

Asian Development Bank

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION REPORT

FOR

TONLE SAP SUSTAINABLE LIVELIHOODS PROJECT

IN

CAMBODIA

August 2005

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CURRENCY EQUIVALENTS

(as of 4 August 2005)

Currency Unit	–	riel (KR)
KR1.00	=	\$0.00023
\$1.00	=	KR4,175

ABBREVIATIONS

ADB	–	Asian Development Bank
CARD	–	Council for Agricultural and Rural Development
CLF	–	Community Livelihood Fund
CLFT	–	community livelihood facilitation team
CNMC	–	Cambodia National Mekong Committee
CPBC	–	Commune Planning and Budgeting Committee
C/SF	–	Commune/Sangkat Fund
DOF	–	Department of Fisheries
EARF	–	environmental assessment and review framework
EARP	–	environmental assessment and review procedure
EIA	–	environmental impact assessment
EMP	–	environmental monitoring plan
IEE	–	initial environmental examination
km ²	–	square kilometers
MAFF	–	Ministry of Agriculture, Forestry and Fisheries
MOE	–	Ministry of Environment
MOI	–	Ministry of Interior
MRD	–	Ministry of Rural Development
NGO	–	nongovernment organization
PPRA	–	purposive participatory rural appraisal
PPTA	–	project preparation technical assistance
PRA	–	participatory rural appraisal
TSBR	–	Tonle Sap Biosphere Reserve

NOTE

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

I. INTRODUCTION

1. This report summarizes the findings of an initial environmental examination (IEE) that the Government of Cambodia conducted to identify and assess the impacts of the Tonle Sap Sustainable Livelihoods Project (the Project). Moreover, this report recommends mitigation and management measures to avoid or minimize the environmental impacts of the Project. The IEE was prepared in accordance with Cambodia's Sub-Decree No. 72.ANRK.BK of August 1999, which defines environmental assessment requirements for development projects and other applicable legal requirements and regulations, and ADB's *Environmental Assessment Guidelines* (2003). The report also highlights the findings of the environmental management plan (EMP), as well as the environmental assessment and review framework (EARF)—integral parts of the environmental assessment process. The report was prepared based on environmental surveys, available data, and feedback received during consultations with officials from key government agencies, affected people and interested groups, and other stakeholders.

2. The Project will support community-driven development to (i) deliver demand-driven services more equitably, efficiently, and effectively; (ii) safeguard the core areas to protect their functions, products, and attributes; and (iii) build skills and awareness for sustainable livelihoods to strengthen institutions and processes at all levels. It will benefit people in the communes that are fully or partly in the buffer zone and core areas of the Tonle Sap Biosphere Reserve (TSBR). The Project will not have any physical interventions in the core area of the Tonle Sap, except for the removal of fishing lots. Based on ADB's *Environmental Assessment Guidelines* (2003), the Project was classified as category B, or environmentally sensitive, due to the potential broad interest in the Project and its relation to the bioserve. To address this, the 120-day disclosure rule¹ applies, and an EMP was prepared to ensure effective management of project activities. An environmental assessment and review procedure (EARP) also was prepared to serve as the framework for the selection, environmental assessment, review, and implementation of the eligible project activities.

3. During project preparation, the IEE developed a conceptual model of ecosystem productivity and integrity, which integrated the best available scientific knowledge and understanding of the Tonle Sap ecosystem. This model was used to formulate guidelines and criteria for activities to be considered under the Project. Using these guidelines and criteria, project alternatives, or alternative practices and approaches, were considered to minimize potential environment impact.

II. DESCRIPTION OF THE PROJECT

A. Need for the Project

1. The Nature of the Tonle Sap

4. The Tonle Sap is the largest freshwater lake in Southeast Asia, covering 2,500 square kilometers (km²) in the dry season and flooding to 7,500–12,500 km² for several months each year. This cycle has created extensive wetlands that harbor high biodiversity at the genetic, habitats, and ecosystem processes levels. The Tonle Sap ecosystem was designated as a Biosphere Reserve in 1997 in recognition of its global significance for biodiversity conservation,

¹ ADB's environmental guidelines (2003) require for summary environmental impact assessment and summary initial environmental examinations produced for Category A and Category B sensitive projects to be disclosed to the public at least 120 days before the Project is considered.

and parts of its wetlands are included in the list of Ramsar sites². Today, the resources of the Tonle Sap directly benefit 40% of the population living around the lake. As a feeding and spawning area for migratory and nonmigratory fish, the Tonle Sap also benefits the lower Mekong basin.

2. The Threats to the Tonle Sap

5. However, population growth has increased the number of people who depend on the Tonle Sap basin's natural resources. Major threats to the Tonle Sap include (i) poverty-driven overexploitation of fisheries and wildlife resources, (ii) conversion of the flooded forest to agriculture, and (iii) collection of fuel wood from the flooded forest. In the watersheds, deforestation is destroying habitats and causing a deterioration of water and soil quality. Outside Cambodia, major threats to the Tonle Sap include the impact of built structures on the hydrology of the Mekong basin. In recent years, conflicts over resource use rights have escalated, as have concerns over the Tonle Sap as a productive ecosystem with high biodiversity.

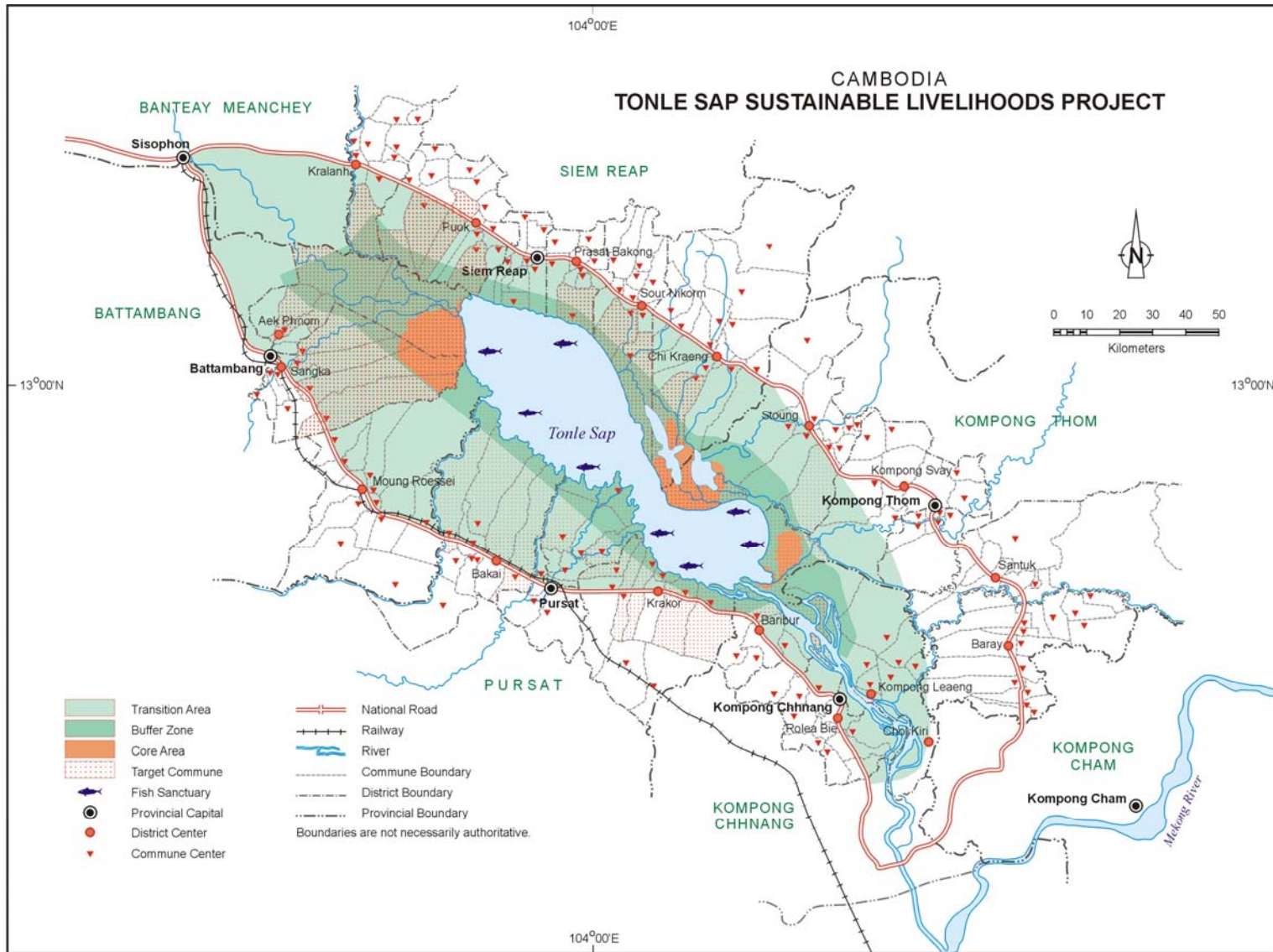
3. Poverty and Vulnerability

6. Despite the richness of its natural resources, the Tonle Sap provides an inadequate living for most of the inhabitants of the adjoining provinces. Indicators show that the incidence of poverty is higher in the Tonle Sap area than for Cambodia as a whole. Health shocks, chronic illness, and poor illiteracy are major causes of impoverishment and vulnerability. Women, who are particularly vulnerable, have more restricted access than men to land ownership and other property rights, credit, paid employment, education, and health services. Further, the lack of clean water and sanitation leads to morbidity and low life expectancy. In the floodplain, rural life is intrinsically linked to the annual cycle of flooding. Declining access to assets is the core problem for the poor populations. Civil war has severely diminished social capital, and democratic processes were introduced only recently. Human exploitation of natural capital, especially forests and fish, is growing. Physical capital is painfully inadequate, and rural amenities are rare. Access to financial capital is restricted—informal credit carries very high interest rates.

B. Location of the Project

7. The Project will benefit people living on or immediately around the permanent lake in communes in the buffer zone and core areas of the TSBR. The project area covers 37 communes: (i) 21 with villages in the Tonle Sap buffer zone and core areas; and (ii) 16 with community fisheries and some areas, but no villages, inside the buffer zone. In all, the project area covers 316 villages with a combined population of 287,430 (54,857 families).

