Environmental and Social Considerations in Development Study  
(Master Plan Study)

1. Full Title of the Study:

Project for the Master Plan Study of Hydropower Development in Indonesia

2. Type of the Study: Master Plan

3. Categorization and its Reason: Category “A”

The Study classification as “Category A” is due to the following reasons:

1) The projects which will be selected in the Study may cause serious negative environmental and social impact including involuntary resettlement, water usage or water rights, and degradation of water quality.

4. Agency or Institution Responsible for the Implementation of the Study:

1) Ministry of Energy and Mineral Resources: MEMR
2) PT. PLN (Persero): PLN

Figure 1: Counterpart Agencies
5. Outline of the Study

5.1 Objectives

The Study aims at technical assistance to formulate the hydropower development master plan based on the economic and industrial development of Indonesia in future. The Study aims for contributing to the stable power supply necessary to support the economic growth of Indonesia through hydropower development based on the formulated master plan. Followings are taken into account for formulating the master plan.

1) The master plan will be based on the power sector plan, and be consistent with the latest power demand forecast and the transmission line plan.

2) Role of hydropower in each region/river/system will be examined.

3) Prioritization of candidate sites for hydropower development will be conducted, and concrete investment program shall be established.

4) Pre-feasibility level study shall be conducted for selected prospective plans.

5.2. Justification

Ten years have passed since the previous hydropower potential study in Indonesia was conducted. There is a possibility that the previous study result does not show the current situation of environmental and social considerations requirement as well as energy demand. From this viewpoint, hydropower development plan is necessary to be reviewed and updated.

5.3. Location

The Study will cover the whole country of Indonesia.

5.4. Proposed Activities

Proposed activities include preparation of the hydropower development master plan for entire Indonesia and pre-feasibility study for two prioritized potential projects to be selected in this study.

5.5. Scope of the Study

The Study consists of four stages with the scopes as follows;
Stage 1: Collection and examination of relevant data and information
1) Collection of relevant data and information and joint revision
2) Examination of data and information
3) Selection of prioritized power systems
4) First stakeholder meeting

Stage 2: Identification of prospective hydropower projects
1) Identification of prospective hydropower projects to be conducted
2) Study on required legal and institutional framework

Stage 3: Field investigation for selected prospective hydropower projects
1) Second stakeholder meeting
2) Field investigation
3) Update of prospective hydropower projects
4) Preliminary design and cost estimation of prospective hydropower project

Stage 4: Update of Master Action Plan
1) Update of long term power sector development plan
2) Update of development scale and commissioning schedule
3) Financial and economic evaluation
4) Third stakeholder meeting
5) Recommendation for hydropower development in Indonesia

6. Description of the Study Area

6.1. Environmental and Social Condition

1) Natural Environment

- Protected Area

The Law No. 40/1999 categorizes forest into three categories such as conservation forest, protection forest and productive forest. The conservation forest includes sanctuary forest (i.e., natural sanctuary forest, and animal/wild life sanctuary forest), nature conservation forest (i.e., national park, grand forest park, and nature tourism park), and game hunting park. The protection forest has a function to prevent flood or erosion as well as to fertilize soil. The productive forest has a function to produce material. Selection of prioritized projects and preparation of master plan will be done by pay much attention to prevent adverse impact to
protected area.

- Protected Species

The Law No. 5/1990 defines species to be protected, and each province defines species to be protected according to the law. On the other hand, IUCN also defines protected species though protected species between the Law No. 5/1990 and IUCN is not necessarily same. The following figure summarizes endangered species in IUCN red list.

Table 1: Summery of Endangered Species

<table>
<thead>
<tr>
<th>Category</th>
<th>Critically Endangered</th>
<th>Endangered</th>
<th>Vulnerable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td>16</td>
<td>33</td>
<td>72</td>
<td>121</td>
</tr>
<tr>
<td>Mammals</td>
<td>15</td>
<td>44</td>
<td>87</td>
<td>146</td>
</tr>
<tr>
<td>Reptiles</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Amphibians</td>
<td>3</td>
<td>10</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>Fishes</td>
<td>6</td>
<td>6</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>Plants</td>
<td>113</td>
<td>70</td>
<td>204</td>
<td>387</td>
</tr>
</tbody>
</table>

Source: 2006 IUCN Red List of Threatened Species

2) Social Environment

- Population

According to the census data conducted in 2005, population of entire Indonesia is below.

