
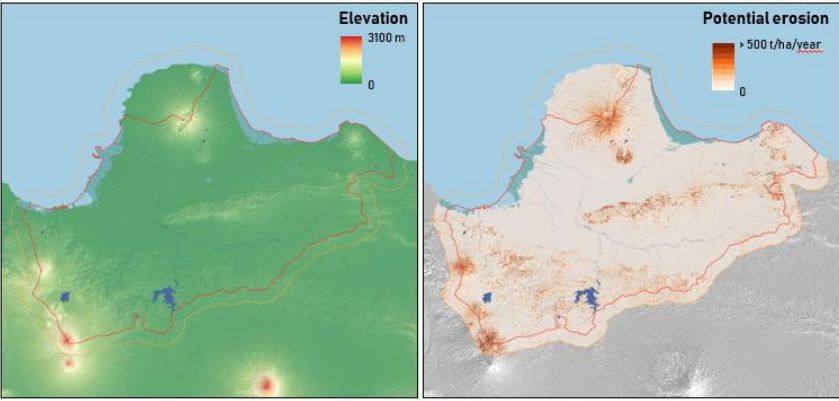
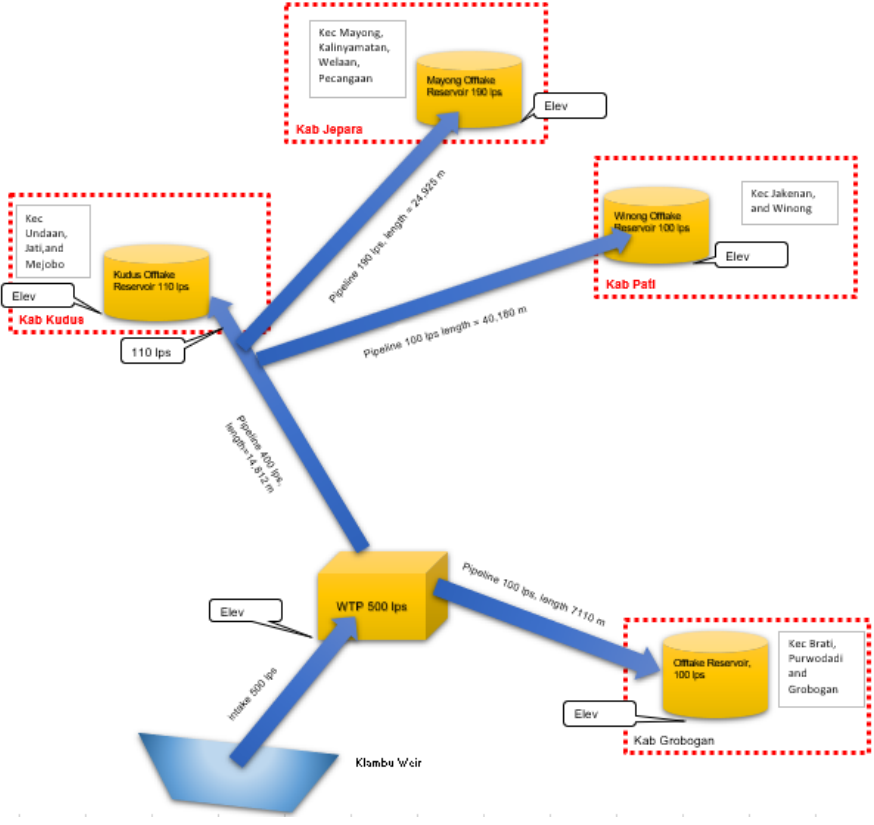


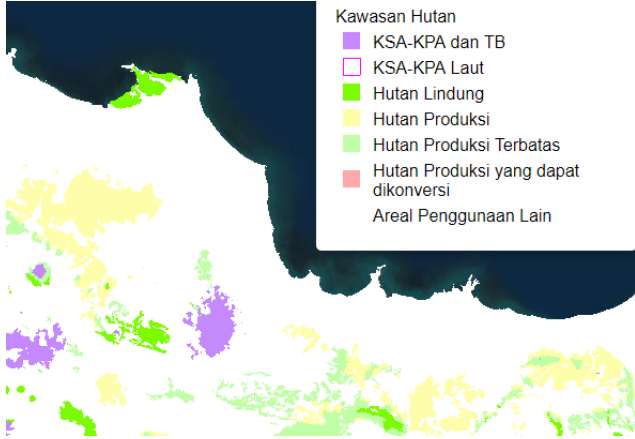
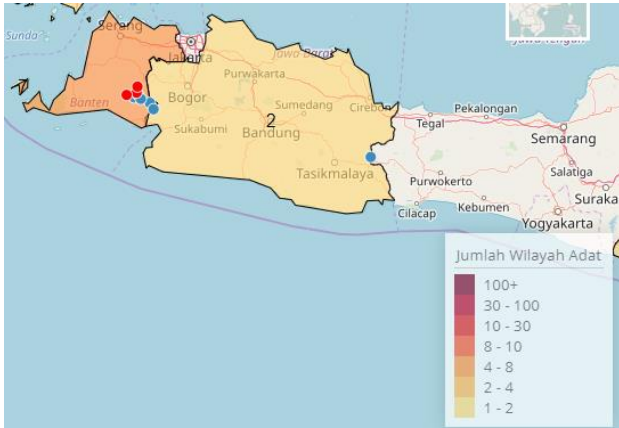
## EWSIP Source-to-Tap (STT) Profile Sheet

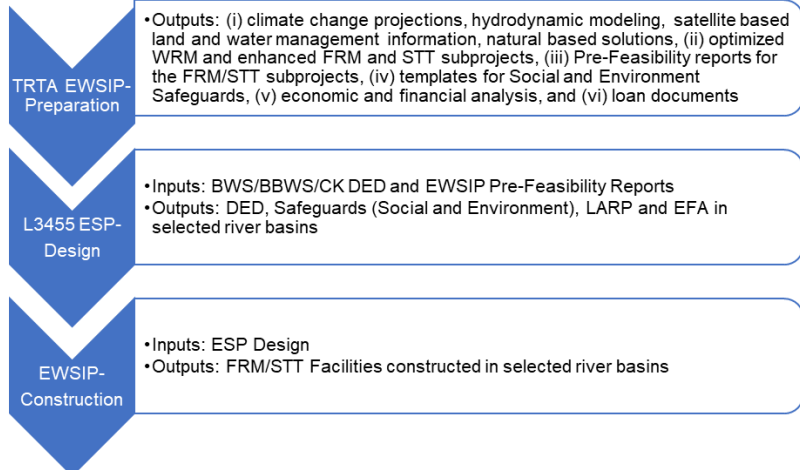
	STT Subproject	<b>Dadi Muria Regional Water Supply System</b>
1	<b>River Basin</b>	Jratunseluna
2	<b>Main River</b>	Serang-Lusi
3	<b>Location of Intake/Water Source (District/Province)</b>	<p>Intake is located in the upstream of Klambu Kudu Barrage in Kab. Grobogan / Central Java.</p> <p>Klambu Kudu Barrage receives water from Kedung Ombo Reservoir located about 60 km at the upstream of the barrage.</p> <div style="text-align: center;">  <p><i>Aerial view of Klambu Barrage</i></p> </div>
4	<b>Water Availability</b>	<p>Water availability upstream of the existing/proposed barrage/reservoir facilities is evaluated by using the Neraca<sup>1</sup> (2016), documented by the Government by Indonesia.</p> <p>The barrage receives water released from Kedung Ombo Reservoir, which is located approximately 60.2 km upstream of the barrage. The upstream catchment area of Klambu Barrage is about 3,207 km<sup>2</sup>. Referring to Neraca document, Klambu Barrage is located in Water District (WD) Serang Hilir Kedungombo. By using weighted average of the catchment area between Klambu Barrage and water district, the average annual water discharge and 80% reliable water upstream of the catchment are estimated about 2,775 mill.m<sup>3</sup>/year and 1,777 mill.m<sup>3</sup>/year or equal to 88 m<sup>3</sup>/s and 56 m<sup>3</sup>/s.</p> <p>A detailed analysis should be undertaken by the ESP Consultant through use of hydrologic modelling and associated hydrometeorological, land use and land cover parameters to characterize historical conditions and future conditions via climate change.</p> <p>The main findings of a regional ADB technical assistance project in Indonesia indicate that the average precipitation is expected to change by ±5% by 2030, and by ±10% by 2050.</p> <p>There are similar findings identified by BMKG, the national agency of Indonesia for climate change studies.</p> <p>ESP consultant should evaluate site-specific conditions by using BMKG driven climate change products and associated impact on the water availability upstream of the existing/proposed storage facilities.</p>