² The Ramsar Convention on Wetlands, signed in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.



C. Project Outputs and Activities

8. The Project will (i) support community-driven development (output 1), (ii) safeguard core areas (output 2), and (iii) build skills and awareness for sustainable development (output 3).

9. Support for community-driven development will be achieved through the establishment of a community livelihood fund (CLF) in each commune to finance small-scale, community-driven activities, which will be planned and agreed at village and commune levels. Eligible activities will involve social infrastructure, income-generating activities, and support for community fisheries. The Project will design and implement livelihood packages, and integrate the planning of activities to be funded through the CLF with the established village and commune planning process.

10. Safeguarding the core areas of the TSBR will be achieved by terminating commercial fishing. Currently, the core areas are included in large-scale, auctioned commercial fisheries, called "fishing lots." The Project will (i) establish a core areas coordinator in the TSBR secretariat; (ii) assist the TSBR secretariat in developing, concluding, and implementing a management and protection agreement for core areas; (iii) develop with the TSBR secretariat a detailed plan and time schedule for the removal of the fishing lots; (iv) select the best means of maximizing the conservation of natural resources in the core areas; (v) identify all current direct users—seasonal and others—of the core areas, and prepare a livelihoods development and support plan; (vi) put in place alternative livelihoods for the population of Boeng Tonle Chhmar; (vii) assess the operations of the fishing lots; (viii) implement systems for management of the core areas, and for monitoring and evaluation; (ix) identify mechanisms to ensure compliance; and (x) incorporate the additional potential core areas.

11. Additionally, the Project will build skills and awareness for sustainable livelihoods by (i) improving coordination of community-driven development, (ii) enhancing the skills base for community-driven development, and (iii) providing education in the protection of natural resources. Under the education component, the Project will (i) assemble educational material on natural resource management; (ii) hold forums on environmental awareness for staff of the Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Environment (MOE), Ministry of Rural Development (MRD), their provincial departments, and commune leaders; (iii) prioritize villages based on their potential impact on resource extraction; (iv) assemble, train, and equip a mobile training team to extend environmental awareness in priority villages; and (v) conduct monitoring and evaluation.

III. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

12. **Climate.** Cambodia's climate is dominated by the tropical wet and dry monsoons. The southwest monsoon brings the rainy season from mid-May to mid-September or early October, while the northeast monsoon's flow of drier and cooler air lasts from early November to March. Temperatures are fairly uniform at around 25°C throughout the Tonle Sap Basin area. Average annual rainfall is between 1,300 and 1,900 millimeters, with the heaviest amounts in the southeast.

11. **Topography and Soil.** The rather flat topography of the project is dominated by the Tonle Sap Lake and the adjacent floodplain. The soils are unconsolidated sediments from

alluvial deposits, comprising clay, silt, sand, and gravel, as well as a variety of soil types such as acidic soil and lateritic clay.

13. **Groundwater.** The distribution and depth of the groundwater table in the project area vary considerably. The water table changes with rainfall, specific local geomorphological conditions, and the distance to the permanent water of the Tonle Sap Lake. Manganese is reported to be found in the groundwater in concentrations that might cause some consumer inconvenience (e.g., staining of laundry and sanitary ware, taste), though it is not believed to have any negative health effects. Although arsenic concentrations are found in the groundwater throughout Cambodia, they commonly do not pose a problem.

14. **Surface Water.** The Mekong River is the main determinant of the hydrology of the Tonle Sap ecosystem. The Tonle Sap Lake is connected to the Mekong River through the 100 km Tonle Sap River. Around 60% of the Tonle Sap water originates from the Mekong, while about 40% comes from its own catchment and tributaries. The Tonle Sap River has six main tributaries. The quality of surface water in the project area shows extreme variations. In the dry season, pollution by human and household waste can be high near densely populated areas.

B. Ecological Resources

15. **Fisheries and Aquatic Biology.** The flooding of the extensive plain covered in forest and other types of vegetation enables the transfer of terrestrial primary products into the aquatic phase and entry into lake-wide food webs. Sedimentation occurs almost exclusively in the floodplain. The floodplain vegetation plays a crucial role in ecosystem productivity by providing habitats, substrate area, and food for aquatic organisms. Many varieties of fish have commercial value, and more than 100 species are caught regularly. However, about a dozen make up the bulk of the catches, by weight and value. A wide variety of active (seining, lifting, casting) and passive (traps, hooks and line, gillnets) fishing gear and methods are used. Fish behavior (migration, habitat preference, reaction to water quality changes, feeding strategies) is exploited in the fishery. The use of destructive gear and practices (poisoning, electrocution, brush parks, damming, and pumping of channels) are widespread.

16. Other aquatic animals with direct livelihood significance include water snakes, mollusks, and invertebrates such as shrimp. Water snakes are common in the Tonle Sap ecosystem, and five species commonly are caught and traded. Around the lake, commercial rearing of captive crocodiles is practiced. Indicators suggest that the current use of the Tonle Sap's natural resources has exceeded optimum ecosystem productivity.

17. **Timber and Nontimber Forest Products.** The natural floodplain vegetation is used for the collection of a variety of wood and non-wood forest products. Wood is collected for domestic use, including for (i) fuel wood or charcoal, (ii) construction material, (iii) use in brick kilns, (iv) fish processing (smoking and drying), and (v) the construction of fishing gear. The dominant species include *Barringtonia acutangula*, *Diospyros cambodiana*, *Terminalia cambodiana*, *Gmelina asiatica*, *Ficus heterophylla*, and *Vitex holoadenon*. Non-wood forest products include a wide range of plants used as food, and for medicinal purposes for humans and husbanded animals. Lianas (in particular *Combretum trifoliatum*, *Breynia rhamnoides*, *Tetracera sarmentosa*, and *Acacia thailandica*) are collected for furniture and fishing gear production. Other plant products include fruits, seeds, resins, tubers, bark, and mushrooms. Some forest animals and their products are collected, including beeswax and honey. Some larger animals are used as pets (macaques, iguanas, birds), traded, or consumed as food. Birds are hunted for food, pets, and trade. Eggs and chicks are collected for consumption. Aquatic plants are

collected for human consumption, as feed for farmed animals, or for further cultivation (e.g., lotus).

18. **Biodiversity.** With the global loss of wetlands, the Tonle Sap ecosystem and its relatively intact processes are exceptionally important for global biodiversity at genetic, species, habitats, and ecosystem processes levels. The species richness of the Tonle Sap ecosystem is only partly known. Recently, 885 species of floodplain plants and animals were found in the Tonle Sap. However, this does not include, for instance, the 197 species of phytoplankton that have been identified separately.

19. The 2004 International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species mentions 197 species in Cambodia considered at risk of extinction, endangered, critically endangered, or vulnerable. Many of these are found in the Tonle Sap ecosystem.³ Of the 197 species mentioned by IUCN, 24 are critically endangered, 39 are endangered, and 53 are vulnerable. In the Tonle Sap ecosystem, 5 critically endangered species (2 fish species, 2 bird species, and the Siamese crocodile) are potentially still present. However, none of these species is endemic to Tonle Sap. As a consequence of 3 decades of unrest, access to the project area has been at times difficult, and a biodiversity inventory of the Tonle Sap ecosystem is far from complete. A systematic effort to conduct a baseline biodiversity survey has not been made. However, such a survey will be undertaken under component 3 of the Project.

20. In Cambodia, 22 species are classified as data deficient. This could mean that some of these species are threatened, though data are insufficient to assess their condition in full. Several fish species, particularly among those that grow large, are endangered. In its 2004 Red List, IUCN classified the giant Mekong catfish (*Pangasianodon gigas*) as critically endangered. The heavy exploitation of crocodile and the endemic Tonle Sap watersnake (*Enhydryis longicauda*) also is of particular conservation concern. The Siamese crocodile (*Crocodylus siamensis*) is critically endangered in the wild, though it is widely bred and kept in captivity. *Orcaella brevirostris*, the freshwater Irrawaddy dolphin that is found in the Mekong, is occasionally also seen in the Tonle Sap ecosystem.

21. The biodiversity in the Tonle Sap is best known for birds. Of the 104 waterbird species that have been recorded in the Tonle Sap, 89 are abundant, while 14 are considered internationally significant. The two core areas of the TSBR, Prek Toal and Lake Chhmar, have the most endangered species. Prek Toal is the most important breeding area.

22. **Land and Crops.** The continued expansion of agricultural land into the floodplain to address the rising population and low productivity of paddy fields has come at the expense of the natural flooded forest vegetation. The competition between the natural assets of flooded forest and rice and other agriculture crops is increasingly undermining the productivity of the Tonle Sap ecosystem. The foreshore of the Tonle Sap's permanent lake and the river banks provide land—even only seasonally—to the landless poor, who also benefit from being in the vicinity of water for their crops.

23. **Livestock.** Livestock are important to the livelihood ambitions of many people. Pigs are held widely in floating villages and throughout the floodplain. Cattle provide traction for rice farmers, though flooded forest is burned in places to promote the growth of grass for cattle

³ The IUCN Red List of Threatened Species provides taxonomic, conservation status, and distribution and information necessary to determine the relative risk of extinction faced by different species.

grazing. Even the poorer households can afford ducks and chickens. Ducks also generate income through their use in pest control in rice fields.

C. Economic Development

24. Most of the activities in the project area are based on fisheries or agriculture. Fish processing is widespread, while agriculture revolves around rice production in most places. Infrastructure facilities are largely absent, particularly in the floating or stilted villages. The few access roads are mostly in poor condition. Although ports and landing sites lack basic infrastructure, they contribute effectively to livelihood generation. Still, they limit improvement and growth. The lake is used for transportation of people and goods, including petroleum products and fish. Most of the people transported are foreign tourists. Low water levels in the dry season limit the size and traffic of boats.

