



A Publication of the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme

# Situation Analysis

Plain of Reeds, Viet Nam



By Nguyen Xuan Vinh and Andrew B. Wyatt

A JOINT UNDP - IUCN - MRC GEF-FUNDED PROGRAMME

The designation of geographical entities in the book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (or other participating organisations, e.g. the Governments of Cambodia, Lao PDR, Thailand and Viet Nam, United Nations Development Programme (UNDP), the World Conservation Union (IUCN) and Mekong River Commission (MRC)) concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (or other participating organisations, e.g. the Governments of Cambodia, Lao PDR, Thailand and Viet Nam, UNDP, IUCN and MRC).

Published by: Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP)



Copyright: © 2006 Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP) on behalf of the United Nations Development Programme

Reproduction of this publication for educational or other non-commercial purpose is authorised without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

The content of this publication was correct at the time of writing - December 2005

Citation: Nguyen. V.X and Wyatt. A (2006). *Situation Analysis: Plain of Reeds, Viet Nam*. Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme, Vientiane, Lao PDR. 60 pp.

ISBN:

Cover design by: Studio Terra Co., Ltd.

Cover photo: Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme

Layout by: Studio Terra Co., Ltd.

Produced by: Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme

Printed by: Ink On Paper Co., Ltd.

Available from: Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme  
Programme Management Unit  
082/02 Fa Ngum Road, Vientiane, Lao PDR  
Tel: +856 (0)21 240 904, Fax: +856 (0)21 216 127  
Email: [info@mekongwetlands.org](mailto:info@mekongwetlands.org)  
Website: [www.mekongwetlands.org](http://www.mekongwetlands.org)

The text of this book is printed on Art Matte 105 gsm paper

# Situation Analysis: Plain of Reeds, Viet Nam

Nguyen Xuan Vinh and Andrew B Wyatt

## Table of Contents

Abbreviations .....	3
Acknowledgements .....	4
Objective of this report .....	5
1. Introduction .....	6
2. General background to the Plain of Reeds.....	8
2.1. Natural history .....	8
2.2. Human modification .....	8
2.3 Settlement.....	10
3. MWBP demonstration sites in Viet Nam: Location, situation and significance for conservation and development.....	11
3.1. Tram Chim National Park – Dong Thap Province .....	11
3.2. Lang Sen Wetland Reserve - Long An Province.....	16
4. Policy environment.....	21
4.1. Recent changes to state policies relating to sustainable wetland management.....	21
4.2. Important international conventions relating to wetlands.....	22
5. People and livelihoods.....	23
5.1. Population and migration .....	23
5.2. Ethnicity and religion .....	23
5.3. Overview of income generating strategies .....	24
5.4. Constraints for community development.....	25
5.5. Overview of causes, characteristics, and extent of poverty and vulnerability.....	25
5.6. Natural resource use, dependence and management.....	27
5.7. Key issues to be considered in relation to buffer zone development .....	28
5.8. Floods and communities.....	30
6. Biodiversity and environmental issues .....	31
6.1. Overview and description of main resources .....	31
6.1.1. Biodiversity values.....	31
6.1.2. Fisheries.....	31
6.1.3. Clean freshwater supply .....	33
6.1.4. Non-Timber Forest Products (NTFPs) .....	33
6.1.5. Nature-based tourism development.....	34
6.2. Threats and opportunities .....	35
6.2.1. Protected area and local community tensions.....	36
6.2.2. Hydrologic regime and fire threat in Tram Chim.....	37
6.2.3. Invasion of exotic species.....	39
6.2.4. <i>Melaleuca</i> plantation versus wetland habitats for wildlife .....	41
6.2.5. Floods and soil productivity.....	42
6.3. Flagship species: The Eastern Sarus Crane .....	42

---

7. Development strategies and changes in recent years.....	45
7.1. Agriculture and flood management strategies .....	45
7.2. Regulatory framework for forests and wetlands .....	46
 8. Politics and institutions.....	 48
8.1. Governance: How different institutions work together – power and influence.....	48
8.2. Management capacity .....	48
8.3. Public participation.....	49
8.4. Key stakeholders .....	50
8.4.1. Government .....	50
8.4.2. Local mass organisations.....	50
8.4.3. Universities and research institutes .....	51
8.4.4. International non-government organisations (INGO) .....	51
8.4.5. Private sector.....	52
 9. Key Findings .....	 53
9.1. Baseline information and knowledge gaps.....	53
9.2. Key Threats .....	54
9.3. Unsustainable management practices .....	54
9.4. Opportunities.....	55
 10. References .....	 56

# Abbreviations

ASS	Acid Sulphate Soil
CRES	Centre for Resources and Environmental Studies - National University of Ha Noi
CPRGS	The Comprehensive Poverty Reduction and Growth Strategy
CTU	Can Tho University
DARD	Department of Agriculture and Rural Development
DoNRE	Department of Natural Resources and Environment
DoST	Department of Science and Technology
EIA	Environment Impact Assessment
FIPI	Forest Inventory and Planning Institute in Ha Noi
FPD	Forest Protection Department of MARD
GoV	Government of Viet Nam
HEPR	Hunger Eradication and Poverty Reduction
HH	Household
ICF	International Crane Foundation
IEBR	Institute of Ecology and Biological Resources, Ha Noi - Viet Nam
IUCN	The World Conservation Union
LSWR	Lang Sen Wetland Reserve
MARD	Ministry of Agriculture and Rural Development
MDG	United Nations Millennium Development Goal
MOFI	Ministry of Fisheries
MOLISA	Ministry of Labour, War Invalids and Social Affairs
MONRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
MWBP	Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme
NGO	Non-Governmental Organisation
NTFPs	Non-timber forest products
PC	People's Committee
SA	Situation analysis
SIERES	Sub-Institute of Ecology, Resources and Environmental Studies - Institute of Tropical Biology (ITB)
Sub-FIPI	Forest Inventory and Planning Sub-institute in Ho Chi Minh City
TCNP	Tram Chim National Park
VANEP	Viet Nam Association for Nature and Environment Protection
VNPPA	Viet Nam National Parks and Protected Areas Association

## Acknowledgements

The authors wish to thank the management and staff of IUCN Cao Lanh Office whose advice and assistance made this research possible. In particular we would like to thank Nguyen Huu Thien and Lam Phat Quoi of IUCN. Special thanks is also due to the management and staff of Tram Chim National Park and Land Sen Wetland Reserve who assisted us during our brief visit to Tram Chim National Park and Land Sen Wetland Reserve in November 2005. We would also like to acknowledge and thank the many authors whose papers/reports are referred to in this report, key informants, and participants of two workshops where drafts of this report were presented for feedback on 30 November 2005 at Tram Chim National Park and on 5 April 2006 at Cao Lanh Town. This research was funded by the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme.

## Objective of this report

The Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP) is a joint programme of the four governments of the Lower Mekong Basin – Cambodia, Lao PDR, Thailand, and Viet Nam – managed by the United Nations Development Programme (UNDP), the World Conservation Union (IUCN), and the Mekong River Commission (MRC). The MWBP aims to strengthen capacity for wetland conservation and sustainable use in the Lower Mekong Basin by working at regional, national and local levels. In Viet Nam, the MWBP has selected two demonstration sites in the Plain of Reeds for this purpose including Tram Chim National Park (TCNP) in Dong Thap province and Lang Sen Wetland Reserve (LSWR) in Long An province.

Within its overall framework the MWBP wishes to understand the context (regional, national, local) that it operates in. Through an analysis carried out by independent consultants, the objectives of the situation analysis are:

- (i) to address the key environmental, developmental, livelihood, political and institutional challenges relating to TCNP and LSWR demonstration sites;
- (ii) to provide useful baseline information to help steer the Viet Nam component of MWBP; and
- (iii) to help identify issues that will need to be addressed and appropriate ways of working or approach for the programme.

This situation analysis does not attempt to make detailed recommendations since this requires close and detailed consultation with the relevant stakeholders and greater depth of analysis on the particular issue of concern than is possible with this predominantly desk based review of literature.

This situation analysis (SA) is prepared based on a review of available literature, limited consultations with key informants and experts, and a brief site visit. In general the authors were able to review a relatively large amount of documented material related to TCNP but not so for LSWR. There is relatively little written research or documented information for LSWR on most of the issues of interest to this SA. Consequently, it will be apparent to the reader that there is relatively less information presented for LSWR.

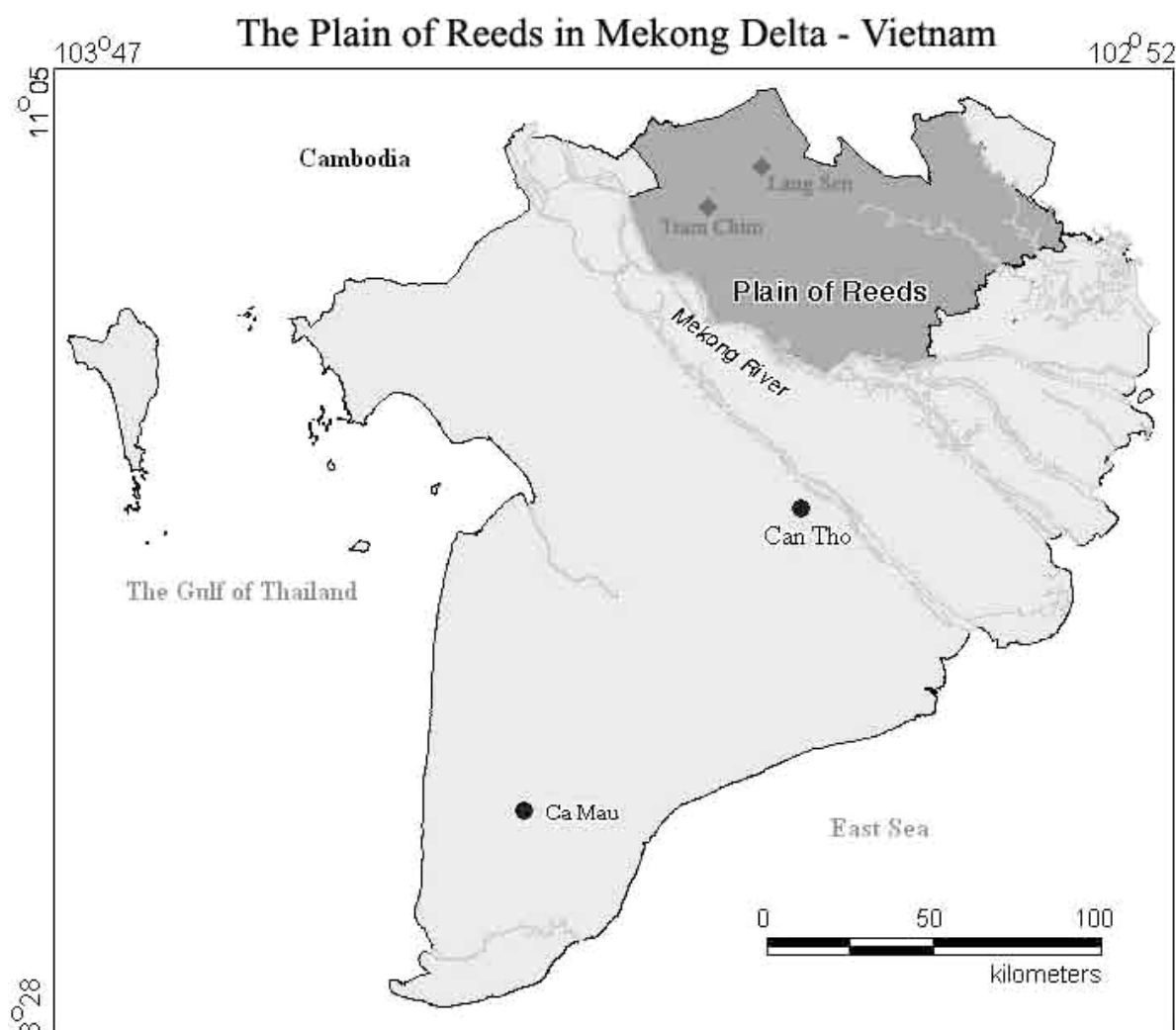
A brief site visit to TCNP and LSWR was made from 29 November to 2 December 2005. During the site visit, a consultation workshop was held at TCNP on 30 November 2005 to validate findings and solicit input from government stakeholders. A second workshop was held on 5 April 2006, at Cao Lanh Town to present and seek feedback from the Project Management Board on a second draft. The SA considers the situation at the two demonstration sites up to December 2005.



