**

**<p>During the last two decades the city of Bangalore has been experiencing unprecedented growth in the field of Industrial, Commercial and Institutional sectors. This phenomenal growth has resulted in unplanned urban activities surrounding Bangalore and increase in population and construction activities. As per the census the population of Bangalore city was 4.08 million in 1991, 5.8 million in 2001 and increased to 8.5 million in 2011. This fast growth in population is posing tremendous pressure on infrastructure especially on water supply and under ground drainage system.</p>**

**<p>The projected water supply requirements for the city of Bangalore and population projections are shown in the table below:</p>**

**<p><b style="line-height: 20.8px;">Table 4: Population and Water supply requirements</b></p>**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<th rowspan="2" scope="col" style="width: 54px;">Year</th>**

**<th rowspan="2" scope="col" style="width: 95px;">Population (Million)</th>**

**<th rowspan="2" scope="col" style="width: 112px;">Water Demand (MLD)</th>**

**<th rowspan="2" scope="col" style="width: 111px;">Water Demand (TMC)</th>**

**<th colspan="2" scope="col">Present Supply</th>**

**<th colspan="2" scope="col" style="width: 114px;">Shortfall in Demand</th>**

**</tr>**

**<tr>**

**<th scope="col">MLD</th>**

**<th scope="col">TMC</th>**

**<th scope="col">MLD</th>**

**<th scope="col" style="width: 59px;">TMC</th>**

**</tr>**

**<tr>**

**<td style="width: 49px;">2011</td>**

**<td style="width: 95px;">8.499</td>**

**<td style="width: 112px;">1400</td>**

**<td style="width: 111px;">18.05</td>**

**<td>950</td>**

**<td>12.25</td>**

**<td>450</td>**

**<td style="width: 59px;">5.80</td>**

**</tr>**

**<tr>**

**<td style="width: 49px;">2021</td>**

**<td style="width: 95px;">10.581</td>**

**<td style="width: 112px;">2100</td>**

**<td style="width: 111px;">27.1</td>**

**<td>1450</td>**

**<td>26.7</td>**

**<td>650</td>**

**<td style="width: 59px;">0.4</td>**

**</tr>**

**<tr>**

**<td style="width: 49px;">2031</td>**

**<td style="width: 95px;">14.296</td>**

**<td style="width: 112px;">2900</td>**

**<td style="width: 111px;">37.39</td>**

**<td>2070</td>**

**<td>26.7</td>**

**<td>1450</td>**

**<td style="width: 59px;">10.69</td>**

**</tr>**

**<tr>**

**<td style="width: 49px;">2041</td>**

**<td style="width: 95px;">17.085</td>**

**<td style="width: 112px;">3400</td>**

**<td style="width: 111px;">43.84</td>**

**<td>2070</td>**

**<td>26.7</td>**

**<td>1950</td>**

**<td style="width: 59px;">17.14</td>**

**</tr>**

**<tr>**

**<td style="width: 49px;">2051</td>**

**<td style="width: 95px;">20.561</td>**

**<td style="width: 112px;">4100</td>**

**<td style="width: 111px;">52.86</td>**

**<td>2070</td>**

**<td>26.7</td>**

**<td>2650</td>**

**<td style="width: 59px;">26.16</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**<p>&nbsp;</p>**

**<p>Though, the Water supply and Sewerage system is available in Core area and 8 erstwhile ULBs, the comprehensive Water supply and Sewerage system does not exist in 110 village area. Existing Water supply to 110 villages is from bore well source. Now the increase in demand has necessitated looking for a reliable and organized / structured water supply source. There is no planned UGD system in 110 village areas. The present sanitation facilities are provided through house hold septic tanks and soak pits. There is no scientific collection system and sewage treatment facilities provided in the 110 village areas (except few layouts). In the absence of proper sewerage system, the sullage and raw sewage generated in various wards are discharged through open drains / nalas to nearby lakes / water bodies. This is adversely affecting the environment.</p>**