D. Social and Cultural Resources

25. More than 1.2 million people in the Tonle Sap area depend on fishing for their livelihood. People typically live in villages, grouped in communes. Many fisherfolk are highly mobile, migrating within the floodplain and lake to find fishing opportunities. The Tonle Sap fish and floodplain resources are also part of the livelihood strategies for many people living outside the project area. The distribution and quality of health and education facilities vary. Both are lacking in lake-based communities. The historic temple complex of Angkor Wat is about 5 km outside the project area. Buildings and features of archaeological and historical significance (e.g., Khmer Empire era temples and shell mounds) are scattered throughout the project area.

E. Conceptual Model of Ecosystem Productivity

26. The Tonle Sap ecosystem, a pulsating lake-floodplain system connected to the Mekong River through the Tonle Sap River, defies many of the traditional concepts of lakes, wetlands, and forests. Many traditional ecological, environmental, and natural resources management concepts and approaches do not apply, or apply only in a modified way. This means a sound foundation is needed for assessing the environmental impacts of activities on the ecosystem.

27. The body of specific knowledge and information about the Tonle Sap ecosystem is growing slowly, though this information has not been integrated. As part of the description of the environment, a conceptual model of ecosystem productivity was developed. This involved reviewing relevant literature on similar ecosystems, and integrating specific relevant ecological paradigms with current knowledge about the Tonle Sap ecosystem. The conceptual model that resulted was used to assess the potential impacts of the proposed Project on the environment. The conceptual model is included as Annex 1 of the IEE report.

IV. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Potential Environmental Impacts

28. The close interaction between the IEE and project formulation teams resulted in the incorporation of environment safeguards into many of the activities, and also predetermined the activities included in the Project. The environmental benefits of the Project are significant, substantial, and sustainable. The Project will (i) reduce pressure on the natural resources of the ecosystem by adding more value to the products already harvested; (ii) reduce spillage; and (iii)

curb destructive and unsustainable management practices by supporting community-driven management organizations, the community fisheries. The Project will help stakeholders diversify their livelihoods, while maintaining and preserving the Tonle Sap as a naturally productive ecosystem with high biodiversity. It will end the large-scale commercial fishing in the core areas of the TSBR, and instigate alternative, durable management and protection arrangements. These will be a huge step toward adequate biodiversity conservation. The Project will increase the environmental awareness of all stakeholders, and educate them about environmental sustainability and conservation.

29. Project activities will not have a negative impact on any of the known species of conservation concern in the Tonle Sap ecosystem. The Project will contribute in many ways to their conservation—either directly by reducing pressure on the populations, or indirectly by reducing the pressure on critical habitats and reducing other threats. In particular, the Project will contribute significantly and directly to the conservation of the five species from Tonle Sap that have been designated as critically endangered. The conservation of the ecosystem and any endangered species will benefit directly from the (i) removal of the fishing lots from the core areas, (ii) strengthening of the network of protected areas, (iii) improvement of fisheries and natural resources management through the strengthening of community fisheries, and (iv) environmental and conservation awareness raising and education.

1. Output 1: Support Community-Driven Development

30. CLF-funded activities contribute—directly or indirectly—to preserving the Tonle Sap as a productive ecosystem with high biodiversity. As almost all livelihoods in the project area are based on natural resources, the preservation of that livelihood basis is a key element of the project approach. The potential impacts of CLF-funded activities due to subproject activity location and subproject design during construction and operations are summarized in this section.

a. Potential Environmental Impacts Due to Project Activity Location

31. The Project is in the buffer zone and core areas of the TSBR. The sensitivity of these areas was taken into consideration when assessing the environmental impact of project activities. To avoid or prevent impacts from subprojects, all project activities must comply with the royal decree establishing the TSBR, and must exclude activities that are not explicitly permitted in the respective zones.

32. For proposed project activities in the core areas, the scope is limited to scientific research, monitoring, and ecotourism. Management activities that would cause degradation and destruction of biodiversity would not be permitted.

33. In the buffer zone, TSBR regulations permit more activities, though these must be compatible with the protection and conservation plans for the core areas. Fishery activities and other development plans will be managed based on existing laws and regulations in a coordinated and cooperative manner. Based on the limitations imposed by the TSBR regulations, the potential negative environmental impacts of project activities due to project location can be identified as:

i. Potential Increased Demand for Natural Resource Products and Flooded Forest Clearing

34. Project activities might increase demand for products from the Tonle Sap's rich natural resources. Trends in catch statistics and composition of catches show that the fisheries resources of the Tonle Sap are highly exploited. Very little value is added to the catches between the time the fish are caught and their consumption. Given the seasonality of the catches, with a sharp peak in November–February, most value-adding activities are aimed at preserving, rather than increasing, the value of the catch. Enormous untapped potential exists for processing and marketing activities to add value to the catches. Initially, this likely would reduce the demand for fish, because the same income can be obtained with less produce. However, in the longer run, this might increase demand for raw material for processing and value adding. While predicting where this balance will be is difficult, evidence suggests that any increase in demand for raw material will be limited. The Project will undertake activities to augment the natural resource stocks under community management of fisheries.

35. The success of recent management improvement initiatives, many of which are also supported by this Project and other elements of the Tonle Sap Initiative, will mitigate effectively any negative impacts of project activities on the demand for natural resource products. The Department of Fisheries (DOF) collects catch statistics, as well as data on export and transport of fish and fish produce. With the TSBR Secretariat, DOF monitors total fish catches and pressure on fishing resources, as well as trends in other natural resource use in the TSBR. Continued monitoring of natural resource use in the Tonle Sap, and further support for improving its management, should mitigate adequately the small risk created by the Project.

ii. Potential Changes to Landscape

36. Some of the project activities might include the establishment of structures in the lake or the floodplain that could impact the landscape, particularly fences and signposts to demarcate the boundaries of fishing areas. Given the environment, particularly the huge difference in water levels between the dry season and the flooding period, these structures might need to be more than 10 meters tall to be effective throughout the year. This also applies to any stilted buildings that might be constructed. However, the overall impact on the landscape is expected to be very limited. The construction of permanent boundary markers is too expensive to be considered. The potential impact of project activities is considered insignificant.

iii. Potential Modifications to Local Drainage Patterns

37. Eligible social infrastructure project activities, such as the construction or rehabilitation of a bridge, culvert, or water storage reservoirs, might alter local drainage patterns. The hydrological characteristics of the Tonle Sap ecosystem are vital to its productivity and biodiversity. Thus, any significant alterations must be avoided. The project activities carry a small risk of changing local drainage patterns, and thereby the hydrology of the lake. The risk of a significant impact on the hydrology of the ecosystem is negligible, given (i) the small size of individual project activities, (ii) the water balance of the Tonle Sap, and (iii) the legal and regulatory limitations on the construction of drainage- or hydrology-altering structures in the Tonle Sap basin.

38. The Project's potential impact on the movement of fish up and down tributaries and across different habitats in the floodplain, particularly floodplain pools, is another small risk. These floodplain habitats are critical to the dry season survival of fish that live in the floodplain.

Fish are known to migrate extensively up tributaries at the end of dry season, returning to the lake at the onset of the flooding. This migration, which can be associated with spawning, feeding, or escaping adverse water conditions, is vital for several species. Several means are available to mitigate the potential impact, including design features and operating procedures. DOF must approve the construction of any structures in the lake or the floodplain. DOF, in principle, will not allow the construction of structures that will have a negative impact on fish production of the Tonle Sap. The size of individual project activities is relatively small. As such, if the project procedures for selecting eligible activities are followed, the risk of impeding fish movements will be insignificant.

iv. Potential Habitat Loss

39. The construction of social infrastructure might decrease habitat area. In the core areas, the risk to habitat areas will be zero as such project activities will not be undertaken. In the buffer zone, some habitats might be affected due to construction of a school building extension, drinking water reservoir, or similar structures. The affected areas are expected to be counted in square meters or acres. The impact is seen as insignificant, given the small size of individual project activities.

v. Potential Erosion and Sedimentation and Associated Changes in Water Quality

40. Where project activities might alter local hydrology, erosion and sedimentation—and associated changes in water quality—pose a risk. Given the nature and small scale of project activities, these effects are expected to be very small and limited to the vicinity of the activities. Overall, given the sediment budget and events occurring at the lake and floodplain scale, these effects are insignificant. The transport of sediment by the Mekong into the Tonle Sap and the floodplain is believed to be essential for ecosystem productivity. Project activities will have no measurable impact on this process.

vi. Potential Impact on Cultural Heritage Sites

41. The project area is not far from the former World Heritage Site of Angkor Wat, where the historic temples and buildings are concentrated in Angkor Park. A few structures are in the project area. These are typically small, part of current religious sites, and active places of worship. All known sites of archaeological importance are under the Apsara Authority, the agency in charge of protection, management, and conservation. One known historic shell mound reportedly is in the middle of the Tonle Sap. The Project will not have any impact on Angkor Park. The impact on the few known cultural heritage structures in the project area is expected to be insignificant or nonexistent. The floodplain or the lake—and thereby the project area—has very few such structures, because of the construction difficulties and the erosion caused by the annual floods. The known structures are heavily protected due to their role in worship. The Apsara Authority also protects them. The Apsara Authority is also responsible for conservation and management of any new discoveries, for instance during excavations, and monitors activities accordingly. Any project construction activity in a site with cultural monument or any such structures will be made ineligible.

vii. Potential Activity Specific Impacts Due to Location

42. The selection criteria and the guidelines that have been prepared for the evaluation of eligible project activities restrict their possible scope. Therefore, despite being in the TSBR, the Project is expected to have few negative impacts. The cumulative impact of project activities also is expected to be very limited or absent, given the individual project activities' (i) diversity (independently developed at the village/commune level), (ii) small size, (iii) spatial distribution, and (iv) likely temporal isolation of impacts from construction.

b. Potential Environmental Impacts Related to Design of Project Activities

43. The design of project activities can determine the presence or absence of significant environmental impacts. Design can also be a tool to mitigate impacts due to project location, construction, or operation. Overall, three potential impacts have been identified for the project activities.

44. Design of social infrastructure project activities can influence the impact on the hydrology of the area, as well as the subsequent impact on sedimentation and water quality. Specific design features, such as culverts, can mitigate the impact.

45. Given the broad range of project activities that can be considered under the Project, impacts related to the design of specific activities cannot be excluded. However, since these impacts are expected to be small, their cumulative impact is likely to be small as well.