# 1. Introduction

The two Vietnamese demonstration sites, Tram Chim National Park (TCNP) and Lang Sen Wetland Reserve (LSWR), are located within an important wetland known as the Plain of Reeds, itself located within the Mekong Delta, sometimes called the rice bowl of Viet Nam for its importance as a nationally important rice growing area.

**Figure 1. Mekong Delta and the Plain of Reeds** (Source: SIERES)



Both demonstration sites are home to a number of important species of high conservation value, and were originally established to conserve two different representative ecosystems within the Plain of Reeds respectively. TCNP is a site of considerable interest for the conservation of the globally endangered Eastern Sarus Crane (*Grus antigone*) as well as other species. LSWR conserves a significant and spectacular form of lotus swampland which is fast disappearing from the Mekong Delta.

However, both sites are now subject to a combination of pressures from internal and external developments, environmental changes and constraints, which are putting pressure

on important species as well as constraining the livelihoods of the poorer segments of local communities, who in turn are putting pressure on the sites. The situation at TCNP is quite critical while that at LSWR is less so.

While there are shared problems, the histories of these two sites are very different, and the way they are managed is also quite different. The area now designated as TCNP has a history that dates back 20 years while LSWR dates back just 10 years. Both sites have had a number of changes as to their formal status over the years, both beginning as forestry enterprises, during which different policy prescriptions and management approaches were implemented over the years.

Presently TCNP is operated as a strictly enforced protected area which excludes local communities using the resources located within the park. LSWR on the other hand is an area with a history of forestry enterprise in certain areas of the reserve and human habitation throughout most of its area. This situation continues today with local communities residing within the reserve with little to no interaction with park management.

The following sections of this situation analysis are designed to give a brief insight into some of the critical elements of the present situation of the two demonstration sites.

## 2. General background to the Plain of Reeds

### 2.1 Natural history

The Mekong River seasonally inundates 3.9 million hectares of land in the Mekong Delta, including the area originally known as the Plain of Reeds (Shulman 2002). The Plain of Reeds is a vast wetland depression located between the Mekong River and Vam Co Tay River, previously comprising some 700,000 ha of Dong Thap, Long An and Tien Giang provinces in Viet Nam (Buckton *et al.* 1999) and a part in Cambodia making a total of 1.8 million hectares<sup>1</sup> (ActionAid 2002). Before human modification and development, the Plain of Reeds was a natural floodplain of the Mekong River without artificial canals and covered with a thick mat of floodplain vegetation. At the onset of the wet season in the Mekong Basin, water penetrated slowly through the vegetation mat and natural streams, and was trapped in the depression. Some of the trapped water later drains slowly through the few small natural streams but most of the water is lost through evapo-transpiration. This system formed the wetland ecosystem which supported tremendous biodiversity and helped regulate the flood pulse of the Mekong River (ActionAid 2002).

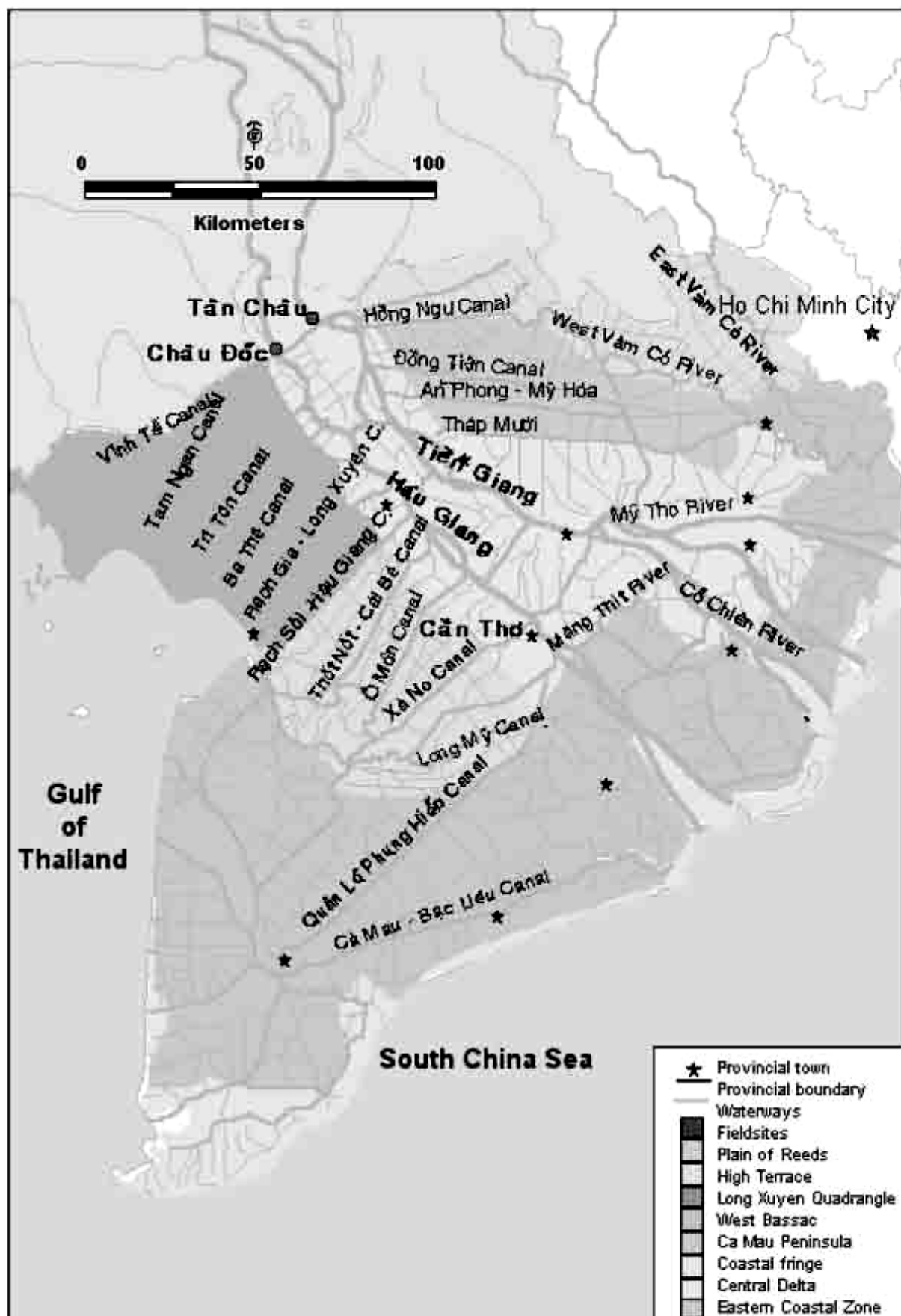
### 2.2. Human modification

During the war years, the Plain of Reeds was devastated by napalm bombs and defoliants (Agent Orange) used by the US military trying to remove the cover of the revolutionary forces (Le Dien Duc 1989). Since the war ended, development activities have taken place in the Plain of Reeds, with approximately 700,000 hectares converted to agriculture during the period 1975-1995 (Shulman 2002). Today, the majority of the Plain of Reeds' seasonally flooded grassland and forests have been fragmented by the building of canals, drained and converted for agriculture production. Consequently, the hydrological regime of the Plain of Reeds is dramatically altered due to the dense network of canals that enable water to flow in and out rapidly (ActionAid 2002). Major axial canals in the Plain of Reeds like Dong Tien, An Binh and Hong Ngu which connect the Tien Giang (Eastern branch of the Mekong River) with the West Vam Co River ("Vam Co Tay" in Vietnamese language) redirect water from the Tien Giang through the Plain of Reeds and drain off to the West Vam Co River and downstream areas (See Figure 2).

---

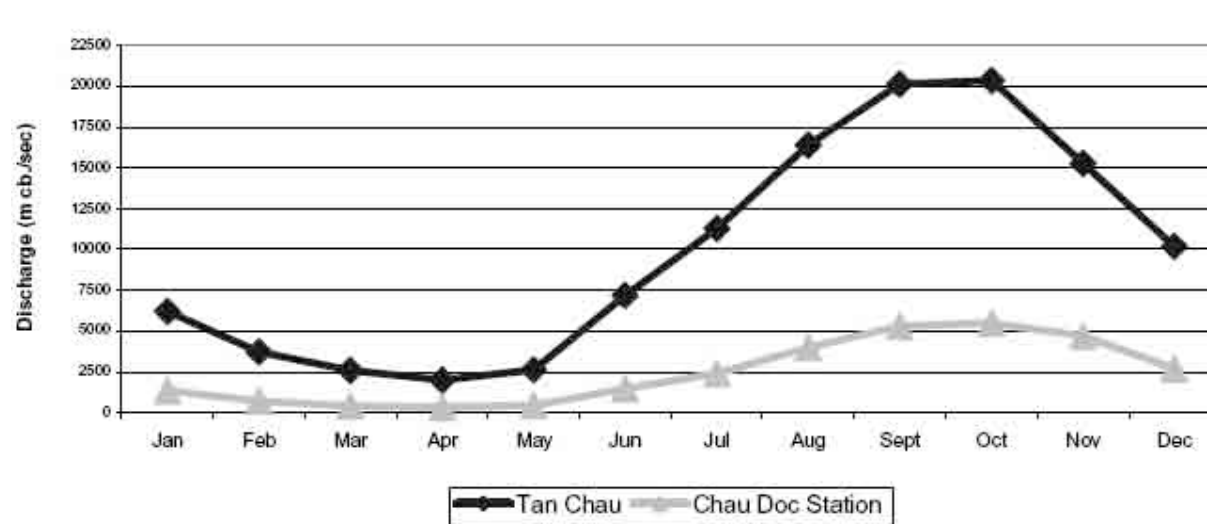
<sup>1</sup> The figure varies depending on different reference sources. In Archibald *et al.* (2003), the Plain of Reeds extends from Phnom Penh in Cambodia almost to the South China Sea (near My Tho, Viet Nam) covering a 62,500 km<sup>2</sup> (or 6.25 million hectares) depression in the Mekong Delta. Whatever the figure, in terms of natural resource management, the Plain of Reeds should be considered as a single ecosystem regardless of national administrative boundaries.

Figure 2. Major canals of the Mekong Delta (Source: Miller, 2003)



The average elevation of the Plain of Reeds is from 0.5 to 1.5 metres above sea level. According to hydrological monitoring data from TCNP, water levels can rise up to three to four metres during large floods. The duration of annual flooding in the Plain of Reeds lasts for a period of four to six months (from July to December) with its peak between late September and the end of October. For these months, Figure 3 shows that the flows are greatest in the Tien Giang branch of the Mekong River.

**Figure 3. River flows in the two branches of the Mekong River** (Source: Miller, 2003)



## 2.3 Settlement

Although the settlement history of the Plain of Reeds began centuries ago, the major influx of people to the area occurred after the land was opened for agriculture development in 1975 when the war ended. Thus, the process of migration was facilitated by the construction of canals. Because an ancient layer of marine deposits lies under the Plain of Reeds, the whole area is affected by potential acid sulphate soils (ASS). When the wetland is drained and disturbed for agriculture, exposure of the pyrite laden soils to the air results in the release of acid leachate which is toxic to plants and animals. Under such conditions, crop production was not productive and thus, the lives of settlers were difficult in the initial years until the acid leachate eventually washed away. Some of the early settlers who had sold their original home-lands to move to the Plain of Reeds lacked the experience to manage ASS and spiralled into debt after several successive crop failures. In such circumstances many were forced to sell their land to yet another generation of settlers or to those with experience in managing ASS who managed to become better off. Some of those who were forced to sell their land have become classified as landless, turning to exploitation of natural resources (such as the wild capture fisheries) for survival or becoming agricultural labourers. This process is one cause for the growing gap between the rich and poor. This phenomenon is more acutely felt in the Tram Chim area while at Lang Sen, the population density is lower and the proportion of landless is less than that of Tram Chim, probably because Lang Sen is geographically more remote (ActionAid 2002).

