Greater Mekong Subregion
Biodiversity Conservation
Corridors Initiative

Strategic Framework and
Technical Assessment
2005–2014

ADB
GMS BIODIVERSITY CONSERVATION CORRIDORS INITIATIVE

STRATEGIC FRAMEWORK AND TECHNICAL ASSESSMENT

May 2005
IX. PROGRAM SUSTAINABILITY ............................................................................................................. 56
   A. National Economic Instruments ................................................................................................. 57
   B. Domestic Private Sector Investment ........................................................................................... 58
   C. Innovative International Financial Flows ...................................................................................... 58

ANNEXES

Annex 1: Logframe of the GMS BCI Program
Annex 3: Pilot Site Proposals
   Annex 3-1: Cardamoms Biodiversity Conservation Corridors, Cambodia
   Annex 3-2: Xe Pian–Dong Hua Sao–Dong Ampham Biodiversity Conservation Corridors, Lao People’s Democratic Republic
   Annex 3-3: Xishuangbanna Biodiversity Conservation Corridors, People’s Republic of China
   Annex 3-4: The Tenasserim Biodiversity Conservation Corridors, Western Forest Complex - Kaeng Krachan Complex, Thailand
   Annex 3-5: Ngoc Linh–Xe Sap Biodiversity Conservation Corridors, Viet Nam
Annex 4: Administrative, Legal, and Institutional Context
Annex 5: BCI GIS Database: Current Status and Gaps
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>BCI</td>
<td>Biodiversity Conservation Corridors Initiative</td>
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<td>BCL</td>
<td>biodiversity conservation landscape</td>
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<td>BI</td>
<td>BirdLife International</td>
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<td>CBD</td>
<td>Convention on Biological Diversity</td>
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<td>CCICED</td>
<td>China Council for International Cooperation on Environment and Development</td>
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<td>CEP</td>
<td>core environment program</td>
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<td>CEPF</td>
<td>Critical Ecosystems Partnership Fund</td>
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<td>EC</td>
<td>economic corridor</td>
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<td>EOC</td>
<td>environment operations center</td>
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<td>GIS</td>
<td>geographic information system</td>
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<td>GMS</td>
<td>Greater Mekong Subregion</td>
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<td>GPS</td>
<td>geographic positioning system</td>
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<td>IBA</td>
<td>important bird area</td>
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<td>IUCN</td>
<td>World Conservation Union</td>
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<td>LUP</td>
<td>land-use planning</td>
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<td>NBCA</td>
<td>national biodiversity conservation area</td>
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<td>NGO</td>
<td>nongovernment organization</td>
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<td>PA</td>
<td>protected area</td>
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<td>PATF</td>
<td>Protected Areas Task Force of the CCICED</td>
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<td>PCU</td>
<td>regional program coordination unit</td>
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<tr>
<td>PDR</td>
<td>People's Democratic Republic (Lao)</td>
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<tr>
<td>PRC</td>
<td>People's Republic of China</td>
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<tr>
<td>RCC</td>
<td>regional coordination committee</td>
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<td>RCSP</td>
<td>regional cooperation strategy and program</td>
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<td>SDF</td>
<td>Strategic Development Framework</td>
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<td>SEF</td>
<td>strategic environmental framework</td>
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<td>TAP</td>
<td>technical advisory panel</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>WCS</td>
<td>Wildlife Conservation Society</td>
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<td>WGE</td>
<td>Working Group on Environment (GMS)</td>
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<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
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### Note

In this report, "$" refers to US dollars, unless otherwise noted.
EXECUTIVE SUMMARY

1. The Greater Mekong Subregion (GMS) Economic Cooperation Program is an association of six countries, namely, Cambodia, Lao People’s Democratic Republic [Lao PDR], Myanmar, the People’s Republic of China (PRC; Yunnan and Guangxi Zhuang Autonomous Region), Thailand, and Viet Nam. The GMS is an informal group, guided by a set of principles and institutional arrangements to help them plan and carry out projects for their mutual benefit. One major initiative is a set of economic corridors based on highways linking the countries in north-south, southern coastal, and east-west directions. The corridors are expected to play a crucial role in meeting regional development goals. However, there is concern that they will fragment and damage critical ecosystems and important areas of biodiversity (biological diversity), which would undermine the long-term environmental security and, therefore, the socioeconomic development of the GMS.

2. In 2001, the GMS countries adopted a Strategic Development Framework (SDF) to guide the next 10 years of development cooperation. Investments of more than $10 billion are envisaged during this period, focused on the economic corridors and transforming economies, communities, and the environment in the subregion. The Asian Development Bank (ADB) regional cooperation strategy and program for 2004-2008 follows the SDF to improve connectivity, competitiveness, and sense of community around the subregion. Increasingly, GMS countries will be linked through transportation, telecommunications, energy production and usage, and cross-border trade. Gross domestic product (GDP) per capita in the subregion is expected to double by 2015, by which time the population will have increased by 40 million from the present 301 million. So far, ADB transport, energy, and tourism infrastructure projects costing almost $3.4 billion have been or are being implemented. Furthermore, the GMS Program envisages additional investments in the range of $10–15 billion over the next 10 years to catalyze economic integration in the subregion.

A. Biodiversity, an Essential Development Asset in the GMS

3. The GMS harbors globally important and irreplaceable elements of biodiversity. It contains several Global 200 ecoregions (natural ecological communities with shared species, dynamics, and environmental conditions), is a global biodiversity hotspot (i.e., it contains important species threatened with extinction), and includes an extensive network of important bird habitats. Much of the subregion, especially along the Greater Annamite Mountains, is biologically unexplored. Surveys over the past 10 years have revealed species new to science. Many of these have very small ranges and are irreplaceable elsewhere. Undoubtedly, many more species await discovery. This rich web of natural systems provides the foundation for the economic, social, and cultural future of the subregion.

4. The key GMS economic sectors of agriculture, energy, fisheries, tourism, and transport all depend on the maintenance and contribution of healthy natural systems. Agriculture and fisheries provide livelihoods for at least half the GMS population and make significant contributions to GDP. The water necessary for agriculture, domestic water supplies, and increasingly, electrical power and industry, comes from the many rivers flowing through the subregion and from its groundwater. The flow and quality of water depends on the integrity of the watersheds. When forest cover is removed, loss of natural water regulation leads to increased floods and droughts and reduced water quality and accessibility. Conservation of hydrological processes is essential for the continuation of these and other ecological services to economic sectors and the numerous human communities that depend on them.
5. Biodiversity is undervalued. The cultural, educational, health, recreational, and spiritual values of the subregion's biodiversity as well as those of ecological services are difficult to quantify in monetary terms. Yet, annual values for different ecosystems on a per-hectare basis for climate regulation, water regulation and supply, soil conditioning, pollination, erosion control, waste treatment, and biological control would run into billions of dollars if applied to the GMS countries. Biodiversity conservation and maintenance require urgent increased investment and attention.

B. Threats to Biodiversity and Natural Resources

6. Evidence from the six GMS countries shows that all levels of biodiversity—habitat, species, and genetic diversity—are being lost at unprecedented rates as a result of development. It is difficult to assess rates of species loss in absolute terms. But, rates of degradation in land, freshwater, and marine habitats are a reflection of species loss. If no action is taken, it is probable that the GMS will lose more than 50% of its remaining land and water habitats over the next century (a third over the next few decades alone), leading to impoverished and unstable natural, social, and economic systems. Threats to biodiversity and natural resources in the GMS come mainly from overexploitation of natural resources and habitat loss, exacerbation of rural poverty, and construction of transnational roads and other economic development, including damming of rivers.

7. Domestic and export demand for many commodities will increase with the construction of transnational roads, and remaining forest patches will become increasingly vulnerable. The planned system of transnational roads could have severe, widespread, and irreversible impact on biodiversity in the GMS. Some of the roads bisect important conservation areas or important biodiversity corridors. Unless mitigation and conservation measures are taken, these roads will encourage the illegal wildlife trade already taking a heavy toll on biodiversity. The roads will encourage encroachment and settlements in conservation areas and will create barriers to dispersal and movement of species, especially such species as primates that are reluctant to cross open areas.

C. Biodiversity Conservation Corridors: a Development Strategy

8. The threats to natural systems, their development values, and conservation needs in the GMS call for a package of measures that build land-use and management regimes for sustainable use and conservation, restoring connectivity of ecosystems, and for poverty alleviation. While the technical problems and possible solutions are well known, there is a need for strengthening local capacity to plan, manage, and maintain biodiversity conservation for the full range of development benefits it brings. Further, there is a need to secure and greatly expand sustainable financing for biodiversity conservation measures in the GMS.

9. Biodiversity conservation corridors are areas of suitable habitat that provide functional linkages between protected areas. They have three main functions: (i) conserving habitat for species movement and for the maintenance of viable populations, (ii) conserving and enhancing ecosystem services, and (iii) promoting and enhancing local community welfare through the conservation and sustainable use of natural resources.

10. Biodiversity corridors are analogous to economic corridors in their function and objectives: both attempt to increase system connectivity, economies of scale, integration, and efficiency. Biodiversity corridors do so by enlarging the functional boundaries of conservation areas. They help the movements of species and safeguard the contributions of natural systems...
more widely across development landscapes. In the absence of such corridors, ecological and environmental services of importance to the GMS development agenda will continue to decline.

11. Biodiversity corridors are intended to consolidate and expand the development and economic benefits derived from natural systems in protected areas and across the landscapes linking them. They do so through rehabilitation, conservation, and sustainable use and by internalizing biodiversity products and services in the development planning process.

D. Priority GMS Biodiversity Conservation Landscapes

12. The GMS governments, with support from ADB and nongovernment organization (NGO) partners, have identified the most important biodiversity conservation landscapes in the subregion and the biodiversity corridors within them that should receive priority attention.

13. The primary biological criteria for identifying the biodiversity conservation landscapes were the presence of landscape species (those that need large, ecologically diverse areas for their survival), ecological processes that occur over large areas, globally important species that will be affected by development and require urgent conservation, and representation of the ecoregions of the GMS. Nine high-priority landscapes were then identified based on five criteria. They had to be in the GMS economic corridors, in a designated biodiversity hotspot, affected by a major transnational road or other development, able to support landscape species and ecological processes, and important for their ecological services.

14. The nine high-priority GMS biodiversity conservation landscapes and their locations are:

(i) Western Forest Complex (Thailand and Myanmar)  
(ii) Ton Le Sap Inundation Zone (Cambodia)  
(iii) Cardamom and Elephant Mountains (Cambodia)  
(iv) Northern Plains Dry Forests (Cambodia and the Lao PDR)  
(v) Eastern Plains Dry Forests (Cambodia and Viet Nam)  
(vi) Tri-Border Forests (Cambodia, the Lao PDR, and Viet Nam)  
(vii) Central Annamites (Viet Nam and the Lao PDR)  
(viii) Northern Annamites (Viet Nam and the Lao PDR)  
(ix) Mekong Headwaters (PRC, Yunnan Province and Myanmar)

E. Protected Areas in the Biodiversity Conservation Landscapes

15. The nine high-priority landscapes include more than 55 protected areas, many contiguous across national borders and forming complexes of regional significance for biodiversity conservation. The protected areas provide the main nodes of connectivity in the nine landscapes linked by remaining but often fragmented and degraded natural forest. With rehabilitation, the habitat linkages could act as corridors for species dispersal between core populations in the protected areas. Rehabilitated and well-managed corridors between protected areas would help conserve biodiversity across the landscape, maintain ecological services, buffer core areas from external influences, and provide natural and semi-natural habitats for sustainable natural resource extraction.
F. Population and Poverty in the Biodiversity Landscapes

16. There are a number of important relationships between the nine GMS biodiversity landscapes and population. In each GMS country, corridors tend to fall in the least populated locations, are situated in regions of medium to high poverty, are subject to increasing immigration, and are experiencing increasing community pressure on biodiversity.

17. In general, although the biodiversity corridors are in regions of low population density, they are areas of medium to high population growth and medium to high poverty incidence. People are moving seasonally and permanently into them in increasing numbers. The migrant population in Cambodia, for example, is 31.5% of the total, and 70% of the migrants move from one rural area to another. People are moving into regions of remaining biodiversity wealth. In Viet Nam, the most notable migration of the last decade has been from the heavily populated north, especially the Red River Delta region, down to the central highlands. Districts around Yok Don National Park in Dak Lak Province experienced population growth rates of 14% annually, compared to the national average of 1.3%, and equivalent to some of the fastest-growing urban centers in the country. As Thailand’s population increased, land-poor families migrated to forest frontier areas declared as National Reserved Forest. By 1980, an estimated 10 million people, or more than 20% of the country’s villages, were located in these forest regions, which include the national protected areas system.

18. Remote areas are a refuge for displaced communities and a “last resort” employer for some of the poorest and most powerless people; these are the people most directly dependent on the supply and quality of natural resources. Often they have moved higher up into mountains, deeper into forests, or closer to sandy shorelines because of development in the lowlands, such as overpopulation, exploitation of new economic zones, and resettlement schemes for development projects, including hydropower and irrigation dams.

19. The broad distribution of poverty in the subregion affirms the importance of undertaking pro-poor and pro-biodiversity conservation interventions: poverty tends to concentrate in and around the biodiversity landscapes and the economic corridors.

G. Key Governance Opportunities for Effective Biodiversity Corridor Management

20. Four fields of governance reform are changing the way protected areas and biodiversity conservation are planned and managed in the GMS countries. They are decentralization, “democratization” (i.e., providing more opportunities for nongovernment groups, communities, and individuals to influence how natural resources are used), institutional innovation, and reinforcing the rule of law.

21. Decentralization is a major force in governance reform in the GMS countries. It entails delegating greater responsibility and authority for development decisions to local government. It involves transferring to local levels certain powers over budget management and even the potential for local taxation and revenue raising. These reforms, combined with expanding legal frameworks for establishing tenure, ownership and rights of access to land and natural resources, shift the weight of development planning and decision making closer to where resources are used.

22. Democratization has three important linked elements: more transparent and open government, easier access to information (e.g., in planning processes, environmental assessment, and state-of-environment reporting), and community participation in planning and
management. All three aspects of governance are being promoted in most GMS countries through laws and policies, with the expanding role for communities and NGOs in information sharing and decision making. Community participation, comanagement, and equity in natural resource use are urgent and rapidly evolving issues confronting biodiversity managers in the region, who have more experience in relatively nonparticipatory and centralized approaches.

23. **Institutional innovation.** Over the past decade, GMS countries have gone through one or two waves of major reform to the organizations managing natural resources and protected areas, most recently in Thailand and Viet Nam, which have new amalgamated ministries of natural resources and environment. Agencies have been set up at central and local levels bringing a reorientation and consolidation of staffing and budgets to focus on new priorities and approaches to natural resource management with the intention of fostering greater cross-sector integration.

24. **Reinforcing the rule of law.** The institutional change has been accompanied by major law reform. New laws are being introduced to

- clarify tenure and land-use rights;
- delegate authority for detailed planning and investment decisions;
- introduce integrated planning for natural resource regions, such as landscapes/river basins (in Thailand and Viet Nam);
- develop systems to resolve conflicts in land and natural resource use; and
- provide national legal frameworks for protected areas.

25. This is a critical period for biodiversity policy development in all GMS countries. Needed are devolved management authority and structures; greater emphasis on outreach and involvement of local communities and governments; and more clarity in management controls, procedures, and rights under the law. A key challenge has been enforcement of new legal regimes, particularly in controlling the use of protected areas and the regions surrounding them.

**H. The Biodiversity Conservation Corridors Initiative**

1. **The vision**

26. GMS leaders will consider the BCI at the Second GMS Summit in July 2005, with the following vision:

   By 2015, GMS countries will have established priority biodiversity conservation landscapes and corridors for maintaining the quality of ecosystems, ensuring sustainable use of shared natural resources, and improving the livelihoods of people.

2. **Goal, purpose, and components**

27. The goal is that by 2015, GMS countries will endeavor to maintain and improve the cover, condition, and biodiversity of forestlands and associated ecosystems in priority biodiversity conservation landscapes and corridors.

28. The purpose of the BCI is to establish sustainable management regimes for restoring ecological connectivity and integrity in a selected set of important biodiversity areas. This is to be combined with provision of natural resource goods and services that contribute to improving livelihoods of peoples living in and around the biodiversity conservation corridors, and protect
the physical infrastructure investments deemed central to economic integration and sustainable development in the subregion.

29. The BCI has five components:

(i) Poverty alleviation through sustainable use of natural resources and development of livelihoods
(ii) Clear definition of optimal land uses and harmonized land management regimes
(iii) Restoration and maintenance of ecosystem connectivity
(iv) Capacity building in local communities and government staff
(v) Sustainable financing mechanisms and structures integrated with government planning and budgeting procedures

30. The orientation of activities under each of the five BCI components is as follows:

(i) Poverty reduction. Livelihood improvement interventions (for example, access to secure land tenure, community forestry, local primary processing of wood and nonwood products, ecological farming, and ecotourism) will be undertaken and market linkages promoted. This entails the provision of incentives, funding, legal rights, and technical assistance in the corridor sustainable-use areas.

(ii) Integrated land-use planning and management. A spatial land-use planning process will be undertaken using a participatory consultative framework. Local communities will benefit (in kind and cash) from their involvement in the required socioeconomic and biodiversity surveys. This process includes the definition and delineation of environmentally sensitive areas, identification of appropriate safeguards, sustainable-use and development zones, and preparation of an overview spatial map of current land-use patterns. Agreements will be reached with stakeholders on appropriate land-use and conservation arrangements.

(iii) Restored ecosystem connectivity. Ecosystem restoration to establish connectivity and sustainable-use areas will be undertaken and evaluated. Planting of native species may be required to create corridors between some core areas. Areas for sustainable use and protection will need to be delineated in the buffer or transition zones around protected areas.

(iv) Capacity building. Institutional and human capacity for managing biodiversity corridors will be improved. Local people and officials need capacity building for biodiversity conservation planning, management, and monitoring.

(v) Sustainable financing. Sustainable financing for the BCI will be identified and secured. This component entails identifying and setting up funding mechanisms that will allow conservation areas as well as corridors to function in the long term. Apart from recurrent budget support from the GMS countries, areas that will be explored include transfer payments for environmental services such as watershed protection, Clean Development Mechanism (CDM), and setting up endowments and contributions from tourism and other natural resource-use tax regimes.
3. **BCI phases**

31. The BCI objectives will be achieved in three phases over 10 years, the period between GMS Summits from 2005 to 2014.

32. In Phase I (2005–2008), five GMS countries (Cambodia, Lao PDR, PRC, Thailand, and Viet Nam) will carry out pilot projects in a selected site in each of the GMS biodiversity corridor landscapes. ADB will work with the United Nations Environment Programme (UNEP) for implementing BCI activities in Myanmar. Each pilot site includes a complex of protected areas and several proposed linking biodiversity corridors. In addition, enabling activities will be carried out at national and regional levels. Plans will be prepared for expansion and scaling-up of the pilot project and for additional corridors in the nine GMS biodiversity landscapes to receive BCI support in Phase II.

33. In Phase II (2009–2011), the methodology and framework of action developed in Phase I will be scaled-up in the pilot sites and applied to other corridors in the nine GMS biodiversity landscapes.

34. In Phase III (2012–2014), all nine GMS biodiversity landscapes and the priority corridors in them will be consolidated in terms of investments, and an evaluation of the approach and achievements will be carried out to determine whether the vision has been achieved.

4. **Phase I pilot projects**

35. Phase 1 of the BCI includes five pilot projects and national and regional activities. The pilot sites were selected by governments with support from NGO partners based on the following six criteria:

   (i) Falling within GMS economic corridors or their zones of influence
   (ii) Reducing ecosystem fragmentation by linking two or more protected areas
   (iii) Areas of international biodiversity importance
   (iv) Areas of high poverty incidence and population growth
   (v) Being of a transboundary nature
   (vi) Having institutional capacity on the ground that is active in implementing one or more projects

36. In Cambodia, the Cardamom and Elephant Mountains landscape down to the southwestern coast is the location of the pilot site. Koh Kong Province and specific corridors within it linking 11 protected areas provide the focus of the project. Preparatory activities will be undertaken at a second site in Mondulkiri Province in northeastern Cambodia bordering Viet Nam, with detailed planning for Phase II.

37. In the Lao PDR, the pilot project is to develop a sustainable-use corridor linking Dong Houa Sao (DHS) national biodiversity conservation area (NBCA) in Champasak Province to the Xe Pian NBCA, which covers both Champasak and Attapeau provinces in the Tri-Border Forests landscape.

38. In the PRC, the pilot site is the Xishuangbanna Tropical Rainforest landscape in southern Yunnan Province, stretching down to the border of the Lao PDR. Yunnan Province and eight corridors in the Prefecture of Xishuangbanna are the focus of the project, including the
linkage of nine existing and proposed protected areas. Preparatory activities will be undertaken in PRC and Myanmar transboundary areas, particularly for the Mangao-Mengsong corridor.

39. In Thailand, the pilot site is in the Tenasserim Range in western Thailand, between the Western Forest Complex (WEFCOM) and the Kaeng Krachan Forest Complex. To the west of both complexes is a forested area in Myanmar. The project will develop a corridor for protection and sustainable use linking the two existing forest complexes with their 19 contiguous protected areas. BCI partners, such as UNEP, will facilitate the undertaking of transboundary cooperation activities between Thailand and Myanmar.

40. In Viet Nam, the pilot project is in Quang Nam Province of the Central Annamites and bordering areas of Thua Thien Hue and Kon Tum provinces and Sekong and Attapeu in the Lao PDR. Activities in the three BCI phases are designed in sequence to tackle the areas of highest risk first without losing sight of the long-term goal of establishing a continuous forest landscape throughout the Central Annamite Mountains. Phase 1 focuses on the links between three nature reserves, Ngoc Linh, Song Thanh, and Ba Na in Quang Nam Province, and Xe Sap NBCA in the Lao PDR.

I. Partnerships and Sustainable Financing

41. The BCI will promote active collaboration with and between NGO partners already implementing activities in the nine GMS biodiversity conservation landscapes, aimed at bringing about synergy in actions and funding for systematic and coordinated conservation and sustainable use in the corridors. The BCI will promote partnerships between governments and NGOs through the program structure and implementation arrangements.

42. Corporate sponsors will be sought to provide patronage to one or more of the corridors that may have flagship species, or to provide opportunities for carbon trading through the Clean Development Mechanism or transfer payment mechanisms relating to watershed protection. In addition to GMS country contributions, all avenues will be explored to raise funds from public and private sources. In particular, multilateral funding sources (e.g., Global Environment Facility), and multi- and bi-lateral partners will be approached to fund the initiative.

J. Expected Benefits of the Initiative

43. The expected benefits of the proposed BCI over a period of 10 years are as follows:

(i) Securing and improving the livelihood of poor people living in and around forests in remote rural areas in the nine GMS biodiversity corridor landscapes
(ii) Securing watershed protection and carbon sequestration by improving forest cover and the quality and productivity of forest ecosystems
(iii) Establishing land management and governance regimes that provide incentives to manage and maintain natural resources responsibly and sustainably
(iv) Establishing and consolidating a system of payment for environmental services that functions as a basis for sustainable financing of BCI
(v) Availability of trained and competent personnel in state and nonstate sectors employed in the growing conservation and environmental protection sector locally and nationally
(vi) Establishing areas of conservation, ecotourism, sustainable use, and regional cooperation in the region that demonstrate best developmental and conservation practices
I. BACKGROUND

A. Greater Mekong Subregion

1. The Greater Mekong Subregion (GMS), which now includes two provinces of the People’s Republic of China (PRC), Yunnan and Guangxi Zhuang Autonomous Region, is one of the fastest growing regions in the world, with GDP growth in 2004 ranging from 5.8% in Cambodia to 8.8% in the PRC, and average per capita income rising from $630 in 1992 to $875 in 2004.

<table>
<thead>
<tr>
<th>Country</th>
<th>Land and water area (km²)</th>
<th>Population (million, 2003)</th>
<th>Annual rate of population change (%)</th>
<th>GDP per capita ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>181,000</td>
<td>13.6</td>
<td>1.81</td>
<td>320</td>
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<tr>
<td>Lao PDR</td>
<td>237,000</td>
<td>6.2</td>
<td>2.42</td>
<td>410</td>
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<td>Myanmar</td>
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<td>0.42</td>
<td>320</td>
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<td>Thailand</td>
<td>514,000</td>
<td>65.4</td>
<td>0.87</td>
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<td>Viet Nam</td>
<td>339,000</td>
<td>83.5</td>
<td>1.04</td>
<td>480</td>
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<td>PRC, Yunnan</td>
<td>394,000</td>
<td>43.8**</td>
<td>0.60*</td>
<td>680</td>
</tr>
<tr>
<td>PRC, Guangxi</td>
<td>230,000</td>
<td>45.9***</td>
<td>0.60*</td>
<td>680</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,563,000</strong></td>
<td><strong>301.3</strong></td>
<td><strong>Average $875</strong></td>
<td></td>
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</tbody>
</table>

Source: ADB Country Key Indicators; * Note: this is PRC annual rate of change; ADB GMS Atlas puts it at 1.01% for Yunnan, PRC in 1999-2000; ** Yunnan Environmental Protection Bureau 2005; ***Ministry of Commerce, PRC 2005.

2. The GMS Summit Declaration issued by the GMS leaders in November 2002 enunciated a vision of freeing their people from poverty and providing sustainable development opportunities for all their citizens. The subregion needs to be increasingly integrated to attain these goals and to compete in a globalized world. Since 1995, the population in the GMS has grown from 240 million to over 301 million, and gross regional product has grown from some $250 billion to over $400 billion. The GMS development program is informal and results-oriented, guided only by a general set of principles and institutional arrangements to facilitate the GMS countries to plan and implement projects to their mutual benefit. To date, Asian Development Bank (ADB) projects in transport, energy, and tourism infrastructure development worth almost $3.4 billion have been or are being implemented. ADB has provided $1.2 billion in loans and about $80 million in technical assistance. About $2.2 billion has been mobilized from GMS governments, cofinanciers, and private sector investors. The GMS Program envisages additional investments in the range of $10-15 billion over the next 10 years to catalyze economic integration in the subregion.

3. ADB’s Regional Cooperation Strategy and Program (RCSP 2004-2008) addresses the GMS developmental challenges by enhancing connectivity, competitiveness, and a greater sense of community in the subregion. Regional economic corridors are expected to play a crucial role in helping meet development goals. But there is concern that increasing development activities in the economic corridors may adversely affect critical ecosystems and important biodiversity areas by fragmenting natural landscapes. This would undermine the functioning and performance of the subregion’s ecosystems, thereby threatening long-term socioeconomic development and environmental security of the GMS.
Recognizing this development challenge, the Biodiversity Conservation Corridors Initiative (BCI) was considered by the second GMS Summit task force meeting held in Beijing, PRC, in July 2004.\(^1\) The Working Group on Environment\(^2\) (WGE-10) meeting held in September 2004 in Viet Nam considered and endorsed the BCI. Further consultations were held with other development partners, including United Nations Environmental Programme (UNEP), World Conservation Union (IUCN), and World Wide Fund for Nature (WWF). There was a general consensus that the initiative would further strengthen the subregion's commitment to and capacity for sustainable development. Furthermore, it would help secure the infrastructure investments that are central to planned economic transformation of the subregion.

The WGE-10 also endorsed the proposal to launch a core environmental program (CEP) as the principle focus of its work. The CEP will focus on strategic environmental assessment of major development sectors, such as hydropower; integrated environmental planning in the GMS economic corridors and assessment of cumulative effects of infrastructure; and biodiversity conservation as an essential development strategy. The CEP also proposes creating an environment operations center to provide technical and secretariat support to the WGE. The BCI will be housed in the environment operations center.

From October 2004 to April 2005, several rounds of consultations and field missions were conducted in five of the GMS countries to shape the BCI and support national teams in preparing pilot project proposals. WGE-11 in March 2005 reviewed progress in BCI preparations. The CEP and BCI will go to the May 2005 meeting of GMS Environment Ministers for endorsement and then for final consideration by the Second GMS Summit to be held on 4-5 July 2005 in Kunming, PRC. This paper provides background and justification for the biodiversity conservation corridors approach, lays out the strategy and action plan for the initiative over ten years, and describes in detail pilot projects for Phase 1 of a three-phase program.

**B. Development Program in the GMS Economic Corridors**

The GMS countries adopted a Strategic Development Framework (SDF) in 2001 to guide the next 10 years of development cooperation.\(^3\) To date ADB projects in transport, energy, and tourism infrastructure development worth almost $3.4 billion have been or are being implemented. Currently, there are 11 flagship programs supported by ADB under the Regional Cooperation Strategy Program (RCSP); three are "economic corridors" known as North-South, East-West, and Southern corridors; the remaining eight are: Telecommunications Backbone, Regional Power Interconnection and Trading Arrangements, Facilitating Cross-Border Trade and Investment, Enhancing Private Sector Participation and Competitiveness, Strategic Environment Framework, Developing Human Resources and Skill Competencies, Flood Control and Water Resources Management, and Tourism Development. A more ambitious level of investment ($10 billion at a minimum) is envisaged for the next 10 years.

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\(^1\) The task force consists of GMS government officials responsible for planning and organizing the Second GMS Summit scheduled for Beijing, PRC, in July 2005.

\(^2\) One of nine sector-based working groups, WGE was established in 1995 under the GMS economic cooperation program to serve as an advisory body on GMS issues in the environment and natural resources management sector. The WGE reports to the GMS Ministerial Conference and to the respective governments. To date, eleven meetings of the WGE have been held.

\(^3\) The SDF gives direction to development cooperation in five major areas: (i) strengthening infrastructure linkages through a multisectoral approach, (ii) facilitating cross-border trade and investment, (iii) enhancing private sector participation and improving its competitiveness, (iv) developing human resource skills and competencies, and (v) protecting the environment and promoting sustainable use of shared natural resources.
8. This development will transform economies, countries, and landscapes in the subregion. Countries will be increasingly linked through transportation, telecommunication, energy production and usage, and cross-border trade. Gross domestic product (GDP) per capita in the subregion is expected to double by 2015, by which time the population will have increased by 40 million from the present 301 million. Economies will undergo structural changes: the manufacturing and service sectors will expand while agriculture will become more diverse, intensive, and productive. Inevitably, these developments will affect environmental quality and natural systems. Already, there are clear indications that unwanted environmental side effects of rapid development are undermining progress in regional and local economies and creating problems of equity and social disruption.

C. Critical Value of the GMS Environment and Natural Resources

9. The key GMS economic sectors of energy, agriculture, fisheries, tourism, and transport all depend on the maintenance and contribution of healthy natural systems. Agriculture and fisheries provide livelihoods for at least half the GMS population and significant contributions to GDP. Subregional development programs are threatening the resource base for these fundamental economic sectors, including expansion of agriculture itself.

10. The water necessary for agriculture, domestic water supply, and increasingly, electrical power and industry, comes from the many rivers flowing through the subregion and from groundwater. The flow and quality of water depends on the integrity of the watersheds. When forest cover is removed, loss of natural water regulation leads to increased floods and droughts and reduced water quality and accessibility.

11. Some of the Mekong River's watersheds will be affected by the planned development associated with the GMS economic corridors. Conservation of the hydrological processes will be essential to maintaining the ecological communities and dynamics of the subregion, and to ensuring continued provision of ecological services for economic sectors and the numerous human communities that depend, either directly or indirectly, on the river network and its resources.4

12. The GMS harbors globally important and irreplaceable elements of biodiversity. It contains several Global 200 ecoregions (natural ecological communities with shared species, dynamics, and environmental conditions),5 is a global biodiversity hotspot,6 and includes several important bird areas (IBAs).7 Much of the subregion, especially along the Greater Annamite Mountains is biologically unexplored, and surveys over the past 10 years have revealed several species new to science. Undoubtedly many more species await discovery. Some species have very small ranges and are irreplaceable elsewhere. This rich web of natural systems provides the foundation for the economic, social, and cultural future of the subregion. Its conservation and maintenance requires urgent increased investment and attention.

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4 ADB is already supporting the Tonle Sap Initiative (2002) and Tonle Sap Basin Strategy (2003). The ADB Tonle Sap Initiative is a pro-poor strategy designed to enable access to the lake's resources and improve management of the seasonally inundated wetlands and forests that are critical habitats for many floral and faunal species.


D. Socioeconomic Context in the GMS

1. Population and Poverty

13. The majority of the 301 million people in the GMS inhabiting the valleys and lowlands of the subregion are lowland ethnic groups: Khmer of Cambodia, Han of the PRC, Lao of the Lao PDR, Burman of Myanmar, Thai of Thailand, and Kinh of Viet Nam.

14. Approximately 200 ethnic minority groups totaling about 75 million people live in remote mountain areas of the GMS, mostly along shared national borders. Many inhabit the watersheds along the Mekong River and its tributaries. They live on a combination of subsistence agriculture, hunting and limited trade in forest products. Because of their geographic isolation, they have little or no access to basic health and education services and often have high levels of poverty, both income and nonincome. There is increasing environmental, population, and commercial pressures on the natural resources that have traditionally provided their livelihoods.

15. It is estimated that about 55 million people in the subregion are poor. The basic indicator used for poverty mapping is “the proportion of people living below the consumption-based poverty line.” In this measurement, poverty is expressed in terms of a person’s consumption of food and basic necessities. The poverty line represents the minimum value of the daily consumption of goods and services needed to sustain an average adult. Each country uses a different methodology to determine the poverty line. Because of this, caution is needed in making comparisons between countries. The incidence of poverty in the subregion varies significantly and is higher in rural areas than in urban areas. It tends to be highest in remote areas, uplands, and watersheds, where most of the ethnic minority groups live.

16. In Cambodia, about 36% of the 1997 population or about 4 million people were classified as poor using a consumption-based poverty line, defined as adequate income to buy a daily 2,100 calorie food basket plus an allowance for nonfood expenditure. The highest prevalence of poverty is in northwestern Cambodia.

17. In the Lao PDR, 39% of the population were below the poverty line in 1997/98. This was based on poverty thresholds that utilize food and nonfood consumptions as well as energy requirements. There is a large difference in poverty incidence between urban (27%) and rural (41%) areas. Poverty is widespread in the north and south of the country.

18. Myanmar has no official poverty line. However, the 1997 Household Income and Expenditure Survey provided important insights about the extent of poverty: almost one in four households were found to be below the minimum subsistence level. In 2003, the total population was 49.4 million, with about 30% in urban areas. The population growth rate is estimated at 0.42% (2005). In 2000, the proportion of the population below the poverty line was estimated at 25%.

19. In the PRC province of Yunnan, there are some areas where poverty incidence is greater than 60%, but in general, poverty incidence is less than 40%. In 2002, of the 43 million people in the province, more than four million were estimated to be trapped in absolute poverty. Peasants earned an average annual income of yuan (CNY)1,500 ($180), CNY700 below the national average.

20. Poverty incidence in Thailand was only about 13% in 1998. Despite this, certain inequities have been increasing (e.g., between urban and rural areas, between regions and
between well-educated workers and those with little education) and poverty remains acute in certain areas, particularly in the northeast.

21. In Viet Nam, poverty incidence was 37% in 1997/98. Poverty is largely a rural phenomenon, with 45% of the rural population living below the poverty line. Poverty is highest in the northwestern region and central highlands.

22. Forests and fisheries no longer provide adequate subsistence due to overexploitation. Throughout the subregion, national economic growth is leaving persistent pockets of poverty in isolated areas where communities are most directly dependent on natural resources.

23. The Protected Areas and Development Review in the Lower Mekong Region found a number of important linkages relating to population and poverty. In each country

(i) protected areas tend to fall in the least populated locations;
(ii) protected areas are situated in regions of medium to high poverty incidence;
(iii) there is increasing migration toward protected areas and regions of biodiversity wealth; and
(iv) there is a direct correlation between population density and the level of community pressure on protected areas.8

24. The migrant population in Cambodia is 31.5% and rural-to-rural migration remains the most common at around 70% of the total. People are moving into regions of biodiversity wealth and complexes of protected areas. In Viet Nam, the most notable migration of the last decade has been from the heavily populated north, especially the Red River Delta region, down to the central highlands. Districts around Yok Don National Park in Dak Lak Province experienced population growth rates of 14% annually, compared with the 1.3% national average and equivalent to some of the fastest-growing urban centers in the country. As Thailand’s population increased, land-poor families migrated to forest frontier areas declared as National Reserved Forest. By 1980, an estimated 10 million people, or more than 20% of the country’s villages, were located in these forest regions, which included the national protected areas system.

25. The broad distribution of poverty in the subregion affirms the importance of undertaking pro-poor interventions. Promoting and supporting the rehabilitation and sustainable management of natural resources can alleviate poverty. An example is the Tonle Sap Environmental Management Project that provides community-based management of natural resources, supported by an improved regulatory framework. Some GMS countries9 have issued policy statements and legal instruments increasing forest cover targets, combating forestland clearings and encroachment, and allocating land and resources for tree planting. These efforts have had slow progress in the face of difficulties in implementation, incentives, and enforcement.


9 Cambodia: National Forest Sector Policy (2002); Government Order to combat forestland clearings and encroachment (2004); Lao PDR: Decree on Allocation of Land for Tree Planting, Regulation No. 196/2000 and 1849/200; establishment of biodiversity conservation area (active since 1988); Land and forest allocation (active since 1990); Viet Nam: Five Million Hectares Reforestation Program (5MHRP), which has the objective of increasing forest cover to more than 40%; Decree 661 which implements 5MHRP; In its 3rd Meeting (October 2004), the China Council for International Cooperation on Environment and Development suggested that the PRC should invest more in rural labor force, land, and water and ensure priority of rural environmental protection as soon as possible (SEPA Express).
2. **Agriculture**

26. The GMS countries, except Thailand, have primarily agrarian economies. Agriculture provides the main source of livelihood for most of the poor, as well as GDP and export earnings (Table 2). Agriculture involves about 70% of the population in the Lao PDR and 53% in Viet Nam, and by 2003 accounted for about 48% of the GDP in the Lao PDR, 57% in Myanmar (including livestock and fisheries) and 22% in Viet Nam. In Thailand, rapid economic growth in recent years has meant that agriculture provides employment to about half of the labor force, while contributing only 9.8% of the GDP.

<table>
<thead>
<tr>
<th>Country</th>
<th>1990</th>
<th>2001</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>55.6</td>
<td>37.6</td>
<td>37.2</td>
</tr>
<tr>
<td>PRC*</td>
<td>27.0</td>
<td>15.8</td>
<td>14.6</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>61.2</td>
<td>51.2</td>
<td>48.6</td>
</tr>
<tr>
<td>Myanmar</td>
<td>57.3</td>
<td>57.2</td>
<td>---</td>
</tr>
<tr>
<td>Thailand</td>
<td>12.5</td>
<td>9.1</td>
<td>9.8</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>38.7</td>
<td>23.2</td>
<td>21.8</td>
</tr>
</tbody>
</table>

Source: ADB Key Indicators, April 2005; *The situation is different in Yunnan Province.

27. More than 21% of the subregion's land, or 49 million hectares, is classified as agricultural land. This includes arable land and land for permanent crops and permanent pastures. Thailand has the most agricultural land (about 19 million hectares) and proportion of agricultural land in total land (about 37%). Agricultural land ranges from 8% to 30% of the total area in the other countries.

28. Rice is critical to subregional economies. Most poor subsist on a diet of rice and fish. Myanmar, Thailand, and Viet Nam earn foreign exchange by exporting their surplus production. The important rice growing areas ("the rice bowls") are the Ayeyarwady, Chao Phraya, Mekong, and Red River deltas. Viet Nam is the subregion's biggest rice producer. Rice is planted on 6.3 million hectares, 82% of the total farm area, and accounts for more than 85% of food grain output. Rice is by far the most important staple food in Cambodia, which has a rice growing area of about 1.8 million hectares. Cambodia was a net importer of rice until 1995. Since then, the country has become self-sufficient in rice and now exports small amounts. In the Lao PDR, because of the high cost of marketing and underdeveloped infrastructure, only a small fraction of total production is traded domestically.

3. **Forests**

29. Forestlands of the subregion are under pressure from population growth and agriculture. The resulting conversion of forest to crop and grazing land and for transportation infrastructure and settlement has gradually altered the landscape.

30. In 2000, about 41% of the subregion was classified as forestland, the proportion varying from country to country, with Cambodia, Lao PDR, and Myanmar being slightly more than 50% forested and Yunnan Province, PRC; Thailand; and Viet Nam, only about 30% (Table 3). The subregion has about 94 million hectares of forestland. Myanmar has about 37% of this total, and the other countries have 10–16% each.
Table 3: Forest Cover and Type, 2000 (‘000 ha)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Land Area</th>
<th>Natural Forest</th>
<th>Plantation Forest</th>
<th>Total Forest</th>
<th>% of land area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>17,652</td>
<td>9,245</td>
<td>90</td>
<td>9,335</td>
<td>52.9</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>23,680</td>
<td>12,507</td>
<td>54</td>
<td>12,561</td>
<td>53</td>
</tr>
<tr>
<td>Myanmar</td>
<td>65,755</td>
<td>33,598</td>
<td>821</td>
<td>34,419</td>
<td>52.3</td>
</tr>
<tr>
<td>Thailand</td>
<td>51,089</td>
<td>9,842</td>
<td>4,920</td>
<td>14,762</td>
<td>28.9</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>32,550</td>
<td>8,108</td>
<td>1,711</td>
<td>9,819</td>
<td>30.2</td>
</tr>
<tr>
<td>Yunnan, PRC</td>
<td>39,679</td>
<td>-</td>
<td>-</td>
<td>12,873</td>
<td>32.4</td>
</tr>
<tr>
<td><strong>Subregion</strong></td>
<td><strong>230,405</strong></td>
<td></td>
<td></td>
<td><strong>93,769</strong></td>
<td><strong>40.8</strong></td>
</tr>
</tbody>
</table>

ha = hectare.

Source: FAO 2001; Yunnan Institute of Environmental Science; Atlas of Remote Sensing Investigation of Eco Environment in Western PRC.

31. Forestland in all countries except Viet Nam declined over the decade 1991–2000. Viet Nam invested heavily in afforestation and reforestation during this period. Average annual rates of decline varied from 0.4% for the Lao PDR to 1.4% for Myanmar. Much forest has been cleared for agriculture and food production by traditional forest dwellers and by immigrant newcomers. At the same time, the rate of commercial timber harvesting has intensified. Although the latter has provided capital for national development, much has benefitted individual concession holders and powerful individuals rather than the state or society as a whole. Considerable illegal logging has also taken place.

32. The dramatic reduction in the area of forests in the region and in the quality of remaining forests means that the need for conservation is widely accepted by all countries (Table 4). All have long-established forestry ministries or departments to manage forests and regulate logging. All countries have established formal networks of protected areas to protect biodiversity and watersheds. These extend over 20% of the national territory in Cambodia, Lao PDR, and Thailand, which is high by international standards. The areas of forest in these protected areas (PAs) are also very high, amounting to 45% of the total remaining forest and set to increase to 55% by 2005 when Thailand includes 86% of its natural forest in formal protected areas.10

Table 4: Trends in forested area cover in GMS countries (million ha)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Land Area</th>
<th>Total Forest Area in 2000</th>
<th>Forest Area (%)</th>
<th>Total Forest Area in 1990</th>
<th>Net annual change in forest area and % annual change, 1990–2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>17,652</td>
<td>9,335</td>
<td>52.9</td>
<td>9,886</td>
<td>-56 (-0.6)</td>
</tr>
<tr>
<td>Yunnan Province, PRC</td>
<td>39,679</td>
<td>12,873</td>
<td>32.4</td>
<td>13,423</td>
<td>-55 (-0.4)</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>23,680</td>
<td>12,561</td>
<td>53</td>
<td>13,088</td>
<td>-53 (-0.4)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>65,755</td>
<td>34,419</td>
<td>52.3</td>
<td>39,588</td>
<td>-517 (-1.4)</td>
</tr>
<tr>
<td>Thailand</td>
<td>51,089</td>
<td>14,762</td>
<td>28.9</td>
<td>15,866</td>
<td>-112 (-0.7)</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>32,550</td>
<td>9,819</td>
<td>30.2</td>
<td>9,303</td>
<td>52 (0.5)</td>
</tr>
</tbody>
</table>

Source: FAO 2001

33. The Lao PDR and Myanmar have the highest proportion of forest area at 53% and 52%, respectively (2000 figures), and Thailand has the lowest at 29%. The annual change in forest cover is the greatest in Myanmar at -1.4%. Thailand and Cambodia have an annual loss in

forest cover of 0.7% and 0.6% respectively. Viet Nam shows a slight increase in the extent of forest area during 1990–2000 at 0.5% annually due to plantation activities undertaken under the 661 Program.

4. Environment and Livelihood Linkage

34. The environment provides sustainable livelihoods to many people, giving them ways to improve their well-being. Maintenance the environment is important, especially to poor people who depend on it for livelihood. The poor, with their limited assets and greater dependence on common property resources, suffer first when the natural environment is degraded. This is true in the subregion, where the majority live in rural areas and depend on agriculture for income and sustenance.

35. The shrinkage of forest disproportionately affects the poor, especially women and children. Most spend an inordinate amount of time and energy on their traditional activities of collecting fuel, fodder, and water. If resources near their homes are already exhausted they may have to walk long distances. Women in such circumstances have less time to earn an income and take care of their children.

36. The poor are also increasingly exposed to environmental degradation. They tend to live in environmentally vulnerable areas, such as flood plains and mountain slopes where the risk from floods, landslides, and severe weather is great. They are also vulnerable when overexploitation destroys the ecology of the environmental resources on which they depend.

E. Policy, Legal, and Institutional Framework

1. Land-use Planning and Land Allocation

37. The application of land-use planning (LUP) and land allocation procedures in the GMS countries has generally occurred in the context of natural resource management and as a tool in land management. However, LUP methodologies and the political and socioeconomic conditions for implementation of LUP and land allocation vary greatly across the subregion.

38. In PRC, Lao PDR, and Viet Nam, local LUP procedures have facilitated agricultural and forestland allocation to households and communities with the intention of stabilizing shifting agriculture and improving agricultural production and, to a lesser extent, protecting forest resources. In Thailand, LUP processes have been restricted to preventing encroachment in protected areas and royal project areas.

39. In Cambodia, participatory land-use planning processes are relatively recent, commencing in 1997 in the framework of a Social Economic Improvement Program project on Community Based Natural Resources Management and a nongovernment organization (NGO) funded Non-Timber Forestry Project in Ratanakiri Province. The participatory LUP approach is now being applied widely, focusing at the district and commune level, and the local administrative structures at the commune level. Commune councils are authorized to supervise the procedures and draw up their own land-use plans.

40. Viet Nam is the only country in the region where LUP is enshrined in law (the new Land Law 2003) and all provinces, districts and communes are required to have land-use plans. The origins of this policy can be traced to the decollectivization of agriculture in the 1990s and the allocation of agricultural land based on Decree No. 64. The Land Law of 1993 gave farmers the
right to inherit, mortgage, transfer, exchange, and lease land. The management of forest zoned for production purposes has generally followed a farm household model. Farm households have received long-term land-use rights for barren land and for land with planted forest located outside critical watershed areas. However, almost everywhere, agricultural land allocation is further advanced than the Forest Land Allocation (FLA) program. Although 61% of the 10.8 million hectares of forestland have been allocated, two thirds of the total has been allocated to state forest enterprises, which in turn are supposed to reallocate the land to households.

41. In most cases, households have been assigned only barren lands and planted forests. Most forestland in the highlands has not been allocated to households. Decree 01/cp (January 1995) mandates the local forest administration to contract forest protection to former state forest enterprise employees and farmers. In fact, only 10% of the total area of forestland has been allocated directly to households (along with cash payments and subsidies to ensure that they protect and plant trees).

42. In the Lao PDR, based on the Forest Law, a well-stocked forest cannot be allocated to individuals or households, but it can be allocated to the village authority. The Forest Law recognizes customary rights of local communities in the forest. The State can allocate potential agricultural land and degraded land to households on a three-year Temporary Land Use Certificate (TLUC), for crop cultivation, tree planting or grazing. A family can be allocated up to 25 hectares of land for agricultural and forest activities. The provincial land office retains the right to convert TLUCs to permanent land title after three years if the land has been used in accordance with the specified use and without claims or disputes.

43. Villagers who receive TLUCs for denuded land are not authorized to transfer, sell, or use as collateral their land or TLUC allocation. Village forest is classified for use, protection, or rehabilitation and agreements on rules managing each forest type are assigned. A prototype of the present approach to land and forest allocation was formally introduced after several years of piloting by PM Decree Nº 186 in 1994; implementation was accelerated after the Ministry of Agriculture and Forestry Instruction of 1996 regarding local forest management.

44. In Myanmar, all forestland is owned by the State with exclusive user rights, except for household use by local people. Farmers are given usufruct rights to agricultural land, but the legislation stipulates that "any individual has no right to hold considerable extent of agricultural land" (Constitutional Law of 1947). As a result, a sizeable portion of agricultural lands is held under individual tenure, but holdings are usually small. Almost two thirds of agricultural holdings are smaller than 5 hectares. However, a large proportion of cultivable areas is under fallow and the Government has initiated a procedure of land reclamation, in which private investors are granted land-use rights to areas up to approximately 2,000 hectares per applicant.

45. Thailand’s LUP has focused on distinguishing the core protected areas from community land and agricultural use zones, in particular in identifying the duration of land occupation and the extent of land use and settlement before the gazetting of the PA. People found to have legal rights to land in PAs are provided land titles by the provincial authorities and illegal squatters are relocated to buffer zone areas. The biggest challenge in Thailand has been to limit land speculation and exclude major land development in protected areas.

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11 Dak Lak Province is a notable exception; households and communities there have been allocated natural forestland.
46. The promotion of tree planting by collectives has long been a central part of forest policy in the PRC. In the 1980s, the contract responsibility system, used for improving agricultural production and promoting rural industries, was adopted for forests. Forest boundaries were changed to permit this reallocation of forestland. By the mid-1980s some 30 million hectares of mountain forests had been allocated to households for afforestation and management. By the year 2000, PRC’s forestry areas were divided approximately equally between state forests, collective forests, and household forests—the last-mentioned category mainly being barren areas allocated to farmer households for afforestation and reforestation. In Yunnan Province, where natural forests make up a large proportion of forestry land, the area of natural forests allocated to households is even less.

2. Community Forestry and Natural Resource Management

47. Community forestry and benefit sharing. The decline in authority of traditional natural resource management in many parts of the GMS due to (a) lack of official recognition; (b) erosion of traditional informal laws; and (c) lack or poor enforcement of formal legislation, has led to open access in formerly well-protected common property resources. GMS countries have initiated reforms related to community forestry during the last decade to address this issue and to extend policies on decentralized and participatory natural resource management into the forestry sector. Community forestry is gaining a foothold in some remote upland communities in the Lao PDR and Cambodia. As yet, however, it has still to be fully recognized as a viable forest management and poverty reduction strategy in the PRC, Thailand, and Viet Nam.

48. The Community Forestry and Non Timber Forest Product Program has been active in the Lao PDR since 1993 and focuses on village management and use of secondary forests, rehabilitation of degraded forest stands and cultivation or sustainable management of nontimber forest products. A village forestry approach was adopted that entailed the formation of formal village organizations (Village Forestry Associations or Joint Forest Management Boards) that could enter into management contracts with the Government. While the Government owns all forestland in the Lao PDR, these contracts empowered the village organization to develop and implement management plans and protect the assigned forest in accordance with agreed principles of sustainable management. These efforts were hindered by the lack of implementing arrangements and the absence of clear legal status for village forests in the Forest Law. When forest is delineated for production, protection or conservation according to the law, it is unclear whether customary use or the imposed land use has priority. In this sense, the Forest Law provides rights and duties of village authorities (Art. 63) but does not provide a clear definition or status of village forest.

49. In Cambodia, the formal concept of (community-based natural resource management (CBNRM) is relatively recent. This newness affords the opportunity for groups and practitioners to modify CBNRM through a livelihood approach that considers how CBNRM can more fully contribute to the overall improvement of livelihood security (e.g., better health care, infrastructure, education, and access to credit). Similar approaches have been adopted, through the Social Economic Improvement Program to integrate conservation and livelihood priorities in poorer provinces, such as Mondulkiri and Ratnakiri. The Forestry Law in Cambodia, is one of the most important pieces of legislation with regard to CBNRM issues. Key provisions are those that allow for the creation and management of community forests, whereby communities are granted an area of the permanent forest reserve to manage and use. Currently, however, provisions in the Forestry Law only allow community forestry activities in areas classified as production forest, thereby excluding areas of protection forest from community use. The
Community Forestry Sub-Decree (2003), under the Forestry Law, outlines the general rules and procedures for community forestry.