46. Some project activities, particularly those related to the implementation of community fisheries management plans, possibly could present navigational hazards. Boundary markers and obstructions to seine net fishing could affect boats, particularly at night, though proper design of such structures would reduce such risks.

47. In conclusion, the potential negative environmental impacts associated with the design of project activities are very limited. In many cases, the design of project activities can be used to mitigate impacts related to the location of the Project.

c. Potential Environmental Impacts During the Construction Phase

48. Negative environmental impacts expected during the construction phase are those associated with all construction projects: (i) dust and noise pollution; (ii) habitat loss; (iii) erosion and sedimentation, and associated changes in water quality; and (iv) pollution from inappropriate disposal of construction waste.

49. Construction activities will be small due to the limited size of funding allocated to each village or commune. Potential impacts from construction are expected to be highly localized, temporary, and easily mitigated through good construction practices.

50. The selection process for project activities at the commune and village level includes the sound and consistent application of technical design standards that address possible adverse effects. Common sense environmental clauses are included in all construction contracts. Contractors for proposed construction works will be expected to adhere to contract clauses with specific performance standards for environment protection. For most activities, this simply will

mean that contractors have to adopt "good housekeeping" measures to ensure on-site erosion is controlled, and that waste materials are disposed of appropriately.

d. Potential Environmental Impacts Related to Project Operations

51. The potential negative environmental impacts that have been linked to project activities include (i) modifications to local drainage patterns; (ii) erosion and sedimentation, and associated changes in water quality; (iii) pollution from inappropriate disposal of operational waste; and (iv) activity-specific impacts. In many cases, appropriate operational management of project activities can mitigate, reduce, or prevent negative environmental impacts.

52. The exclusion of nonresident resource users from the community fisheries areas is another potential negative impact of project activities. Management plans typically give high priority to patrolling and enforcing regulations. In some community fisheries, nonpermanent resident resource users are as numerous as permanent residents. Providing community fisheries with the physical means to improve the exclusion of these "outsiders" from fishing and using other natural resources could harm their livelihoods. For many, seasonal migration to the lake for fishing or collecting fuel wood is a livelihood strategy. Alternative livelihood opportunities developed under the Project will partially mitigate such impacts if they occur.

53. The Project begins the mitigation strategy for this potential social impact with a study⁴ to assess the scale. The study will comprehensively identify stakeholders, assess how their livelihoods depend on the use of Tonle Sap's natural resources, and determine how implementing community fisheries management plans might affect them. Past studies and inventories focused almost exclusively on the permanent residents. To obtain a comprehensive overview of resource use, and to identify seasonal or nonpermanent resource users in particular, all resource users in different areas of the project area must be identified over at least 1 full year. By carrying out the study during the first year of the Project, the community livelihood facilitation teams (CLFTs) can take into consideration the possible impact on nonpermanent resource users in the selection process of eligible funding requests.

54. The Project was designed within the framework known as the Tonle Sap Initiative. With a strong internal rationale and logic, the Initiative approaches the management of the Tonle Sap basin in a cyclic, centrifugal manner. Stakeholders who might be negatively affected by project activities will be the focus of the further projects and interventions under the Tonle Sap Initiative. The Tonle Sap Initiative is at the center of the ADB country strategy for Cambodia.⁵ As such, future components of the Initiative can be expected to have a higher-than-average probability of becoming reality. The next substantial component of the Tonle Sap Initiative, the Lowland Stabilization Project, would provide support to many of the "outsider" stakeholders of the Tonle Sap fisheries resources. This new project probably would reduce the need or desire of nonpermanent residents in the lake or the floodplain to seasonally migrate to that area for fishing and other natural resource uses.

2. Output 2: Safeguard Core Areas

55. Activities under output 2 include (i) establishing an information base on core areas, (ii) instituting a management system for core areas, and (iii) instituting a network of fish

⁴ In years 1 and 2 in one pilot community fishery site in each project province; in conjunction with stakeholders and livelihoods analysis under output 2.

⁵ ADB. 2005. *Country Strategy and Program (2005–2009)*. Manila.

sanctuaries. None of these activities is expected to have any significant direct negative impacts on the environment. The alternative livelihood activities that will be supported will be subject to the same safeguarding measures as described under output 1.

56. These activities carry a small but significant secondary risk that the protection and management arrangements for the core areas will not be effective when the fishing lots are removed. The Government's assurances in this matter, as well as the role of the TSB Secretariat in the process, will substantially reduce this risk.

3. Output 3: Build Skills and Awareness for Sustainable Livelihoods

57. None of the activities under output 3 is expected to have adverse environmental impacts. These activities include (i) improving coordination for community-driven development, (ii) enhancing the skills base for community-driven development, and (iii) educating for protection of natural resources. In fact, these activities will be designed to enhance sustainable use of resources in the project area.

58. Table 1 summarizes the impacts described above.

Table 1: Overview of Potential Negative Environmental Impacts From Project Activities

Possible Impacts Due to Project Activity Characteristic	Activity Type		
	Social Infrastructure	Income-Generating Activities	Support to Community Fisheries
Location	<ul style="list-style-type: none"> • modifications to local drainage patterns • habitat loss • erosion and sedimentation, and associated changes in water quality • impact on cultural heritage elements 	<ul style="list-style-type: none"> • activity specific • increased demand for natural resource products and flooded forest clearing 	<ul style="list-style-type: none"> • activity specific • increased demand for natural resource products and flooded forest clearing • changes to the landscape
Design	<ul style="list-style-type: none"> • modifications to local drainage patterns 	<ul style="list-style-type: none"> • activity specific 	<ul style="list-style-type: none"> • creation of navigational hazards
Construction	<ul style="list-style-type: none"> • dust and noise pollution • habitat loss • erosion and sedimentation, and associated changes in water quality • pollution from inappropriate disposal of construction waste 	<ul style="list-style-type: none"> • dust and noise pollution • habitat loss • erosion and sedimentation, and associated changes in water quality • pollution from inappropriate disposal of construction waste 	<ul style="list-style-type: none"> • dust and noise pollution • habitat loss • erosion and sedimentation, and associated changes in water quality • pollution from inappropriate disposal of construction waste

Possible Impacts Due to Project Activity Characteristic	Activity Type		
	Social Infrastructure	Income-Generating Activities	Support to Community Fisheries
Operations	<ul style="list-style-type: none"> • modifications to local drainage patterns • erosion and sedimentation, and associated changes in water quality • pollution from inappropriate disposal of operational waste 	<ul style="list-style-type: none"> • pollution from inappropriate disposal of operational waste • activity specific 	<ul style="list-style-type: none"> • activity specific • social impacts due to the exclusion of nonresident resource users from the community fisheries area

B. Proposed Mitigation Measures

59. The procedures that will be used in the selection and design of project activities will ensure that many of the potential negative environmental impacts of these activities will be avoided. The EARP, prepared and discussed in section VII, will guide eligible project activity (i) screening and selection, (ii) environmental assessment, (iii) review, (iv) implementation, and (v) monitoring. EARP also describes the responsibilities of staff, as well as the estimated cost, to ensure that project activities do not have a significant negative impact on the environment.

60. The mitigation activities identified based on the potential negative environmental impacts are summarized in Table 2. The level of mitigation is defined in accordance with the sensitivity of the project area. Core area activities require a higher level of negative impact prevention and mitigation than buffer zone activities.

61. The overall approach has been to avoid negative environmental impacts as much as possible. The sector-like approach of output 1 and the wide range of potential project activities suggest that the application of strict subproject selection criteria is possible. Given the sensitive character of the project area, this is required. Eligibility criteria for all project activities include (i) absence of unacceptable environmental impacts; (ii) absence of impact on cultural heritage sites; and (iii) compliance with applicable environmental, legal, and other requirements. The mitigation measures require clear and achievable targets and quantitative indicators. Since eligible project activities have not been identified, providing such details at this stage is impossible. These will be determined as part of the process of identifying eligible subproject activities based on the guiding principles and the selection criteria.

Table 2: Summary of Potential Negative Environmental Impacts and Proposed Prevention and Mitigation Measures

Activity	Expected and Possible Negative Environmental Impact	Prevention and/or Mitigation
•Funding social infrastructure activities	•Dust and noise pollution during construction; modifications to local drainage patterns; habitat loss; erosion and sedimentation, and	•C/SF planning and environmental screening process; has been incorporated in project design •C/SF contracting specifications,

Activity	Expected and Possible Negative Environmental Impact	Prevention and/or Mitigation
	<p>associated changes in water quality; and pollution from inappropriate disposal of construction and operational waste.</p> <ul style="list-style-type: none"> •Possibly significant: prevention and mitigation required. 	<p>including environmental conditions to contractors; has been incorporated in project design</p> <ul style="list-style-type: none"> •Project specific guidelines regarding eligibility of requests for funding; has been incorporated in project design
<ul style="list-style-type: none"> •Funding income-generating activities 	<ul style="list-style-type: none"> •Activity-specific impacts, which cannot be forecasted or assessed at this stage. In general, a potential risk of increased demand for natural resource products and flooded forest clearing. •Possibly significant: prevention and mitigation required. 	<ul style="list-style-type: none"> •Environmental screening in selection of activities eligible for funding; has been incorporated in project design •Monitoring of project performance and impact; has been incorporated in project design
<ul style="list-style-type: none"> •Funding community fisheries activities 	<ul style="list-style-type: none"> •Activity-specific impacts, which cannot be forecasted or assessed at this stage. Likely to relate to changes to the landscape, creation of navigational hazards, increased demand for natural resource products, and social impacts due to the exclusion of nonresident resource users from the community fisheries area. •Possibly significant: prevention and mitigation required. 	<ul style="list-style-type: none"> •Environmental screening in selection of activities eligible for funding; has been incorporated in project design at two levels •Monitoring of project performance and impact; has been incorporated in project design •Study on natural resource use and importance for livelihoods for nonresident stakeholders, and link to project monitoring and selection of activities
<ul style="list-style-type: none"> •Institute a management system for core areas 	<ul style="list-style-type: none"> •Risk of protection vacuum of the core areas in case of project failure. •Significant, but unlikely. 	<ul style="list-style-type: none"> •Government assurance to maintain the fishing lot until effective alternative management and protection is put in place, and a commitment to remove the lots when this is achieved; will be included in a loan covenant •Project monitoring: a mechanism needs to be identified to review the proposed mechanism and alternative management arrangements.