Table 2: Summery of Population Distribution

(Unit: thousand people)

<table>
<thead>
<tr>
<th>Island/Province</th>
<th>Population in 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sumatra</td>
<td>46,294.6</td>
</tr>
<tr>
<td>Java</td>
<td>123,793.1</td>
</tr>
<tr>
<td>Jakarta</td>
<td>8,699.6</td>
</tr>
<tr>
<td>Bali</td>
<td>11,861.3</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>12,583.2</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>15,997.7</td>
</tr>
<tr>
<td>Maluku/ Papua</td>
<td>4,674.8</td>
</tr>
<tr>
<td>Total</td>
<td>219,204.7</td>
</tr>
</tbody>
</table>

Source: Population Census Data in 2005
- Cultural and Historical Properties

There are three places of cultural heritages and four places of natural heritages which are registered at UNESCO.

Table 3: List of UNESCO Registered Properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Island/Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Heritage</td>
<td></td>
</tr>
<tr>
<td>Borobudur Temple Compounds</td>
<td>Central Java</td>
</tr>
<tr>
<td>Prambanan Temple Compounds</td>
<td>Central Java</td>
</tr>
<tr>
<td>Sangiran Early Man Site</td>
<td>Central Java</td>
</tr>
<tr>
<td>Natural Heritage</td>
<td></td>
</tr>
<tr>
<td>Komodo National Park</td>
<td>East Nusa Tenggara</td>
</tr>
<tr>
<td>Ujung Kulon National Park</td>
<td>Banten and Lampung</td>
</tr>
<tr>
<td>Lorentz National Park</td>
<td>Papua</td>
</tr>
<tr>
<td>Tropical Rainforest Heritage</td>
<td>Sumatra Island</td>
</tr>
</tbody>
</table>


- Ethnic Minority and Ingenious People

The ethnic groups in Indonesia are classified into three groups such as Javanese group, Sumatra group, and Kalimantan group. The population census in 2000 shows the ethnic distribution in Indonesia as follows.

Table 4: Distribution of Ethnic Groups in Indonesia

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Rate (%)</th>
<th>Ethnic Group</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javanese</td>
<td>40.6</td>
<td>Sundanese</td>
<td>15</td>
</tr>
<tr>
<td>Madurese</td>
<td>3.3</td>
<td>Minangkabau</td>
<td>2.7</td>
</tr>
<tr>
<td>Betawi</td>
<td>2.4</td>
<td>Bugis</td>
<td>2.4</td>
</tr>
<tr>
<td>Baten</td>
<td>2</td>
<td>Banjar</td>
<td>1.7</td>
</tr>
<tr>
<td>Others</td>
<td>29.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Population Census 2000

7. Legal framework of environmental and social considerations

7.1. Relevant Laws, Regulations and Standards

1) Natural Environment
- Law No. 5/1990: Conservation of living natural resources and its ecosystem
- Law No. 40/1990: Forestry
- Law No. 23/1997: Management of living environment
- Presidential Decree No. 32/1990: Management of protected area
- Decree of Ministry of Environment No. 48/MENLH/11/1996: Noise standards
- Decree of Ministry of Environment No. 49/MENLH/11/1996: Vibration standards
- Decree of Ministry of Environment No. 50/MENLH/11/1996: Odor standards
- Government Regulation No.7/1999: Protection of plant and animal species
- Government Regulation No. 19/1999: Seawater pollution control
- Government Regulation No. 41/1999: Air quality management and pollution control
- Government Regulation No. 82: Water quality management and pollution control
- Government regulation No. 74: Hazardous waste material management

2) Social Environment
- Law No. 5/1960: Basic Agrarian Law
- Law No. 5/1992: Cultural Heritage Objectives
- Law No. 24/1992: Spatial Use Management
- Presidential Decree No. 36/1993: Procurement of Land for Realizing the Development for Public Interest (revised decree of Presidential Decree No. 55/1993 concerning Land Acquisition for the Development in the Public Interest)
- Government Regulation No. 10/1993: Protection of cultural heritage
- Government Regulation No. 24/1997: Land Registration
- State Minister of Agrarian Affairs Decree No. 5/1990: Guideline for the Settlement of Problems related to the Communal Reserved Land of the Customary-law-abiding Community
- Presidential Decree No. 36/2005: Provision of land for development in public interest

