Technical Assistance Report

Project Number: 39537
December 2005

Technical Assistance
Socialist Republic of Viet Nam:
Implementation of the Environmental Management Plan for the Son La Hydropower Project
(Financed by the Government of Finland)

Asian Development Bank
CURRENCY EQUIVALENTS
(as of 23 November 2005)

Currency Unit – dong (D)
D1.00 = $0.000063
$1.00 = D15,905

ABBREVIATIONS

ADB – Asian Development Bank
EIA – environmental impact assessment
EMP – environmental management plan
EVN – Electricity of Viet Nam
MONRE – Ministry of Environment and Natural Resources
SLHPP – Son La Hydropower Project
TA – technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification – Targeted intervention
Sector – Energy
Subsector – Energy sector development
Themes – Capacity development, environmental sustainability
Subthemes – Natural Resources conservation, environmental policy and legislation

NOTE

In this report, "$" refers to US dollars.

Vice President L. Jin, Vice President, Operations Group 1
Director General R. Nag, Mekong Department
Director J. Cooney, Infrastructure Division, Mekong Department
Team leader S. Tu, Environment Specialist, Mekong Department
I. INTRODUCTION

1. The Government of the Socialist Republic of Viet Nam requested assistance from the Asian Development Bank (ADB) to build the capacity of Electricity of Viet Nam (EVN) in implementing the Environmental Management Plan (EMP) for the Son La Hydropower Project (SLHPP). A Fact-Finding Mission visited Viet Nam in August 2005 and reached understanding with the Government on the objective, scope, cost estimates, financing, and implementation arrangements for the technical assistance (TA). The design and monitoring framework for the TA is in Appendix 1.

2. The TA focuses on achieving sustainable and environmentally sound development of the energy sector in Viet Nam. The TA aims at building the capacity of EVN in environmental management best practices in relation to developing its hydropower resources, the benefits of which will include poverty reduction and sustainable livelihood programs for the downstream area of the SLHPP. This is in line with the Government’s priorities for poverty reduction as outlined in its comprehensive poverty reduction and growth strategy and other documents.

3. Implementation of an improved EMP for the SLHPP will help those affected by the Project to enhance their livelihoods and will help mitigate the Project’s environmental impacts in a sustainable manner. In addition, capacity built in EVN to employ best practices in implementing the EMP for areas upstream and downstream from the SLHPP can be extended to other EVN power projects.

II. ISSUES

4. Electricity demand in Viet Nam grew at an annual rate of 15% during 2000–2004 and is projected to continue to grow at this rate until 2010, and then at 12% per year until 2015. To meet this demand, the Government and EVN expect to double installed generating capacity from 10,871 megawatts in 2004 to 22,600 megawatts by 2010. In addition, high-voltage and medium-voltage transmission and distribution systems need to be improved to deal with transmission bottlenecks and reduce losses. EVN’s master plan for the power sector for 2000–2010 emphasizes the importance of developing hydropower along with other generation technologies, mainly because of the country’s abundant water resources and hydropower’s cheaper generation costs. However, the country’s large hydropower projects, such as the 2,400-megawatt Son La hydropower plant, are expected to have significant environmental and social impacts, especially downstream. In provinces such as Lai Chau and Son La and in the central highlands, where large hydropower projects are planned, the poverty rate is significantly higher than the national average. Therefore addressing livelihood enhancement issues for those affected through improved environmental management is as important as developing the power projects.

