

Evidence-based Conservation

Lessons from the Lower Mekong

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2 Cat Tien National Park

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Cat Tien National Park (CTNP) is located in the south of Vietnam, about 150 km north of Ho Chi Minh City (CTNP, n.d.) in the administrative areas of Dong Nai, Binh Phuoc and Lam Dong provinces. The Park is divided into three provincial sectors, Nam Cat Tien, Tay Cat Tien and Cat Loc. CTNP is one of the largest national parks in Vietnam, with a total area of almost 72,000 hectares (UNESCO, 2009).

CTNP has successfully conserved biodiversity, despite the impacts of the Vietnam War (BirdLife International, 2004). It has suffered degradation from the activities of local people and encroachment by shifting cultivators (Polet and Ling, 2004). Thanks to the early attention of the government and a range of innovative approaches applied by the management board, the national park has achieved much in terms of conservation results (CTNP, n.d.). In recent years CTNP has gradually gained in environmental importance both nationally and internationally, and has had its status evolve from that of a nature reserve, to a national park, to the world's 411th biosphere reserve (UNESCO, 2009) and 1,499th Ramsar site. Cat Tien is now being proposed as a combined Natural and Cultural World Heritage site (UNESCO, 2009). Despite these successes, CTNP still faces challenges from the presence of people in its core zone and the on-going development pressures in its surrounding areas.

Environmental context of the landscape

Biophysical features

CTNP spans 71,920 hectares (UNESCO, 2009), in three provinces, presenting a range of topographic features. The landscape varies from low and gentle hills in Nam Cat Tien and Tay Cat Tien areas to steep hills in Cat Loc province. This mixture of terrains contributes to the rich biodiversity of the area (BirdLife International, 2004). Five State Forest Enterprises that are now under a logging ban, forming a complex of a further 100,000 hectares of lowland forest (Nguyen, 2009), bound the park.

Cat Tien National Park is part of the basin of the Dong Nai river, the third longest and largest river in Vietnam, after the Mekong and the Red Rivers.

The Dong Nai river flows for over 90 km through the park, forming the western boundary of the Cat Loc sector and eastern boundary of the Nam Cat Tien sector (BirdLife International, 2004). This river boundary allows park authorities to better control encroachment by local communities. The tributaries of the Dong Nai River flowing through the park connect with lakes and a major wetland. During the rainy season, extended parts of the forest are flooded, creating species-rich wetland ecosystems that are fed with silt and nutrients by the river (CTNP, 2005). CTNP also supports and protects the watershed of the Tri An Reservoir located in Dong Nai province, which is the major electricity supplier of the southern region, and of Ho Chi Minh city (Morris and Polet, 2004).

CTNP experiences a monsoon tropical climate, with two main seasons: the rainy season spans the period from April to November, and the dry season lasts five months from November to March. The yearly average temperature is relatively cool, fluctuating from 21°C in Cat Loc to 27°C in Nam Cat Tien (CTNP, 2005). The average annual rainfall ranges from 2,175 mm in Nam Cat Tien to 2,675 mm in Cat Loc (CTNP, 2005). These high levels of rainfall support the wetland areas of Cat Tien, one of the unique ecosystems of the park.

Biodiversity

CTNP is located in the transition zone between the Central-Southern Highland and the Southern Plain bio-geographic areas (UNESCO, 2009). Most of the national park is covered by forest accounting for 86 per cent of the area; the rest of the area is covered by grasslands (6.7 per cent) and wetlands (1.4 per cent) (CTNP, 2005).

CTNP flora has been categorized into six main types of forests: (a) evergreen forest; (b) semi evergreen forest; (c) mixed bamboo forest; (d) bamboo forest; (e) bush/scrub forest; and (f) plantations. There are 1,610 species of plant that have been identified in CTNP, among which there are 31 Endangered species listed in the Red Data Book for Vietnam, and 22 species endemic to Vietnam (CTNP, 2005).

Compared to other protected areas in Vietnam, CTNP contains a very diverse fauna (Polet and Ling, 2004). The animal species found in CTNP are similar to the ones found in the highlands of Truong Son range, and a strong relationship with the Central-Highland Plateau (CTNP, 2005). A total of 1,039 faunal species have been identified. Among these are 76 species of mammals, 321 species of birds, 73 species of reptiles, 35 species of amphibian, 99 species of fresh water fish and 435 species of insects (Polet and Ling, 2004). In 2003, IUCN identified 16 mammals species, 15 birds species, 8 reptiles species and one species of freshwater fish as Endangered (IUCN, 2003; Polet and Ling, 2004).