### 3. MWBP demonstration sites in Viet Nam: Location, situation and significance for conservation and development

The MWBP has selected TCNP and LSWR as demonstration sites for sustainable management and wise use of natural resources in the Plain of Reeds wetland ecosystem, because of their important biodiversity value in the Mekong Delta. TCNP and LSWR are both under great pressure from their immediate surroundings due to high population densities, poaching of wildlife, unsustainable agricultural practices, over-harvesting of fish and other aquatic resources both within and around the protected areas (PAs) and not least inefficient management of the wetlands.

**Table 1: Comparison of the two MWBP demonstration sites in Viet Nam** (Derived from: BirdLife and FIPI 2004; Tordoff 2002)

Items	TCNP	LSWR
Province	Dong Thap	Long An
Area (ha)	7,513	5,030
Agro-ecological zone	Mekong Delta	Mekong Delta
Decreed by government	Yes	No
Management board established	Yes	Yes*
Investment plan prepared	Yes	Yes
International IBA <sup>2</sup> criteria met	Yes (Zones A1, A3 & A4i)	Yes (Zone A1)
Ramsar criteria met	Yes	No
Conservation needs assessment prepared	No	No
Operational management plan prepared	No	No
Monitoring plans completed	No	No

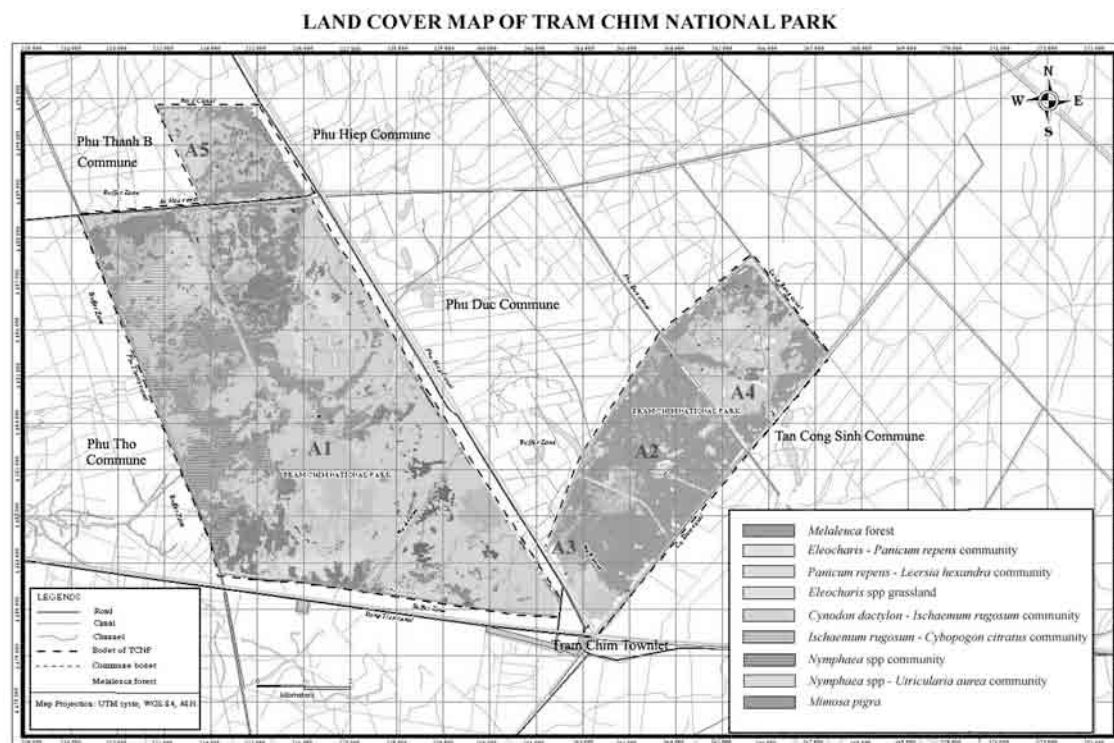
\* Management board was established by Long An Province Peoples Committee in 2004.

#### 3.1. Tram Chim National Park – Dong Thap Province

TCNP is located in Tam Nong District, Dong Thap province, right in the heart of the Plain of Reeds of the Mekong Delta, 38 km to the north of Cao Lanh, the capital of Dong Thap province, 19 km to the east of the Mekong River, and 200 km to the southwest of Ho Chi Minh City. Bordering the park are the communes of Phu Hiep, Phu Duc, Phu Tho, Phu Thanh B, Phu Cuong, Tan Cong Sinh and the Tram Chim Townlet.

<sup>2</sup> Important Bird Area (IBA) Program - A global-wide systematic approach of Birdlife International using birds as indicators to identify a set of internationally important sites for biodiversity conservation.

**Figure 4. Map of TCNP land cover and surrounding communes** (Source: Lam Phat Quoi, MWBP)



The name "Tram Chim" has been in existence for a long time. Tram Chim is a depressed wetland area within the Plain of Reeds with natural **Melaleuca** forests (meaning "**Tram**" in Vietnamese language), an abundance of freshwater fish, and consequently many **birds** ("**Chim**").

The park topography is quite flat, and slopes slightly to the east. In the past, several natural streams and rivers flowed from west to east, distributing water from the Mekong River to the Plain of Reeds. Now these streams and rivers have been replaced by a system of canals, some of which flow through the national park (Pham Trong Thinh 1998).

**Figure 5. View of flooded *Melaleuca* forests and grasslands from the watch tower in the centre of Zone A1 - note the canal** (Picture: Andrew B. Wyatt)



### ***Timeline of events leading to the establishment of Tram Chim National Park***

Before 1975: During the war, Tram Chim, located within the Plain of Reeds, was an inaccessible wilderness area, a stronghold of the revolution force, and a battlefield. In the 1960s and early 1970s, the US armies attempted to drain the Plain of Reeds by constructing canals to drain the wetlands so the area could later be burned to remove tree cover (Kuznik, 1994; Pacovsky, 2001). The Plain of Reeds was devastated by napalm bomb and defoliants during this time.

After 1975: When the war ended, the government decided to reclaim and develop the Plain of Reeds for rice production. Large investments were made in water control infrastructure and new settlers moved into the area.

1978: The provincial PC initiated a reforestation program to plant *Melaleuca* in the Tram Chim area and managed to establish a total area of 2,300 ha of *Melaleuca* forest by 1990 (Duong Van Ni *et al*, 1999).

1985: The provincial PC set aside 5,200 ha in order to preserve a small representation of the Plain of Reeds and assigned Tram Chim Agriculture-Forestry-Fishery Enterprise, under the management of Tam Nong District, to protect and exploit the area (Duong Van Ni *et al* 1999, VANEP 2002). Dykes were built around the area during this time in order to control water in and out of the area.

1986: The return of the Eastern Sarus Crane to Tram Chim was scientifically confirmed by CRES and ICF. The provincial PC banned the hunting of Eastern Sarus Cranes and carried out public awareness campaigns on the conservation of the large bird. The area was later expanded to over 7,000 ha.

1991: The provincial PC established the Center for Sarus Crane and Natural Environment Protection to protect the Eastern Sarus Crane and management of the reserve was assigned to the PC of Tam Nong District (VANEP 2002) (at district level).

1992: Early 1992, the reserve suffered from continuous and serious encroachment from the local community. On 18 May 1992, the Prime Minister issued a special order,



169/CT, requesting Dong Thap Provincial Authority to take prompt action to save the Eastern Sarus Crane and wetland ecosystem of Tram Chim (Thai Van Vinh 1997, VANEP 2002). In order to strengthen its management, in July 1992 management of the reserve was handed over to the provincial PC, under direct management of Dong Thap Provincial DOSTE (VANEP 2002).

- 1994: Decision No. 47/TTg of the Prime Minister decreed the establishment of Tram Chim-Tam Nong Nature Reserve (conservation at national level).
- 1998: The management category of Tram Chim was revised from nature reserve to national park following Prime Minister Decree No. 253/QĐ-TTg dated 29 December 1998 (VANEP 2002, BirdLife and FIPI 2004) and an investment plan for Tram Chim National Park for the period of 1999-2003 was approved with total budget of 59 billion VND (Vu Thi Nhung 2004). According to Decree 253, the mandate of the Park is to,

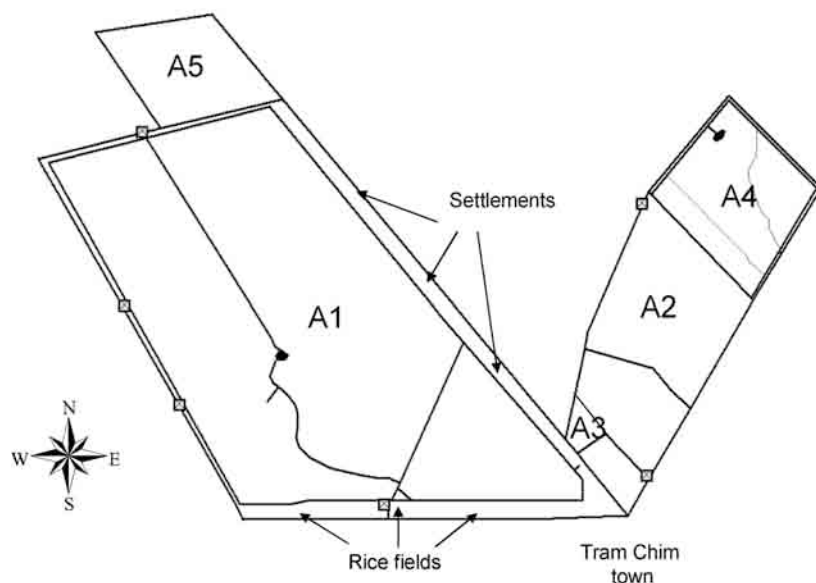
*“preserve the typical ecological system of the submerged land of the Mekong river delta, making it a national-standard model of the submerged ecological system in the enclosed Dong Thap Muoi (Plain of Reeds) flood area; to preserve unique cultural and historical values while studying, rationally exploiting the regional ecological system for the nation’s interests and for contribution to the protection of the common ecological environment of the Southeast Asian region.”*

However, while TCNP is designated as a national level conservation area, its direct management is assigned to Dong Thap Provincial PC.

Presently, TCNP covers a total area of 7,588 hectares, comprising a mixture of seasonally inundated grassland, regenerating *Melaleuca* forests covering approximately 30% of the park, and open swamp. The park is surrounded by a 52 km perimeter dyke system interspersed by sluice gates (see Figure 6) which control water flow in and out of the different zones. A system of canals and dykes dissects the park into six pieces, specifically A1 (the largest pieces), A2, A3 and A4 as strictly protected areas; A5 as ecological rehabilitation area; and C as administration and service area (see Figure 7).

**Figure 6. A Sluice gate in the dyke around Zone A1** (Picture: Nguyen Van Hung)



**Figure 7. Management zones within TCNP** (Source: MWBP)

BirdLife International and IEBR ranked TCNP as one of the most important sites for conservation in the Mekong Delta. The park receives international recognition as seasonal habitat for the globally endangered eastern race of the Sarus Crane (*Grus antigone*), and as an extant portion of the Plain of Reeds (Shulman 2002). The site is an important feeding area along the migratory route of the Eastern Sarus

Crane in the dry season, supporting as much as 60 % of the total population in the Lower Mekong Basin during the last decade. The tubers of *Eleocharis* spp. grasses found in the park are the primary food of the crane. It is also an important breeding site for water birds and other wildlife such as the Bengal Floricans (*Eupodotis bengalensis*), another globally endangered species. Tram Chim is also one of the few places in the Mekong Delta where wild rice varieties still grow. At landscape level, TCNP currently is a little spot of natural wetland area remaining in the heart of the former Plain of Reeds. The Plain of Reeds could now be renamed the 'Plain of Rice' since the park is surrounded by a 'sea of rice' and human settlements in six surrounding communes and a district town.