5. ADB’s past involvement in the power sector in Viet Nam focused on extending and rehabilitating existing substations and distribution networks. To support EVN’s long-term need for growth of the generating and distribution capacity, ADB approved the $120.0 million Northern Power Transmission Sector Project to improve the reliability and quality of high-voltage transmission network in the northern region. A follow-up project, the Northern Power Transmission Expansion Sector Project (targeted for approval in December 2005), is currently being prepared to further strengthen transmission networks to enable the evacuation of power from generation projects currently under construction, improve north-south transmission, and

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reduce system losses. Further ADB assistance to the sector will be for power generation projects, such as the Song Bung 4 Hydropower Project and the Moung Duong Coal Power Project.\(^4\) Given that ADB’s focus in the power sector over the next 5 to 10 years will be power generation projects, there is a need to help build EVN’s capacity to address the adverse impacts of such projects and support sustainable development in project areas. The SLHPP is the largest hydropower scheme planned for the country and is part of a master plan for the hydropower development cascades on the Da River listed in the Fifth Power Development Plan (2000 – 2005). The Project is financed by the Government and EVN for about $2.5 billion (ADB is not involved in its financing) and is linked to the proposed Northern Power Transmission Expansion Sector Project. The mitigation of SLHPP’s long-term environmental impacts requires adequate attention to implementation and monitoring by EVN, whose capacity in this respect needs to be built.

6. The Government has various laws and requirements that are relevant to this TA, including the 1994 Environmental Protection Law, which is being amended; the Water Law, which governs rights of access to water and to fish in rivers; a law governing the rights to access forest resources, and so on. The Ministry of the Environment and Natural Resources (MONRE), the authority for issues pertaining to environmental safeguards, and EVN have both recognized that the country’s capacity for formulating and implementing EMPs for major hydropower projects has been weak and showed strong interest in receiving assistance. EVN, in particular, has not only taken the initiative in drafting the initial EMP, but has also expressed its desire to undertake measures to improve its EMP and to build its capacity.

7. An environmental and social due diligence study conducted in 2005 for the SLHPP concluded that the Son La power management board is proceeding with a modest EMP only for the upstream area. This EMP, the first EMP prepared for a hydropower project of national significance by EVN, covers the scope of standard impact mitigation activities. ADB reviewed the EMP and found that it could be further improved. In particular, it needed to include a comprehensive list of mitigation and monitoring activities with indicative budgets and institutional arrangements. Livelihood restoration and enhancement programs, such as aquaculture in the reservoir as part of the program to manage downstream impacts, will also be useful. ENV has requested TA to improve the EMP for SLHPP and to build its capacity to implement the EMP. EVN envisages the EMP as a prototype for future power projects.

8. An environmental impact assessment (EIA) for the SLHPP was submitted to MONRE and the National Assembly for review and is still being revised. The EIA focused on assessing potential impacts, but did not include an EMP, nor did it address downstream impacts. The final EIA for the SLHPP is currently being prepared, and the EMP will become a chapter of that final EIA. The EMP prepared by the Son La power management board was meant to be used as a guide during project implementation until MONRE officially approves the final EIA. The lessons learned from formulating and implementing the EMP under this TA will be used to finalize the EMP for the final version of the EIA. EVN envisions a seamless transition from the current EMP to the final EMP. In addition, implementation of the improved EMP for the SLHPP will be carried out with the involvement of other hydropower project management boards that may soon need to devise their own EMPs, for example, for the Ban Chat and Huoi Quang hydropower plants. Participation by these other management boards is a first step toward replicating the results of

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the TA for other hydropower projects managed by EVN. Given that EVN is planning to undertake more than 20 hydropower projects in the next 10 years, opportunities to apply the lessons learned from the TA to future projects are substantial.

9. Estimates indicate that about 2,000 people currently live in the temporarily flooded area (depending on rainy or dry seasons) downstream from the Son La hydropower plant. The flooding will reduce people’s incomes by 10 to 50% by 2010, when the SLHPP becomes operational. Most of these people are vulnerable because of their high poverty rates (up to 45% in some communes); their ethnic origins (more than 60% of residents in most communes are minorities); their marginal living conditions (little arable land is available because of the mountainous terrain); and their resettlement in the 1980s during the construction of the Hoa Binh hydropower plant, which is located downstream from the planned Son La hydropower plant.