50. In Myanmar, in order to foster community participation in managing the forests, the "Community Forestry Instructions (CFI)" were issued in late 1995, focusing on the management of forests by rural communities through the protection of natural vegetation, establishment of forest nurseries, and forest plantations, to enable them to fulfill their own basic needs for fuelwood and small timber. The instructions also focus on the flow of benefits to communities participating in forest management activities. As a result of Myanmar's revised Forest Law of 1992, and the CFI, approximately 15,000 ha of community-owned forest plantations have been established since 1995. NGOs, such as farmer's and women's income generation groups (FIGGs) are being formed. This initiative aims at raising off-farm incomes and helping sustainable forest management.

51. The situation is markedly different in the other three GMS countries. In Viet Nam, although the 1993 Land Law opened up possibilities for community forestry at the state level by allowing forestland allocation to communities, more recent stipulations on forestland in critical watershed areas have narrowed those possibilities. Recent policy decisions have limited local people to the role of custodians of the forest, granting them only restricted rights over forest resources. The Decree 327/556 program has effectively circumscribed community participation in forest management.

52. In Myanmar, all forestland is owned by the State with exclusive user rights, except for household use by local people. Farmers are given usufruct rights to agricultural land, but the legislation stipulates that "any individual has no right to hold considerable extent of agricultural land" (Constitutional Law of 1947). As a result, a sizeable portion of agricultural lands is held under individual tenure, but holdings are usually small. Almost two thirds of agricultural holdings are smaller than 5 hectares. However, a large proportion of cultivable areas is under fallow and the Government has initiated a procedure of land reclamation, in which private investors are granted land-use rights to areas up to approximately 2,000 hectares per applicant.

53. In 2004, Thailand enacted a draft community forestry bill. Provisions in the bill continue to elicit different responses among government and nongovernment constituencies regarding the exact role of communities in protection and planning activities in the forest.

3. Framework for Protected Area Management

54. Forestry sector reform is underway in the GMS countries. All have drafted forestry and biodiversity sector master plans. Throughout the GMS region, there has been an increased focus on protected areas as an instrument for natural resource management and biodiversity conservation. Several new protected areas have been gazetted and management plans adopted. Thailand, for instance, has set aside 21% of its land area—a total of 106,000 square kilometers—to be managed as protected areas.

55. The GMS countries have also issued a plethora of recent legislation in recent years governing forests and various components of biodiversity. However, specific legislation governing protected areas is either present in rudimentary form or nonexistent. PAs are governed by a considerable number of cross-cutting policies and plans. A recent review of Viet Nam's protected area system found that "a number of legal documents, policies and guidelines at central and local level are not up-to-date, constitute an obstacle for the effective
implementation of forestry activities, conflict with each other and overlap”. In Thailand, PAs are governed by various sectoral policies and plans formulated by the National Economic and Social Development Board, Ministry of Natural Resources and Environment, as the implementing agency. PA management is through the Department of National Parks, Wildlife and Plant Conservation. General environmental policy is under the Office of Natural Resources and Environmental Policy and Planning. Forest production in areas surrounding PAs is under the Royal Forest Department, and conservation of marine and coastal resources is done through the Ministry of Agriculture and Cooperatives.

56. Management of activities in the buffer zones and delineation of responsibilities within and outside protected areas is evolving. Procedures applied for boundary demarcation and area gazetted vary between sites and countries. Local community participation is increasingly involved and several expansion proposals have been withdrawn because of community objections. Yet, throughout the region centrally-driven and proscriptive procedures continue to create conflict. For instance, internally recognized zones such as wilderness zones, management zones, administration zones, and rehabilitation zones are not used in the PRC and the term “buffer zone” has different meanings. Most nature reserves in Yunnan Province are located in remote areas with inconvenient transport, and poor villagers within them are dependent on the reserve resources for their livelihoods. To reconcile the needs of the villagers for forest resources and economic development, studies and policies are needed to define the functions of the “buffer zones.” Also, in many PAs, core areas are not often clearly designated and are intensively used by surrounding local populations.

57. In the Ton Le Sap inundation area in Cambodia, overlapping zones, complicated by general lack of zone demarcation and changing fishery and forestry management practices, make national and international initiatives on wetlands and management of their associated forestry and biodiversity highly complicated. There are areas of discord between the various departments and line agencies involved in conservation in Ton Le Sap.

58. If present in PAs, local communities usually lack capacity and their management roles are frequently not clarified. Also, multi-use zones for areas bordering and outside PAs are not included in current PA management jurisdiction and lack integrated systems of planning other than on an ad hoc basis through individual internationally supported projects.

59. Descriptions of the institutional and legal context in each country are provided in the BCI pilot site proposals (Annex 3) and are detailed in Annex 4.

4. Regional Cooperation

60. Regional mechanisms like the GMS Working Group on Environment (WGE), the Association of Southeast Asian Nations (ASEAN), and the Mekong River Commission can provide a catalytic influence and guide the setting of an appropriate policy environment for the planning and execution of transboundary agreements. In addition, there are less formal models of engagement on biodiversity issues in the GMS. Two such initiatives are (1) the Sub-regional Biodiversity Forum project (1995–1999), implemented by the World Wide Fund for Nature (WWF)-Indochina and funded by the United Nations Development Programme, is a good example of regional cooperation to enhance biodiversity protection in the tri-border areas (GMS biodiversity conservation corridors) between Viet Nam (Kon Tum), Cambodia (Ratnakiri), and Lao PDR (Attapeau); and (2) “Management of the Pha-tam Protected Forests Complex,” a pilot

12 MARD/ICD/5 MHRP Secretariat 2001.
project implemented by the International Tropical Timber Organization in Ubon Ratchathani Province in Northeastern Thailand which addresses trade and poaching issues from across the border in Cambodia.

61. Much of the existing conservation effort has focused at the national and local level, and BCI will work through existing institutional structures. Regional institutions have proved useful in programs of collaborative economic development but are not yet as effective in the conservation and environment field because they lack the ability to enforce concrete commitments.

5. International Agreements

62. The overall response by GMS countries to their biodiversity conservation challenges is shaped by a number of international agreements. Cambodia has acceded to the Convention on Biological Diversity (CBD), the RAMSAR convention on wetlands, Convention on International Trade in Endangered Species (CITES), and the Convention on Climate Change. The CBD and the CITES were ratified by Cambodia in 1996. The Lao PDR has ratified the CBD, Convention Concerning the Protection of World Cultural and Natural Heritage, the RAMSAR convention, and the UN Convention on Combat Desertification (UNCCD). Myanmar is a signatory to the CBD, RAMSAR convention, CITES, Convention to Combat Climate Change, and the Convention on the Conservation of Migratory Species of Wild Animals. The PRC has ratified CBD, CITES, RAMSAR convention, and the Convention on the Migration of Wild Animals. Thailand has ratified the CBD, CITES, RAMSAR convention, and UNCCD. Viet Nam has ratified the main international conventions relating to biodiversity, including the CBD, RAMSAR convention, and UNCCD.

II. THREATS TO BIODIVERSITY AND NATURAL RESOURCES

63. Evidence from the six GMS countries shows that all forms of biodiversity—ecosystems, species, and genetic resources—are being lost at unprecedented rates. It is difficult to assess rates of species loss in absolute terms. Rates of degradation in land, freshwater, and marine habitats are a reflection of species loss. If no action is taken, it is probable that the GMS will lose more than 50% of its remaining land and water habitats over the next century (a third over the next few decades alone), leading to impoverished and unstable natural, social, and economic systems.

64. Threats to future biodiversity and natural resources in the GMS come mainly from overexploitation of natural resources and habitat loss; exacerbation of rural poverty; construction of transnational roads and linked development; and other economic activities, and damming of rivers.

A. Overexploitation of Natural Resources and Habitat Loss

65. As with many areas in Asia and around the world, overexploitation of natural resources and habitat loss have been identified as the major threats in the GMS, although the primary drivers of threats seem especially intense in the GMS.13, 14

66. Overexploitation of animals is very significant across the GMS. Subsistence hunting is widespread, but in the last few decades commercial trade-driven exploitation has become the most serious threat, especially with the emergence of strong economies, improved trade routes and access, and the relatively free availability of firearms in the subregion. Many important faunal and floral populations—and even species—are on the verge of extirpation. Some animals, such as the kouprey, may have become extinct during the past decade. Other large, charismatic species, such as the Sumatran rhinoceros may have been extirpated, and populations of the Asian elephant, Indochinese tiger, Javan rhinoceros, several primates (e.g., Douc langurs, Francois’ langur, and Tonkin snub-nosed monkey) are on the verge of extirpation because of hunting and habitat fragmentation. The animals that are regularly and widely used in traditional medicines and food are particularly targeted. Loss of key species is an indicator of the overall health of natural systems and of their capacity to sustain and serve development.

67. Overexploitation of plants has serious effects on the livelihoods and welfare of indigenous communities, many of whom still rely heavily on forest products for food, medicines, shelter, and other uses. Together with slash-and-burn agriculture and logging, overexploitation of flora can lead to degraded watersheds and economic and cultural impoverishment.

68. Although habitat loss is widespread across the GMS, its intensity and extent vary. Most of the lowland forests have been highly fragmented by conversion to settlements, industries, and permanent agriculture. Conversion has been especially extensive in Viet Nam and Thailand. Some forests remain in the lowlands of Cambodia and the Lao PDR, and along the mountain ranges. However, these are also subject to widespread slash-and-burn agriculture, which has been practiced for centuries. Although the traditional rotations and dispersion of this practice were sustainable, the fallow periods are now shorter due to population pressure and competition for land. Intact forests are being cleared to increase the extent of shifting cultivation as more land is being claimed for permanent cash cropping.

69. Commercial logging in the subregion is widespread. Although subject to government regulations, enforcement is ineffective, especially with the difficulties in policing national borders and curbing illegal logging practices. The process of granting forestry concessions can facilitate sustainable forest management practices while bringing optimal economic benefits from the resource. Yet, the lack of transparency in the granting of concessions and improper forestry management practices have led to wholesale destruction. The secondary impacts of logging are also significant threats. The roads associated with logging—and other developments—provide easy access to forests, leading to hunting, wildlife trade, settlement, and permanent forest conversion to other land uses.

B. Wildlife Trade

70. In the GMS, the legal and illegal trade in wildlife is selective in the species it targets but is leading to an “empty forest syndrome,” in which cumulative extractions result in impoverishment and disruption of the affected ecosystems. The wildlife trade is badly affecting
protected areas. Most of the main trade routes from the Lao PDR and Cambodia, for example, link directly to protected areas.

71. Underground routes and a variety of methods that deceive forest rangers and enforcement authorities are used in illegal sales in Cambodia, southern PRC, Lao PDR, Myanmar, Thailand, and Viet Nam. Large networks and syndicates are often involved, using hunters and collectors in rural areas, and entrepreneurs and high-level traders in urban centers. Some species of wildlife from GMS countries are consumed locally as food and as ingredients in traditional medicines. However, large volumes are transported to markets elsewhere, including areas in East Asia, Europe, and the US where they fetch high prices.

72. The problem is intensifying. According to figures released by Viet Nam’s Department of Forestry, more than 1,000 cases of illegal deforestation (730) and wild animal trafficking (290) were uncovered nationwide between January and April 2004. The trade in Viet Nam alone was estimated to be worth $66.5 million in 2002, much destined for international markets, particularly the PRC. In Yunnan Province of the PRC, more than $1.3 million worth of live and dead wild animals, including pangolin, were seized in one week in early June 2004.

73. As large mammal populations disappear from the GMS, the most visible trade flows increasingly involve small mammals, reptiles, fish, and plants. Governments throughout Southeast Asia are now voicing concerns about the biological and social impacts of the illegal wildlife trade. In September 2004, Viet Nam’s Prime Minister approved a National Action Plan to Strengthen Control on Trade of Wild Fauna and Flora, and in October 2004 the ASEAN member nations produced a statement calling for regional cooperation in the implementation and enforcement of wildlife trade controls, in particular, CITES. A draft ASEAN action plan on wildlife trade was finalized in May 2005 by the ASEAN members in Indonesia. Bilateral agreements to combat the international wildlife trade have been drawn up between Viet Nam and the Lao PDR as well as with the PRC. A similar agreement is being contemplated between Viet Nam and Cambodia.

C. Construction of Transnational Roads

74. Domestic and export demand for many commodities will increase with the construction of transnational roads and economic development, and remaining forest patches will become increasingly vulnerable. The planned system of transnational roads can have severe, widespread, and irreversible impacts on biodiversity in the GMS. Some of the roads bisect PAs or their “zones of influence” extend into protected areas or important biodiversity corridors. Unless conservation and policing mechanisms are put in place, these roads will exacerbate the wildlife trade already taking a heavy toll on biodiversity. The roads will encourage encroachment and settlements into protected areas and will create barriers to dispersal and movement of species, especially for species, such as primates, that are reluctant to cross open areas.

D. Other Economic Activities

75. Other economic developments, especially the numerous dams planned for the subregion to meet the demand for flood control, irrigation, and electricity generation, will adversely affect large areas of forests and wildlife habitats. The dams will have direct impacts on aquatic communities by disrupting flow regimes and blocking spawning migrations and breeding of
fish,16 and affecting birds that use sand bars for nesting.17 The families displaced by dam developments often resettle in other forestlands or critical biodiversity areas, severing important habitat linkages and further disrupting ecological processes.

76. Economic development and industrialization will lead to increased urbanization, with accompanying increases in discharge of pollutants into waterways and the atmosphere. Industrial waste and toxic agrochemicals can affect aquatic as well as terrestrial ecological communities and their productivity. There is widespread misuse of chemicals, which bring significant economic and social costs through degraded natural systems and public health. According to the Division of Agricultural Toxic Substances of the Thailand Department of Agriculture, for example, imports of herbicides into Thailand trebled in quantity between 1987 and 1994.18 Treatment and effective management of solid and liquid wastes are scarce throughout the subregion.19

E. Weak Capacity in Biodiversity Conservation Management

77. Insufficient number of trained staff to undertake and implement biodiversity conservation effectively has been cited as a major underlying “threat”.20 Capacity limitations translate into unmanaged—or even mismanaged—protected areas, low staff morale, and likelihood of collaboration with or contributing to illegal activities, inappropriate or inadequate budget allocations for effective management, overemphasis on infrastructure development, and a host of related problems that have negative effects on biodiversity conservation.

F. Critical Governance Issues and Opportunities

78. Four fields of governance reform have been changing the way PAs and biodiversity conservation are planned and managed in the GMS countries. They are decentralization, “democratization” (i.e., providing more opportunities for nongovernment groups, communities, and individuals to influence how natural resources are used), institutional innovation, and reinforcing the rule of law.

79. Decentralization is a major force in governance reform in the GMS countries. It entails delegating greater responsibility and authority for development decisions to local government. It involves transferring to local levels certain powers over budget management and creates potential for local taxation and revenue raising. Combined with expanding legal frameworks for establishing tenure, ownership, and rights of access to land and natural resources, these

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18 P. D. Round in litt. 2002, cited in CEPF, Ecosystem Profile, see footnote 12


reforms shift the weight of development planning and decision making closer to where resources are used. This trend in governance has far-reaching implications for PA institutional arrangements, planning, and management and the potential for innovative financing mechanisms and revenue raising associated with specific protected areas. It also has the effect of more clearly distinguishing between government and private sector responsibilities and obligations at the local level.

80. All six countries in the subregion have emphasized the importance of decentralization measures and allocated resources for this purpose. However, the process of consolidating government commitments to decentralization through legal reform and capacity building has had mixed results. For example, in the PRC, the direct election of village committees was organized to encourage village communities to be more responsible for their affairs. Two landmark laws in 1998 established democratic elections of village committees (VCs) and village leaders, placing new responsibilities/rights for managing local natural resources in the hands of VCs. Villages have been provided access to and management responsibilities for collective forests. Typically, these are a few hundred hectares in size, covering low-elevation forest near the village. The VCs, however, remain essentially an organ of the government administration and not an independent organ of the community. Under the current system prevalent in collective forests, 30–50 year contracts are entrusted to village groups, which then have the right to use and manage that forestland and secure the benefits. In reality, township forestry officials oversee most decisions, including how quotas for timber cutting will be allocated.

81. Other countries in the region have had different decentralization experiences. In Cambodia, in 1996–2000, more than $75 million were disbursed through the Social Economic Improvement Program (Seila) to support investment at province and commune level and to build the capacity of local government authorities to plan and manage development. Nearly $9 million were transferred through donor resources to commune development committees and the first commune elections were held in 2002. A commune development fund has been established involving the Ministry of Economy and Finance, the Ministry of Interior, Ministry of Rural Development, the Seila secretariat, and local communities. However, significantly, the commune development committees have no control over forestry issues.

82. In the Lao PDR, where more than one tenth of the villages are located inside or close to protected areas (PAs), village leaders are actively involved in the administration of the PAs. Their specific responsibilities are evolving through the Land Law drafted in 1995 and participatory models of development contained in the Forestry Law of 1996, discussed in the next section. As in Cambodia, however, there are no overarching provisions in the national legal framework and there are varying laws governing provincial and district protected areas.

83. Despite some difficulties, GMS countries have made important strides in empowering local levels of government. For example, Thailand has implemented wide-ranging reforms transferring responsibilities to the district/township and subdistrict levels. Tambon administrative organizations are authorized to undertake local environmental planning and management, as well as developing local infrastructure and spatial planning. In local communities, the village headman structure (Phu Yai Baan) is one of the influential factors in village-level decision making, with links to the subdistrict and district authorities. The passage of the new Community Forest Act provides a legal avenue for involvement of local and indigenous groups in conservation efforts and PA management.

84. Democratization has three important linked elements: more transparent and open government, easier access to information (e.g., in planning processes, environmental
assessment, and state-of-environment reporting), and community participation in planning and management. All three aspects of governance are being promoted in most GMS countries through laws and policies, with the expanding role for communities and NGOs in information sharing and decision-making. Community participation, comanagement, and equity in natural resource use are urgent and rapidly evolving issues confronting biodiversity managers in the region, who have more experience in relatively nonparticipatory and centralized approaches.

85. **New natural resource management institutions.** Over the past decade, GMS countries have gone through one or two waves of major reform to the organizations managing natural resources and protected areas, most recently in Thailand and Viet Nam, which have new amalgamated ministries of natural resources and environment. Agencies have been set up at central and local levels bringing a reorientation and consolidation of staffing and budgets to focus on new priorities and approaches to natural resource management with the intention of fostering greater cross-sector integration.

86. **Reinforcing the rule of law.** The institutional change has been accompanied by major law reform. New laws are being introduced to:

(i) clarify tenure and land-use rights;
(ii) delegate authority for detailed planning and investment decisions;
(iii) introduce integrated planning for natural resource regions, such as landscapes/river basins (in Thailand and Viet Nam);
(iv) develop systems to resolve conflicts in land and natural resource use; and
(v) provide national legal frameworks for protected areas.

87. This is a critical period for PA policy development in all GMS countries, including devolved management authority and structures; greater emphasis on outreach and involvement of local communities and governments; and more clarity in management controls, procedures, and rights under the law. Cambodia and Thailand are drafting national PA laws and, following the introduction of PA regulations, Viet Nam and the Lao PDR are considering doing the same. As a first step, the Government in Viet Nam has adopted a National Protected Areas Strategy.

88. A key challenge has been enforcement of new legal regimes, particularly in controlling the use of protected areas and the regions surrounding them. This remains a critical issue as development and population pressures mount. 21

### III. JUSTIFICATION FOR BIODIVERSITY LANDSCAPES AND CORRIDORS

#### A. Relevance of Biodiversity Conservation Landscapes and Corridors

89. Strictly defined, biological corridors are conduits for movements of species and ecological processes between core areas. The GMS biodiversity conservation landscapes represent ecological networks, which can be defined as "a coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity while also

providing appropriate opportunities for the sustainable use of natural resources.\textsuperscript{22} These landscapes usually have four main elements:\textsuperscript{23}

(i) core areas (usually protected areas),
(ii) corridors or habitat linkages (continuous habitat of patchy “stepping stones”),
(iii) transitional areas or buffer zones, and
(iv) sustainable-use areas (Figure 1).

\textbf{Figure 1: Types of Biodiversity Corridors}

90. The biodiversity conservation landscape approach\textsuperscript{24} is described by many different names,\textsuperscript{25} the most common being ecological network,\textsuperscript{26} reserve network,\textsuperscript{27} bioregional planning\textsuperscript{28} and ecoregion-based\textsuperscript{29} conservation. All these approaches have five key elements:\textsuperscript{30}

\begin{itemize}
  \item \textsuperscript{22} Bennett, Graham. & Wit, Piet: The Development and Application of Ecological Networks, IUCN July 2001, p.5
  \item \textsuperscript{23} Biodiversity corridors are not to be defined “narrowly” as connectors only; large PA networks have also been called biodiversity corridors, such as the Mesoamerican biological corridor covering a protected area network spread over 8 countries, or the Y2Y (Yucatan to Yellowstone), covering the entire Rockies.
  \item \textsuperscript{24} For example, the flyway and corridor programs that primarily aim to meet the needs of migratory species or those that need to disperse over large areas, e.g., the 1979 Bonn Convention, the Western Hemisphere Shorebird Reserve Network, and the Naya Conservation Corridor
  \item \textsuperscript{25} Bennett, Graham. & Wit, Piet: The Development and Application of Ecological Networks, IUCN July 2001, p.5
  \item \textsuperscript{26} These developed in Europe in the 1970s and 1980s e.g. the Estonian Network of Ecologically Compensating Areas, the Dutch Ecological Network, and the Pan-European Ecological Network.
  \item \textsuperscript{27} These were developed in North America in the 1980s, with the main aim of conserving biodiversity at the regional scale, e.g., the Wildlands Project and the Main Wildlands Reserve Network.
  \item \textsuperscript{28} This was developed primarily by the World Resources Institute in the US and focuses on the process of planning and managing the protection of ecosystem services and biodiversity at the bioregional scale, e.g., the Klamath/Siskiyou Bioregion and the St. Elias-Northern Borders Bioregion.
  \item \textsuperscript{29} A WWF initiative aimed at conserving the world’s key ecoregions, that is, relatively large units of land or water that harbor a characteristic set of species, communities, dynamics, and environmental conditions, (e.g. the Global 200, the Carpathian Ecoregion Initiative, and East African Marine Ecoregion.
  \item \textsuperscript{30} Bennett, G. / Wit, Piet ibid
(i) focus on conserving biodiversity at the ecosystem, landscape, or regional scale; 
(ii) emphasize maintaining or strengthening ecological coherence, primarily through providing for ecological interconnectivity (corridors); 
(iii) buffer critical areas from the effects of potentially damaging external activities; 
(iv) restore degraded ecosystems where appropriate; and 
(v) promote complementarity between land uses and biodiversity conservation objectives, particularly by exploiting the potential biodiversity value of associated semi-natural landscapes.

91. The biodiversity corridors that fall within the wider landscapes have three main functions: (i) conserving habitat for species movement and for the maintenance of viable populations; (ii) conserving and enhancing ecosystem processes and ecological services; and (iii) promoting and enhancing local community welfare through the conservation and sustainable use of natural resources.

92. To a certain extent, biodiversity corridors are analogous to economic corridors in their functionality and objectives: both attempt to increase system connectivity, economies of scale, integration, and efficiency. The biodiversity corridors do this by enlarging the functional boundaries of protected areas. They facilitate the unhindered movement of species, and safeguard the contributions of natural systems more widely across development landscapes. In the absence of such corridors, ecological and environmental services of importance to the GMS development agenda are likely to be threatened.

93. Biodiversity corridors represent an important strategy for combating habitat fragmentation and conserving threatened species and high-value ecological processes that require large spatial areas for their viability over the long term. Such species include several high-profile threatened and endangered animals like elephants, tigers, and several large birds, such as hornbills, vultures, and cranes. Seasonal flows of the Mekong and associated tributary rivers and streams are an important process-related feature. Other ecological phenomena, such as fruit and seed dispersal by large birds and bats, and the predator-prey relationships among several larger vertebrates in the region occur at spatial scales that tend to transcend the PA boundaries. Depending on the focal species and processes, corridors can be continuous strips of land or “stepping stones,” patches of suitable habitat used to improve ecological coherence.

94. The corridors contribute to social and economic development by promoting sustainable natural resource use to sustain the livelihoods and lives of the millions of people in the region who still depend on these resources on a daily basis. They provide economic alternatives through ecological and/or cultural tourism.

95. Biodiversity corridors have gained currency as countries are finding that their existing protected areas (PAs), which are the main strategy for meeting their biodiversity conservation needs and obligations under the CBD, are unlikely to deliver the desired results on their own. Existing PAs are being reduced to islands in a cultivated landscape that is under increasing development pressure and fragmentation. Biodiversity corridors are best developed in Europe and are in use in Latin America and South Africa.

96. Already, various forms of biodiversity corridors are under design and/or under implementation in Cambodia, Yunnan Province of the PRC, Thailand, and Viet Nam. Under the proposed ADB Forests for Livelihood Improvement project in Viet Nam, for example, corridors have been identified as the means to enhance the biodiversity conservation function of special-use forests in the central highlands. The corridor approach is of relevance and importance to
GMS countries because competitiveness of GMS member countries will to a large extent depend on the efficiency and effectiveness with which their natural resource endowments are protected and maintained. Direct and indirect costs of environmental degradation will undermine national and the subregional development performance.

97. A goal of landscape conservation is to restore severed or degraded corridors or habitat linkages between core areas. The landscape approach can be linked to poverty reduction measures by providing opportunities for local people to participate in paid corridor restoration work as well as to be involved in its management and maintenance. Depending on the focal species or processes considered in designing landscapes, the linkages can be restored through land uses that are compatible with conservation. For instance, community forestry, plantations of native species, and even shifting cultivation can provide effective habitat linkages for many dispersing or migrating species or for maintaining and expanding ecological services.

98. The threats and conservation needs in the GMS outlined earlier call for a package of measures that build land-use and management regimes for sustainable use and conservation, restore connectivity of ecosystems, and promote poverty reduction. While the technical problems and possible solutions are well known, there is a need for strengthening local capacity to plan, manage, and maintain biodiversity conservation for the full range of development benefits it brings. Further, there is a need to secure and greatly expand sustainable financing for biodiversity conservation in the GMS.

99. Sector policies of GMS countries support investment in PAs established under current legal frameworks. Over the past decade, PA financing has increased significantly although it remains inadequate. The BCI will build on the existing foundation of protected areas and conservation financing.

100. Several countries have issued statements of intent as well as formulated objectives in their forest policy documents and legal instruments to increase forest cover and enhance biodiversity as part of implementing obligations under the CBD. The BCI is to be seen as part of that endeavor to assist the GMS countries in achieving their national policy objectives and international obligations.

101. The Millennium Development Goals rely on environmental sustainability. This is explicitly recognized in the seventh goal, one target of which is to “Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources.” The BCI approach represents a step toward reaching that target.

102. Biodiversity is undervalued. Usually, the cultural, spiritual, recreational, health, educational and ethical values and those of ecological services are difficult to quantify in purely monetary terms. Yet, achieving the GMS development visions depends largely on the maintenance of healthy ecosystems. A few examples of various facets of development in the subregion illustrate that relationship. During the past decade, more than 50% of foreign earnings in Cambodia, Lao PDR, and Myanmar came from forest products. Twenty percent of all fish caught from the inland waters of the world come from the lower Mekong region meeting the protein needs of 90% of its population. Cambodia’s inland fisheries have an annual value of up to $500 million with 60% coming from Tonle Sap, directly connected to the Mekong River and dependent on its annual flooding regime for productivity. The Mekong delta contains 34% of Viet Nam’s farmland and provides 40% of its agricultural output. It relies on the river’s annual flooding for soil deposition and freshwater pressure to keep salinization at bay. Similarly, in Cambodia and the Lao PDR, more than 80% of the population depend on the Mekong system...
for their agricultural produce. Hydropower has been given center stage in Lao PDR national development plans. Currently, 3.5% or 627 MW of an estimated 18,000 MW of exploitable hydropower potential has been harnessed. Expanding this capacity is intimately linked with the management of watersheds. Tourism development is a shared priority of the GMS countries and nature-based tourism is the fastest-growing subsector.

103. Each of these situations point to the growing importance of natural systems as the foundation for development in the subregion as well as the shared nature of many of the development challenges facing the GMS counties. Well-defined networks of protected areas linked through biodiversity corridors are becoming a key strategy for managing the development potentials of those systems.

B. Economic Benefits of Biodiversity and Ecosystem Services

104. In the GMS, a recent study\(^{31}\) has evaluated the economic benefits of biodiversity and showed, for example, that Ream National Park in southwestern Cambodia constitutes an extremely important economic resource for local communities. Up to 84% of households depend on the park’s biodiversity for their basic subsistence and income, with a net annual value of some $1.24 million or an average of $233 for every household living in and beside the national park. In an area where the median annual family income is only $316 and a third of families earn less than $200—and where half of households can barely provide for their own subsistence—this figure is extremely significant. Without access to the basic subsistence and income that the Park provides, many of the 30,000 local people would find it difficult to survive because they lack access to other sources of livelihood.

105. The study found the value of two neighboring national parks, Bokor and Kirirom, for hydropower watershed catchment protection services was $2 million annually. Given Bokor National Park’s annual budget is $10,000, investment in maintaining ecosystem services is clearly inadequate. Similar values were found for clusters of protected areas in the three other countries of the lower Mekong area.

106. Ecosystem services and functions are partly invisible, long term, or not traded in conventional markets. Regulation of climate, water regulation and supply, soil conditioning, pollination, erosion control, waste treatment, and biological control have recently been allocated annual values on a per-hectare basis for different ecosystems (Table 5). The annual values would run into billions of dollars if applied to the GMS countries.

Table 5: Ecosystem Services and Functions

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Estimated Economic Value (global, ha/year)</th>
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<tbody>
<tr>
<td></td>
<td>Wetland</td>
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<tr>
<td>Climate regulation</td>
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<td>Disturbance regulation</td>
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<td>2</td>
</tr>
</tbody>
</table>

ha = hectare.


107. Biodiversity corridors are intended to consolidate and expand the development and economic benefits derived from natural systems in protected areas and across the landscapes linking them. They do so through rehabilitation, conservation, and sustainable use and by internalizing biodiversity products and services in the development planning process.

IV. BIODIVERSITY CONSERVATION LANDSCAPES IN THE GMS

A. Selection of Priority Landscapes

108. There have been several significant studies to identify and delineate important biodiversity conservation areas in the GMS.32 BirdLife International has identified important bird areas in the subregion;33 WWF and IUCN have identified centers of plant diversity;34 WWF and Wildlife Conservation Society (WCS) identified a suite of prioritized tiger conservation units,35 and WWF has identified ecoregions across the Indo-Pacific region, including several important (Global 200) ecoregions in the GMS.36 In March 2000, WWF led a workshop attended by regional and local experts to develop a biodiversity conservation vision for Indochina.37 The outcome was a network of high-priority conservation areas that represent the key ecoregions in Indochina. In 2002, the Stockholm Environment Institute developed a strategic environmental framework for the GMS commissioned by ADB. This analysis assessed the impacts of ADB’s

32 For Maps and overlays see Annex 1.
planned regional developments on biodiversity and the environment. The framework identified “hotspots” broadly defined as areas of high biodiversity conservation value that will be affected by regional development plans. In 2004, the Critical Ecosystems Partnership Fund (CEPF) formulated an ecosystem profile for the Indochina Region of the Indo-Burma hotspot,\(^{38}\) which built on the WWF ecoregions, BirdLife International’s IBAs, and consultations with regional experts.

109. The priority GMS biodiversity conservation landscapes were delineated using the outcomes of these previous analyses. The series of map overlays leading to the definition of the landscapes are provided on the BCI website (www.adb.org/projects/gms-biodiversity).

B. Priority GMS Biodiversity Conservation Landscapes

110. The set of CEPF corridor outcomes was used as the basis for the GMS biodiversity landscape assessment (Figure 2). The primary biological criteria for identifying the biodiversity landscapes were:

(i) presence of landscape species (those that need large, ecologically diverse areas for their survival);
(ii) ecological or evolutionary processes that occur over large spatial areas;
(iii) globally important and irreplaceable elements of biodiversity that will be affected by development and require urgent conservation actions in the GMS; and
(iv) representation of the ecoregions in the GMS.

111. Nine high-priority biodiversity conservation landscapes were then identified based on five criteria. The priority landscapes had to be:

(i) in the GMS economic corridors;
(ii) affected by the “zone of influence” along a major transnational road in the GMS;
(iii) in a designated hotspot;
(iv) able to support landscape species that are of conservation importance or landscape-scale ecological or evolutionary processes; and
(v) important for their ecological services.

112. The nine high-priority GMS biodiversity conservation landscapes and their locations (Figure 3) are:

(i) Western Forest Complex (Thailand and Myanmar)
(ii) Ton Le Sap Inundation Zone (Cambodia)
(iii) Cardamom and Elephant Mountains (Cambodia)
(iv) Northern Plains Dry Forests (Cambodia and the Lao PDR)
(v) Eastern Plains Dry Forests (Cambodia and Viet Nam)
(vi) Tri-Border Forests (Cambodia, Lao PDR, and Viet Nam)
(vii) Central Annamites (Viet Nam and the Lao PDR)
(viii) Northern Annamites (Viet Nam and the Lao PDR)
(ix) Mekong Headwaters (PRC, Yunnan Province and Myanmar).
113. Management of the nine high-priority biodiversity landscapes should meet the following key conservation objectives:

(i) Conserve biodiversity at the ecosystem, landscape, or regional scale, especially to maintain large-scale processes and viable populations.
(ii) Buffer core areas from the effects of potentially damaging external activities.
(iii) Restore degraded ecosystems and expanding ecosystem services.
(iv) Allow sustainable use and forms of land tenure consistent with conservation.

114. The nine biodiversity conservation landscapes all have relatively high natural forest cover except Tonle Sap, which is a wetland, and the Mekong headwaters in Yunnan Province, which include a great diversity of plant communities (Table 6).
Table 6: Estimated Land Cover and Forestland in Biodiversity Conservation Landscapes (ha)

<table>
<thead>
<tr>
<th>GMS Biodiversity Conservation Landscape</th>
<th>Total Forestland (ha)</th>
<th>Total Land Cover (ha)</th>
<th>Forestland as % of Total Land Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardamom and Elephant Mountains</td>
<td>1,218,971</td>
<td>1,429,231</td>
<td>85.3</td>
</tr>
<tr>
<td>Eastern Plains Dry Forests</td>
<td>1,704,698</td>
<td>2,597,346</td>
<td>65.6</td>
</tr>
<tr>
<td>Northern Plains Dry Forests</td>
<td>1,192,259</td>
<td>1,928,720</td>
<td>61.8</td>
</tr>
<tr>
<td>Tonle Sap Inundation Zone</td>
<td>402,598</td>
<td>1,752,108</td>
<td>23.0</td>
</tr>
<tr>
<td>Tri-Border Forests</td>
<td>1,422,755</td>
<td>1,990,630</td>
<td>71.5</td>
</tr>
<tr>
<td>Central Annamites</td>
<td>2,192,903</td>
<td>3,290,999</td>
<td>66.6</td>
</tr>
<tr>
<td>Northern Annamites</td>
<td>2,043,435</td>
<td>3,292,395</td>
<td>62.1</td>
</tr>
<tr>
<td>Western Forest Complex</td>
<td>3,804,688</td>
<td>6,771,285</td>
<td>56.2</td>
</tr>
<tr>
<td>Mekong Headwaters</td>
<td>3,230,579</td>
<td>10,719,546</td>
<td>30.1</td>
</tr>
</tbody>
</table>


115. Both Cambodia and the Lao PDR have five of the biodiversity landscapes, in part or in whole, inside their borders (Table 7). As a percentage of national area those two countries have more than 50% of original forest remaining (2003) compared to well under 30% in Thailand and Viet Nam. This illustrates the importance to the subregion of Cambodia and the Lao PDR in terms of the maintenance of ecosystem services and products.

Table 7: Areas of Biodiversity Conservation Landscapes in Each GMS Country (million ha and % of total)

<table>
<thead>
<tr>
<th>GMS Biodiversity Conservation Landscape</th>
<th>Cambodia</th>
<th>Yunnan, PRC</th>
<th>Thailand</th>
<th>Myanmar</th>
<th>Lao PDR</th>
<th>Viet Nam</th>
<th>Total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardamom and Elephant Mountains</td>
<td>3,391.5</td>
<td>(97.3)</td>
<td>94.8</td>
<td>(2.7)</td>
<td></td>
<td></td>
<td>3,486.3</td>
</tr>
<tr>
<td>Eastern Plains Dry Forests</td>
<td>3,298.3</td>
<td>(66.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,976.1</td>
</tr>
<tr>
<td>Northern Plains Dry Forests</td>
<td>2,410.7</td>
<td>(64.3)</td>
<td>790.4</td>
<td>(21.1)</td>
<td>545.3</td>
<td>(14.6)</td>
<td>3,746.4</td>
</tr>
<tr>
<td>Tonle Sap Inundation Zone</td>
<td>3,013.0</td>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,013.0</td>
</tr>
<tr>
<td>Tri-Border Forests</td>
<td>1,029.8</td>
<td>(32.3)</td>
<td></td>
<td>1,654.6</td>
<td>(51.9)</td>
<td>(15.8)</td>
<td>3,188.7</td>
</tr>
<tr>
<td>Central Annamites</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,290.0</td>
<td>3,818.0</td>
<td>5,108.0</td>
</tr>
<tr>
<td>Northern Annamites</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(25.3)</td>
<td>(74.7)</td>
<td>6,293.0</td>
</tr>
<tr>
<td>Western Forest Complex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,299.8</td>
<td>(68.3)</td>
<td>(31.7)</td>
</tr>
<tr>
<td>Mekong Headwaters</td>
<td>15,114.6</td>
<td>(78.9)</td>
<td>135.9</td>
<td>2,434.0</td>
<td>1,465.8</td>
<td>(7.7)</td>
<td>19,150.4</td>
</tr>
</tbody>
</table>

Total Country Areas in Landscapes: 13,143.4 million ha (47.9%) for Cambodia, 15,114.6 million ha (52.1%) for Myanmar, 6,050.8 million ha (0.7%) for Thailand, 7,894.7 million ha (12.7%) for Viet Nam, and 9,255.3 million ha (7.7%) for Lao PDR.

C. Protected Areas in the GMS Biodiversity Conservation Landscapes

116. The nine GMS biodiversity landscapes identified for priority attention are each made up of networks and clusters of protected areas linked across a shared landscape. The landscapes outside the PAs are subject to varying intensities of use but in most cases, with sufficient remaining natural forest and wetland to make the maintenance of corridors of habitat linking the PAs feasible. In reality, formal tenurial arrangements often do not reflect practice because most of the PAs themselves are subject to varying intensities of use from core protected zones to areas of heavy exploitation, cultivation, and habitation. The challenge is the maintenance of habitat corridors inside the boundaries of PAs connecting their remaining core biodiversity zones. Thus, the BCI will need to work closely with existing projects and organizations supporting activities within the PAs that the BCI corridors are linking. This may involve contributing directly to various management interventions inside PA boundaries as well as those beyond them.

117. During the past decade, there were some clear trends in the GMS protected areas systems:
   (i) The number of PAs increased rapidly.
   (ii) The total PA coverage as a proportion of national land area increased rapidly.
   (iii) The number and coverage of locally established and managed PAs increased.
   (iv) The remaining natural forest is being progressively brought under PA tenure.

118. These positive trends were offset by the following issues:
   (i) Biodiversity in the PAs decreased.
   (ii) Use of products and services in PAs by communities and development sectors, such as hydropower, greatly intensified.
   (iii) Few PAs were established in floodplains, deltas, and wetlands.
   (iv) Relatively few PAs were established in the marine environment.

119. The trends show there has been a dramatic increase in the use of protected areas as a mechanism for natural resource management in the GMS. Protected areas have increased in number and coverage. As a proportion of national territory they have become some of the largest protected area systems in the world. The most significant expansions have occurred in Cambodia, Lao PDR, and Thailand, which are moving rapidly toward a 25% protected area coverage of their collective territory.

120. The region’s protected areas are located mainly in forested uplands. Currently, 66% of remaining natural forest in Thailand falls within the national protected area system. By 2005, if governments meet their targets, 53% of the combined remaining natural forests of the four lower Mekong countries will fall within this form of land tenure. In Viet Nam and Thailand, the past decade has seen an increasing policy and budgetary emphasis on rehabilitation of forest ecosystems inside and outside PAs—a trend gaining momentum throughout the region.

121. There are three main reasons that, despite increasing attention, protected areas are continuing to degrade—even if more slowly than surrounding biodiversity:
   (i) Investment in PAs remains a very small proportion of gross national product, given the size of the areas and importance of the natural resources involved.
   (ii) Populations are increasing rapidly along with natural resource demand and people are moving to areas of remaining biodiversity wealth.
   (iii) Natural resources outside PAs are diminishing due to neglect and overuse by development sectors.
For these reasons, a parallel investment strategy is required, focusing on the renewal and enhancement of natural systems in corridors linking PAs, and, equally, a substantial increase in investment in more effective management of biodiversity in PAs.\(^3\)

The nine high-priority biodiversity landscapes include over 55 PAs, many contiguous across national borders and forming important protected area complexes of regional significance for biodiversity conservation.\(^4\) The protected areas in each corridor provide the main nodes of connectivity within the nine landscapes linked by remaining but often fragmented and degraded natural forest. With rehabilitation, the habitat linkages could act as corridors for species dispersal between the core populations in the protected areas. Rehabilitated and well-managed corridors between protected areas would help conserve biodiversity across the landscape; maintain ecological processes; buffer core areas from external influences; and provide semi-natural habitats for sustainable natural resource extraction.

D. Transnational Roads Affecting the Priority Biodiversity Conservation Landscapes

The biodiversity conservation landscapes fall within the GMS economic corridors, in part or in whole. Although only the extreme southern part of the Northern Annamites corridor is in an economic corridor, it is also affected by the R2(N) road from the Lao PDR to Viet Nam across the Nam Theun Plateau and south of the Vu Quang Nature Reserve. Similarly, only the southern section of the large Mekong Headwaters corridor lies in an economic corridor. However, road R4 from Kunming to Bangkok via Baoshan City and its zone of influence cut through the northern section of the corridor.

V. THE BCI PROPOSAL

A. Objectives and Scope

The BCI is a regional program designed to build on existing activities in the GMS countries in their implementation of CBD obligations, including national protected area systems and ongoing conservation projects, in collaboration with national and international NGOs.

1. Vision

GMS leaders will consider the BCI at the Second GMS Summit in July 2005 with the following vision:

By 2015, GMS countries will have established priority biodiversity conservation landscapes and corridors for maintaining the quality of ecosystems, ensuring sustainable use of shared natural resources, and improving the livelihoods of people.

The BCI seeks to meet human welfare and ecological protection needs in the GMS economic corridors through conservation and sustainable use of natural systems. The initiative will pay special attention to poverty reduction by improving the services healthy ecosystems provide and by expanding the livelihood options available to local communities.

\(^3\) This section was compiled from analysis in ICEM 2003. Regional Report on Protected Areas and Development. Review of Protected Areas and Development in the Lower Mekong Region. Indooroopilly, Australia.

128. This vision is in line with the increasing levels of support given by the governments of the six GMS countries to regional cooperation through the GMS program. The first GMS Summit of Leaders, in Phnom Penh in November 2002, resulted in a commitment to regional cooperation to promote growth and equitable development. GMS countries envision a subregion that is more integrated and prosperous with development that respects environmental and social interests. The proposed BCI summit declaration contributes to ADB’s overarching goal of poverty reduction to be achieved in the GMS through enhanced connectivity, increased competitiveness, and greater sense of community. ADB’s RCSP for 2004–2008 supports pro-poor and sustained growth, among other things through environmental and collaborative natural resource management, especially of the watershed systems of the Mekong River.

2. Goal

129. The goal is that by 2015, GMS countries will endeavor to maintain and improve the cover, condition, and biodiversity of forestlands and associated ecosystems in priority biodiversity conservation landscapes and corridors.

130. By end of 2008, it is expected that the following elements of this goal will be achieved:
   (i) At least 5 biodiversity conservation corridors will be established in 5 pilot sites of the GMS countries, covering a total area not less than 1 million ha.
   (ii) Restoration and regeneration will be visible on satellite images; the rate of deforestation in and around pilot sites will have slowed down or stopped.
   (iii) There will be increasing trends in key species and population numbers.

3. Medium-term Objective

131. The medium-term objective of the BCI is to establish sustainable management regimes for restoring ecological connectivity and integrity in a selected set of important biodiversity areas. This is to be combined with provision of natural resource goods and services that contribute to improving livelihoods of peoples living in and around the biodiversity conservation corridors, and protect the physical infrastructure investments deemed central to economic integration and sustainable development in the subregion.

132. The expected indicators to measure attainment of these objectives by 2008 are improvement in social amenities, clear land management regimes, and increased incentives and cash benefits from natural resources and infrastructure in 80% of the villages and hamlets located in corridors of pilot sites where project activities have been undertaken.

4. Components

133. The BCI has five components:
   (i) Poverty alleviation through sustainable use of natural resources and development of livelihoods.
   (ii) Clear definition of optimal land uses and harmonized land management regimes.
   (iii) Restoration and maintenance of ecosystem connectivity.
   (iv) Capacity building in local communities and government staff.
   (v) Sustainable financing mechanisms and structures integrated with government planning and budgeting procedures.

134. The orientation of activities under each of the five BCI components is as follows:
(i) **Poverty reduction.** Livelihood improvement interventions (for example, access to secure land tenure, community forestry, local primary processing of wood and nonwood products, ecological farming, and ecotourism) will be undertaken and market linkages promoted. This entails the provision of incentives, funding, legal rights, and technical assistance in the corridor sustainable-use areas.

(ii) **Integrated land-use planning and management.** A spatial land-use planning process will be undertaken using a participatory consultative framework. Local communities will benefit (in kind and cash) from their involvement in the required socioeconomic and biodiversity surveys. This process includes the definition and delineation of environmentally sensitive areas, identification of appropriate safeguards, sustainable-use and development zones, and preparation of an overview spatial map of current land-use patterns. Agreements will be reached with stakeholders on appropriate land-use and conservation arrangements.

(iii) **Restored ecosystem connectivity.** Ecosystem restoration to establish connectivity and sustainable-use areas will be undertaken and evaluated. Planting of native species may be required to create corridors between some core areas. Areas for sustainable use and protection will need to be delineated in the buffer or transition zones around protected areas. Some transnational roads that have been planned in the GMS bisect key PAs or PA complexes and biodiversity corridors. Where this intrusion is severe, design adjustments may be necessary, for example, exploring realignment to avoid core areas and installing under- or overpasses. Where the intrusion is marginal, a cost-benefit analysis will be made to assess the feasibility of detours against excising small segments of protected areas in return for a covenant for effective threat mitigation and long-term compensation to a protected area management fund. In corridors affected by the zones of influence of major roads, mitigation measures, such as prohibition of development along roads and policing roads for illegal wildlife trade, need to be put in place. Other infrastructure development proposals, such as dams, must receive comprehensive assessment for cumulative affects, accompanied by transfer payments for watershed management functions and compensation arrangements for downstream effects.

(iv) **Capacity building.** Institutional and human capacity for managing biodiversity corridors will be improved. Local people and officials need capacity building for biodiversity conservation planning, management, and monitoring.

(v) **Sustainable financing.** Sustainable financing for the BCI will be identified and secured. This component entails identifying and setting up funding mechanisms that will allow conservation areas as well as corridors to function in the long term. Apart from recurrent budget support from the GMS countries, areas that will be explored include transfer payments for environmental services such as watershed protection, Clean Development Mechanism (CDM), and setting up endowments and contributions from tourism and other natural resource-use tax regimes.

5. **Phasing (program duration)**

135. The BCI objectives will be achieved in three phases over 10 years, the period between GMS summits from 2005 to 2014.
In Phase I (2005–2008), five GMS countries (Cambodia, PRC, Lao PDR, Thailand, and Viet Nam) will carry out pilot projects in a selected site in one of the nine GMS biodiversity corridor landscapes. ADB will work with the UNEP for implementing BCI activities in Myanmar. Each pilot site includes a complex of protected areas and several proposed linking biodiversity corridors. In addition, enabling activities will be carried out at national and regional levels. Plans will be prepared for expansion and scaling-up of the pilot project and for additional corridors in the nine GMS biodiversity landscapes to receive BCI support in Phase II.

In Phase II (2009–2011), the methodology and framework of action developed in Phase I will be scaled-up in the pilot sites and applied to other corridors in the nine GMS biodiversity landscapes.

In Phase III (2012–2014), all nine GMS biodiversity landscapes and the priority corridors in them will be consolidated in terms of investments, and an evaluation of the approach and achievements will be carried out to determine whether the vision has been achieved.

6. Beneficiaries (Direct and Indirect)

The intended direct beneficiaries of the BCI program are households, household groups, village communities, and community-based user groups resident in the biodiversity corridors in the pilot sites. These will directly receive services from collaborating and implementing partners. The indirect beneficiaries are area managers, PA staff, and district, provincial, and national administrators who will receive capacity-building inputs.

7. Conformity with National Policies and Plans

With over 50 million poor in the subregion, all GMS national governments have shown a strong commitment to poverty reduction. Increasingly, there is greater convergence among the socioeconomic development plans and poverty reduction strategies of these countries. For instance, in Viet Nam, the poverty strategy and national socioeconomic development plan will be integrated into one in the 2006–2010 development planning cycle. In Cambodia, efforts are underway to align domestic and donor-funded programs to existing government strategies, such as the Rectangular Strategy, National Poverty Reduction Strategy and Socioeconomic Development Plan II (SEDP II); and to produce a single, integrated national strategic development plan for 2006–2010. The BCI aims to support implementation of national poverty reduction plans.

There is growing emphasis on biodiversity conservation and the forestry sector. All the GMS countries are now parties to the CBD and have national biodiversity action plans. Viet Nam is preparing its second 10-year Biodiversity Action Plan (2006–2015), the Lao PDR has recently completed its National Biodiversity Strategy and Action Plan, the PRC has taken biodiversity planning to provincial level, and Thailand prepared an integrated conservation strategy and recently joined the CBD. The biodiversity action plans have been used as a guide by national and international organizations to select and implement biodiversity conservation projects, which must be consistent with the CBD. The BCI has taken as its foundation the priorities defined in the national biodiversity action plans.

There is a discernable shift toward spatial integrated planning in development processes. This is reflected in an emphasis on integrated river basin planning in the region. Thailand is setting in place a river basin approach to local planning throughout the country. Similarly, Viet Nam has enacted a water law that envisages integrated planning for all river
basins coordinated through river basin organizations. The Lao PDR has adopted a national watershed planning strategy.

143. Biodiversity planning is moving to a local government area focus and on specific sites, the habitats of individual species. Increasingly thematic and forestry sector plans are being expressed in terms of agroecological regions, as in Viet Nam. Forest estates outside protected areas are receiving concentrated attention through zoning and plans for sustainable management of forest resources and allocation of community use rights to them. The BCI builds on this spatial approach to integrated planning, first by defining spatial priorities on a GMS scale, then by identifying corridors in those landscapes and, through the pilot projects, by supporting provincial and corridor-wide planning.

8. Sustainable Financing

144. Sustainable financing for the BCI will be identified and made operational. This entails identifying and setting up funding mechanisms that will allow PAs as well as biodiversity corridors to function in the long term. Apart from recurrent budget support from the GMS countries, areas that will be explored include transfer payments for environmental services, Clean Development Mechanism (CDM), and setting up endowments and contributions from tourism and other natural resource use tax regimes.

B. BCI Approach

1. Multistakeholder Participatory Consultation

145. Participatory multistakeholder diagnostic and land-use planning will be carried out to demarcate agreed zones of use and protection, and to establish an enabling institutional and policy framework that provides incentives and monitors compliance with guiding principles and regulations pertaining to conservation and use (Figure 4). Benchmarks will be established to determine progress toward achieving objectives. It is envisaged that initially, site level implementation units consisting of NGO, government, and national consultants will initiate and document the participatory consultations. As agreements are reached and demarcation and delineation can begin on the ground, the local authorities (in particular land registry offices, district, and provincial officials, as well as protected area/reserve management) will record agreements in a form that has legal status for and recognition by all parties concerned. Where relevant, village officials and relevant households will be mentioned as party to these agreements. Copies of these agreements will be provided to the parties and also made publicly accessible in villages, subdistricts, and districts. In countries where provincial approvals are required, these will be sought, secured, and made public.

146. As a general principle, the BCI program envisages collaboration with NGOs in pilot sites that already have a recognized track record for participatory consultations and have been involved in land allocation processes and harmonized land management regimes. The BCI also plans to document the process of participatory consultation at start of the program for use as a learning and dissemination tool as well as for monitoring and documentation.