Cat Tien National Park is one of the most important sites in Vietnam for the conservation of large mammals, and until recently was home to the last surviving lesser one-horned rhinoceros. This was the only known population of this species in mainland South-East Asia, and the only known population of the sub-species *R. s.annamiticus* in the world. However, the population

size and range of this species at CTNP has declined over the last two decades, and recent estimates put the population size at seven or eight individuals over a range of 6,500 hectares (BirdLife International, 2004). However, recent reports suggest this population may now be extinct (Anderson *et al.* and Sunderland *et al.*, in Chapters 19 and 25 of this volume). CTNP is also home to two other threatened mammals, the gaur (*Bos gaurus*) and the banteng (*Bos javanicus*) (Nguyen, 2009).

Socio-economic and demographic context of the landscape

There are eleven ethnic groups represented in and around the park, of which two are indigenous ethnic minorities, the Chau Ma and Stieng. Post-American War immigrants include the Kinh people, the majority group in Vietnam. Other minorities from northern Vietnam have recently migrated to the area, including ethnic H'Mong, Hoa, Tay and Nung (Petheram and Campbell, in Chapter 22 of this volume). These groups have different histories, connections to administrative structures and land-use strategies (CTNP, n.d.). For instance, many indigenous people have a long tradition of shifting slash and burn cultivation. This historically important practice of local people is no longer sustainable as populations increase and fallow periods get shorter.

Approximately 200,000 people live inside Cat Tien National Park's core and buffer zones, a combined area of over 320,000 hectares. An estimated 2,000 people live in the 72,000-hectare Core Zone of CTNP, in the Cat Loc sector (CTNP, 2005). Some of these groups are the original inhabitants of the area. There is also a small group of Kinh people living in the core zone of the park, who migrated to this area around 1975, fleeing the Vietnam War (CTNP, n.d.). The buffer zone of CTNP, an area of 251,445 hectares, which spans thirty-six communes in eight districts and four provinces, supports most of the remainder of the 200,000 people (Petheram and Campbell, in Chapter 22 of this volume). Most are recent immigrants that came to the area from other regions of Vietnam. This migration occurred primarily between 1990 and 1998 when the government declared the area a "New Economic Zone".

The Vietnamese government together with international and national organizations have invested in infrastructure in the Cat Tien area, and have provided all villages with basic medical facilities and schools. However, these facilities remain mostly unutilized, as there is a lack of medical staff and teachers willing to work in the area (Polet and Ling, 2004). A recent study by Petheram of two villages in CTNP showed that although roads reached the villages, their quality was very poor; furthermore, children's school enrolment rate, especially of indigenous groups, remains low (Petheram and Campbell, Chapter 22 of this volume).

The livelihoods of the people in the core zone of the park are based on agricultural activities that include the cultivation of cashew nuts, maize and cassava as well as shifting cultivation. A few households raise cattle, buffalo, pigs and chickens. However, agriculture does not provide enough food, and the

hunting of wildlife and the collection of non-timber forest products (NTFPs) for subsistence purposes and for sale remains important. The immigrants around the CTNP, who have been settling the area since 1990, also practise fishing and hunting, and, recently, have been getting increasingly involved in farming (CTNP, n.d.). In the buffer zone, the main livelihood activities for indigenous people are agricultural, and crops include cashew, rice and some animal husbandry. Besides rice cultivation and livestock rearing, Kinh people and other immigrants also carry out business activities and own most of the shops in the region. Other occupations include weaving, administrative jobs; many people depend upon remittances from family members who have moved to towns.

Local people's incomes are generally low because most of them depend on rice cultivation that yields only an average of 150 to 200 kilograms of rice per hectare (CTNP, 2005). Some households in Cat Tien are now engaged in growing coffee, from which they expect to earn more income.

People in the core zone are not allowed to own land in the national park, which in turn restricts access to formal credit, and discourages long-term investment in land and housing (Morris and Polet, 2004). Even if they are considered as de facto inhabitants, the situation of these communities leads to unsustainable practices, as the prospect of relocation deters them from long term investments (CTNP, n.d.). Nevertheless, interviews carried out by Petheram in 2008 with local people in one of the core zone villages showed that the people did not wish to be relocated, and that they would prefer that even more land should be allocated to them (Petheram and Campbell, in Chapter 22 of this volume).