10. Without additional external assistance for the EMP, expectations are that (i) about 2,000 to 3,000 hectares of productive land in the temporarily flooded area will be lost permanently, but most households will not be compensated for this loss because they do not have formal titles to the land; (ii) EVN may not be able to restore the livelihoods of these households because of its limited experience in mitigating downstream impacts; and (iii) poverty rates will increase. Field surveys of the downstream area undertaken in July 2005 found that the potential to restore, if not improve, the livelihoods of those living downstream from the SLHPP is high. Local residents and authorities provided several suggestions in relation to livelihood restoration and enhancement, the most common of which included developing aquaculture for households losing productive land. By incorporating participatory rural appraisal methodology and the development of alternative livelihoods in the EMP and by involving relevant government agencies, nongovernment organizations, and other stakeholders, the expected downstream impacts could be mitigated significantly by providing assistance for pilot aquaculture and other livelihood restoration programs.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

11. The expected impact of this TA is the development of environmentally-sensitive power generation with an emphasis on sustainable development. The outcome will be EVN’s adoption of an EMP in line with best practices that is sustainable, environmentally sound, and sensitive to upstream and downstream impacts and affected stakeholders; the implementation of pilot livelihood enhancement programs; and the capacity building of EVN staff. Specifically, the TA’s purpose is to (i) improve the formulation and implementation of the EMP for the SLHPP by developing the monitoring mechanisms for the EMP, a realistic and sustainable implementation budget for the EMP, and the specific performance indicators for evaluating improvements in EMP outcomes (ii) build the capacity of EVN and the Son La power management board in EMP development and implementation; (iii) ensure that such capacity building is done in such a way that accumulated experience will be used for future hydropower projects; and (iv) formulate and implement a viable livelihood enhancement or restoration pilot program involving aquaculture for those people affected downstream of the SLHPP as part of the EMP. This TA will complement and build synergies with other ADB TAs for capacity building in relation to livelihood restoration for people affected by power generation projects.\

12. The proposed TA will focus on the following outputs: (i) an improved EMP with a

monitoring program and budgets, including pilot livelihood restoration and/or enhancement programs using a participatory approach with downstream stakeholders; (ii) the environmental specifications for contractors, for example, the environmental management requirements to be incorporated in contracts and method statements for site EMPs; and (iii) the holding of public disclosure and consultation events in areas affected by the Project. Expected TA results include (i) improved capacity of EVN and its power management boards to develop and implement hydropower EMPs; (ii) improved environmental quality in and near the SLHPP area; (iii) restored or enhanced livelihoods for people affected by the SLHPP, especially downstream communities, including by means of aquaculture and fish stocks; and (iv) shared lessons within EVN, with its other hydropower plant management boards, and with MONRE.

B. Methodology and Key Activities

13. Various methodologies will be employed to achieve the intended TA outputs, such as desk reviews, field surveys, workshops, and consultations. A participatory approach will be given priority when developing the livelihood enhancement pilot program with the affected people as part of the EMP mitigation measures. The TA will improve ownership and build awareness among decision makers and other stakeholders at the central and provincial levels, such as government agencies; the private sector; and civil society, including nongovernment organizations and representatives of those affected by power projects. The TA will be implemented from December 2005 through 2010, with its first activity being the establishment of a steering committee.

14. A small team of individually recruited consultants will help EVN modify, implement, monitor, and report on the EMP for the SLHPP. The assistance will be oriented toward ensuring that the EMP’s scope, content, and activities are in accordance with the safeguard requirements of the national and provincial governments, ADB, and other donors and with relevant international best practices. The targeted EMP will cover, but will not be limited to, the following: the Son La dam site, construction roads, diversion channels, resettlement sites, quarries, workers’ camps, waste disposal sites, materials staging and storage sites and other ancillary facilities, and identified sensitive areas both upstream and downstream from the SLHPP. It will cover preconstruction, construction, and operational phases.