**<p>After formation of BBMP in 2007, the rapid growth and development has happened in the 110 village area. Based on this development the population has increased substantially. The rapid growth in these areas demands improvements in urban infrastructure like water supply, sewerage system and roads etc. The Bangalore Water Supply and Sewerage Board (BWSSB) has the responsibility for providing water supply and underground drainage system to Bangalore city including extended areas under BBMP.</p>**

**<p>&nbsp;</p>**

**<p><b>Bulk water supply CWSS Stage V </b></p>**

**<p>Recently, the Urban Development Department, Govt. of Karnataka (GoK) allocated an additional 10 TMC (775 MLD) of Cauvery Water for Bangalore city. Formulation of CWSS Stage V scheme for Bangalore City and preparation of Detailed Project Report (DPR) for the same is completed for getting financial assistance from funding agencies, such as JICA (Japan International Co-operation Agency). Considering the technical aspects and water demand it is proposed to take up the Stage V Scheme in two Phases i.e., Phase I of 500 MLD (6.45 TMC) capacity and Phase II of 275 MLD (3.55 TMC) capacity. It is proposed to provide raw water transmission pipeline for 810 MLD flow, water treatment plant at T.K. Halli for minimum 500 MLD output and common facilities (Aerator, Raw Water Channel and all buildings) for 775 MLD Capacity, clear water pumping stations with mechanical and electrical works at three locations (T.K. Halli, Harohalli and Tataguni), clear water transmission system for 755 MLD up to the city entry (Vajarahalli) and city trunk main and city reservoirs.</p>**

**<p>&nbsp;</p>**

**<p><b>Water Supply and Sanitary Facilities to 110 Villages</b></p>**

**<p>A project is proposed and prepared for providing water supply &amp; UGD facilities to extended area of Bangalore City covering 110 Villages under BBMP. Project area is 225 Sq. Km. This project is to be taken up early to provide basic amenities of water supply and UGD system to the extended 110 village areas of Bangalore city. The DPR of the 5 zones (Dasarahalli, R.R Nagar, Bommanahalli, Mahadevapura and Byatarayanpura), has been now prepared based on the 2011 census details, for the projected population for the intermediate year 2034 and ultimate year 2049 as per CPHEEO guidelines. The project cost of 5 zones has been estimated at Rs. 5018.38 Crore based on the 2014-15 SR (Schedule of Rates) of BWSSB, KUWS &amp; DB, PWD &amp; Ind STT. In the present proposal of DPR, the water supply component includes distribution system &amp; Feeder mains of 100 mm to 600 mm dia Ductile Iron (DI) pipe 711 mm &amp; above dia Mild Steel (MS) pipe, Sump and pump house, Over head tanks of various capacity ranging from 1.5 Lakh Liters to 25 Lakh liters capacity, GLRs wherever required. Also, provision for providing Supervisory Control and Data Acquisition (SCADA) system for water Supply distribution network is included. The sewerage component includes laterals fr om 200 mm to 230 mm dia Glazed Stoneware (GSW) pipe &amp; sub-mains, main &amp; trunk sewers from 300 mm to above dia Reinforced Cement Concrete (RCC) NP-3 class pipes, ISPS (intermediate sewage pumping stations), 16 No’s of STP (Sewage Treatment Plant) of total capacity 129 MLD and Sewer cleaning machines are included in the and its operation for 3 years. The road restoration component includes restoration of road damaged during execution of water supply and sewerage pipeline work.</p>**

**<p>&nbsp;</p>**

**<p><b>Water supply improvement works</b></p>**

**<p>Towards covering complete area of the core Bengaluru, for Proper Water Accounting and Loss reduction with the aims towards improvement to water distribution system, reduction in unaccounted for water and leakage control three major works are being taken covering about 50% of the core area (116 sq km) in East (full), North East (part), North (part), South west (part) wherein it is envisaged to reduce the overall water losses to 16%. The number of connections that will be attended are more than 1.60 lakhs covering a total length of 1220 kms at a total project cost of Rs 821 crores. The benefits of these works are: Improvement in Supply hours, Pressure and assets condition; Improvement in Water Quality; Reduction in Customer complaint; Total Water Accountability and increase in Revenue.</p>**