2. Service Delivery to Beneficiaries

147. Attention will be given to assessing the poverty and development situation in the pilot sites and offering interventions with the aim of contributing to poverty reduction and sustainable development planning of the pilot corridors. Local people will receive cash benefits for labor
provided for carrying out detailed survey and demarcation of selected priority biodiversity corridors; participation in restoration, management, and maintenance work; and from sustainable harvesting of fruits, timber, or collection of fuelwood and nonwood products.

**Figure 4: Participatory Consultations**

148. While it is expected that collaborating partners will synchronize activities in the field and use an integrative program approach, it may be necessary at times to allow on-demand provision of specialist services to beneficiaries by certain partners. Participatory consultations with beneficiaries may lead to the need for provision of services by various local partners (government and nongovernment) that may not be the primary implementers. In such cases, the program will encourage networking and establishment of linkages with a variety of service providers.

3. **Institutional Collaborative Arrangements (Government and Nongovernment)**

149. The BCI approach encourages collaboration and partnership between government organizations and NGOs in the delivery of program interventions. It builds on the premise and experience that civil societies and NGOs around the world have an impressive service delivery record at the micro level whereas government has the greatest impact at the policy and regulatory levels. In the field of conservation, partnerships between government and civil societies have led to synergies and efficiencies wherever government has welcomed collaboration toward achieving mutual goals and objectives. In the context of the BCI, such partnerships will be fostered with the conviction that each partner has a particular role to play and has particular strengths that can be used to achieve mutual goals. Implementation of pilot site proposals, as well as regional activities under the BCI program, is based on partnership and synergies between government and nongovernment bodies. In sites where NGOs or community-based organizations) are absent, capacity building will have to take precedence over
interventions until implementation capacity can be identified and partnered with civil society organizations.

4. Knowledge and Skills Transfer, Capacity Building

150. The BCI approach puts special emphasis on knowledge sharing and skills transfer. While local indigenous knowledge of traditional medicinal plants, herbs, and essences will be documented and preserved for posterity, the program will foster special exchange visits of implementers in the GMS countries to learn and share information and experiences from various pilot sites and corridors. In particular, regional knowledge and skill transfers as well as between villages and communities in a particular site or country will be promoted. This will be particularly important in transboundary situations, where joint seminars and experiential learning can lead to better understanding and enforcement, and eventually to conducting joint patrols in the true sense of a transboundary undertaking. Sharing of knowledge and skills in restoration activities, environmental protection, and improved productivity in upland farming systems will be beneficial across the GMS. The BCI will tap into existing sources of information and centers of excellence in the GMS countries and promote wider networking, dissemination, and exchange of ideas within the ambit of the biodiversity corridors and landscape approach.

151. Also, institutional and human capacity for managing biodiversity corridors will be improved. Local people and officials need skills for biodiversity conservation planning, management, and monitoring. Weak capacity has been identified as an overarching threat. It has been demonstrated worldwide that education, knowledge, and skills can provide a sound basis for people to be proactive in biodiversity conservation and sustainable management.

5. Standardization of Instruments and Procedures

152. Biodiversity corridor interventions and transboundary activities in the GMS will require appropriate policy and regulatory framework in the GMS countries. The BCI will foster a process that generates a degree of standardization in the regulatory framework establishing corridors, landscapes, and transboundary projects. Following examples of similar standardization of procedures and regulations in transboundary traffic and movement of goods and persons elsewhere, the BCI envisages a similar development in conservation and environmental protection across GMS countries. The BCI will seek to lay the groundwork for such developments in the shape of GMS transboundary protocols or regional agreements.

6. Community Responsibility

153. Last but not least, the BCI approach aims at fostering local approaches and decision making that lead to local benefits and responsibilities. Without active involvement of local communities, any conservation approach is bound to fail in the medium-to-long term because local communities and households are the ultimate custodians of the natural resources they share and use. In the same way that providing proprietary or user "rights" over means of production (e.g., land) has acted as an incentive and a driving force in market and transition economies, the granting of access and user rights to natural resources will galvanize communities (villages and groups of households) into higher levels of incentive to protect what is theirs against outsiders. With benefits come responsibilities; it is important in many places to support communities with capacity building to manage these resources sustainably.
C. Selection of Pilot Sites

154. The pilot sites (Figure 5) were selected by governments with support from NGO partners based on the following six criteria:

1. Cambodia

155. The Cambodian pilot site is the Cardamom and Elephant Mountains landscape down to the southwestern coast. Koh Kong Province and specific corridors within it linking 11 protected areas provide the focus of the project. The pilot project targets three corridors: (i) a corridor of protection linking the Central Cardamoms Protected Forest and Phnom Samkos Wildlife Sanctuary with the Southern Cardamoms Protected Forest with further links along Route 48 to Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Area. It can be described as the Areng catchment corridor, after the name of the main river and watershed running through its center; (ii) the mangrove forest or coastal corridor running from Dong Peng to Phnom Samkos with an initial focus on the coastal system and communities of southeastern Botum-Sakor National Park; and (iii) the Aural-Kirirom sustainable-use corridor between Phnom Aural and Kirirom and then from Kirirom to Bokor. In addition, preparatory activities will be undertaken at a second site in Mondulkiri Province in northeastern Cambodia, bordering Viet Nam, with detailed planning for Phase II. The Mondulkiri pilot is also described in Annex 3.

2. People’s Republic of China

156. The Xishuangbanna Tropical Rainforest landscape in southern Yunnan Province stretching down to the border of the Lao PDR is the location of the PRC pilot site. Yunnan Province and specific corridors in the Prefecture of Xishuangbanna provide the focus of the project, including the linkage of nine existing and proposed protected areas. Eight corridors are targeted: (i) Mengyang to Xiao He Jiang; (ii) Xiao He Jiang to King Tea River; (iii) King Tea River; (iv) King Tea River to Mengla; (v) Mengla to Shangyong—a wild elephant sanctuary and a transboundary nature reserve bordering the Lao PDR; (vi) Mengyang to Menglun; (vii) Mengyang to Mangao; and (viii) Mangao to Mengsong.

3. Lao PDR

157. The pilot project in the Lao DPR will develop a sustainable-use corridor linking Dong Houa Sao National Biodiversity Conservation Area (NBCA) in Champasak Province to Xe Pian NBCA, covering both Champasak and Attapeau provinces in the Tri-Border Forests landscape. Two other conservation corridor linkages will be explored for support during phase II of the BCI, including some preparatory land-use planning and capacity-building activities: (i) a corridor linking Xe Pian NBCA to Dong Ampham NBCA, which falls within Attapeau Province as well as the Dakcheung district in Sekong Province in the northern portion of the Tri-Border Forests landscape; and (ii) a corridor linking Dong Ampham and Xe Xap NBCAs in Sekong and Saravane provinces in the Central Annamites landscape.
4. Thailand

158. The pilot site in Thailand is in the Tenasserim Range in western Thailand, between the Western Forest Complex and the Kaeng Krachan Forest Complex. To the west of both complexes is forested area in Myanmar. The complexes are situated in two important ecoregions in mainland Southeast Asia—the Kayah-Karen montane rain forests ecoregion and
Tenasserim-South Thailand Semi-evergreen rain forests. The distance between the two complexes is approximately 75 km, an area largely covered by forest remnants. The project will develop a corridor for protection and sustainable use linking the two existing forest complexes with their 19 contiguous protected areas. In addition, preparatory activities will be undertaken in the Khao Yai National Park in Eastern Thailand.

5. Viet Nam

159. The pilot project in Viet Nam is focused in Quang Nam Province of the Central Annamites and bordering areas of Thua Thien Hue and Kon Tum provinces and Sekong and Attapeu provinces in the Lao PDR. Activities in the three BCI phases are designed in sequence to tackle the areas of highest risk first without losing sight of the long-term goal of establishing a continuous forest landscape throughout the Central Annamite Mountains. Phase 1 focuses on the links between three nature reserves, Ngoc Linh, Song Thanh, and Ba Na in Quang Nam Province and Xe Sap NBCA in the Lao PDR.

VI. IMPLEMENTATION ARRANGEMENTS

160. BCI program management will take place at three levels: regional, national, and site.

A. Program Management at Regional Level

161. Through the WGE, the BCI will evolve into a broader forum for regional cooperation on conservation. In its 11th meeting in Siam Reap (2005), the WGE approved the launching of the core environment program (CEP), under which the BCI is seen as a flagship intervention. The BCI is firmly anchored in the WGE, especially in the environment operations center (EOC) that will serve as a permanent dedicated secretariat. Currently, the WGE reviews project proposals and initiatives related to the environment and endorses or recommends implementation. Technical assistance papers are prepared by ADB, which is the secretariat to the GMS, and concurrence of GMS governments is secured before technical assistance can proceed.

162. During implementation in Phase I (2005–2008), the BCI envisages a regional coordination committee (RCC) under the WGE, with functions of steering, oversight, and approval. The RCC will consist of high-level representation from GMS countries with authority to pursue policy changes and introduce regulatory instruments at the national level if deemed necessary for BCI implementation. In particular, representation of GMS countries in the RCC should be different from that at the implementation level (usually at province or site) so that review and oversight functions are exercised without any conflict of interest.

163. The RCC will (i) receive and review project proposals that have been screened by the technical advisory panel (TAP); (ii) approve proposals and budgets; (iii) receive BCI progress, monitoring, and performance reports and discuss issues requiring resolution at the regional level; (iv) make decisions on program disbursements based on performance; and (v) deliberate on policy and regulatory issues relating to BCI implementation and make recommendations to WGE members for national action.

164. A regional program coordination unit (PCU) will act as the secretariat to the RCC and will be embedded in the EOC, which is the secretariat of the core environment program (CEP). These relationships are shown in Figure 6.
The PCU will report to the RCC and have the following functions:

(i) Maintain overall program coordination.
(ii) Monitor data collection, processing, storage, and make data accessible beyond project life.
(iii) Collect project proposals of additional sites submitted by GMS countries or regional activities proposed by NGOs and submit these to the TAP for review and recommendation to the RCC.
(iv) Organize and coordinate BCI assignments of short- and long-term international and national consultants directly recruited by ADB through the PCU.
(v) Hold regular meetings on behalf of the RCC and ADB to review progress of program implementation, and document and disseminate minutes.
(vi) Organize and coordinate regional field visits of consultants and resource persons on review or supervision missions.
(vii) Organize and coordinate exchange visits and study tours in the GMS countries as well as outside the subregion.
(viii) Collect progress and financial reports from BCI national coordinators and submit these to the RCC on a half yearly basis.
Monitor disbursements to program implementers according to the performance-based allocation system.

Organize publication of reports and documents as approved by the RCC.

Maintain regional program unit accounts and submit statements of expenditure.

The TAP, consisting of well-known experts in biodiversity conservation and sustainable use, will be attached to the PCU so that they can review proposals for interventions and advise the PCU, the national working groups and the national coordinators on the soundness and technical compliance of proposed interventions with general conservation guidelines. Experts from this panel can also be called on to advise national biodiversity programs on demand and request by the GMS countries. The TAP will receive secretarial support to be provided by a conservation organization that is not involved in implementation activities in the pilot sites.

In particular, the TAP will:

- Review and carry out technical screening of project proposals.
- Provide advisory services to the RCC and the PCU on request.
- Undertake technical feasibility checks of proposals as and when requested.
- Undertake reviews of technical progress reports and make suggestions for improvement or solution of technical problems.
- Undertake field monitoring visits and submit biodiversity status reports on pilot sites.
- With input from national advisory groups, draft and submit technical guidelines that can be adopted by GMS countries.
- In collaboration with national advisory groups, provide guidance on overall subregional standards and regulatory framework to be applied in biodiversity conservation landscapes and corridors.
- Supervise exchanges, study visits, and training.

All proposed projects and activities will be submitted to the PCU, which will submit them to the TAP for screening and recommendation to the RCC. Once RCC approves, the PCU will make arrangements for disbursement of funds to the respective implementers. Regional activities under the BCI program will be coordinated by the PCU. Implementers involved in undertaking regional activities (cross-cutting and transboundary activities) will report directly to the PCU and submit progress and financial reports to it.

**B. Program Management at National Level**

In each GMS country, there will be a BCI national coordinator from the executing agency, who will be represented in the RCC as an observer. The national coordinator will be responsible for monitoring and coordinating BCI activities in the country (in all sites) and report to a national steering committee (see Annex 3 for implementation structure at the national level in the pilot site proposals). While the national coordinator will be responsible for overall coordination at national level, implementation of proposals will be undertaken by the site-level implementation units in collaboration with partners at site level. Most of these units are located below the provincial level. These site-level units could be existing groups already active in environmental matters and biodiversity conservation or set up by the provincial authorities for implementation of the BCI. National and international NGOs already active in the designated areas will be partners in implementation. An overview is shown in Figure 7.
Figure 7. Program Management (National)

C. Site-level Project Management

170. At the site level, the project implementation units (which could consist of several local authorities) will be responsible for day-to-day activities. NGOs in the pilot sites have already established working relationships with the local authorities and beneficiaries. It is envisaged that poverty reduction support as well as conservation interventions addressing beneficiaries at the micro level will be channeled through a mixture of government project staff, national experts or consultants, and NGOs.

171. In addition, steps will be undertaken to build a forum of stakeholders in the pilot sites for the consultative process to establish the BCI and sustainable-use areas. This will require regular dialogue and collaboration with central, provincial, and district authorities, the lead agencies responsible for managing protected areas in the BCI, key local leaders, village elders, and local communities.

172. In the pilot sites proposed in the GMS countries (see Annex 3), the following NGOs have been identified as potential collaborative partners during Phase I (2005–2008):

(i) Cardamom Mountains, Cambodia: WildAid, Conservation International, Fauna and Flora International; Eastern Plains: WCS and WWF.

(ii) Xishuangbanna, Yunnan Province, PRC: Xishuangbanna Tropical Botanical Garden, China Academy of Sciences; Mekong Headwaters, Deqin County, Yunnan: The Nature Conservancy.
(iii) Xepian – Dong Amphan, Lao PDR: IUCN and WWF.

(iv) Western Forest Complex and Khao Yai National Park, Thailand: WCS, Kasetsart and Mahidol universities.

(v) Ngoc Linh – Xe Xap, Quang Nam Province, Viet Nam: WWF and BirdLife International.

173. Arrangements for operationalizing collaboration at pilot site level are given in the section below.

D. Operationalizing BCI Program and Pilot Site Projects

174. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence (no objection).

175. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI Regional Coordination Committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

176. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

177. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

178. The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.
179. On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

180. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

181. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.

E. Disbursement Arrangements and Fund Flows

182. On securing approval from RCC, funds will be released to the national coordination offices and NGOs for the first six months. Funds under BCI will be disbursed by ADB to the coordination offices directly and to one disbursing NGO in the subregion, which will further disburse to collaborating NGOs. Subsequent disbursements will be conditional on receipt of progress and financial reports by the PCU and its approval by the RCC.

183. Fund disbursements in subsequent years will be performance based. If pilot sites in the country are underperforming, funds may be reallocated to other sites that show a better performance. This principle could also be applied to reallocation of funds between countries if project implementation is seriously hampered in any one country. Approvals for performance-based allocation will be undertaken by the RCC and the ADB.

F. Accounting, Auditing, and Reporting

184. The BCI national coordinator's office as well as the implementing NGOs will maintain accounts and provide a statement of expenditure every six months based on the advances received, which will be attached to the half-yearly progress reports to be submitted by the BCI national coordinators. Accounts will be externally audited on an annual basis and audit reports submitted to the PCU. The PCU will submit these reports to the RCC for acceptance and, if needed, action.
G. Program Performance Monitoring and Evaluation

185. The success of the BCI is closely linked to the establishment of an effective geographical information system (GIS). The GIS is to support and facilitate BCI decision making by accurately assessing and monitoring regional and national parameters and trends across two main categories: the state of the habitat and socioeconomic characteristics. The results of such analyses will be the basis of assessing overall program performance.

186. The GIS data needed for this project include static environmental data, dynamic environmental data, and dynamic socioeconomic data (Annex 5).

187. Static environmental data are the geophysical information on the biodiversity conservation landscapes. BCI uses shuttle topographic radar mission (SRTM) digital elevation models (DEMs) of 90-m resolution, which are sufficient for assessing general terrain characteristics (elevation, hill shade) as well as erosion potential (slope) and watershed parameters (flow paths, flow lengths, stream network, overall size). DEMs derived from toposheets can reach resolutions of 20 m and better, and are highly accurate in terrain details. Datasets of this quality are desirable for the BCI, but are currently available only for parts of Viet Nam (20 m), Cambodia, and Lao PDR (50 m). These data are also the backbone for high-precision river network digitization, of which BCI holds detailed information for Cambodia, Lao PDR, Viet Nam, and Xishuangbanna Prefecture (PRC). Because terrain characteristics are unlikely to change during the time frame of the project, this information does not need to be monitored. River datasets need to be reviewed only where development projects affect riverbeds.

188. Dynamic environmental data combine all biophysical information in a short to medium time frame, particularly ecosystem (land cover) and its associated biodiversity (species richness). These characteristics are crucial to BCI decision making on corridor demarcation as well as environmental monitoring of the designated corridor area (for example, land cover/use change, land degradation and regeneration of forests). Today’s prime source of land cover information is satellite images and aerial photography. National datasets available to BCI (all except the PRC) have used a mix of satellite imagery and ground truthing for deriving this information. However, land cover and use class definition standards vary greatly between the countries, and most of the datasets are at least 5 years old. Newer data and classification standardization are required.

189. To retrieve newer land cover data and to ensure high geospatial accuracy, the BCI will use recent satellite imagery of medium to medium-high resolution (30–15 m; e.g., Landsat ETM+, IRS) to derive standardized land cover data for all pilot sites. However, the quality of the land cover information derived from these images either by semi-automatic processing or delineation will be subject to the local knowledge and rating of the operator. Therefore, high-resolution imagery (5–<1 m, e.g., SPOT V, IKONOS, QUICKBIRD, aerial photographs) at least for the corridors and contiguous protected areas will be crucial to assess land cover classes at a detail sufficient for the BCI (for example, separation between different vegetation types as well as separation between natural vegetation, secondary growth, and plantations).

190. An image database of this kind is not only a technically standardized knowledge base for all the pilot sites, but will provide a powerful monitoring tool to assess the performance of the project, if sampled in regular periods (e.g., in the beginning and end of Phase 1). As high-resolution imagery reduces the need for ground-truthing, the interpretation process can be done
by a small number of people, which will greatly reduce interpretation variation among the operators.

191. While floral biodiversity can be rated using remotely-sensed land cover information, faunal biodiversity requires thorough ground surveying. Faunal biodiversity needs to be regularly surveyed (at least at the beginning and the end of Phase I). The same team/partner should conduct all surveys in an area to ensure consistent interpretation methods and compatibility of the data in the BCI monitoring system.

192. **Socioeconomic data** provide the BCI with information to estimate pressure on the pilot sites (for example, poverty, population growth, road upgrades and extension, and settlement expansion) as well as to monitor the performance of the project (for example, poverty reduction). Province and district socioeconomic data are publicly available through statistics collected by international organizations, such as the World Bank, International Food Policy Research Institute (IFPRI), and United Nations agencies. Government organizations provide data down to the commune level (e.g., detailed road information, village distribution, and population statistics), including a larger variety of parameters. Governments are urged to provide the BCI with the necessary data (preferably not older than two years) to ensure thorough socioeconomic assessments on the pilot sites.

193. In addition to GIS information, external supervision missions will be undertaken by ADB and review missions commissioned by the PCU. The latter will be conducted in collaboration with the TAP, which shall submit an annual review report of program progress based on GMS country reports and selective field visits.

VII. **PROGRAM FUNDING**

A. **Cost Estimate**

194. In Phase I (2005–2008), program costs for establishing the national coordination office, testing out approaches in the pilot sites detailed planning and design in additional sites, and preparing for scaling-up activities in phase II. The total cost in Phase I is estimated to be $10.9 million, of which over 70% is earmarked for investments in the GMS countries and pilot sites. The breakdown is given in table 8 below:
Table 8: Proposed Budget by Components/Activities

<table>
<thead>
<tr>
<th>Objectives/Activities</th>
<th>$ ('000)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Poverty reduction</td>
<td>1,200</td>
<td>10.98</td>
</tr>
<tr>
<td>2 Land-use planning and management</td>
<td>960</td>
<td>8.79</td>
</tr>
<tr>
<td>3 Restore ecosystem connectivity</td>
<td>2,770</td>
<td>25.35</td>
</tr>
<tr>
<td>4 Capacity building</td>
<td>730</td>
<td>6.68</td>
</tr>
<tr>
<td>5 Sustainable financing</td>
<td>140</td>
<td>1.28</td>
</tr>
<tr>
<td>6 National/cross cutting activities</td>
<td>1,100</td>
<td>10.07</td>
</tr>
<tr>
<td>7 National project management/coordination</td>
<td>1,100</td>
<td>10.07</td>
</tr>
<tr>
<td>8 Regional activities</td>
<td>1,500</td>
<td>13.73</td>
</tr>
<tr>
<td><strong>Total estimated cost</strong></td>
<td>9,500</td>
<td>86.96</td>
</tr>
<tr>
<td><strong>O &amp; M costs including contingency</strong></td>
<td>1,425</td>
<td>13.04</td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td>10,925</td>
<td>100.00</td>
</tr>
</tbody>
</table>

O & M = operation and maintenance.

B. Financing Sources

1. Public Sector (Government)

195. GMS country contributions are expected to be in kind (office space, utilities, staff time, etc.) as well as in cash (operations). Some countries like PRC and Thailand have committed substantial funds to cover government costs. The PRC has set up a $20 million Trust Fund for Poverty Reduction with the ADB for use in GMS countries.

2. Private Sector (corporate)

196. Corporate sponsors will be sought to provide patronage to one or more of the corridors that may have flagship species, or which may provide opportunities for carbon trading through the Clean Development Mechanism or transfer payment mechanisms relating to watershed protection. Corporate sponsors have been active in other parts of the world in nature and ecotourism projects as well as debt swaps and investments in nature conservancies. In countries where hydropower stations are being built or in the planning stage (e.g., the Lao PDR and Viet Nam) private sector as well as state commercial entities will be encouraged to fund conservation measures in the corridors.

3. Development Partners (multilateral and bilateral)

197. Bilateral and multilateral (e.g., Global Environment Facility) development and conservation partners will be approached to support the initiative over the short, medium, and long term. The overall planning and financing for establishment and management of priority corridors in the respective countries will be integrated with existing programs of support currently being provided to protected areas and buffer zone management. It is envisaged that Phase I will be grant financed.

4. Nongovernment Organizations

198. The BCI will promote active collaboration with and between NGO partners already implementing activities in the nine GMS biodiversity corridor landscapes, aimed at bringing about synergy. The BCI will promote partnerships between governments and NGOs through the
program structure and implementation arrangements. NGOs will be requested to flag the in-kind and cash contributions to be made during phase I in the pilot sites.

5. Communities

199. In almost all cases, community-based natural resource management will entail some kind of voluntary contributions in kind (e.g., labor and time) or small amounts of cash (savings). The amount of contributions to be made will be decided on by the beneficiaries during participatory consultations.

VIII. PROGRAM BENEFITS, IMPACTS AND RISKS

A. Benefits

200. The expected benefits of the proposed BCI initiative over a period of 10 years are:

(i) Securing and improving the livelihood (in cash and in kind) of poor people living in and around forests in remote rural areas in the nine GMS biodiversity corridor landscapes.

(ii) Securing watershed protection and carbon sequestration by improving forest cover and the quality and productivity of forest ecosystems.

(iii) Establishing land management and governance regimes that provide incentives to manage and maintain natural resources responsibly and sustainably.

(iv) Establishing and consolidating a system of payment for environmental services that functions as a basis for sustainable financing of BCI.

(v) Availability of trained and competent personnel in state and nonstate sectors employed in the growing conservation and environmental protection sector locally and nationally.

(vi) Establishing areas of conservation, ecotourism, sustainable use, and regional cooperation in the region that demonstrate best developmental and conservation practices.

B. Impacts

201. The following positive impacts can be expected from the BCI:

(i) Increased additional capital flows (investments in tourism, water, and ecological farming) in remote and mountainous areas

(ii) Continuation of schooling and studies (lesser number of dropouts) among the younger generation in ethnic minority groups living in remote and mountainous areas

(iii) Improved access of all beneficiaries to information, communication, and technology in remote areas.

(iv) Improved access to markets and buyers of traditional and nontraditional goods and services.

(v) Improved awareness of and active involvement of local communities in biodiversity conservation interventions in landscapes and corridors.
(vi) Improved conservation of large landscapes with their fauna and flora in harmony with human activity, thus improving occurrence and maintenance of biodiversity outside the protected areas and core zones.

C. Risks and Assumptions

202. There are risks involved with BCI program implementation that need to be monitored and mitigated:

(i) Central and provincial governments may not support the process of land allocation, tenurial security, or user rights.

(ii) Ad hoc and overriding national or provincial development interventions may lead to disruption of BCI program work relating to conservation landscapes and corridors.

(iii) Species selection for restoration work may not be suitable or may (unintentionally) promote invasive species leading to further loss of biodiversity.

(iv) Commercialization and aggressive market interests may marginalize traditional forms of livelihood.

(v) Market incentives may prove too strong for communities to abstain from unauthorized land conversion.

(vi) Communities may not adhere to the regulatory framework relating to community forests or sustainable use.

203. Following are some assumptions for the successful implementation of Phase I.

(i) The long-term political commitment of GMS countries will be sustained at required levels for the establishment and effective management of the biodiversity corridor landscapes.

(ii) Adequate financial resources can be mobilized for implementation of the initiative in all priority sites in the GMS.

(iii) The BCI builds on and extends existing effort and does not attempt to achieve too much if the initiative moves into multisectoral development investments similar to integrated conservation and development projects in the past.

(iv) High-level involvement of multistakeholders requires a high level of coordination and collaborative working arrangements among various agencies—a complex and difficult task.

(v) The project coordinators and management will be able to manage and maintain smooth operations and relationships between the many participating partners.

(vi) Government and nongovernment staff who manage the corridor protection and sustainable-use zones on the ground are skilled and highly motivated.

IX. PROGRAM SUSTAINABILITY

204. Natural systems provide essential products and services for GMS development. Those systems need to be rehabilitated, conserved, and enhanced if their productivity and development benefits are to continue. Current levels of investment in natural systems maintenance inside and outside protected areas are a small fraction of that required.

205. Both government budgets and donor funds are low and under pressure from other sectors of the economy, such as defense, health, and education—all often seen as having a more urgent need than conservation. Sources of commercial funds are also limited and under
heavy competition from activities that may more easily be shown to be profitable and secure investment opportunities than biodiversity conservation. There is an urgent need to identify additional and innovative financing mechanisms for conservation inside and outside PAs to supplement and improve existing sources of funds.

206. Three major categories of funding are conventionally used to fund conservation. These include borrowing from banks and other commercial lending institutions; multilateral, bilateral, and NGO grants and loans; and public sector investments and budgetary allocations. They are the primary means of financing other public and private sector activities in most countries. Yet, all have common limitations that may constrain the degree to which they can fully meet conservation funding needs.

207. First they are limited in scope and amount. Frequently, there is little potential either for increasing the overall amount of finance available, or for reallocating funds to biodiversity conservation from other activities. Protected areas, for example, typically find it hard to compete with other sectors of the economy that appear to generate wider development benefits or can demonstrate higher and more immediate returns.

208. Conventional sources of finance are also often unsustainable. Donor funds are limited, government budgets are mostly decreasing in real terms, and both commercial and donor loans incur financial and pay-back burdens. As well as stretching already indebted public and private sectors and sometimes being uncertain over the long term, donor financing mechanisms run the additional risk of decreasing national, individual, or group control and sovereignty over natural systems because they depend on external decisions and are often tied to particular conditions, goals, or activities.

209. For these reasons, although conventional financing mechanisms provide an essential source of funds for conservation that must be more effectively tapped, they are usually inadequate to meet the need and may not even be desirable for some types of conservation activity.

210. Three types of innovative mechanisms that have been demonstrated to be successful for financing conservation are national economic instruments, domestic private sector investment, and innovative international financial flows. Each will need to be explored for potential to provide sustainable financing to the GMS biodiversity corridors initiative and, more specifically, to the management of each of the corridors targeted for support.

A. National Economic Instruments

211. The primary goal of using economic instruments for biodiversity conservation is to change people’s behavior. Some economic instruments have the additional advantage of generating and allocating funds for conservation. For example, fiscal instruments, markets, charge systems, bonds, and deposits all generate revenues; and property rights provide a means of ensuring that funds accrue to particular economic sectors or social groups. Economic instruments are particularly effective ways of making sure that the private sector and communities both generate and receive conservation finance, and can be easily used to channel revenues to the small-scale, community, or site-specific level.
B. Domestic Private Sector Investment

212. There is no reason why the state should have a monopoly on funding conservation or managing PAs. Most GMS countries have an efficient and rapidly expanding private sector, including large-scale commercial concerns as well as small-scale and community-level enterprises. There is great potential for encouraging private and community sector investment in conservation based on a better appreciation of the benefits received from healthy natural systems. This can generate funds, increase community participation in conservation, and transfer some of the cost burden from government.

213. For the private sector to be more fully engaged, biodiversity conservation must be made an attractive and accessible investment opportunity. The private sector can be encouraged to invest in conservation in various ways. Most important, opportunities must be created for private engagement, both in terms of ownership and control of natural resources and land areas as well as in support to sustainable conservation-based enterprises, such as the extraction and processing of biological resources and nature tourism.

214. Also, support can be provided to the entry of the private sector into conservation, such as through research and development into new products and markets, elimination of barriers to trade and business, allocation of concessions, franchises, sponsorship, and advertising deals in areas or enterprises, and provision of credit on favorable terms. Many of these forms of support can be made under joint arrangements and partnerships between the public, commercial, and community sectors.

215. The private sector can be encouraged to invest in biodiversity indirectly. Efforts can be made to attract charitable contributions and donations through such mechanisms as trusts, foundations, and endowments. Contributions can be made more attractive to the private sector by providing incentives such as tax relief or publicity to contributors.

C. Innovative International Financial Flows

216. Donor arrangements are not the only means of funding conservation from international sources. Many other possibilities exist for attracting international finance, including those that encourage the transfer of private financial resources as well as the more innovative use of donor funds. Although many of these arrangements are in use, some have given rise to great controversy, especially in issues relating to national sovereignty, ownership and control over biological resources, and the balance of power between developed and developing countries.

217. Some of the more innovative ways in which international funds have been used to finance PA conservation in recent years include:

(i) **International funds** (for example, a GMS conservation fund) can be used to finance conservation. These include trust funds, foundations, endowments, revolving funds, green funds, and other grant or loan-making entities. These funds can both be used as a means of raising money from international sources as well as channeling money to PAs and corridors.

(ii) **Debt relief**, such as debt rescheduling, debt forgiveness, debt for-equity and debt-for-nature swaps can be used as a means of simultaneously generating funds, increasing private and NGO participation in conservation, and reducing national indebtedness.
(iii) **Offsets and credits** can generate flows of funds from international industries to conservation. For example under carbon offset and credit arrangements, developed-country power utilities finance the operations of a developing country Forest Department, in exchange for credit for the amount of carbon saved or sequestered.

(iv) **International compacts** are voluntary agreements made by developing countries to engage in policy reforms and biodiversity conservation in exchange for the transfer of financial or technological resources from international sources to support these reforms.

(v) **Concessions or prospecting rights** can be offered in PAs and for species to companies interested in their possible future uses, for example, agricultural, industrial, and pharmaceutical applications of biodiversity and genetic resources.41

218. The BCI at local, national, and regional levels will explore opportunities for increasing the share of investments from conventional sources and for expanding the total flow of investment to conservation through innovative financing mechanisms.

## Annex 1. Logframe of GMS Biodiversity Conservation Corridors (GMS BCI) Program

<table>
<thead>
<tr>
<th>Narrative Summary</th>
<th>Indicators</th>
<th>Means of Verification</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision:</strong> By 2015, GMS countries will have established priority biodiversity conservation landscapes and corridors for maintaining the quality of ecosystems, ensuring sustainable use of shared natural resources, and improving the livelihoods of people</td>
<td></td>
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</tr>
<tr>
<td><strong>Program Goal:</strong> By 2015, GMS countries will endeavor to maintain and improve the cover, condition and biodiversity of forest lands and associated ecosystems in priority biodiversity conservation landscapes and corridors</td>
<td></td>
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</tr>
<tr>
<td><strong>Phase I (2005 – 2008):</strong> - At least 5 biodiversity conservation areas established in 5 pilot sites of the GMS countries covering a total area not less than 1 million ha. - By 2008, restoration and regeneration is visible on satellite images as compared to 2005; Rate of deforestation in and around pilot sites slowed down or stopped - Increasing trends in key species and population numbers</td>
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</tr>
<tr>
<td>- Project reports from GMS countries</td>
<td>- Satellite images and comparative spatial data from 2005/06 and 2008</td>
<td>- Political commitment of GMS leaders and governments to establish and maintain biodiversity corridors and areas of sustainable use (A)</td>
<td>- Sufficient levels of funding can be secured (A) - Institutional capacity and cooperation is harnessed for achieving common objectives (A) - Ad hoc development interventions can be minimized (R)</td>
</tr>
<tr>
<td><strong>Purpose:</strong> Sustainable management regimes established in the biodiversity corridors are providing benefits of natural resource (forest, water, soil, air) goods and services thus contributing to improving livelihoods of peoples living in and around the biodiversity corridors and protect the developmental, particularly physical infrastructure, deemed central to economic integration and sustainable development in the Subregion</td>
<td></td>
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<tr>
<td><strong>Phase I (2005 – 2008):</strong> - By 2008, 80% villages and hamlets located within corridors of pilot sites where project activities have been undertaken, report: a) improvement in social amenities b) Clear land management regimes c) Increased incentives and cash benefits from natural resources and infrastructure</td>
<td></td>
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<tr>
<td>- Project reports from GMS countries - External field verifications and survey reports - Land titling records &amp; village/commune tenurial security &amp; land management guidelines - Cash and non-cash benefits survey – pre and post phase I</td>
<td>- Provincial authorities are committed to participatory land use planning/ establishment of transparent and reliable land governance regimes (A)</td>
<td>- Central governments promote process of land allocation and tenurial security with undaunting vigour (A+R) - Market forces interested in linking up with products from...</td>
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</tr>
<tr>
<td>Narrative Summary</td>
<td>Indicators</td>
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<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>Components:</td>
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</tbody>
</table>
| 1. Poverty Reduction | - By 2008, 80% of households described as “poor” as per socio-economic studies in the corridors of the 5 pilot sites where project activities are undertaken, receive project services and cash benefits that impacts upon food and cash income availability, and accessing “additional” opportunities of livelihood improvement as compared to the HH situation at start of project  
- "improvements" in HH livelihood situation that are measured by 2008 as compared to baseline data of 2005/06 can be attributed to project interventions  | - Project reports from GMS countries  
- External field verifications and survey reports  
- Cash and non-cash benefits survey – pre and post phase I  | - sufficient demand is sustained and additional market opportunities available that impact on poverty alleviation measures (A)  
- marginalization of “traditional” forms of livelihood through commercialization and aggressive market interests (R)  
- conducive macro-economic policies and world economy support growth led strategies (A) |
| 2. Harmonized land management and governance regimes | - By 2008, all households affected by tenurial arrangements in the corridors of pilot sites where project activities are undertaken have received or are in the process of receiving tenurial security arrangements (e.g. land tenure certificates, registration etc.)  
- By 2008 legal and regulatory | - Land titling records & village/commune tenurial security & land management guidelines  
- Project reports from GMS countries  
- Draft legal text or gazetted edition of regulation/legal | - Government policies and laws conducive for provision of tenurial security and land allocation are implemented by local and provincial officials (A)  
- Governments provide easy and unfettered “registration” of land and issue of “certificates” (A) |
<table>
<thead>
<tr>
<th>Narrative Summary</th>
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<tbody>
<tr>
<td></td>
<td>instruments are in place or under approval process stipulating unambiguous rules governing land use and land management within sustainable use corridors, multiple use areas, and buffer zones.</td>
<td>instrument</td>
<td>Communities adhere to regulatory framework for community forests and abstain from unauthorized land conversion (R)</td>
</tr>
<tr>
<td>3. Restoring ecosystem connectivity</td>
<td>By 2008, villages within the corridors establish nurseries with native tree spp within each corridor area requiring restoration work that is supervised by qualified project staff in each pilot site</td>
<td>Soil and species surveys during phase I - Biodiversity Assessments and monitoring during phase I - Project reports from GMS countries</td>
<td>Forestry inventory, including, regular growth monitoring and updating of forest descriptions (A)</td>
</tr>
<tr>
<td></td>
<td>a restoration &quot;strategy/plan&quot; covering priority corridors is ready by end 2006</td>
<td>Satellite images and comparative spatial data from 2005/06 and 2008 - Ground truthing/ external site inspection reports, and digital analysis</td>
<td>Species selected are suited to the new environment and the roots and canopy structure will effectively diminish soil loss and assist regeneration (A + R)</td>
</tr>
<tr>
<td></td>
<td>60% of &quot;critical&quot; areas identified for restoration connectivity between fragmented PAs or forest gaps requiring enrichment planting in the pilot sites at start of project have replanted with native species or are under a mix of replantation and natural regeneration</td>
<td>Satellite images in year 2006, 2007 and 2008 show areas under regeneration and restoration as well as loss of habitat (conversion) and by 2008, images show that habitat status quo in the corridor is</td>
<td>Technology and training activities are successfully implemented in GIS-based mapping, modeling, and integrated assessment (A +R)</td>
</tr>
<tr>
<td></td>
<td>Satellite images in year 2006, 2007 and 2008 show areas under regeneration and restoration as well as loss of habitat (conversion) and by 2008, images show that habitat status quo in the corridor is</td>
<td></td>
<td>Potential remote sensing data</td>
</tr>
<tr>
<td>Narrative Summary</td>
<td>Indicators</td>
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</tbody>
</table>
maintained or tree and forest cover is increased| | | gaps (e.g., haze, clouds, shade, reduced quality of data & monitoring accuracy) (R) |

4. Capacity building

- By 2006, at least one natural resource committee consisting of male and female members set up in each community (village) level capable of planning and implementing NRM projects
- By 2007, skills imparted at local level lead to regular monitoring transects, improved protection measures and local skills available to carry out population census, demarcation, village level natural forest management plans
- By 2008, village – village and farmer-to-farmer exchanges lead to increased dissemination of knowledge and skills in NRM, improved farming skills, erosion control and water harvesting
- Project reports
- Monitoring reports; site inspection reports; project reports
- external verification; random surveys of beneficiaries

- Trained personnel remain on jobs in local bodies, non-governmental and community-based organizations (A)
- Low turn over of staff and institutional continuity (R)

5. Sustainable financing of the biodiversity corridor interventions

- By 2008, at least three (3) schemes for transfer payments for ecosystem services proposed and testing phase in
- Project Reports
- Consultancy Reports on Payment for Ecosystem Services (PES)

- GMS Countries willing to introduce innovative financing schemes (A)
<table>
<thead>
<tr>
<th>Narrative Summary</th>
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<th>Means of Verification</th>
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</tr>
</thead>
<tbody>
<tr>
<td>- progress;</td>
<td>- By 2008, regulatory framework for ecosystem service charges drafted and submitted for approval in at least two (2) sites - By 2007, Regional and national funding sources identified and linked to GMS BCI pilot sites including various funding mechanisms</td>
<td>- draft regulatory instrument - community revolving funds; regional/national endowments;</td>
<td>- Donor and Government in support of sustainable funding (R)</td>
</tr>
</tbody>
</table>
GMS BIODIVERSITY CONSERVATION CORRIDORS INITIATIVE


May 2005
# TABLE OF CONTENTS

I. INTRODUCTION ................................................................................................................................................. 1  
   A. Biodiversity Conservation Landscapes in the GMS ........................................................................ 1  
   B. Management Objectives of the Biodiversity Conservation Landscapes ........................................... 2  
II. BCI VISION, OBJECTIVES, COMPONENTS, AND PHASING ........................................................................... 2  
   A. BCI Vision ....................................................................................................................................................... 2  
   B. Program Goal (Long Term) .............................................................................................................................. 2  
   C. Program Purpose (Medium Term) ..................................................................................................................... 2  
   D. Program Components (Short-to-Medium Term) ............................................................................................... 2  
   E. BCI Phasing (Program Duration) ..................................................................................................................... 3  
   F. Estimated Budget for Phase I (2005–2008) ................................................................................................. 3  
III. BCI PILOT SITES, PHASE I (2005–2008) ...................................................................................................... 3  
   A. Cambodia ......................................................................................................................................................... 3  
   B. People's Republic of China, Yunnan Province ......................................................................................... 4  
   C. Lao PDR ......................................................................................................................................................... 5  
   D. Thailand .......................................................................................................................................................... 5  
   E. Viet Nam ......................................................................................................................................................... 5  
IV. BCI ACTION PLAN (2005–2008) .................................................................................................................... 5  
   A. Poverty Reduction ........................................................................................................................................... 5  
   B. Integrated Land-Use Planning and Management ..................................................................................... 6  
   C. Restored Ecosystem Connectivity .................................................................................................................. 7  
   D. Capacity Building .......................................................................................................................................... 7  
   E. Sustainable Financing ................................................................................................................................. 8  
   F. National Activities .......................................................................................................................................... 8  
   G. Regional activities and coordination ........................................................................................................... 9  
V. PROGRAM IMPLEMENTERS ................................................................................................................................. 11
I. INTRODUCTION

A. Biodiversity Conservation Landscapes in the GMS

1. The Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) is a 10-year program aimed at establishing and maintaining the following nine priority biodiversity conservation landscapes and corridors, illustrated in Figure 1:

   (i) Western Forest Complex (Thailand and Myanmar)
   (ii) Ton Le Sap Inundation Zone (Cambodia)
   (iii) Cardamom and Elephant Mountains (Cambodia)
   (iv) Northern Plains Dry Forests (Cambodia and the Lao PDR)
   (v) Eastern Plains Dry Forests (Cambodia and Viet Nam)
   (vi) Tri-Border Forests (Cambodia, Lao PDR, and Viet Nam)
   (vii) Central Annamites (Viet Nam and the Lao PDR)
   (viii) Northern Annamites (Viet Nam and the Lao PDR)
   (ix) Mekong Headwaters (Yunnan Province, People's Republic of China [PRC]; Myanmar; and Lao PDR).

Figure 1: Priority GMS Biodiversity Conservation Landscapes
2. The series of map overlays leading to the definition of the landscapes are provided on the BCI website (www.adb.org/projects/gms-biodiversity).

B. Management Objectives of the Biodiversity Conservation Landscapes

3. Management of the nine high-priority biodiversity landscapes should meet the following key conservation objectives:
   (i) Conserve biodiversity at the ecosystem, landscape, or regional scale, especially to maintain large-scale processes and viable populations.
   (ii) Buffer core areas from the effects of potentially damaging external activities.
   (iii) Restore degraded ecosystems and expanding ecosystem services.
   (iv) Allow sustainable use and forms of land tenure consistent with conservation.

II. BCI VISION, OBJECTIVES, COMPONENTS, AND PHASING

A. BCI Vision

4. By 2015, GMS countries will have established priority biodiversity conservation landscapes and corridors for maintaining the quality of ecosystems, ensuring sustainable use of shared natural resources, and improving the livelihoods of people.

B. Program Goal (Long Term)

5. By 2015, GMS countries will endeavor to maintain and improve the cover, condition, and biodiversity of forestlands and associated ecosystems in priority biodiversity conservation landscapes and corridors.

C. Program Purpose (Medium Term)

6. Sustainable management regimes established in the biodiversity corridors are providing benefits of natural resource (forest, water, soil, air) goods and services, thus contributing to improving livelihoods of peoples living in and around the biodiversity corridors and protecting the developmental, particularly physical infrastructure, deemed central to economic integration and sustainable development in the subregion.

D. Program Components (Short-to-Medium Term)

   (i) Poverty alleviation through sustainable use of natural resources and development of livelihoods.
   (ii) Clear definition of optimal land uses and harmonized land management regimes.
   (iii) Restoration and maintenance of ecosystem connectivity.
   (iv) Capacity building in government staff and local communities.
   (v) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures.
E. **BCI Phasing (Program Duration)**

7. The BCI objectives will be achieved in three phases over 10 years, the period between GMS Summits from 2005 to 2014.

   (i) In Phase I (2005–2008), five GMS countries (Cambodia, PRC, Lao PDR, Thailand, and Viet Nam) will carry out pilot projects in selected sites within one of the nine GMS biodiversity corridor landscapes. Each pilot site includes a complex of protected areas and several proposed biodiversity corridors. In addition, enabling activities will be carried out at national and regional levels. Assessments will be carried out and plans prepared to define additional priority corridors within the nine GMS biodiversity corridor landscapes to receive BCI support in Phase II. Plans for expanding and scaling-up the pilot project will be prepared.

   (ii) In Phase II (2009–2011), the methodology and framework of action developed in Phase I will be applied to other corridors within the nine GMS biodiversity corridors landscapes.

   (iii) In Phase III (2012–2014), all nine GMS biodiversity corridor landscapes will be consolidated in terms of investments and an evaluation of the approach and achievements will be carried out to determine whether the vision has been achieved.

F. **Estimated Budget for Phase I (2005–2008)**

8. It is estimated that $10.9 million will be needed to implement the Action Plan for phase I (2005–2008), for implementation of activities in the BCI pilot sites as well as regional support and cross-cutting activities.

III. **BCI PILOT SITES, PHASE I (2005–2008)**

A. **Cambodia**

9. The Cambodian pilot site is the Cardamom and Elephant Mountains landscape down to the southwestern coast. Koh Kong Province and specific corridors within it linking 11 protected areas provide the focus of the project. The pilot project targets three corridors: (i) a corridor of protection linking the Central Cardamoms Protected Forest and Phnom Samkos Wildlife Sanctuary with the Southern Cardamoms Protected Forest with further links along Route 48 to Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Area. It can be described as the Areng catchment corridor, after the name of the main river and watershed running through its center; (ii) the mangrove forest or coastal corridor running from Dong Peng to Phnom Samkos with an initial focus on the coastal system and communities of southeastern Botum-Sakor National Park; and (iii) the Aural-Kirirom sustainable-use corridor between Phnom Aural and Kirirom and then from Kirirom to Bokor. In addition, preparatory activities will be undertaken at a second site in Mondulkiri Province in northeastern Cambodia, bordering Viet Nam, with detailed planning for Phase II.
B. People’s Republic of China, Yunnan Province

10. The Xishuangbanna Tropical Rainforest landscape in southern Yunnan Province stretching down to the border of the Lao PDR is the location of the PRC pilot site. Yunnan Province and specific corridors in the Prefecture of Xishuangbanna provide the focus of the project, including the linkage of nine existing and proposed protected areas. Eight corridors are targeted: (i) Mengyang to Xiao He Jiang; (ii) Xiao He Jiang to King Tea River; (iii) King Tea River; (iv) King Tea River to Mengla; (v) Mengla to Shangyong—a wild elephant sanctuary and a transboundary nature reserve bordering the Lao PDR; (vi) Mengyang to Menglun; (vii) Mengyang to Mangao; and (viii) Mangao to Mengsong.

Figure 2: Pilot Sites within GMS Biodiversity Conservation Landscapes
C. Lao PDR

11. The pilot project in the Lao DPR will develop a sustainable-use corridor linking Dong Houa Sao National Biodiversity Conservation Area (NBCA) in Champasak Province to Xe Pian NBCA, covering both Champasak and Attapeu provinces in the Tri-Border Forests landscape. Two other conservation corridor linkages will be explored for support during phase 2 of the BCI, including some preparatory land-use planning and capacity-building activities: (i) a corridor linking Xe Pian NBCA to Dong Ampham NBCA, which falls within Attapeu Province as well as the Dakcheung district in Sekong Province in the northern portion of the Tri-Border Forests landscape; and (ii) a corridor linking Dong Ampham and Xe Xap NBCAs in Sekong and Saravane provinces in the Central Annamites landscape.

D. Thailand

12. The pilot site in Thailand is in the Tenasserim Range in western Thailand, between the Western Forest Complex and the Kaeng Krachan Forest Complex. To the west of both complexes is forested area in Myanmar. The complexes are situated in two important ecoregions in mainland Southeast Asia—the Kayah-Karen montane rain forests ecoregion and Tenasserim-South Thailand Semi-evergreen rain forests. The distance between the two complexes is approximately 75 km, an area largely covered by forest remnants. The project will develop a corridor for protection and sustainable use linking the two existing forest complexes with their 19 contiguous protected areas. In addition, preparatory activities will be undertaken in the Khao Yai National Park in Eastern Thailand.

E. Viet Nam

13. The pilot project in Viet Nam is focused in Quang Nam Province of the Central Annamites and bordering areas of Thua Thien Hue and Kon Tum provinces and Sekong and Attapeu provinces in the Lao PDR. Activities in the three BCI phases are designed in sequence to tackle the areas of highest risk first without losing sight of the long-term goal of establishing a continuous forest landscape throughout the Central Annamite Mountains. Phase 1 focuses on the links between three nature reserves, Ngoc Linh, Song Thanh, and Ba Na in Quang Nam Province and Xe Sap NBCA in the Lao PDR.

IV. BCI ACTION PLAN (2005–2008)

14. This action plan covers the five program components, the national activities of the GMS countries, and the regional program activities in support of crosscutting or transboundary themes.

A. Poverty Reduction

15. Attention will be given to assessing the poverty and development situation in the pilot sites and offering interventions with the aim of contributing to poverty reduction and sustainable development planning of the pilot corridors. Livelihood improvement interventions (for example, access to secure land tenure, community forestry, plantations, local primary processing of wood and nonwood products, ecological farming and ecotourism) will be undertaken and market linkages promoted. This entails the provision of incentives, funding, legal rights, and technical assistance in the corridor sustainable-use areas outside protected areas (PAs), improving upland farming practices, and enabling local people to grow trees of their choice in their
homestead plantations and community forests for subsistence such needs as fuelwood and construction. Local people will receive cash benefits for labor provided for carrying out detailed survey and demarcation of selected priority biodiversity corridors; participation in restoration, management, and maintenance work; and from sustainable harvesting of fruits, timber, or collection of fuelwood and nonwood products. Small loan schemes for micro- and small enterprises can encourage local (wood and nonwood) primary processing to emerge or existing ones to become vibrant. The establishment of management regimes in the corridors will create jobs for local people, such as carrying out biodiversity inventories and surveys and monitoring and protection of forests. Similarly, employment opportunities will emerge in ecotourism and educational and cultural tourism networks as these services gain ground. In particular, the following activities will be supported in phase I:

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Poverty reduction</td>
<td>1.1 Market analysis and linkages</td>
</tr>
<tr>
<td></td>
<td>1.2 Socioeconomic and alternative livelihood studies in corridors</td>
</tr>
<tr>
<td></td>
<td>1.3 Community-based forest and protected area management</td>
</tr>
<tr>
<td></td>
<td>1.4 Sustainable agricultural practices and appropriate technology</td>
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<tr>
<td></td>
<td>1.5 Village development funds and small grant facilities</td>
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<td></td>
<td>1.6 Exchange and learning between communities</td>
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<td></td>
<td>1.7 Incentive and compensation systems for conservation</td>
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<tr>
<td></td>
<td>1.8 Support for small-scale infrastructure</td>
</tr>
</tbody>
</table>

B. Integrated Land-Use Planning and Management

16. A spatial land-use planning process will be undertaken using a participatory approach. This requires socioeconomic surveys, including the delineation of environmentally sensitive areas and appropriate safeguards, biological surveys, clarification of current demarcations of protected areas, and an overview spatial map of current land-use patterns. Possible connecting corridors and zones will be identified and agreements made with all stakeholders (institutions, communities, and households) on appropriate land-use arrangements and delineation of sustainable-use areas. Such agreements recognized by government are critical for identifying and mitigating land- and resource-use conflicts prior to making investment decisions and for creating enabling conditions for integrating local livelihoods with local and market-oriented development needs.