Institutional context: background and main issues

The creation of Cat Tien National Park resulted from the consolidation of three areas of high conservation value (Morris and Polet, 2004). These areas, referred to as sectors, went through different processes of gazettelement before being consolidated into a single management unit. They are: the Nam Cat Tien sector, with 39,627 hectares in Dong Nai Province; the Tay Cat Tien sector in Binh Phuoc Province, measuring 4,443 hectares; and the Cat Loc sector, with 27,850 hectares, in Lam Dong Province (UNESCO, 2009).

Cat Tien bore the brunt of the American-Vietnamese war, which had a devastating impact, not only on the forest environment but also on local people living in the surroundings. Being a fighting hot spot during the war, large areas of the forest were sprayed with defoliants and logged immediately afterwards (BirdLife International, 2004).

Even so, in 1978, shortly after independence, the government gazetted 35,000 hectares in Nam Cat Tien as a protected area, by Prime Ministerial Decision No. 360/TTg (Morris and Polet, 2004). Its establishment was a result of governmental efforts to increase the country's forest cover from 1 million hectares to 2 million hectares, an initiative that had been promoted by President Ho Chi Minh since 1960 to restore forest quality (Thuy Ngoc Nguyen, 2007). In 1986, the government proposed a 10,000-hectare nature reserve in Tay Cat Tien

(Morris and Polet, 2004). Three years later, the rediscovery of a population of lesser one-horned rhinoceros, *Rhinoceros sondaicus*, in Cat Loc, managed at the time by the Cat Tien and Loc Bac State Forest Enterprises, pushed forward the gazettelement of the area as a rhinoceros sanctuary in 1992. That same year, the Decision No. 08/CT of the Chairman of the Council of Ministers upgraded Nam Cat Tien status to that of a national park of 38,900 hectares (BirdLife International, 2004). Finally, in 1998, the three areas were recognized as a single management unit of 73,100 hectares. An investment plan was approved by Decision No. 38/1998/QD-TTg for the newly formed Cat Tien National Park (Morris and Polet, 2004). At that point, the responsibilities for the management of the national park were transferred from the Provincial People's Committees to the Ministry of Agriculture and Rural Development (MARD). It was not until December 2001 that MARD promulgated the Administration and Operations Program Regulation for the national park and its buffer zone, finally setting out the regulations for the management of the area.

That same year, the United Nations Educational, Scientific and Cultural Organization (UNESCO) recognized CTNP as a UNESCO biosphere reserve (CTNP, n.d.), and this was the starting point for an increased focus on biodiversity conservation. The Secretariat of the International Ramsar Convention followed in 2003, recognizing Bau Sau Wetland Complex as the 1,499th Ramsar site. Cat Tien became the second Ramsar site in Vietnam, after Xuan Thuy.

Despite all the international attention, Cat Tien National Park is still facing difficulties. The location of the park in a highly populated area, the process of gazettelement and the shifting of management responsibilities have resulted in an unclear demarcation of the park boundaries (Polet and Ling, 2004). In addition, land use within the park is not all under the same authority, with the forested land managed by the CTNP management board, but not the agricultural land (CTNP, n.d.). Unclear demarcation and lack of coordination of land designation have caused a series of problems both for conservation and for the livelihoods of people living in the park (Polet and Ling, 2004). Moreover, there are conflicts of interests in the management board of the Biosphere Reserve. This board is formed by eight chairmen – the Cat Tien National Park director and the chairmen of the districts covered by the park – who disagree on the level of priority to be given to conservation as opposed to development in the landscape. In an effort to reach a compromise between conservation and livelihood development, and minimize the cost of the Prime Ministerial Decision 173/2003/QD-TTg, dated 19 August 2003, the boundary of CTNP was adjusted to an area of 71,920 hectares. This re-demarcation avoided the displacement of around 80 per cent of the people living inside the park, and has partly solved the land tenure issues inside CTNP (Morris and Polet, 2004).

Major threats to environment and conservation

The majority of the threats to Cat Tien National Park's ecosystems stem from its location in a densely populated area (CTNP, n.d.). The people in both the

core and buffer zones have long been exploiting Cat Tien National Park's natural resources; however, a growing human population is accentuating the intensity of the threats. Encroachment of agricultural land into the protected area is one of the major issues the park is facing. Other destructive activities include the practice of swidden agriculture and livestock rearing inside the national park, NTFP collection, hunting and fishing, and an increased need for infrastructure development are all contributing to the fragmentation and degradation of CTNP's habitats (Morris and Polet, 2004).