<sup>1</sup> DGWR-MPWH. 2016. Penyusunan Peta Ketersediaan Air (Preparation of Water Availability Map

5	<p><b>Sediment Yield</b></p>	<p>A recent study by the EWSIP international partner-European Space Agency (ESA) indicated that expected erosion levels in the watershed of Jratunseluna basin varies, and the highest erosion rate is expected to be 480 ton/ha/year (see below).</p> <div style="text-align: center;">  <p>Erosion Potential in Jratunseluna Watershed</p> <table border="1" data-bbox="496 797 1378 1115"> <thead> <tr> <th rowspan="2">Erosion level*</th> <th colspan="2">Current Annual precipitation</th> <th colspan="2">5% Precipitation increase</th> <th colspan="2">10% Precipitation increase</th> <th colspan="2">15% Precipitation increase</th> </tr> <tr> <th>Area km<sup>2</sup></th> <th>Area %</th> <th>Area km<sup>2</sup></th> <th>Area %</th> <th>Area km<sup>2</sup></th> <th>Area %</th> <th>Area km<sup>2</sup></th> <th>Area %</th> </tr> </thead> <tbody> <tr> <td>Very light</td> <td>5,289.48</td> <td>56.50</td> <td>5,195.32</td> <td>55.50</td> <td>5,106.55</td> <td>54.55</td> <td>5,022.38</td> <td>53.65</td> </tr> <tr> <td>Light</td> <td>2,390.11</td> <td>25.53</td> <td>2,409.13</td> <td>25.73</td> <td>2,424.89</td> <td>25.90</td> <td>2,438.13</td> <td>26.04</td> </tr> <tr> <td>Moderate</td> <td>1,128.77</td> <td>12.06</td> <td>1,166.09</td> <td>12.46</td> <td>1,201.27</td> <td>12.83</td> <td>1,235.43</td> <td>13.20</td> </tr> <tr> <td>Heavy</td> <td>465.77</td> <td>4.98</td> <td>491.20</td> <td>5.25</td> <td>515.73</td> <td>5.51</td> <td>538.64</td> <td>5.75</td> </tr> <tr> <td>Very heavy</td> <td>87.48</td> <td>0.93</td> <td>99.87</td> <td>1.07</td> <td>113.16</td> <td>1.21</td> <td>127.02</td> <td>1.36</td> </tr> </tbody> </table> <p>Erosion Potential in Jratunseluna Watershed</p> <p>* Erosion levels: very light: &lt; 15 ton/ha/year, light: 15 – 60, moderate: 60 -180, heavy: 180-480, very heavy &gt; 480  The evaluation was based on ESA satellite images and the potential erosion was calculated using RUSLE (Revised Universal Soil Loss Model)  Source: European Space Agency, 2018</p> <p>ESP Consultant shall evaluate the sediment yield upstream of existing/proposed facilities in further detail by reviewing existing/proposed conditions for land use/land cover and meteorological conditions.