17. As a general principle, the BCI program envisages collaboration with nongovernment organizations (NGOs) in the pilot sites that already have a recognized track record for participatory consultations at the grass-root level and have been involved in land allocation processes and harmonized land management regimes. The BCI also plans to document the process of participatory consultation at the start of the program for use as a learning and dissemination tool as well as for monitoring and documentation. In particular, the following activities will be supported in phase I:

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Harmonized land management and governance regimes</td>
<td>2.1 Forest protection management and planning.</td>
</tr>
<tr>
<td></td>
<td>2.2 Landscape-level analysis of existing and proposed developments</td>
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<tr>
<td></td>
<td>2.3 Preparing detailed land-use and zoning plans at the landscape level</td>
</tr>
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<td></td>
<td>2.4 Participatory demarcation of protected areas and corridor zones</td>
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<td></td>
<td>2.5 Updating and maintenance of land cover data and classification</td>
</tr>
<tr>
<td></td>
<td>2.6 Feasibility studies into ecotourism and agricultural tourism</td>
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<td></td>
<td>2.7 Legal framework for corridors</td>
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<tr>
<td></td>
<td>2.8 Participatory village level planning and secure land allocation</td>
</tr>
</tbody>
</table>
C. Restored Ecosystem Connectivity

18. Ecosystem restoration to establish connectivity and sustainable-use areas will be undertaken and evaluated. This process will require preparation of rehabilitation strategies. Planting of native species may be required to create linear corridors between some core areas. Areas for sustainable use and protection will need to be delineated within the buffer or transition zones around protected areas. People whose land is currently under productive utilization and who will be affected by rehabilitation measures can receive compensation through similar use rights within the sustainable-use areas.

19. Some transnational roads that have been planned in the GMS bisect key PAs or PA complexes and biodiversity corridors. Where this intrusion is severe, design adjustments may be necessary—for example by exploring realignment to avoid core areas and installing under- or overpasses. Where the intrusion is marginal, a cost-benefit analysis will be made to assess the feasibility of detours against excising small segments of protected areas in return for a covenant for effective threat mitigation and long-term compensation to a protected area management fund. In corridors that are affected by the zones of influence of major roads, mitigation measures, such as prohibition of development along roads and policing roads for illegal wildlife trade, need to be put in place. Other infrastructure development proposals, such as dams, must receive comprehensive assessment for cumulative effects, accompanied by transfer payments for watershed management functions and compensation arrangements for downstream effects. Specific activities in phase I are

<table>
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<tr>
<th>BCI component</th>
<th>Key activities</th>
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<tbody>
<tr>
<td><strong>3. Restored ecosystem connectivity</strong></td>
<td>3.1 Forest restoration and protection in corridors</td>
</tr>
</tbody>
</table>

D. Capacity Building

20. Institutional and human capacity for managing biodiversity corridors will be improved. Local people and officials need capacity building for biodiversity conservation planning, management, and monitoring. Weak capacity has been identified as an overarching threat. It has been demonstrated worldwide that education, knowledge, and skills can provide a sound basis for people to be proactive in biodiversity conservation and sustainable management.

21. The BCI approach puts special emphasis on knowledge sharing and skills transfer. While local indigenous knowledge of traditional medicinal plants, herbs, and essences will be documented and preserved for posterity, the program will foster special exchange visits of implementers in the GMS countries to learn and share information and experience from various pilot sites and corridors. In particular, regional knowledge and skill transfers as well as between villages and communities in a particular site or country will be promoted. This will be particularly important in transboundary situations, where joint seminars and experiential learning can lead to better understanding and enforcement, and eventually to conducting joint patrols in the true sense of a transboundary undertaking. Sharing knowledge and skills in restoration activities as well as environmental protection with improved productivity in upland farming systems will be
beneficial across the GMS. The BCI will tap existing sources of information and centers of excellence in the GMS countries and promote wider networking, dissemination and exchange of ideas within the ambit of the biodiversity corridors, and the landscape approach.

22. The BCI aims at fostering local approaches and decision making that lead to local benefits and responsibilities. Without active involvement of local communities, any conservation approach is bound to fail in the medium-to-long term because local communities and households are the ultimate custodians of the natural resources they share and use. In the same way that providing proprietary or user "rights" over means of production (e.g., land) has acted as an incentive and a driving force in market and transition economies, the granting of access and user rights to natural resources will galvanize communities (villages and groups of households) into higher levels of incentive to protect what is theirs against outsiders. With benefits come responsibilities; it is important in many places to support communities with capacity building to manage these resources sustainably. Key activities are

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Capacity building</td>
<td>4.1 Community training in market linkages, sustainable use, protection, and collaborative management</td>
</tr>
<tr>
<td></td>
<td>4.2 Training and exchanges for government staff in corridor and protected area management</td>
</tr>
<tr>
<td></td>
<td>4.3 Education and public awareness</td>
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</tbody>
</table>

E. Sustainable Financing

23. Sustainable financing for the BCI will be identified and made operational. This component entails identifying and setting up funding mechanisms that will allow PAs and corridors to function in the long term. Apart from recurrent budget support from the GMS countries, areas that will be explored include transfer payments for environmental services, Clean Development Mechanism, and setting up endowments and contributions from tourism and other natural resource use tax regimes. Key activities to be undertaken in phase I are

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Sustainable financing</td>
<td>5.1 Valuation of ecosystem services</td>
</tr>
<tr>
<td></td>
<td>5.2 Testing of payment mechanisms for ecosystem services</td>
</tr>
<tr>
<td></td>
<td>5.3 Pilot regional funds and funds for specific protected areas</td>
</tr>
<tr>
<td></td>
<td>5.4 Identification of mechanisms for sustainable funding of corridors and protected areas</td>
</tr>
</tbody>
</table>

F. National Activities

24. Under the national coordination office, several biodiversity assessments, surveys and studies need to be conducted in order to carry out ground-truthing, updating existing inventories, and elaboration of biodiversity indicators. Impact assessments need to be carried out for monitoring and reporting purposes and these will be conducted periodically.

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. National</td>
<td>6.1 Biodiversity surveys and corridor definitions</td>
</tr>
<tr>
<td></td>
<td>6.2 Environmental assessments of overall impact of the economic corridors</td>
</tr>
</tbody>
</table>
G. Regional Activities and Coordination

25. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence.

26. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working Group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI Regional Coordination Committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

27. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or crosscutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or crosscutting activity proposals screened prior to the inception workshop for Phase I.

28. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

29. The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

30. On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

31. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and
give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

32. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.

33. Biodiversity corridor interventions and transboundary activities in the GMS will require appropriate policy and regulatory frameworks within the GMS countries. The BCI will foster a process that generates a degree of standardization in the regulatory framework establishing corridors, landscapes, and transboundary projects. Following examples of similar standardization of procedures and regulations in transboundary traffic and movement of goods and persons, the BCI envisages in the medium-to-long term a similar development in conservation and environmental protection across the GMS countries. The BCI will seek to lay the groundwork for such future developments that may emerge in the shape of GMS transboundary protocols or regional agreements.

34. The success of the BCI is closely linked to the establishment of an effective geographical information system (GIS). The core goal of the GIS is to support and facilitate BCI decision making by accurately assessing and monitoring regional and national parameters and trends across two main categories: (i) the state of the habitat, and (ii) socioeconomic characteristics. The results of such analyses will be the basis of assessing overall program performance.

35. To retrieve newer land cover data and to ensure high geospatial accuracy, the BCI will use recent satellite imagery of medium to medium-high resolution (30–15 m; e.g., Landsat ETM+, IRS) to derive standardized land cover data for all pilot sites. However, the quality of the land cover information derived from these images either by semi-automatic processing or delineation will be subject to the local knowledge and rating of the operator. Therefore, high-resolution imagery (5–<1 m, e.g., SPOT V, IKONOS, QUICKBIRD, aerial photographs) at least for the corridors and contiguous protected areas will be crucial to assess land cover classes at a detail sufficient for the BCI (for example, separation between different vegetation types as well as separation between natural vegetation, secondary growth, and plantations).

36. An image database of this kind is not only a technically standardized knowledge base for all the pilot sites, but will provide a powerful monitoring tool to assess the performance of the project, if sampled in regular periods (e.g., in the beginning and end of Phase 1). As high-resolution imagery reduces the need for ground-truthing, the interpretation process can be done by a small number of people, which will greatly reduce interpretation variation among the operators.

37. While floral biodiversity can be rated using remotely-sensed land cover information, faunal biodiversity requires thorough ground surveying. Faunal biodiversity needs to be
Annex 2

regularly surveyed (at least at the beginning and the end of Phase I). It is desirable that the same team/partner conduct all surveys in an area to ensure consistent interpretation methods and compatibility of the data in the BCI monitoring system. Socioeconomic data will allow BCI to estimate pressure on the pilot sites (for example, poverty, population growth, road upgrades and extension, and settlement expansion) as well as to monitor the performance of the project (for example, poverty mitigation). Province and district-level socioeconomic data are publicly available through statistics collected by international organizations, e.g., the World Bank, International Food Policy Research Institute, and United Nation agencies. Government organizations can provide data down to the commune level (e.g., detailed road information, village distribution, and population statistics), including a larger number of parameters.

38. The following key activities will be undertaken or coordinated by the regional PCU:

<table>
<thead>
<tr>
<th>BCI component</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Regional</td>
<td>7.1 Facilitation of transboundary cooperation, exchange, and training</td>
</tr>
<tr>
<td></td>
<td>7.2 Ecosystem services valuation and transfer payments</td>
</tr>
<tr>
<td></td>
<td>7.3 Monitoring and evaluation, including wildlife trade monitoring</td>
</tr>
<tr>
<td></td>
<td>7.4 Database management and accessibility</td>
</tr>
<tr>
<td></td>
<td>7.5 Project preparation and investment portfolios in additional sites</td>
</tr>
</tbody>
</table>

V. PROGRAM IMPLEMENTERS

39. The BCI program envisages collaboration and partnership between government and nongovernment organizations in the delivery of program interventions. In the field of conservation, partnerships between government and civil societies have led to synergies and efficiencies wherever government has welcomed collaboration toward achieving mutual goals and objectives. Within the context of the BCI, such partnerships will be fostered with the conviction that each partner has a particular role to play and also has particular strengths that can be used to achieve mutual ends. In sites where NGOs or community-based organizations are absent, capacity building will have to take precedence over interventions until such time that adequate capacity can be identified and partnered with civil society organizations on the ground.

40. While it is expected that the collaborating partners will synchronize their activities in the field and use an integrative program approach, it may be necessary at times to allow provision of specialist services to beneficiaries by certain partners on demand. Participatory consultations with beneficiaries may lead to the need for provision of services by a host of local partners (government and nongovernment) that may not be the primary implementers. In such cases, the program will encourage networking and establishment of linkages with a variety of service providers.
Cardamoms Biodiversity Conservation Corridors
Cambodia

Pilot Project Profile (2005–2008)

May 2005
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>BCI</td>
<td>Biodiversity Conservation Corridors Initiative</td>
</tr>
<tr>
<td>CDC</td>
<td>Council for the Development of Cambodia</td>
</tr>
<tr>
<td>CEDAC</td>
<td>Centre d’Etude et de Developpement Agricole Cambodgien</td>
</tr>
<tr>
<td>CI</td>
<td>Conservation International</td>
</tr>
<tr>
<td>CITES</td>
<td>Convention on International Trade in Endangered Species of Wild Fauna and Flora</td>
</tr>
<tr>
<td>CMWSP</td>
<td>Cardamom Mountains Wildlife Sanctuaries Project</td>
</tr>
<tr>
<td>DANIDA</td>
<td>Danish International Development Assistance</td>
</tr>
<tr>
<td>DONRAEDAM</td>
<td>Department of Natural Resource Assessment and Environmental Data Management</td>
</tr>
<tr>
<td>FA</td>
<td>Forest Administration</td>
</tr>
<tr>
<td>FFI</td>
<td>Fauna and Flora International</td>
</tr>
<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
</tr>
<tr>
<td>GMS</td>
<td>Greater Mekong Subregion</td>
</tr>
<tr>
<td>IUCN</td>
<td>World Conservation Union</td>
</tr>
<tr>
<td>MAFF</td>
<td>Ministry of Agriculture, Forestry and Fisheries</td>
</tr>
<tr>
<td>MEF</td>
<td>Ministry of Economy and Finance</td>
</tr>
<tr>
<td>MOC</td>
<td>Ministry of Commerce</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>MOP</td>
<td>Ministry of Planning</td>
</tr>
<tr>
<td>MOT</td>
<td>Ministry of Tourism</td>
</tr>
<tr>
<td>MRD</td>
<td>Ministry of Rural Development</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernment organization</td>
</tr>
<tr>
<td>NPRS</td>
<td>National Poverty Reduction Strategy</td>
</tr>
<tr>
<td>NREM</td>
<td>natural resource and environmental management</td>
</tr>
<tr>
<td>PCU</td>
<td>regional program coordination unit</td>
</tr>
<tr>
<td>PIU</td>
<td>project implementation unit</td>
</tr>
<tr>
<td>RCC</td>
<td>regional coordination committee</td>
</tr>
<tr>
<td>RETA</td>
<td>regional technical assistance</td>
</tr>
<tr>
<td>SWEC</td>
<td>South West Elephant Corridor</td>
</tr>
<tr>
<td>TAP</td>
<td>technical advisory panel</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USFWS</td>
<td>United States Fish and Wildlife Service</td>
</tr>
<tr>
<td>WCS</td>
<td>Wildlife Conservation Society</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
</tr>
</tbody>
</table>

## NOTE

In this report, "$" refers to US dollars, unless otherwise noted.
A. Project Context

1. Under the Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) currently being implemented as Asian Development Bank (ADB) regional technical assistance (RETA) 6213, biodiversity corridor pilot sites for 2005–2008 in each GMS country are to be selected based on the following criteria:

   (i) Falling within GMS economic corridors or their zone of influence
   (ii) Reducing ecosystem fragmentation by linking two or more protected areas
   (iii) Areas of international biodiversity importance
   (iv) Areas of high poverty incidence and population growth
   (v) Being of a transboundary nature
   (vi) Having institutional (state and nonstate) capacity on the ground that is currently active in implementing one or more projects

B. Selection and Location of Pilot Sites

2. In Cambodia, the biodiversity conservation corridor pilot sites are located in the Cardamom and Elephant Mountains landscape down to the coast (Map 1). This project profile provides background information on the area and sets out the project objectives, indicative activities, and institutional arrangements. Koh Kong Province and specific corridors in it provide the focus of the project.
3. Koh Kong Province takes in part of Phnom Samkos Wildlife Sanctuary and the Central Cardamoms Protected Forest in the north, the Coastal Cardamoms Protected Forest and Peam Krasop Wildlife Sanctuary, Botum-Sakor National Park and Dong Peng Multiple Use Area to the south, and parts of Kirirom and Bokor national parks to the east (Map 1). In the face of mounting development challenges, the provincial government has provided strong backing for conservation, supported by the Ministry of Agriculture, Forest, and Fisheries and the Ministry of Environment in partnership with three international conservation organizations with a long-term commitment to the region: Conservation International (CI), Fauna and Flora International (FFI), and WildAid. This combination of commitment and capacity in a region of international biodiversity importance makes it well suited for the focus of the BCI in Cambodia.

4. The pilot project targets three corridors: a corridor of strict protection linking the Central Cardamoms Protected Forest and Phnom Samkos Wildlife Sanctuary with the Southern Cardamoms Protected Forest, with further links along Route 48 to Peam Krasop Wildlife Sanctuary and Dong Peng Multiple Use Area (Map 2). It can be described as the Areng catchment corridor after the main river and watershed running through its center.

5. The other two critical corridors will receive attention on a more modest scale including non-timber forest product survey, sustainable use, and management. One is the mangrove forest or coastal corridor running from Dong Peng to Phnom Samkos, with an initial focus on the coastal system and communities of southeastern Botum-Sakor National Park. Part of the coastal corridor should be under protection. The other is the Aural-Kirirom sustainable-use corridor between Phnom Aural and Kirirom and then from Kirirom to Bokor. The outer boundary of this corridor is the Koh Kong provincial boundary.

Map 2. Cardamoms Biodiversity Corridor Conservation Pilot Site
6. These three corridors are identified for highest priority action according to the pilot site selection criteria. The corridors are

(i) within the southern GMS economic corridor with links to Thailand;
(ii) essential as a focus of effort to reduce ecosystem fragmentation;
(iii) areas of international biodiversity importance;
(iv) areas of high poverty incidence, increasing poor populations, and ethnic minorities with traditional ties to the Cardamoms; and
(v) areas with high levels of provincial, national, and international commitment and well-established conservation and livelihoods programs as a foundation for sustainability of the pilot project activities.

7. While the pilot project will have a sharp geographic and community focus, the provincial authorities have identified the need to keep in view the broader development planning landscape. The pilot project will reinforce some province-wide planning activities that involve supporting the Government in a study of the socioeconomic, biodiversity, and natural resources situation as a contribution to a provincial land-use planning process and clearer definition of development and conservation opportunities and zones. The pilot corridors themselves will need to be more precisely defined. Some areas will need to be strictly protected because of their importance for biodiversity and ecosystem service values. Other areas can sustain various intensities of use and development.

8. Initially, the project will concentrate on the unique Khmer Daeum minority community of the Areng Valley, where there is an urgent need for reducing poverty and improving food security in ways that are compatible with the outstanding biological values of the Areng Catchment Corridor. Other communities within the project area will be the focus of socioeconomic studies and land-use planning. Current livelihood work and village-level planning with these communities involve Ministry of Environment (MOE) and Ministry of Agriculture, Forests, and Fisheries (MAFF) with WildAid, CI, and FFI. This demonstration work needs to be strengthened and expanded according to the capacity of the state and nonstate implementers. Mutual learning and exchange between target villages should be promoted. Implementation arrangements involving the main partners are defined in Section 10.

C. Description of Pilot Project Corridors

9. The three corridors each connect existing areas under various forms of protection to contribute to one of the largest blocks of contiguous forest in Southeast Asia. The natural systems of the corridors contribute in significant ways to the maintenance of habitat and watershed functions, water supply, protection against flooding and other natural disasters, and to the productivity of fisheries and agricultural systems. The sizes of the corridors’ components are shown in Table 1.

10. Areng catchment corridor. This corridor is part of the most significant Indochina habitat for the tiger (*Panthera tigris*) and Asian elephant (*Elephas maximus*) and most significant global habitat for the Siamese crocodile (*Crocodylus siamensis*). It is one of the very few sites in Asia with white-winged ducks, black-necked storks, and Asian arowana. It includes hilly evergreen forest, unique upland and lowland freshwater swamp forest, with some semi-evergreen and dry forest, and will require strict protection. The rugged western portion of this corridor (Mondulseima District) contains pristine evergreen forest that receives up to 5 meters of rain per year, and must be safeguarded as a critical watershed for the Koh Kong City development zone. The elephants in the area move through a diversity of habitats down to Botum-Sakor. Further
surveys are needed to confirm their connectivity with herds in Samkos, Kirirom, and Aural. The corridor is part of the former Silveroad forest concession managed by the Forest Administration. It connects the Central and Southern Cardamoms Protected Forests, both under Forest Administration jurisdiction, and the Phnom Samkos Wildlife Sanctuary, under MOE jurisdiction. Route 48 is included in this corridor to stress the importance of maintaining the forests on either side of the road by strengthening the current Forest Administration and WildAid program. The corridor encompasses the Chi Phat settlement in the south to join the Dong Peng Multiple Use Area managed by MOE, the location of Sovanna Baitong. The corridor also contains the indigenous minority communities of the Areng valley.

11. Coastal corridor. Throughout the 1990s, the mangrove and coastal/marine systems from Dong Peng west to the Thai border were heavily exploited, leading to destruction of habitat and collapse of commercial and subsistence uses, forcing communities back to illegal and damaging forest exploitation in protected areas. The mangroves are recovering significantly but intensive collaborative management and rehabilitation are needed to restore productivity. The corridor includes an extensive network of river estuaries, shallow coastal waters, and mangrove forests backed by lowland melaleuca wetlands. Management of the corridor is shared by MOE and the MAFF Department of Fisheries, with an influential monitoring and enforcement role by the Navy.

12. Aural-Kirirom corridor. The need to maintain ecosystem connectivity between the Cardamom Mountains and the Elephant Range has long been recognized. In the past, populations of elephants, tigers, and other large mammals moved freely between the two wet coastal upland systems. Now, Bokor National Park and Kirirom National Park are relatively isolated with little effective land-use planning and management or sustainable natural resource use across the interconnecting landscapes. The Phnom Aural Wildlife Sanctuary is connected to the Central Cardamom Protected Forest to the west and contains some of the best evergreen forests in Cambodia and significant large mammal populations, but is under rapid destruction to the east and south from illegal logging, land speculation, and charcoal production. Controlled and systematic management in the sanctuary and the surrounding development landscape is needed. This project will address conservation and sustainable use in the corridor linking the three MOE-managed protected areas. The corridor falls within the former Samling and Sre Ambel forest concessions, as far as the Koh Kong border. It includes the Sre Ambel River, which is home to Cambodia’s only population of the critically endangered royal turtle (*Batagur baska*).

Table 1. Land Cover Overview (hectare)

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Area</th>
<th>Natural Forest</th>
<th>Young Forest</th>
<th>Bamboo Forest</th>
<th>Melaleuca/Mangrove</th>
<th>Plantation</th>
<th>Grassland</th>
<th>Agriculture</th>
<th>Water Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aural-Kirirom Corridor</td>
<td>91,171</td>
<td>73,677</td>
<td>6,936</td>
<td>6,779</td>
<td>0</td>
<td>?</td>
<td>728</td>
<td>3,073</td>
<td>?</td>
</tr>
<tr>
<td>Areng Catchment Corridor - strict</td>
<td>140,182</td>
<td>122,354</td>
<td>2,638</td>
<td>633</td>
<td>1,260</td>
<td>?</td>
<td>10,705</td>
<td>2,525</td>
<td>?</td>
</tr>
<tr>
<td>protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aural Catchment Corridor - sustainable</td>
<td>17,481</td>
<td>4,574</td>
<td>3,053</td>
<td>0</td>
<td>768</td>
<td>?</td>
<td>1,615</td>
<td>7,479</td>
<td>?</td>
</tr>
<tr>
<td>land use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Corridor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>To be defined at project start</td>
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<td></td>
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<td>Total</td>
<td>248,834</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annex 3-1

D. Biodiversity Values

13. The Cardamom and Elephant Mountain landscape is rich in habitat types and species diversity. The most species-rich ecosystems in Cambodia are the lowland wet evergreen forests. Montane forests are less diverse but support more endemic species.

14. Within the Cardamom Mountain system, there are also distinct biogeographical landscapes containing important protected area complexes. The Central Cardamom Protected Forests connects the Phnom Samkos Wildlife Sanctuary (333,800 hectares) and Phnom Aural Wildlife Sanctuary (253,800 hectares), forming one of Asia’s largest protected area complexes. The Coastal and Southern Cardamoms and the Botum-Sakor Peninsula comprise another important biogeographical landscape. Most of the area is covered with either tall evergreen forest on sandy-clay soils, or short evergreen forest on white sand soils. The former has the highest tree diversity of any forest type in Cambodia. There are also sizeable areas of freshwater and estuarine swamps, melaleuca woodland, and both natural and fire-regulated grassland.

15. The Cardamom Mountains (sensu stricto) cover only about 6% of Cambodia’s land area, but support almost all of the nation’s known species of mammals and amphibians, and well over half of the known resident birds and reptiles. The Cardamoms host over half of Cambodia’s known 2,300 species of plants. About 230 of these species are endemic to Cambodia. More than 100 are from the Cardamom forests. The Cardamom Mountains and adjoining corridors contain significant populations of at least 59 globally threatened species (Table 2), and are crucial to the conservation of these species at an international level. The elephant population appears to remain highest in the regions and is thought to be one of the largest in Indochina, and the forests have been recognized as a Level I tiger conservation unit. Other important species in the region include the Asiatic wild dog, gaur, pileated gibbon, Eld’s deer, Siamese crocodile, elongated tortoise, spiny mountain frog, chestnut-headed partridge, Cambodian laughing thrush, silver oriole, great hornbill, lesser adjutant stork, Asian arowana, green peafowl, eaglewood and Siamese cycad.

Table 2. Globally threatened species of the Cardamom Mountains Complex

<table>
<thead>
<tr>
<th># total species known in Greater Cardamoms</th>
<th># species evaluated by IUCN</th>
<th>CR</th>
<th>EN</th>
<th>VU</th>
<th>LR/nt</th>
<th>DD</th>
<th>Total</th>
<th>% of total species</th>
<th>% of evaluated species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammals</td>
<td>97</td>
<td>0</td>
<td>4</td>
<td>14</td>
<td>5</td>
<td>3</td>
<td>26</td>
<td>26.80</td>
<td>28.89</td>
</tr>
<tr>
<td>Birds</td>
<td>322</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>11</td>
<td>0</td>
<td>18</td>
<td>5.59</td>
<td>5.59</td>
</tr>
<tr>
<td>Reptiles</td>
<td>88</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>13.64</td>
<td>92.31</td>
</tr>
<tr>
<td>Amphibians</td>
<td>44</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>11.36</td>
<td>92.00</td>
</tr>
<tr>
<td>Angiosperms</td>
<td>?</td>
<td>8</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>?</td>
<td>0</td>
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<tr>
<td>Total</td>
<td></td>
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<td>21</td>
<td>28</td>
<td>20</td>
<td>6</td>
<td>85</td>
<td>-</td>
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</tr>
</tbody>
</table>

Note: Does not include marine species, fish, or lower taxonomic groups.

16. The Cardamom Mountains with its 1,870,300 hectares of dense forest cover, intricate network of rivers, coastal wetlands, and mangrove forests is also the key watershed for the western section of Cambodia, providing water supply, climate regulation, and abundant fisheries for hundreds of thousands of people. The Coastal Cardamoms are the only source of water to the Bay of Koh Kong (inside the Gulf of Thailand) and Bay of Dong Peng (outside the Gulf).
1. Protected areas and protected forests

17. Koh Kong Province includes 10 protected areas in whole or in part.

18. **Phnom Samkos and Phnom Aural Wildlife Sanctuaries.** The Phnom Samkos Wildlife Sanctuary (333,800 hectares) and Phnom Aural Wildlife Sanctuary (PAWS; 253,800 hectares) have similar ecosystem profiles, consisting of lowland dry dipterocarp forest, lowland dry evergreen forest, gallery forest (along rivers), bamboo forest, lower and upper hill evergreen forest, extensive pine forest, and some marshes and grassland. They contain the highest forests in Cambodia and support many unique plant and animal communities. The hot springs of PAWS are very rare, perhaps unique in Cambodia.

19. **Botum-Sakor National Park.** The Botum-Sakor National Park (176,900 hectares) was established in 1993, but little is known about its fauna or flora, apart from general information gleaned from satellite images. Images in 1988/89 indicated that 87% of the area was in a natural or semi-natural state, with a large expanse of dense evergreen forest and significant areas of mangroves, dunes, and aquatic plant formations.

20. **Kirirom National Park.** Kirirom National Park (282,000 hectares) was established in 1993. The park is largely covered by semi-evergreen forest, with drier deciduous forest at lower elevations and an extensive area of pine forest on a central plateau at 700 m. The park now contains many old logging tracks and a paved road leading to the park headquarters. It contains the reservoir for the Kirirom First Hydropower Rehabilitation Project completed in 2002.

21. **Bokor National Park.** Bokor National Park (140,000 hectares) is dominated by evergreen forests in the south and southwest and semi-evergreen green forests in the northeast. The forests are relatively intact apart from northern areas of the park, which were heavily logged. The Kamchay hydropower scheme located in the southeast of the park is planned to meet the energy demands for Kampot, Sihanoukville, and the Phnom Penh economic corridor, and is expected to be operational in 2008.

22. **Peam Krasop Wildlife Sanctuary.** Peam Krasop Wildlife Sanctuary is 26,000 hectares of coastal wetland, including mangrove and melaleuca forests.

23. **Central Cardamoms Protected Forest.** The Central Cardamom Protected Forests connects the Phnom Samkos and Phnom Aural wildlife sanctuaries, forming one of Southeast Asia’s largest protected area complexes. This landscape contains large areas of three of the most threatened ecosystems in the region: lowland evergreen forest, riparian forests, and wetlands. Despite extensive logging, most of the forest still retains complete canopy closure, reducing fire risk and promoting natural regeneration.

24. **Southern Cardamoms Protected Forest.** The Southern Cardamoms Protected Forest covers 144,275 hectares. Vegetation types are a combination of dry evergreen forest, melaleuca woodland, and grassland. It connects the Botum-Sakor National Park to the Talam village community and Dong Peng Multiple Use Area. This area was delineated as a protected forest by MAFF in August 2004.

25. In addition, there are the Dong Peng Multiple Use Area managed by MOE, and Kiri Sakor District Marine Protected Area managed by the Department of Fisheries.
E. Threats

26. Forest clearing and subsequent land encroachment is likely to increase with the improvement of National Road 48 linking Thailand to Phnom Penh and Viet Nam. Land along the road will have better access and greater real estate value.

27. Illegal logging remains a serious problem in some areas involving increasing settlement and land speculation, despite the cancellation of all commercial logging concessions. The moratorium, coupled with road construction within the protected area, has led to an intensification of illegal logging in Phnom Aural Wildlife Sanctuary. Fragmentation of the connecting corridor between Bokor and Kirirom National Parks was due to illegal logging outside and inside the parks during the late 1990s, and has been further exacerbated by road construction.

28. Burning of dry dipterocarp forest is often associated with bush meat hunting and cattle grazing and to give access to resin trees. Repeated burning is a widespread problem leading to permanent ecosystem degradation.

29. Tiger and elephant killings are conducted by armed groups of organized hunters that sell their wildlife products through cross border trade. Other species targeted for trade include pangolins, bears, crocodiles, tortoises, and turtles. Villagers practicing subsistence poaching on an unsustainable level is also a concern.

30. The southern slopes of the Cardamoms are vulnerable to commercial hunting. There are numerous points of entry from the coastal areas and the forest is more accessible to hunters than in the Central Cardamoms, where steep slopes discourage intensive hunting.

31. The proper planning, zoning, and environmental assessment of transport and energy infrastructure development pose the greatest challenges to the national and provincial government in the southwest region.

F. Demographic Profile

32. Cambodia has a population of some 13 million people of predominantly Mon-Khmer ethnolinguistic origin. Koh Kong province, which encompasses the Southern Cardamoms area and part of the Central Cardamoms, consists of 8 districts divided into 31 communes and 131 villages. The provincial population is 126,595 with a population density of 10.5 persons per square kilometer (km²).

33. The population is not distributed evenly due to varying accessibility, historical settlement patterns, and resource availability. Thmar Bang District of Koh Kong has the lowest population density at 1.35 persons/km² (in contrast, Kampong Bay District of Kampot Province has a population density of 637 persons/km²). The population in some areas, such as the Phnom Aural Wildlife Sanctuary, has more than doubled in the past few years as a result of immigration from lowland areas in eastern Cambodia and the creation of a military base inside the sanctuary. However, some settlements in this region have been abandoned since the Pol Pot period.

34. Relative to the national average, Koh Kong Province has medium poverty incidence with pockets of high poverty, including communities living within protected areas and protected forests. Thmar Bang District, which falls within the Route 48 corridor, has the highest levels of
poverty in the province. The Cardamom Mountains is home to about 5,000 culturally diverse indigenous people, many of whom have forest-based livelihoods. The Khmer Daeum (original Khmer) are physically distinct and some of the older people speak different languages and dialects. These groups are called the Sa’och, Samre, or Por. Their cultural identity is fading rapidly, as many indigenous communities have become displaced or diluted by lowland Khmer migrations.

35. Agriculture is the mainstay of the Koh Kong economy with the vast majority of families relying on subsistence, rainfed rice cultivation. Fisheries, logging, and hunting are the other main sources of livelihood. Many communities in the region are heavily dependent on nontimber forest products for their subsistence throughout the year. Fishing communities are located in the mangrove forests at the southeast tip of Botum-Sakor and along the western coast of the Peam Krasop Wildlife Sanctuary. Livelihood assessments have highlighted the prevailing food insecurity in the region, which is only mitigated by the extensive availability of forest products.

G. Ongoing Projects

36. There are several important project activities underway in the Cardamom Mountains, initiated by the Government of Cambodia with support of donors and nongovernment organizations (NGOs). MOE; MAFF; Ministry of Land Management, Urban Planning and Construction; and Seila are the national agencies involved in conservation and development activities throughout the Cardamoms. CI, FFI, WildAid, and Cat Action Treasury are the main international conservation NGOs in this region. In much of the region, approaches adopted by the NGOs include consultations and cooperation with the relevant provincial governments. Project activities are listed below.

1. National and regional projects

37. **ADB Project R1: Bangkok-Phnom Penh-Ho Chi Minh City-Vung Tau Road Project.** The project will improve the international road connection linking Bangkok, Phnom Penh, Ho Chi Minh City, and Vung Tau. Proposed improvement options range from a simple overlay, to widening and reconstruction, to the construction of new road segments. Inevitably, this will lead to increased development and pressure on the region’s forests.

38. **National Protected Area Review.** Part of the Biodiversity and Protected Area Management Project funded by World Bank and the Government of Cambodia since 2000, the national protected area review component is being implemented through 2005.

39. **NREM Mainstreaming Strategy.** In 2002, the Seila Task Force completed the formulation of a natural resource and environmental management (NREM) mainstreaming strategy in collaboration with nine concerned ministries, with technical support financed by the Danish International Development Assistance (DANIDA). The strategy is focused on promoting and developing NREM and the sustainable use of natural resources to improve rural livelihoods at the subnational level through the structures, systems, and principles associated with the deconcentration and decentralization reforms. In 2004, commune-based NREM and land management were established in three new provinces—Koh Kong, Sihanoukville, and Kep—and coverage was expanded in the three pilot provinces of Kratie, Pursat, and Siem Reap.

40. **CITES MIKE Programme.** In 2004, the Forest Administration’s Wildlife Protection Office was identified as the lead Cambodian Government agency for implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) monitoring of
illegal killing of elephants (MIKE) program in Cambodia. One of the two national MIKE sites covers the Cardamom Mountains complex, with the main emphasis on the Southern Cardamoms Protected Forest and the proposed Areng Catchment Corridor.

41. **Cambodian Crocodile Conservation Programme.** Implemented by FFI and the Forestry Administration, this national project has a special emphasis on the Central and Southern Cardamom Mountains, where most of the world’s critically endangered Siamese crocodiles remain. Within this area, the project includes community-based initiatives that link livelihood assistance with crocodile protection and habitat preservation.

2. **Coastal and Southern Cardamoms**

42. **South West Elephant Corridor (SWEC) Program.** Since April 2002, WildAid and the Forestry Administration have implemented the SWEC program for the protection of the Southern Cardamoms. In October 2003, WildAid launched the first pilot site of the Community Agriculture Development Project, supported by grants from the United States Agency for International Development (USAID) and DANIDA. In the first year, the pilot project provided agricultural assistance for 120 families and aims to include 400 families by 2007. The project provides agriculture inputs, training, and microcredit in addition to facilitating the delivery of social services.

43. **Batagur Project.** Implemented by the Wildlife Conservation Society and Department of Fisheries, this project aims to conserve the critically endangered royal turtles upstream from Sre Ambel.

3. **Central Cardamoms**

44. **Cardamom Mountains Wildlife Sanctuaries Project (CMWSP).** This is a four-year project (2003–2006) aimed at ensuring long-term conservation of some of mainland Southeast Asia’s most important forests and their biodiversity. The project is focused on two protected areas in the Cardamom Mountains Range in southwestern Cambodia: Phnom Samkos Wildlife Sanctuary and Phnom Aural Wildlife Sanctuary. CMWSP is a collaboration between MOE and FFI with involvement of a wide range of governmental and nongovernment agencies from the environment, land-use, and development sectors. Shared responsibility and enhanced national ownership are seen as essential components of capacity development within the project. The project is funded by the Global Environment Facility (GEF), United Nations Development Programme, European Union, and others.

45. **Cardamom Conservation Program.** Implemented by CI Cambodia in partnership with the Forestry Administration, this project was initiated with GEF funding. Project activities are ongoing and focus on the conservation of biodiversity and forests in the Central Cardamoms Protected Forest, as well as buffer zones, such as Thma Bang and Areng Valley. The CI project now has three components: (i) law enforcement; (ii) community engagement, and (iii) biological research and monitoring. Donors include GEF (completed), the United Nations Foundation, USAID, United States Fish and Wildlife Service (USFWS), Save the Tiger Fund, DANIDA, and Disney Foundation, among others. CI is committed to continuing its support to this program.

46. **Cambodia Tiger Conservation Project: Community Wildlife Ranger Program.** Donors include the USFWS, Save the Tiger Fund, and the Taiwan Council of Agriculture. Implementer is the Forestry Administration in collaboration with Cat Action Treasury.
H. Policy and Legal Framework

47. The overarching policy framework that shape the forestry and biodiversity sectors includes (i) the Royal Decree on Protected Areas (1993); (ii) the Law on Environmental Protection and Natural Resource Management (1996), which sets up the basic provision for environmental protection and preservation of natural resources, including important provisions on the requirement for environment impact assessments; (iii) the Land Law (2001) that sets out a comprehensive system of land classification and land ownership rights; (iv) the Forestry Law (2002), which outlines the general rules and regulations related to administration and management of the Permanent Forest Estate; (v) the sub-decree on the establishment and management of Protection Forests (2002); (vi) the Community Forestry Sub-decree (2004); (vii) Community Fisheries Sub-decree (in preparation); (viii) the forthcoming Protected Areas Law (approval stage); and (ix) the Sub-decree on Indigenous Land Titling (in preparation).


49. Several plans have been formulated in the biodiversity and forestry sectors that have specific implications for the proposed conservation corridors including
   • National Wetlands Action Plan (under review)

I. Proposal

1. Goal of project

50. The goal of the pilot project is to restore and maintain the ecological integrity of the Cardamom and Elephant Range landscape through improved management of core areas for biodiversity conservation and watershed protection and development of sustainable-use corridors that connect existing protected areas.

2. Objectives

51. The project has five objectives:

   (i) Poverty reduction through sustainable use of natural resources and development of livelihoods
   (ii) Clear definition of optimal land uses and harmonized land management regimes
   (iii) Restoration and maintenance of ecosystem connectivity
   (iv) Capacity building in government staff and local communities
   (v) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures

3. Indicative pilot project activities

   a. Poverty Reduction

High-priority activities
(i) Improve sustainable livelihood development through intensive agricultural inputs and appropriate technology support and demonstration
(ii) Community-based natural resource management and protected area comanagement

Supplementary activities
(iii) Community-based forest enrichment with high-value natural resources
(iv) Establishment of market links
(v) Support for the establishment of forestry communities, protected area communities, and fisheries communities
(vi) Provide community support for small-scale infrastructure (e.g., water wells, school improvement, ceremonial houses)
(vii) Establish village development and poverty reduction funds
(viii) Promote exchange and learning between community development activities in the southwestern region
(ix) Establish village/commune advocacy groups to support villagers or local communities regarding their stewardship and rights over resources

b. Land-use Planning and Management

High-priority activities
(i) Support provincial authorities in preparing a detailed land-use and zoning plan for Koh Kong Province including socioeconomic studies, future development options, and strategic environmental assessments
(ii) Support the process of village-level planning, participatory demarcation, the issue of land titles, and delineation of forest/conservation corridor areas from village areas

Supplementary activities
(iii) Review land-use planning and land allocation already undertaken
(iv) Conduct landscape-level analysis of existing and proposed developments (in particular industry, roads, dams, and other infrastructure projects), trade patterns, and production and investment
(v) As part of the land-use planning process, conduct a feasibility study into tourism development and design pilot activities for the next phase of the project
(vi) Continue with participatory land-use planning and land allocation exercise
(vii) Formulate and secure approval for policy and legal regulatory framework for corridors
(viii) Update land cover data and classification

Restoring Ecosystem Connectivity

High-priority activities
(i) Promote landscape connectivity in key fragmentation points through targeted afforestation/enrichment planting or natural regeneration
(ii) Reduce impacts at key landscape fragmentation points through strengthened enforcement
(iii) Undertake a study of forest trees and plants of economic value that have potential to contribute to local livelihoods
(iv) Monitor impact of interventions and evaluate corridor establishment
Supplementary activities
(v) Carry out or update surveys with regard to maintaining viable populations of globally threatened plant and animal species, especially large mammals
(vi) Limit the impact of large infrastructure developments in strategically identified ecologically important locations (e.g., realignment of roads to avoid protected areas)
(vii) Based on the results of monitoring and evaluation, prepare an action plan to upscale corridor implementation as appropriate

d. Capacity Building

High-priority activities
(i) Strengthen the capacity of district officials and key provincial and national-level staff involved in corridor and protected areas management and raise public awareness
(ii) Support efforts to strengthen the capacity of villagers to manage and protect forest and natural resources in the corridors and move toward effective community-based natural resource management (with comanagement of some parts of protected areas and protected forests)
(iii) Strengthen institutional capacity for corridor conservation

e. Sustainable Financing

High-priority activity
(i) Design the establishment of a Cardamom fund and funds for specific protected areas (principally through NGO contributions with proposed BCI regional contribution)

Supplementary activity
(ii) Pilot the establishment of a regional fund and funds for specific protected areas and protected forests

J. Implementation Arrangements

1. Project management and coordination

52. The proposed institutional setup for implementing the GMS BCI project in 2005–2008 is as follows (Figure 1):
Figure 1.

Central Level

National Biodiversity Steering Committee (MOE, MAFF, MOP, MRD, MEF, CMNC, MOT, CDC, MOC and 4 Provincial Governors)

National Coordination Unit (MOE)
- National Coordinator (MOE)
- National Co-coordinator (FA)
- Accountant

Working Group on GMS-BCI (Technical Depts, IUCN, Mlup Baitong, WCS, WWF, FFI, CEDAC, Royal Univ. of Agriculture)

Provincial Level

Provincial Project Implementation Unit

NGOs

Cardamom and Elephant Mountains

BCI = Biodiversity Conservation Corridors Initiative; CDC = Council for the Development of Cambodia; CEDAC = Centre d’Etude et de Developpement Agricole Cambodgien; CI = Conservation International; FA = Forest Administration; FFI = Fauna and Flora International; GMS = Greater Mekong Subregion; IUCN = World Conservation Union; MAFF = Ministry of Agriculture, Forestry and Fisheries; MEF = Ministry of Economy and Finance; MOC = Ministry of Commerce; MOE = Ministry of Environment; MOP = Ministry of Planning; MOT = Ministry of Tourism; MRD = Ministry of Rural Development; NGO = nongovernment organization; WCS = Wildlife Conservation Society; WWF = World Wide Fund for Nature.

53. The national biodiversity steering committee will also be the steering committee for the pilot project. It is chaired by the Senior Minister for Environment and Vice-Chair is the Secretary of State for Agriculture, Forestry, and Fisheries, with the following functions:

(i) Meet at least once a year
(ii) Approve work plans and budgets
(iii) Review project progress and provide guidance
(iv) Secure collaboration of relevant ministries
(v) Review proposals for additional project sites and seek government approval

54. The national coordination unit will be headed jointly by national coordinators from MOE and FA, with the following functions:
(i) Establish the central coordination unit in MOE
(ii) Assist the provincial level to establish project implementation units in the pilot site
(iii) Draw up annual work plans and budgets and seek approval from national steering committee
(iv) Maintain project accounts (in US$ and Riel) and produce financial reports
(v) Provide funds according to approved budget to provincial project implementation units (PIUs)
(vi) Recruit staff and contract national consultants and subcontract institutions for database management
(vii) In collaboration with provincial PIUs, acquire and update the digital database of the project area
(viii) Monitor and review progress on a half-yearly basis
(ix) Hold annual review workshop with all stakeholders
(x) Submit progress and financial reports to the national steering committee on a half-yearly basis
(xi) Organize field visits as and when required
(xii) Conduct study tours and organize training; document evaluations and lessons learned
(xiii) Raise awareness about the project and need for conservation in institutions and among public at large
(xiv) Review existing technical guidelines and standardize for all corridor work areas

55. The national working group on biodiversity will consist of representatives from Department of Nature Conservation and Protection, FA, DONRAEDAM, DOPLA, IUCN, Mlup Baitong, WCS, WWF, WildAid, CI, FFI, and Royal University of Agriculture. The chair will rotate between government and nongovernment agencies every six months. The working group has the following functions:

(i) Meet half yearly or as and when required
(ii) Review existing technical guidelines and standards and propose improvements
(iii) Provide advisory support to the national coordination unit
(iv) Screen or organize technical screening of project proposals
(v) Discuss and recommend complementary activities in support of the project
(vi) Promote biodiversity conservation activities at national level and feed experience into regional institutions
(vii) Document lessons learned from other projects for dissemination

56. The project implementation unit (PIU) at provincial level will be headed by provincial departments of environment and forest administration. The PIU functions are as follows:

(i) Establish the PIU, comprising a chief, project administrative assistant, and support staff
(ii) Prepare annual work plans and budgets and submit to the national coordination unit for approval
(iii) Maintain accounts and prepare financial statements
(iv) Request consultant support from the national coordination unit
(v) Liaise with other relevant departments at the provincial level
(vi) Implement project activities in collaboration with NGOs
(vii) Inform the governor's office about project progress
(viii) Write progress reports and submit on a half-yearly basis to the national coordination unit

2. Project implementation partners

57. Building on existing efforts and investments on the ground, site-specific activities in the Cardamoms will be carried out by MOE, with technical support from existing nonstate partners, such as WildAid (Coastal and Southern Cardamoms), CI (Central Cardamoms), FFI (Phnom Samkos and Phnom Aural wildlife sanctuaries, crocodile, and elephants), and with collaboration from all three NGOs, in province-wide activities. In addition, local or national NGOs, such as Mlup Baitong and CEDAC, will be included in implementation as the need arises.

58. It is imperative that the government institutions (MOE and FA) at the provincial level, the governor's office in Koh Kong, and three international NGOs mentioned above, draw up a joint strategy for project implementation, stipulating clear responsibilities in the form of an integrated plan of operations (see section below).

59. As part of this collaborative arrangement, consultative mechanisms will be developed between the Cardamom Mountain’s Conservation Project steering committee, the national working group for south-west elephant corridor (SWEC) projects and the BCI national coordinating unit. At the provincial level, consultative arrangements will be developed between the provincial steering committee for SWEC and the provincial PIU.

3. Operationalizing pilot site activities

60. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a RETA, detailing the program for Phase I (2005–2008) for securing funding commitments. The RETA paper will be sent to the GMS countries for concurrence.

61. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working Group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI regional coordination committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

62. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to have the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

63. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being
undertaken (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); or (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). A provincial land-use and zoning exercise at the provincial level will be a priority activity in the work plan.

64. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

65. The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB, development partners, or government will be guided by the plan of operations.

66. The BCI national coordinator’s office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

67. The regional PCU will circulate the draft plan of operations from the BCI national coordinators to the TAP to get feedback. The TAP will scrutinize the draft plan for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

68. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

69. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six-monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
Eastern Plains Biodiversity Corridor Conservation Project
Mondulkiri province, Cambodia

Pilot Site - Project profile

GMS Biodiversity Conservation Corridors Initiative
May 2005
Eastern Plains Conservation Corridor project

Priority GMS Biodiversity Corridor: Eastern Plains

1 Project Context

Under the GMS Biodiversity Corridors Conservation Initiative (GMS – BCI) currently being implemented as ADB RETA 6213, biodiversity corridor pilot sites for the period 2005-2008 within each GMS country are to be selected based on the following criteria:

a) Falling within GMS Economic Corridors or their zone of influence
b) Reducing ecosystem fragmentation by linking two or more protected areas
c) Areas of international biodiversity importance
d) Areas of high poverty incidence and population growth
e) Being of a transboundary nature
f) Having institutional (state and non-state) capacity on the ground that is currently active in implementing one or more projects.

2 Selection and location of pilot sites

The proposed pilot project aims to develop a sustainable use corridor linking seven protected areas in the Eastern Plains Dry Forest landscape (Map 1), Five of these are in Cambodia: Lomphat Wildlife Sanctuary (Lomphat WS); Mondulkiri Protected Forest; Phnom Prich WS; Phnom Nam Lyr WS; and Snoul WS, and two in Vietnam: Yok Don National Park (NP); and Bu Gia Map NP. An eighth site, the Seima area (see Map 2) forms a key corridor between four of the other sites and is currently under production forest status. The pilot site fulfils the selection criteria mentioned above:

a) It falls within the zone of influence of one east-west GMS Economic Corridor
b) It would maintain habitat links between core conservation zones of many protected areas and can also be zoned to take account of a wide variety of productive uses (see Maps 1 and 2)
c) The combined landscape has outstanding global biodiversity value (e.g. for forest and wetland types, threatened mammals and birds, and endemic plants and vertebrates)
d) It is located in a high poverty area with a very high proportion of disadvantaged ethnic minority groups vulnerable to the effects of unplanned development
e) The conservation network within Mondulkiri would form connections to two National Parks in Vietnam as well as several Vietnamese State Forest Enterprises proposed for protected status
f) Strong on-the-ground capacity exists within the province to implement a project of this nature, most notably through the long-established programs of two major conservation NGOs that maintain excellent relationships between themselves and with the district, provincial and national authorities

The protected areas and other landscape units in the pilot site have a total area of over 1.3 million ha, excluding the adjoining sites in Vietnam. Sizes, management responsibility and progress with development of core areas are shown in Table 1.
Eastern Plains biodiversity corridor conservation project profile

Map 1: North Eastern Cambodia showing conservation areas that could be linked by conservation and sustainable use corridors

Table 1 Key landscape units in the pilot area in Cambodia

<table>
<thead>
<tr>
<th>Landscape Unit (N to S)</th>
<th>Ministry/NGO</th>
<th>Size (ha)</th>
<th>Core areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lomphat WS</td>
<td>MoE</td>
<td>250,000</td>
<td>Not yet zoned</td>
</tr>
<tr>
<td>Mondulkiri Protected Forest</td>
<td>MAFF/WWF</td>
<td>430,000</td>
<td>Drafted</td>
</tr>
<tr>
<td>Phnom Prich WS</td>
<td>MoE/WWF</td>
<td>222,000</td>
<td>Drafted</td>
</tr>
<tr>
<td>Phnom Nam Lyr WS</td>
<td>MoE</td>
<td>47,000</td>
<td>Not yet zoned</td>
</tr>
<tr>
<td>Seima area</td>
<td>MAFF/WCS</td>
<td>305,000</td>
<td>Under discussion</td>
</tr>
<tr>
<td>Snoul WS</td>
<td>MoE</td>
<td>75,000</td>
<td>Not yet zoned</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,329,000</td>
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</tbody>
</table>

WS = Wildlife Sanctuary, MAFF = Ministry of Agriculture, Forestry and Fisheries, MoE = Ministry of Environment

The landscape units of the pilot site fall largely in Mondulkiri Province, with limited parts in Kratie and Ratanakiri Provinces (Table 2). The key sites, and the proposed corridors, fall entirely within Mondulkiri Province, thus making the administration of the project and of corridor planning much simpler.

Table 2 Administrative locations of the key landscape units

<table>
<thead>
<tr>
<th>District</th>
<th>Mondulkiri Province</th>
<th>Kratie Province</th>
<th>Ratanakiri Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lomphat WS</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Mondulkiri Prot. Forest</td>
<td>+ + + +</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Phnom Prich WS</td>
<td>+ + + +</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Seima Biodiversity Conservation Area</td>
<td>+ + + +</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Phnom Nam Lyr WS</td>
<td>+ +</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Snoul WS</td>
<td>+ +</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

### 3 Description of Proposed Sites

Several conservation designations exist in this landscape. Most importantly, three core conservation zones (areas 2, 3 and 4 on Map 2) have been proposed in two of the protected areas, based on scientific criteria. These form the focus of current conservation activities, together with some of the blocks of habitat linking them. The three other Wildlife Sanctuaries in the pilot site have yet to be zoned in this way (areas 1, 5 and 6 on Map 2). The key threat to connectivity between sites is rapid unplanned development along transport corridors as the road network is progressively upgraded, and so most proposed corridors (green on Map 2, see Table 3) are focused on these critical sites.

The vision for the future of the pilot site is a fully integrated network of core areas for conservation, recognised by all stakeholders, linked by protected corridors and bordered by sustainable-use zones for NTFP harvesting, village agriculture and more intensive activities such as sustainable commercial forestry or plantations. Due to the distribution of existing settlements and uses, some of these corridors and use zones will have to be established within the current boundaries of protected units whilst others will bridge gaps between them (see Table 3). These needs for rationalisation and harmonisation are typical of other conservation landscapes across Cambodia; the pilot site is therefore valuable for identifying potential replicability.

In the south of the landscape one part of the proposed corridor network (the Seima area) is production forest managed by MAFF/WCS under a temporary order to take account of its biodiversity value. This area offers particular flexibility in designing innovative corridor, production zone and core area arrangements.

**Map 2: Eastern Plains Biodiversity Conservation Corridor Pilot Site**
The six landscape connection corridors (see Map 2) that form the proposed pilot site locations are described in Table 3.