Agricultural activities in the core and buffer zones have left a significantly negative impact on the forest environment of the park. People in the core zone have traditionally depended upon shifting cultivation, and have grazed their cattle within the park's borders. Short-cycle shifting cultivation causes the loss of natural habitats and increases the risk of uncontrolled forest fires. The practice of rearing domestic livestock in the park increases the risk of disease transfer to wildlife populations, leads to inter-breeding with native species, and increases competition for food with wild species (Morris and Polet, 2004). Human disturbance has led to deforestation, habitat destruction and fragmentation, increasing the pressures on forest resources (Morris and Polet, 2004). The growing population inside the national park will face further shortages of land for cultivation (CTNP, n.d.), which can, in turn, further exacerbate the threat of land encroachment. Another negative impact of agricultural activities outside the borders of the park, in the buffer zone, is the pollution that is affecting CTNP's water resource, due to the heavy use of fertilizers and pesticides that infiltrate the river basin.

One of the other factors exacerbating agricultural encroachment is the unclear and confusing land tenure system that exists in national parks in Vietnam. Forested land inside the park is under the jurisdiction of MARD, and managed by the CTNP management board; however, agricultural land inside the park is not. This lack of coordination between different government bodies and different government levels is resulting in too much emphasis on development instead of conservation in the agricultural land within the national parks (CTNP, n.d.).

Furthermore, some agricultural activities carried out around Cat Tien National Park are contributing to another type of pollution: the expansion of invasive species. For instance, a mimosa species, *Mimosa pigra*, that is used in green fences upstream in the Dong Nai River, is now spreading to the Bau Sau wetland complex, becoming a serious ecological problem for the wetland ecosystems (Pilgrim and Nguyen, 2007; GISD, 2009; Preece *et al.*, Chapter 21 of this volume). The breeding of Pacu species in fish farms in the buffer zone is also alarming, as it involves a voracious fish species that can potentially escape during the flood season, establishing new populations in the wild, and outcompeting local species (Morris and Polet, 2004). An unintentional introduction of the alien Rhesus macaque (*Macaca mulatta*), is a threat to the park's native crab-eating macaque (*Macaca fascicularis*), as the two species interbreed.

Population growth is a threat, not only for intrinsic reasons but also because the increase in people brings about an increased need for infrastructure to meet the basic needs of the local communities. Some development of infrastructure is necessary to meet the development objectives of the districts; however, providing it can contradict conservation objectives set by the park, and it can become a threat to the protected area. For instance, the appearance of roads, housing, schools and other facilities is fragmenting the habitat of many species and increasing their vulnerability.

Cat Tien National Park also faces threats that stem far away from the borders of the protected area itself. Several major hydroelectric dams are planned or proposed for the Dong Nai River Basin, both upstream and downstream of CTNP. These include the Dai Ninh Hydropower Project and the Dong Nai 3 and 4 Combined Hydropower Project (Morris and Polet, 2004). These dams present both opportunities and threats to the protected area. There is the prospect of developing financial mechanisms with them that recognize the environmental services that CTNP provides for the production of hydroelectricity. The money derived from these PES agreements could help fund conservation in the park, and support socio-economic activities for the adjacent communities (Petheram and Campbell, Chapter 22 of this volume). However, disregard for the protected area in the building of the dams could result in further forest and biodiversity loss, notably through flooding and construction (Morris and Polet, 2004). Moreover, poor planning of peak discharges from the dam could alter the flow of water into the wetlands, with implication for the ecosystem's fauna (Do, 2008).

A similar scenario to that of the dams is created by the expansion of tourism in the park. Due to its relative proximity to Ho Chi Minh City, CTNP has recently become a popular destination for city-based ecotourists in the south of Vietnam. Numbers of visitors to Cat Tien are increasing every year, especially during the summer months. If not well managed, the flood of tourists could threaten the fragile ecosystems of CTNP. Tourism is already contributing to the generation of revenue for both the park and the households that participate in homestay initiatives. However, the increase in tourism is responsible for an increased accumulation of waste, causing both surface and ground water pollution that is damaging important wetland and grassland areas, and having a negative effect on the biodiversity of the area (Do, 2008). Unfortunately, the revenues generated through tourism are not always spent in the way that was initially intended. The limited budget received from the government is not always sufficient to pay for routine infrastructure maintenance, and this had resulted in tourism funds being redirected for major infrastructure repairs and development (CTNP, n.d.).