**<div class="content\_image"><a href="/sites/default/files/aboutbwssb3.jpg" rel="attachment wp-att-915" style="padding-right:10px"><img align="left" alt="" class="alignright size-full wp-image-915" height="154" src="/sites/default/files/aboutbwssb3.jpg" title="rwh" width="197" /></a></div>**

**<center><h3><b>Figure 4: 110 village area of BBMP showing in different 5 - Zone</b></h3></center>**

**<div>&nbsp;</div>**

**<p><b>Proposed Sewerage System works</b></p>**

**<p>For effective conveyance of sewage from the core area, Environmental Action Plan – C for the balance 74 Kms of the trunk sewers out of 300 KMs of existing sewers is proposed. Action is being taken to prepare Detailed Project Report (DPR) by addressing all the inherent problems as well as the present scenario of the existing pipelines. The preparation of DPR will take 6 months time and the approximate cost of this project is about Rs 500 crores. It is expected that the increase in flow to the sewage treatment plants will be about 120 MLD.</p>**

**<p>Further, it is proposed to construct 6 new treatment plants of total capacity of 520 MLD for treating the additional wastewater generated. The DPRs for these projects have been prepared. The KUIDFC agreed to provide 50% of project cost as shown under megacity scheme. For 25% funding a proposal has been sent to Government. The Board will bear the balance 25% of the project cost. The total cost of the scheme as per the DPRs prepared is Rs.1373.42 crores. The details of the future plants are furnished below.</p>**

**<p>a) 150 MLD wastewater treatment plant at V Valley</p>**

**<p><br />**

**b) 100 MLD wastewater treatment plant at Hebbal</p>**

**<p><br />**

**c) 20 MLD wastewater treatment plant at K R Puram</p>**

**<p><br />**

**d) 150 MLD wastewater treatment plant at K &amp; C Valley</p>**

**<p><br />**

**e) 40 MLD wastewater treatment plant at Doddabele</p>**

**<p><br />**

**f) 60 MLD wastewater treatment plant at Bengaluru University</p>**

**<p>&nbsp;</p>**

**<p>To avoid pollution of Bellandur and Varthur lakes it is proposed to construct waste water treatment plants in the upstream areas of Hulimavu, Begur, Sarakki and Agarm. The Lake Development Authority have been requested to handover the required land for setting up of these plants near the lakes. For establishing and maintaining of these plants an amount of Rs.585 crore is required.</p>**

**<p>&nbsp;</p>**

**<p><b>Rain Water Harvesting, Rejuvenation of Lakes </b></p>**

**<p>Rain water and ground water are important components of the hydrological cycle. At an average rainfall of 750mm per year the total available rain water will be 33TMC in 1250 sq.km. area of Greater Bangalore. The Board can utilize 5 to 10 TMC of rain water that falls in and around the city by utilising the benefits of the complete remodelled storm water drains by BBMP, ensuring collection of all the sewage in the sewerage net work so that all the sewage is taken to the treatment plants. The rain water collected in shafts, galleries and lakes through the storm water drain net work will help in revival of the depleted groundwater level. About 30% of the treated effluent from the sewage treatment plants is led to the Lakes for dilution with rain water. Water that percolates into ground from these lakes increases the ground water level in vadose and phreatic zones. For studying the feasibility a consultancy has been entrusted and by the end of 2016 the DPR will be ready.</p>**