62. The selection process for project activities at commune and village level will include the sound and consistent application of technical design standards that address possible adverse effects. Environmental clauses will be included in construction contracts. Contractors responsible for civil works will be expected to adhere to contract clauses with specific performance standards for environment protection. For most activities, this will simply mean that contractors have to adopt "good housekeeping" measures to ensure on-site erosion is controlled, and that waste materials are disposed of appropriately. Table 3 summarizes the proposed mitigation measures for identified impacts, as well as the institutional responsibility for implementation and cost of mitigation.

Table 3: Summary of Mitigation Measures

Potential Impacts	Expected Significance	Mitigation Measures	Institutional Responsibility for Mitigation	Cost of Mitigation
<p>Project Activities</p> <p>Increased demand for natural resource products and flooded forest clearing</p>	<p>Possibly significant, but unlikely</p>	<p>Monitoring</p>	<p>Ministry of Interior, as Executing Agency, is responsible for organizing the mitigation. DOF carries out the mitigation, i.e., collection of catch statistics, as well as data on export and transport of fish and fish produce. DOF monitors total fish catches and fishing pressure, as well as trends in other natural resource use in the TSBR, with the TSBR Secretariat</p>	<p>No cost (ongoing regular activity)</p>
<p>Changes to the landscape</p>	<p>Insignificant</p>	<p>None required</p>		
<p>Modifications to local drainage patterns</p>	<p>Insignificant if environmental assessment review procedures are applied</p>	<p>Specific design features and/or operating procedures</p>	<p>Grant beneficiaries</p>	<p>Cost included in project activities</p>
<p>Habitat loss</p>	<p>Insignificant, given the small size of project activities</p>	<p>None required</p>		
<p>Erosion and sedimentation, and associated changes in water quality</p>	<p>No measurable impact</p>	<p>None required</p>		
<p>Impact on cultural heritage elements</p>	<p>Insignificant or absent</p>	<p>None required</p>		
<p>Activity-specific impacts</p>	<p>Limited, but impact needs to be assessed</p>	<p>Mitigation to be determined for each subproject</p>	<p>Grant beneficiaries</p>	<p>Cost included in project activities</p>
<p>Creation of navigation hazards</p>	<p>Possibly significant, but limited given the small scale of project activities</p>	<p>Proper design</p>	<p>Grant beneficiaries</p>	<p>Cost included in project activities</p>

Potential Impacts	Expected Significance	Mitigation Measures	Institutional Responsibility for Mitigation	Cost of Mitigation
Dust and noise pollution	Possibly significant in the immediate vicinity and for the duration of construction work, but limited given the small scale of project activities	<ul style="list-style-type: none"> ▪ Application of good construction practices ▪ Contract clauses with specific expected performance standards for environment protection. 	Grant beneficiaries	Cost included in project activities
Pollution from inappropriate disposal of construction waste	Possibly significant in the immediate vicinity and for the duration of construction work, but limited given the small scale of project activities	<ul style="list-style-type: none"> ▪ Application of good construction practices ▪ Contract clauses with specific performance standards for environment protection. ▪ "Good-housekeeping" measures to ensure that waste materials are disposed of appropriately 	Grant beneficiaries	Cost included in project activities
Pollution from inappropriate disposal of operational waste	Possibly significant, but limited given the small scale of project activities	<ul style="list-style-type: none"> ▪ Contract clauses with specific expected performance standards for environment protection. ▪ "Good-housekeeping" measures to ensure that waste materials are disposed of appropriately 	Grant beneficiaries	Cost included in project activities
Social impacts due to the exclusion of nonresident resource users from the community fisheries area	Possibly significant	Study of natural resource use and adjustment of subproject selection criteria if required	MOI	\$25,000
Potential impacts by output 2: safeguarding the core areas Protection vacuum of the core areas in case of project failure	Significant, but unlikely	Government assurance to maintain the fishing lots until effective alternative management and protection is put in place, and a commitment to remove the lots when this is achieved; will be included in a loan covenant.	DOF	No cost

DOF – Department of Fisheries, MOI – Ministry of Interior, TSBR – Tonle Sap Biosphere Reserve.

C. Cost Estimates for Environmental Mitigation and Monitoring

63. Environmental monitoring costs by the different agencies involved have been budgeted at \$2,000 per month, which is the cost of a person-month of domestic consultant time. As shown in Table 4, implementation of the environmental management plan costs \$105,000. However, by including the cost of the environmental specialists, the total cost of environmental management rises to \$213,000.

Table 4: Project Budget for Environment Safeguarding

Item	Unit Cost (\$)	Units	Budget (\$)
International environmental specialist	15,000/ person-month	2	30,000
Domestic environmental specialist	2,000/ person-month	39	78,000
Mitigation activities	25,000	1	25,000
Monitoring activities	20,000/year	4	80,000
Total			213,000

64. The close interaction between the implementing agencies—in most cases the commune councils and the CLFTs—and the involvement of the TSBR Secretariat in all components of the Project, creates continuous opportunities for feedback on the implementation of mitigation measures and monitoring. Further, this allows for adjustments in project procedures and operational arrangements. Formally, the 6-monthly project reviews will be the forum for providing feedback and making adjustments, as required.

V. INSTITUTIONAL REQUIREMENTS AND ENVIRONMENTAL MONITORING PLAN

65. **Planned Environmental Monitoring.** Environmental monitoring will be undertaken at several levels. The overall impact of the Project on the environment will be monitored through subproject impacts, as well as through the effectiveness of the Project in preserving the Tonle Sap's natural resources as the livelihoods base of the people who depend on it.

66. For each of the potential negative impacts on the environment, environmental performance indicators have been identified to provide the link between the impacts and mitigation measures.

67. Not all monitoring activities have been fully developed. Some activities require the consideration of activity-specific elements, which are unknown at this stage. The detailed monitoring requirements and procedures that will be used for these will be finalized as activities are identified during project implementation.

68. The best suited agencies will provide specific monitoring. The TSBR Secretariat plays an important role in monitoring specific impacts and activities, as well as in monitoring the overall project achievements and impacts. The TSBR Secretariat will monitor the impact of the project activities on the landscape of the project area, as well as possible habitat loss caused by the Project. The Secretariat is in a unique position to conduct this monitoring as it manages the Tonle Sap environmental information database, which is being developed as part of the Tonle Sap Environmental Management Project. It also will monitor the Project's impact on erosion and sedimentation, as well as associated changes in water quality. The TSBR Secretariat will

monitor the effectiveness of the proposed mechanism and alternative management arrangements for the removal of the fishing lots from the core areas to ensure no interruption in effective protection of these valuable areas.

69. Furthermore, the TSBR Secretariat will cooperate with other agencies in monitoring activities. It will collaborate with DOF in its monitoring of the Project's impact on the demand for natural resource products and possible flooded forest clearing. As part of its regular activities, DOF collects (i) catch statistics, (ii) data on the export and transport of fish and fish produce, (iii) total fish catches, (iv) fishing pressure, and (v) trends in the use of other natural resources in the TSBR. DOF will assist the commune councils in monitoring the impact of project activities on local drainage patterns and associated fish migrations. The TSBR Secretariat also will cooperate with the commune councils in monitoring the impact of project activities on navigation safety and waste disposal.

70. As the implementing agencies, the commune councils are at the forefront of environmental monitoring. They will monitor performance of CLF grant beneficiaries, particularly their compliance with the environment safeguard clauses in the construction contracts, operating agreements etc. The performance of the commune councils will be supported continuously, while simultaneously being monitored by the project CLFTs.

71. The Apsara Authority, which is in charge of conserving and managing the country's rich cultural heritage, will carry out further specific monitoring. It will monitor the impact of project activities on known cultural heritage sites, as well as any archaeological finds during construction.

72. A local nongovernment organization (NGO) will be contracted to monitor conflicts and exclusion of nonresident resource users as a consequence of project activities.

73. The TSBR Secretariat will monitor the cumulative impacts of the project activities with support from the Project and its CLFTs. The CLFTs, particularly its member representative from the Provincial Department of the Environment, will monitor the cumulative impact of project activities at the province level, and report its findings to the TSBR Secretariat every 6 months. The TSBR Secretariat will coordinate the environmental monitoring activities for the Project in close collaboration with the Ministry of Interior (MOI) and MOE. It also will monitor compliance of all project activities with the national environmental impact assessment (EIA) legislation using reports prepared by the commune councils and CLFTs. Specific monitoring, such as that by the Apsara Authority or DOF, will be contracted to these agencies.

74. The semiannual reports by the TSBR Secretariat are at the center of environmental monitoring reporting. The Secretariat will report on its own specific monitoring activities, and will incorporate the cumulative impacts monitoring and other monitoring activities reports, as appropriate. The project implementation unit in the MOI will oversee environmental monitoring, integrating its reporting with overall project reporting and reviewing.

75. ADB will conduct semiannual project reviews facilitated by the Council for Agricultural and Rural Development (CARD). The reviews will (i) examine the appropriateness of implementation arrangements and schedules of activities; (ii) assess the procedures for village and commune development plans; (iii) review compliance with agreed procurement procedures; (iv) analyze the outcomes of the capacity building and training programs; and (v) monitor, in consultation with the TSBR Secretariat, the effectiveness of safeguard procedures. At midterm, ADB and the Government will undertake jointly a comprehensive project review.

76. Environmental performance indicators to be used in monitoring are diverse and depend, to an extent, on the specific nature of project activities, which is largely unknown. General environmental performance indicators are also hard to identify, because the impact of project activities on the environment often will be difficult to distinguish from the impact by nonproject activities. Based on the guiding principles for project activities, indicators that should be included in the monitoring activities include (i) number of complaints or conflicts generated by project activities, (ii) area of natural floodplain vegetation affected by the Project, (iii) diversity of project activities, (iv) absence of fish migration barriers, (v) connectivity of the flooded forest belt, (vi) hydrology of floodplain pools, (vii) presence of new exotic species, (viii) fish catches and fishing effort, (ix) demand for non-fish natural resource products in the project area, and (x) absence of navigation hazards created by the Project. Detailed environmental performance indicators will be defined for each of the monitoring activities in collaboration with each monitoring agency at the beginning of the Project. These will be based on the project activities selected for funding through the CLF.