The landscape initiative

The establishment of Cat Tien National Park (CTNP) originated from the national-level push to increase the forest cover of Vietnam from 1 million

hectares to 2 million hectares. The main goals of CTNP since its management board was established in the late 1990s are to conserve the local ecosystems, to preserve the watershed of Tri An Reservoir, to provide research opportunities for national and international scientists, and to act as a destination for sustainable tourism (CTNP, n.d.). These objectives illustrate CTNP's importance for both biodiversity conservation and socio-economic development in Vietnam (Morris and Polet, 2004).

CTNP receives an annual budget allocation from MARD to carry out basic management, maintenance and research activities. These activities include such things as raising environmental awareness of the local population, engaging in discussions with commune governments in and outside the park on how to minimize human impact, and studying the genetic diversity of the approximately sixty Siamese crocodiles that remain in Bau Sau Lake (CTNP, 2005). Between 1999 and 2004, CTNP's management board also guided the science and technical department and the forest protection section to carry out biodiversity monitoring and valuation of the park.

CTNP's management board employs 175 staff in seven departments and centres. Compared to other national parks in Vietnam, the education level and technical capacity of the CTNP's staff is high, with most of the staff responsible for conservation and management activities having graduated from colleges and universities in Vietnam. The expertise of the park's staff is also improved by the provision of training by the Forest Protection Department (FPD) from MARD.

Besides annual funding from MARD, CTNP also receives funds through the Five Million Hectares Reforestation Programme (5MHRP); this has amounted to approximately 1 billion Vietnamese dong (VND) per year in recent years. The target of the programme is to rehabilitate and improve the quality of the forest cover nationwide. The programme gives responsibility for protecting existing forests and reforesting marginal lands to the local communities, who receive remuneration from the government for this service. They are organized, supervised, and advised by forest rangers.

However, funding to CTNP from the Vietnamese government, particularly from MARD, is not enough to fulfil all the needs of biodiversity conservation and socio-economic development. In addition to the main activities supported through MARD funding, the park is also receiving help through other nationally and internationally funded projects. Many institutions and organizations have collaborated with the Cat Tien management board in carrying out the park's conservation and development objectives. Most of the national partners are in Ho Chi Minh City, and include the Forest Inventory and Planning Institute II (FIPI) from MARD, the Institute of Ecology and Biological Resources, the Institute of Tropical Biology, and the Biology Faculty of the Natural Science University. The main international organizations include the World Wide Fund for Nature (WWF), the World Bank (WB), BirdLife International, Fauna & Flora International (FFI), Winrock International (WI), IUCN and UNESCO.

One of the main initiatives implemented recently in CTNP to address the dilemmas of achieving both conservation and development is the Boundary Re-demarcation and Voluntary Resettlement Plan. This action plan was planned by FIPI, FPD and MARD with support from WWF. The plan was approved by the Prime Minister in 2003 and aimed to save the biodiversity in Cat Tien, while avoiding the resettlement of around 80 per cent of the communities inside the Park (Morris and Polet, 2004; Polet and Ling, 2004). Re-demarcation of the boundaries effectively reduced the size of the park by 10 per cent; however, the excised area contained most of the communities living inside the park, and the area lost was already of little or no conservation value. The main rationale for boundary re-demarcation was to clarify the confusing jurisdiction over agricultural land within the park, and was used as an alternative where resettlement was not feasible, effectively avoiding the resettlement of the park's households (Morris and Polet, 2004). It was also aimed at simplifying and consolidating the park's area, e.g., through land acquisition, in order to help CTNP focus its conservation efforts on key biodiversity areas, and facilitate patrolling and enforcement activities (Morris and Polet, 2004).

The main rationale for the resettlement of the local communities inside the park was to consolidate and increase the current area of natural habitat available inside CTNP. In some cases, resettlement was preferred over other options because the current area of natural habitat inside CTNP was deemed too small and fragile to withstand the continued presence of human communities (Morris and Polet, 2004). This action plan was developed through a participatory process, where dialogue with local communities was maintained throughout (Polet and Ling, 2004). As part of the action plan, land-use plans were drafted at the commune and village levels, and appropriate land certificates were provided to the local people. The park, as the implementing agency for community development activities in the buffer zone, established active ties with the surrounding communities and gained their respect (Polet and Ling, 2004). Nevertheless, the lack of financial resources means that there is still one village that remains in the core zone of the park. Recently, the Minister of MARD issued a decision to officially accept this temporary settlement inside the park.