15. A brief review of the hydropower sector’s experience with EMPs in the Greater Mekong Subregion will be conducted to serve as a reference for the TA work. Best practices will be a recurring theme for each component. Specific components of the TA activities will involve the following:

(i) Set up a monitoring system and performance indicators for the EMP, including (a) demonstrating the monitoring of mitigation measures to be undertaken by contractors (referred to as environmental performance monitoring) and documentation and corrections of these mitigation measures as applicable; (b) demonstrating the monitoring of the Project’s impacts on air, water, soil, and biodiversity (referred to as environmental effects monitoring) with documentation and corrections of these monitoring results, with a focus on downstream water quality; (c) reviewing the results of monitoring to assess the effectiveness of the mitigation measures applied; (d) preparing a sustainable and realistic budget for the EMP; and (e) recommending corrective action based on the results of the monitoring.

(ii) Help build capacity in EVN, including (a) assisting EVN to revise and improve the EMP in accordance with the safeguard requirements of ADB and other donors and following international best practices; (b) train staff from EVN, Son La Hydropower Project Management Board, and other related agencies in EMP formulation and implementation; and (c) draft contractor specifications for
environmental management and strengthen the awareness of construction contractors in relation to the design and implementation of their site EMPs. Guidance and assistance will be provided by the TA consultants for drafting these documents based on EMP best practices.

(iii) Engage in public participation and consultation, including (a) strengthening the use of a participatory approach in relation to EMP implementation and cooperation between project owners and related parties, such as MONRE and provincial departments of Natural Resources and Environment, and Agriculture and Rural Development; (b) conducting disclosure and consultation events with those affected by the Project; and (c) developing options for integrating the results of consultations into the Project and into improvements of the EMP.

(iv) Initiate pilot livelihood improvement activities by, for example, coordinating with the Danish International Development Agency’s fishery program in Son La province and other donor programs; conducting participatory rural appraisal; and testing the pilot livelihood improvement program to see its future applicability in the downstream area.

16. The consultants will provide interim and final reports and will disseminate summary reports in both Vietnamese and English to stakeholders by means of workshops and web sites, following approval by ADB, as part of the public communications and disclosure process.

B. Cost and Financing

17. The total cost of the TA is estimated at $1,050,000 equivalent, of which the foreign exchange cost is $700,000 and the local currency cost is $250,000. The Government has requested ADB to finance $800,000 equivalent, comprising the entire foreign exchange cost and a portion of the local currency cost. The TA will be financed on a grant basis by the Government of Finland and will be administered by ADB. The Government will finance the remaining cost of $250,000 equivalent of local currency costs through in-kind contributions. Detailed cost estimates and the financing plan are provided in Appendix 2.

C. Implementation Arrangements

18. The executing agency for the TA will be EVN. ENV will set up a steering committee to implement the TA activities that will consist of representatives from MONRE, the Ministry of Planning and Investment, the Ministry of Industry, the Ministry of Fisheries, the Ministry of Agriculture and Rural Development, provincial departments of Agriculture and Rural Development and Natural Resources and Environment, provincial and district peoples Committees, and EVN. The main role of the committee will be to guide the implementation of the TA and to advise on the overall policy direction. The team of individual consultants will be recruited in accordance with ADB’s Guidelines on the Use of Consultants and other arrangements acceptable to ADB for engaging domestic consultants. The TA will require a total of 54 person-months of consulting services, consisting of 28 person-months of domestic consultants and 26 person-months of international consultants in the areas of environmental assessment and aquaculture, and will be carried out over a 61-month period commencing in December 2005 and ending in December 2010. The outline terms of reference for the consultants are provided in Appendix 3.