**Figure 8. Eastern Sarus Cranes feeding in TCNP** (Picture: Nguyen Van Hung)

The management goals in zones A1 and A2 are to restore the native vegetation of the Plain of Reeds including the maintenance of seasonal feeding grounds for the Eastern Sarus Cranes. Management goals of zones A4 and A5 are to provide habitat for cranes as well as

other bird species dependent on vegetation associated with earlier patterns of seasonal water draw-down, for example, Bengal floricans, Oriental pratincoles and green bee-eaters.

The first Investment Plan of Tram Chim Nature Reserve (1994) proposes a buffer zone for TCNP covering an area of 20,500 ha. However, the extent, boundaries and purpose of the buffer zone is not defined in practice or in the Investment Plan. There is a proposal to expand the buffer zone incorporating land from the following communes: Phu Tho, Phu Duc, Phu Hiep, Tan Cong Sinh and Phu Thanh (Vu Thi Nhung 2004) though this is thought not to be practical by present park management partly because of compensation issues. There are approximately 32,000 people living in the communes adjacent to the boundary of the park, the majority of which are rice farmers, fishers, or agricultural labourers. Twenty percent of the households in the area would be categorised as poor using criteria set by the MOLISA (ActionAid 2002). In conservation science, the objective of a buffer zone is to buffer human access to the protected area and resource use in order to support conservation objectives. In terms of this objective, TCNP at present has no functioning buffer zone since it suffers constant and significant poaching pressure and impact from the surrounding communities residing in the buffer zone area. An issue which is a significant, if not the major constraint to the use of a buffer zone as a management tool, is that most of the population within the buffer zone has legal land use certificates for the land they reside on and cultivate (discussed further in Section 5.5).

Major infrastructure developments that are presently being implemented include (Validation workshop, 2005):

- Upgrading and reinforcing the road along the perimeter dyke for zone A1 to facilitate tourist sightseeing activities.
- Establishing tourist rest stations at one kilometre intervals along the perimeter road.
- Minor modifications and repair to water control infrastructure in zone A4 and A5 to enable the retention of water during the dry season for conservation and fire control purposes.

It should be noted that the MWBP, through its Interim Water and Fire Management Strategy for April 2005 to June 2006 (see Section 6.2.2), has come to an agreement with the TCNP management for a moratorium on further canal developments for the purpose of fire management. Results of monitoring and research during the interim period will inform the need or otherwise for further canal building.

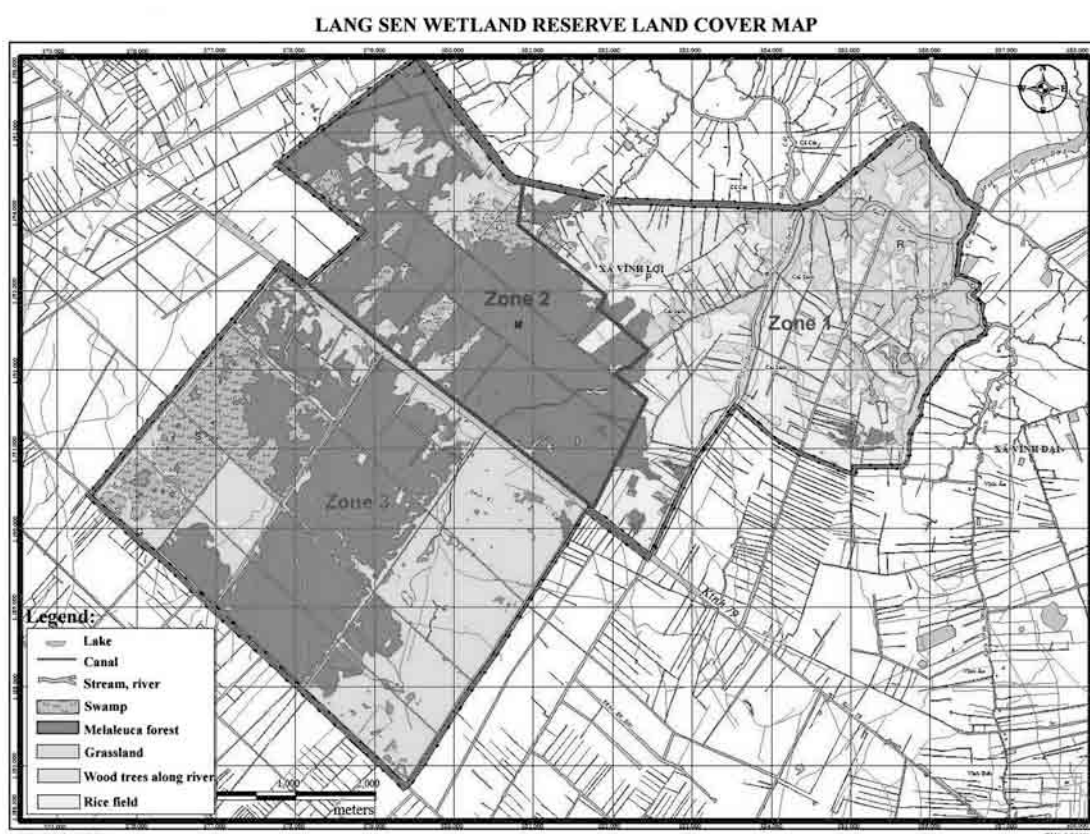
### 3.2. Lang Sen Wetland Reserve - Long An Province

Lang Sen is another remnant of the original wetland landscape of the Plain of Reeds, located in Vinh Loi commune, Tan Hung District, Long An province, approximately 23 km north east of TCNP. Unlike Tram Chim, Lang Sen is not connected to or drained by the Mekong River, but by the western branch of the Vam Co River. In severe flood years (such as 1996 and 2000), Lang Sen is flooded under 2.5 to 3.0 m of water for a duration of three to four months. However, with development and enlargement of the canal network, the flood period has shortened by about one month compared to previous periods (LSWR 2005).

Lang Sen is not included in any government decision or official set of proposals regarding the national special-use forests system, as is Tram Chim (BirdLife International and FIPI

2004). However, the establishment of a nature reserve at Lang Sen was proposed by the Long An Provincial People's Committee in 1994, at which time an investment plan was prepared by Sub-FIPI (Anon. 1994). This investment plan proposed establishing a 1,124 ha nature reserve, with the name Dong Thap Muoi (Anon. 1994). This proposal to establish a nature reserve at Lang Sen is still under consideration by MARD. However, on 19 January 2004, Lang Sen was officially established as a Provincial Wetland Reserve by Long An Province People's Committee. The LSWR covers an area of some 5,030 ha, among which 1,500 ha is swamp land providing habitats for a variety of wetland fauna and fish.

**Figure 9. Map of Lang Sen Wetland Reserve** (Source: Lam Phat Quoi, MWBP)



In Vietnamese language, "**Lang Sen**" means "**Lotus swamp**". Substantial areas of natural lotus swamp are preserved at Lang Sen. This vegetation type is characteristic of the Plain of Reeds but is now seldom found anywhere to any great extent (BirdLife International and FIPI 2004). A survey of key wetland sites in the Mekong Delta by BirdLife International and the IEBR in 1999 reported that Lang Sen was the only site visited where semi-natural *Melaleuca* forest occurs along a natural river channel, and, as such, is of notable biodiversity value (Buckton *et al.* 1999). The site is listed as an Important Bird Area (IBA) because a significant number of large water birds, including the Eastern Sarus Crane (*Grus antigone*) and the globally near-threatened Painted Stork (*Mycteria leucocephala*), en-route between their breeding areas in Cambodia and their non-breeding areas in the Mekong Delta of Viet Nam, use Lang Sen as a stop-over area (BirdLife and FIPI 2004).

A recent biodiversity survey carried out by the Reserve has recorded 156 plant species, 149 vertebrate species (among which 13 species are listed in the Viet Nam Red Book for endangered species) and 11 benthic animal species. Typical habitats found in LSWR are:

- Natural streams and rivers;
- Riparian forests (average 10 - 15 m wide band of multi-species woody trees) along rivers and canals;
- Seasonally flooded grasslands, flooded for five to six months a year and susceptible to fire in the dry season;
- Swamp with water almost year round, providing good refuge for wildlife like snakes, turtles, tortoises and various fish species;
- *Melaleuca* forests;
- Rice fields; and
- Canals.

**Figure 10. Lotus swamp in LSWR** (Picture: Andrew B. Wyatt)



A major challenge at LSWR is that much of the reserve and surrounding area is inhabited by local communities, predominantly along the network of canals that criss-cross the park. This differs to TCNP where there are no communities living within the park boundary. The most heavily populated areas are in the north-eastern corner of the park which is also the area of highest conservation value. According to the Director of LSWR, there is a proposal to resettle willing households from this high value area to the major canal which bisects the centre of the reserve. An alternative idea is for the area to be co-managed between residing households and the reserve management (Ngo Quang Phuc, pers. comm.). The rationale for moving these households is related to the lack of opportunities for the poorer households to improve or diversify their livelihoods rather than any real pressure on the natural resources or biodiversity in the area. It is thought that many would take the opportunity to move willingly because of the difficult conditions. Richer households from this area typically have *Melaleuca* plantations and they would be less willing to move. The reserve's management propose that they would involve these richer households who are unwilling to move in any co-management initiative (Ngo Quang Phuc, pers. comm.).

Much of the central area of LSWR largely includes the remaining *Melaleuca* forest which is designated as production forest under the management of Tan Hung Forest Enterprise (Buckton *et al.* 1999, Nguyen Duc Tu 2002). According to the Director of LSWR (pers. comm.), the Provincial Government which owns the Forest Enterprise has set a timetable to phase out all its operations within the boundaries of the reserve at which time the forest will be handed over to the management of LSWR. Details on the timing of the phase out are not known.

**Figure 11. Settlement along canal of LSWR** (Picture: Andrew B. Wyatt)



The present five year Investment Plan for LSWR (2005–2009) outlines the following as its planned activities (LSWR 2005):

- Define and demarcate the boundary of the reserve, including the handing over of land from the Vinh Loi Forestry Enterprise to the reserve and organising the Reserve Management Board.
- Wetland biodiversity inventory and ecological zoning for the reserve. Based on findings of these activities, measures and specific annual activities will be recommended for natural resource and biodiversity restoration in each of the reserve habitats.
- Habitat restoration.
- Management of alien invasive species.
- Monitoring of wetland environment and biological resources (hydrology, invasive species, wildlife in ecological zones in the reserve).
- Conduct scientific research, including research capacity building, for the reserve.
- Develop ecotourism plan and implement activities.
- Address resettlement issue in the reserve.
- Support community development in reserve's buffer zone.
- Organise community participation in biodiversity conservation and sustainable use of natural resources in the reserve.
- Develop and implement a plan to build capacity for reserve staff.
- Develop an environment education program.
- Establish cooperation relationship and partnership.
- Build reserve infrastructure.

---

A budget of 15.3 billion VND (US\$968,000) has been allocated, 13.3 billion VND from the Provincial Government Budget and 2.0 billion VND from international donors. Both the commitment to disband the provincial owned forestry enterprise and the budgetary support from the Provincial Government suggests a high degree of commitment toward the conservation objectives of LSWR.

## 4. Policy environment

### 4.1. Recent changes to state policies relating to sustainable wetland management

There have been a number of major developments regarding wetland protected areas over the last three years. A new government ministry, the Ministry of Natural Resources and Environment (MONRE<sup>3</sup>) with responsibility for development of national wetland protected areas and a number of new policies and regulations have been issued. Two new key policies and regulations are:

- Decision No. 192/TTg of the Prime Minister, dated 17 September 2003, on a Strategy for Viet Nam's Protected Areas System; and
- Decree No. 109/CP of the Prime Minister, dated 23 September 2003, on the Conservation and Development of Wetlands, which provides the legal basis for promoting sustainable management of wetlands in Viet Nam.