3) Environmental Impact Assessment
- Decree of State Minister of Environment No. 56/1996: Criteria on significant environmental impact
- Decree of Head of BAPEDAL No. KEP299/11/1996: Guideline of social aspect in AMDAL
- Decree of Head of BAPEDAL No. KP124/12/1997: Guideline of public health aspect in AMDAL
- Governmental Regulation No. 27/1999: Environmental Impact Analysis (AMDAL)
- Presidential Decree No. 10/2000: Environmental Impact Management Agency (BAPEDAL)
- Decree of Minister of Environment No. 2/MENLH/02/200: Guideline of AMDAL document evaluation
- Decree of Ministry of Environment No. 4/MENLH/02/2000: Guideline of preparing AMDAL document of integrated residential development activity
- Decree of Ministry of Environment No. 5/MENLH/2000: Guideline of preparing AMDAL document for development activity in wetland area
- Decree of Ministry of Environment No. 8/MENLH/02/2000: Public involvement and information release on the analytical process concerning AMDAL
- Decree of Ministry of Environment No. 9/MENLH/02/2000: Designing guideline of environmental impact assessment
- Decree of Ministry of Environment No. 17/2001: Type and size of business and/or activities requiring AMDAL document

7.2. Relevant Agency and Institutions

1) Ministry of Environment
2) Ministry of Forest

8. Provisional Scoping

Result of provisional scoping is as seen in Attachment-1.

9. Alternatives to the Project Activities including ‘Without Project’ Option

9.1. Without Project

In the case of without project, negative impact to natural and social environment will not be occurred. However, without project will cause negative impact to economic development since sufficient power supply will not be secured.

9.2. Other Alternatives

Development type, scale and layout will be studied.

10. Result of the Consultation with Recipient Government on Environmental and Social Consideration including Roles and Responsibilities

Consultation on Inception Report was held at the coordination committee which was composed of MEMR and PLN, and main agreements were described below.
- Disclosing final report of the study on the JICA web-site
- Conducting site investigation of prioritized projects at pre-feasibility study level
- Examining optimum size of prioritize projects at the Stage 3 study level
- Core counterparts in PLN are both of System Planning Division and Renewable Energy Division.

At the first stakeholder meeting held on 16th February 2010 jointly by MEMR and PLN, it was confirmed that the Study might be conducted according to JICA Guidelines for Environmental and Social Considerations (April, 2004).

11. Terms of Reference for Environmental and Social Considerations

Environmental and social considerations study should be included, but not limited to, as follows.
1) collecting relevant data and information, and interpreting them
2) conducting site reconnaissance
3) preparation of TOR for environmental sub-contract work
4) supervising environmental sub-contract work
5) supporting to conduct stakeholder meetings
6) conducting technical transfer to counterparts through OJT activities
### Checklist for Scoping (For all Projects)