IV. THE PRESIDENT’S DECISION

19. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of $800,000 to the Government of Viet Nam, to be financed on a grant basis by the Government of Finland, for the Implementation of the Environmental Management Plan for the Son La Hydropower Project, and hereby reports this action to the Board.
### DESIGN AND MONITORING FRAMEWORK

<table>
<thead>
<tr>
<th>Design Summary</th>
<th>Performance Targets/Indicators</th>
<th>Data Sources/Monitoring Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td>Five years after TA completion:</td>
<td>Government regulations pertaining to power generation projects, environmental assessment, and EMPs</td>
<td><strong>Assumptions</strong>&lt;br&gt;- The Government is committed to implementing the EMP on a pilot basis&lt;br&gt;- The Steering Committee participates fully in guiding the TA implementation.</td>
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<tr>
<td>Development of environmentally-sensitive power generation with an emphasis on sustainable economic growth</td>
<td>An EVN-wide system and staff for developing and implementing EMPs are in place</td>
<td>Semi-annual monitoring reports by EVN and Asian Development Bank staff and consultants’ reviews of the SLHPP’s performance</td>
<td></td>
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<tr>
<td>Records indicate that the livelihood enhancement program has improved the livelihoods of people downstream from the SLHPP</td>
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<tr>
<td><strong>Outcome</strong></td>
<td>Following TA completion:</td>
<td>Consultant reports, monitoring reports, and feedback from the Steering Committee and by EVN and the Ministry of Environment and Natural Resources in adopting them systematically</td>
<td></td>
</tr>
<tr>
<td>Best practices are adopted and monitoring for the EMP and the pilot livelihood enhancement programs are carried out</td>
<td>ENV management and staff recognize and accept EMP best practices and the pilot livelihood enhancement program has been evaluated as successful</td>
<td></td>
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<tr>
<td>EVN capacity is adequately built</td>
<td>ENV becomes sensitive to and professionally capable of developing and implementing EMPs independently and a sufficient number of staff are trained</td>
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</tr>
<tr>
<td>Ensuring that the Millennium Development Goal of environmental sustainability is achieved</td>
<td>Natural resources, the ecosystem, and biodiversity will be better conserved</td>
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</tr>
<tr>
<td>Design Summary</td>
<td>Performance Targets/Indicators</td>
<td>Data Sources/Monitoring Mechanisms</td>
<td>Assumptions and Risks</td>
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</tbody>
</table>
| **Outputs**    | - Improved EMP for the SLHPP with a monitoring program and budgets and a pilot livelihood restoration and/or enhancement program  
- Environmental specifications for contractors  
- Public disclosure and consultation events in project-affected areas |  
- During TA implementation:  
  - Interim and draft final reports on the EMP and monitoring reports submitted; completed livelihood restoration and enhancement programs devised using a consultative process  
  - Adequate quality environmental specifications for contractors are delivered in a timely fashion  
  - Public disclosure and consultation events are conducted in project-affected areas, with specific documentation is provided, and reactions are addressed |  
- Review of the EMP at workshops and by staff of ADB  
- Review at workshops and by ADB staff  
- Consultations’ timing, transparency, and reviewed by ADB staff and civil society |  
- **Assumptions**  
  - Government’s willingness to disclose all information about the SLHPP’s environmental and social impacts  
  - Environmental, social, and institutional data are available  
  - Steering Committee members allocate adequate time to work closely with ADB staff and technical assistance consultants |  
- **Risk**  
  - Implementation of the EMP may affect how EVN conducts business and may face resistance |
| **Activities with Milestones** | **Inputs** |  
  (i) Demonstrate monitoring of contractor mitigation measures (entitled “environmental performance monitoring”) and documentation and corrections of these mitigation measures as applicable.  
  (ii) Demonstrate monitoring of project impacts on air, water, soil, and biodiversity (entitled ‘environmental effects monitoring”) with documentation and corrections- with an additional focus on the downstream water quality of these monitoring results.  
  (iii) Review the results of monitoring to assess the effectiveness of the mitigation measures applied.  
  (iv) Recommend corrective action based on the results of the monitoring.  
  (v) prepare a realistic and sustainable budget. |  
- An estimated 28 person-months of local consultants and 26 person-months of international consultants, plus the assistance of local support staff, with other costs as presented in Appendix 2 |
EVN capacity building (December 2005–December 2010):
(i) Help EVN revise and improve the EMP in accordance with the safeguard requirements of the Asian Development Bank and other donors and following relevant international best practices.
(ii) Train staff from EVN, Son La Hydropower Project Management Board and other related agencies in EMP formulation and implementation.
(iii) Draft contractor specifications for environmental management and strengthen the awareness of construction contractors in relation to the design and implementation of their site EMPs.