Consequently, management responsibility for the protected areas systems in Viet Nam is divided as follows:

- MARD is responsible for the national special-use forests system
- MONRE is responsible for the national wetland protected areas system
- MOFI is responsible for the national marine protected areas system

The result of this restructuring is that there is an overlap in responsibility for wetland areas such as TCNP which also contains forest classified as special-use forests. These overlapping responsibilities cause confusion and weak collaboration in wetland management. As a national park, Tram Chim is a special-use forest currently under the overall management of MARD through the FPD. But it is also a recognised wetland area, responsibility for which falls under MONRE. Furthermore, MONRE is the national focal point for issues and activities related to the Ramsar Convention and the Convention on Biological Diversity, and it is responsible for putting forward nominations for new Ramsar Sites and Biosphere Reserves in Viet Nam (BirdLife International and FIPI 2004).

Decree No. 109/CP on the Conservation and Development of Wetlands provides the legal basis for promoting sustainable management of wetlands in Viet Nam. The Decree stipulates that MONRE will play a management role in the conservation and sustainable exploitation of wetlands, including formulating policy and legislation. The Decree also stipulates that wetland protected areas need to be managed and identifies the activities that are encouraged and prohibited at these areas. This is the first time that wetlands have gained official recognition as a distinct land-use or conservation management category. To date, however, proposals to designate a national network of wetland protected areas have not been formulated (BirdLife International and FIPI 2004) and to date the Decree remains

---

<sup>3</sup> Ministerial responsibility for environment and natural resources was removed from the former Ministry for Science Technology and Environment which became the Ministry for Science and Technology.



ineffective. It does however, present an opportunity or opening by which the MWBP can influence and shape Viet Nam's wetland management framework.

Based on the Prime Ministerial decree, MONRE prepared and approved the Strategic Action Plan on the Conservation and Sustainable Exploitation of Wetlands for the period of 2004-2010 through Decision 04/2004/Q -BTNMT dated 05 April 2004. This strategic action plan is an orientation document for the implementation of the Prime Ministerial decision, as well as Viet Nam's commitments under the Ramsar Convention. The strategic action plan provides guidance for policy makers, managers and researchers in conserving and exploiting wetlands in Viet Nam.

While bringing MONRE into the policy and management framework is a positive step given the multi-sectoral nature of wetlands management, there are a number of challenges to be addressed if their role is not to be marginalised. First of all MONRE has no jurisdiction over land use decisions. MONRE has relatively little power in this respect compared to MARD. Secondly, MONRE does not recognise MARD's land use classification system. This situation only compounds the already poor cooperation and coordination between the two ministries.

## 4.2. Important international conventions relating to wetlands

Viet Nam has ratified a number of significant international conventions in relation to wetlands. The following table summarises the dates of ratification by the GoV for the five most important Multilateral Environment Agreements with regards to wetland biodiversity conservation.

***Table 2: Dates of ratification for conventions related to wetland biodiversity conservation (Source: Friederich)***

Convention	Ratification date
Convention on Biological Diversity - CBD (1992)	1994
Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES (1973)	1994
Convention on Wetlands of International Importance Especially as Waterfowl Habitat - Ramsar Convention (1971)	1989
Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)	1987
Convention on the Conservation of Migratory Species of Wild animals - CMS (1979)	not ratified yet

It should be noted that the Ramsar Convention calls for cross-border collaboration, but capacity to implement the convention in Viet Nam is limited. Despite being a vast wetland area, there currently is no Ramsar site of international significance in the Mekong Delta, although at least two or three qualify for the designation criteria. Furthermore, no wetlands in the Mekong River Basin have been nominated as World Heritage Sites (Source: Friederich).

## 5. People and livelihoods

### 5.1. Population and migration

In 2003, Tam Nong District had a human population of 96,641, among which 31,922 live in the six adjacent communes or buffer zone of TCNP. The rate of population growth was 2.18% in comparison with the provincial average rate of 1.93%, largely due to migration (Duong Van Ni *et al* 1999). High rates of migration have occurred during the period of 1984-1991 following government policies on the settlement and reclamation of fallow or “uncultivated” lands and the establishment of new economic zones. In addition, migrants from the surrounding region move seasonally into the area surrounding Tram Chim to sell their labour during the Winter-Spring and Summer-Autumn rice cropping seasons and to exploit the wild-capture fisheries during the flood season<sup>4</sup>. Most of the seasonal labourers living around Tram Chim are not registered with the local government which poses a problem for the government in terms of the provision of services for this group of people. It also makes it difficult to estimate pressure on the surrounding area and its resources from this particular group.

**Table 3: Population of Tam Nong District and TCNP buffer zone**

Source of information (a): Duong Van Ni *et al* (1999)

(b): Dong Thap 2003 census data - Vu Thi Nhung (2004)

Year	Tam Nong District		Tram Chim Buffer Zone*	
	Population	Number of HHs	Population	Number of HHs
1999 (a)	76,206		24,545	5,080
2003 (b)	96,641	21,959	31,922	7,303

Notes: \* The Tram Chim buffer zone in this definition consists of five communes (Phu Hiep, Phu Duc, Phu Tho, Phu Thanh B, Tan Cong Sinh) and Tram Chim Townlet  
HH: Household

Lang Sen, which is located in the administrative territory of Vinh Loi commune, has a total population of approximately 3,600 people, most of whom are also rice farmers, fishers and *Melaleuca* farmers (ActionAid 2002). Information is not readily available regarding seasonal labour movements in the Lang Sen area.

### 5.2. Ethnicity and religion

The majority of people living in Tam Nong and Lang Sen are Kinh. The Kinh make up the majority of Vietnamese people. Other ethnicities are Chinese Vietnamese and Khmer (Duong Van Ni *et al* 1999). Hoa Hao is the most popular religion in Tam Nong making up 27.6% of total population (Duong Van Ni *et al* 1999). Other religions are Christianity (9.7%), Buddhism (8%), Cao Dai (4.5%) and Protestantism. Duong Van Ni *et al* (1999) reported that within the TCNP buffer zone, there were 12 religious meeting halls, four oratories and two churches. Information on religion is not readily available for LSWR.

<sup>4</sup> The flood season generally occurs in Tram Chim between July/August and November/December.

### 5.3. Overview of income generating strategies

In general, the living conditions of local communities surrounding TCNP and LSWR could be said to be poor. Disaggregated statistical data on income and poverty levels for the surrounding communes are not readily available. Most local communities within the demonstration sites predominantly carry out rice cultivation during the dry season and switch to fishing or wildlife hunting in the flood season as the floods submerge their rice growing lands. According to ActionAid (2002), local livelihoods are derived from three main resources: land (e.g. agriculture, mostly rice cultivation), natural resources (e.g. fishing; wildlife hunting; timber harvesting and processing; and limited collection of NTFPs) and human (e.g. selling labour, small trading, services). Fishing and hunting involve the highest number of households but due to the decline in these natural resources the importance of land-based income is increasing while the former is decreasing.

Rice cultivation is still the main source of land-based incomes. Intensification of rice cultivation (two crops per year) in the area has increased risks for local farmers because it requires large investments in fertilizer, pesticide, fuel and labour. This has led to increasing levels of debt for some farmers as rice prices have dropped and input costs have gone up. In recent years some have invested in *Melaleuca* plantations which can be highly profitable over a six to seven year cycle (see Figure 12). However this form of livelihood is not amenable to investment from poor, landless or land poor households because of the high and long-term investment needs. Vu Thi Nhung (2004) found nearly 40% households in Tram Chim are landless or land poor, whose income is derived mainly from selling labour, poaching in the park, or where households do have a small plot of land, small-scale fish aquaculture. Natural resources which are exploited from within the protected area are fish, birds, snakes, turtles, lotus, firewood, etc. Anecdotal evidence suggests that the gap between the rich and poor is growing and this has implications for conservation and sustainable development at the demonstration sites.

**Figure 12. Small-scale household run *Melaleuca* plantation** (Picture: Andrew B. Wyatt)



## 5.4. Constraints for community development

At Tram Chim, most of the social infrastructure and services such as high schools and clinics are concentrated in Tram Chim Town. Tan Cong Sinh, Phu Thanh B, Phu Hiep communes are considered as more remote and difficult areas with inadequate infrastructure. The authors were not able to gauge the state of social infrastructure at Lang Sen.

During the flood season, land transportation within the surrounding communes is difficult since most local roads are not sealed, slippery or flooded. The major means of transportation during this period is by small boat. In the dry season, low water levels in canals limits waterway transportation, particularly at Tram Chim.

A high voltage power grid has been extended to all buffer zone communes in Tram Chim, but most poor households have not been able to hook up to the power grid because they cannot afford the connection expense. Vu Thi Nhung (2004) reports that only 70% of households in Tram Chim have access to electricity. Household access to electricity at Lang Sen is not known.

Local households at both the demonstration sites have very limited access to formal information channels. For example, the number of households who own televisions or radios is very low. Interviews with local households by Vu Thi Nhung (2004) in Tam Nong District shows that approximately 60% of households do not regularly watch television, listen to radio or read newspapers. This figure suggests that any communication strategy will be faced with a major challenge. Currently the communication of government policy, regulations, programs, farming techniques and agricultural extension information has been done through local officials, in particular, staff at commune level. Low literacy is a further constraint with an illiteracy rate of 12.2% in Tam Nong District (Vu Thi Nhung 2004).

## 5.5. Overview of causes, characteristics, and extent of poverty and vulnerability

Despite improving economic conditions over the last ten years, communities within the demonstration sites are still among the poorest in the Mekong Delta. Twenty percent of the households in the area would be categorised as poor or poverty stricken by the Ministry of Labour War Invalids and Social Affairs (MoLISA) standards for the 2000-2005 period<sup>5</sup> (ActionAid 2002). In May 2005, the Government of Viet Nam officially approved MoLISA's plan to apply a higher poverty line for the period of 2006-2010. Accordingly, an urban resident who earns VND 230,000 (\$14.60) or less a month and a rural resident earning VND 200,000 (US\$12.70) or less will be considered poor. The adjustment will put the demonstration sites firmly within targeted areas for poverty reduction efforts.

Poor households are characterised by the following criteria: landlessness, land shortage, food insufficiency, and/or the selling of labour for survival. ActionAid (2002) identifies the main causes of poverty are due to insufficient land holdings, alcoholism and domestic abuse problems. The increasing level of household debt is also cited as an important contributor to poverty because it has led to households selling their land. Surveys conducted by Duong

---

<sup>5</sup> Under these criteria, the poverty threshold in rural areas was between VND 80,000-100,000 (\$5.1-6.37) per capita per month and VND 150,000 (\$9.55) for urban areas.

Van Ni *et al* (1999) in the buffer zone of TCNP found about 21.5% of the households living within the buffer zone own less than 1,000 m<sup>2</sup> per person or has no land. Landlessness or land shortage is seen by the government as the most challenging issue for sustainable development at TCNP.

By contrast, ActionAid (2002) has found that food shortages have not been a major problem in the Lang Sen area. The Chairman of Vinh Loi commune government is quoted as saying: *"Poor people in Vinh Loi do not lack of food because we have a good fishery. People who are from Kien Giang and Dong Thap even come here to earn money. In flood season, there are some difficulties but the poor here do not lack food to survive."* This may be because natural resources such as the wild-capture fishery is under less pressure at Lang Sen than in Tram Chim and a smaller proportion of households at Lang Sen are landless or land short.

A major issue of concern to all households, rich or poor, has been their vulnerability to floods in terms of personal safety and livelihood security, under-developed infrastructure and accessibility to services such as clinics, schools, clean water, and their children's future (education, jobs) (ActionAid 2002). The ActionAid research finds that social capital plays a major role in reducing vulnerability, "... people who are living in communities where they have good relationships and neighbours can give support whenever others meet difficulties and those are things that local people are very satisfied with".