Table 5: Environmental Monitoring of Specific Activities

Potential Impacts by Project Activities	Environmental Performance Indicators	Responsibility for Monitoring	Cost of Monitoring	Monitoring Frequency/Reporting
Increased demand for natural resource products and flooded forest clearing	Catch statistics, data on export and transport of fish and fish produce, total fish catches, fishing pressure, trends in use of other natural resources in the TSBR	Department of Fisheries (DOF), in collaboration with TSBR Secretariat	No additional cost, part of ongoing activities	Annually
Changes to the landscape	Changes to the landscape by project activities	TSBR Secretariat	\$2,000 per year	semiannual monitoring report
Modifications to local drainage patterns	Effect of project activities on local drainage patterns and on fish migration	Commune councils with support by CLFT and DOF	\$2,000 per year	semiannual monitoring report
Habitat loss	Habitat loss caused by project activities	TSBR Secretariat	\$2,000 per year	semiannual monitoring report
Erosion and sedimentation, and associated changes in water quality	Erosion and sedimentation, and associated changes in water quality caused by project activities	TSBR Secretariat	\$2,000 per year	semiannual monitoring report
Impact on cultural heritage elements	Presence of cultural heritage elements in vicinity of project activities areas, and monitoring of construction works	Commune councils with support by CLFT and Apsara Authority	\$2,000 per year	Continuous or annual monitoring report by Apsara Authority
Activity-specific impacts	Part of subproject approval process	Commune councils with support by CLFT	No additional cost	Continuous
Creation of navigation hazards	Assessment of project activities in terms of being navigation hazards	Commune councils with support by CLFT and TSBR Secretariat	\$2,000 per year	semiannual monitoring report

Potential Impacts by Project Activities	Environmental Performance Indicators	Responsibility for Monitoring	Cost of Monitoring	Monitoring Frequency/Reporting
Dust and noise pollution	Dust and noise levels and impact as indicated by complaints of people negatively affected	Commune councils with support by CLFT	No additional cost	Continuous
Pollution from inappropriate disposal of construction waste	Compliance with contractually agreed practices	Commune councils with support by CLFT	No additional cost	Continuous
Pollution from inappropriate disposal of operational waste	Compliance with contractually agreed practices	Commune councils with support by CLFT and TSBR Secretariat	\$2,000 per year	semiannual monitoring report
Social impacts due to the exclusion of nonresident resource users from the community fisheries area	Conflicts and exclusion of nonresident resource users as a consequence of project activities	Commune councils with support by DOF, CLFT, and a local NGO	\$4,000 per year	Annual monitoring report by local NGO
Potential impacts by output 2: safeguarding the core areas Protection vacuum of the core areas in case of project failure	Effectiveness of the proposed mechanism and alternative management arrangements	TSBR Secretariat	\$2,000 per year	semiannual monitoring report

CLFT – community livelihood facilitation team, DOF – Department of Fisheries, MOI – Ministry of Interior, TSBR – Tonle Sap Biosphere Reserve.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

77. Information was disclosed to affected people and the general public before and during consultation to inform them of the IEE findings and receive feedback, creating a forum for consensus building or conflict resolution, if required.

78. The Tonle Sap Sustainable Livelihoods Project was prepared in a highly consultative and participatory manner. The project preparatory technical assistance (PPTA) was divided into two phases, the first of which consisted of a project area-wide purposive participatory rural appraisal (PPRA) to assess the livelihoods basis for the target population.

79. In addition to the highly consultative and participatory approach followed in the project design, public consultations were organized at different levels to provide stakeholders with sufficient and adequate information in an accessible and culturally appropriate way. Stakeholders in fishing villages were approached in a different way than national NGOs, donors, and the general public. However, the information provided to different stakeholders and groups differed only in presentation format, and complete information was provided on all occasions. The stakeholders included (i) rural poor; (ii) ethnic minorities, such as the Vietnamese and Muslim Cham; (iii) local government authorities; (iv) commune councils; (v) NGOs; and (vi) Government agencies, such as MRD, MAFF, MOE, and CARD. Officials from the village up to the national level were involved throughout the PPTA, enabling them to talk with local stakeholders. Different groups of stakeholders from the three zones in the TSBR were brought together to discuss a range of livelihood-based issues.

Table 6: Stakeholder Categories and Their Involvement in Public Consultation on the Initial Environmental Examination Process and Findings

Stakeholder Category	Represented by or as:	Involvement in Public Consultation
Local communities	Individuals, community fishery committee members, village chiefs, commune council members, mutual interest groups representatives	Village-level workshops
Civil society	Pagoda committee	Village-level workshops
Government and local government bodies	Commune council, provincial officials, line ministries, Ministry of Environment	Village-level workshops, national consultation
Private sector bodies	Largely absent as few such bodies exist in the project area, mutual interest groups representatives	Village-level workshops
Other institutions	Nongovernment organizations, donors, international organizations	National consultation workshop

80. The stakeholders for direct consultation on the process and findings of the IEE were selected to include those directly and indirectly affected; those positively and negatively affected (although that was not always clearly assessable); the most vulnerable groups; and supporters and opponents of livelihood support.

A. Village-Level Public Consultation

81. Village-level public consultation workshops were held in two locations in the project area. The villages were selected to represent the range of environmental awareness and exposure to external assistance with natural resources management and conservation activities. The consultations were undertaken in village Anlong Taa Uor, in the core area of the TSBR of Prek

Tual in Battambang Province; and village Chnok Tru, in Kampong Chnang Province. The village-level public consultation workshops were held on 28 April 2005 in the primary school of Anlong Taa Uor village, Koh Chiveang commune; and on 29 April 2005 in Chnok Tru commune, Kampong Chnang. The consultations were organized with the support of the respective DOF provincial offices and local authorities. In total, 90 people participated in the two consultations—42 in Anlong Taa Uor and 48 in Chnok Tru. The participants included fisherfolk, fish and crocodile cage owners, fish processors, elderly villagers, school teachers, fish traders, village leaders, community fishery members, and commune council members.

82. The consultation format consisted of an introductory presentation of the proposed Project and its activities; followed by an overview of the meaning, purpose, and procedures of the IEE process; and the findings of the IEE, including expected environmental and social impacts and proposed mitigation measures. Feedback was invited from all attendants. Both consultations were active and lively, providing enthusiastic feedback. The questions raised during the public consultations in the two villages are documented in the full IEE report. The guidelines and criteria for income-generating activities and investments to be supported by the Project were presented and briefly explained. Comments were invited. The following principles were presented: (i) protect the flooded forest; (ii) do not stop fish migration in and out; (iii) do not change the flow of water in channels; (iv) do not use destructive fishing gear (explosives, poison, electric fishing); and (v) do not use introduced species in aquaculture. All participants agreed with these criteria.

83. The two villages displayed marked differences. While the comments involving endorsement of the IEE and its findings were similar in the two villages, the portion of irrelevant comments was much higher in Chnok Tru (45% of all responses). The percentage of relevant comments contributing to the IEE or project design was almost twice as high in Anlong Taa Uor.

B. National-Level Public Consultation

84. Public consultation of national-level stakeholders was organized on 25 May 2005. Of the 35 invited parties, 15 participated in the workshop at the ADB Cambodia Resident Mission. The list of participants is in the full IEE report. The meeting was chaired by HE Mr. Nouv Kanun (CARD). The Tonle Sap Initiative and the Project were presented. The draft summary IEE was provided to all participants, and the process and purpose of the IEE as part of ADB's environment safeguarding activities were explained. The findings and conclusions regarding expected impacts of project activities were presented, as well as the assessment of their significance and the proposed mitigation measures. The participants were provided with cards for recording comments and questions regarding the IEE process and findings, in addition to any subjects discussed during the meeting. The comments received are in the full IEE report.

C. Follow-Up to Public Consultation

85. More than a third of the comments received (30 of 83) in the two villages were considered irrelevant to the IEE process and findings. They included (i) comments on, or endorsement of, project activities and chosen solutions; (ii) suggestions for alternative or additional activities not based on environmental considerations; (iii) misunderstandings of the topic or technical misconceptions; and (iv) comments on impacts not caused by project activities. More than half of the comments received (27 out of 45) during the national-level consultation were considered irrelevant to the IEE.

86. Comments endorsing the IEE process, its findings, and the identified mitigation measures were received in both villages. A majority of the comments endorsed the IEE conclusions, particularly regarding (i) the impact of training and capacity building, (ii) the support for patrolling and protecting sanctuaries and community fisheries, and (iii) the safeguarding of the core areas. Based on the comments received, the consultations seem to have explained inadequately the expected impact of stocking endangered species. The national-level consultation also included comments endorsing the IEE process and findings. In general, however, these comments were more critical and provided more recommendations for additional considerations.

87. None of the comments received during the national-level consultation contested the findings of the IEE, although some weaknesses were identified. A majority of the comments was related to important details regarding project design and implementation arrangements, of which insufficient information was provided at the time.

VII. ENVIRONMENTAL ASSESSMENT AND REVIEW PROCEDURES

88. The EARP was formulated during the preparation of the Tonle Sap Sustainable Livelihoods Project to detail procedures for environmental assessment and review of project activities. The EARP is based on (i) a thorough assessment of the design and scope of the Project, (ii) the likely scope of individual project activities under the Project, (iii) the results of the IEE, and (iv) an assessment of the capacity of responsible agencies in Cambodia to effectively implement environmental mitigation measures and monitoring activities. The EARP also considers the specific circumstances of the project area, as well as the sensitivity of the ecosystem. It describes procedures for environmental planning and screening for project activities.