Public participation and consultation (May 2006–December 2010):
(i) Strengthen the use of a participatory approach in relation to EMP implementation and cooperation between project owners and related parties, such as the Ministry of Environment and Natural Resources and provincial departments of Agriculture and Rural Development and Natural Resources and Environment.
(ii) Conduct disclosure and consultation events with those affected by the Project and
(iii) develop options for integrating the results of consultations into the Project and into improvements of the EMP.

Pilot livelihood improvement efforts, such as coordinating with the Danish International Development Agency’s fishery program in Son La province, conducting participatory rural appraisal, and test the pilot livelihood improvement programs for its applicability in the downstream area (August 2006–October 2010)

ADB= Asian Development Bank, EMP = Environmental Management Plan, EVN = Electricity of Viet Nam, SLHPP = Son La Hydropower Project
## COST ESTIMATES AND FINANCING PLAN
($'000)

<table>
<thead>
<tr>
<th>Item</th>
<th>Foreign Exchange</th>
<th>Local Currency</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Government of Finland Financing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Consultants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remuneration and Per Diem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) International Consultants</td>
<td>400.0</td>
<td>0.0</td>
<td>400.0</td>
</tr>
<tr>
<td>(ii) Domestic Consultants</td>
<td>0.0</td>
<td>60.0</td>
<td>60.0</td>
</tr>
<tr>
<td>b. International and Local Travel</td>
<td>70.0</td>
<td>5.0</td>
<td>75.0</td>
</tr>
<tr>
<td>c. Reports and Communications</td>
<td>30.0</td>
<td>3.0</td>
<td>33.0</td>
</tr>
<tr>
<td>2. Training, Seminars, Consultation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops, including Steering Committee Meetings</td>
<td>50.0</td>
<td>5.0</td>
<td>55.0</td>
</tr>
<tr>
<td>3. Surveys, Materials, and Equipment</td>
<td>50.0</td>
<td>15.0</td>
<td>65.0</td>
</tr>
<tr>
<td>4. Miscellaneous Administration and Support Costs</td>
<td>30.0</td>
<td>2.0</td>
<td>32.0</td>
</tr>
<tr>
<td>5. Contingencies</td>
<td>70.0</td>
<td>10.0</td>
<td>80.0</td>
</tr>
<tr>
<td><strong>Subtotal (A)</strong></td>
<td>700.0</td>
<td>100.0</td>
<td>800.0</td>
</tr>
<tr>
<td><strong>B. Government Financing</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Office Accommodation and Transport</td>
<td>0.0</td>
<td>60.0</td>
<td>60.0</td>
</tr>
<tr>
<td>2. Remuneration and Per Diem of Counterpart Staff</td>
<td>0.0</td>
<td>180.0</td>
<td>180.0</td>
</tr>
<tr>
<td>3. Others</td>
<td>0.0</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Subtotal (B)</strong></td>
<td>0.0</td>
<td>250.0</td>
<td>250.0</td>
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<tr>
<td><strong>Total</strong></td>
<td>700.0</td>
<td>350.0</td>
<td>1,050.0</td>
</tr>
</tbody>
</table>

\(^a\) Financed on a grant basis by the Government of Finland.

\(^b\) Training and seminars involve fees and expenses for selected international experts and resource persons on vegetation, biomass and reservoir management, Geographic Information System for Environmental Impact Assessment, and so on.

\(^c\) Surveys on water quantity and quality, the ecosystem, and biodiversity. Materials are for the pilot livelihood enhancement programs, such as fish cages. Equipment includes computers, water sampling and test kits, equipment for fish counts, and so on.