Recent research suggests that institutional structures such as the legal requirement for households to maintain a household registration book (*Ho Khau*) can discriminate against migrant groups who have moved into new areas. The *Ho Khau* is maintained by each household in order to identify their official place of residence and entitlement to a range of government provided services. Without the *Ho Khau*, a household's access to schooling and health services as well as access to micro-finance, for example through the Women's Union, may be restricted. Furthermore, many poor land-holding households often do not have formal land use certificates (Red Book). Without formal land titles, such households are often not able to access low interest loans from the banks to invest in income generation activities (CIEM 2005).

Lack of participation in management decisions can also leave poor communities vulnerable when unanticipated new rules and regulations are implemented. An important policy of the GoV that can enhance community livelihood and reduce vulnerability at the demonstration sites is Decree No. 79/2003/N -CP of 7 July 2003, promulgating the regulation on the exercise of democracy in communes. The regulation on the exercise of democracy in communes provides an enabling environment and an institutional mechanism for peoples' participation in natural resources management and socio-economic development since the regulation enables people to participate in discussion, and decisions over the implementation and monitoring of important matters relating to their own rights and responsibility (DWC 2003). Lack of power and choice, and the lack of material resources form the basis of poverty (Sida 2002). In seeking new ways of working with the local community, this new regulation presents an opportunity to push ahead with the development of broad based participatory management approaches.

## 5.6. Natural resource use, dependence and management

The natural resources at TCNP are central to the livelihoods of local communities, particularly the poorer households. Most local people at the demonstration sites who participated in a 2002 survey for IUCN reported that natural resources were an important source of income for them, but this has decreased in terms of biodiversity and abundance due to shrinking natural habitats and over-exploitation. Householders understood they were using natural resources in unsustainable ways but they believed they had no choice if they were to survive and improve their economic situation (ActionAid 2002).

Presently, the management approach to natural resource use at TCNP is strict enforcement of an exclusion policy. This policy is enforced by armed park rangers at Tram Chim. However, the large area of TCNP means that in practice it is difficult to police the whole park. Indeed, a number of poachers utilising fishing nets were encountered and observed in zone 1 by the authors during a site visit in November 2005.

**Figure 13. A poacher fishing with nets in TCNP** (Picture: Andrew B. Wyatt)



The management approach at Lang Sen is much more inclusive because of the legal residence of households within the boundaries of LSWR. This poses a challenge for the management of the reserve since management has no legal right to manage the activities of households within the reserve so long as their activities are broadly within the bounds of their legal land use rights. Hence the reserve management is proposing a co-management approach to deal with natural resource management issues within the park.

The management of natural resources such as the wild capture fisheries at TCNP is also influenced by surrounding developments and their management. A major issue here is the continued official support for dyke building within the Plain of Reeds in general and, in particular, within the surrounding communes of TCNP. For example, Miller (2004) documents the implementation of recent dyke developments within Phu Cuong Commune on the northern side of the Dong Tien Canal which are designed to facilitate government policies to intensify rice cropping to two or three crops per year. There is also demand from within the surrounding communities for continued dyke developments. The cumulative

impacts of increased chemical usage and loss of habitat (loss of flood plain breeding areas for certain endemic species of fish) of such developments are difficult to quantify, however, associated fisheries studies of dyke developments in An Giang Province recognise that such dyke developments will lead to a reduction of aquatic biodiversity and abundance (Root *et al* 2003).

## 5.7. Key issues to be considered in relation to buffer zone development

A number of key issues which have the potential to impact on buffer zone community development at TCNP are considered below. This consideration is limited to TCNP since a recent buffer zone proposal at LSWR presently makes little sense since communities already reside within the reserve.

- **Buffer zone management:** Vu Thi Nhung (2004) pointed out that the idea of buffer zone for TCNP was proposed as a conservation management tool for the national park, but in effect the buffer zone remains just an idea or concept in documents and the minds of managers. A number of unresolved issues are raised here about why the concept has not moved much further than an idea, as clear objectives for buffer zone management still do not exist. Further, who will have the primary authority and responsibility to manage the buffer zone given that the zone consists of communes administrated by commune level governments? How does buffer zone management contribute to conservation in the core zone of TCNP? How can the buffer zone communities participate in biodiversity conservation in the core zone and what might be their incentives? What are the necessary mechanisms, and supporting policies and regulations that are required to address the aforementioned issues? All of these fundamental questions must be resolved before a clear idea of whether a buffer zone approach is needed or if an alternative management approach might be considered.

Another significant problem, as a consequence of the above unresolved issues, is that the buffer zone area is not defined on paper or on the ground. Furthermore, the boundary between TCNP and its buffer zone has been modified several times. This has caused confusion and some households are not aware of whether they are living in the park or not (Vu Thi Nhung 2004). This has also caused some confusion in relevant stakeholder identification for the project sites.

- **Access and control over resources:** there is presently an exclusionary policy which bans all forms of community access to resources within the park boundaries which is strictly enforced by park management. According to park managers, the majority of poachers are landless or land poor people from the surrounding communities. Vu Thi Nhung (2004) argues that a major negative sentiment towards the park within the surrounding communities is directed at the strict enforcement of the exclusion policy. These community attitudes will be a major barrier to any future cooperation from surrounding communities with regards to developments within the buffer zone.
- **Land tenure:** historical settlement in Tram Chim predates its establishment and extension of park boundaries. There are still a number of unresolved compensation claims that date back a decade to the park's establishment which are yet to be fully

resolved. The authors were informed that the park management is working with Tam Nong District Peoples Committee to resolve the problem (Validation Workshop 2005). Leaving such claims unresolved or allowing them to drag on adds to the build-up of negative sentiments within the surrounding communities towards the park. These negative sentiments have the potential to compound on sentiments related to other tenure issues such as the exclusionary access policies and their strict enforcement.

- **Landlessness, land shortage and indebtedness:** indebtedness and landlessness are different stages of a cycle of poverty which exists in the buffer zone area of TCNP. The poorest place heavy pressure on the natural resources within the core zone. They should be treated as a principle beneficiary group in any programs for community development within the buffer zone. Adequate effort and resources will need to be invested in addressing this major challenge of helping this group find alternative and sustainable sources of income.
- **Encroachment of public lands and poaching:** Duong Van Ni *et al* (1999) reported the following forms of exploitation within the protected area of TCNP: fishing (netting, trapping, electric fishing), hunting, wood cutting (collection of *Melaleuca* wood as firewood for own use or to sell), free range cattle and buffalo grazing, and burning of grassland and forest (arson).
- **Water supply and sanitation:** many of the poor at TCNP are not able to access clean water and sanitation. Clean water supply and sanitation are major determinants for good public health in the Plain of Reeds, and the Mekong Delta in general. Domestic water of poor quality carrying water-borne communicable diseases is a large threat to public health. Coupled with poor nutrition and low education levels leaves the poor more vulnerable to stresses and shocks. Currently water supply networks are often not available in the buffer zone communities. Local people use rain water stored in containers during rainy season or ground water from tube-wells in the dry season. The poor often cannot afford the cost of a tube-well and must travel long distances to fetch water or use canal water.
- **Low literacy:** there is significant illiteracy in the buffer zone communities, specifically 12.2% in Tam Nong District (Vu Thi Nhung 2004) which poses a challenge for any communication strategy related to developments within the buffer zone.
- **Access to education:** the distance to high schools and affording education tuition fees which increase from primary school to high school generally limits the number of students from poor families going on to higher levels of education.
- **Pollution:** as is common practice in other places of the Mekong Delta, local communities in Tram Chim do not manage waste well or have little access to adequate waste management facilities. The practice of dumping household and agricultural waste into canals is widely practiced. This pollution together with agro-chemical residues in water is posing a high risk for sustainable development in the area.
- **Migration and population growth:** in-migration, seasonal migration and population growth are among the underlying causes of increased human pressure on resources in the protected area. These issues pose a major challenge in terms of development which can create new livelihood and job opportunities that will reduce pressure on the natural resource base of the area.



## 5.8. Floods and communities

The annual floods are a part of the natural hydrological cycle at the demonstration sites in particular and the Plain of Reeds in general. As a large area of wetlands, the Plain of Reeds acts as a regulator (or sponge) for the Mekong's 'flood pulse'. The continuing fragmentation and loss of wetland areas to absorb and moderate the rate of flooding within and in adjacent areas to the Plain of Reeds is expected to lead to more intensive and prolonged flooding. Floods may rise faster and earlier than might otherwise be expected. Continuing government support for dyke building within the Plain of Reeds (Miller 2004), and in particular within the surrounding communes of TCNP and Lang Sen, is a major process by which the total area of wetlands is being reduced and fragmented. This is likely to further compound on other dyke developments in the upper Mekong Delta (SIWRP 2004).

Local communities do not necessarily perceive 'normal' floods as something negative. Local communities have long lived with the floods and adapted their livelihoods to the seasonal cycles. However, severe flooding events which are more intensive and prolonged than normal flood years can take a heavy toll on human life, infrastructure and agricultural production. In 2000, a particularly severe year for floods in the Mekong Delta, Long An Province alone suffered severe losses from the floods at the estimated cost of 671 billion VND, including 296 billion VND of damage to agriculture (T.T.K Dinh 2004). The poor are the most vulnerable to flooding since many of them do not have the financial or social capital to cope with the floods, for instance houses built in safe places or boats to do fishing (Oxfam GB 2004). During the flood season, the main livelihood of local communities is from fishing and transportation is mostly by boat. Refer to Section 6.2.5 and Section 7.1 for further discussion on floods.

## 6. Biodiversity and environmental issues

### 6.1. Overview and description of main resources

TCNP and LSWR are the last remaining wilderness areas of high biodiversity value in the Plain of Reeds. A brief overview of the main resources and values of the demonstration sites is discussed below.

#### 6.1.1. Biodiversity values

TCNP and LSWR represent the last remnants of the natural wetland ecosystem of the Plain of Reeds. Both of the sites are listed in the list of 63 internationally important bird areas of Viet Nam (Tordoff 2002). Buckton *et al.* (1999) and BirdLife & FIPI (2004) describe in detail the flora and fauna biodiversity of the sites. For fauna, the studies concentrate mainly on birds. Biodiversity information on other fauna is currently not available. The following summarises some key biodiversity features of the demonstration sites.

Tram Chim is home to circa 200 species of birds (ActionAid 2002<sup>6</sup>), among which 16 globally threatened and near-threatened bird species are confirmed (Nguyen Van Hung, pers. comm.). Large populations of water birds are found at the sites, particularly in the winter when many thousands of waterfowl visit (Buckton *et al.* 1999). Of particular importance is the non-breeding population of the eastern subspecies of Sarus Crane (*Grus antigone sharpie*), which regularly spends the dry season at TCNP (BirdLife and FIPI 2004). Tram Chim is also one of the few places in the Plain of Reeds where a wild rice (*Oryza rufipogon*) community is likely to survive to any extent, and, therefore, one of the most important sites for the conservation of wild rice in Viet Nam (Buckton *et al.* 1999).

Lang Sen is the only site in the Mekong Delta where a natural *Melaleuca* swamp occurs along a natural river channel, and as such is of considerable conservation value (Buckton *et al.* 1999). This site includes substantial areas of lotus swamp. Patches of semi-natural *Melaleuca* forest are found in some swampy areas. Protection of the site will support conservation of migratory species like the globally vulnerable Eastern Sarus Crane and the globally near-threatened Painted Stork (*Mycteria leucocephala*) currently using Lang Sen at a staging post in their flyways between Viet Nam and Cambodia.

#### 6.1.2. Fisheries

Compared to other areas of the Plain of Reeds in particular, and the Mekong Delta in general, Tram Chim and Lang Sen presently still harbour a high abundance of freshwater fish resources. The wetlands of TCNP and LSWR play a critical role in replenishing the fishery resources in the surrounding area. Fish species of high economic value in Tram Chim and Lang Sen include Chevron Snakehead (*Channa straita*), Blotched Snakehead (*Channa lucius*), Bronze Featherback (*Notopterus notopterus*), Broadhead Catfish (*Clarias macrocephalus*), Walking Catfish (*Clarias batrachus*), Climbing Perch (*Anabas testudineus*), Swamp Eel (*Monopterus albus*) and other river fishes (cá tr ng).

---

<sup>6</sup> Reference source for this figure is unclear in ActionAid report and needs to be checked.