**<p>&nbsp;</p>**

**<p><b>Financial Position of the Board </b></p>**

**<p>The major source of Revenue is from Water user Charges collected from the consumers. In addition to this, the Board generates revenue from other sources like Sanitary charges, prorata charges, borewell charges and bulk water supply to areas of Kanakapura Town and Tataguni gramapanchayat. The Board is executing some major capital intensive works like Cauvery Water Supply Scheme Stage IV Phase II, Greater Bangalore Water Supply and Karnataka Municipal Reforms Works with the assistance of Japanese International Cooperation Agency (JICA) and World Bank. The capital source of funds for this project is from JICA, Govt. of Karnataka , World Bank and Beneficiaries of this project. Some of the major heads of expenditures of the Board are power charges payable to BESCOM and CHESCOM, maintenance of bore wells in the city, and debt servicing of the loans borrowed towards projects executed by the Board in addition to committed expenditure like Establishment charges and Operation and Maintenance charges of the assets of the Board.</p>**

**&nbsp;**

**<p>&nbsp;</p>**

**<p><b>a) Revenue and Expenditure Position</b></p>**

**<p>1. The monthly Water Revenue Demand is about Rs.90.00 Crore during FY 2015-16</p>**

**<p>2. The monthly Water Revenue Collection is about Rs.80.00 Crore during FY 2015-16 and the expected Annual Revenue from all sources is Rs.1228.21 Crore.</p>**

**<p>3. The monthly Revenue Expenditure is Rs. 138.75 Crore towards all expenditures including repayment of Government Loan Principal and Intrest components and the expected Annual Expenditure is Rs.1665.07 Crore.</p>**

**<p>4. The Revenue gap is Rs.36.00 Cr per month and the Annual Revenue gap is Rs.436.00 Cr</p>**

**<p>5. The gap is due to increase in power tariff, increase in maintenance costs and other administration costs.</p>**

**<p>&nbsp;</p>**

**<p><b>b) Loan Position </b></p>**

**<p>The total loan sanctioned by Government of Karnataka for various projects including CWSS IV Stage, Phase I &amp; CWSS Stage IV Phase II stands at Rs.3272.95 crore as at the end of 31st March 2014 (audited by AG). The total Outstanding Loans as at the end of 31st March 2015 is Rs.3597.36 Crore. The total interest payable on these loans is Rs.2085.72 Crore as at the end of 31st March 2015. The outstanding loans borrowed from institutions like LIC and KUIDFC is to the extent of Rs.155.87 Crore at the end of 31st March 2015.</p>**

**<span style="line-height: 1.6;">a) Due to financial constraints and accumulated deficit coupled with subsidized water being supplied to the economically vulnerable sections of the society, which is a major strain on the finances, the Board could not discharge the loan liability of the Government. The existing tariff is able to recover only O&amp;M cost. Unless tariff recovers the cost of debt from the general public, the Board will not be in a position to repay the loan, as BWSSB is not receiving any budgetary support from GoK.</span>**

**<p><span style="line-height: 1.6;">b) BWSSB is also supplying water through public taps. No revenue is generated out of Public Taps. The Board has not received the water dues to the extent of Rs.207.64 crores out of which Rs.8.00 cores is due from BDA and Rs.154.00 Crores is due from BBMP on account of public taps. In spite of efforts the revenue dues have not been realized from BDA and BBMP.</span></p>**

**<p><span style="line-height: 1.6;">c) Further, the Board is entrusted with maintenance of borewell’s in the city. The borewell’s hitherto maintained by BBMP/ CMC’s are now handed over to BWSSB. The total Power Charges for pumping water to the city including energisation of these borewells works out to Rs.394.97 Crores per annum which consumes half of the Revenue Income of the Board.</span></p>**

**<p><span style="line-height: 1.6;">d) The present revenue of the Board is insufficient to meet the debt servicing. However the Board is discharging all institutional debts out of Board revenue itself .</span></p>**

**<p>&nbsp;</p>**

**<center><h3><b>Income and Expenditure Statement</b></h3></center>**

**<p>&nbsp;</p>**

**<div>&nbsp;</div>**

**<div class="bwssb\_table\_blue bwssb\_table\_blue\_strips t\_wid\_100">**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tbody>**