Sources: Asian Development Bank estimates.
OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The technical assistance will require a total of 54 person-months of consulting services consisting of 28 person-months of domestic consultants and 26 person-months of international consultants.

A. Environmental Planner and Team Leader (international, 18 person-months)

1. Selection Criteria

2. The consultant should have a background in environmental engineering or environmental science, regional planning, urban planning, or water resources management and planning and be familiar with environmental impact assessment theories and practices and with regional and subregional experience. Working knowledge of Viet Nam is useful, but not mandatory.

2. Responsibilities

3. Under the guidance of Asian Development Bank (ADB) staff, the environmental planner will have the following responsibilities:

(i) **Team leadership.** The consultant will serve as team leader and will manage the consultant team. Under the consultant’s leadership, the team will accomplish the following:
   (a) Deliver interim and final reports and monitoring reports of an adequate quality in a timely fashion.
   (b) Deliver the review and training workshops.
   (c) Assist Electricity of Viet Nam and the Son La Hydropower Project Management Board to train their staff in formulating and implementing environmental management plans (EMPs).
   (d) Ensure that guidance provided by the Steering Committee is integrated into the Project’s outcomes.
   (e) Ensure that comments resulting from public consultations are reflected in the Project’s results, especially the livelihood enhancement program.

(ii) **EMP improvement and implementation.** Review and critique the existing EMP and environmental impact assessment as prepared by the Son La Hydropower Project Management Board and communicate the findings to Electricity of Viet Nam and ADB. This will include the following:
   (a) Develop an improved EMP to ensure that specific mitigation measures and monitoring programs with indicative budgets are included.
   (b) Develop a framework for a monitoring system and improve performance indicators for implementation of the EMP.
   (c) Develop an implementation budget that is realistic and sustainable.
   (d) Integrate the outcomes from the work of the aquaculture specialist and from the public consultations into a pilot livelihood enhancement program as part of the EMP mitigation program to benefit those households losing productive land, focusing on ethnic minorities.
   (e) Group the various mitigation measures, monitoring report forms, training materials, consultation procedures, livelihood improvement cases, and so on into an integrated manual of EMP best practices.
(iii) **Capacity building and training for EVN and related agencies.** This aspect of the consultant’s work will include the following:

(a) Assess the EVN’s capacity to determine the strategies for capacity building.
(b) Train the staff of Electricity of Viet Nam and the Son La Hydropower Project Management Board in EMP formulation and implementation.
(c) Deliver the training workshops and related capacity-building activities, including preparing training materials of adequate quality in a timely fashion with support from the team.
(d) Conduct capacity-building activities, including on-the-job training and selected study tours, under the guidance of the Steering Committee.
(e) Formulate a monitoring mechanism for effectiveness of evaluation of the capacity-building activities.

B. **Aquaculture Specialist** (international, 8 person-months)

1. **Selection Criteria**

4. The aquaculture specialist should have a background in biology, environmental science, or aquatic ecology and be familiar with freshwater biodiversity management theories and practices and regional experience with caged fisheries. A working knowledge of Viet Nam is useful, but not mandatory.

2. **Responsibilities**

5. Under the guidance of the team leader, the aquaculture specialist will have the following responsibilities:
   (i) Research and collect data on existing aquaculture and fresh water fisheries, including reservoir fisheries, in Viet Nam, especially in the northern region, for use in developing the livelihood program.
   (ii) Develop and refine a pilot livelihood program with to potentially enhance the fish stock and with initial capital, materials, and marketing assistance as relevant.
   (iii) Coordinate and work with the Danish International Development Agency’s fishery advisers in Son La province to select pilot caged fishery or other aquaculture options.
   (iv) Develop a monitoring system and performance indicators for the implementation of the aquaculture program.
   (v) Help the team leader integrate outcomes from the public consultations into the pilot livelihood enhancement program as part of the EMP mitigation program.
   (vi) Deliver training and related capacity-building activities of adequate quality in a timely fashion to downstream communities.
   (vii) Conduct pilot training activities with support from the Ministry of Fisheries and provincial departments of Agriculture and Rural Development and Natural Resources and Environment.
C. **Environmental Specialist** (domestic, 20 person-months)

1. **Selection Criteria**

6. The environmental specialist should have a background in environmental science, regional planning, urban planning, or water resources management and planning and be familiar with environmental impact assessment theories and practices and power projects.