<table>
<thead>
<tr>
<th>Number (Map 2)</th>
<th>Connecting corridors</th>
<th>Description</th>
<th>Corridor Area (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mondulkiri Protected Forest to Lomphat WS</td>
<td>Lies mostly within the outer zone of Mondulkiri Protected Forest and crosses a key transport corridor</td>
<td>42,000 ha</td>
</tr>
<tr>
<td>2</td>
<td>Phnom Prich WS to Lomphat WS</td>
<td>Includes large areas in Mondulkiri province between the two protected areas; not yet designated for any form of sustainable use with the exception of draft zonation within Phnom Prich WS</td>
<td>141,000 ha</td>
</tr>
<tr>
<td>3</td>
<td>Mondulkiri Protected Forest to Phnom Prich</td>
<td>Lies mostly within the outer zone of Mondulkiri Protected Forest; contains several villages, crosses a major transport corridor and forms a key migration route for elephants and other large mammals</td>
<td>24,000 ha</td>
</tr>
<tr>
<td>4</td>
<td>Mondulkiri Protected Forest to Yok Don NP and Phnom Nam Lyr WS</td>
<td>Lies mostly in the outer zones of Mondulkiri Protected Forest and forms a crucial trans-boundary link</td>
<td>33,000 ha</td>
</tr>
<tr>
<td>5</td>
<td>Within Phnom Prich WS</td>
<td>Lies within Phnom Prich WS, joining two proposed core areas across an important transport corridor</td>
<td>30,000 ha</td>
</tr>
<tr>
<td>6</td>
<td>Southern Corridor</td>
<td>Falls mostly in production forests currently managed as Seima Biodiversity Conservation Area, plus some unclassified forest lands and numerous villages; contains core sites that merit protected area status and other forests that can form corridors to Phnom Prich WS, Snoul WS, Phnom Nam Lyr WS and sites in Vietnam; also crosses three key transport corridors.</td>
<td>294,000 ha</td>
</tr>
</tbody>
</table>

In addition, there are two important transboundary areas that may need attention. These are:

<table>
<thead>
<tr>
<th>Potential Transboundary sites</th>
<th>Area (ha)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bu Gia Map National Park, Vietnam</td>
<td>23,000</td>
<td>Several large neighbouring State Forest Enterprises are also proposed for conservation status</td>
</tr>
<tr>
<td>Yok Don National Park, Vietnam</td>
<td>115,000</td>
<td>One of Vietnam's largest protected areas, contiguous with State Forest Enterprises</td>
</tr>
</tbody>
</table>

Map 3 illustrates the legally designated protected area boundaries in the current conservation landscape in the Eastern Plains. Extensive work has been carried out in Phnom Prich WS and Mondulkiri PF to produce draft zonation plans, including sustainable use zones that are within the existing protected area boundaries and would fall within the proposed new corridors.
4 Biodiversity Values

The landscape units in the pilot area cover a wide range of habitats from lowland deciduous dipterocarp forest at 100 m altitude through mixed deciduous and semi-evergreen lowland forests to montane evergreen forests above 1000 m. Wetlands include headwater streams, a major river (the Srepok) and many lakes and pools. The distribution of habitats between sites is shown in Table 5.

Table 5: Habitats present at the pilot site

<table>
<thead>
<tr>
<th>Site</th>
<th>DDF</th>
<th>MDF</th>
<th>SEF</th>
<th>MEF</th>
<th>Most notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Lomphat WS and corridor to Phnom Prich WS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Extensive DDF, sections of the Srepok River, many pools.</td>
</tr>
<tr>
<td>b Mondulkiri Protected Forest</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Extensive DDF, sections of the Srepok River, many pools.</td>
</tr>
<tr>
<td>c Phnom Prich WS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Extensive DDF, many pools</td>
</tr>
<tr>
<td>d Phnom Nam Lyr WS</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Mountain forests and volcanic rock exposures, scenery.</td>
</tr>
<tr>
<td>e Seima Biodiversity Conservation Area</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Extensive lowland and hilly SEF and deciduous forests; many pools, scenery.</td>
</tr>
<tr>
<td>f Snoul WS</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>Extensive flat lowland SEF, many pools.</td>
</tr>
<tr>
<td>g Yok Don NP</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Largest DDF landscape in Vietnam, many pools</td>
</tr>
<tr>
<td>h Bu Gia Map NP</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>Hilly SEF, scenery.</td>
</tr>
</tbody>
</table>

1 DDF = Deciduous Dipterocarp Forest; MDF = Mixed Deciduous Forest; SEF = Semi-evergreen Forest; MEF = Montane Evergreen Forest
The large mammal fauna of the landscape is exceptional, forming the last major stronghold in Indochina for several species, including both deciduous and evergreen forest specialists. A recent review found that it is the most important area of the country for highly threatened mammal species1. Six of the species present are considered Endangered (see Table 6) and for these the populations of Wild Water Buffalo, Banteng and Black-shanked Douc Langur are particularly notable on a regional and global scale. At least twelve other Globally Threatened mammal species listed as Vulnerable are present (including Eld’s Deer, Gaur, four cats and four primates), together with several Data Deficient species. Several sites, notably Snoul and Phnom Nam Lyr, have received very little survey coverage for mammals or birds and are probably richer than the tables suggest.

Table 6: Mammals of exceptional conservation concern present at the pilot site

<table>
<thead>
<tr>
<th>Species</th>
<th>IUCN</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiger</td>
<td>EN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Dhole</td>
<td>EN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Black-shanked Douc Langur</td>
<td>EN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Asian Elephant</td>
<td>EN</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Banteng</td>
<td>EN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Wild Water Buffalo</td>
<td>EN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

EN = Endangered; Site codes follow Table 5

The pilot site supports an exceptional assemblage of threatened bird species, especially those associated with rivers and pools in lowland forest. The evergreen forests near the border support several highly localised endemic species typical of the Southern Annamite Mountains. The montane habitats have been poorly studied and potentially contain additional key species. Table 6 lists Critically Endangered and Endangered birds found in each landscape unit. Many other Globally Threatened species listed as Vulnerable also occur, notably including Green Peafowl, Germain’s Peacock-Pheasant, Lesser Adjutant, Sarus Crane and Masked Finfoot.

Table 7: Birds of exceptional conservation concern present at the pilot site

<table>
<thead>
<tr>
<th>Species</th>
<th>IUCN</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giant Ibis</td>
<td>CR</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>White-shouldered Ibis</td>
<td>CR</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-rumped Vulture</td>
<td>CR</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slender-billed Vulture</td>
<td>CR</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Adjutant</td>
<td>EN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-winged Duck</td>
<td>EN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange-necked Partridge</td>
<td>EN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

CR = Critically Endangered; EN = Endangered; Site codes follow Table 5

The pilot site is also notable for the presence of remnant populations of the Critically Endangered Siamese Crocodile and several populations of the Elongated Tortoise (Endangered).

5 Threats

The main direct threats to biodiversity and to local livelihoods are illegal hunting for subsistence and wildlife trade, forest clearance for agriculture, logging and unsustainable non-timber forest products (NTFP) extraction. One of the key drivers for these problems is a lack of land and resource tenure or effective planning that has resulted in an uncontrolled influx of non-locals seeking to cut, clear and claim land, most notably along the roads running

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west and north from the provincial capital. There are also issues with governance, capacity of government staff and environmental awareness.

An ever-present threat at all sites is the issuance of large economic concessions for plantations or mining; these can have dramatic negative impacts yet rarely take account of biodiversity at the planning stages.

A major underlying threat in all these cases is the progressive upgrading of the road network, notably the roads from Snoul to Sen Monorom, Sen Monorom to Ban Lung, Sen Monorom to Dak Dam and Keo Seima to the Vietnamese border. These are all feeder roads for the major East-West development corridor through Ban Lung and will transmit the negative impacts on biodiversity of that development throughout the pilot site.

6 Demography, poverty and economic profiles

Mondulkiri is one of the most remote and little developed provinces in Cambodia. With less than 50,000 people, and only a single major road connecting it with the rest of the country, the provincial economy relies almost entirely on forestry, agriculture and the use of forest products, including wildlife.

Mondulkiri is one of the least densely populated provinces in the country. The population density is 2 people/km², and total population was 32,037² people (49 % female) in 1998, and 43,067 in 2003³, representing 0.33% of the total national population. Most of the inhabitants belong to the Phnong indigenous ethnic minority. A high proportion of the population lives in rural areas and the majority of household economic revenue comes from the agriculture sector. The literacy rate is less than 15%, lower in rural areas⁴. In Phnong families fluency in spoken Khmer, the national language is often limited. Over 97% of households used firewood as the main source of cooking fuel in 1998.

7 Ongoing projects

Several government and non-governmental agencies are active in the pilot area. Recently, the Provincial governor and his senior deputies have expressed the wish to enact provincial-level laws ('deikas') to support conservation.

The most significant conservation activities in the Cambodian part of the pilot site are focused on site-based management at three sites (see below). At all of these, partnership approaches are taken between the NGOs involved and provincial and national government. Both the key Ministries (MoE and MAFF) are primary partners at different sites. Other environmental and development NGOs are active in parts of the pilot area and partnerships with them would be maintained and enhanced during the pilot project.

Snoul WS and Phnom Nam Lyr WS

MoE/DNCP has built basic infrastructure including ranger stations and headquarters in Snoul WS. The Ministry supports 35 rangers in patrolling and enforcement (26 in Snoul and 9 in Phnom Nam Lyr). In addition, it has demarcated the boundary of the Snoul WS. Recently, MoE has built a ranger station and recruited ground staff and rangers for Phnom Nam Lyr WS to enforce the law. Boundary demarcating in Phnom Nam Lyr is ongoing. Funding comes from the government.

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² 1998 National Population Census
³ SEILA, 2003
⁴ International Cooperation Cambodia (ICC), 2003
Mondulkiri Protected Forest
Since early 2004, support has been provided by WWF for construction of basic protected area infrastructure, including headquarters and ranger accommodation, and three other ranger posts, wildlife monitoring, patrolling, and general PA management capacity building. A management plan is under development in conjunction with local participation in zoning. WWF has a permanent field presence, and is planning to scale-up activities in mid-2005 to include development of a pilot ecotourism project, as well as expansion of enforcement capabilities. Funding comes from WWF Netherlands.

Phnom Prich WS
Since 2002, WWF has supported a team of rangers in conducting wildlife monitoring and patrolling for law enforcement. Basic protected area infrastructure has been constructed and ongoing PA management training undertaken, including development of a management plan and support to a permanent team of MoE rangers in the field. The WWF MOSAIC (Management of Strategic Areas for Integrated Conservation) team has been conducting community surveys and PLUP (Participatory Land Use Planning) training activities in and around PPWS. Funding comes from WWF-US, USFWS, USAID, and private foundations.

Seima area
This area has been the site of a collaborative program between WCS and MAFF (through the Forestry Administration, FA) since 2000. The four principal activities are strategic planning, law enforcement, PLUP and wildlife survey/monitoring. Field research and consultation with stakeholders to develop a long-term vision for the management of the area as a multiple-use landscape and to delineate land-use zones that enable this to be done sustainably. Technical and logistical support are provided to law enforcement teams in order to reduce illegal hunting, logging and land grabbing, with benefits both to biodiversity and local livelihood security. PLUP is undertaken with indigenous ethnic minority groups to increase their livelihood security and minimize their impacts on local resources. It should enable most villages to obtain permanent legal communal title to their lands. Wildlife survey and monitoring is used to identify critical sites and to track changes in populations and threats. This work is funded by a wide variety of donors including USFWS, the MacArthur Foundation, EAPEI, DFI, Danida, GTZ, SIDA and private foundations.

8 Legal and Policy Frameworks
The overarching policy frameworks that shape the forestry and biodiversity sectors include: Royal Decree on Protected Areas (1993); the Law on Environmental Protection and Natural Resource Management (1996), that sets up the basic provision for environmental protection and preservation of natural resources within Cambodia, including important provisions on the requirement for EIAs; ; the Land Law (2001), that sets out a very comprehensive system of land classification and land ownership rights in Cambodia; the Forestry Law (2002), which outlines the general rules and regulations related to administration and management of the Permanent Forest Estate within Cambodia; the Sub-decree on the establishment and management of Protection Forests (2002); the Community Forestry Sub-decree (2004); Community Fisheries Sub-decree (in preparation); the forthcoming Protected Areas Law (in preparation); and the Sub-decree on Indigenous Land Titling (in preparation).

In addition there are cross-cutting, macro-level national strategies and frameworks including: the National Poverty Reduction Strategy (NPRS) 2003-2005; and the Rectangular Strategy for National Development (2004).
8.1 Sector plans and programmes

A number of recent programmes and plans have been formulated in the biodiversity and forestry sectors that have specific implications for the proposed conservation corridors including:
- The National Wetlands Action Plan (under review)

9 Proposal

9.1 Goal of project

The goal of the pilot project is to restore and maintain the ecological integrity of the Eastern Plains landscape through improved management of core areas for biodiversity conservation and watershed protection and development of sustainable use corridors that connect existing protected areas.

9.2 Objectives

The project has five objectives:

1. Poverty alleviation through sustainable use of natural resources and development of livelihoods
2. Clear definition of optimal land uses and harmonised land management regimes
3. Restoration and maintenance of ecosystem connectivity
4. Capacity building in government staff and local communities
5. Sustainable financing mechanism and structures integrated with government planning and budgeting procedures.

9.3 Indicative activities

1. Poverty Reduction

1.1 Improve sustainable livelihood development through intensive agricultural inputs and appropriate technology support and demonstration (e.g. ecotourism, organic agriculture, and NTFP processing)
1.2 Community-based natural resource management and protected area co-management
1.3 Community-based forest enrichment with high value natural resources
1.4 Establishment of market links
1.5 Support the establishment of forestry communities, protected area communities and fisheries communities.
1.6 Promote exchange and learning between community development activities within the south west region.
1.7 Establish a village/commune advocate groups to support villagers or local communities regarding their stewardship and rights over resources
1.8 Conduct CBNRM activities in high priority communities, including awareness raising, zoning, and community development plans
1.9 Conduct feasibility studies and pilot activities for targeted livelihoods assistance, e.g. ecotourism, organic agriculture, and NTFP processing

2. Harmonised Land Management and Governance Regimes

2.1 Develop a Provincial Conservation Planning Unit to improve coordination of biodiversity conservation with other large-scale development activities.
2.2 Integrate this unit with existing local planning mechanisms (such as the commune-based PLG/Seila system and the Provincial Land Use and Allocation Committee).
2.3 Develop liaison mechanism with neighbouring provinces, including those in Vietnam
2.4 Identify and fill data gaps through biological and socio-economic surveys
2.5 Conduct Participatory Land Use Planning activities at critical sites
2.6 Facilitate legal tenure by assisting communities to submit Land Titling applications

3. **Maintaining Ecosystem Connectivity**
   3.1 Develop a Provincial Conservation Corridor Strategy that guides management and land-use planning within the conservation landscape:
      (i) Carry out or update biological and/or socio-economic surveys with regard to maintaining viable populations of globally threatened plant and animal species, and understanding the social fabric of the landscape
      (ii) Conduct landscape level analysis of existing and proposed major developments, (in particular industrial and infrastructure projects) including landscape-wide predictive GIS mapping of future developments and impacts
      (iii) Conduct comprehensive zoning of the conservation landscape through full participation of communities and other key government stakeholders
   3.2 Mitigate the negative impacts of industrial and large infrastructure developments in strategically identified key biodiversity areas (including mapping anticipated future impacts of development; such as population in-migration along upgraded roads, expansion of commercial plantations, and increased cross-border trade)
   3.3 Reduce impacts in and between core biodiversity areas through strengthened protected area management at the site level
   3.4 Expand existing PA management activities, e.g. wildlife and threats monitoring, ranger training, etc.

4. **Capacity Building**
   4.1 Strengthen the capacity of key provincial, district and commune officials to participate in conservation planning, consultation and the analysis of impacts from development proposals
   4.2 Strengthen the capacity of local government officials to deliver improved on-the-ground management in collaboration with local communities
   4.3 Strengthen local community capacity in managing their own resources and in understanding their legal rights.
   4.4 Conduct training workshops on biodiversity conservation, protected area management, land use planning, community-based approaches to NRM, analytical skills, strategy development
   4.5 Conduct training workshops for local government in community liaison and consultation
   4.6 Strengthen institutional capacity for corridor conservation

5. **Sustainable Financing**
   5.1 Develop sustainable financing strategy, including recommendations for potential site-specific sustainable financing mechanisms
10 Implementation arrangements

10.1 Project management and coordination

The institutional set up proposed for implementing the GMS BCI project in the period 2005 – 2008 is as follows:

A. The National Biodiversity Steering Committee will also be the Steering Committee for the Project. It is chaired by the Senior Minister for Environment and Vice-Chair is the Secretary of State for Agriculture, Forestry and Fisheries. It will:

1. Meet at least once a year
2. Approve work plans and budgets
3. Review project progress and provide guidance
4. Secure collaboration of relevant ministries
5. Review proposals for additional project sites and seek Government approval.

B. The National Coordination Unit will be headed jointly by National Coordinators from MoE and FA. This Unit will:

1. Establish the central level Coordination Unit within MoE
2. Assist the provincial level to establish Project Implementation Units in pilot site
3. Draw up annual work plans and budgets and seek approval from National Steering Committee
4. Maintain project accounts (in USD and Riel) and produce financial reports
5. Provide funds according to approved budget to provincial PIUs
6. Recruit staff and contract national consultants and sub-contract institutions for database management
7. In collaboration with Provincial PIU acquire and update digital database of project area
8. Monitor and review progress on a half-yearly basis
9. Hold annual review workshop with all stakeholders
10. Submit progress and financial reports to National Steering Committee on a half yearly basis
11. Organize field visits as and when required
12. Conduct study tours and organize training; document evaluations and lessons learned
13. Raise awareness about the project and need for conservation within institutions and with public at large
14. Review existing technical guidelines and standardize for all corridor work areas

C. The National Working Group on Biodiversity will consist of representatives from DNCP, FA, DONRAEDAM, DOPLA, IUCN, Mlup Baitong, WCS, WWF, WILDAID, CI, FFI, and Royal University of Agriculture. The chair will rotate between government and non-government agencies every six months. This Working Group will:

1. Meet half yearly or as and when required
2. Review existing technical guidelines and standards and propose improvements
3. Provide advisory support to the NCU
4. Screen or organize technical screening of project proposals
5. Discuss and recommend complementary activities in support of the project
6. Promote biodiversity conservation activities at national level and feed experience into regional institutions
7. Document lessons learned from other projects for dissemination

D. The Project Implementation Units (PIU) at provincial level will be headed by Provincial Departments of Environment and Forest Administration. The PIUs will:

1. Establish Project Implementation Unit comprising of Chief, project administrative assistant, and support staff
2. Prepare annual work plans and budgets and submit to NCU for approval
3. Maintain account and prepare financial statements
4. Request for consultant support from central NCU
5. Liaise with other relevant departments at Provincial Level
6. Implement project activities in collaboration with NGOs
7. Inform Governor’s Office about project progress
8. Write progress reports and submit on a half yearly basis to NCU

10.2 Project implementation partners

Building on existing efforts and investments on the ground, site specific activities in the Eastern Plains corridor will be carried out by MoE and MAFF/FA with technical support from existing non-state partners such as WWF and WCS. In addition, local or national non-governmental organizations (NGOs) will be brought into various stages of implementation as the need arises.

It is imperative that the government institutions (MoE and MAFF) at provincial level, the Governor’s Office in Mondulkiri, and two above mentioned international NGOs draw up a joint
strategy for project implementation stipulating clear responsibilities in the form of an integrated plan of operations (see section below) that enables targeted and smooth implementation of activities in the pilot sites.

10.3 Operationalizing pilot site activities

Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence (no objection).

On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI Regional Coordination Committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: a) work plan (activities with timeline, responsibility, and milestones); b) budget with costs related to activities; c) monitoring plan with indicators of expected achievements by end of year one and those by year three; and d) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: a) protection—where focal species are sensitive to habitat change; b) low-intensity land use—where focal species can withstand some disturbance; c) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); d) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). A priority activity in the workplan will also be the provincial land use and zoning exercise at provincial level. In Mondulkiri, this activity will be taken up in Phase I (2005 – 2008) as a preparatory step towards full implementation in Phase II. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB or development partners and government will be guided by the plan of operations.

The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the
pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
Xe Pian–Dong Hua Sao–Dong Ampham Biodiversity Conservation Corridors
Lao People’s Democratic Republic

Pilot Project Profile (2005–2008)

May 2005
A. Project Context

1. Under the Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) currently being implemented as Asian Development Bank (ADB) regional technical assistance (RETA) 6213, biodiversity corridor pilot sites for 2005–2008 in each GMS country are to be selected based on the following criteria:

   (i) Falling within GMS economic corridors or their zone of influence
   (ii) Reducing ecosystem fragmentation by linking two or more protected areas
   (iii) Areas of international biodiversity importance
   (iv) Areas of high poverty incidence and population growth
   (v) Being of a transboundary nature
   (vi) Having institutional (state and nonstate) capacity on the ground that is currently active in implementing one or more projects

2. This project profile provides background to the region and sets out the project objectives, indicative activities, and institutional arrangements.

B. Selection and Location of Pilot Sites

3. The pilot site is located in the southern Lao People’s Democratic Republic (PDR). The pilot project will develop a sustainable-use corridor linking Dong Houa Sao National Biodiversity Conservation Area (NBCA) in Champasak Province to the Xe Pian NBCA that covers both Champasak and Attapeu provinces in the Tri-Border Forests landscape (Maps 1 and 2).

Map 1. Southern Lao PDR, showing National Biodiversity Conservation Areas that could be linked by conservation and sustainable-use corridors
4. This site fulfils the selection criteria as follows:

(i) It falls within the zone of influence of two east-west GMS economic corridors
(ii) It will help reduce fragmentation
(iii) Xe Pian NBCA is an area of rich biodiversity
(iv) It is located in a medium poverty area and adjacent to a high poverty area (Attapeu Province)
(v) Xe Pian is located on the Cambodian border and can be linked to Virachay protected area
(vi) Champasak Province has capacity on the ground to implement a project of this nature

Map 2. Xe Pian – Dong Huao Sao Biodiversity Conservation Corridor Pilot Site

5. Two other conservation corridor linkages will be explored for support during phase 2 of the BCI program: (i) a corridor linking Xe Pian NBCA to Dong Ampham NBCA, which falls within Attapeu Province as well as the Dakcheung District in Sekong Province in the northern portion of the Tri-Border Forests landscape; and (ii) a corridor linking Dong Ampham and Xe Xap NBCAs in Sekong and Saravane provinces in the Central Annamites landscape (Map 3). Capacity-building activities and exchanges will commence during phase 1, involving staff working in Xe Xap and Dong Ampham NBCAs and the adjoining districts.
6. Dong Houa Sao NBCA, with an area of 110,000 ha, is located 10 km east/southeast of Pakse, the provincial capital of Champasak Province in the southern Bolovens plateau. Xe Pian NBCA covers 240,000 ha, with 43,000 ha within Attapeu Province and the rest in Champasak. Attapeu is the southeastern-most province in the Lao PDR, bordering Viet Nam to the east and Cambodia to the south. Dong Ampham NBCA is located on the eastern side of Attapeu Province along the Vietnamese border and covers 200,000 ha. Xe Xap NBCA is located in Saravane and Sekong provinces and covers 152,000 ha.

7. The provinces and districts that include the focal NBCAs in the Lao PDR are summarized in Table 1 below.
### Table 1. Provinces, districts, and NBCAs in the Lao PDR

<table>
<thead>
<tr>
<th>Province</th>
<th>Lao PDR District</th>
<th>Dong Houa Sao</th>
<th>Xe Pian</th>
<th>NBCA Coverage Dong Ampham</th>
<th>Xe Xap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Champasak</td>
<td>Bachiangchaleunsook</td>
<td>√</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Paksong</td>
<td>√</td>
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<tr>
<td></td>
<td>Phonthong</td>
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<tr>
<td></td>
<td>Pathoumphon</td>
<td>√</td>
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<tr>
<td></td>
<td>Khong</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Attapeu</td>
<td>Sanamxay</td>
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<td>√</td>
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<tr>
<td></td>
<td>Sanxay</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Pouvong</td>
<td></td>
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<tr>
<td>Sekong</td>
<td>Kaleum</td>
<td></td>
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<td>√</td>
</tr>
<tr>
<td>Saravane</td>
<td>Ta oi</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### C. Description of Proposed Sites

8. The three landscape connection corridors (see Map 3) that form the proposed pilot site locations are described in Table 2.

### Table 2. Description of proposed corridors

<table>
<thead>
<tr>
<th>Connecting Corridors (sustainable use area)</th>
<th>Description</th>
<th>Corridor Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dong Houa Sao – Xe Pian</td>
<td>Located within Pathoumphon District of Champasak Province and Sanamxay District in Attapeu, this critical landscape area lies in the northern tip of the Tri-Border forests. This corridor is intersected by Highway 18 and several smaller roads.</td>
<td>82,659 ha</td>
</tr>
<tr>
<td>Xe Pian – Dong Ampham</td>
<td>Situated in four districts in Attapeu (Sanamxay, Pouvong, Samakkhixay, and Xaysatha) in the northern border of the Tri-Border forests, this is a critical watershed for several dam projects, including Nam Kong 2, Nam Kong 3, and Xe Xou. Highway 18 intersects Xe Pian and runs through the bottom section of Dong Ampham.</td>
<td>414,000 ha</td>
</tr>
<tr>
<td>Dong Ampham – Xe Xap</td>
<td>Situated in Sanxay in Attapeu Province and Dakcheung, Kaleum and the western border of Lamarmin in Sekong Province. One dam project is situated at the border of Dong Ampham (Se Kaman 2) and other dam proposals are under evaluated. R9 is a major transboundary road that intersects the corridor and there are several minor roads connecting to Viet Nam.</td>
<td>340,000 ha</td>
</tr>
</tbody>
</table>
9. Opportunities for collaboration between the Lao PDR and Viet Nam in some important transboundary areas will be explored when planning phase 2. These are shown in Table 3.

Table 3. Potential transboundary sites

<table>
<thead>
<tr>
<th>Site Description</th>
<th>Link to Other Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bach Ma – Xe Sap – Phong Dien</td>
<td>Link to Viet Nam in the west with Xe Sap</td>
</tr>
<tr>
<td>Phu Xiang Thong (120,000 ha)</td>
<td>Link to Pha Taem in Thailand across the Mekong River in the west</td>
</tr>
<tr>
<td>Namtha in Luang Namtha Province (221,532 ha)</td>
<td>Link to Shangyong NR of Xishuangbanna in PRC Yunnan Province in the north</td>
</tr>
<tr>
<td>Xe Pian - Virachay</td>
<td>Link to Cambodia in the south with Virachay</td>
</tr>
</tbody>
</table>

D. Biodiversity Values

10. The central Truong Son landscape in the Central Annamites, identified as a priority landscape at the workshop on Ecoregion-based Conservation in the Forests of the Mekong Biological Assessment, held in Phnom Penh in March 2000, takes in parts of Attapeu, Sekong, and Saravane provinces. In particular, Xe Xap and Dong Ampham NBCAs in the Lao PDR were identified as priority 1 areas. Their conservation could support the full range of biodiversity and biological processes in the landscape in the short term (0–10 years). While extensive areas of the natural habitats within the central Truong Son landscape have been degraded or cleared, particularly at low elevations, the remaining areas still support relatively intact animal and plant communities.

11. This priority landscape supports remnant populations of a number of globally threatened large mammal species, such as Asian elephant (*Elephas maximus*), gaur (*Bos gaurus*), tiger and Asiatic black bear (*Ursus thibetanus*). The main significance of the populations of these taxa is their importance as “keystone” species, whose impact on a community or ecological system is disproportionately large for their abundance. The mammal community is representative of the Greater Truong Son area, with high regional and global priority for conservation.

12. The priority landscape also supports a number of vegetation formations of conservation concern. The majority of these are monodominant forest formations whose distributions are limited by ecological factors. Lowland forest formations of the highest conservation significance in the priority landscape include those dominated by members of the Dipterocarpaceae. A number of rare taxa have an association with Dipterocarpaceae stands, for example cycads.

13. The southern provinces of Attapeu and Champasak have a rich endowment of natural resources, including forest and wildlife, wetlands, and aquatic resources. These resources are important supplements of nutrients and income potential for the communities, in addition to their value for the production of rice. Although there is increasing pressure on lowland natural resources in Champasak and Attapeu, there is the potential to exploit the natural resource base in a sustainable way. Moreover, ecological services provide tangible benefits to development projects, e.g., maintenance of the rich Xe Pian NBCA ecosystem through effective management contributes to irrigated rice cultivation in the lowland.

14. The area of forestland and forestland classification in the two focal provinces are shown in Table 4.
Table 4. Forest area (hectare) and classification

<table>
<thead>
<tr>
<th>Land Type</th>
<th>Attapeu</th>
<th>Champasak</th>
</tr>
</thead>
<tbody>
<tr>
<td>National /provincial protected area</td>
<td>457,900</td>
<td>425,640</td>
</tr>
<tr>
<td>Production forest</td>
<td>139,400</td>
<td>112,800</td>
</tr>
<tr>
<td>Protection forest</td>
<td>17,600</td>
<td>169,300</td>
</tr>
<tr>
<td>Regeneration forest</td>
<td>19,589</td>
<td>120,000</td>
</tr>
</tbody>
</table>

15. The protected areas in the focal provinces contain a rich and varied biodiversity.

1. Xe Pian NBCA

16. Biodiversity values in Xe Pian place it among the top 3 protected areas in the Lao PDR and among the top 10 in Southeast Asia/Indochina. At least 29 different habitat types have been identified within the area in the elevation range 150–844 meters. The main forest type is an evergreen/mixed forest covering three quarters of the NBCA. There is a relatively high abundance of wetlands, including perennial and seasonal ponds, peat swamps, and perennial streams.

17. There are 62 species of mammals, including at least 13 globally and 12 regionally threatened species. The tiger, Asian elephant, and banteng are classified as acutely threatened and as national conservation priorities.

18. There are 334 species of birds in the NBCA, including 7 not found in any other protected area in the Lao PDR. Xe Pian includes significant wetland habitat important for large water birds, such as giant and black ibis, sarus crane, masked finfoot, lesser adjutant, and woolly-necked stork.

19. The NBCA has 44 species of reptiles and 21 species of amphibians. Freshwater crocodiles have been reported along the northern boundary and two species of freshwater turtles are found in the wetland areas.

20. 176 species of fish are found in the NBCA, including the barbs Probarbus jullieni and Probarbus labeamajor, both threatened, according to the World Conservation Union (IUCN).

2. Dong Houa Sao NBCA

21. Dong Hua Sao NBCA lies in the province of Champasak. The area covers about 910 square kilometers (km²) of the southern Bolovens plateau, the intervening slope and adjacent lowlands. Most of the area (70%) lies below 250 m, but the sheer escarpment and plateau rise to over 1,000 m. The highest point, Phou Tabeng, is 1,280 m.

22. The most important terrestrial habitats identified for wildlife are the unlogged forests on the steep escarpment slopes and in the Houay Bangliang gorge. Also, the plateau forests in areas not encroached by coffee plantations are of high importance. The large area of mixed deciduous forest in the southeast has fewer key species but one, green peafowl, is of great importance.

23. The most common habitat is the logged semi-evergreen forest of the flat lowlands, but this is currently of lower importance for key terrestrial species, mainly because of heavy hunting...
pressure. It is an important habitat for species not sensitive to hunting or logging and would become more important if allowed to regenerate.

24. The area has about 300 bird species. The list of species is still incomplete at these altitudes. Those still to be found are probably in very small numbers, occur erratically or are particularly secretive. Likely candidates include white-winged duck, other large waterbirds and tawny fish-owl (*Ketupa flavipes*). Searches of the hill slopes may produce more records of such species as great hornbill (*Buceros bicornis*), grey peacock-pheasant and coral-billed ground-cuckoo (*Carpococcyx renaulti*).

3. Dong Ampham NBCA

25. The vegetation types in this NBCA are lowland evergreen, semi-evergreen, mixed deciduous and dry dipterocarp forests; evergreen, and semi-evergreen forests; dry, temperate-like upland coniferous and broadleaf woodlands; and mature submontane and montane evergreen forests. There is a mosaic of secondary habitats and two wide clear water rivers flowing through the area, fed by a dense network of tributary streams.

26. There are 84 species of mammals, at least 30 of global conservation significance, including
   (i) six primates, with two threatened taxa (Douc langur and buff-cheeked gibbon) which may be of global importance;
   (ii) four rare cats (fishing cat, golden cat, clouded leopard, and tiger)
   (iii) eight ungulates, including small numbers of gaur, and populations of two recently discovered deer: large antlered muntjac and a small dark muntjac (which may be the recently described Annamites dark muntjac), both of which have very restricted world ranges and are only known to occur in three other protected areas in the Lao PDR; and
   (iv) a small population of Asian elephants.

27. Bird populations are also diverse and significant. There are 280 species of birds, 37 species of conservation importance. These include
   • a high density population of Siamese fireback, possibly of global importance
   • local reports of the presence of crested argus;
   • riverine specialists, including one of only three known populations of masked finfoot in the Lao PDR and a population of lesser fish eagles of national significance;
   • a suite of Indochinese lowland forest specialists, including red-collared and pale-headed woodpeckers, bar-bellied and blue-rumped pittas, and greyfaced tit babbler;
   • two vulture species and woolly-necked stork, all of which have undergone dramatic declines in the Lao PDR;
   • healthy populations of at least five dry dipterocarp specialists, including Rufous winged buzzard and white-rumped falcon; and
   • a nationally significant population of great hornbills.

28. Additionally, the Xe Kaman and Xe Xou rivers provide habitat for 300–400 fish species, including many endemic fish and other aquatic resources. These rivers are regionally important for their biodiversity.
4. Xe Xap NBCA

29. The Xe Xap NBCA covers 136,897 hectares located in two provinces (Salavan and Xekong) along the border with Viet Nam.

30. Little information is available on the habitat condition over most of the Xe Xap NBCA. Evergreen forest covers most of the higher slopes and ridges, while the valleys and lower slopes have been heavily degraded and in most cases support a mosaic of secondary vegetation.

31. To the south of Xe Xap NBCA in the Xe Kong valley and its tributary headwaters, habitat degradation is severe. Secondary vegetation extends above 1000 m in several areas, with extensive areas covered in bamboo-dominated secondary growth. The extent of secondary vegetation and relatively low density of villages suggests that the area has been more extensively populated and that forest clearance has been a long-term factor in the area’s history.

32. Pine forest is mainly open and interspersed with areas of grass and scrub, the trees relatively small, rather than closed old growth forest of large diameter trees as found on the Nakai Plateau. Patches of pine forest vary considerably in size, and apparently in their age. Satellite images show the greatest concentration of pine forest in the central southern and western portions of the plateau with the largest areas to the southwest of Ban Dakchung.

33. At least 32 key species are present in the area, including three globally threatened bird species: crested argus (*Rheinardia ocellata*), black-hooded laughing thrush (*Garrulax milleti*) and probably yellow-billed nuthatch (*Sitta solangiae*), and a further three globally near-threatened species. Mammal species include globally threatened gibbon species, Douc langur, Malayan Sun Bear, recently discovered Large-antlered muntjac, and a small as yet unidentified muntjac species.

E. Threats

34. Shifting agriculture and fruit and coffee plantations in the upland areas of Champasak and Attapeu provinces are damaging the lowlands through changes in the wet and dry season runoff leading to soil erosion and increased sedimentation and turbidity in the rivers. Other effects are decline in the lowland fish stocks and other riverine species.

35. The existing lowland agricultural areas in the two provinces have all been converted from former lowland forest and wetland areas. Increasing population pressure continues to stimulate demand for new land for irrigated agriculture development and pasture, especially along Route 18. Significant areas of lowland forest in Champasak have also been identified for cattle ranching.

36. Champasak and Attapeu provinces both have a number of ethnic groups, including the Souya, Lawae, Oy, Chieng, Sapuan, and Nyahoa. Slash-and-burn agriculture is the main mode of livelihood of the upland ethnic groups. In line with government programs to stabilize agriculture, the provincial development plans of Champasak and Attapeu envisage resettlement of ethnic groups to other agriculture focal areas. In Khong District, there are plans for agricultural development along Route 13. These resettlement plans constitute an additional development pressure that needs to be considered in the proposed landscape planning process.
37. **Xe Pian.** The threats in Xe Pian are primarily related to local human use. The activities of wildlife traders are a major threat and species such as tiger, bears, sambar, muntjac, mousedeer, and gibbons have been hunted from the NBCA. Nontimber forest products are also commonly extracted. Agriculture activities include lowland and upland rice cultivation. Livestock encroach on important habitats in and around the area. Development encroachment in Xe Pian also poses potential future threats. Wetlands are significant, particularly at Kiet Ngon Village, Patumphon District in Champasak Province, where a biofertilizer factory is planned for peat extraction.

38. The Xe Pian/Xe Nam Noy hydroelectric development project will have far-reaching effects on the NBCA. This project is to be constructed by Dong Ah, a Korean company under a BOT agreement and is to be completed by 2008. It poses the greatest threat to habitats on the Attapeu portion of the area by dissecting the corridor between Xe Pian NBCA and provincial protected areas to the east.

39. **Dong Ampham.** Local human uses in Dong Ampham include wildlife trade, subsistence hunting and fishing, nontimber product collection, and resettlement of local communities. Wildlife trade across the international border with Cambodia is of particular concern to the NBCA. Wildlife is commonly traded out of the Lao PDR to supply the market for wildlife products in the People’s Republic of China. Similarly, there is a large demand for a variety of nontimber products from the area. Mai Dam or black wood (*Aquilaria* species) used for incense is highly sought after for its economic value. Bamboo is also regularly harvested for a variety of products, including chopsticks. The primary development encroachment threats are the development of the Xe Kaman I Hydroelectric project and the variety of planned road improvement projects.

40. Threats for Xe Xap and Dong Huao Sao have not been documented.

**F. Demographic Profiles**

41. Champasak Province has a population density of 40.4 people/km$^2$ and a total population of 622,400. Within Xe Pian NBCA, the population is estimated at 50,000. Fourteen of the 80 villages in the 3 districts covered by Xe Pian are located inside the NBCA. Seven ethnic groups reside in and around the NBCA. The total population of Dong Houa Sao NBCA is 28,800 and of the 82 villages contained in the 3 districts that it covers, two are inside the NBCA. Dong Houa Sao has 7 ethnic groups that reside within its boundary. According to the National Growth and Poverty Eradication Strategy (NGPES 2002), poverty is rated as medium in Champasak compared to high in Attapeu, Saravane, and Sekong provinces (Map 4).
42. Low yields characterize farming systems throughout the Lao PDR. The agro-ecosystems of the poor are low-input rice-based agriculture, already stressed by external factors beyond the control of villagers. Family labor is the major input. Even in Champasak, which is self-sufficient in aggregate terms, social differentiation has meant that some households are rice insufficient. This problem is exacerbated in time of drought and flood.

43. Attapeu is one of the least densely populated provinces in the country at 10.5 people/km² with a total population of 108,300 people (51.3% female), making up 1.9% of the national population. The annual population growth rate in Attapeu is 2.7%, the birth rate is 3.7%, and the mortality rate is 1.6%. Almost all the population live in rural areas, with over 98% of households relying on agriculture (96% rice, 4% other crops). Roughly 1.3% of the provincial area is under rice production. The poor condition of roads and road access prevents the development of economic diversification and alternate income activities, such as the commercialized marketing of nontimber forest products. Little data are available on the contribution of timber and wood processing to the Attapeu economy. In 2001, there were three major wood factories and 10 wood-processing companies. There are five official production forests (139,400 ha) in the province, three of which have forest inventories and management plans.

44. Many of the local communities in the two provinces already practice traditional natural management systems. Villages set aside areas in the river as no-fishing zones to protect fish
stocks. In Xe Pian, some communities have regulations on access and use of natural resources in their territory.

45. Champasak and Attapeu provinces have a large and somewhat unexploited tourism potential. Through the support of the provincial and district authorities and the NBCA management unit, Kiatngong village in Xe Pian has developed as a small ecotourism base, providing income to the village development fund. There are also plans to set up a special economic zone in Champasak Province.

46. Sekong is the smallest province in the Lao PDR. The province has the lowest population density of the country with 10.4 people/km² and a total population of 79,700 people. Saravane Province has a population density of 29.8 persons/km² and a total population of 318,100. Sekong is not self-sufficient in rice and shifting cultivation is still a common practice. The main exports are coffee, cardamom, and wood.

G. Recent and Ongoing Projects

47. The Forest Management and Conservation Project (FOMACOP) 1995–2000 was established to develop systems for the sustainable management of forests and the conservation of biodiversity. FOMACOP was a joint undertaking of the Government of the Lao PDR, Government of Finland, World Bank, and Global Environmental Facility (GEF). At the national level, it assisted the Government in developing the policy and legal foundation to support sustainable forest management and biodiversity conservation. At the field level, it assisted in developing pilot programs for sustainable forest management and also for managing NBCAs.

48. The Sustainable Forestry and Rural Development Project (SUFORD) (2004) has completed its first year of operations funded by an International Development Association loan, a grant from Finland and a contribution from the Lao PDR. The development objectives of the project are to improve the policy, legal, and incentive framework enabling the expansion of sustainable, participatory forest management throughout the country; bring priority natural production forests under participatory, sustainable management; and improve villagers’ well-being and livelihoods through benefits from sustainable forestry, community development, and development of viable livelihood systems. The project field sites are in Khammouane, Savannakhet, Saravan, and Champasak provinces and include 400 villages in 8 production forest areas, with a total of 640,000 ha. Project activities in Champasak Province are also focused in the area between Dong Huao Sao and Xe Pian NBCAs.

49. Since 2000, Danish International Development assistance (DANIDA) has provided supported to the Xe Pian NBCA management unit for the continuation of activities initiated under the FOMACOP project. The assistance aims at improving livelihoods and reduction of poverty through the integration of development and natural resource management at the community level. The Southern Lowlands Natural Resource Management Project (2002–2006) aims to (i) improve capacity for integrated community development and natural resource management at provincial and district levels, and (ii) develop an action plan for Xe Pian NBCA, including zoning and demarcation and an operational management unit developed and the implementation initiated. It envisages cross-border activities with Ratnakiri and Stung Treng provinces in Cambodia.

50. ADB has a Forest Plantation for Sector Project in the Lao PDR planned for 2005–2010. The project’s long-term goal is to tap the significant potential of the plantations subsector and turn it into a driver of economic growth. A more immediate purpose is to (i) provide income-
generating opportunities to poor rural communities, (ii) increase private-sector participation in commercial plantations, (iii) rehabilitate degraded forestland by developing plantations, and (iv) strengthen capacity of government institutions to support commercially viable forest plantations. Components will include (i) training for planters and private entrepreneurs, (ii) credit lines for planters and private companies, (iii) improvement of plantation access roads, (iv) market development, and (vi) establishment of requisite government institutions and capacity-building of the executing and implementing agencies.

51. The Mekong Wetlands Biodiversity Programme has a project in Attapeu focused on Sanamxay, Saysetha, and Sumakhixay districts.

52. Other donor-assisted programs and initiatives operating in the natural resources sector in Champasak Province are the French-supported International Environment Reconstruction and Sustainable Natural Resources Management Project in Paksong District; the proposed ADB project on Critical Wetlands in the Lower Mekong Basin and the ADB/International Fund for Agricultural Development project in Phouvony, Attapeu; the Siphandone wetlands component of the proposed Mekong River Commission Regional Wetlands Management Project; the World Bank Agriculture and Forest Development Project in Sanamxay, Attapeu; the World Bank’s Poverty reduction Fund that operates in Pathoumphon and Khong districts of Champasak; two World Wide Fund for Nature (WWF) projects due to commence shortly—on natural resources management, including nontimber forest products and wetlands resources in Sanamxay District, Attapeu, and an ecotourism project in Pathoumphone, Champasak; the Canadian Association for People and Environment working in Champasak; and some Wildlife Conservation Society (WCS) projects.

1. Projects in the focal NBCAs

a. **Dong Houa Sua**
   (i) 1995–2000 IUCN-advised management project
   (ii) 2000–2002: Dutch funding extended for management.
   (iii) 2001 onwards: provincial funding

b. **Dong Ampham**
   (i) 1997 WCS/ Center for Protected Areas and Watershed Management (CPAWM) field training for NBCA staff some WWF staff training

c. **Xe Pian**
   (i) 1996–2000 FOMACOP management assistance.
   (ii) 2000/01: DANIDA management assistance
   (iii) 2003: Nordic Agency for Development and Ecology (NORDECO) assistance
   (iv) 2002 onward: provincial funding
   (v) 2005: Ecotourism Project (WWF, awaiting government confirmation)

d. **Xe Xap**
e. Dong Hua Sao – Xe Plan Corridor
   (i) Sustainable Use and Management of Forest Resources (WWF, under government approval)

f. Dong Ampham – Xe Sap Corridor
   (i) Human-elephant conflict resolution project (WWF, 2005)
   (ii) Community fishery project (WWF, 2005)
   (iii) Xe Kong Forest Watershed Management project (WWF, 2005)
   (iv) Xe Kong River project (WWF, under government approval).

H. Legal and Policy Framework

1. National plans and programs

53. Policies and plans formulated in the last decade in the Lao PDR principally focused on the objectives of poverty eradication and food self-sufficiency. The major macro policies are presented in this section. These two major objectives are emphasized in most of these policies and plans.

54. 5th Socio-Economic 5 Year Plan (2001–2005). This plan has, among its overall objectives, the goal of halving poverty by 2005, securing self-sufficiency in rice by producing 3 million tons of foodstuff, of which 2.7 million tons is rice, encouraging tree planting and cultivation of forest products, and eradication of shifting cultivation. The 6th 5 year Plan will come into force in 2006.

55. National Growth and Poverty Eradication Strategy (NGPES). The government has finalized the NGPES following discussions at the September 2003 Donor Roundtable Meeting. The NGPES aims to reduce poverty through strong economic growth and an increased focus on the poorest districts. The government has selected 47 of the poorest districts for priority investment.


57. National Rural Development Programme (NRDP). A key element in the NRDP is the Focal Sites concept: Specific focal site offices are to be established to coordinate the delivery of development services by different line agencies in the focal sites. This development strategy is synergistic. It posits a number of national objectives, such as promoting rice production, promoting commercial crop production, promoting settled agriculture to replace slash-and-burn shifting cultivation, and improving access to development services. It proposes village consolidation or the merging of villages—which may or may not involve resettlement—the most feasible and cost-effective way of making development services available to scattered and remote communities.

58. Strategy for the Agricultural Sector (2001–2010). The strategy begins with an overview of the duality of the Lao agricultural economy: the flat lowlands along the Mekong River and the sharply contrasting uplands. In the uplands, agriculture is practiced basically for subsistence and farm households are locked in a poverty trap created by a lack of regional market access, absence of productivity, isolation from increasing technology flows, and a lack of capital to fuel the transformation process. For the Mekong corridor, the strategy aims at
maintaining and accelerating the pace of agricultural diversification and intensification with increased productivity per land unit, improved value added processing, and expanding markets and sales. At this stage, the Government will concentrate more of its limited resources in highland areas where market forces have yet to penetrate.

59. **Master Plan for Agricultural Development (2020).** Eleven high-priority projects have been selected for the master plan for agricultural development to the year 2020, related to fisheries, livestock, nontimber forest products, seed multiplication, horticulture, and rural finance.

60. **Forest Strategy 2020.** The Forest Strategy is the official document guiding development of the forestry sector. Shifting cultivation is to be basically stabilized by 2005 and completely stabilized (eradicated) by 2010. Tree plantations for commodity production are to be strongly promoted, with a target area of 134,000 ha for the 5-year period to 2005. The third priority action is to accelerate classification and delineation of forests for protection, conservation, and production purposes. In 2001, the Government began charging a reforestation fee on top of log royalties to promote tree planting by small farmers, with revenues being used for promotional activities, establishment of nurseries, and production of seedlings for distribution to farmers.

61. In 2004, the National Biodiversity Strategy and Action Plan (NBSAP) and the National Strategy for Integrated Watershed Management were adopted.

2. **Forest sector legal framework**

62. The overarching policy frameworks that shape the forestry sector and biodiversity conservation include the Prime Minister’s Decree 164 (1993) that established the protected area system (the NBCAs) in the country, the Land Law (1997) that supports land allocation among communities, and the more recent NBCA regulations of 2001. Other policy implements include the following:

63. **Forest Law Nº 01/1996** defines the nature, functions, objectives, and legal status of conservation forests¹ and requires the Government to engage in participatory management of NBCAs with villagers. It also provides for zoning within the NBCAs into totally protected zones, controlled utilization zones, and link or corridor zones. The law recognizes the legitimacy of community-based forest management, or village forestry. There are two kinds of village forestry projects: those that focus on the management of natural forests, such as the FOMACOP/SUFORD, and those that focus on the rehabilitation and management of degraded watersheds, such as the Nam Ngum Watershed Conservation Project. Despite support for village forestry, the law reserves a role for government in forest management. Two types of joint management exist: government partnerships with large-scale forestry enterprises and, increasingly, government partnerships with village organizations.

64. **MAF Regulation Nº 0524/2001** on Management of National Biodiversity Conservation Areas, Aquatic Animals and Wildlife provides guidelines on NBCA establishment and zoning, and also on restricted activities and development fund establishment and the rights and duties of state agencies in NBCA management.

¹ The Forestry Law also defines “protection forests” as a distinct forest category (Art. 17) not intended for protection of biodiversity, environment or culture, but for watershed protection, erosion control, national security, and/or prevention of natural disasters.
65. **PM Decree Nº 59 on Sustainable Management of Production Forest** of May 2002 provides for delineation of production forest and management planning, and acknowledges the participation of villages in all aspects of production forest management.

66. **PM Order Nº 18/2002 on Forest Management Policy** for 2002–2003 required the Ministry of Agriculture and Forests (MAF) to reassess national forest cover, allocate and designate all forest categories according to present conditions, determine regions where logging bans should be placed on natural forests, and develop strategies for forest conservation and reforestation.

67. A number of recent forestry sector policies and plans have also been formulated that have specific implications for the proposed conservation corridors, including

- MAF Regulation 196 on Development and Promotion of Tree Planting
- PM Order 18 on Forest Resource Management Policy for 2002–2003, which promotes the development of tree plantations by increasing incentives and market demand
- The NBSAP sets the framework for biodiversity conservation and planning up to 2020.

I. **Proposal**

1. **Goal of project**

68. To restore and maintain the ecological integrity of the Tri-Border Forest landscape through improved management of core areas for biodiversity conservation and watershed protection and development of sustainable-use landscapes or corridors that connect NBCAs.

2. **Objectives**

69. The project has five objectives:

   (i) Poverty reduction through sustainable use of natural resources and development of livelihoods
   (ii) Clear definition of optimal land uses and harmonized land management regimes
   (iii) Restoration and maintenance of ecosystem connectivity
   (iv) Capacity building in government staff and local communities
   (v) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures

3. **Indicative activities**

   **a. Poverty Reduction**

   (i) Improve sustainable livelihood development through community-based natural resource management and protected area co-management
   (ii) Enrich community-based forests with high-value natural resources and establish market links
   (iii) Inform and orient beneficiaries about the project objectives and the need for establishing sustainable-use corridors
   (iv) Establish village development and poverty reduction funds
(v) Encourage families and groups of families to grow trees and establish farm forests
(vi) Provide community support for small-scale infrastructure (water wells, school improvement, small culverts, ceremonial houses, etc.)
(vii) Promote eco- and cultural tourism in the project area

b. Harmonized Land Management and Governance Regimes
(i) Provide a framework for community-based natural resource management through secure land tenure and sustainable, legal harvest mechanisms
(ii) Review land-use planning and land allocation already undertaken and continue with participatory land-use planning and land allocation
(iii) Apply provincial and district land use planning and natural resource management guidelines to establish forest corridors and sustainable-use areas between the NBCAs in the pilot sites
(iv) Undertake participatory demarcation and delineation of forest/conservation corridor areas from village areas

C. Restoring Ecosystem Connectivity
(i) Promote landscape connectivity in key fragmentation points through targeted afforestation/enrichment planting or natural regeneration
(ii) Reduce impacts at key landscape fragmentation points through strengthened enforcement
(iii) Carry out or update surveys with regard to maintaining viable populations of globally threatened plant and animal species especially large mammals and timber trees
(iv) Conduct landscape-level analysis of existing and proposed developments (in particular industry, road, dam and other infrastructure projects), trade patterns, and production and investments
(v) Limit the impact of large infrastructure developments in strategically identified ecologically important locations (e.g., realignment of roads)
(vi) Protect forest surrounding water sources in the Bolaven Plateau,
(vii) Monitor habitat and implementation of the “closed forest” policy in project districts

d. Capacity Building
(i) Strengthen the capacity of district officials and key provincial level staff involved in corridor and protected areas management
(ii) Strengthen the capacity of villagers to manage and protect forest and natural resources in the corridors and move toward effective community-based natural resource management (with comanagement of some parts of the NBCAs)
(iii) Strengthen the capacity of central and local government agencies to collaborate with villages in forest and corridor management

e. Sustainable Financing
(i) Produce a comprehensive report on the economic values of the area including studies on upstream–downstream financial systems
(ii) Lobby for development of payment for environmental services mechanisms for large infrastructure development, especially road and dam construction
J. Implementation Arrangements

1. Project management and coordination

70. The following institutional setup has been proposed for implementing the pilot site project in Phase I (2005–2008).

Central Level:

- National Coordinator/Project Management Office (DOF)
  - Project Director/National Coord.
  - Project Assistant
  - Accountant

Provincial Level:

- PAFO Champasak Project Implementation Unit
- PAFO Attapeu Collaboration Unit

BCI = Biodiversity Conservation Corridors Initiative; DOF = Department of Forestry; GMS = Greater Mekong Subregion; MAF = Ministry of Agriculture and Forests; MOE = Ministry of Education; MOH = Ministry of Health; MPI = Ministry of Planning and Investment; NGO = nongovernment organization; NBCA = national biodiversity conservation area; PAFO = Provincial Agriculture and Forestry Office; STEA = Science, Technology and Environment Agency.