**<tr>**

**<th>Sl.No</th>**

**<th>Income</th>**

**<th>2013-14 (Rs. in Lakhs)</th>**

**<th>2014-15(Rs. in Lakhs)</th>**

**</tr>**

**<tr>**

**<td>a</td>**

**<td>Water Revenue including Meter Hire</td>**

**<td>59199.19</td>**

**<td>81103.86</td>**

**</tr>**

**<tr>**

**<td>b</td>**

**<td>Other Income</td>**

**<td>14906.05</td>**

**<td>6711.60</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>TOTAL</td>**

**<td>74105.24</td>**

**<td>87815.46</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**</tr>**

**<tr>**

**<th>Sl.No</th>**

**<th>Expenditure</th>**

**<th>&nbsp;</th>**

**<th>&nbsp;</th>**

**</tr>**

**<tr>**

**<td>a</td>**

**<td>Establishment</td>**

**<td>15282.15</td>**

**<td>16303.85</td>**

**</tr>**

**<tr>**

**<td>b</td>**

**<td>Power Charges</td>**

**<td>35649.95</td>**

**<td>39497.69</td>**

**</tr>**

**<tr>**

**<td>c</td>**

**<td>Repairs and Maintenance</td>**

**<td>9544.04</td>**

**<td>10509.48</td>**

**</tr>**

**<tr>**

**<td>d</td>**

**<td>Cost of General Administration</td>**

**<td>8653.58</td>**

**<td>7933.14</td>**

**</tr>**

**<tr>**

**<td>e</td>**

**<td>Depreciation</td>**

**<td>16330.57</td>**

**<td>16612.74</td>**

**</tr>**

**<tr>**

**<td>f</td>**

**<td>Write off</td>**

**<td>0.00</td>**

**<td>0.00</td>**

**</tr>**

**<tr>**

**<td>g</td>**

**<td>Interest Payment on Loans</td>**

**<td>29985.31</td>**

**<td>30889.95</td>**

**</tr>**

**<tr>**

**<td>h</td>**

**<td>Provisions</td>**

**<td>77.06</td>**

**<td>73.55</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>TOTAL</td>**

**<td>115522.66</td>**

**<td>121820.40</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>SURPLUS / DEFICIT</td>**

**<td>-41417.42</td>**

**<td>-34004.94</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**<td>&nbsp;</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>Previous Year Adjustments Credit / Debit Balance</td>**

**<td>0.00</td>**

**<td>0.00</td>**

**</tr>**

**<tr>**

**<td>&nbsp;</td>**

**<td>NET SURPLUS / DEFICIT</td>**

**<td>-41417.42</td>**

**<td>-34004.94</td>**

**</tr>**

**</tbody>**

**</table>**

**</div>**

**<p>&nbsp;</p>**

**<b> Future Outlook and Challenges</b><br />**

**<br />**

**The BWSSB future outlook covers several issues like:<br />**

**<br />**

**a) The availability of dependable resources<br />**

**<br />**

**b) Sustainable Water Quality and Quantity<br />**

**<br />**

**c) Effective Wastewater collection, transmission and treatment for safe disposal<br />**

**<br />**

**d) Water reuse for multipurpose usages with different modes and strategies<br />**

**<br />**

**e) Water related disasters.**

**<p>&nbsp;</p>**

**In order to tackle the above issues BWSSB is making efforts towards<br />**

**<br />**

**1. Effective water demand management<br />**

**<br />**

**2. Water loss reduction programme<br />**

**<br />**

**3. Water Conservation programme<br />**

**<br />**

**4. Rain Water Harnessing from Urban Catchment<br />**

**<br />**

**5. Effective Public outreach programme to implement the above.<br />**

**&nbsp;**

**<p>&nbsp;</p>**

**The challenges faced by BWSSB mainly being, supply management with fresh water resources, engineering solutions to fetch water from far off places, financial resource. Apart from these challenges following are also to be addressed immediately:<br />**