</p> </div>	Erosion level*	Current Annual precipitation		5% Precipitation increase		10% Precipitation increase		15% Precipitation increase		Area km <sup>2</sup>	Area %	Area km <sup>2</sup>	Area %	Area km <sup>2</sup>	Area %	Area km <sup>2</sup>	Area %	Very light	5,289.48	56.50	5,195.32	55.50	5,106.55	54.55	5,022.38	53.65	Light	2,390.11	25.53	2,409.13	25.73	2,424.89	25.90	2,438.13	26.04	Moderate	1,128.77	12.06	1,166.09	12.46	1,201.27	12.83	1,235.43	13.20	Heavy	465.77	4.98	491.20	5.25	515.73	5.51	538.64	5.75	Very heavy	87.48	0.93	99.87	1.07	113.16	1.21	127.02	1.36
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6	<p><b>Areas to be Served</b></p>	<p>The areas to be served include Kota Semarang and Kabupaten Demak, who are administered by the Provincial Governments of Central Java.</p> <p>The proposed raw water allocation (including drinking water) from the Jragung Reservoir is summarized below:</p> <table data-bbox="491 1659 772 1827"> <tr> <td>Kab Grobogan</td> <td>100 lps</td> </tr> <tr> <td>Kab Kudus,</td> <td>110 lps</td> </tr> <tr> <td>Kab. Pati</td> <td>100 lps</td> </tr> <tr> <td>Kab Jepara</td> <td><u>190 lps</u></td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>500 lps</b></td> </tr> </table>	Kab Grobogan	100 lps	Kab Kudus,	110 lps	Kab. Pati	100 lps	Kab Jepara	<u>190 lps</u>	<b>TOTAL</b>	<b>500 lps</b>																																																				
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7	<p><b>Institutions Involved</b></p>	<p>DGWR, BBWS Pemali Juana, DGHS, BP2W, Bappeda Kab. Grobogan, Bappeda Kab. Kudus, Bappeda Kab Pati and Bappeda Kab. Jepara.</p> <p>The related offtaker PDAMs.</p>																																																														

<p>8</p>	<p><b>Proposed Works</b></p>	<p>Dadimuria STT system needs an intake and water transmission pipeline from intake to a WTP with capacity of 500 lps, distribution pipelines to target kabupatens and its offtake reservoirs. It needs pumping to extract water from the upstream of Klambu Barrage and transmit to the WTP. This system will be further analyzed by the ESP consultant by using an integrated hydraulic modelling structured in an STT setting.</p>  <p style="text-align: center;">Schematic System</p>																																			