A. National Environmental Assessment and Review Procedures

89. This EARP will be undertaken within the context of four legal documents: (i) Sub-Decree No 72.ANRK.BK of August 1999, which defines environmental assessment requirements for development projects; (ii) The Royal Decree establishing the TSBP; (iii) The Sub-Decree establishing the TSBP Secretariat; and (iv) Decree No. 33: Law on Fisheries Management, approved on 9 March 1987. The fisheries law, which is under review, had not been enacted when EARP was prepared.

B. Specific Procedures to Be Used for Project Activities

90. The Project will support at least 500 small project activities, and possibly many more. These will have a maximum cost of \$20,000 for social infrastructure per village, and \$5,000 for other eligible activities. The procedures for environment safeguarding reflect this.

1. Responsibilities and Authorities

91. MOI, which will be responsible for output 1 and the bulk of output 3, will execute the Project. The TSBP Secretariat within the Cambodia National Mekong Committee, in consultation with DOF within MAFF and MOE, will be responsible for output 2. The Ministry of Economy and Finance will ensure the smooth flow of funds from central to provincial and commune levels. A project steering committee headed by the CARD secretary general will provide policy and strategy guidance, and communicate project outcomes to the Council of Ministers and relevant ministries.

92. The Project, which will be implemented predominantly at the commune level, relies heavily on the decentralized structures strengthened under the Seila/Partnership⁶ for Local Governance program. The commune councils play a key role in project implementation. The commune councils drive and guide the planning process by identifying eligible project activities, and ensure that the procedures for environment safeguarding are implemented. As subproject proponent, the commune councils are responsible for ensuring compliance with national EIA legislation, which is under MOE. As part of the commune planning process, the commune councils are responsible for the screening and scoping proposed project activities for potential negative environmental impacts. The councils also are responsible for implementation of the guidelines for subproject selection prepared by the Project. Further, the commune councils monitor implementation of project activities to ensure compliance with the guidelines and any mitigation or environmental management measures that have been prescribed.

93. The primary responsibility for environment safeguarding for project activities lies with the commune councils. As the principle decision-making body for community investments for the Commune/*Sangkat* Funds (C/SF), the commune councils must ensure that all investment decisions are given due environmental consideration. The commune councils also are responsible for ensuring that village residents are kept informed regarding possible environmental concerns relating to investment proposals. Working closely with the district facilitation team, they ensure that information on possible impacts is made available in a timely manner to facilitate informed decision making. In addition, they closely monitor and assist the village committees in environmental matters. Commune councils are also responsible for reviewing the performance of contractors to ensure that any environmental clauses are adhered to, and that they respond to any grievances submitted by adversely affected people.

94. MOI will assure interministerial cooperation and effective cross-sectoral coordination during project implementation. In the context of decentralization and deconcentration, MOI has been tasked with building the central and local institutions that will support the operation of the subnational system of governance. MOI also will implement the related capacity-building effort. A project steering committee, headed by the secretary general of CARD, will provide policy and strategy guidance. The steering committee will communicate project outcomes to the council of ministers and relevant ministries, including MAFF, MEF, MOE, MOI, MRD, the Ministry of Planning, the Ministry of Women's Affairs, and the Ministry of Water Resources and Meteorology. The steering committee will meet at least twice a year. An international consultant will assist CARD intermittently. CARD will equip itself to improve coordination for community-driven development.

95. MOE will oversee education activities for the protection of natural resources. It is also responsible for the enforcement of national EIA legislation. The Provincial Departments of the Environment are responsible for monitoring the compliance of project activities proponents with the recommendations made in the environmental assessment.

96. The TSBR Secretariat will manage output 2, safeguarding the core areas of the TSBR, in consultation with DOF, the Inland Fisheries Research and Development Institute, and MOE. The TSBR Secretariat also has a mandate to review all activities that might have an impact on the TSBR. In this capacity, it will review the implementation of environment safeguarding procedures and arrangements.

⁶ The Seila Program of the Royal Government of Cambodia is an aid mobilization and coordination framework to support the country's decentralization and 'deconcentration' reforms.

97. MAFF is involved in environmental monitoring and management through DOF and its provincial offices. DOF has a role in reviewing and approving the formation of community fisheries and their management plans. Implementation of parts of these management plans can be considered project activities. DOF is responsible for the fisheries domain and enforcement of the fisheries law, which covers all fishing activities and natural resource use in the project area. DOF is critical in ensuring effective implementation of output 2 of the Project. In collecting catch statistics, DOF plays an important role in monitoring.

2. Criteria for Selection of Project Activities

98. Table 7 outlines the eligibility criteria that will be applied. In particular, project-funded activities should comply with applicable environmental, legal, and other requirements of the Government, as well as with ADB's environmental assessment requirements.

Table 7: Eligibility Criteria for Community Livelihood Fund Activities (Project Activities)

Type of Investment	Criteria	Certifying Agency
Any activity funded by the Community Livelihood Fund	<ul style="list-style-type: none"> • High priority accorded by community in the village development plan. • Inclusion in the commune development plan. • Not expected to have adverse environmental impacts. • Compliance with applicable environmental, legal, and other requirements of the country, and with environmental assessment requirements of the Asian Development Bank (ADB). • Does not disadvantage any part of the community. • Demonstrable benefits to the poor, women, ethnic minorities, or vulnerable groups. • Entails only legal activities. • No impact on cultural heritage sites. 	Commune Planning and Budgeting Committee (CPBC) of the Commune Council
Social Infrastructure	<ul style="list-style-type: none"> • Total cost limit per village not to exceed \$20,000. • Technical, financial, economic feasibility. • New road construction requires special clearance from the Ministry of Environment. • Compliance with applicable environmental, legal, and other requirements of the country, and with ADB's environmental assessment requirements. 	CPBC
Income generation	<ul style="list-style-type: none"> • Each grant not to exceed \$5,000. • Financial feasibility of the business plan. • Enterprise would employ a significant number of persons. • Improved technology successfully demonstrated and financially feasible. • Compliance with applicable environmental, legal, and other requirements of the country, and with ADB's environmental assessment requirements. 	CPBC

Type of Investment	Criteria	Certifying Agency
Support to community fisheries	<ul style="list-style-type: none"> • Cost of each community fishery grant not to exceed \$5,000. • Supported by a majority of the members of the community fisheries. • Compliance with applicable environmental, legal, and other requirements of the country, and with ADB's environmental assessment requirements. 	CPBC Department of Fisheries

3. Environmental Criteria for Selection of Eligible Project Activities

99. To minimize the Project's potential negative environmental impacts, environmental criteria are recommended to guide the selection of eligible activities for project support. The guiding principles are based on the conceptual model of ecosystem productivity that was developed for the Tonle Sap's ecosystem as part of the IEE.

100. **Guiding Principles.** The guiding principles are:

- (i) Any CLF-funded activity is not expected to have adverse environmental impacts.
- (ii) Any CLF-funded activity will comply with applicable environmental, legal, and other requirements of the country, as well as with ADB's environmental assessment requirements.
- (iii) All the natural characteristics and variability of the flood pulse, as well as its associated processes, must be maintained.
- (iv) The natural floodplain vegetation must be preserved and, where possible, restored and enhanced. The area within the boundaries of the upper flood level has the potential to contribute to ecosystem productivity.
- (v) Biodiversity must be preserved at all levels (genetic, species, ecosystems, and ecosystem processes).
- (vi) The natural variability in the ecosystem should be preserved.
- (vii) Sedimentation patterns in the lake and the floodplain should be preserved.
- (viii) Land cleared of natural vegetation should not be left barren before becoming flooded. The amount of standing biomass and organic structure and surface area should be left as high as possible.
- (ix) Substitution of natural floodplain vegetation by agriculture crops or animal grazing fodder should be avoided.
- (x) Given the importance of the buffer zone and core areas, the precautionary principle should be applied rigorously. Activities with uncertain impacts should not be supported. For the core areas, a positive justification approach should be used—i.e., only activities permitted in the TSBP regulations should be supported.
- (xi) Migration and movements, locally and over long distances, of non-target fish species and life stages, as well as of other organisms, should not be hampered. No migration path should be blocked completely, physically or functionally.
- (xii) The connectivity between habitats in the ecosystem must be preserved. Where connections are threatened, they should be strengthened and restored.
- (xiii) Where small piped water supply systems or wells are provided, the quality of the water should be adequately tested.⁷

⁷ Arsenic can be present in groundwater. Therefore, testing existing wells would be prudent, or establishing test wells to ensure that concentrations are within the guidelines of the World Health Organization.

101. **Specific Guidelines and Criteria for Project Activities.** These guidelines include:

- (i) Natural pools in the floodplain must be protected, and their water should not be extracted during the dry season.
- (ii) Diversity among the natural floodplain vegetation is important and should be maintained or restored.
- (iii) The natural vegetation belt around the lake should not be interrupted, and gaps (e.g., at Kompong Luang) should be restored.
- (iv) Construction of floodwater retention structures in the floodplain should be avoided.
- (v) Trees in the floodplain face enormous recruitment challenges and must be promoted actively.
- (vi) Some invasive species are in the ecosystem (e.g., golden apple snail, *Mimosa pigra*), and activities to reduce them through profitable uses should be promoted.
- (vii) The introduction of new species of any taxon should be avoided.
- (viii) Where agriculture is practiced in the floodplain, the organic matter left on the fields must be maximized before flooding.
- (ix) Where agriculture is practiced in the floodplain, the surface area of standing plants left on the fields must be maximized before flooding.
- (x) Soil left uncovered by any kind of vegetation at the onset of flooding should be avoided. Any kind of vegetation is preferable to no vegetation.
- (xi) The use of pesticides of all kinds, as well as the run-off of pesticides into the ecosystem, must be avoided or minimized.
- (xii) Fishing pressure needs to be reduced, and activities that directly or indirectly increase the demand for fish—except at the household level for household consumption—must be avoided.
- (xiii) Activities that increase the demand for other non-fish products, such as fuel wood, nontimber forest products, wild animals, etc. should be avoided.
- (xiv) Pressure on other animals of the ecosystem, particularly aquatic snakes and all kinds of birds, should be reduced, and activities that increase their demand must be avoided.
- (xv) Activities that encourage or facilitate human migration, seasonal or permanent, into the ecosystem must be avoided.
- (xvi) Capture of juvenile fish from the wild for aquaculture should be monitored and avoided when its negative impact cannot be excluded.
- (xvii) Migration pathways for migratory species must be preserved.
- (xviii) Petroleum storage facilities and other potentially catastrophic hazards in or near the ecosystem must be secured and monitored.
- (xix) Localized environmental problems due to point pollution (e.g., in floating villages or around cages) should be minimized through measures such as collection points for used engine oil and batteries in floating villages.
- (xx) Transport of cargo, particularly of dangerous products, and passengers over the lake should be discouraged. Instead, use of the improved roads system should be encouraged.
- (xxi) The installation of structures in the ecosystem that could pose a risk to navigation should be avoided. Structures should not be installed in the permanent lake without the development of an effective removal method.
- (xxii) Processing and other uses of natural resources products from the ecosystem should be selected and supported to limit the amount of primary product lost due to spillage and conversion, among others. The shortest path between the resource and the consumer should be promoted