71. The national steering committee will be chaired by STEA with vice-chair being MAF, with the following functions:

(i) Meet at least once a year
(ii) Approve work plans and budgets
(iii) Review project progress and provide guidance
(iv) Secure collaboration of relevant ministries
(v) Review proposals for additional project sites and seek government approval.

72. The Project Management Office, headed by a project director, has the following roles:

(i) Establish the central project management office in DOF
(ii) Assist the PAFO in establishing the provincial project implementation unit (PPIU) in Xe Pian
(iii) Draw up annual work plans and budgets and seek approval from the national steering committee
(iv) Maintain project accounts (in US$ and Kip) and updated financial statements
(v) Provide funds according to the approved budget to the PPIU
(vi) Recruit staff and contract national consultants and subcontract institutions for database management
(vii) In collaboration with the PPIU at PAFO, acquire and update a digital database of the project area
(viii) Monitor and review progress on a half-yearly basis
(ix) Hold annual review workshops with all stakeholders
(x) Submit progress and financial reports to the national steering committee on a half-yearly basis
(xi) Organize field visits as and when required
(xii) Conduct study tours and organize training; document evaluations and lessons learned
(xiii) Raise awareness about the project and need for conservation in institutions and with the public at large
(xiv) Review existing technical guidelines and standardize for all corridor work areas

73. The working group will consist of representatives from IUCN, WCS, WWF, MRC, technical departments (Ministry of Communications, Transport, Posts and Construction [MCTPC]; LDA; STEA; DOF; Institute of Fisheries Research), and Association for Biodiversity Conservation. This working group will undertake the following:

(i) Review existing technical guidelines and standards and propose improvements
(ii) Provide advisory support to the project management office
(iii) Screen or organize technical screening of project proposals
(iv) Discuss and recommend complementary activities in support of the project
(v) Promote biodiversity conservation activities at the national level and pass on experiences to regional institutions
(vi) Document lessons learned from other projects for dissemination

74. The PPIU will be based in Xe Pian NBCA in Champasak Province and headed by a chief of section. The PPIU will do the following:

(i) Establish a project implementation unit comprising a chief, accountant, and forest development and community support staff
(ii) Prepare annual work plans and budgets and submit to the project management office for approval
(iii) Maintain account and prepare financial statements
(iv) Request consultant support from the project management office
(v) Liaise with other relevant departments at the provincial level through the Governor's office
Annex 3-2

(vi) Implement project activities in collaboration with Attapeu PAFO  
(vii) Inform the Governor’s office about project progress  
(viii) Write progress reports and submit on a half-yearly basis to the project management office

75. The provincial project collaboration unit in Attapeu Province headed by a chief of section will carry out the following activities in collaboration with the PPIU based in Champasak:

(i) Prepare annual work plans and budgets and submit to the project management office for approval  
(ii) Maintain account and prepare financial statements  
(iii) Request for consultant support from the project management office  
(iv) Liaise with other relevant departments at the provincial level through the Governor’s office  
(v) Implement project activities in collaboration with Attapeu PAFO  
(vi) Inform the Governor’s office about project progress  
(vii) Write progress reports and submit on a half-yearly basis to the project management office

2. Operationalizing pilot site activities

76. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a RETA, detailing the program for Phase I (2005–2008) for securing funding commitments. The RETA paper will be sent to the GMS countries for concurrence.

77. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working Group on Environment to send official nominations of GMS country representatives, who will sit in the BCI regional coordination committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

78. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to have the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

79. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); or (iv) land-use patterns and configuration for dispersal ability.
(continuous vs. patchy/stepping stone habitats). A provincial land-use and zoning exercise at the provincial level will be a priority activity in the work plan.

80. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

81. The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB, development partners or government will be guided by the plan of operations.

82. The BCI national coordinator’s office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

83. The regional PCU will circulate the draft plan of operations from the BCI national coordinators to the TAP to get feedback. The TAP will scrutinize the draft plan for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

84. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

85. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six-monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
Xishuangbanna Biodiversity Conservation Corridors
People’s Republic of China

Pilot Project Profile (2005–2008)

May 2005
A. Project Context

1. Under the Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) currently being implemented as Asian Development Bank (ADB) regional technical assistance (RETA) 6213, biodiversity corridor pilot sites for 2005-2008 in each GMS country are to be selected based on the following criteria:

   (i) Falling within GMS economic corridors or their zone of influence
   (ii) Reducing ecosystem fragmentation by linking two or more protected areas
   (iii) Areas of international biodiversity importance
   (iv) Areas of high poverty incidence and population growth
   (v) Being of a transboundary nature
   (vi) Having institutional (state and non-state) capacity on the ground that is currently active in implementing one or more projects.

2. In the People’s Republic of China (PRC), the Xishuangbanna Tropical Rainforest landscape in South Yunnan and stretching down to the border of the Lao People’s Democratic Republic (Lao PDR) is the location of the biodiversity corridor conservation pilot site. This project profile provides background to the region and sets out the project objectives, indicative activities, and institutional arrangements. Yunnan Province and specific corridors in the Prefecture of Xishuangbanna provide the focus of the project.

Map 1. The Xishuangbanna Complex showing the existing system of areas under protection
B. Selection and Location of Pilot Sites

3. Located in the southwestern PRC, Yunnan Province covers a total area of 394,139 km² and contains half of the known important plant species (16,000 out of 32,000) of PRC. The Xishuangbanna Prefecture has a total area of 19,700 km² and harbors the Xishuangbanna National Nature Reserve complex consisting of Mengyang Nature Reserve in the north, the Mangao Nature Reserve in the north-west, Menglu Nature Reserve composed of three fragments and lying south of Mengyang NR, Mengla Nature Reserve to the south-east and also bordering the Lao PDR in the east, and Shangyong Nature Reserve, the southern most protected area also bordering the Lao PDR (Map 1). The tropical forests of Xishuangbanna are unique because of the transitional geographic location and climatic features crossing the tropics and subtropics. Thus, both the northern and southern biotas meet in this region. Although Xishuangbanna covers only 0.2% of the area of the PRC, it maintains nearly 16% of higher plant species of the country, underscoring the importance of Xishuangbanna in the national biodiversity conservation strategy.

4. The core zones of the nature reserves complex are currently fragmented and the State Environment Protection Agency (SEPA) (both at central and provincial level) has a strong commitment to reducing ecosystem fragmentation and restoring connectivity in the Xishuangbanna area. Currently, the complex is administered by the National Nature Reserve Bureau of Xishuangbanna and there is local capacity (Xishuangbanna Tropical Botanical Garden of the Chinese Academy of Science) in the area to implement the proposed conservation measures. This combination of commitment and capacity in a region of international biodiversity importance makes it well suited as a focus of the BCI in the PRC.

Map 2. Xishuangbanna biodiversity corridors conservation pilot site
5. This pilot project targets eight corridors (Map 2): (i) Mengyang to Xiao He Jiang; (ii) Xiao He Jiang to King Tea River; (iii) King Tea River; (iv) King Tea River to Mengla; (v) Mengla to Shangyang (wild elephant sanctuary), which is also a transboundary nature reserve bordering the Lao PDR; (vi) Mengyang to Menglun; (vii) Mengyang to Mangao; and (viii) Mangao to Mengsong. The Mengsong area is currently not under any protected area status and it should be declared as a nature reserve. These proposed corridors are mostly forested areas that will link up to the existing nature reserves and need to be put under protection. In addition, there are villages in Jinghong, Menghai, and Mengla counties which border or lie within the proposed corridor areas and should fall within sustainable use zones.

Map 3. Villages in and around Xishuangbanna nature reserve

6. The eight corridors are identified for highest priority action according to the pilot site selection criteria. The corridors are:

(i) within the North-South GMS economic corridor with links to the Lao PDR;
(ii) essential as a focus of effort to reduce ecosystem fragmentation;
(iii) areas of international biodiversity importance (known as the Indo-Burma biodiversity hotspot);
(iv) areas of growing population (growth rate per annum 10.31% in 2003) with poverty pockets and ethnic minorities with traditional ties to the Xishuangbanna Complex;
(v) areas with high levels of provincial and national commitment and ongoing government poverty reduction programs.
7. While the pilot will have a sharp geographic and community focus, there is a need to reinforce provincial wide land-use planning and zonation activities involving the strict enforcement of certain regulations that support and maintain existing natural forest cover as well as promote ecosystem connectivity. Studies of the socioeconomic, biodiversity and natural resources situation contributing to a provincial land use planning and zonation process should lay out clearer demarcation of nature reserves as well as conservation areas such as stepping stone forest (e.g. holy or spiritual forests) and protection of riverine areas by natural tree cover. The pilot corridors themselves will need to be more precisely defined. Some areas will need to be strictly protected because of their importance for biodiversity and ecosystem service values whereas other areas can sustain various intensities of use and development. In particular, incentives need to be provided to protect and maintain natural forest and biodiversity areas as opposed to permitting felling in such areas and replacing them with plantations (rubber) and commercial species (as is the current practice in Xishuangbanna).

C. Description of Pilot Project Corridors

8. The eight corridors each connect existing areas with weak levels of protection but will establish a total forest area of one of the largest blocks of contiguous forest in southeast Asia. As shown below in Table 1, the total area of national nature reserves managed by the Nature Reserve Bureau is estimated to be about 247,800 ha. Under current regulations, each reserve has a core area and an experimental area (multiple use) but no system of buffer zones. It is proposed that a total area of 80,854 ha covering five nature reserves be assigned as buffer zones, thereby reducing the core area as well as the experimental area.

<table>
<thead>
<tr>
<th>Nature Reserve</th>
<th>Managed By NRB (ha)</th>
<th>Core Area</th>
<th>Buffer Area</th>
<th>Experimental Area (Multiple Use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>247,800</td>
<td>130,849</td>
<td>102,560</td>
<td>0</td>
</tr>
<tr>
<td>Mengyang</td>
<td>102,913</td>
<td>62,739</td>
<td>43,223</td>
<td>0</td>
</tr>
<tr>
<td>Mengla</td>
<td>93,994</td>
<td>31,048</td>
<td>34,809</td>
<td>0</td>
</tr>
<tr>
<td>Shanyong</td>
<td>32,384</td>
<td>25,263</td>
<td>19,575</td>
<td>0</td>
</tr>
<tr>
<td>Menglu</td>
<td>10,185</td>
<td>9,519</td>
<td>3,371</td>
<td>0</td>
</tr>
<tr>
<td>Mangao</td>
<td>8,324</td>
<td>2,280</td>
<td>1,582</td>
<td>0</td>
</tr>
</tbody>
</table>


9. Mengyang–Xia He Jiang, Xia He Jiang–King Tea River, King Tea River–Mengla are four contiguous corridors connecting Mengyang NR to Mengla NR to promote the migration of fauna between them. The Mengla–Shangyong link is a small corridor, which maintains ecosystem connectivity between the Mengla NR and the Shangyong NR. It is also a passageway for elephant movement and creates a larger forest area for the existing elephant population in Shangyong. The Mengyang–Menglun corridor creates connectivity between the Mengyang NR and the Menglu NR. The proposed corridors (see Table 2 below) contribute in significant ways to the maintenance of habitat and watershed functions, to water supply, protection against flooding and other natural disasters and to increased productivity of riverine fisheries and agricultural systems.
Table 2. Proposed corridor areas

<table>
<thead>
<tr>
<th>Corridor Connection</th>
<th>Corridor Function</th>
<th>Corridor Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mengyang–Xia He Jiang</td>
<td>a) Reducing Nature Reserve fragmentation</td>
<td>21,199</td>
</tr>
<tr>
<td>2. Xia He Jiang–King Tea River</td>
<td>b) Enabling expansion of species range between fragments</td>
<td>4,727</td>
</tr>
<tr>
<td>3. King Tea River</td>
<td></td>
<td>24,732</td>
</tr>
<tr>
<td>4. King Tea River–Mengla</td>
<td></td>
<td>5,138</td>
</tr>
<tr>
<td>5. Mengla–Shangyong</td>
<td></td>
<td>1,206</td>
</tr>
<tr>
<td>6. Mengyang–Menglun</td>
<td>c) Promoting migration of fauna</td>
<td>13,903</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>70,905</strong></td>
</tr>
</tbody>
</table>


10. In addition, links between the Shangyong Nature Reserve in the south bordering with the Lao PDR and the Nam Ha and Phou Dene Din National Biodiversity Conservation Areas (NBCA) in the Lao PDR and Muong Nhe Nature Reserve in Viet Nam, will be explored for support in phase 2 of the BCI program forming a transboundary biodiversity corridor that allows for increased rangeland for elephants and cats.

Map 4. Xishuangbanna transboundary linkages: Green Triangle

11. On its own initiative and later with support from the MacArthur Foundation of USA (1995-2000), Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences has cooperated with local governments in Northern Lao PDR on: (i) Demonstration and training for integrated rural development; (ii) Transboundary farmer to farmer training and communication; and (iii) a "PRC-Lao PDR Transboundary Biodiversity Management and
Development Workshop," XTBG proposes to study and establish the Great Green-Triangle Conservation and Sustainable Use area.

Table 3. Transboundary protected areas on the borders of PRC-Lao PDR-Viet Nam

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of Protected Area</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRC</td>
<td>Mengla Nature Reserve</td>
<td>93,994</td>
</tr>
<tr>
<td>PRC</td>
<td>Shangyong Nature Reserve</td>
<td>32,384</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>Nam Ha NBCA</td>
<td>222,400</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>Han Tun NBCA</td>
<td>222,000</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Muong Nhe Nature Reserve</td>
<td>396,000</td>
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</tbody>
</table>

12. A study will be undertaken in Phase I (2005-2008) on the potential of establishing a transboundary corridor link between Mengla Nature Reserve in Xishuangbanna and Phou Dene Din NBCA in the Lao PDR as well as Muong Nhe Nature Reserve in Viet Nam.

D. Biodiversity Values

13. Biogeographically, Xishuangbanna is located at a transitional zone with tropical SE Asia to the south, subtropical East Asia to the north, the Sino-Japanese floristic region to the east, and the Sino-Himalayan floristic region to the west. Southern Yunnan is, therefore, a key area in biogeography and a hotspot for biodiversity. The flora of the region consists of 3,336 native seed plant species belonging to 1,140 genera in 197 families. The primary vegetation in Xishuangbanna can be categorized into four main vegetation types: tropical rain forest, tropical montane rain forest, tropical montane evergreen broad-leaved forest (monsoon evergreen broad-leaved forest), and tropical monsoon forest. There are also four secondary vegetation types, i.e. deciduous broad-leaved forest, pine forest, bamboo forest, and shrubs.

14. The tropical rain forest in Xishuangbanna is characterized by Pomentia tomentosa and Terminalia myriocarpa. It also contains species of Shorea and Vatica of Dipterocarpaceae, the characteristic plant family of tropical rain forests in Southeast Asia. Like equatorial lowland rain forest, the tropical rain forest has 3-4 indistinct tree layers, of which the top layer is mainly composed of emergent trees more than 30m tall (the tallest up to 70m) and has 30% of crown coverage; the second layer, up to 30m tall, with almost continuous crowns and the greatest density of stems (70%-80% coverage), is the main canopy layer. Buttresses and cauliflory are common, and both big woody climbers and vascular epiphytes are abundant. The rare herbaceous species Tacca integrifolia grows underneath the tropical rain forest. The forest is mainly evergreen although there are some deciduous trees in the emergent layer.

15. There are 539 species of vertebrate, 400 bird species, and 36-44 reptile species recorded in Xishuangbanna, which make up ¼ of the total vertebrates and ¹/₃ of the birds of the PRC respectively. There are 114 rare and endangered animal species, comprising 28.6% of the total of 398 species, and 57 rare and endangered plant species, making up 22.4% from 254 species, which are under national protection in Xishuangbanna.

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1. Nature reserves (protected areas and protected forests)

16. Xishuangbanna Prefecture includes six national nature reserves (protected areas). Five of these nature reserves are managed by the Nature Reserve Bureau and have a total area of 247,439 ha, i.e. 12.9% of the total area of Xishuangbanna. They were approved as national nature reserves in 1986 and were named as Xishuangbanna National Nature Reserve. In Xishuangbanna National Nature Reserve, natural forests make up over 81% of its total area, shrub land around 1.12%, bamboo cover 5.92%, and other plant communities at 11.14%. Classified by vegetation types, tropical seasonal rain forest makes up 4.79% of the total area, and tropical monsoon forest 1.24%, while tropical montane evergreen broad-leaved forest makes up 74.38% of the total area of the nature reserve.3

Map 5. Forest cover of Yunnan

Source: Yunnan Statistical Yearbook 2000

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3 Xishuangbanna Prefecture, 2001. Beijing: Xinhua Press,
Table 4. Vegetation type in Xishuangbanna Nature Reserve

<table>
<thead>
<tr>
<th>Vegetation types</th>
<th>Tropical seasonal rain forest</th>
<th>Tropical montane rain forest</th>
<th>Tropical monsoon forest</th>
<th>Tropical montane evergreen broad-leaved forest</th>
<th>Deciduous forest</th>
<th>Pine forest</th>
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<tbody>
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<td>1,307</td>
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<td>69,413</td>
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<td>0</td>
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<tr>
<td>Mangao NR</td>
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<td>700</td>
<td>0</td>
<td>5,720</td>
<td>153</td>
<td>400</td>
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<td><strong>Total</strong></td>
<td><strong>1,1592</strong></td>
<td><strong>2,327</strong></td>
<td><strong>3,000</strong></td>
<td><strong>179,833</strong></td>
<td><strong>153</strong></td>
<td><strong>400</strong></td>
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</tbody>
</table>

17. Mengyang NR is located in Jinghong county and covers four townships (Puwen, Dadugan, Jingna, and Mengyang). It is the largest fragment of Xishuangbanna NR. It protects mainly tropical seasonal rain forest, tropical montane rain forest, tropical montane evergreen broad-leaved forest and bamboo forest.

18. Menglun NR covers Jiro township in Jinghong county and Menglun township of Mengla county and is composed of 3 separate fragments: Wangzishan in the east, limestone in the south and Menglu in the west. The NR protects mainly limestone forests and bamboo forest.

19. Mengla NR is located in Mengla county and covers Yaoqu and Mengban townships. It is also composed of 2 fragments with the eastern fragment bordering the Lao PDR. It protects tropical seasonal rain forest and limestone forest at lower altitudes, and tropical montane rain forest, tropical montane evergreen broad-leaved forest and mossy forest (on summits over 1900 m) at higher latitude.

20. Shangyong NR is located in the southern part of Xishuangbanna and borders the Lao PDR in the south. It protects mainly tropical seasonal rain forest and tropical montane evergreen broad-leaved forest.

21. Mangao NR is located at a higher altitude (between 1200–1771m) and has a southern subtropical climate. It protects mainly tropical montane evergreen broad-leaved forest, tropical montane rain forest and pine forest.

22. Nabanhe NR is located 25 km northwest of Jinghong city and straddles the border between Jinghong city and Menghai county with a total area of 26,600 ha. Nabanhe River runs from north to south through the middle of the nature reserve and then joins the Mekong River. The NR is mountainous with the lowest altitude at 539 meters and the highest 2,304 meters. It is rich in biodiversity and has 15,600 ha of primary forest. The major forest vegetation types include tropical rain forest, tropical seasonal rain forest, tropical montane evergreen broadleaf forest and coniferous forest, bamboo forest of secondary forest vegetation. The observed plants in the NR include 1,782 species and terrestrial vertebrates include 227 species in 164 genera and 78 families.

23. In addition, the Mensong forest area is proposed as a nature reserve because it contains primary tropical montane rain forest, which is under management of mainly Hani communities. The area is dominated by plant families of Magnoliaceae, Lauraceae and Euphorbiaceae and contains species such as Mastixia of Cornaceae. The forest is floristically similar to that of Doi (Mount) Inthanon near Chiang Mai in northern Thailand.
24. The Xishuangbanna NR complex is spread out over all three counties of Xishuangbanna Prefecture and related to 28 townships. All 13 minority nationalities in Xishuangbanna are living in and around the nature reserve. A survey in 2002 revealed that a population of 18,415 lived inside the NR, and 29,741 people lived in the marginal areas of the NR. In the nature reserve, state owned forests make up 87.5% of the total area, and community-owned forests make up 12.5%.

2. Community forests

25. The existing community forests in Xishuangbanna are mainly secondary or strongly disturbed forests. These forests are composed mainly of pioneer tree species, such as *Milletia leptobotrya*, *Castanopsis meikongensis*, *Litsea panamonja*, *Castanopsis hystrix*, *Aporusa yunnanensis*, *Dolichandrone stipulata*, *Acronychia pedunculata*, *Cratoxylon cochinchinensis*, *Phoebe lanceolata*, *Meliosma velutina*, *Macaranga denticulata*. However, these forests are essentially succession stages of the tropical forest regeneration in the region.

3. Spiritual (holy) forests

26. In Xishuangbanna, there are some semi-natural fragments of tropical rain forests, which are remnants near local villages and usually untouched for religious reasons. These remnants are generally called "holy hill forest" by local people. Although they are isolated from continuous primary forests, the species composition of the fragmented forests is basically the same as the primary forest in the Nature Reserve, except for the presence of more pioneers. They are stepping-stones of connection of primary forests in protected areas.

E. Threats

27. A severe decline of local primary forest cover took place in the period from the early 1950s through to the beginning of the 1990s during which the primary forest cover dropped from about 60% to 27%. This led to the loss of habitats for some local animal and plant species and a large number of endangered species. Fragmentation of the tropical forest has occurred as large-scale cash crop plantations (rubber) have been undertaken in Xishuangbanna. The Xishuangbanna NR complex is currently composed of five separate fragments. The Asian elephant population is now dispersed between Mengyang NR in the north and Shangyong in the south. More intensive human activities in the areas between NRs reduce migration of fauna.

28. Conversion of natural forests for cash cropping has been one of the major concerns. The upswing in market prices creates strong incentives to grow cash crops, increasing destruction of natural forest areas. Rubber trees require similar conditions to tropical rain forest and such plantations are the biggest threat to these natural areas in Xishuangbanna.

29. Local people in Xishuangbanna plant *Amomum* (ginger family), a commercial herbaceous plant, underneath the tropical rain forest. This poses a serious threat to natural regeneration because gathering of *Amomum* fruit requires complete cleaning of young trees, saplings, seedlings, and shrubs. The tropical rain forest regenerates from its sapling-seedling bank, especially the lower tree layer and sapling-shrub layer. If cleaning takes place, there is destruction of sapling-seedling bank of the rain forest that causes the forest to lose its regeneration capability.

30. There is also some over-exploitation of non-timber forest products.
31. Cross-border trade in illegal wildlife and forest products (of over 100 species of wild plants and animals) flowing mainly from northern Lao PDR to Mengla county remains another major threat that needs to be addressed.

F. Demographic Profile

32. Yunnan has a population of some 43.75 million (2003) people of predominantly Han ethnolinguistic origin. Xishuangbanna Prefecture, which encompasses the southern part of Yunnan Province, consists of 2 counties and the city of Jinghong, 40 townships, 260 administrative villages, and 2,248 natural villages. The provincial population has a population density of 111.2 persons per km². In Xishuangbanna the density is 44.1 persons per km² (data published in 2004).

33. Xishuangbanna Dai Autonomous Prefecture consists of Jinghong City, Menghai County and Mengla County. Menghai is in the southwest of the prefecture, with relatively higher average altitudes (800–1,000m). Jinghong and Mengla are in the central and the southeast portions respectively, with low average altitudes (500–600m). The heterogeneous topography has led to different patterns of human settlement and retention of forest areas. Jinghong covers the largest land area and has the largest population size in the prefecture. In contrast, Mengla has the smallest population size, although it covers about the same land area as Jinghong. Xishuangbanna is home to 13 culturally diverse indigenous people (including Dai, Hani, Lahu, Bulang, Yi, Jinuo, Yao, Wa, etc.) which account for about three quarters of the local population.

34. The population is not distributed evenly due to accessibility, historical settlement patterns, and resource availability (Tables 5 and 6). The population in some areas such as the Xiangshan township has more than doubled in the past few years as a result of immigration from lowland areas in the east.

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35. **Poverty.** In 2003, the per capita net income of farmers in Yunnan was 1,697 Yuan ranging from a low of 1,029 in Weixi to 2,111 in Jinghong (Table 7). The GDP of Xishuangbanna is at the lower-middle level of Yunnan province, but over the national poverty line of 820 Yuan per person per year. The poor are mainly minority groups, such as Yao, Bulan, and Jiro.

**Map 7. Poverty profile of Yunnan**

![Map of Yunnan's poverty profile](source: Yunnan Statistical Yearbook 2000)

36. In Xishuangbanna prefecture, the average annual income of farmers is 1,910 Yuan, but 1,306 Yuan inside and surrounding the nature reserves (Table 7). Income in other parts of the region varies as follows: an average of 856 Yuan for Mengyang NR and surroundings, 1,107 Yuan for Menglun and surroundings, 1,331 Yuan for Shangyong NR and surroundings, 1,471 Yuan for Mengla NR and surroundings, and 1,764 Yuan for Mangao NR and surroundings (2002 figures).
Table 5. Area and population of counties, townships, and villages in Xishuangbanna (2003)

<table>
<thead>
<tr>
<th>County</th>
<th>Township</th>
<th>Area (km²)</th>
<th>Number of Administrative Villages</th>
<th>Population</th>
<th>Population Density (person/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinghong (city)</td>
<td>Jinghong Town</td>
<td>243</td>
<td>5</td>
<td>11,881</td>
<td>49</td>
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<tr>
<td></td>
<td>Mengyang</td>
<td>688</td>
<td>7</td>
<td>14,421</td>
<td>21</td>
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<tr>
<td></td>
<td>Menghan</td>
<td>301.5</td>
<td>9</td>
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<td>Dadugang</td>
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<td>9,079</td>
<td>12</td>
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<td></td>
<td>Jingna</td>
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<td>11,551</td>
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<td></td>
<td>Jinuo</td>
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<td><strong>Total</strong></td>
<td><strong>Jinghong (city)</strong></td>
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<td><strong>370,111</strong></td>
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<td><strong>Total</strong></td>
<td><strong>Mengla</strong></td>
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<td><strong>195,220</strong></td>
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<td><strong>158</strong></td>
<td><strong>859,731</strong></td>
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<table>
<thead>
<tr>
<th></th>
<th>Population (10,000 persons)</th>
<th>Natural growth rate</th>
<th>Population Density (person/km²)</th>
<th>Total Households (10,000 persons)</th>
<th>Agricultural population (10,000 persons)</th>
<th>Non-agricultural Population (10,000 persons)</th>
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<td>Yunnan total</td>
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<td>111</td>
<td>1,083.1</td>
<td>3,662.4</td>
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<td>23.3</td>
<td>59.7</td>
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<td>7.0</td>
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<td>4.7</td>
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<td>Menghai</td>
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<td>7.0</td>
<td>12.7</td>
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<td>17.7</td>
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<td>12.7</td>
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<td>Diquing Prefecture</td>
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<td>14.1 (lowest in Yunnan)</td>
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<td>3.3</td>
<td>10.8</td>
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<td>1.3</td>
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<td>0.7</td>
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<td>13.3</td>
<td>3.4</td>
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<td>1.2</td>
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Table 7. Per capita gross domestic product (GDP) and per capita net income of farmers (2003)

<table>
<thead>
<tr>
<th></th>
<th>Per Capita GDP (Yuan/person)</th>
<th>Per Capital Government Revenue (Yuan/person)</th>
<th>Per Capita Net Income of Farmers (Yuan/person)</th>
</tr>
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<tbody>
<tr>
<td>Yunnan total</td>
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<td>562</td>
<td>1,697</td>
</tr>
<tr>
<td>Xishuangbanna Prefecture</td>
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<td>1,910</td>
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<tr>
<td>Jinghong</td>
<td>8,627</td>
<td>435</td>
<td>2,111</td>
</tr>
<tr>
<td>Menghai</td>
<td>3,699</td>
<td>208</td>
<td>1,720</td>
</tr>
<tr>
<td>Mengla</td>
<td>7,367</td>
<td>463</td>
<td>1,981</td>
</tr>
<tr>
<td>Diquing Prefecture</td>
<td>3,880</td>
<td>280</td>
<td>1,116</td>
</tr>
<tr>
<td>Shangri-la</td>
<td>3,690</td>
<td>315</td>
<td>1,256</td>
</tr>
<tr>
<td>Deqin</td>
<td>2,544</td>
<td>138</td>
<td>1,059</td>
</tr>
<tr>
<td>Weixi</td>
<td>2,981</td>
<td>86</td>
<td>1,029</td>
</tr>
</tbody>
</table>


37. Agriculture in the Xishuangbanna area was developed at least 3,700 years ago. River basins, valleys, lowlands and hills, where tropical seasonal rain forest was distributed, were cultivated first. Shifting cultivation was practiced by a small number of mountain tribes on a small scale. Dry land rice is one of the main crops grown under shifting cultivation in Xishuangbanna. Menghai county has the largest area under shifting cultivation. Rubber and tea make up 88% of local cash crop plantations (in 1998).

G. Ongoing and Planned Projects

1. National and regional level programs and projects

38. Convention on Biological Diversity (CBD) implementation has been underway in the PRC since it entered into force in 1993. Together with other member organizations of the coordination group, SEPA has been taking an active part in follow-up international activities.
Beginning 1996, the PRC played an active part in negotiating “Cartagena Protocol on Biosafety” under the CBD and signed the Protocol in August 2000. The legal process for ratification of the protocol is underway.

39. The China Biodiversity Partnership Framework (CBPF) with international collaborative funding from EU, UNDP and the Global Environment Facility (GEF) is being designed by the State Environment Protection Agency (SEPA) and will cover the whole of PRC. The partnership is to be built around a multi-level, multi-phase, multi-component, well-funded framework of activities for conserving biodiversity, many of which are new and innovative in the PRC. The CBPF will focus its activities on a strategic set of four inter-connected themes: (i) strengthening the overall enabling environment for biodiversity conservation; (ii) mainstreaming biodiversity conservation into socioeconomic sectors and development; (iii) protecting biodiversity inside protected areas, and (iv) protecting and sustainably utilizing biodiversity lying outside of protected areas. The CBPF will contain short-term measures to conserve and sustainably use biodiversity, and the longer term measures to modify the drivers of biodiversity loss. The partnership members will jointly take responsibility for implementing CBPF activities. Initially, the Chinese agencies represented in the CBDSC and some provincial governments will participate in the partnership. The following international agencies are also be invited to participate: ADB, GEF, UNDP, UNEP, World Bank, EU, SICP, IUCN, TNC, WWF, CI, BP, and UNF. There is already good collaboration with UNEP, EU, SICP, TNC, CI, WWF, and UNF. All the agencies have expressed a strong interest in wanting to participate in the CBPF and discussions are ongoing with IUCN.

40. The National Natural Forest Protection (NNFP) program and the Sloping Lands Re-conversion Programme (SLP) focus respectively on reducing erosion due to deforestation and the unsuitable cultivation of sloping lands. The combined national budget is $40 billion over 10 years. The NNFP provides subsidies to logging companies and local governments to stop logging, retrain loggers, and support reforestation and forest maintenance. For example, during 1998-2002, 315 million hectares of land was closed to logging under the NNFP. The main target groups for the SLP are individual households and farmers. Farmers are paid to convert agricultural land to forest (Grain-to-Green program) and are given the right to use the trees. About 3.8 million hectares of land were converted during 1998-2002. The State Forest Administration (SFA) is responsible for overseeing implementation of these two programs.

41. The Land Consolidation and Rehabilitation Programme includes two components: (i) Land Consolidation and (ii) Land Reclamation and Rehabilitation. The former restrains the conversion of land from traditional agriculture to industry and commits to the improvement of agricultural production, agriculture field quality, and ecological environment. The latter component focuses on recovery of land productivity and environmental improvement through land rehabilitation from land destruction caused, for example, by industrial production and natural disasters. From January 2001 to July 2003, funding of $597 million was arranged through different projects by central government with additional provincial financial input for the land consolidation and rehabilitation. It is anticipated that $40 billion will be invested by central government for the programme by 2010. The Ministry of Land and Resources is responsible for the implementation of the programme.

42. In 1998, the State Council issued the Environmental Ecological Construction Plan, and in 2000 the State Council issued the Guidelines on Ecological Environmental Protection. The

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6 Approximately 50% of the budget is provided by national government on the condition that the remainder is mobilized by local governments or from social sources.
Plan and the Guidelines, coming from the highest levels of government, provide both technical guidance and funding for ecological protection, including biodiversity conservation. In order to operationalize the guidelines, SEPA and SDPC introduced a new conservation tool: Ecological Functioning Conservation Areas (EFCA). The plan is to establish 110 EFCAs, 15 of national status. The EFCAs are established in critical ecological zones to stimulate environmentally friendly investments and combine nature conservation with development and poverty alleviation. Typically, EFCAs are large and may include several nature reserves as well as land allocated to agriculture, forestry, and other economic activities. The EFCA would aim to give a coherent guidance to land-use across the area. The EFCAs are an attempt to encourage sustainable utilisation of biodiversity (as opposed to strict protection), as well as to conserve biodiversity that lies outside nature reserves.

43. National and local government agencies are cooperating with international agencies to strengthen biodiversity conservation at many critical sites around the PRC. Most projects, including several financed by GEF through UNDP and the World Bank are focused on nature reserves and have secondary objectives related to disseminating lessons learnt and feeding experience into policies and national practices. These multi-level projects aim to demonstrate new practices and develop new biodiversity management technologies. Many include poverty alleviation components.

44. **Nature Reserves Management Project.** The GEF China Nature Reserves Management Project was carried out by the World Bank and the State Forestry Administration with a grant of $17.9 million from the World Bank and an appropriation of $5.7 million from the Chinese government. Major activities of the project were: (i) strengthening management of the nature reserves covered by the project by intensifying protection, planning and community participation; (ii) restructuring forestry enterprises, specifically turning the Changqing Forestry Bureau into a state-level nature reserve in Shaanxi; (iii) institutional capacity building, including establishment of national nature reserves system and training nature reserve employees; (iv) setting up an advanced biodiversity management information database and, a surveying and monitoring system, and providing equipment, and (v) supporting research in nature reserves including spatial techniques and equipment.

45. **Sustainable Forest Development Project, Protected Areas Management Component.** In 1998, the Chinese government and World Bank both agreed to include the “Forestry Sustainable Development Project” in a three-year rolling program, and specified that the project encompass three major items in content, management of natural forest, management of nature reserves, and afforestation. The “Management of Nature Reserves” plan assists in selection of nature reserves of global significance and in their participatory conservation and management. The project was carried out in 13 nature reserves in 7 provinces covering a total land area of 1.16 million ha. The budget of the project was $22.5 million–$16 million GEF funding and $6.5 million from the Chinese government.

46. **Wetland Biodiversity Conservation and Sustainable Use in the PRC.** The PRC has over 60 million ha of wetlands—25 million hectares natural and 38 million hectares paddy fields. About 40% of the wetlands of global significance are under medium or high threat according to the standard of the “The Wetlands Convention.” The project had a budget of over $30 million, $11.689 million from GEF, and $20.297 million from the Chinese government. The project chose four typical, but different wetlands of global significance—the Sanjiang Plain of Heilongjiang, the Ruoergai Marshes in Sichuan and Gansu provinces, the coastal swamps in Yancheng of Jiangsu Province, and Dongting Lake of Hunan Province.
47. Local governments in Yunnan and some other provinces have implemented some GEF biodiversity projects, e.g. GEF project of Multi-agency and Local Participatory Cooperation in Biodiversity Conservation, Yunnan’s Upland Ecosystem, launched jointly by the UNDP and Yunnan province in 2000 with a total budget of $750,000; the “IBRD/GEF Lake Dianchi Freshwater Biodiversity Restoration Project” launched in 2003 and to be implemented by the Kunming Zoology Institute, Chinese Academy of Sciences with a budget of $975,000; and the ADB/GEF Sanjiang Plain Wetlands Protection Project” launched in 2004 and to be implemented by ADB and the Heilongjiang Government with a budget of $12.14 million.

48. GEF also approved the Lop Nur Nature Sanctuary Biodiversity Conservation Project in October 1998 with a grant of $725,000, aiming to conserve the desert ecosystems and the unique landscape of Yardang wind-erosion and its rare and endangered species, especially wild dual hump camels, an endangered species unique to the PRC.

49. There is a bilateral cooperation between the EU and Chinese government, which calls for the EU to contribute 30 million Euro in the next 5 years for conservation and sustainable use of biodiversity in the PRC. The targets of the project are to: set up biodiversity management systems; review the policies, by-laws, and detailed rules for implementation of these policies, to ensure that decision-makers in various ministries and administrations merge biodiversity into their respective plans for socio-economic development, and set up demonstrations of conservation and sustainable use of biodiversity in provinces of the southwestern PRC.

50. In May 2001, the Sino-Canada Project of Biodiversity Conservation and Community Development in Inner Mongolia Autonomous Region was officially launched. The Canadian Government is to invest 6 million Canadian dollars in the five-year cooperative project, covering conservation and management of biodiversity, environmental education, and improvement of the living standard of communities. The SEPA and the Environment Protection Bureau of the Inner Mongolia Autonomous Region are in charge of the project. It will be carried out in seven state-level nature reserves and local communities. The project is expected to finish by the end of 2005.

51. **Forest conservation and community development projects.** In the field of forest conservation, the PRC has a number of cooperative projects with Germany and other European countries. In May 1998, the PRC and the Netherlands started a project on “Forest Conservation and Community Development” in Yunnan aiming to protect the tropical and subtropical forest resources and the biodiversity, especially in Simao, Baoshan, Nuijiang, and Dehong. The project has set up 21 demonstration villages, prepared communities’ environment action plans and run environmental education seminars. Functions of the protected forests in these prefectures, counties and townships involved in the project have been strengthened and the overall management of the nature reserves and the 350,000 ha of forests in their neighborhood have improved significantly.

52. The Chinese Academy of Sciences has long been involved in extensive cooperation and communication with botanic gardens in other countries on conservation of biodiversity. For instance, the Beijing Botanic Garden has established relations with botanic gardens in over 30 countries for exchange of seeds; compiled “Flora of China” (25 volumes in total) in cooperation with the Missouri Botanic Garden of the USA, which took 15 years and $10 million; and carried out staff exchanges with the Chicago Botanic Garden of the USA, Kew Garden and Edinburgh Botanic Garden of the UK.
2. Yunnan and Xishuangbanna projects

53. The ADB-funded Bangkok-Kunming Road Project is a major infrastructure investment project being implemented in Yunnan and affecting the Prefecture of Xishuangbanna. Slight re-alignment to the original plans now takes the highway close to the Mengla NR but not bisecting it as initially envisaged.

54. The GTZ-funded a Tropical Forest Ecosystems Management Project (as a TA) in Xishuangbanna between 1997–2004 focusing on protection of Xishuangbanna's tropical forest ecosystems by involving Government institutions and villagers in joint management of natural resources in pilot sites. Project partners were (i) Forestry Bureau, (ii) Xishuangbanna National Nature Reserve Bureau, and (iii) Nabanhe Prefectural Nature Reserve Bureau. It was planned that funds would come from several sources such as the poverty alleviation offices (fu ping ban), township government budgets, and from the Natural Forest Program in Xishuangbanna. Lessons learned from this project were: (i) negative impact on biodiversity by conversion of natural forest to rubber plantations or sugar cane and other cash crops; (ii) leasing of land from villages for conversion by state agriculture farms and private investors; (iii) no diversification within rubber plantations (mixed forest) to maintain biodiversity; (iv) lack of policy regulations or market mechanisms (incentives and disincentives) to promote mixed plantations (diversification); and (v) weak political commitment to protect the natural forest and biodiversity by giving priority to economic benefit goals at the cost of conservation. Although community-based protection and land use concepts do exist in the traditional land use systems of the ethnic minorities (in particular with Dai und Bulang), authorities did not build on these strengths.

55. Currently, there are no international NGOs operating in the Xishuangbanna Prefecture. However, international NGOs are operating elsewhere in Yunnan.

56. The Nature Conservancy is engaged in a large-scale ecoregional conservation project located in northwest Yunnan province. The project encompasses four prefectures and 15 counties, an area of approximately 66,000 km². The Yunnan Provincial Government and TNC committed $5 million to the project over five years, beginning in 1997. The project includes five modules, (i) biodiversity protection; (ii) cultural resource protection; (iii) sustainable economic development; (iv) regional planning; and (v) geographic information system mapping. As part of this project, a regional conservation and development action plan and an ecoregional conservation plan have been developed. Current activities are focused on conservation management activities and sustainable development initiatives in Meilixueshan/Kawagebo in Deqin county, Laojunshan in Lijiang, Jianchuan and Lanping counties, Nujiang Grand Canyon in Gongshan, Fugong and Lishui counties, and Lashihai Watershed in Lijiang county. In particular, alternative energy and sustainable tourism are the focus in the Meili Snow Mountain project in Deqin county.

57. In 2001, WWF launched an "Economic Change, Poverty and Environment" project as a case study in Baimaxueshan Nature Reserve (Deqin County, Yunnan). Notable features of the ICDP work in the nature reserve are participatory planning, capacity building, and establishing marketing linkage for particular products (mushrooms). In Xishuangbanna, WWF attempted to undertake tiger conservation activities which have been phased out as habitat destruction and conversion made it difficult to maintain the tiger rangeland.

58. Wildlife Conservation Society has conducted reserve management training and environmental education projects in Yunnan.
59. IUCN’s geographical focus is the southwestern PRC. The Regional Forest Program has prepared project proposals on forest management in the southwestern PRC.

60. MacArthur Foundation’s focal area in Indo-Burma covers western Yunnan and southeastern Tibet. Since the mid-1990s, the MacArthur Foundation has funded a number of projects through WCS, Kunming Institute of Zoology, and the Tibet Forestry Department on environmental education, biodiversity surveys, and training. The MacArthur Foundation has been funding pilot measures in selected villages around the Xishuangbanna NR to maintain community forests.

H. Policy and Legal Framework

61. At the highest level, the PRC’s efforts to conserve biodiversity have been guided by its Agenda 21 and the National Biodiversity Action Plan (both 1994). Initial attention focused on the establishment of a system of strictly protected areas (‘Nature Reserves’), on research and on responding to specific directives of the CBD. In February 2004, at the COP-7 meeting under the Convention on Biological Diversity (CBD), as a member of the Conference of the Parties, the Chinese Government adopted the Programme of Work on Protected Areas (UNEP/CBD/COP/7/21; Decision VII/28). The overall objective of the Programme of Work is to establish comprehensive, ecologically representative and effectively managed national and regional systems of protected areas by 2010 for terrestrial systems and 2012 for marine systems. In addition, the Programme of Work includes over 50 specific time-bound output targets.

62. Direct funding of the establishment and management of nature reserves was relatively small at about $4 million from central government in 1994, but increased rapidly in recent years to about $40 million in 2002. This does not include many government-funded activities that indirectly impact biodiversity, such as *ex situ* facilities and ecological engineering like reforestation, grassland rehabilitation and wetland restoration.

63. Over the years, the government has moved to establish a comprehensive legislative framework, including the Law on the Protection of Wild Animals (1989), the Environmental Protection Law (1982, amended in 2000), the Forestry Law (1985, amended in 1998), the Grassland Law (1985, 2002), the Marine Environmental Protection Law (1982, 2000), the Sand Prevention and Control Law (2002), the Fishery Law (1986, 2000), the Water and Soil Conservation Law (1991), and the Land Law (1986, 1999). The State Council has also issued some complementary administrative regulations such as the Regulation on Nature Reserves\(^7\) and the Regulation on Wild Plants Protection. Moreover, ministries concerned with environmental protection and natural resource management under the State Council as well as the people’s governments of provinces, municipalities and autonomous regions have promulgated departmental rules and local administrative regulations in line with the national laws.

64. The government has moved to strengthen the institutional arrangements for biodiversity conservation within the framework of environmental protection. The State Environmental Protection Administration (SEPA) takes the lead in coordinating biodiversity conservation, developing regulations and guidelines, monitoring, and in interactions with the UNCBD. Several inter-ministerial mechanisms and working groups have been established with specific

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\(^7\) Plans are underway to upgrade this regulation to a law.
mandates, the most important being the steering committee for the implementation of the CBD (CBDSC). This Committee, established by the State Council in 1993, is composed of 22 central government agencies and SEPA provides the secretariat for the CBDSC.

65. Several other government agencies play key roles in managing natural resources, and have responsibility for conserving biodiversity on the land they manage in line with relevant legislation. The most important agencies are the Ministry of Land and Resources (MLR), the State Forestry Administration (SFA), the Ministry of Agriculture (MoA), the State Oceanographic Administration (SOA), the Chinese Academy of Sciences (CAS), and the State Administration of Traditional Chinese Medicine (SATCM).

66. There have been some initiatives by local (provincial, county, and township) governments to protect biodiversity, including enforcing national policy and legislation, adopting local regulations in line with national legislation, and establishment of nature reserves. The depth and success of these initiatives varies from locality to locality. In general, policy and laws are issued at the national level and implementation is the duty of local governments. In cases when national policies are not clear or are conflicting, local governments can select priorities from amongst the many national objectives.

67. Generally, the national government provides initial infrastructure for the national reserves, whereas local governments must provide the operating costs, even for the national reserves. Ownership and management responsibility of the nature reserves is distributed across a range of national agencies - including SFA, SEPA, MOA, MLR and SOA. In recent years, the annual budget for nature reserves has grown rapidly and for the period 2001–2006, is approximately $350 million from central government. A range of ongoing efforts, many with support from international agencies are strengthening the management of individual nature reserves and the nature reserves system.

68. Most of the above initiatives adopt a protectionist approach to conserving biodiversity. The approach is to designate a biodiversity rich area for conserving and then attempt to implement a ban of all production or exploitive economic activities in the area. Often, the agency responsible for the protected area, such as the line ministries or the local government, is also responsible for production activities and for economic development in areas adjoining the reserve.

69. In addition to the nature reserve system, the national government has initiated several large-scale programmes related to nature and biodiversity conservation. Key decentralization initiatives with direct implications for the management of the biodiversity and forestry sector include:

- **Household responsibility system.** This process seeks to shift the centrally-planned and commune-based decision-making process to a household-based process, and to shift from a subsistence to a market-oriented economy in rural areas.

- **Village democratization process.** For the first time two landmark 1998 laws establish democratic elections of village committees (VC) and village leaders, placing new responsibilities/rights for managing local natural resources in the hands of VCs.

- **Collective forests.** Villages have been provided access to and management responsibilities for collective forests. Typically, these are a few hundred hectares in size, covering low-elevation forest in proximity to the village.
70. In 2000, the Yunnan Provincial Government also initiated a new strategy to build Yunnan as a national bridge linking the PRC to southeast Asia and South Asia as part of the PRC’s Western Development Strategy. A number of collaborative initiatives with Yunnan’s neighbors were undertaken as part of this overall strategy.

I. Proposal

1. Goal of project

71. The goal of the pilot project is to restore and maintain the ecological integrity of the Xishuangbanna national nature reserve complex through improved management of corridors and core zones for biodiversity conservation and watershed protection and development of sustainable use areas that are part of proposed biodiversity protection corridors connecting existing nature reserves (protected areas).

2. Objectives

72. The project has five objectives:

(i) Poverty alleviation through sustainable use of natural resources and development of livelihoods
(ii) Clear definition of optimal land uses and harmonised land management regimes
(iii) Restoration and maintenance of ecosystem connectivity
(iv) Capacity building in government staff and local communities
(v) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures.

3. Indicative pilot project activities

a. Poverty Reduction

(i) Update current socioeconomic profiles and assess levels of poverty in the corridor areas
(ii) Together with communities assess alternative livelihoods potential and livelihood improvement interventions (ecological farming, community forestry, etc.)
(iii) Explore specific market linkages in Xishuangbanna and build on existing studies conducted by the Yunnan Poverty Alleviation Office and other agencies
(iv) In the corridors, provide small grants to communities (villages) that can be set up as revolving accounts for village groups to manage
(v) Together with provincial and prefecture authorities identify incentives to promote natural forest protection and biodiversity conservation on competing land uses (e.g. rubber or other cash crop)
(vi) Assess wildlife and people conflicts and improve compensation system for damages
(vii) Develop strategic plan for Deqin county and integrate into local 11th five-year plan of social-economy
(viii) Update socioeconomic studies in Deqin County, conduct land use and zonation planning and identify poverty alleviation interventions supplementing on-going efforts
b. Land Use Planning and Management

(i) Review current land use planning and land use patterns and strengthen land use rights within corridors; review applicability Xishuangbanna corridors to the rest of the province

(ii) Together with provincial and prefecture authorities identify incentives to promote natural forest protection and biodiversity conservation on competing land uses (e.g. rubber or other cash crop); support provincial authorities in preparing a detailed land use and zoning plan for including socio-economic studies, future development options and strategic environmental assessments

(iii) Demarcate and delineate sustainable use corridors (experimental and multiple-use areas) that are surrounding nature reserves (core areas and buffer zones)

(iv) Identify and demarcate areas (e.g. along rivers and on steep slopes) that require soil erosion and other conservation and soil erosion protection measures

(v) Define, regulate, provide guidance and training, and enforce a percentage of community natural forest that must remain under conservation as opposed to conversion to cash crops

(vi) Formulate and secure approval for policy and legal regulatory framework for corridors

(vii) Update land cover data and classification

(viii) Establish linkage to ADB initiated regional energy analysis, strategy, and options study being undertaken in the GMS

c. Restoring Ecosystem Connectivity

(i) Promote landscape connectivity in key fragmentation points through natural regeneration and human assisted natural regeneration (including enrichment planting)

(ii) Reduce impacts at key landscape fragmentation points through strengthened enforcement

(iii) Carry out or update surveys with regard to maintaining viable populations of globally threatened plant and animal species especially large mammals

(iv) Undertake biodiversity assessment of the Mekong River Headwaters (basin–northern, central, and southern portions)

(v) Update existing data of forest trees and plants of economic value which have potential to contribute to local livelihoods

(vi) Monitor impact of interventions and evaluate corridor establishment;

(vii) Based on the results of monitoring and evaluation prepare an action plan to upscale corridor implementation as appropriate

(viii) Support the Biodiversity Action Plan of Yunnan

(ix) Undertake biodiversity assessments in the corridors

(x) Assess technical feasibility of proposed Mengsong NR

d. Capacity Building

(i) Strengthen the capacity of prefecture and county officials and key provincial and national level staff involved in corridor and protected areas management

(ii) Promote education and public awareness

(iii) Support efforts in strengthening the capacity of villagers to manage and protect forest and natural resources in the corridors and move towards effective
community based natural resource management (with co-management of some parts of protected areas and protected forests)

(iv) Implement capacity building activities in Deqin County in Yunnan Province and Guangxi province

(v) Set up database; unify information systems of BCI for PRC

e. **Sustainable Financing**

(i) Identify and assess feasibility and valuation of mechanisms for ecosystem services

(ii) Identify mechanisms relating to payment for ecosystem services (upstream transfer payments for protecting watersheds, incentives to keep natural forest areas intact) and implement such schemes

(iii) Assess feasibility of providing a percentage of fuel or other tax (natural resource tax) for Nature Reserve administration and promotion of biodiversity corridors

(iv) Identify international, regional, national and provincial level mechanisms for funding corridors and protected areas in the long-term

D. **Implementation Arrangements**

1. **Project management and coordination**

73. The institutional set up proposed for implementing the GMS BCI project in the period 2005–2008 is as follows:
74. The national steering committee will be chaired by SEPA and will have the representatives from MOF, PAOSC, MOA, SFA, CAS, and MOE. It will:

(i) Meet at least once a year
(ii) Approve work plans and budgets
(iii) Review project progress and provide guidance
(iv) Secure collaboration of relevant ministries
(v) Review proposals for additional project sites and seek government approval
75. The GMS BCI at national level will be located in SEPA. A national coordination office will be headed by a national coordinator with support staff. This unit will:

(i) Carry out overall national level coordination of all biodiversity corridor sites
(ii) Assist the provincial levels (Yunnan and Guangxi) to establish Project Implementation Units in pilot sites
(iii) Draw up annual work plans and budgets and seek approval from national steering committee
(iv) Maintain project accounts (in US$ and RMB) and produce financial reports
(v) Provide funds according to approved budget to provincial and prefecture PIUs
(vi) Recruit staff and contract national consultants and subcontract institutions for database management
(vii) In collaboration with provincial PIU acquire and update digital database of project area
(viii) Monitor and review progress on a half-yearly basis
(ix) Hold annual review workshop with all stakeholders
(x) Submit progress and financial reports to national steering committee on a half yearly basis
(xi) Organize field visits as and when required
(xii) Conduct study tours and organize training; document evaluations and lessons learned
(xiii) Raise awareness about the project and need for conservation within institutions and with public at large
(xiv) Review existing technical guidelines and standardize for all corridor work areas

76. The national technical advisory panel will consist of the following:
- Team leader (biodiversity expert)
- 1 environmental expert
- 2 biodiversity experts
- 1 planning expert
- 1 agricultural expert
- 1 forestry expert
- 1 social-economic expert
- 1 legislative expert
- 1 educational expert
- 1 monitoring and evaluation expert, and
- 2 International NGO representatives.