<p>9</p>	<p><b>Upstream Watershed Protection</b></p>	<p>In order to optimize amount of sediment yield and associated impacts on the life cycle of existing/proposed facilities, upstream watershed protection measures must be introduced by the ESP Consultant.</p> <p>The global applications introduced by the International Fund for Agriculture Development and FAO should be evaluated by the ESP Consultant to identify applications for site-specific actions.</p>																																			
<p>10</p>	<p><b>Implementation Plan</b></p>	<p>DED, AMDAL, and LARAP will be prepared under ESP in 2020-2021. Land acquisition might be conducted in 2021-2022. The Dadi Muria STT likely will start in 2022 and followed by the downstream system in 2022 until 2024.</p> <table border="1" data-bbox="497 1630 1248 1877"> <thead> <tr> <th>Works</th> <th>2020</th> <th>2021</th> <th>2022</th> <th>2023</th> <th>2024</th> <th>2025</th> </tr> </thead> <tbody> <tr> <td>Land Acquisition by Central Jawa Province or PDAM Tirta Utama</td> <td></td> <td>■</td> <td>■</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Water Supply System DED Preparation by completely by Loan 3455 INO ESP</td> <td>■</td> <td>■</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>RWS Intake and Transmission Construction by BBWS Pemali Juana</td> <td></td> <td></td> <td>■</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Water Supply Production and Distribution System Construction by DGHS</td> <td></td> <td></td> <td>■</td> <td>■</td> <td>■</td> <td></td> </tr> </tbody> </table> <p>The schedule above is excluding the implementation schedule for house connection. ESP consultant will complete this schedule.</p>	Works	2020	2021	2022	2023	2024	2025	Land Acquisition by Central Jawa Province or PDAM Tirta Utama		■	■				Water Supply System DED Preparation by completely by Loan 3455 INO ESP	■	■					RWS Intake and Transmission Construction by BBWS Pemali Juana			■				Water Supply Production and Distribution System Construction by DGHS			■	■	■	
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11	<b>Beneficiaries</b>	Approximately 250,000 people of Grobogan, Pati, Kudus and Jepara population will have access to drinking water.
12	<b>Alignment with Spatial Plan</b>	The subproject is consistent with the spatial plan of Central Java year 2009-2029.