2. **Responsibilities**

7. Under the guidance of the team leader, the environmental specialist will have the following responsibilities:

   (i) **Team leadership.** The environmental specialist will serve concurrently as the deputy team leader and assist the team leader to accomplish the following:

   (a) Coordinate and communicate within the team and with the Steering Committee members and relevant stakeholders to accomplish the team’s tasks.

   (b) Deliver interim and final reports and monitoring reports of adequate quality in a timely fashion.

   (c) Deliver the review and training workshops.

   (d) Help Electricity of Viet Nam and the Son La Hydropower Project Management Board to train their staff in EMP formulation and implementation.

   (e) Ensure that the Steering Committee’s guidance is integrated into the Project’s outcomes.

   (f) Ensure that the comments provided in public consultations are reflected in the Project’s results, especially the pilot livelihood enhancement program.

   (ii) **EMP improvement and implementation.** The environmental specialist will help the team leader undertake the following:

   (a) Coordinate with EVN and related agencies to obtain relevant information and documents and arrange for their translation into English.

   (b) Help review and critique the existing EMP and environmental impact assessment as prepared by the Son La Hydropower Project Management Board and communicate the findings to EVN and ADB as relevant.

   (c) Help develop an improved EMP with assistance from the other consultants to ensure that specific mitigation measures and monitoring programs with indicative budgets are included.

   (d) Help develop a framework for a monitoring system and improved performance indicators for the implementation of the EMP.

   (e) Integrate the results of the work of the aquaculture specialist and the outcomes of the public consultations into the pilot livelihood enhancement program as part of the EMP mitigation program.

   (iii) **Capacity building and training for ENV and related agencies.** The environmental specialist will assist the team leader to do the following:

   (a) Coordinate with various stakeholders to deliver the training workshops in a timely fashion.

   (b) Train the staff of Electricity of Viet Nam and Son La Hydropower Project Management Board in EMP development and implementation.
(c) Deliver the training workshops and related capacity-building activities, including preparing training materials of adequate quality in a timely fashion.

(d) Help conduct capacity-building activities, including on-the-job training and selected study tours, under the guidance of the Steering Committee.

(e) Help formulate a monitoring mechanism for evaluation of effectiveness of the capacity-building activities.

D. **Fisheries Expert** (domestic, 8 person-months)

1. **Selection Criteria**

8. The fisheries expert should have a background in biology or aquatic ecology, should be familiar with freshwater biodiversity management theories and practices, and should have experience working with aquaculture and fisheries.

2. ** Responsibilities**

9. Under the guidance of the team leader, the fisheries expert will have the following responsibilities:

   (i) Help the team, especially the international aquaculture specialist, collect data on existing aquaculture and freshwater fisheries, including in reservoirs, in Viet Nam, and especially in the northern region, for use in developing the livelihood program.

   (ii) Help develop and refine a pilot livelihood program with assistance from the domestic resources.

   (iii) Help the team, especially the international aquaculture specialist, coordinate with and work with the Danish International Development Agency’s fishery advisers in Viet Nam to select pilot caged fishery or other aquaculture options for the Son La downstream communities.

   (iv) Help the team develop a monitoring system and performance indicators for the implementation of the aquaculture program.

   (v) Help the team integrate the results of the public consultations into the pilot livelihood enhancement program as part of the EMP mitigation program.

   (vi) Help the team deliver training and related capacity-building activities of adequate quality in a timely fashion for the Son La downstream communities.

   (viii) Conduct pilot training activities with support from the Ministry of Fisheries and provincial departments of Agriculture and Rural Development and Natural Resources and Environment.