77. This working group will:

(i) Meet half yearly or as and when required
(ii) Review existing technical guidelines and standards and propose improvements
(iii) Provide advisory support to the National Coordination and Provincial Implementation Units
(iv) Screen or organize technical screening of project proposals
(v) Discuss and recommend complementary activities in support of the project
(vi) Promote biodiversity conservation activities at national level and feed experience into regional institutions
(vii) Document lessons learned from other projects for dissemination
78. The provincial implementation unit (PIU) at provincial level will be headed by EPB and will consist of EPB, DOF, DOA, DOLR, and DOF. The provincial PIU will have overall supervision and quality control aspects and report to the provincial steering committee. It will also receive budget proposals from the Prefecture Implementation Unit as well as technical and financial reports.

79. The prefecture implementation office (PIO), which will be attached to the Governor's Office at prefecture level, will be chaired by the Prefecture Governor with representation of County Governors. The technical day-to-day affairs will be run by a small team consisting of staff nominated from government departments, NGO(s) and national experts. The PIO will:

(i) Establish the operations of the unit comprising of head, project administrative assistant, and support staff
(ii) Prepare annual work plans and budgets and submit to provincial and national steering committee for approval
(iii) Maintain accounts and prepare financial statements
(iv) Request for consultant support from central and provincial units as and when required
(v) Liaise with other relevant departments at provincial level
(vi) Implement project activities
(vii) Inform Prefecture Governor's Office about project progress
(viii) Write progress reports and submit on a half yearly basis to the provincial and national units.

2. Project implementation partners

80. Building on existing efforts and investments on the ground, site specific activities in the Xishuangbanna Nature Reserves and corridors will be carried out by a team consisting of EPB, DOF, DOA, DOLR and DOF with technical support from the Xishuangbanna Tropical Botanical Garden and other local, national or international NGOs.

81. It is necessary that government departments at prefecture and provincial levels work in an integrated manner and coordinate activities as policy decisions that are supportive for biodiversity conservation in the reserves and the corridors need to be put in place and adhered to. A joint strategy for project implementation stipulating clear responsibilities in the form of an integrated plan of operations (see section below) needs to be drawn up that enables targeted and smooth implementation of activities in the pilot sites.

3. Operationalizing pilot site activities

82. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence.

83. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working Group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI regional coordination committee (RCC) with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).
84. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

85. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); and (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). A priority activity in the work plan will also be the provincial land-use and zoning exercise at provincial level. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

86. The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB or development partners and government will be guided by the plan of operations.

87. The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

88. On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

89. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities,
funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

90. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
The Tenasserim Biodiversity Conservation Corridors
Western Forest Complex - Kaeng Krachan Complex, Thailand

Pilot Project Profile (2005–2008)

April 2005
A. Project Context

1. Under the Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) currently being implemented as Asian Development Bank (ADB) regional technical assistance (RETA) 6213, biodiversity corridor pilot sites for 2005–2008 in each GMS country are to be selected based on the following criteria:

(i) Falling within GMS economic corridors or their zone of influence
(ii) Reducing ecosystem fragmentation by linking two or more protected areas
(iii) Areas of international biodiversity importance
(iv) Areas of high poverty incidence and population growth
(v) Being of a transboundary nature
(vi) Having institutional (state and nonstate) capacity on the ground that is currently active in implementing one or more projects

2. The proposed Thailand biodiversity conservation corridor is in the Tenasserim Range in western Thailand, between the Western Forest Complex (WEFCOM) and the Kaeng Krachan Complex (Map 1). To the west, both complexes border forested areas in Myanmar. This project profile provides background to the region and sets out the project objectives, indicative activities, and institutional arrangements.

Map 1. The Tenasserim range with WEFCOM and Kaeng Krachan complexes
B. Selection and Location of Pilot Sites

3. The two forest complexes proposed to be linked are located at the crossroads of four biogeographical zones: Indo-Chinese, Sino-Malayan, Indo-Burmese, and Eastern India. These biogeographical overlaps have provided a unique assemblage of Asian species and much of the basis for the designation of Huai Kha Khaeng and Thung Yai Naresuan wildlife sanctuaries (in the core area of WEFCOM) as United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage sites in 1991. These two complexes are situated in two important ecoregions in mainland Southeast Asia: the Kayah-Karen Montane Rain Forests and Tenasserim-South Thailand Semi-Evergreen Rain Forests. The distance between the two complexes is approximately 75 kilometers (km). This is largely covered by forest remnants.

C. Description of Pilot Project Corridor

4. Descriptions of each complex and the proposed corridor area follow.

1. Western Forest Complex

5. The WEFCOM comprises 17 protected areas. Six areas have been declared as wildlife sanctuaries, namely Salakpra, Huai Kha Khaeng, Thung Yai West and Thung Yai East, Khao Sanampriang and Umphang. In addition, there are 11 national parks, including Erawan, Sai Yok, Chalerm Rattanakosin, Khlong Lan, Sri Nakharin, Mae Wong, Khao Laem, Khlong Wang Chao, Phu Toey, Thong Pha Phum, and Lam Khlong Ngu (Annex 1). The last two units are still proposed as national parks. This complex covers six provinces in western Thailand: Kanchanaburi, Suphanburi, Uthaithani, Nakhon Sawan, Kamphaengphet, and Tak.

6. The section of the complex in Kanchanaburi Province occupies 9,975 km² or 51.26% of WEFCOM. In addition, approximately 4,478 km² or 23.01% of this protected forest complex is situated in Tak Province and 2,498 km² or 12.4% in Suphanburi Province. The remaining three provinces contain about 12% of the whole WEFCOM area. Currently, there are 17 headquarters and 145 ranger stations scattered in the WEFCOM area; most of them are situated in the buffer zone to the east of the complex.

2. Kaeng Krachan Forest Complex

7. The Kraeng Krachan Forest Complex is situated in Ratchaburi, Petchaburi, and Prachuab Kirikhan provinces to the south of WEFCOM. It comprises two adjoining protected areas, namely, the Mae Nam Phachi Wildlife Sanctuary and Kaeng Krachan National Park. The Kaeng Krachan National Park (2,915 km²) is located in Petchaburi and Prachuap Kirikhan provinces and includes an altitudinal zone ranging from lowlands to 1,300 m elevation. It is the largest national park in Thailand. Mae Nam Pachi Wildlife Sanctuary, 489.31 km², is located in Ratchaburi Province and was established in 1978, three years before Kaeng Krachan. The sanctuary lies to the north of Kaeng Krachan National Park and is contiguous with the park for much of its southern boundary. The wildlife sanctuary has the same habitat types, flora, and fauna as the larger national park and there is some movement of larger mammals and birds between the two areas. There are 2 headquarters and 26 ranger stations inside the complex and in the buffer zone. Of these, 18 ranger stations and one of the headquarters are within Kaeng Krachan National Park. The number of park officials and permanent rangers of both protected areas is similar despite the differences in size (Kaeng Krachan is almost 7 times the size of Mae Nam Pachi).
3. **Government plans and activities along the proposed corridor**

8. The plan (Map 2) and activities along the proposed biodiversity corridor (Map 3) are as follows:

**Map 2. Government plans in the Tenasserim Range Corridor**

9. The Department of National Parks will establish Chalerm Prakiat Thai Prachan National Park, covering approximately 400 km² in the Kaeng Krachan Complex. The proposed area comprises four fragmented forest patches, the largest patch covering about 290 km² situated in eastern Maenam Phachi and adjoining the northern part of Kaeng Krachan. The remaining 3 small patches of 17–60 km² are located in the north of Maenam Phachi; however, an area of approximately 35 km² between Maenam Phachi and the proposed national park will be revoked due to the presence of densely populated settlements.

10. The 3rd Regional Protected Area Administration Office (Banpong) has surveyed the remaining forests in southern Erawan National Park to be included in the national park. The total area covers approximately 300 km² in the reserve forest. The proposed extension also covers the area between the Royal Princess’s Project and the proposed extension national park, which is under the administration of the Royal Thai Army and covers 200 km².

11. Her Royal Highness Princess Sirindhorn is conducting the Royal Initiative Project on nature education. The project area adjoins the proposed Chalerm Prakiat Thai Prachan National Park. The west of the project site borders Myanmar.
4. Proposed 5 km, 10 km and 15 km corridors

12. The proposed conservation corridors include one of 5 km width and the other of 10 km (Map 3). In Phase I (2005–2008), the project will cover an area starting in the south with a 5 km buffer zone around the proposed Chalerm Prakiat NP and a 10 km wide stretch in the Royal Princess’s Project area. The remaining areas, including an extension up to 15 km wide will be covered in Phase II (2009–2011) and beyond.

Map 3. The proposed Tenasserim range corridor

13. The proposed 5 km corridor will cover 8 subdistricts in 4 districts in Kanchanaburi and Ratchaburi provinces. The four subdistricts are: Wang Krachae, Pong Ti, Sri Mong Kol, and Ban Kao. In Ratchaburi, all 3 subdistricts—Suan Puk, Tanawasee, and Ban Khai—are situated in Suan Puk District (Table 1). The 10 km corridor will cover 11 subdistricts of 4 districts in Kanchanaburi and Ratchaburi provinces. The eight subdistricts in Kanchanaburi are Sai Yok, Wang Krachae, Lum Sum, Pong Ti, Sri Mong Kol, Ban Kao, Chorakae Puek, and Makham Tia. In Ratchaburi, the three subdistricts are Suan Pung, Tanawasee, and Ban Khai, situated in Suan Puk District.
### Table 1. Subdistricts and populations in the Kraeng Krachan complex and proposed corridor

<table>
<thead>
<tr>
<th>Area</th>
<th>Province</th>
<th>District</th>
<th>Subdistrict</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kaeng Krachan Complex</strong></td>
<td>Ratchaburi</td>
<td>Suan Pung</td>
<td>Ban Kha</td>
<td>5,396</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ban Bung</td>
<td>5,221</td>
</tr>
<tr>
<td></td>
<td>Pak Tho</td>
<td></td>
<td>Yang Hak</td>
<td>3,994</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yang Nam Kad Tai</td>
<td>1,903</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yang Nam Kad Nue</td>
<td>1,394</td>
</tr>
<tr>
<td></td>
<td>Tha Yang</td>
<td></td>
<td>Khao Kra Puk</td>
<td>5,501</td>
</tr>
<tr>
<td></td>
<td>Kaeng Krachan</td>
<td>Huai Mae Priaew</td>
<td></td>
<td>2,223</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kaeng Krachan</td>
<td></td>
<td>4,503</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Song Pi Nong</td>
<td></td>
<td>2,274</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pa Teng</td>
<td></td>
<td>3,409</td>
</tr>
<tr>
<td></td>
<td>Hua Hin</td>
<td>Huai Sat Yai</td>
<td></td>
<td>3,744</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nong Plub</td>
<td></td>
<td>3,992</td>
</tr>
<tr>
<td><strong>5 km corridor</strong></td>
<td>Kanchanaburi</td>
<td>Sai Yok</td>
<td>Wang Krachae</td>
<td>3,547</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pong Ti</td>
<td>1,557</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sri Mong Kol</td>
<td>3,661</td>
</tr>
<tr>
<td></td>
<td>Muang</td>
<td></td>
<td>Ban Kao</td>
<td>6,765</td>
</tr>
<tr>
<td></td>
<td>Dan Makham Tea</td>
<td>Choralae Puek</td>
<td></td>
<td>5,598</td>
</tr>
<tr>
<td><strong>Ratchaburi</strong></td>
<td>Suan Pung</td>
<td>Suan Pung</td>
<td></td>
<td>3,182</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tanawsee</td>
<td></td>
<td>3,661</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ban Kha</td>
<td></td>
<td>5,396</td>
</tr>
<tr>
<td><strong>10 km corridor</strong></td>
<td>Kanchanaburi</td>
<td>Sai Yok</td>
<td>Sai Yok</td>
<td>3,038</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wang Krachae</td>
<td>3,547</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lum Sum</td>
<td>3,264</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pong Ti</td>
<td>1,557</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sri Mong Kol</td>
<td>3,661</td>
</tr>
<tr>
<td></td>
<td>Muang</td>
<td></td>
<td>Ban Kao</td>
<td>6,765</td>
</tr>
<tr>
<td></td>
<td>Dan Makham Tia</td>
<td>Choraka Puek</td>
<td></td>
<td>5,598</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Makham Tia</td>
<td>4,853</td>
</tr>
<tr>
<td><strong>Ratchaburi</strong></td>
<td>Suan Pung</td>
<td>Suan Pung</td>
<td></td>
<td>3,182</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tanawsee</td>
<td></td>
<td>3,661</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ban Kha</td>
<td></td>
<td>5,396</td>
</tr>
</tbody>
</table>
D. Biodiversity Values

14. The proposed conservation corridor joining the two fragmented protected forest complexes is of high conservation importance because the complexes are located at a high altitudinal gradient that constitutes a critical watershed for 6 of the 25 major basins in Thailand, including the Mae Ping, Sakae Krang, Tha Chin, Mae Khlong, Petchaburi, and West Peninsular (Maenam Tawan Tok) basins in western Thailand and also parts of the central region.

1. WEFCOM

15. The WEFCOM is one of the largest protected area complexes in Southeast Asia. It is recognized as a site of international importance for conservation of biodiversity. In 1991, Thung Yai-Huai Kha Khaeng became a World Heritage site. The sanctuary adjoins areas of near-pristine forest in Myanmar and has potential as a trans-frontier reserve (for a full listing of vegetation types in WEFCOM, see Annex 2).

16. Thung Yai-Huai Kha Khaeng may be one of the few protected areas in Thailand large enough to support some wide-ranging mammal species in the long term. The sanctuary is unique in supporting a diverse group of large mammal fauna, including 10 species of primates (all five of the region’s macaques), three bovids (banteng, gaur, wild water buffalo), elephants, tapir, and four of Thailand’s five deer species and mousedeer populations. The 27 carnivores recorded in the sanctuary represent 75% of the total carnivore population of Thailand and 63% of the carnivores of mainland Southeast Asia. The rich bird fauna represent about one third of the birds of mainland Southeast Asia and 57% of the resident forest birds of Thailand. The insect fauna are very rich, with abundant populations of dung beetle and hawkmoths found across the region.

17. The complex includes some of the most extensive limestone habitats in Thailand, supporting high species endemism. Limestone fauna include cave-dwelling bats (important as pollinators of fruit trees and predators of insect pests), swiftlets, limestone wren-babbler Nepothera crisiprons, Kanburi pit viper Trimeresurus kanburiensis, and the serow Capricornis sumatraensis. Cave fishes and invertebrates also show high levels of endemism. Two of Thailand’s endemic mammals, Kitti’s bumblebee bat (Craseonycteris thonglongyai) and Neill’s rat (Leopoldamys neilli) probably occur in the sanctuary.

18. Thung Yai-Huai Kha Khaeng has been an important site for biological research, with more than 70 research projects undertaken as well as extensive flora and fauna inventories. This provides valuable baseline data for monitoring and evaluation. A 50-hectare tree plot has been established as part of a region-wide study in forest regeneration and phenology. For more than 20 years the Khao Nang Rum Wildlife Research Station has served as the main nodal point for research in Huai Kha Khaeng.

19. Thung Yai-Huai Kha Khaeng has some important wetland sites, riverine forests, small lakes, ponds, and swamps. Seasonal wetlands and their associated habitats support at least 234 species of riparian or aquatic vertebrates.

20. In addition to its biological values, the protected areas in WEFCOM protect the watersheds of 4 of the 25 major rivers in Thailand: the Mae Ping, Sakae Krang, Tha Chin, Mae Khlong rivers and their tributaries. They provide water supply to two hydropower facilities: Srinakharin and Khao Laem. The Huai Kha Khaeng Wildlife Sanctuary entire watershed forest is
encompassed by the sanctuary. The two major rivers in the park are unique in Thailand because their lowland reaches have not been logged, dammed, or cleared for intensive agriculture. In 1987, the watersheds protected by the sanctuary were conservatively estimated to have been worth baht 344 million ($13.8 million) in water and soil protection to neighboring areas.

2. Kaeng Krachan

21. Kaeng Krachan National Park together with Mae Nam Pachi Wildlife Sanctuary in the north forms a large protected area complex with much of the natural evergreen forest intact (Table 2). The western section of the park is bordered by large expanses of relatively undisturbed forest in Myanmar. This effectively increases the conservation estate, allowing animals to move across the border and enhancing the biodiversity value of the area.

22. Kaeng Krachan and Mae Nam Pachi are linked by forests both in Thailand and Myanmar to the large Huai Kha Khaeng/Thung Yai Complex further north. This whole extended area with its high biological value is important for the protection of the Kaeng Krachan National Park and West Peninsular watershed.

### Table 2. Generalized Kaeng Krachan forest types assessed by DNP (2000)

<table>
<thead>
<tr>
<th>Forest type</th>
<th>Kaeng Krachan Complex (km²)</th>
<th>5 km buffer</th>
<th>10 km buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kaeng Krachan</td>
<td>Mae Nam Phachi</td>
<td>Total</td>
</tr>
<tr>
<td>Hill evergreen forest</td>
<td>106.94</td>
<td>89.41</td>
<td>196.35</td>
</tr>
<tr>
<td>Dry evergreen forest</td>
<td>811.83</td>
<td>7.72</td>
<td>819.55</td>
</tr>
<tr>
<td>Mixed deciduous forest</td>
<td>1,814.82</td>
<td>336.26</td>
<td>2,151.08</td>
</tr>
<tr>
<td>Dry dipterocarp forest</td>
<td>0</td>
<td>29.95</td>
<td>29.95</td>
</tr>
<tr>
<td>Bamboo</td>
<td>1.66</td>
<td>0</td>
<td>1.66</td>
</tr>
<tr>
<td>Plantation</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Secondary growth &amp; others</td>
<td>88.99</td>
<td>1.85</td>
<td>90.84</td>
</tr>
<tr>
<td>Agriculture</td>
<td>92.68</td>
<td>23.85</td>
<td>116.53</td>
</tr>
<tr>
<td>Total</td>
<td>2,916.92</td>
<td>489.04</td>
<td>3,405.96</td>
</tr>
</tbody>
</table>

DNP = National Parks, Wildlife and Plant Conservation Department; km² = square kilometer.

23. Forty-one mammal species are confirmed in Kaeng Krachan National Park; of which nine are vulnerable to habitat loss or are endangered. The population of elephants (*Elephas maximus*) was estimated to be 100–150 individuals in 1985, constituting one of the largest elephant populations in the country. There are unconfirmed reports of Sumatran rhinoceros (*Dicerorhinus sumatraensis*) in the complex. There are 220 bird species recorded from the complex, including four hornbill species. Rare species include the bar-backed partridge (*Arborophila brunneopectus*) and Kalij pheasant (*Lophura leacomelana*). The endangered woolly-necked stork (*Ciconia episcapus*), and the fresh water crocodile, recorded in Kaeng Krachan, are found in only one other protected area in Thailand.
3. Biodiversity values in the proposed corridors

24. About 57% of the proposed 5 km corridor is covered by mixed deciduous forest from the lowlands to the maximum altitude of 1,000 m. Dry evergreen forest and dry dipterocarp forest occupy about 10% and 8.7% of the linkage, respectively. Bamboo forest and hill evergreen forest together cover less than 4% of the total area. About 80% of the proposed 5 km conservation corridor is still under forest cover. The remaining 20% has been converted to upland crops and scattered settlements.

25. If the project aims to establish a 10-km wide conservation corridor, the percentage of remaining forest cover will substantially decrease, from 80% to 68% because the additional area in the east is mainly used for agriculture contains many human settlements. The coverage of dry evergreen forest, bamboo forest, and hill evergreen forest are similar but the spread of the mixed deciduous forest and dry dipterocarp forest almost doubles from the 5km corridor to 10km corridor. Further, the quality of additional forest cover may not be as high.

26. The status of wildlife in the proposed corridor has not been assessed, but park rangers and local people frequently observe elephant, sambar, and bear. Occasionally, tigers have been seen crossing the boundary of protected areas into nearby farmland.

E. Threats

27. The major threats to be addressed by establishment of the corridor area are

(i) forest clearing and subsequent land encroachment,
(ii) small-scale illegal logging,
(iii) influx of refugees and in-migration,
(iv) increasing settlement,
(v) habitat fragmentation,
(vi) forest fires and repeated burning leading to permanent ecosystem degradation, and
(vii) commercial and subsistence poaching and selling of wildlife products through cross-border trade.

F. Demographic and Poverty Profiles

1. WEFCOM

28. Based on rapid socioeconomic surveys to collect demographic inside the WEFCOM, it was found that there are 215 village clusters and subclusters inside and in the buffer zone of the WEFCOM areas, comprising 14,512 households and 68,997 people (Map 4).
29. A total of 112 communities are inside the protected areas (Table 3). These settlements include 5,436 households with 27,687 individuals. There are 103 villages located within 3 km of WEFCOM boundaries and most are settled along the western border of WEFCOM.
### Table 3. Subdistricts, villages, and population inside and outside the WEFCOM

<table>
<thead>
<tr>
<th>Name</th>
<th>Subdistrict</th>
<th>Inside Village/HH</th>
<th>Population</th>
<th>3 km Buffer Village/HH</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEFCOM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalerm</td>
<td>5</td>
<td>1/52</td>
<td>321</td>
<td>1/148</td>
<td>286</td>
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<td>Ratanakosin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erawan</td>
<td>4</td>
<td>14/214</td>
<td>990</td>
<td>5/451</td>
<td>1,556</td>
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<tr>
<td>Khao Laem</td>
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<td>6/679</td>
<td>2,708</td>
<td>6/837</td>
<td>4,085</td>
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<tr>
<td>Sri Nakharin</td>
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<td>Thong Pha Phum</td>
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<td>864</td>
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<td>226</td>
<td>2/296</td>
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<td>Salakpra</td>
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<td>2,671</td>
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<td>5,960</td>
<td>16/1,992</td>
<td>9,418</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>112/5,436</strong></td>
<td><strong>27,687</strong></td>
<td><strong>103/13,938</strong></td>
<td><strong>62,956</strong></td>
</tr>
</tbody>
</table>

HH = households; WEFCOM = Western Forest Complex.

Source: Data from WEFCOM and DNP (2004).

30. The Thais are the dominant ethnic group in this complex and constitute almost half (45.0%) of the total population. The rest are Karen (29%); Hmong (10.1%); nonresident groups, such as groups from Myanmar (12.6%); and others (2.3%). Table 3 shows numbers of population of villages selected for in-depth study, classified by ethnic groups in protected areas of WEFCOM. Typically most Thai and Hmong grow single cash crops, such as corn and sugar, for their income while rice is grown for their own consumption. Karen villages practice land rotation or shifting cultivation with the rotation period ranging from 3 to 10 years.

31. The Community Development Department (CDD), Ministry of Interior, regularly conducts a village socioeconomic census and summarizes the data at subdistrict, district, and provincial levels. The CDD has defined the poverty line at an average annual income per head of baht (B)
20,000 as the national standard level. If local people in villages earn less than this amount, they are classified as “poor” or below the poverty line. Local poverty at the subdistrict level of Kanchanaburi, Ratchaburi, and Petchaburi is shown in Map 5.

32. The results of rapid economic survey carried in the WEFCOM show that the average total income of villagers living inside and in the buffer zone from both agricultural and nonagricultural sources is B33,496 per household per year or about $800. However, this income is not equally distributed among sub-districts. For instance, all households in five subdistricts in Srisawat earn more than B20,000 per year, and there are 15 subdistricts with 80–99% of total households above the poverty line. However, there are three subdistricts (Rai Wo, Nong Lu and Plang Plae subdistricts in Sang Klaburi District) in which villagers earn limited income and are thereby listed as poor villages. The average annual incomes per head of Rai Wo and Nong Lu subdistricts are B10,123 and B16,990, respectively. Although the average income in Plang Plae is B22,859, there is a wide range of income among villages. Villagers in these areas are Karen minority who practice land rotation or shifting cultivation. Approximately 75% of households in Pi Lok subdistrict in Thong Pha Phum District and Sai Yok subdistrict in Sai Yok District earn more than B20,000 per year.
2. **Kaeng Krachan Complex**

Unlike the WEFCOM, the socioeconomic situation inside and around the buffer zone of the Kaeng Krachan Complex has not been studied in detail. Officials of Kaeng Krachan National Park conducted a preliminary population survey inside the park and along the periphery in 1998. The results are shown in Table 4. There were 16 villages with a total of 6,753 individuals residing inside the parks. Of these 16 villages, 4 were partially overlapping with the park areas and the rest were inside the park. There were 33 settlements with a total population of 15,478. Approximately two thirds of these villages were in the southwestern part of the park.

### Table 4. Number of villages and population residing inside and in the buffer zone of Kaeng Krachan National Park

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>District</th>
<th>Inside the Park</th>
<th>Buffer Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. villages</td>
<td>Population</td>
<td>No. villages</td>
</tr>
<tr>
<td>Petchaburi Province</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khao Krapu</td>
<td>Tha Yang</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Yang Nam Krad Tai</td>
<td>Nong Ya Plong</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>Yang Nam Krad Nue</td>
<td>Nong Ya Plong</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Kaeng Krachan</td>
<td>Kaeng Krachan</td>
<td>4</td>
<td>1,893</td>
</tr>
<tr>
<td>Song Pi Nong</td>
<td>Kaeng Krachan</td>
<td>1</td>
<td>726</td>
</tr>
<tr>
<td>Pa Teng</td>
<td>Kaeng Krachan</td>
<td>4</td>
<td>2,435</td>
</tr>
<tr>
<td>Huai Mae Pieng</td>
<td>Kaeng Krachan</td>
<td>4</td>
<td>1,540</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prachuap Khiri Khan Province</td>
<td>Hua Hin</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>Huai Sad Yai</td>
<td>Hua Hin</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td><strong>16</strong></td>
<td><strong>6,753</strong></td>
</tr>
</tbody>
</table>

Source: Kaeng Krachan National Park (1998)

34. The general social and economic census undertaken by the CDD in 2003 revealed that the average annual income of residents in five subdistricts was above the poverty line in 2003. Approximately 62–70% of the of the total households in Yang Hak in Pa Tho districts and Nong Plub in Hua Hin districts earned more than B20,000 per head per year.

3. **Demographic and poverty profiles in the proposed corridors**

35. For the Kaeng Krachan Complex, the general social and economic census undertaken by CDD in 2003 showed that there were 11,533 households with a population of 44,462 individuals in 11 subdistricts along the proposed corridors. Thanawasee (Tenasserim) subdistrict in Suan Pung was the only district in which all households earned income above the poverty line. The average annual household income in Ban Kha and Ban Pung subdistricts was more than B20,000, but there was significant disparity in the income spread among households; 85% of total households in Ban Kha and 75% of the total households in Bang Pung earned income above the poverty line.
G. Ongoing Programs, Projects, and Activities

36. At the proposed site, there are several ongoing programs and activities related to biodiversity conservation, protected areas, and natural resources management with national and international funding support. This section emphasizes the internationally funded projects.

36. The International Tropical Timber Organization (ITTO) Project on Integrated Buffer Zone Development for Sustainable Management of Tropical Forest Resources in Thailand is being implemented in the buffer zone of Kaeng Krachan National Park. The project objective is to achieve sustainability in the Kaeng Krachan Natural Resources and Environment Conservation Network. It is jointly implemented by the National Parks, Wildlife and Plant Conservation Department (DNP) and Thailand Environmental Institute (TEI). Phase I was completed in 2003 and the responsible agencies have proposed to ITTO a second phase for 3 years and are awaiting approval.

37. The Western Forest Complex Ecosystem Management Project or WEFCOM Project (1999–2003) was supported by Danish Cooperation for Environment and Development (DANCED) in capacity development at central and local levels for integrated ecosystem management of the 17 contiguous protected area units in the complex. Significant outputs are survey and analysis of key wildlife distribution in the WEFCOM landscape and ecosystem-based management zones. In January 2004, the Minister for Natural Resources and Environment agreed to collaborate with Myanmar for the second Transboundary Conservation Area (TBCA). Experience from these projects encourages the DNP to extend the ecosystem approach to the Dong Phyayen-Khao Yai forest complex, which embraces six protected areas.

38. The Joint Management of Protected Areas Project funded by Danish International Development Assistance (DANIDA) (2004–2008) promotes participatory approaches to protected area management with a view to securing both biodiversity conservation and improved livelihood of local communities. In the WEFCOM, there are two important activities: (i) formulation of a collaborative framework for ecosystem management by using the ecosystem-based management zones derived in phase I as a strategic guideline; and (ii) working with nongovernment organizations (NGOs) (Seub Nakhasatien Foundation) on participatory management, covering all villages in the WEFCOM, to resolve land-use conflicts through participatory and ecosystem management approaches.

39. The Wildlife Conservation Society (WCS) has worked intensively in Kaeng Krachan National Park in the last three years with park rangers and border patrol police on wildlife monitoring techniques and strategic patrolling to combat wildlife poaching. In recent years, monitoring of tiger and prey species has been conducted along the Petchaburi River inside the park. In addition, WCS is implementing a project on elephant-human conflict in the southern part of Kaeng Krachan National Park. In the core zone of WEFCOM, WCS has set up a long-term monitoring system for tiger populations and their prey, working in collaboration with the wildlife research station of DNP.

40. The Wildlife Research Section of the DNP is also monitoring large mammal distribution in the Royal Princess’s Project area north of Kaeng Krachan National Park.

41. A proposed Tenasserim Transboundary Biodiversity Conservation Project to be conducted jointly by the DNP Wildlife Conservation Office and University of Minnesota, USA, which involves cooperation with Myanmar, is under discussion.
42. The World Wide Fund for Nature (WWF-Thailand program) is carrying out collaborative monitoring of ungulates and participatory approaches to natural resource management, involving local communities in Thung Yai Naresuan Wildlife Sanctuary. In the buffer zone of Huai Kha Khaeng Wildlife Sanctuary, WWF is promoting environmental education in local schools and with local religious groups. In Kaeng Khachan and Kuiburi national parks, WWF is training protected area staff to develop community outreach units funded by WWF, Save the Tiger Fund, and the United States Fish and Wildlife Service (USFWS). In addition, in Kuiburi National Park, a working group is being set up to work on participatory management for elephant conservation, funded by USFWS and WWF. Discussions are underway with the Royal Thai Army to explore management options in a corridor between Kaeng Krachan and Kuiburi national parks, covering a forested area of 172 km².

H. Policy and Legal Framework

1. The Constitution of the Kingdom of Thailand

43. The Thailand’s Constitution enacted on 11 October B.E. 2540 (1997) states that “the state shall promote and encourage public participation in the preservation, maintenance and balanced exploitation of natural resources and biological diversity and in the promotion, maintenance and protection of quality of the environment in accordance with the persistent development principle as well as the control and elimination of pollution affecting public health, sanitary condition, welfare and quality of life.”


44. The Thai Forestry Sector Master Plan (TFSMP) was formulated in 1993 by the Royal Forestry Department and was endorsed by the National Forest Policy Committee. The TSFMP provides general guidelines for long-term forest development. Policy and land management guidelines for forestry are as follows:

(i) All state forestlands will be allocated for management in the following sequence of priority:
   - Remaining natural forests for the conservation of biodiversity protection of critical watersheds and multipurpose forestry
   - Deforested lands outside protected areas for land reform and to be leased for agriculture and tree farming

(ii) The state will support the use of private land for forestry purposes.

45. In addition, a section on conservation of ecosystems and biodiversity outlines programs for action as follows:

(i) Demarcation of all protected areas
(ii) Local people involvement and participation in conservation management through buffer zone management and conservation education
(iii) Natural resources rights and land reform to provide leaseholds in buffer zones and production forest
(iv) Support to local communities to encourage resettlement and out-migration from protected areas, etc.

46. The Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality (1997–2016) was submitted by the National Environmental Board to the cabinet for approval on 26 November 1996, and has been adopted as a policy guideline by the Minister of Natural Resources and Environment.

47. The policy targets for forest resources are as follows:
   (i) Protect 50% of country as forest cover; of which at least 30% is designated as conservation forest, and the remaining 20% as economic forest
   (ii) Utilize forest resources based on maintaining balanced ecosystems and environmental quality
   (iii) Conserve biodiversity sustainability.

4. The Ninth National Economic and Social Development Plan (NESDP) 2002–2006

48. The NESDP is a strategic plan that serves as a framework for medium-term national development consistent with the long-term vision of the Government. It builds on the Eighth Plan that advocated a holistic people-centered development approach. In the Ninth Plan, major emphasis is placed on balanced development of human, social, economic, and environmental resources. A priority goal is pursuance of good governance at all levels of Thai society in order to achieve real, sustainable people-centered development. The NESDP also sets the goals on forest resources as follows:
   - Forest reserves shall cover an area not less than 25% of the whole kingdom
   - Economic or production forest shall cover an area of 15% of the country

5. Thailand National Forest Policy

49. The cabinet adopted the Thailand National Forest Policy on 3 December 1985. Key provisions include the following:
   - Long-term guidelines for forest management and development shall be established to maximize national social and economic benefits as well as national security
   - Forty percent of the country area shall be kept under forest (25% protected forest and 15% production forest)

50. The protected forest should be kept for nature conservation, recreation, and environmental quality protection. Production forest should be designated for timber and other forest products.

6. Major laws governing the forestry sector

51. Enhancement and Conservation of National Environment Quality Act, 1992. This act establishes ecologically sensitive areas (e.g., sensitive to soil erosion or landslide) outside existing national parks or wildlife sanctuaries as environmentally protected areas. It also establishes the environmental impact assessment system, which applies to mitigation measures to reduce soil erosion caused from any development projects.

52. Forest Act, 1960. The Forest Act defines land that is not officially occupied by the private sector or individuals and prohibits the holding and conversion of forestland.

53. Forest Reserve Act, 1964. The national forest reserve was classified into 3 zones (A,E,C): A) agriculture, E) economic forest, and C) conservation forest. Zone A has been
allocated to landless farmers under the Land Reform Program. In addition, soil and water conservation practices are promoted in Zone A. Agriculture is prohibited in Zones E and C.

54. **National Park Act, 1961.** Land defined as national park is not allowed to be used for cultivation. Rehabilitation of degraded forest using native species is promoted.

55. **Wildlife Preservation and Protection Act, 1992.** Land defined as wildlife sanctuary is not allowed to be used for cultivation or modified. Rehabilitation of degraded forest and habitat manipulation for wildlife management are promoted.

56. **Reforestation Act, 1992.** This act supports reforestation of restricted tree species, such as teak and dipterocarps, by the private sector on private land. The act also describes the types of land on which forest plantations may be registered and established.

57. **Cabinet Resolution dated 30 June 1998 on Resolving Land Issues in Forest Areas.** This resolution was issued as a means of solving the conflict between the Royal Forestry Department (RFD) and communities in forestland, including protected areas and other types of restricted areas. The key provisions specify that

   (i) There shall be no issuance of agricultural land titles inside protected areas

   (ii) RFD is charged with identifying and registering all occupants in protected areas and establishing their date of origin inside the area. RFD shall define an occupation boundary for households/community. There shall be no expansion of settlements outside this boundary. In case it is proven that a household or community settled in the area after the area was gazetted, RFD shall either

       • relocate the households to a new area and provide initial subsidies to enhance alternative income generation; or

       • if no land is available for resettlement, forbid all further expansion and seek to support the existing livelihoods.

   (iii) In upland areas, government development agencies seeking to promote upland development should take notice of protected area restrictions and initiate only low-impact activities.

I. **Proposal**

1. **Goal of project**

58. The goal of the Tenasserim corridor is to enhance the ecological integrity of and facilitate landscape-scale species movement within and between the WEFCOM and Kaeng Krachan Forest Complex through improved management of core zones and sustainable-use areas, demonstrating a model that can be scaled-up and replicated at the national level.

2. **Objectives**

59. The project has five objectives:

   (i) Restoration and maintenance of ecosystem connectivity

   (ii) Capacity building in government staff and local communities

   (iii) Clear definition of optimal land uses and harmonized land management regimes

   (iv) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures
3. **Indicative pilot project activities**

a. **Poverty Reduction**

(i) Introduce alternative agricultural practices that are environmentally friendly and with appropriate technology support and demonstration as implemented by Her Royal Princess’s Project (Royal Queen’s Project)

(ii) Community-based natural resource management

(iii) Comanagement in the proposed extension area in selected villages (PAAO 3)

(iv) Support the establishment of community forests outside protected areas (RFD)

(v) Establish village development and poverty reduction funds (in phase II)

(vi) Promote exchange and learning between communities within the corridor (PAAO 3)

(vii) Promote village/local community participation in protected area committees regarding stewardship and rights over resources, fodder, and forest fire prevention (PAAO 3)

(viii) Review, update, and carry out additional socioeconomic/livelihood assessments in the corridor

(ix) Undertake a study of nontimber forest products (including medicinal and edible plants) that have potential to contribute to local livelihoods

b. **Land-use Planning and Management**

(i) Review land-use planning, land allocation, and land tenure issues already undertaken and encourage concerned parties (RFD, Royal Thai Army, provinces, etc) to be involved (provincial authorities and PAAO 3)

(ii) Demarcate proposed protected area extensions (PAAO 3)

(iii) Conduct rapid assessment on target landscape species both inside and outside protected area complexes and proposed corridors for future demarcation, and conduct long-term monitoring (universities and NGOs)

(iv) Update land cover data and classification, assess and predict land-use changes in the Tenasserim landscape, and identify the key factors; maintain a geographic information system and management information system to support protected area staff and decision makers (DNP)

(v) Conduct landscape-level analysis and formulate a bioregional management plan, covering the core zone, buffer zone, corridor, and landscape matrix in a framework of transboundary biodiversity conservation areas with Myanmar (DNP and PAAO 3)

(vi) As part of the land-use planning process, conduct a feasibility study into ecotourism and agricultural tourism development and design activities for the next phase of the project

(vii) Formulate and secure approval for policy and legal regulatory framework for corridors (DNP)

(viii) Conduct long-term monitoring of water regime and distribution in target watersheds (DNP)

(v) Poverty alleviation through sustainable use of natural resources and development of livelihoods
c. Restoring Ecosystem Connectivity

(i) Identify critical corridor areas or stepping stones within and between the two complexes to facilitate movement of selected key landscape species (PAAO 3 and NGO)
(ii) Evaluate the status of genetic resources in the Tenesserim Range and relate with data in other GMS countries (DNP)
(iii) Improve water resource availability (e.g., check dams) for local villages and fire prevention (PAAO 3)
(iv) Promote landscape connectivity in key fragmentation points through targeted reforestation/enrichment planting of native species or natural regeneration (PAAO 3)
(v) Reduce impacts at key landscape fragmentation points through strengthened enforcement and provision of incentives to local people (PAAO 3)
(vi) Limit the impact of large infrastructure developments in strategically identified ecologically important locations (e.g., realignment of roads) (PAAO 3)
(vii) Collaborate with border patrol police and military to control commercial wildlife poaching and illegal logging (DNP)
(viii) Monitor impact of interventions and evaluate corridor establishment (universities and NGOs)
(ix) Based on the results of monitoring and evaluation, prepare an action plan to scale-up corridor implementation as appropriate and replicate the model in other sites (DNP)

d. Capacity Building

(i) Strengthen the capacity of central and regional staff through a training program and field studies (DNP, universities, NGOs)
(ii) Organize training study tour(s) for senior staff and superintendents of protected areas to gain experience of other biodiversity conservation corridor projects overseas and visit other corridor initiatives in the GMS (DNP)
(iii) Conduct training workshops related to biodiversity conservation corridors for ground staff and stakeholders at the local level (universities and NGOs)
(iv) Support efforts in strengthening the capacity of villagers to manage and protect forest and natural resources in the corridors and move toward effective community-based natural resource management (with comanagement of some parts of protected areas and protected forests) (universities and NGOs)
(v) Establish and strengthen the existing nature education center in order to raise awareness in schools and nearby communities through mobile units (DNP and NGOs)
(vi) Continue cooperation with Myanmar through mutual visits and invite Myanmar staff to attend training sessions (DNP and NGOs)

e. Sustainable Financing

60. Pilot the establishment of a regional fund and funds for specific protected areas and protected forests (DNP and GMS regional project unit)
J. Implementation Arrangements

1. Project management and coordination

61. The institutional setup proposed for implementing the BCI in 2005–2008 is as follows:

Central Level:

- National Steering Committee (DNP, MONRE, ONEP, DEQP, DLA – MoI, DoA, RFD)

- National Coordination Unit (DNP)
  - National Coordinator
  - Project Assistant

Regional Level:

- Project Office
  - Project Manager
  - 2 Assistants
  - Accountant
  - Support Staff

- Regional Advisory Committee
  - Director, Protected Area Administration Office (PAAO 3)
  - DNP Representative
  - Provincial Representatives
  - NGOs (local+international)

Western Forest Complex, Kaeng Krachan and within and between Tenasserim Corridor (Kanchanaburi/Ratchaburi/Petchaburi)

DEQP = Department of Environmental Quality Promotion; DNP = Department of National Parks, Wildlife and Plant Conservation Department; DOA = Department of Agriculture; MOL = Ministry of Labor and Social Welfare; MONRE = Ministry of Natural Resources and Environment; NGO = nongovernment organization; ONEP = Office of Natural Resources and Environmental Policy and Planning; RFD = Royal Forestry Department.

62. The national steering committee will be chaired by the director general of DNP and the vice-chair will be the deputy director general of DNP. Its functions are as follows:

(i) Meet at least twice a year
(ii) Approve work plans and budgets
(iii) Review project progress and provide guidance
(iv) Secure collaboration of relevant ministries
(v) Review proposals for additional project sites and seek government approval
63. The national coordination unit will be headed by a coordinator from DNP and have the following functions:

(i) Establish the national coordination unit within DNP
(ii) Assist the regional level to establish a project office in pilot site(s)
(iii) Draw up annual work plans and budgets and seek approval from the national steering committee
(iv) Maintain project accounts (in US$ and baht) and produce financial reports
(v) Provide funds according to approved budget to project office(s)
(vi) Recruit staff and contract national consultants
(vii) Manage the database and update records; in collaboration with the regional project office acquire and update a digital database of the project area
(viii) Monitor and review progress on a half-yearly basis
(ix) Hold an annual review workshop with all stakeholders
(x) Submit progress and financial reports to national steering committee on a half-yearly basis
(xi) Organize field visits as and when required
(xii) Conduct study tours and organize training; document evaluations and lessons learned
(xiii) Raise awareness about the project and need for conservation in institutions and with the public at large
(xiv) Review existing technical guidelines and standardize for all corridor areas

64. The national technical advisory group will consist of representatives from international and national NGOs, and research and academic institutions. The group will select the chairperson and the national coordination unit will be secretariat of the group. This working group will have the following functions:

(i) Meet half-yearly or as and when required
(ii) Review existing technical guidelines and standards and propose improvements
(iii) Provide technical advisory support to the national coordination unit
(iv) Screen or organize technical screening of project proposals
(v) Discuss proposals (including training and capacity building) made by the national coordination unit and recommend them to the national steering committee
(vi) Promote national biodiversity conservation activities and pass on these experiences to regional institutions
(vii) Facilitate workshops/seminars to share experiences and disseminate lessons learned

65. The regional project office will be headed by a project manager appointed by the director general of the DNP. The project office has the following roles:

(i) Establish a project office comprising of technical and support staff
(ii) Prepare annual work plans and budgets and submit them to the national coordination unit for approval
(iii) Maintain accounts and prepare financial statements
(iv) Request consultant support from the national coordination unit
(v) Liaise with other relevant departments at the provincial level
(vi) Implement project activities in collaboration with government and nongovernment agencies
(vii) Write progress reports and submit them on a half-yearly basis to the national coordination unit

66. The regional advisory committee will be chaired by the director of DNP (PAAO 3) and have the following functions:

(i) Provide guidance on implementation at the provincial level
(ii) Resolve conflicts
(iii) Assist the project office in developing work plans and budgets
(iv) Identify training and capacity-building needs and propose training
(v) Indicate any issues that require resolution at the national level

2. Project implementation partners

67. Building on existing efforts and investments, such as the Royal Princess’s project, site-specific activities in the WEFCOM-Tenasserim range will be carried out by DNP with technical support from existing state and nonstate (NGOs and universities, Regional Community Forestry Training Center, Seub Foundation, WCS, WWF, etc.) partners in collaboration with provincial authorities.

68. It is important that the project office at pilot-site level, government institutions at the regional and provincial level, and the collaborating NGOs draw up a joint plan of operations (see below) stipulating clear and targeted activities with responsibilities in the pilot sites.

3. Operationalizing pilot site activities

69. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence (no objection).

70. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI Regional Coordination Committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

71. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

72. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the
plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). A priority activity in the work plan will also be the provincial land-use and zoning exercise at provincial level. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.

73. The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB or development partners and government will be guided by the plan of operations.

74. The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

75. On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

76. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

77. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee as well as hold a program orientation workshop to launch pilot site activities. Six-monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
ANNEX 1. Summary of background information of fragmented protected areas in WEFCOM and Kaeng Krachan Complexes

<table>
<thead>
<tr>
<th>Name</th>
<th>Province(s)</th>
<th>Date of gazetting</th>
<th>Size (km²) ¹/</th>
<th>HQ &amp; RSt. ²/</th>
<th>Officials</th>
<th>Permanent Rangers</th>
<th>Management plan</th>
<th>Ecoregions ³/</th>
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Notes: 1/ Official area in the Royal Gazette; 2/ Ranger Station; 3/ Name of ecoregion defined by the WWF IM0119 - Kayah-Karen montane rain forests ecoregion; IM0163 - Tenasserim-South Thailand Semi-evergreen rain forests
## ANNEX 2. Vegetation types and percentage of vegetation in each protected area of the WEFCOM

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<th>MF</th>
<th>PF</th>
<th>SIF</th>
<th>DDF</th>
<th>MDF</th>
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<td>3.84</td>
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<td>1.34</td>
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| Total (%)            | 7.28 | 5.44 | 0.07 | 0.04 | 0.02 | 2.12 | 31.88 | 15.97 | 20.31 | 4.09 | 1.62 | 6.32 | 0.30 | 3.76 | 100.00 |
| Total (km²)          | 1410 | 1053 | 14.33 | 7.99 | 3.92 | 410 | 6172 | 3092 | 3933 | 792 | 314 | 1224 | 58.49 | 728 | 19363 |

Note: 1/ area calculated by GIS
### ANNEX 3. Number of households, average annual income and % of household in sub-district above poverty line

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<th>Sub-district</th>
<th>District</th>
<th>Ann. Income Baht</th>
<th>Household No. HH</th>
<th>Above poverty line %</th>
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<td></td>
</tr>
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<td>Mung</td>
<td>28,628</td>
<td>590</td>
<td>585</td>
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<td>1,213</td>
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<td>Thong Pha Phum</td>
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Note: 1/ Average annual income per head, baht 40 ~ $1
A. Project Context

1. Under the Greater Mekong Subregion (GMS) Biodiversity Conservation Corridors Initiative (BCI) currently being implemented as Asian Development Bank (ADB) regional technical assistance (RETA) 6213, biodiversity corridor pilot sites for 2005-2008 in each GMS country are to be selected based on the following criteria:

   (i) Falling within GMS economic corridors or their zone of influence
   (ii) Reducing ecosystem fragmentation by linking two or more protected areas
   (iii) Areas of international biodiversity importance
   (iv) Areas of high poverty incidence and population growth
   (v) Being of a transboundary nature
   (vi) Having institutional (state and nonstate) capacity on the ground that is currently active in implementing one or more projects.

2. In Viet Nam, the Central Annamites is ranked as a “critically important” landscape because of its unique assemblages of species representing one of the world’s most important areas of biodiversity, having the highest levels of endemism in a continental setting. The landscape is highly threatened by habitat fragmentation, primarily due to the construction of roads and their resultant impacts. The landscape is bisected by two sections of the east-west economic corridor and the Ho Chi Minh Highway in Viet Nam cuts through the landscape.

3. Being threatened in many places, the forested landscape of the Central Annamites requires a comprehensive strategy to mitigate habitat fragmentation (Map 1) and enhance forest connectivity. This document outlines a phased approach to ensuring the continuity of the central Truong Son landscape between 2006 and 2016.
4. The Central Annamites landscape is a focus of conservation attention for the governments of Viet Nam and the Lao PDR with support from international conservation organizations. This profile builds on ongoing work of the Government of Viet Nam in the central Truong Son biodiversity conservation initiative.

B. Selection and Location of Pilot Sites

5. The project is focused in Quang Nam Province (Map 2) and bordering areas of Thua Thien Hue and Kon Tum provinces of Viet Nam and Sekong and Attapeu provinces in the Lao PDR. Quang Nam is a central province of Viet Nam in the Indo-Malayan zoogeographic region and in the subunit Ma (Central Annamite Mountains). Three smaller ecoregions cover parts of the province: the Northern Viet Nam Lowland Rain Forest, the Southern Viet Nam Lowland Dry Forest, and the Southern Annamites Montane Rain Forest.

Map 2. Biodiversity corridors proposal in Viet Nam

6. In the Central Annamites, the initial investments (during Phase 1) will focus on the northern part of the landscapes, where the immediate threats are, for example, the roads with direct impacts in Quang Nam Province. Project phases (Table 1) are designed in sequence to tackle the areas of highest risk first, while not losing sight of the long-term goal of maintaining a continuous forest landscape. Table 2 shows the districts and communes covered by the project.

7. The successful implementation of all phases will ensure that
• connectivity of nine protected areas is made,
• the Central Annamites landscape remains intact,
• the Central Annamites landscape is connected to the Central Indochina Limestone landscape, and
• the Central Annamites remains connected to the tri-border landscape.

Table 1. Central Annamites corridor phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Province</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Quang Nam</td>
<td>Ngoc Linh-Song Thanh–Xe Sap–Ba Na</td>
</tr>
<tr>
<td>2005-2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 2</td>
<td>Quang Nam</td>
<td>Upscale Ngoc Linh-Song Thanh–Xe Sap–Ba Na</td>
</tr>
<tr>
<td>2009-2011</td>
<td>Thua-Thien Hue and Kon Tum</td>
<td>Bach Ma–Xe Sap–Phong Dien</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ngoc Linh–linking to Dong Ampham (Lao PDR)</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Quang Tri</td>
<td>Dak Rong–linking to Xe Sap–adjacent landscape</td>
</tr>
<tr>
<td>2012-2014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Provinces, districts and communes covered by the project phases

<table>
<thead>
<tr>
<th>Province</th>
<th>District</th>
<th>Communes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quang Nam</td>
<td>Tay Giang</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Dong Giang</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Nam Giang</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Phuoc Son</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Nam Tra My</td>
<td>6</td>
</tr>
<tr>
<td>Thua-Thien Hue</td>
<td>A’Luoi</td>
<td>10</td>
</tr>
<tr>
<td>Kon Tum</td>
<td>Dak Glei</td>
<td>6</td>
</tr>
<tr>
<td>Quang Tri</td>
<td>Dak Rong</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Huong Hoa</td>
<td>6</td>
</tr>
</tbody>
</table>

C. Description of Proposed Pilot Sites

8. Seven landscape connection corridors will be the focus of project conservation activities (Table 3) with five landscape fragmentation zones the focus of project restoration and protection activities (Table 4). Map 1 identifies the location of these areas.