13	<b>Potential Environment Impact</b>	<p>The subproject works are not expected to cross any protected area (forest/swamp), biodiversity sanctuary or protect forest, according to Indonesia Forest Area Map 2019 by Ministry of Environment and Forestry.</p>  <p>There are no documents on environmental impacts (i.e., IEE, AMDAL, etc.)</p>
14	<b>Potential Involuntary Resettlement</b>	<p>The subproject is expected to affect 3 ha of (agriculture/estate) land, and 3,725 households. The main impact is expected along the pipe route</p> <p>There are no documents on land acquisition, socio-economic conditions and resettlement needs along the project corridor (i.e, LARAP, IP&amp;IR, etc.)</p>
15	<b>Potential Indigenous People Impact</b>	<p>The proposed subproject doesn't cross any IP area according to the BRWA (Registration Agency of Indigenous Community Territories) map as shown below.</p>  <p>The potential for crossing areas with Indigenous People (IP) should be evaluated by i) reviewing the BRWA (Indigenous Territory Registration Agency) database, ii) reviewing the AMAN (Indigenous Peoples Alliance of the Archipelago) database, and iii) site-specific surveys by the ESP Consultant during Detailed Engineering Design.</p>

16	<b>Readiness (FS/DED/IEE-EIA/LARP)</b>	DED and AMDAL were prepared on 2012 but in 2017 was recommended to be revised. There is no LARP document available.
17	<b>Proposed Enhancements</b>	<p>Enhancements to be administered through the STT framework include the following:</p> <ol style="list-style-type: none"> <li>Automatization system (SCADA system) of the water treatment process control for efficiency improvement and monitoring.</li> <li>Smart meter reading and smart billing system to minimize error reading hence minimize the administrative losses.</li> <li>Sludge management of the excess sludge from the Water Treatment Plant process through design and construction of sludge treatment plant and train the PDAM staff in sludge management and handling.</li> <li>Establishment of District Metered Areas (DMAs) as part of a Non-Revenue Water management system and stay equipped with calibrated telemetry water meter instruments for managing water flows and Non-Revenue Water reduction program.</li> <li>Development of an integrated asset management system via GIS to allow PDAM's efficient management of assets through operation and maintenance activities by including capacity building to the water utilities (PDAM) staff.</li> <li>Development of a real-time operation system equipped with SCADA network, integrated hydraulic model, real-time monitoring of gage network along the integrated STT system.</li> <li>Improvement in the technical operation and maintenance (O&amp;M) through energy efficiency and Non-Revenue Water Management by including capacity building.</li> <li>Introduction of smart water technologies through use of automated and telemetry control of hydrometric equipment along the integrated STT system (reservoir, water treatment plant, pumps/valves along the water transmission/distribution network) for operational efficiency and optimization.</li> <li>Consideration for use of renewable energy sources along the integrated STT system including i) pumped hydropower schemes in reservoirs, ii) solar panels (green technology) at water treatment and water distribution/transmission network to produce the power for pump as Indonesia is located in tropical area (high solar radiation and renewable energy).</li> </ol>
18	<b>Linkages between EWSIP and ESP</b>	<p>The linkages between the TRTA, Engineering Services Project (ESP), DED, and construction under EWSIP are schematized below:</p>  <pre> graph TD     A[TRTA EWSIP-Preparation] --&gt; B[L3455 ESP-Design]     B --&gt; C[EWSIP-Construction]   </pre> <ul style="list-style-type: none"> <li><b>TRTA EWSIP-Preparation</b> <ul style="list-style-type: none"> <li>•Outputs: (i) climate change projections, hydrodynamic modeling, satellite based land and water management information, natural based solutions, (ii) optimized WRM and enhanced FRM and STT subprojects, (iii) Pre-Feasibility reports for the FRM/STT subprojects, (iv) templates for Social and Environment Safeguards, (v) economic and financial analysis, and (vi) loan documents</li> </ul> </li> <li><b>L3455 ESP-Design</b> <ul style="list-style-type: none"> <li>•Inputs: BWS/BBWS/CK DED and EWSIP Pre-Feasibility Reports</li> <li>•Outputs: DED, Safeguards (Social and Environment), LARP and EFA in selected river basins</li> </ul> </li> <li><b>EWSIP-Construction</b> <ul style="list-style-type: none"> <li>•Inputs: ESP Design</li> <li>•Outputs: FRM/STT Facilities constructed in selected river basins</li> </ul> </li> </ul>