C. Recommended Approach to Environmental Management

102. The elected commune councils are at the core of community-driven development in Cambodia. Nonetheless, village- and commune-level development planning, design, construction, procurement, and operations procedures have been well established in all the project communes. Seila has supported these communes. This support has been extended and strengthened through the World Bank-funded Rural Investment and Local Governance Project, which supports the C/SFs. The village and commune planning processes follow the procedures of the C/SF, which includes an environmental screening of all proposed activities at commune level. Provincial and district technical support service teams provide support. This process ensures that potential negative environmental impacts of activities funded through the C/SF are avoided or mitigated. All proposed project activities for CLF funding will go through the village and commune planning process, and will follow the procedures of the C/SF.

103. Seila has included clauses into recent contracts to ensure adequate environmental and natural resource management, and this practice will be continued and expanded. Finally, communes are expected to adhere to good management practices during project operations. These measures are expected to be simple, low-cost, and feasible under Cambodia field conditions. As the principle decision-making body for community investments for the C/SF, the commune councils have primary responsibility for ensuring that all investment decisions are given due environmental consideration. The commune councils are responsible for ensuring that village residents are kept informed of possible environmental concerns related to investment proposals. Working closely with the district facilitation team, they ensure that information on possible impacts is made available in a timely manner to facilitate informed decision making. In addition, they closely monitor and assist the village committees in environmental matters. Commune councils are also responsible for reviewing the performance of contractors to ensure that environmental clauses are adhered to, and that they respond to any grievances submitted by adversely affected people.

104. Public disclosure and consultation is an integral part of the commune planning process, and public input is solicited at numerous points in the planning process. As part of the broader guidelines on CLF use, the commune councils will apply to all projects considered for CLF funding the environmental guidelines and criteria for the selection of eligible project activities, as well as the C/SF safeguarding procedures. Given the limited budget of individual project activities, subprojects are highly unlikely to require a procedure under the national EIA law.

105. The Project will provide the commune councils with adequate training, awareness raising, funding, and technical support to carry out this task effectively. This will ensure that negative environmental impacts of project activities are avoided or adequately mitigated. The Project will provide intense support to the commune councils for the identification, preparation, selection, implementation, monitoring, and evaluation of all project activities. Two commune facilitators will be posted in each commune to help (i) identify activities suitable for CLF funding, and (ii) prepare them for submission to the planning and budgeting committee of the commune councils. The commune facilitators will have extensive facilitation experience, including presentation and synthesizing skills, and will be able to respond to questions about organizational issues. Additionally, the Project will attach to each CLFT domestic consultants responsible for guiding, training, fielding, and backstopping the line agency staff and commune facilitators in the performance of their duties. An international consultant will be based in each of the CLFTs in Pursat and Siem Reap to manage and coordinate CLF implementation.

106. The capacity of commune councils to perform their environment safeguarding role is being strengthened through the World Bank-funded Rural Investment and Local Governance Project. This project strengthens the C/SFs procedures, including environmental screening of all proposed activities at the commune level. Provincial and district technical support service teams provide support.

107. The CLFTs will review proposed project activities for compliance with the environment safeguard guidelines and criteria. To facilitate this process, the commune councils will complete for each subproject a rapid environment assessment checklist based on ADB's environmental selection criteria. When the absence of negative environmental impacts cannot be demonstrated for a project activity, the CLFT will forward the proposed subproject, together with proposed mitigation and safeguarding measures as prepared by the commune council, to the TSBR Secretariat for review and a final decision on acceptability of the proposed subproject. The TSBR Secretariat then would require that an IEE be carried out according to ADB's environmental assessment requirements, and could impose additional conditions to ensure environment safeguarding. Given the small scale of project activities, this is expected to be an exceptional occurrence.

108. The CLFT, particularly its member representative from the Provincial Department of the Environment, will monitor at the province level the cumulative impact of project activities. It will report its findings to the TSBR Secretariat every 6 months.

109. The executive committees of the Provincial Rural Development Committees, which were set up under the Seila program, will be contracted to monitor project performance. In consultation with the TSBR Secretariat, ADB will conduct semiannual reviews, facilitated by CARD, to monitor the effectiveness of the environment safeguard procedures.

110. The commune councils, as principle project proponents, are responsible for screening the proposed project activities against the criteria of the national EIA legislation and undertaking the required steps. The CLFT's Provincial Department of Environment member will monitor the performance of the commune councils in this area, and advise them as required. It will prepare a semiannual report to MOE on compliance with national EIA law.

D. Staffing and Reporting Requirements

111. In general, the cost for implementing the EARP, including environmental monitoring, capacity building, and institutional strengthening, will be borne by other elements of the Project. Costs have already been identified for these elements. In addition to these costs, the implementation of the EARP requires the input of 2 person-months of an international environmental specialist and 39 person-months of a domestic environmental specialist. Their tasks are described in the terms of reference (Appendix).

112. The implementation arrangements for the Project provide for the deployment and staffing of the CLFTs, which will have administrative staff and representatives from line agencies, supported by domestic and international consultants. The commune councils, which play a crucial role in the implementation of the EARP and EMP, will receive permanent support from the Project through the commune facilitators based in each of the project communes. These staffing arrangements are considered adequate to ensure an effective and timely implementation of the EARP.

113. The TSBR Secretariat has a leading role in monitoring and reviewing environmental management implementation of the Project. It will coordinate the activities of the other agencies involved in monitoring. The TSBR Secretariat will produce a semiannual monitoring report, providing details of its own specific monitoring activities. In addition, this report will integrate the cumulative impacts monitoring and the outcomes of monitoring by others. The environmental monitoring reporting will be integrated with overall project reporting and reviewing.

114. The CLFTs will provide the MOI with reports on environmental aspects during implementation as part of their regular progress reports.

115. MOI will then provide the project steering committee, headed by the CARD secretary general, with semiannual progress reports and annual reports on environmental performance. The project steering committee will forward these reports to the relevant ministries, including MOE, and ADB. During the regular project reviews performed by ADB, environmental aspects of the Project will be reviewed alongside project implementation.

VIII. CONCLUSIONS

116. The Project is expected to benefit the environment significantly. It is expected to reduce pressures on the Tonle Sap ecosystem over the long term by enhancing and diversifying the livelihoods basis for its population. The Project will be a major step towards effective biodiversity conservation, while raising awareness and educating the public about environmental protection and conservation.

117. The Project is not expected to have significant negative environmental impacts. The IEE has assessed thoroughly the potential environmental impacts associated with the Project. The environmental impacts identified in the course of this assessment are manageable. The Government, through the executing agency, will ensure that the recommended mitigation and management measures are implemented. The environment safeguards developed for the Project are comprehensive, realistic, and achievable. If implemented in full, these safeguards are adequate. The designated government agencies, especially at the provincial and local level, will handle monitoring and compliance oversight. Semiannual reports will be submitted to ADB and relevant government agencies.

118. In accordance with environmental assessment requirements of the Government of Cambodia as well as of ADB, an EIA is not required for the Project. The IEE, with the EMP and EARP, were formulated to ensure that project activities will be designed and implemented in accordance with the applicable environmental, legal, and other requirements of the Government of Cambodia, as well as with ADB's environmental assessment requirements as prescribed in its *Environment Policy* (2002).⁸

⁸ ADB. 2002. *Environment Policy*. Manila.

TERMS OF REFERENCE FOR ENVIRONMENTAL SPECIALISTS

1. Implementation of this environmental assessment and review procedure (EARP) will require the input of one international specialist for 1 month per year during the first 2 years; and one domestic specialist for 36 months over the first 3 years, and for 3 months per year for subsequent years. They will ensure that the procedures and guidelines contained in the EARP are implemented fully.
2. The international environmental specialist will
 - (i) finalize the environmental management plan;
 - (ii) ensure integration of the environmental guidelines and criteria for project activities into the guidelines for project activities;
 - (iii) ensure that the roles of all agencies involved in project implementation are clarified and understood by all parties;
 - (iv) conduct an early review of the adequacy of the environment safeguarding activities by the commune councils, and make recommendations accordingly;
 - (v) ensure that the environmental awareness and capacity building of the Project adequately covers the requirements for environment safeguarding;
 - (vi) finalize detailed monitoring requirements and procedures for all activities; and
 - (vii) remedy any problems that might arise regarding the environment safeguarding procedures of the Project.
3. The domestic environmental specialist will
 - (i) serve as the Project's focal point for all environment safeguarding issues;
 - (ii) assist the community livelihood facilitation teams (CLFTs) and commune councils in all aspects of implementing the environment safeguarding procedures for project activities;
 - (iii) guide the CLFTs in implementing the environmental assessment and review procedures;
 - (iv) review and identify prevention and project-specific environmental mitigation measures for eligible subprojects;
 - (v) help the commune councils prepare and incorporate environmental clauses into the contractors' contracts, and conduct compliance monitoring of subprojects;
 - (vi) coordinate the involvement of the Tonle Sap Biosphere Reserve (TSBR) Secretariat, as required, as well as technical inputs by line agencies;
 - (vii) monitor the performance of commune councils in applying the environment safeguarding procedures; and
 - (viii) review subproject monitoring suggestions to ensure that they comply with proposed environmental selection criteria.