Table 3. Landscape connection corridors of the Central Annamites

<table>
<thead>
<tr>
<th>Phase</th>
<th>Landscape connection corridor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>Song Thanh–Ba Na</td>
<td>Situated in three districts of Quang Nam (Nam, Tay and Dong Giang), this area is critical watershed for a suite of dam projects including Song Bung IV and A’Vuông. Bisected by the east-west economic corridor’s road 14D, this corridor links Song Thanh to Xe Sap, Bach Ma, Ba Na, and the Green Corridor area.</td>
</tr>
<tr>
<td>1 and 2</td>
<td>Ngoc Linh - Song Thanh</td>
<td>A small area of Phuoc Son District, Quang Nam Province</td>
</tr>
<tr>
<td>Phase</td>
<td>Landscape connection corridor</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>Xe Sap–Green Corridor</td>
<td>The area west of the HCMH in A’Luoi district, Thua-Thien Hue Province, this connection will join conservation activities in the Green Corridor to the Xe Sap allowing secure connections between Xe Sap, Phong Dien and Bach Ma PAs.</td>
</tr>
<tr>
<td>2</td>
<td>Ngoc Linh/Song Thanh–Dong Ampham</td>
<td>Situated within Dak Glei district of Kon Tum province this critical area lies in the transition zone between the Central Annamites and the tri-border forests. It is located within the ADB central highlands forestry project area and bisected by the HCMH.</td>
</tr>
<tr>
<td>3</td>
<td>Dak Rong–Xe Sap–adjacent landscape</td>
<td>Covering a proposed protected area bridge between the Central Annamites and the forested landscape to the north this area will ensure the connection between Dak Rong and Xe Sap through to the proposed Huong Hoa protected area in northern Quang Tri.</td>
</tr>
</tbody>
</table>

**ADB = Asian Development Bank; HCMH = Ho Chi Minh Highway; PA = protected area.**

**Source:** WWF Indochina–Viet Nam Programme

**Table 4. Landscape fragmentation zones of the Central Annamites**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Landscape fragmentation zones</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>Song Thanh–14D</td>
<td>Road 14D of the east-west economic corridor runs along the northern part of Song Thanh NR and through the core zone to the west. It may be diverted into the core zone due to the construction of the Song Bung IV dam. This dam project will supply compensatory forestry activities to reforest along the road and stabilize the surrounding slopes.</td>
</tr>
<tr>
<td>1 and 2</td>
<td>Song Thanh–HCMH</td>
<td>The HCMH poses a great threat to landscape connectivity, especially where it cuts through PAs. It bisects Song Thanh Natural Reserve in the south and reforestation activities are required to maintain connectivity.</td>
</tr>
<tr>
<td>1 and 2</td>
<td>Tay Giang/A’Luoi–HCMH</td>
<td>The HCMH poses a great threat to connectivity of this landscape also. This area is critical saola habitat and protection/reforestation work is required to conserve this species.</td>
</tr>
<tr>
<td>2</td>
<td>Ngoc Linh–HCMH</td>
<td>The HCMH poses a great threat to connectivity here, especially where it cuts through PAs. It bisects Ngoc Linh (Kon Tum) Nature Reserve in the south and reforestation activities are required to maintain connectivity.</td>
</tr>
<tr>
<td>3</td>
<td>Dak Rong–Huong Hoa</td>
<td>The east-west economic corridor bisects Quang Tri Province, although one section of the road has been put aside by the People’s Committee to ensure forest connectivity between Dak Rong Nature Reserve and the</td>
</tr>
</tbody>
</table>
Annex 3-5

<table>
<thead>
<tr>
<th>Phase</th>
<th>Landscape fragmentation zones</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>proposed Huong Hoa reserve. Support to this initiative will benefit conservation and mitigate the environmental effects of the economic corridor</td>
<td></td>
</tr>
</tbody>
</table>

HCMH = Ho Chi Minh Highway; PA = protected area
Source: WWF Indochina–Viet Nam Programme

D. Biodiversity Values

9. The proposed corridors are of high conservation importance. They are located at a large altitudinal gradient, constitute a critical watershed for major downstream development and dams, and are key links in the Central Annamites landscape.

10. The focal provinces contain a rich biodiversity. In Quang Nam1, 49 species of large mammal have been confirmed with an additional 12 provisionally recorded through interviews. Nine confirmed and two provisionally recorded large mammal species are classed by the World Conservation (IUCN) as globally threatened: vulnerable2. Additional large mammals are found in the greater landscape including gaur (Bos gaurus) and yellow-cheeked crested gibbon (Namascus gabriellae). Twenty two species of bat are confirmed. Of particular note are the recently discovered saola (Pseudoryx nghetinhensis), Annamite muntjac (Muntiacus truongsonensis), large-antlered muntjac (muntiacus vuquangensis), Annamite rabbit (Nesolagus timminsi), and grey-shanked douc (Pygathrix cinerea). All of these large mammals have been described since 1993 and are endemic to the Annamites with the grey-shanked douc being endemic to the southern Central Annamites in Viet Nam.

11. A total of 272 birds species are confirmed from Quang Nam, two of which are globally threatened: vulnerable – the crested argus (Rheinardia ocellata) and golden-winged laughing thrush (Garrulax ngoclisthensis). Two species described since 1999 are found in the landscape along with 14 range-restricted species (including the enigmatic Edward’s pheasant, Lophura edwardsii) covering two endemic bird areas and several bird areas classified as important.

12. Quang Nam has 48 taxa of reptiles, including six vulnerable species of turtle and 35 amphibians; one, the Annam flying frog (Rhacophorus annamensis), is globally threatened: vulnerable. The Annam leaf turtle (Mauremys annamensis) and Bourret’s box turtle (Cuora galbinifons bourreti) are both on the verge of extinction and endemic to the landscape, the former not known from a single field record.

13. There are 194 butterfly species in Quang Nam and tens more across the landscape. A total of 1,129 species of plant in 164 families have been identified in Quang Nam, and six are classified as globally threatened: vulnerable, most being valuable timber trees, and 47 species classed as vulnerable by the 2003 Viet Nam Red Data Book.

14. Natural forests of the Central Annamite landscape span some 17,175 square kilometers (km²) across an altitude range of 0–2,598 meters (m). Quang Nam has 4,259 km² of natural forest (Table 5) and almost as much bare land. The forests of Quang Nam are critical for watershed protection as the province receives annual floods causing millions of dollars of

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1 All Quang Nam data provided by WWF Indochina – Viet Nam Programme’s MOSIAC project
damage. Moreover a series of large and medium-sized dams are under construction or planned. Forest protection would bring significant economic and development returns.

Table 5. Forest and forestland in Quang Nam (km²)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Special-Use Forests</th>
<th>Protection Forest</th>
<th>Production Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest and forestland</td>
<td>7,948.9</td>
<td>1,161.4</td>
<td>5,145.5</td>
<td>1,641.9</td>
</tr>
<tr>
<td>A. Forested land</td>
<td>4,259.2</td>
<td>8,58.2</td>
<td>2,507.3</td>
<td>893.5</td>
</tr>
<tr>
<td>1. Natural forest</td>
<td>3,888.0</td>
<td>854.5</td>
<td>2,289.4</td>
<td>744.0</td>
</tr>
<tr>
<td>Woody forest</td>
<td>3,788.7</td>
<td>851.5</td>
<td>2,219.9</td>
<td>717.2</td>
</tr>
<tr>
<td>Bamboo forest</td>
<td>99.3</td>
<td>3.04</td>
<td>69.4</td>
<td>26.7</td>
</tr>
<tr>
<td>2. Plantation</td>
<td>3,71.1</td>
<td>3.68</td>
<td>217.9</td>
<td>149.5</td>
</tr>
<tr>
<td>B. Bare land</td>
<td>3,689.7</td>
<td>303.1</td>
<td>2,638.1</td>
<td>748.4</td>
</tr>
</tbody>
</table>

Source: Quang Nam FPD

E. Threats

15. Significant threats to biodiversity are:
   (i) Illegal hunting driven by the wildlife trade
   (ii) Illegal logging
   (iii) Infrastructure development: dams, roads
   (iv) Gold mining, and
   (v) Migration and development along roads

F. Demographic Profile

16. Some 8 million people live in the Central Annamites. The remoter, often mountainous areas, encompassing most of the priority conservation areas, are among the poorest in the country. Most of the groups in the mountainous areas are ethnic minority peoples, such as the Ka Tu, Bru, Pa Co, M’Nong, Gie Trieng, and Gia Rai. The Kinh people, Viet Nam’s majority ethnic group, dominate the lower-lying areas.

17. Ethnic minority peoples are geographically clustered. Although they represent only 30% of the national population they make up close to 100% of the population in Kon Tum, and some districts of Quang Nam and Thua-Thien Hue.

18. The population in the Central Annamites region includes 37 ethnic minority groups, although only 11 can be regarded as indigenous, having resided there for many generations. Nine percent are recent migrants, mainly settling in Gia Lai and Kon Tum.

19. During 1996–2000, the gross domestic product (GDP) in the region increased by over 9% annually; higher than the national average. The region still relies on agroforestry production, representing 50–60% of GDP, although in recent years the industrial sector has expanded dramatically, mainly through construction in urban areas and investment in infrastructure. Industrial crops, such as coffee, rubber, and pepper, are an important factor in GDP growth, but they are heavily dependent on export markets and international pricing. During 1999–2000, economic growth slowed in the Central Annamite provinces due to natural disasters, drought, and falling prices for agricultural products.
20. Dependence on forest resources varies from one ethnic group to another. Those poor minority communities located in remote mountainous areas are highly dependent on forest resources for their food production, building materials, handicraft material, and cultural practices. Many ethnic minority peoples still practice shifting cultivation (making it difficult to obtain "red-book" land ownership certificates). The Kinh majority is less forest-based although they also hunt and gather in the forests. More significantly, the Kinh practice permanent cultivation. Expansion of settlements and agricultural production have resulted in clearing large swathes of lowland forest, decreasing the area and biodiversity of critical habitat, and fragmenting forest cover.

21. Economic development has gradually reduced dependence on agriculture. Yet, progress has been slow, especially in predominantly agricultural provinces such as Kon Tum. Annual income per head is around $200, 70% of the national average, with Kon Tum the lowest at $170.

G. Ongoing Project and Conservation Activities

22. The Central Annamites Landscape was subject of a biological assessment (Tordoff et al., 2003) which resulted in a Ministry of Agriculture and Rural Development (MARD) landscape conservation plan that covers the region on the Vietnamese side.

23. **Quang Nam.** A provincial conservation strategy has been developed in Quang Nam with technical support from the WWF MOSAIC project, which runs until at least 2008. A provincial land allocation program is underway, providing community access to and protection rights over natural resources. Provincial action plans on law enforcement and education have been developed as part of a management plan for Song Thanh Nature Reserve. Working examples of community-based natural resource management (CBNRM) are being developed in 14 communes. Species surveys, monitoring, and protection systems are being developed. Training in natural resource management for government and communities is an integral part of all activities.

24. **Thua-Thien Hue.** Phong Dien Nature Reserve has support from the McArthur Foundation through the Hue Forest Protection Department until 2006. The four-year WWF Green Corridor project will develop a provincial conservation plan, land-use planning, species protection, strengthened enforcement, CBNRM, and land allocation to communities.

25. **Kon Tum.** Ngoc Linh (Kon Tum) Nature Reserve has developed an operational management plan for submission to the Global Environment Facility (GEF) Viet Nam Conservation Fund. The district covered by the corridors initiative is also a focal district for the Asian Development Bank (ADB) community forestry project.

26. **Quang Tri.** Dak Rong Nature Reserve has received three years support from the McArthur Foundation. BirdLife International work in all forested areas of the province and is planning to scale-up activities in the future.

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H. Policy and Legal Framework

27. Following are major national plans and programs with implications for the proposed pilot site project.

28. **Comprehensive Poverty Reduction and Growth Strategy (CPRGS).** This is an action plan that translates the Government’s Ten-Year Socio-economic Development Strategy, Five-Year Socio-economic Development Plan, and other sectoral development plans into concrete measures with well-defined road maps for implementation. The plan has economic growth and poverty reduction objectives. The CPRGS is closely related to the national annual socioeconomic development plans and the plans developed by different ministries, agencies, and sectors. The national annual socioeconomic development plan that is passed by the National Assembly serves a tool for bringing the policies and measures contained in the CPRGS into practice.

29. The CPRGS has important linkages and intersects with the Government’s current Ten-Year Socio-Economic Development Strategy (2001–2010) and accompanying Five Year Development Plan (2001–2005). In addition, it also shares many common objectives with the Hunger Eradication and Poverty Reduction (Program 133) and the program on Socio-Economic Development in Communes with Extreme Difficulties (Program 135).

30. **Biodiversity Action Plan.** The Government drafted the 1995 Biodiversity Action Plan (BAP), which maps out broad strategies for strengthening institutional capacity in the management of protected area, wetlands, and biological diversity in general. These strategies are consistent with the obligations of Viet Nam under the 1992 UN Convention on Biological Diversity (CBD). A new ten-year BAP is under preparation.

31. **National Environment Protection Strategy (NEPS).** The NEPS provides the policy orientation for national environment protection up to 2020 and is an integral part of Viet Nam’s Socio-Economy Development Strategy. It aims to (i) slow down the growth of environment pollution; (ii) remedy environment erosion and improve environment quality; (iii) deal with environment pollution and enhance capacity to cope with natural disasters; (iv) appropriately exploit and use natural resources while ensuring ecological balance, and (v) realize global environmental standards while limiting the negative impacts of globalization on Viet Nam’s economic growth.

32. **The Five Million Hectare Program (5MHRP).** The 5MHRP was approved by the Parliament in 1997 and by the Prime Minister with Decision No. 661/QD – TT dated July 29 1998. The 5MHRP extends from 1998–2010 and aims to (i) increase nationwide forest coverage up to 43% of the total land cover; (ii) develop timber wood supply for the paper industry, and (iii) develop domestic supplies of high-quality wood for the wood processing industry. According to a recent assessment of the Forestry Department, between 1998 and 2003, a total budget of VND3.848 billion was allocated to this program. State budget funds accounted for VND2.444 billion or 63.5% of the program.

33. **Management Strategy for a Protected Area System in Viet Nam to 2010.** This important strategy was approved by the Prime Minister in September 2003 through Decision No.192/2003/QD-TTg. It aims to improve general awareness of the importance and value of natural resources and biodiversity and improve the capacity of local authorities and protected
area management boards in managing these resources. This strategy will also help to identify areas for funding support and international cooperation.

34. **Central Truong Son biodiversity conservation initiative (2004-2020).** The central Truong Son biodiversity conservation initiative's long-term objective is to establish an integrated mosaic of complementary land-use and development practices to protect, manage, and restore natural resources and biodiversity in the Truong Son (Central Annamites), while contributing to institutional development, good governance, and an increased standard of living for local communities. The landscape covers six provinces of Quang Tri, Thua Thien Hue, Quang Nam, Kon Tum, Gia Lai, Binh Dinh and Da Nang City.

35. **Quang Nam Biodiversity and Natural Resource Conservation Strategy (2005-2020).** Twenty-nine forest management units (FMUs) are identified in Quang Nam. Priority ranks have been assigned to each FMU based on the following criteria: forest size, hunting pressure, isolation threat, biodiversity and watershed importance, presence of priority and flagship species, and length of important rivers. The implementation of this strategy is based around appropriate planning for sustainable forest and freshwater management. It is recommended that district-level forest and freshwater management steering committees be formed to develop appropriate management plans for each FMU, starting with FMUs of highest priority. The first five years of the strategy will focus on these issues, implementing activities in the highest-priority areas and creating provincial processes that can be replicated across other areas in the future.

36. **Ho Chi Minh Highway protection instruction letter.** Forest cover protection along the Ho Chi Minh Highway has been given special priority by a letter issued by the Prime Minister through MARD in 2002/3.

I. **Links to other ADB initiatives**

37. A number of ADB projects in the region also intersect with the proposed pilot site areas. The most significant of these include:

38. **Forests for Livelihood Improvement in Central Highlands.** A project preparatory technical assistance will assist the government in implementing a forestry policy that will enhance sustainable natural resource management and environmental protection; improve food and livelihood security; and reduce social, economic, and gender inequities as well as poverty by improving on-off-farm incomes, particularly of ethnic minorities living in or near forests in the central region. The proposed project, with a total cost of about $77 million, is expected to begin in 2006, subject to the approval of the Board of Directors.

39. **Song Bung IV Hydropower Project.** The objective of the technical assistance is to prepare the proposed 165 megawatt Song Bung 4 Hydropower Project located in Vu Gia-Thu Bon River basin in Quang Nam Province in central Viet Nam for ADB financing (executing agency is the Electricity Authority of Viet Nam-EVN). A dam (120 m high, 360 m long, and 340 m wide) would be built across the Bung River creating a reservoir with a storage capacity of 621 million cubic meters and a surface area of 18.4 km². It has been estimated that reservoir inundation would require the resettlement of 188 households (mainly ethnic minority families – 1,096 individuals) in 5 hamlets from the flooded section of highway 14D. The total project cost has been estimated at D3.425 billion ($218 million).
40. **Economic corridor development.** In an effort to improve intraregional transport and maximize benefits derived, GMS countries have begun to adopt a holistic approach to development, in the form of economic corridors. The central component of this flagship project of ADB is the 1,450-km long road connecting Da Nang in Viet Nam on the eastern end, with Mawlamyine in Myanmar on the western end, cutting across central Lao PDR and Thailand. The eastern section of the east-west corridor transport infrastructure is scheduled to be completed by 2006/07.

**J. Proposal**

1. **Goal of project**

41. To maintain the ecological integrity of the Central Annamites landscape through improved management of core areas for biodiversity conservation and watershed protection and the sustainable development of landscape linkages through the creation of government-community comanagement mechanisms.

2. **Objectives**

42. The project has five objectives:

(i) Poverty alleviation through sustainable use of natural resources and development of livelihoods
(ii) Clear definition of optimal land uses and harmonized land management regimes
(iii) Restoration and maintenance of ecosystem connectivity
(iv) Capacity building in government staff and local communities
(v) Sustainable financing mechanism and structures integrated with government planning and budgeting procedures

3. **Indicative pilot project activities**

a. **Poverty Reduction**

(i) Community-based forest management
(ii) Economic evaluation of poverty alleviation impacts of CBNRM
(iii) Market analysis study, assisting communities in linking products and markets
(iv) Enrichment planting by communities in restoration areas on piecework basis including establishment of nurseries
(v) Establishment of review mechanisms, including measuring of impact

b. **Harmonized Land Management and Governance Regimes**

(i) Establishment of mechanisms for legal harvesting by communities
(ii) District forest protection management planning

c. **Restoring Ecosystem Connectivity**

(i) Forest restoration using native species in corridors and along the transport network
(ii) Enforcement along roads in six districts
(iii) Tree surveys, monitoring, and protected area strengthening
(iv) Landscape-level analysis of existing and proposed developments, (in particular industry, road, dam, and infrastructure projects), trade patterns, and production and investments
(v) Limit the impact of large infrastructure developments in important areas for conservation

d. Capacity Building

(i) Training of rangers
(ii) Community training in CBNRM and market linkages
(iii) Capacity building at district level

e. Sustainable Financing

(i) A comprehensive valuation of the existing and potential development contribution of natural systems in the region when effectively conserved and managed, including studies of upstream-downstream relationships
(ii) Promote the testing of payment for environmental services mechanisms for large infrastructure development, especially road and dam construction

4. Major targets and complementary activities

<table>
<thead>
<tr>
<th>Objective</th>
<th>Actions</th>
<th>Complementary ongoing activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty Reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Community-based forest management in 40 communes</td>
<td>Community-based forest management in 20 communes</td>
<td></td>
</tr>
<tr>
<td>1.2 Economic evaluation of poverty alleviation impacts of CBNRM</td>
<td>CBNRM impact monitoring indicator development</td>
<td></td>
</tr>
<tr>
<td>1.3 Market analysis study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Enrichment planting by communities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 Review mechanism establishment including impact studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmonized Land Management and Governance Regimes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Establishment of legal community harvest mechanism</td>
<td>Land allocation</td>
<td></td>
</tr>
<tr>
<td>2.2 District forest protection management planning in 5 districts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restoring Ecosystem Connectivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Forest restoration using native species in corridors and along the transport network</td>
<td>Possible compensatory forestry through ADB Song Bung 4 dam project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community forestry in Green Corridor</td>
<td></td>
</tr>
<tr>
<td>3.2 Enforcement along roads in 6 districts</td>
<td>Interdepartmental enforcement plan development</td>
<td></td>
</tr>
<tr>
<td>3.3 Tree surveys and monitoring of protected area strengthening</td>
<td>Large mammal monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protected area strengthening</td>
<td></td>
</tr>
<tr>
<td>3.4 Analysis studies</td>
<td>Ho Chi Minh Highway district-level land-use planning and enforcement operations</td>
<td></td>
</tr>
<tr>
<td>3.5 Impact mitigation actions based on 3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity Building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Training of rangers</td>
<td>Training of rangers</td>
<td></td>
</tr>
<tr>
<td>4.2 Community training in CBNRM and market linkages</td>
<td>Community training in CBNRM</td>
<td></td>
</tr>
<tr>
<td>4.3 District-level authority training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainable Financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Valuation studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2 Investigation of PES mechanisms</td>
<td>Example of PES through ADB dam financing</td>
<td></td>
</tr>
</tbody>
</table>
5. Enrichment planting and reforestation targets

43. The following areas are available for enrichment planting and reforestation. The actual number of hectares to be covered per annum in Phase I will be slow in year 1 but will gather pace in years 2 and 3. The total areas will depend on budget availability.

Table 6. Areas requiring enrichment planting and reforestation in Quang Nam corridors (in ha)

<table>
<thead>
<tr>
<th>Commune</th>
<th>Scrub area for enrichment planting (ha)</th>
<th>Bare land for reforestation (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A’Vuong</td>
<td>8,114</td>
<td>6,345</td>
</tr>
<tr>
<td>B’Halee</td>
<td>3,407</td>
<td>3,229</td>
</tr>
<tr>
<td>A’nhong</td>
<td>4,910</td>
<td>686</td>
</tr>
<tr>
<td>A’Tieng</td>
<td>3,613</td>
<td>1,539</td>
</tr>
<tr>
<td>Lang</td>
<td>12,220</td>
<td>9,632</td>
</tr>
<tr>
<td>Tr’Hy</td>
<td>5,469</td>
<td>2,971</td>
</tr>
<tr>
<td>A’Xan</td>
<td>4,486</td>
<td>3,014</td>
</tr>
<tr>
<td>Gari</td>
<td>3,538</td>
<td>1,846</td>
</tr>
<tr>
<td>Ch’Om</td>
<td>1,510</td>
<td>1,865</td>
</tr>
<tr>
<td>Ta Lu</td>
<td>5,929</td>
<td>1,512</td>
</tr>
<tr>
<td>Song Kon</td>
<td>5,387</td>
<td>1,237</td>
</tr>
<tr>
<td>A’Ting</td>
<td>5,071</td>
<td>1,447</td>
</tr>
<tr>
<td>Ba</td>
<td>5,237</td>
<td>1,413</td>
</tr>
<tr>
<td>Tu</td>
<td>6,882</td>
<td>1,742</td>
</tr>
<tr>
<td>Phuoc Thanh</td>
<td>4,156</td>
<td>1,767</td>
</tr>
<tr>
<td>Phuoc Loc</td>
<td>4,305</td>
<td>4,983</td>
</tr>
<tr>
<td>Cha Val</td>
<td>3,300</td>
<td>7,338</td>
</tr>
<tr>
<td>Dak Pring</td>
<td>22,036</td>
<td>8,216</td>
</tr>
<tr>
<td>Zuoih</td>
<td>6,108</td>
<td>17,070</td>
</tr>
<tr>
<td>La Ee</td>
<td>11,548</td>
<td>10,817</td>
</tr>
<tr>
<td>La De</td>
<td>11,687</td>
<td>5,373</td>
</tr>
<tr>
<td>Dak Pre</td>
<td>5,258</td>
<td>3,559</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>144,171</strong></td>
<td><strong>97,601</strong></td>
</tr>
</tbody>
</table>

6. Additional activities at national level

44. In addition to the pilot site, national activities have been identified:

(i) Biodiversity surveys (e.g., eastern Ngoc Linh and other potential sites) and socioeconomic assessments and description of present status in Viet Nam (biodiversity status report)

(ii) Studies (assessments) and exchange of experience with international experts in conservation, and development of a biodiversity law and related policies and regulations

(iii) Support for drafting a biodiversity law with decrees and guidelines

(iv) Overviews and overlays of data using existing information and updates

(v) Review of the planned hydropower scheme and coordination of activities on compensatory forestry with ADB, if project is implemented

(vi) Assistance in carrying out environment impact assessments in potential pilot sites where major infrastructure projects are planned (e.g., overall impact of the economic corridor)
G. Implementation

1. Institutional arrangements

45. The institutional setup proposed for implementing the BCI in 2005–2008 is as follows (Figure 1):

Figure 1. Proposed institutional setup

Central Level:

GMS BCI
National Steering Committee - VIE

National Coordination Office
- National Coordinator
- Project Assistant
- Accountant

Technical Working Group on GMS BCI

Provincial Steering Committee

Provincial Level:

Project Management Unit
PMU (DONRE-DARD-FPD)

NGOs

FPD = Forest Protection Department; MARD = Ministry of Agriculture and Rural Development; MONRE = Ministry of Natural Resources and the Environment; NGO = nongovernment organization

46. At the national level, there will be a national steering committee consisting of a representative from:
   (i) Department of Environment (MONRE)
   (ii) Department of Science and Technology (MARD)
   (iii) Forest Protection Department (MARD)
   (iv) Foreign and Economic Department, Ministry of Planning and Investment (MPI)

47. The tasks of the national steering committee will be to (i) provide policy direction and guidance, (ii) approve work plans and budgets, (iii) review progress, and (iv) resolve issues and conflicts.

48. The national steering committee will have a working group consisting of representatives from:
(i) Department of Environment (MONRE)
(ii) International Cooperation Department (MONRE)
(iii) Viet Nam Environment Protection Agency (VEPA)
(iv) FPD (MARD)
(v) WWF
(vi) IUCN, and
(vii) Institute of Ecology and Biological Resources.

49. The technical working group will have the following roles:
(i) Promote field and monitoring visits
(ii) Promote training and information dissemination
(iii) Carry out technical screening of proposals or organize such screening by a competent group of technical experts
(iv) Formulate work plans for the national level and submit them to steering committee for approval
(v) Review work plans of the province (where the pilot site is located) and make recommendations to the national steering committee
(vi) Discuss national biodiversity issues and formulate a regulatory framework.

50. The national coordination office will function as follows:
(i) Represent the project externally
(ii) Act as a secretariat to the national steering committee
(iii) Chair meetings of the working group
(iv) Prepare and submit progress and financial reports to the national steering committee
(v) Arrange for field visits, workshops, seminars, trainings, meetings
(vi) Disseminate information
(vii) Submit proposals and recommendations to the national steering committee
(viii) Contract external specialists for technical screening of proposals
(ix) Implement national level activities or organize such implementation.

51. The provincial steering committee will consist of representatives of provincial people’s committee (Chair), DONRE, DARD, FPD, and DPI.

52. The provincial steering committee will guide and oversee the project management unit (PMU) at the provincial level. The PMU will be irresponsible for implementation of activities at the project pilot site.

53. Two national-level project accounts (one in US$ and one in VND) will be established (or existing accounts used) and operated by the national coordinator with countersignature of the accountant. Project funds from this account will be disbursed to various implementers (PMU in the province implementing the project, national consultants carrying out assignments, etc.) as per approved work plans of the national steering committee. Disbursements will be undertaken semi-annually. NGOs will receive direct disbursements from ADB.

I. Project Implementation Partners

54. Building on existing efforts and investments on the ground, site-specific activities in the Quang Nam pilot site will be carried out by the provincial PMU with technical support from existing nonstate partners, such as WWF and BirdLife International. WWF is present in most sites and it is proposed that community-based work, capacity development, protected area
strengthening, and studies are carried out through WWF in all areas except in Quang Tri, where BirdLife International are best placed to assist. Forestry work should be channeled through the respective provincial governments, but should follow the successful models developed (e.g. by Kreditanstalt für Wiederaufbau [KfW] in Thanh Hoa and Nghe An provinces).

55. In addition, local or national NGOs will be brought into various stages of implementation as the need arises.

56. It is imperative that provincial government institutions, people’s committees, and NGOs draw up a joint strategy for project implementation stipulating clear responsibilities in the form of an integrated plan of operations (see section below) that enables targeted and smooth implementation of activities in the pilot sites.

J. Operationalizing Pilot Site Activities

57. Following adoption of the resolution on the BCI program at the GMS Summit in Kunming in July 2005, ADB will formulate a regional technical assistance (RETA), detailing the program for Phase I (2005–2008) and for securing funding commitments, which will be described in the RETA paper. The RETA paper will be sent to the GMS countries for concurrence.

58. On receiving concurrence from GMS governments and securing program funding, ADB, in its capacity as the GMS secretariat, will call on the coordinators of the Working Group on the Environment to send official nominations of GMS country representatives, who will sit in the BCI Regional Coordination Committee with the BCI national coordinators. ADB will also follow standard procedures to put in place the regional program coordination unit (PCU).

59. Once the regional PCU is in place, it will request the BCI national coordinators to call on nongovernment collaborative partners and provincial authorities to work out a draft plan of operation for the first year of implementation. At this stage, any institutions (government and nongovernment) that have regional or cross-cutting activity proposals can submit these to the regional PCU. The PCU will also activate a technical advisory panel (TAP) with terms of reference laid down in the RETA paper and work with the TAP secretariat to get the regional or cross-cutting activity proposals screened prior to the inception workshop for Phase I.

60. Each BCI national coordinator will submit to the regional PCU a draft plan of operations that must contain: (i) work plan (activities with timeline, responsibility, and milestones); (ii) budget with costs related to activities; (iii) monitoring plan with indicators of expected achievements by end of year one and those by year three; and (iv) a logframe for the pilot site project. In detailing the work plan, the national coordinator and implementation team will select priority activities from the indicative list suggested in the pilot project profiles. In particular, the plan of operations should indicate under which functions the land-use and corridor configuration is being undertaken: (i) protection—where focal species are sensitive to habitat change; (ii) low-intensity land use—where focal species can withstand some disturbance; (iii) mitigation—where ecological processes should be conserved (e.g., watershed or hydrology: ensure steeper slopes, riparian zones forested); (iv) land-use patterns and configuration for dispersal ability (continuous vs. patchy/stepping stone habitats). A priority activity in the work plan will also be the provincial land use and zoning exercise at provincial level. If necessary, the BCI national coordinators can request the regional PCU to provide technical assistance in drafting the plan of operations.
61. The plan of operations will be the main instrument of implementation and reporting project progress and any external supervision, monitoring or field visits by ADB or development partners and government will be guided by the plan of operations.

62. The BCI national coordinator office will also enter into a standard memorandum of understanding (MoU) with the NGO(s) for that particular project site, which can later be extended to other sites if mutually agreed. The text of the MoU will be supplied by the regional PCU and will form the basis for project site implementation responsibilities of the parties concerned.

63. On receiving the draft plan of operations from the BCI national coordinators, the regional PCU will circulate these to the TAP to get feedback. The TAP will scrutinize the draft plan of operations for plausibility, realistic targets, and approaches as per details contained in the pilot site proposals. Any adjustments or modifications of the pilot site proposals suggested in the draft plan of operations will also be scrutinized.

64. Representatives from implementing (government, nongovernment, and potential national consultant) institutions in the GMS will be invited to participate in the inception workshop to finalize the work plans and budgets. Once these have been finalized, the first regional coordination committee (RCC) will be convened, which will deliberate over submissions and give its approvals and decisions. Probably, the first RCC could be held back-to-back with the inception workshop. The BCI national coordinators will attend the RCC meetings as observers. The proceeding of the RCC will be recorded by the regional PCU and distributed to all RCC participants. Once approvals are given, disbursement instructions will be issued by the regional PCU as per minutes of the RCC meeting and funds will be provided to the BCI national coordinator office and the NGOs as per approved plan of operations. For regional activities, funds will be disbursed directly by the regional PCU to the implementers (these could be international/national consultants or institutions).

65. On receiving funds from the BCI program, the national coordinators will convene a meeting of the national steering committee and hold a program orientation workshop to launch pilot site activities. Six-monthly progress reports will be collected and collated by the national coordinators and submitted to the regional PCU. Standard reporting formats and deadlines will be provided by the regional PCU.
Annex 4. Administrative, Legal, and Institutional Context

A. Cambodia

1. The Ministry of Environment (MOE) and the Ministry of Agriculture, Forests, and Fisheries (MAFF) are the two key ministries coordinating conservation and forestry activities. The MOE is the focal agency for biodiversity issues and is responsible for coordinating implementation with line ministries. Of the six departments under MOE, the Department of Nature Conservation and Protection (DNCP) is responsible for coordinating and managing protected areas and conservation activities throughout the country. Most forestland, including an increasing number of protected forests, falls under the jurisdiction of the MAFF through its Department of Forestry and Wildlife (DFW). The DFW is responsible for the formulation and implementation of forest policy.

2. The Social Economic Improvement Agency (SEILA) program, in conjunction with the Cambodia Area Rehabilitation and Regeneration Project, has established village development committees, commune development committees, and provincial rural development committees. Significantly, the recently formed commune councils as yet do not have control over forestry issues.

3. **Legal framework.** A decree on forestry administration was promulgated in 1988. The first comprehensive legislation focusing on protective areas was passed in 1993 in the form of a royal decree, the “Declaration of the Protection of Natural Areas.” It created the present system of 23 protected areas. The Law on Environmental Protection and Natural Resources Management of 1996 is the principle legal instrument of MOE. The Ministry is soon to introduce a comprehensive statute on protected areas, although it will not cover the protected forest areas established by MAFF. The Forestry Law of 2002 provides for the classification of land areas throughout the country and distinguishes between state-owned and private forest areas. The Sub-Decree on Community Forestry Management was approved by the Council of Ministers on 17 October 2003 and provides the legal framework for developing comanagement arrangements in forestry throughout the country. Cambodia’s overarching policy for management of the environment is the National Environmental Action Plan 1998–2003 (NEAP) and Biodiversity Action Plan (2004).

4. **Nongovernment organizations (NGOs).** A growing number of local NGOs are making important contributions to conservation and community development in Cambodia. International NGOs active in the country include CARE, the World Conservation Union (IUCN), World Wide Fund for Nature (WWF), Wildlife Conservation Society (WCS), Fauna and Flora International, BirdLife International, and WildAid. Each has a portfolio of projects with MOE and MAFF.

B. Lao People’s Democratic Republic

5. Development of the protected area system in the Lao PDR originated through two parallel and strategically linked processes. In 1988, a conservation subprogram was established within an existing Lao-Swedish Forestry Cooperation Program, with technical assistance from IUCN, and the Government’s Center for Protected Areas and Watershed Management (CPAWM). The need for a comprehensive approach to forest conservation and watershed protection was recognized at the First National Forestry Conference in 1989 and incorporated in the subsequent National Forestry Action Plan.
6. Two principal agencies involved in biodiversity conservation and management in the central government have joint responsibility for executing the National Biodiversity Strategy and Action Plan: (i) the Ministry for Agriculture and Forestry (MAF), including the Department of Forestry, which is responsible for forest resource use and management, biodiversity conservation, and management of the national protected area (NPA) system; and (ii) the Science, Technology and Environment Agency (STEA) is responsible for policy, research, and international agreements and is the lead agency for the Convention on Biological Diversity and Global Environment Facility. Within the Department of Forestry (DOF) is the CPAWM, responsible for general policy matters, coordination, and international cooperation. CPAWM is the national focal point for biodiversity conservation. It has two technical components: a Protected Areas Division (PAD) and Watershed Division (WD).

7. The responsibility for NPAs flows from the MAF Department of Forestry (DOF) to line agencies at the provincial level (provincial agricultural and forestry offices or PAFOs) and district level (district agriculture and forestry offices or DAFOs). The head of each NPA is assigned from the PAFO and most staff are from the districts. Field offices are established in nine of the 20 NPAs.

8. A more holistic form of community forestry called “village forestry” is being developed. The government has implemented participatory forest practices through its Joint Forest Management process and the Forest Management and Conservation Program that is part of the Lao-Swedish Forestry Program. Village forestry is being piloted on a large scale in two provinces, Savannakhet and Khammouane, which form part of the Northern Annamite biodiversity corridor in southern Lao. In 1998, in another example from one of the corridor provinces implementing joint forestry management initiatives, the Phalanxai District Agriculture and Forestry Office (DAFO) carried out land and forest allocation in Nalay Village, with assistance from the Lao-Swedish Forestry Program.

9. **Policy and legal framework.** The legal basis for much of the forest and biodiversity conservation efforts rests in the Prime Minister’s Decree 164 (1993), the Forestry Law (1996), and the NBCA regulations of 2001. The reform of the mechanisms of forest management includes communal control of forestlands, zoning procedures, and incentives to manage forests within concessions. A National Environmental Action Plan (NEAP) was adopted in 1994. More recently, MAF crafted the “Strategic Vision for the Agricultural Sector” including a draft Forestry Strategic Vision 2020 and with STEA, formulated the National Biodiversity Strategy and Action Plan 2004. Government is required to provide secure access to land for indigenous populations, develop a legislative framework for wildlife protection and protected area systems, and implement management plans for national biodiversity conservation areas (NBCAs).

10. **NGOs.** The Laotian Government discourages national NGOs in their civil society framework. International NGOs working on conservation issues in the country include WWF, WCS, and IUCN.

**C. Myanmar**

11. The overall management of environmental policy is under the control of the National Commission of Environmental Affairs (NCEA), including coordination of international

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1. Also known as national biodiversity conservation areas (NBCAs).

environmental issues. The Ministry of Forestry and its Forest Department are responsible for biodiversity conservation, forestry issues, and land-use conflict resolution. The Nature and Wildlife Conservation Division (NWCD) has direct responsibility for protected areas.

12. Protected area management is often implemented by the NWCD in coordination with local staff in the concerned areas, but they usually have no input in priority setting or management. Myanmar’s situation is unique among the GMS countries in that the Government states that there are no settlements in close proximity or within protected areas.


14. **NGOs.** WWF, BirdLife International, and WCS are steadily developing activities in the country. Local NGO presence is limited.

D. People's Republic of China (Yunnan Province)

15. Decentralization initiatives with direct implications for the management of biodiversity and forests include the “household responsibility system” that seeks to shift the centrally planned and commune-based decision-making process to the household. Two landmark 1998 laws established democratic elections of village committees and village leaders. Also, villages have been provided access to and management responsibilities for collective forests.

16. The first protected area regulations were promulgated in 1985 (Management Approaches of Nature Reserves of Forest and Wildlife, Law of Grassland). There are two major categories of protected areas: nature reserves and forest parks. Nature reserves are delineated for biodiversity conservation and watershed protection, while forest parks are designated to provide facilities for public recreation, particularly in urban communities.

17. There are six levels of government jurisdiction: national, provincial, prefecture, county, township, and administrative village. The State Environmental Protection Agency (SEPA) is designated as the lead agency for biodiversity management and administration. SEPA was chiefly responsible for implementing the National Biodiversity Action Plan in 1993. The State Forestry Administration (SFA) is responsible for all forestry-related issues and shares jurisdiction with SEPA over protected areas. Management of environmental issues is undertaken by the provincial environmental protection bureaus (EPBs), but also by many natural resource management agencies. At the prefecture level, there are 14 EPBs in 16 prefectures. At the county level, there are 49 independent EPBs in 127 counties.

18. In Yunnan Province, the Department of Forestry is responsible for forest protection, afforestation, biodiversity, and wildlife management. The Yunnan Environmental Protection Bureau includes nine functional divisions, with two, the Policy and Statute Division and the Nature Protection Division, having mandates for natural resource management.

19. **Legal framework.** The Provincial Peoples' Congress has passed the following primary pieces of legislation: Wildlife Conservation Law in 1988; the China Biodiversity Action Plan in 1992; the Forest Law in 1983; the Environmental Protection Law; the Regulations about Nature Reserves in 1994; and a Biodiversity Conservation Action Plan in 1995. In 2004, the Protected Area Task Force (PATF) of the China Council for International Cooperation on Environment and
Development (CCICED) outlined a set of policy recommendations for rationalizing the protected areas system.3

20. **NGOs.** Yunnan has a number of local NGO groups active in conservation and protected area management, in addition to resource centers, such as the Yunnan Environmental Monitoring Central Station, Environment Supervision and Management Station, and the Yunnan Environmental Science Institute. There are several international NGOs that assist in protected area management, notably, WCS, The Nature Conservancy, the MacArthur Foundation, and the Ford Foundation.

E. **Thailand**

21. Thailand has more national protected areas than any other country in the GMS. Until 2002, the protected area system was managed and supervised by the Royal Forest Department (RFD). Since 2002, management of the national protected areas system has been the responsibility of the National Parks, Wildlife and Plant Conservation Department (DNP) of the newly established Ministry of Natural Resources and Environment (MONRE), with RFD focusing on forest plantation and production. The DNP has several key offices relevant to protected area management including the National Parks Office, the Wildlife Conservation Office, the Watershed Conservation and Management Office, Forest and Plant Conservation Research Office, and the Planning and Information Office. The other main government institutions involved in natural resources management are the Office of Natural Resources and Environmental Policy and Planning (ONEP) and Department of Environmental Quality Promotion (DEQP), both under MONRE. ONEP is national focal point for the Convention on Biological Diversity and serves as the National Biodiversity Reference Unit (NBRU) for the ASEAN Regional Centre for Biodiversity Conservation (ARCBC). Also, it is responsible for the operation of the National Committee on the Conservation of Biological Diversity. The Ministry of Agriculture and Cooperatives (MOAC) is the other important central agency with authority over the forestry sector and includes the National Resources and Biodiversity Institute (NAREBI).

22. As part of a larger decentralization effort, some development planning and resource allocation roles have been devolved to the elected councils under the Tambon administrative organizations. Local communities within and adjacent to protected areas have been given roles within the village headman structure (Phu Yai Baan) linking to the district authorities. This role sometime takes the form of more organized community-based organizations with significant ties to various stakeholders in the protected areas.

23. **Legal framework.** The Forest Act 1960, the Wildlife Preservation and Protection Act 1960 as amended in 1992, the National Park Act 1961, and the National Forest Reserves Act 1964 as amended in 1985 form the backbone of Thailand’s legislative framework in the biodiversity and forestry sectors. Recent acts that are significant include the Reforestation Act (1992), the Enhancement and Conservation of National Environment Quality Act (1992), and the Community Forest Bill.

24. **NGOs.** Local NGOs are well developed in Thailand. Those active in biodiversity conservation include the Asian Elephant Foundation of Thailand, the Bird Conservation Society of Thailand, the Hornbill Research Foundation, the Seub Nakhasthein Foundation, and Wildlife

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Fund Thailand. International conservation organizations active in Thailand include IUCN, WCS, WildAid, and WWF.

F. Viet Nam

25. The main impetus for conservation policy in Viet Nam came from the National Conservation Strategy of 1985. The Government approved the Biodiversity Action Plan (BAP) in 1995 and is preparing a new ten-year BAP. One of the main components of the BAP is the establishment and management of protected areas. Viet Nam's protected areas system is evolving in terms of coverage and institutional arrangements. Protected areas are primarily special-use forests and include a Ramsar Convention site (Xuan Thuy Wetland National Park) and four biosphere reserves.

26. The Forest Protection Department (FPD) within the Ministry of Agriculture and Rural Development (MARD) is responsible for overall supervision of the special-use forest system, although most protected areas are under the direct responsibility of provincial peoples committees. The Ministry of Natural Resources and Environment (MONRE) coordinates overall natural resource management, including protection of wetlands and biodiversity. MONRE is the nodal organization in implementing the BAP through concerned ministries, sectors, and local agencies. The Ministry of Fisheries (MOF) is responsible for marine protected areas.

27. The provincial people’s committees at the province and district level have the authority to draw up their own development and environmental protection plans and discuss them with MONRE, MARD, and other concerned ministries.

28. Legal framework. The latest regulations on the management of three types of forests, including special-use forests, were promulgated through Decision No. 08/QD-TTg, which defined protected area categories and prescribed the institutional structure that would manage the special-use forest system. A revised Forest Protection and Development Law was adopted by the National Assembly in 2004 and entered into effect early 2005. The Law on Environmental Protection 1994 is under revision. Other important recent legislative developments include the new Land Law 2003; Law on Fishery 2003; Law on Biodiversity (under preparation); a Civil Code; Decree 48/2002, updating the list of endangered species; Decree 109/2003 on conservation and sustainable development of wetlands; Decision 153/2004 by the Prime Minister on implementing the National Agenda 21; and Decision 06/2004 by MARD on biodiversity conservation in the Middle of Truong Son (or the Annamite Mountains between Cambodia, Lao PDR, and Viet Nam).

29. NGOs. There are several international conservation NGOs working in the country, including BirdLife International, Fauna and Flora International, IUCN, and WWF. In addition, there are several local NGOs working in this area in Viet Nam.
Annex 5. BCI GIS Database: Current Status and Gaps

1. To support decision making in the GMS Biodiversity Conservation Corridors Initiative (BCI), regional technical assistance (RETA) 6213 from the Asian Development Bank has built up a comprehensive geographical information system containing both environmental and socioeconomic data. A description of the datasets and notes on the remaining gaps follow.

A. Environmental Data

2. Satellite imagery. The image database archives scenes of three different satellite sensors:

   (i) Landsat TM, covering the entire Greater Mekong Subregion (GMS) during 1990–1992. Maximum geospatial resolution is 30 meters (m);
   (ii) Landsat ETM+, covering the entire GMS during 1999–2001). Cambodia, the Lao PDR, and parts of Viet Nam are also covered during 2002–2004. Maximum geospatial resolution is 15 m after pan sharpening (see examples in maps 1 and 2); and
   (iii) ASTER, covering most of Cambodia during 2002/03. Maximum geospatial resolution is 15 m after pan sharpening.

3. Thus, although the satellite image archive covers all biodiversity conservation landscapes and pilot sites, image information is at least two (Cambodia, Lao PDR) to five years old (other GMS countries).

4. For areas that are not yet archived for 2002–2004, images will be successively retrieved from the Earth Science Data Interface. Additional, up-to-date high-resolution imagery (e.g., SPOT V, IKONOS, QUICKBIRD) should be bought to produce land-cover information at the level of precision required for detailed pilot-site planning of Phase 1.

Map 1. Cambodia, Cardamom Mountains Pilot Site, ETM+ Mosaic
5. **Topography.** BCI uses region-wide shuttle radar topographic mission data of 90-m resolution. Slope, aspect, and hillshade information has been calculated from this dataset at the same resolution and is available for the entire GMS.

6. More precise topographic data are available for the lower Mekong River watersheds. The digital elevation model (DEM) provided by the Mekong River Commission (MRC) has been derived from digitized toposheets and covers almost the entire Lao PDR and Cambodia at 50-m resolution. Corresponding datasets are available for parts of Viet Nam and for Cambodia (through the Japan International Cooperation Agency [JICA]). For precise pilot site assessment, DEMs of 20-m resolution should be made available. Such data are currently not available for any pilot site.

Map 2. Xishuangbanna Pilot Site, PRC Yunnan Province; 3-D View of Mengla Nature Reserve

7. **Land cover, land use.** BCI holds five regional or subregional land cover classifications: (i) United Nations Environment Programme (UNEP) RRC.AP land cover classification based on the US National Oceanic and Atmospheric Administration advanced very high resolution radiometer, 1986 and 1993; (ii) United Nations Food and Agriculture Organization Global Forest Resource Assessment, 2000; (iii) European Commission – Joint Research Centre land cover classification for South and Southeast Asia, 2000; (iv) UNEP RRC.AP land cover classification for Strategic Environment Framework (SEF I) “hotspots” in the GMS, 1999–2001; and (v) MRC land cover classification for the lower Mekong River watersheds, 1997. All five datasets are either not of sufficient geospatial resolution for analysis within the pilot sites (1, 2, and 3) or need a thorough update/accuracy check before further use (4, 5).
8. Several national datasets have been retrieved from government offices and nongovernment organizations (NGOs) in the GMS countries. For Viet Nam, the World Wide Fund for Nature (WWF) land cover classification of 2000 is available to BCI. However, the official Forest Inventory and Planning Institute dataset (1998–2002) is available only for selected provinces not in the pilot site area. The Lao PDR has provided countrywide land cover classification for 1992 and 2000 via the Forest Administration, as well as a WWF adaptation of the 1997 MRC land cover classification that fits with the respective land cover classification of Viet Nam. For Cambodia, BCI holds both the JICA (1996/2002) dataset and a subset of the forest cover classification of the Forest Administration (2002), covering the Cardamom pilot site. BCI also holds the nationwide land cover classification of the Royal Forest Department (2000) of Thailand. The People’s Republic of China (PRC) could not provide BCI with a land cover classification for Yunnan Province.

9. The national datasets are of improved geospatial resolution. However, most of them are at least five-years old, which limit their precision. A more prominent problem with these datasets is the lack of standardization. Objective benchmarks have not been used in the classifications to describe and define the classes. Thus, data integration to provide a seamless, comparable transboundary dataset for the entire region is not possible. BCI needs to derive its own land cover classification for the pilot sites to ensure precise site planning.

10. **Biodiversity.** Comprehensive surveys have been made available for Cambodia (Cardamom and Eastern Plains Pilot Site) by Conservation International, Fauna and Flora International, WildAid, and WWF. WWF has provided countrywide biodiversity surveys for the Lao PDR and Viet Nam. However, the resolution is inadequate to provide a good decision base for the scale of the selected pilot sites. This is also the case in Thailand, where the Royal Forest Department has only conducted an elephant survey on the Western Forest Complex. For the PRC, biodiversity information was not immediately accessible to BCI.

11. **River and water body network.** Datasets are archived and have been accessed nationwide for Cambodia, Thailand, and Viet Nam. The dataset on the Lao PDR needs refinement at the pilot site scale. For the PRC, comprehensive river data are available only for Xishuangbanna Prefecture. A general problem of all the datasets is that they do not specify river names, particularly of smaller tributaries.

**B. Administrative and Socioeconomic Data**

12. BCI currently holds a complete boundary/administrative dataset on provinces. District level boundaries are also available GMS-wide, although the Thailand dataset needs revision. Subdistrict administrative boundaries are available for Cambodia and Viet Nam.

13. Population data (village datasets) are available nationwide for the Lao PDR and Cambodia. The PRC has provided village data for Xishuangbanna Prefecture and Deqin County. However, translation from the Chinese characters remains an issue. For Thailand, precise village data are only available for parts of the Western Forest Complex. WWF Viet Nam has provided a settlement polygon layer for Quang Nam and bordering provinces. This dataset does not contain village names.

14. On protected areas, the BCI database includes both the World Conservation Union (IUCN) World Database on Protected Areas (WDPA) and more precise national datasets, provided either by NGOs (WildAid Thailand, WWF) or respective government offices. For the
PRC, the national protected area database has been provided only for the subset of Xishuangbanna Prefecture and Deqin county.

15. Infrastructure data available to BCI include transboundary and national roads, railroad networks, and airports. As the subregional dataset lacks precision on the pilot-site scale, national datasets have been retrieved. BCI holds detailed road datasets for Cambodia, Lao PDR (Map 3), and Viet Nam. Thailand has provided precise road data only for the Western Forest Complex area, and PRC only for Xishuangbanna prefecture and Deqin county.

Map 3. Lao PDR, Xe Pian – Dong Hua Sao – Dong Ampham Pilot Site, Village, and Road Network

GIS-ready socioeconomic statistics are available on a province level for the entire GMS. They include population density, population growth, and poverty. District-level poverty information has been imported to the respective geospatial boundary map from sources such as the International Food Policy Research Institute (Viet Nam), World Food Programme (Cambodia) and the Lao PDR National Growth and Poverty Eradication Strategy. BCI also holds comprehensive subdistrict data on Yunnan Province (Map 4; county level, Yunnan Statistical Yearbook 2000) and Viet Nam (Communes, Quang Nam, WWF), Thailand (Tambons, Western Forest Complex, Royal Forest Department). Still, there a several pilot sites for which commune-level data are not yet available, particularly Xishuangbanna pilot site, Cardamom and Eastern Forest Complex pilot sites, and Xe Pian – Dong Hua Sao – Dong Ampham pilot site. These data should be made available to thoroughly assess these pilot sites in Phase 1.
Map 4. PRC Yunnan Province, Population by County (2000)
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