For local people, fish serves as an important source of protein and essential amino acids in their diet. Fishing is the most important livelihood of communities living around TCNP and in LSWR, particularly for the poor during the flood season. Access to fishing in water bodies outside of the protected area is open to everyone. In addition, fishers from the surrounding region also come to Tram Chim and Lang Sen to fish during the flood season from August to November (Duong Van Ni *et al* 1999, T.T.K Dinh 2004). These outsiders further contribute to increasing pressure on the unregulated fishery resources at the demonstration sites.

**Figure 14. Local communities utilise a range of different fishing techniques along the canals and flood plains around TCNP and LSWR** (Pictures: Andrew B. Wyatt)





Currently, TCNP and LSWR do not have a long-term fishery management plan. Unsustainable and destructive fishing methods are still practiced at the sites using high voltage electricity and small mesh nets, both in and outside of the protected areas. There have been signs of decline in fishery resources in the Plain of Reeds and at the demonstration sites alike. In the Plain of Reeds area that belongs to Long An Province, annual fishing yields have showed a declining trend and native fish species like Marbled Goby (*Oxyeleotris marmorata*/ Bồng Tượng), Bồng Cát, Bồng Dừa, Chạch Lấu, Cá Chày have disappeared (T.T.K Dinh 2004).

### 6.1.3. Clean freshwater supply

“Clean” freshwater here can be understood as freshwater of a neutral pH value (around seven) coming from the wetlands of the demonstration sites. Like most of the Plain of Reeds area, soils at the demonstration sites are highly acidic and require water to flush the acidity out. Canal water in the demonstration sites is often highly acidic by the end of April and during May, when the first rains come and flush acidic materials from the exposed soils into the canals. This is a constraint for agricultural production in the area as well as for water supply for domestic consumption. Hence TCNP and LSWR play a valuable role as a source of freshwater from the conserved wetlands which contribute to agricultural production in adjacent areas, particularly during the drawdown period in the dry season.

### 6.1.4. Non-Timber Forest Products (NTFPs)

Both TCNP and LSWR are rich in terms of their NTFPs. Despite this, there has been little systematic study of their potential for sustainable use and livelihood support for the poor. Partly this has been because of the exclusionary policies at TCNP which do not encourage their exploitation. Some potential NTFPs at both TCNP and LSWR include:

- Honey - local people once traditionally harvested honey in the area.
- Edible wetland products, for example lotus stem and seeds.
- Medicinal products such as essential oils extracted from *Melaleuca* leaves.

- Reeds which can be used to make paper pulp and traditional household brooms and brushes.
- Materials to manufacture handicraft products, for instance, dried water hyacinth to weave baskets and mats.

### 6.1.5. Nature-based tourism development

Nature-based tourism is a major justification for conservation since it provides an economic value to support conservation and appreciation of the cultural values of the Plain of Reeds. Tram Chim and Lang Sen have many activities to offer tourists including bird watching and cultural activities such as the study of their historical role in Viet Nam's revolutionary struggles when the Plain of Reeds provided a base for the revolutionary forces. TCNP has invested in some basic tourist facilities, for instance it has a guest house, tourist transportation within the park and a number of observation towers at strategically located bird watching points within the park. In recent years, the condition of roads to the park from major centres like Ho Chi Minh City and Can Tho City has seen much improvement.

Since records were kept in 2000, there has been a small but increasing number of tourists visiting TCNP (refer to Table 4). According to park records, visitors come to the park mainly for bird watching, particularly the Eastern Sarus Crane, appreciation of the revolutionary role that the Plain of Reeds played in Viet Nam's history, enjoyment of the beautiful wetland scenery, recreational fishing, and conducting research. The peak tourist season coincides with the New Year and the return of the Eastern Sarus Crane to Tram Chim in the dry season (from November to April).

**Table 4: Annual number of visitors to Tram Chim National Park** (Source: TCNP Center for Tourist Services and Environment Education)

Visitors	Year					
	2000	2001	2002	2003	2004	2005
Number of visitor groups	41	71	79	126	356	408
Number of visitors	620	1180	1610	2583	3206	3571
among which,						
international visitors	98	157	163	206	84	207
recreational fishing tourists			78	571	2373	1315
research groups	6	5	7	10	6	26

The potential for sustainable ecotourism development in the demonstration sites is still very high, even for Tram Chim. There has been relatively no tourism development at LSWR. At both TCNP and LSWR, local communities are not directly involved in tourism activities. Tours run at TCNP are conducted entirely by the Park's Center for Tourist Services and Environment Education. Hence present tourism operations do not provide any benefits to local communities. Some tour activities such as sport fishing where tourists are able to buy a

permit to fish within the park boundaries may even create resentment within local communities who are shut out of the park.

The Center for Tourist Services and Environment Education was established in 2003 and is responsible for ecotourism development in Tram Chim, but their capacity to implement ecotourism sustainably and which is of benefit to the local community is weak. Negative impacts caused by tourists, even with the small numbers of visitors to the park, have occurred, for instance disturbance of sensitive feeding habitats of the Eastern Sarus Crane (noise pollution from tourist activities and the use of lights), fishing, hunting (bird) and garbage disposal in the park. To date, TCNP and LSWR do not have a strategy for ecotourism development. During the authors' site visit, park managers at the Tourist Center expressed an urgent need for support to develop capacity for and a strategy for sustainable ecotourism in Tram Chim.

The recent outbreaks of bird flu in Viet Nam have had an impact on tourism activities at the park. Concern over the risk of bird flu transmission through wild bird migrations has led the government to take precautionary measures by closing the park to tourists for three to four months during the peak migratory periods in 2004 and 2005 (November to February).

## 6.2. Threats and opportunities

The following table is a summary of threats to the biodiversity and environment of TCNP and LSWR and the severity level for each threat. This work was carried out by BirdLife International and IEBR (Tordoff 2002).

**Table 5: Threats to biodiversity in TCNP and LSWR and their severity** (Source: Tordoff 2002)

Threat to biodiversity	Severity	
	TCNP	LSWR
Agricultural intensification / expansion	• •	• • •
Construction of dykes / dams	• •	
Disturbance to birds	• •	• •
Dredging and canalisation	• •	
Hunting	• •	• •
Infrastructure development	• •	
Introduction of exotic plant species	• •	
Selective logging/ cutting		• •
Unsustainable exploitation of NTFPs		• •
Other	• • •	

**Key**     • Low Severity     • • Medium Severity     • • • High Severity

Some of these key threats are selectively discussed in more detail below.

### 6.2.1. Protected area and local community tensions

Buckton *et al.* (1999) reported that the frequent encroachment of people who fish, hunt and collect firewood is a primary conservation problem facing TCNP. Wildlife collected from the demonstration sites includes snakes, turtles, frogs, birds and fish. Numbers are dropping disturbingly and illegal wildlife trading partly drives the situation. The situation of wildlife poaching and trading at the demonstration sites remains unclear since there are no known systematic studies of the issue. Park management estimate that on any one day there would be up to 100 poachers in the park. The response at TCNP has been the strict enforcement of exclusionary policies which restrict local communities' access to the park.

Thus, the conservation objectives of the park have come into conflict with local people's need for economic subsistence and development. A major manifestation of tension between the local community, or at least certain segments of the community, and the park management has been the growing number of arson related events. Shulman (2002) has reported arson as the major cause of fires in TCNP. Park management report that approximately 95% of all fire events in the park are caused by arsonists. In 2005 there were an estimated 20 cases of arson (Nguyen Van Hung, pers. comm.).

A study of community attitudes towards the park in 90 households in four communes adjacent to TCNP by Vu Thi Nhung (2004) found that:

- 100% of households were aware that park management has banned access to park land;
- Only 9.2% of households understood the park's objectives/purpose;
- 42% of households would like to convert the park into paddy fields, because they consider it wasted land while they do not have enough cultivatable land for themselves;
- 94.6% of households consider the protected area does not benefit local people in the buffer zone at all;
- 8.2% of households claim that people poach in the park because they are poor and they will not have enough to eat otherwise;
- Most households think that the only thing in the park that needs to be conserved is the Sarus Crane. Other bioresources such as fish, *Melaleuca*, lotus and so on should be harvestable.

These negative sentiments within the local community are likely to have been formed within the context and with knowledge of unresolved historical compensation claims from the park's establishment, as well as from perceptions of the unfairness of the current exclusionary policies. Addressing these negative sentiments and historical claims are a major challenge and opportunity which must not be ignored. By the end of 2005 there had been relatively little effort and resources directed to resolving these issues in comparison to the more technical management challenges such as fire fighting strategies. However, it was claimed by the Head of Dong Thap Province DARD that community relations had improved recently though there is no documented research to back this claim up (Cao Lanh Workshop 2006).

To help address the issue of shared benefits and negative community attitudes the international non government organisation, CARE, began implementing a sub-project in January 2005 with two components which target poor groups including migrants and convicted landless poachers in both TCNP and LSWR:

1. Sustainable Resource Use: here the target groups will conduct resources assessments, formulate sustainable use plans of certain resources for approval from the park, and implement their plans under supervision of a board; and
2. Livelihoods development: here the project will facilitate target groups of poor people to come up with livelihoods ideas and plans to be funded by the sub-project.

Despite the promising nature of the CARE sub-project, progress has been slow during 2005 because of CARE management problems. New management has been put in place early in 2006 and it is hoped the project will proceed now in the manner intended.

Recently MWBP has been building awareness of the concept of co-management in relation to future management approaches at TCNP and LSWR. This has been received positively by the management at both demonstration sites but the full implications of such an approach will need to be further explored not only within park management, but at higher levels of authority such as the provincial government. It is often the case that the full implications of a new approach are not well understood, for example, effective co-management necessitates the sharing of power over decisions. This is not an approach that is normally well received within governmental contexts despite recent policy initiatives towards grassroots democracy in Viet Nam (Decree No. 79/2003/N -CP). This represents one opportunity through which community grievances and benefit sharing can be addressed at an institutional level which compliments the material assistance that the CARE project is attempting to implement.

### 6.2.2. Hydrologic regime and fire threat in Tram Chim

Forest fires have been a major concern at TCNP since the early 1990s. In 1994, 1995 and 1996, a number of large forest fires occurred in Tram Chim which seriously damaged the forests. By 2002 the problem of forest fires in the Mekong Delta came to a head when an exceptionally large fire broke out during the dry season of March to April 2002, at U Minh National Park in Ca Mau and Kien Giang Province in the lower Mekong Delta. In the Lower U Minh area, about 5,000 ha (17% of total forested area) of *Melaleuca* forest was destroyed and in the Upper U Minh area, about 3,212 ha (40% of total forested area) was destroyed. This caused a public outcry with unsophisticated media reports blaming park managers for mismanagement and simply equating forest losses with monetary losses. Research teams were dispatched to find out the reasons why the fire had been so large. The conclusion was that there was an inadequate irrigation system and not enough water to suppress and fight the fires, which were partly fuelled by underlying peat formations (Mai Van Nam *et al* 2002). Both media and research reports have focused on the market values of the forests while ignoring the fact that within National Parks, these forests serve an ecosystem function rather than an economic one. Such understanding derives from enterprise forestry paradigms and to stop the losses, a simplistic logic of fires are bad, more water is the solution, canals help mitigate fire risks is set in train. Unfortunately this logic has transferred itself into very different ecosystems, such as TCNP, in inappropriate and unsustainable ways.

Following the fires at U Minh National Park, and responding to the media reports and government research, the Prime Minister issued orders to all special-use forests to increase their efforts to prevent fires. Thus, forest fires, or their suppression became a high level political issue. Unfortunately, in responding to the pressure from their political masters and the media, park managers, such as those at TCNP, have responded by taking on the



commonly used management approach of fighting or suppressing fires by retaining or storing more water in the irrigation canals and forests. This might be an appropriate response for a forest located amongst peat deposits such as U Minh National Park, however TCNP has a very different agro-ecology without any significant peat deposits.