**<br />**

**1. Condition of water/wastewater infrastructure<br />**

**<br />**

**2. Lack of public appreciation for the value of water<br />**

**<br />**

**3. Funding for capital improvement projects<br />**

**<br />**

**4. Water scarcity/supply<br />**

**<br />**

**5. Replacing a retiring workforce<br />**

**<br />**

**6. Customer/community relations<br />**

**<br />**

**7. Recovering costs for service/investment<br />**

**<br />**

**8. Government regulations<br />**

**<br />**

**9. Emergency planning and response<br />**

**<br />**

**10.Energy usage/cost<br />**

**<br />**

**11. Climate change<br />**

**<br />**

**12. Utility security<br />**

**&nbsp;**

**<p>&nbsp;</p>**

**<p><b>Vision document upto 2050 </b></p>**

**<p>In order to develop an effective road map BWSSB has envisioned a vision document with strategic Master plan to address the future outlook and challenges.</p>**

**<p>Outcome of this study will include a holistic and integrated evaluation of all available and current water resources, including recycled water, and identification of alternatives and strategies, which can be further developed as future water resources. It will result into a vision document which will have identified potential Water Supply and Sewerage Schemes along with their implementation framework that will serve as a guidance document for BWSSB. It can then later identify and select individual projects that may be considered for implementation based on assessment of needs, its feasibility and priority. The vision document will also include broad cost estimates and time frame for implementation of the preferred strategy and option, as well as suggested and recommended phasing and staged implementation of the preferred option with a breakdown of investments into Long Term, Medium Term and Short Term timeframes with relevant finances and other resources required.</p>**