<table>
<thead>
<tr>
<th>No.</th>
<th>Impacts</th>
<th>Rating</th>
<th>a Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Social Environment: *Regarding the impacts on “Gender” and “Children’s Right”, might be related to all criteria of Social Environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Involuntary Resettlement</td>
<td>A</td>
<td>Run-of-river type development will not cause substantial resettlement, meanwhile reservoir type may cause that.</td>
</tr>
<tr>
<td>2</td>
<td>Local economy such as employment and livelihood, etc.</td>
<td>B</td>
<td>Opportunity of employment for farming or fishery may decrease.</td>
</tr>
<tr>
<td>3</td>
<td>Land use and utilization of local resources</td>
<td>B</td>
<td>Construction of hydropower plant may cause effective utilization of land and local resources.</td>
</tr>
<tr>
<td>4</td>
<td>Social institutions such as social infrastructure and local decision-making institutions</td>
<td>B</td>
<td>Resettlement may cause some impact on social institutions of local community.</td>
</tr>
<tr>
<td>5</td>
<td>Existing social infrastructures and services</td>
<td>B</td>
<td>Resettlement may cause some impact on existing social infrastructure and services of local community.</td>
</tr>
<tr>
<td>6</td>
<td>The poor, indigenous and ethnic people</td>
<td>A</td>
<td>Territory of ethnic people may be affected due to construction of dam.</td>
</tr>
<tr>
<td>7</td>
<td>Misdistribution of benefit and damage</td>
<td>B</td>
<td>If fishermen could not catch fish after operation of a dam, it might be misdistribution of benefit and damage.</td>
</tr>
<tr>
<td>8</td>
<td>Cultural heritage</td>
<td>B</td>
<td>Significant impact on cultural heritage can be prevented by considering it at the stage of site selection.</td>
</tr>
<tr>
<td>9</td>
<td>Local conflict of interests</td>
<td></td>
<td>There may not be local conflict of interests.</td>
</tr>
<tr>
<td>10</td>
<td>Water Usage or Water Rights and Rights of Common</td>
<td>A</td>
<td>Significant impact may occur for water usage downstream in the river due to construction of dam.</td>
</tr>
<tr>
<td>11</td>
<td>Sanitation</td>
<td>B</td>
<td>Some impact may be given on sanitation downstream in the river due to construction of dam.</td>
</tr>
<tr>
<td>12</td>
<td>Hazards (Risk) Infectious diseases such as HIV/AIDS</td>
<td>B</td>
<td>A lot of laborers and people concerned will come into the area around the site from outside.</td>
</tr>
<tr>
<td></td>
<td>Natural Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Topography and Geographical features</td>
<td>B</td>
<td>Excavation of open structures may cause alteration of topography.</td>
</tr>
<tr>
<td>14</td>
<td>Groundwater</td>
<td>B</td>
<td>Some impact will be given on groundwater due to change of surface water flow as well as underground tunnel excavation.</td>
</tr>
<tr>
<td>15</td>
<td>Soil Erosion</td>
<td>B</td>
<td>Countermeasure for soil erosion may be required for areas of excavation and embankment.</td>
</tr>
<tr>
<td>16</td>
<td>Hydrological Situation</td>
<td>B</td>
<td>Flood discharge may be changed due to dam construction.</td>
</tr>
<tr>
<td>17</td>
<td>Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)</td>
<td>B</td>
<td>As most of hydropower projects are located in mountainous areas, impact on coastal zone is assumed to be minimal.</td>
</tr>
<tr>
<td>18</td>
<td>Flora, Fauna and Biodiversity</td>
<td>B</td>
<td>Significant impact will be minimized by keeping away of protected area like National parks and taking into consideration conservation of endangered flora, fauna and ecosystem.</td>
</tr>
<tr>
<td>19</td>
<td>Meteorology</td>
<td></td>
<td>No impact is assumed on meteorology.</td>
</tr>
<tr>
<td>20</td>
<td>Landscape</td>
<td>B</td>
<td>Some impact may be given on landscape.</td>
</tr>
<tr>
<td>21</td>
<td>Global Warming</td>
<td>B</td>
<td>Green trees on the site for reservoir will be lost.</td>
</tr>
<tr>
<td></td>
<td>Pollution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Air Pollution</td>
<td>B</td>
<td>Air pollution may increase due to traffic of vehicles for construction.</td>
</tr>
<tr>
<td>23</td>
<td>Water Pollution</td>
<td>B</td>
<td>Water quality may be deteriorated due to decrease of discharge in the river.</td>
</tr>
<tr>
<td>24</td>
<td>Soil Contamination</td>
<td></td>
<td>Impact on soil contamination will be minimal.</td>
</tr>
<tr>
<td>25</td>
<td>Waste</td>
<td>B</td>
<td>Some amount of waste will be discharged during construction.</td>
</tr>
<tr>
<td>26</td>
<td>Noise and Vibration</td>
<td>B</td>
<td>Noise and vibration may increase due to heavy machine and vehicles for construction.</td>
</tr>
<tr>
<td>27</td>
<td>Ground Subsidence</td>
<td></td>
<td>Impact on ground subsidence will be minimal.</td>
</tr>
<tr>
<td>28</td>
<td>Offensive Odor</td>
<td></td>
<td>Impact on offensive odor will be minimal.</td>
</tr>
<tr>
<td>29</td>
<td>Bottom sediment</td>
<td>B</td>
<td>Bottom sediment in regulating ponds may be flushed or removed.</td>
</tr>
<tr>
<td>30</td>
<td>Accidents</td>
<td>B</td>
<td>Some accidents may occur due to construction.</td>
</tr>
</tbody>
</table>

Rating:

- A: Serious impact is expected.
- B: Some impact is expected.
- C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
- No Mark: No impact is expected. IEE/EIA is not necessary.