To fulfil the mission of socio-economic development, CTNP has cooperated with several partners to implement projects that integrate conservation and development. CTNP in cooperation with local committees carried out a project called "Forest protection and rural development" from 1998 to 2006. The Dutch government, the World Bank and the Vietnamese government funded this project. The project's objectives were to assist the government to protect and manage the natural forest by: (a) protecting CTNP; (b) managing the natural forests inside the buffer zones of the CTNP; (c) developing the livelihoods of the residents in the buffer zones to reduce their dependency on the CTNP for subsistence and cash incomes; and (d) strengthening the government's capacity to design, implement and monitor integrated conservation and development

projects (ICDPs) (World Bank, 2007). The project achieved its targets in reducing the incidence of illegal harvesting and transportation, reducing the proportion of local people facing food security problems, enhancing awareness among buffer zone communities and allocating land-use certificates (World Bank, 2007).

More recent projects include a two-year-long project funded by the Vietnam Conservation Fund, “Building capacity for biodiversity conservation in Cat Tien National Park”. This operated from 2008 to 2009 and aimed at building the capacity of CTNP’s staff for biodiversity conservation. The Danish International Development Agency (DANIDA) conducted a three-year project to develop and improve community-based ecotourism in CTNP that concluded in 2011.

Other projects in CTNP focus more on the park’s wildlife. Between 1996 and 2005, the Dutch government funded WWF to implement a project called the “Cat Tien conservation project” to carry out species monitoring, re-demarcation of the park boundary and capacity building for Cat Tien staff. WWF collaborated with IUCN to do an extensive survey on the fauna and flora, as well as an analysis on the socio-economic status of the people in and around Cat Tien National Park. This project assisted the Cat Tien management board in proposing the re-demarcation and resettlement action plan. Among other activities, the project successfully supported the re-introduction of the locally extinct crocodiles *Crocodylus siamensis*, and this helped Cat Tien to achieve its Ramsar site listing.

Other projects include the “Bos Gaurus and Wild Cattle Conservation Project”, funded by the French Fund for Environmental Development (FFED), which ran from 2006 to 2009. Two more long-term projects have started in CTNP. One, the “Primates Endangered Species Center in Dao Tien, CTNP” that started in 2006, focuses on rescuing, rehabilitating and releasing Endangered species of primates back into the wild. This project is funded by the Monkey World Ape Rescue Centre from the UK, in collaboration with the Pingtung Rescue Center in Taiwan. The other project started in 2007, the “Bear Endangered Species Center in CTNP” is funded by Free the Bears. It aims to rescue, rehabilitate and release bear species back into the wild in their home range in the south of Vietnam.

The park’s potential for ecotourism is being expanded through tour operators who bring visitors for “mammal sight-seeing tours” and “crocodile tours”. The park is now opening new trails for tourists, such as Bau Sau, Cay Si and Doi Tuong hill. The management board has invested in the renovation of the guesthouse in the park’s headquarters, and is cooperating with fifteen local families in the buffer zone to run a tourism business based on a benefit-sharing scheme.

Future visions and likely trends

Cat Tien National Park is recognized as a special and unique place both in Asia and worldwide. It has gained national and international recognition as a national

park, a Ramsar site, a biosphere reserve and a natural and cultural World Heritage site. As such, it aims at being a model for other conservation and development projects in the region. However, it will require improved collaboration between central and local governments to confront the serious threats that the area is now facing.

To tackle the population problems the park needs to support people living in the park to allow them to achieve sustainable livelihoods while maintaining their cultural heritage. Resettlement should be carried out in a way that is socio-economically viable, and this can be achieved through the involvement of local people in the park's conservation and ecotourism activities. Tourism is considered one of the best ways in which conservation of the environment can be reconciled with the socio-economic objectives of the area. However, the rapid expansion of tourism needs to be carefully monitored and controlled in order not to exacerbate its negative impacts on the park. To do this, it is necessary to ensure that: (a) regulations on tourism activities in CTNP are promulgated, and strictly applied; (b) officers and tourist guides are properly trained; (c) the environmental impacts are assessed and negative impact mitigation approaches are implemented; and (d) sites for waste collectors are established. Although the establishment of an overall project for rural development in the buffer zone is essential, and improving the living standards of the local people around the park is important, the park will need to find a way to mitigate the potential negative impacts of infrastructure development on the park.

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