**</div>**

**</div></div></div> </div>**

**</div>**

**</div>**

**</div>**

**</div>**

**</div>**

**</ul>.**

**</body>**

**</html>**

**Photogallery.ḥtml**

**<html>**

**<head>**

**<title>urban water supply</title>**

**<style>**

**video{**

**background-color:white;**

**}**

**table{**

**background-color:white;**

**}**

**p{**

**background-color:white;**

**}**

**ul {**

**list-style-type: none;**

**margin: 0;**

**padding: 0;**

**overflow: hidden;**

**background-color: Orange;**

**}**

**li {**

**float: left;**

**}**

**li a {**

**display: block;**

**color: white;**

**text-align: center;**

**padding: 14px 16px;**

**text-decoration: none;**

**}**

**li a:hover {**

**background-color: #111;**

**}**

**h2,h1**

**{**

**background-color:Black;**

**color:white;**

**}**

**body**

**{**

**background-color:orange;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>**

**<h2><center><b> BWSSB </b></center></h2>**

**<nav>**

**<ul>**

**<li><a href="about.html">About</a></li>**

**<li><a href="dhome.html">Home</a></li>**

**<li><a href="homee.html">zones</a></li>**

**<li><a href="phot.html">Photo gallery</a></li>**

**<li><a href="contact.html">Contact us</a></li>**

**</ul>**

**</nav>**

**<style>**

**div.img {**

**margin: 5px;**

**padding: 5px;**

**border: 1px solid #0000ff;**

**height: auto;**

**width: auto;**

**float: left;**

**text-align: center;**

**}**

**div.img img {**

**display: inline;**

**margin: 5px;**

**border: 1px solid #ffffff;**

**}**

**div.img a:hover img {**

**border: 1px solid #0000ff;**

**}**

**div.desc {**

**text-align: center;**

**font-weight: normal;**

**width: 120px;**

**margin: 5px;**

**}**

**</style>**

**</head>**

**<body>**

**<td>**

**<img src="1.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 1.jpg" style="width:250px;height:250px;">**

**<img src="2.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 2.jpg" style="width:250px;height:250px;">**

**<img src="3.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 3.jpg" style="width:250px;height:250px;">**

**<img src="4.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 4.jpg" style="width:250px;height:250px;">**

**<img src="5.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 5.jpg" style="width:250px;height:250px;">**

**<img src="6.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 6.jpg" style="width:250px;height:250px;">**

**<img src="7.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 7.jpg" style="width:250px;height:250px;">**

**<img src="8.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 8.jpg" style="width:250px;height:250px;">**

**<img src="9.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 9.jpg" style="width:250px;height:250px;">**

**<img src="10.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 10.jpg" style="width:250px;height:250px;">**

**<img src="11.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 11.jpg" style="width:600px;height:600px;">**

**<img src="12.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 12.jpg" style="width:600px;height:600px;">**

**<img src="13.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 13.jpg" style="width:600px;height:600px;">**

**<img src="14.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 14.jpg" style="width:600px;height:600px;">**

**<img src="15.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 15.jpg" style="width:600px;height:600px;">**

**<img src="16.jpg" path="C:\Users\Vinay Kumar\Documents\New folder(2) 16.jpg" style="width:600px;height:600px;">**

**</body>**

**</html>**

**Contact.html**

**<html>**

**<head>**

**<title>urban water supply</title>**

**<style>**

**video{**

**background-color:white;**

**}**

**table{**

**background-color:white;**

**}**

**p{**

**background-color:white;**

**}**

**ul {**

**list-style-type: none;**

**margin: 0;**

**padding: 0;**

**overflow: hidden;**

**background-color: Orange;**

**}**

**li {**

**float: left;**

**}**

**li a {**

**display: block;**

**color: white;**

**text-align: center;**

**padding: 14px 16px;**

**text-decoration: none;**

**}**

**li a:hover {**

**background-color: #111;**

**}**

**h2,h1**

**{**

**background-color:Black;**

**color:white;**

**}**

**body**

**{**

**background-color:orange;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> BANGLORE URBAN WATER SUPPLY</center></h1>**

**<h2><center><b> BWSSB </b></center></h2>**

**<nav>**

**<ul>**

**<li><a href="about.html">About</a></li>**

**<li><a href="dhome.html">Home</a></li>**

**<li><a href="homee.html">zones</a></li>**

**<li><a href="phot.html">Photo gallery</a></li>**

**<li><a href="contact.html">Contact us</a></li>**

**</ul>**

**</nav>**

**<style>**

**div.img {**

**margin: 5px;**

**padding: 5px;**

**border: 1px solid #0000ff;**

**height: auto;**

**width: auto;**

**float: left;**

**text-align: center;**

**}**

**div.img img {**

**display: inline;**

**margin: 5px;**

**border: 1px solid #ffffff;**

**}**

**div.img a:hover img {**

**border: 1px solid #0000ff;**

**}**

**div.desc {**

**text-align: center;**

**font-weight: normal;**

**width: 120px;**

**margin: 5px;**

**}**

**</style>**

**</head>**

**<body>**

**<h1><center> CONTACT US</center></h1>**

**<table border="5" align="center" cellpadding="5" cellspacing="5">**

**<tr>**

**<td>Sri. Tushar Girinath,IAS**

**</td>**

**<td>Chairman, 1st Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945100</td>**

**<td><a>chairman@bwssb.gov.in</a></td>**

**</tr>**

**<tr>**

**<td>Sri. Kemparamaiah</td>**

**<td>Engineer-In-Chief, 2nd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945105</td>**

**<td><a>eic@bwssb.gov.in</a></td>**

**</tr>**

**<tr>**

**<td>Sri. H M Ravindra</td>**

**<td>Chief Engineer Maintenance Zone , 2nd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>9845823556</td>**

**<td><a>cema@bwssb.gov.in</a></td>**

**</tr>**

**<tr>**

**<td>Smt. T. C. Sarala Kumari</td>**

**<td>Public Relation Officer, 2nd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22945114 / 9845443647</td>**

**<td><a>pro@bwssb.gov.in</a></td>**

**</tr>**

**<tr>**

**<td>Call Centre</td>**

**<td>2nd Floor, Cauvery Bhavan, Kempegowda Road, Bengaluru-560009</td>**

**<td>22238888 / 1916</td>**

**<td><a>callcenter@bwssb.gov.in</a></td>**

**</tr>**

**</tbody>**

**</div>**

**<p>&nbsp;</p>**

**</div></div></div> </div>**

**</body>**

**</html>**

**</body>**

**</html>**