Afraid of being criticised by the mass media and the provincial and national government if forest fires occurred within the protected area, managers of TCNP have tried to store higher levels of water for longer periods in the park to prevent fires in the dry season. This practice represents a radical alteration to the hydrological regime of the wetland ecosystem and has had negative impacts. The maintenance of high water levels in the park during the dry season has come into conflict with other management objectives integral to the park (Shulman 2002<sup>7</sup>). Specifically, and most seriously, the high water level in the dry season has reduced the feeding habitat of the Eastern Sarus Crane by flooding substantial amounts of *Eleocharis ochrostachys* grasslands in TCNP. Observations by park management also suggest that with predominantly wet conditions, *Eleocharis* produces less tubers.

In response, the MWBP has assisted park management with the development of an interim water and fire management strategy April 2005 – June 2006, in order to study the trade-offs between the need to retain water in the dry season and the need to retain adequate amounts of feeding habitat for the Eastern Sarus Crane.

Park management describe this technical process as an optimisation process where a safe minimum level of water can be retained for fire fighting and suppression purposes while maximising Eastern Sarus Crane habitat. However, the present strategy does not consider the impact of maintaining an artificially high level of water during the dry season on other bio-resources such as aquatic species, *Melaleuca* forests, etc. Artificially high dry season water levels might be expected to cause changes to the aquatic ecosystem and stunt forest growth.

At the same time, different approaches to suppressing fires are presently being experimented with. With assistance from the United States Forest Service, capacity is being built to implement a regime of prescribed burns to reduce the fuel load in the park.

---

<sup>7</sup> Upon request from the International Crane Foundation in collaboration with Dong Thap Province, the United States Forest Service conducted a fire management assessment in Tram Chim National Park. Deanne Shulman - an United States Forest Service fire management specialist visited TCNP during the period 1-12 March 2000, to conduct the assessment.

**Figure 15. A prescribed burn being carried out in TCNP** (Picture: Nguyen Van Hung)



While the technical optimisation process is a required short term strategy, the longer term solution, which recognises that a major cause of fires is the arson which arises out of the negative community sentiments towards the park, is to address the root cause of the problem. Indeed, an overall approach that seeks to resolve the tensions within the community would render much of the optimisation work in the water and fire management strategy redundant.

### 6.2.3. Invasion of exotic species

***Mimosa invasion in Tram Chim:*** *Mimosa pigra* is one of the most invasive and damaging weed species for any tropical wetland and is currently a serious threat to the sustainability of TCNP. It has invaded the surface of all dykes and penetrated into all the protected zones of the park (TCNP 2005). The *Mimosa* invasion also threatens the grasslands of Tram Chim including the feeding habitat of the Eastern Sarus Crane (*Eleocharis ochrostachys* grassland) by taking over these habitats and excluding wildlife from the area.

The park management's first recorded sightings of *Mimosa* at Tram Chim was around 1985. By 1999, the infested area was estimated to be greater than 100 ha. By 2001 the infested area had grown to greater than 400 ha. The total area which is highly susceptible to potential *Mimosa* invasion is estimated to be over 4,000 ha, or 60% of the park's land surface. By 2005, *Mimosa* had already infested over 1,600 ha of TCNP in all zones (see Table 6). The invasion of *Mimosa* at Tram Chim presently exceeds the capacity of the park's staff to get the weed under control.

**Table 6: Estimated and predicted area infested by *Mimosa pigra* in Tram Chim National Park (Source: TCNP, 2005)**

Year	Area (ha)	Infested zones
Before 1975	0	
1975 - 1980	Early phase of infestation	Along perimeter dykes
1980 - 1990	< 0.1	Along canals and begin to invade the park
1990 - 1999	> 100	In all zones (A1, A2, A3, A4, A5)
2000	> 200	In all zones (A1, A2, A3, A4, A5)
2001	> 400	In all zones (A1, A2, A3, A4, A5)
2003	> 800	In all zones (A1, A2, A3, A4, A5)
2005	> 1,600	In all zones (A1, A2, A3, A4, A5)
2010	(predicted) > 4,000	In all zones (A1, A2, A3, A4, A5)

In 2000, ICF and IUCN in collaboration with the National Centre for Tropical Wetland Research, Australia, provided a training course on weed management in wetlands including development of a weed management strategy utilising participatory planning techniques. Amongst the outcomes of the training course is a three phase weed management plan for TCNP which included:

- a manual control program over the coming wet season to contain the spread of mimosa;
- a three year chemical control program starting in the dry season of 2001; and
- a long-term manual control program as part of a holistic strategic weed management program.

Materials from the training course can be found on the website of the Center for Tropical Wetlands Management (2000). Some other research, awareness raising activities, training and control method experiments have been carried out. Specifically, awareness and action campaigns were facilitated during important events like the ceremonies for the World Wetland Day (2 February). However, to date there has not been any effective large-scale eradication activities carried out in the field with an adequate budget allocation. Since it became aware of the serious threat that *Mimosa* represented, the park's management has sought funding support for more effective programs without success (Nguyen Van Hung, pers. comm.).

To date, results of the park's *Mimosa* control experiment demonstrates that stem cutting, fire and combination of stem cutting, and fire have not been effective in eradicating *Mimosa* at Tram Chim. However, during the trials, cutting *Mimosa* stems during the flood season proved to be the best method (Tran Triet *et al.* 2001).



**Figure 16. Mimosa growth along canal banks in Zone A1 of TCNP** (Picture: Andrew B. Wyatt)

***Mimosa invasion in Lang Sen:*** there are no known studies of Mimosa invasion in LSWR., however, Mimosa can be observed along the banks of many major canals in Lang Sen and has the potential to become a serious problem at LSWR as well.

***Other invasive species:*** other serious invasive species in Tram Chim and Lang Sen are Water Hyacinth and Golden Snail, however, the authors are not aware of any studies of these alien species at the demonstration sites.

**Figure 17. Mimosa growth and golden snail eggs in LSWR** (Picture: Andrew B. Wyatt)  
**Figure 18. Golden snail shells in LSWR**



#### 6.2.4. *Melaleuca* plantation versus wetland habitats for wildlife

Over the last couple of decades, several thousand hectares of *Melaleuca* forests (*Melaleuca cajuputi*) have been planted within TCNP (Shulman, D. 2002). Originally this planting was to predominantly serve production objectives rather than conservation objectives. The result has been that the expansion of *Melaleuca* forests within TCNP has often been at the expense of wetland habitats that could underpin greater biodiversity levels. The *Melaleuca* stands in TCNP are also striking in that they appear to be very uniform in height and structure which is not supportive of the maintenance of a range of different habitats.

If the conservation of biodiversity is the underlying management objective, the park should endeavour to maintain and restore a diverse range of different habitats from open swampland, grasslands and *Melaleuca* forests.

Present budgetary restrictions set by the provincial government are a significant driver of which values within the park receive the greatest priority at the expense of other values. For example, 500 million VND is presently allocated to *Melaleuca* reforestation within TCNP. However, park management would prefer to spend this on biodiversity and conservation issues but are unable to because of the strict budgetary guidelines. This inflexibility therefore prioritises the reforestation of *Melaleuca* and is inadvertently shaping the park's values. This suggests that budgetary allocations are not aligned with the overall conservation objectives of the park and that both the conservation objectives and budgetary alignments need some re-examination.

### 6.2.5. Floods and soil productivity

From August to November, floodwaters bring sediments which are important in maintaining soil fertility (Rothuis 1998). However, until recently the dominant approach to flood management, and one of the greatest threats to soil productivity in the Plain of Reeds, has been the building of dykes and canals. Designed to support the government's national priorities to intensify rice production in flood affected areas, both Vietnamese and international scientists have long pointed out the impacts of dyke facilitated rice intensification within the ASS areas of the Plain of Reeds (Magnus Torell *et al.* 2003). These impacts have involved the reduced capacity to flush out acid leachate, the loss of flood borne sediments which compounds the diminishing soil nutrients as a result of intensive cultivation, the accumulation of chemical fertilisers (response to diminishing soil nutrients) and pesticides in soils and water, and the loss of greater areas of flood plains which function as fish breeding areas during the flood season (Root *et al.* 2003).



**Figure 19. Acid sulphate soil in Plain of Reeds** (Picture: Andrew B. Wyatt)

The dominant approach to flood management, termed the 'structural approach' because it is primarily based on the building of physical infrastructure, has recently come under increasing criticism and new flood management strategies, or 'non-structural' approaches, are now being experimented with. These new directions, their implications and the opportunities they provide are discussed in Section 7.1.

## 6.3. Flagship species: The Eastern Sarus Crane

The Eastern Sarus Crane is a good indicator of the health of Tram Chim and Lang Sen wetland ecosystems. There are no known studies of the Eastern Sarus Crane at LSWR, nor

a monitoring system in place. Hence the following discussion focuses entirely on the situation at TCNP.

Their population numbers have been monitored at TCNP on an annual basis since 1986. They are intolerant of people and depend almost completely on natural wetlands for their feeding grounds (Archibald *et al*, 2003). These large birds feed primarily on the tubers of *Eleocharis ochrostachys* grasses when the soils are damp enough for the birds to dig out the tubers.

**Figure 20. Eastern Sarus Cranes feeding on *Eleocharis ochrostachys*** (Picture: Doan Hong)



In Viet Nam, Eastern Sarus Cranes disappeared from the Plain of Reeds when it was devastated by draining and burning during the War (Archibald *et al*, 2003). Their return to Tram Chim was officially confirmed in 1986, and reached 1000 individuals in 1988. This constituted almost the entire world population of the Eastern Sarus Crane according to figures presented by Archibald *et al* (2003). Table 7 presents annual monitoring data for the Eastern Sarus Cranes feeding in TCNP.

**Table 7: Recorded number of the Eastern Sarus Cranes and water levels in Tram Chim National Park from 1988-2004** (Data source: TCNP/ICF)

Year	1988	1994	1996	1998	1999	2000	2001	2002	2003	2004	2005
Crane number	1,052	217	631	489	423	200	150	113	128	159	93
Water levels in Zone A1 (cm)	NA	NA	65	115	212	198	184	253	252	158	NA

The population of Eastern Sarus Cranes have fluctuated over the years but the general trend has been a steady drop off in numbers to just 93 in 2005. The large drop in numbers beginning in 2000 appears to be linked to the introduction of the fire prevention regime which is dependent on maintaining high water levels in the park during the dry season which reduced the area of feeding habitat for the Eastern Sarus Crane. In 2003 and 2004, a slight increase in numbers was recorded and according to park management is possibly due to the slight lowering of water levels in the park as fine tuning and optimisation of the water and fire management strategy is implemented. However, the large drop in numbers in 2005 has not yet been explained and may be due to factors beyond the site specific factors. The

question of which major factors controlling the arrival and departure of migratory species like the Eastern Sarus Crane at the demonstration sites must be addressed both at site-specific and regional landscape level. The latter has not yet been the subject of study.

The following are the key factors which have been put forward by park management as possible causes for the decline in the number of Eastern Sarus Cranes in TCNP (Nguyen Van Hung, pers. comm.):

- Water level kept artificially high during the dry season which inundates feeding habitat, (or) soil conditions too dry due to canal drainage in the dry season (formerly a problem in A4 and A5);
- Increasing human population and widespread conversion of natural wetlands into rice fields in the wider Plain of Reeds;
- Human-induced disturbances in and outside the park, including poaching activities, poisoning and hunting pressures;
- Serious Mimosa invasion in Tram Chim wetlands including their feeding habitats; and
- Water quality changes in the plain of reeds from once clear flood water filtered through formerly extensive wetlands/grasslands to silt-laden flood waters causing sedimentation in their feeding habitat.

In the 2006 dry season, the park is planning on further lowering water levels in zone A1 in order to increase the amount of feeding habitat for the Eastern Sarus Crane. Simultaneously and with similar objectives, water levels in zone A4 and A5 (zones which are normally too dry for feeding Eastern Sarus Cranes) are being raised. These measures are now made possible by the recent construction of spill dams in the dykes of these zones.

## 7. Development strategies and changes in recent years

### 7.1 Agriculture and flood management strategies

During the period from 1984 to 1991, government programs, specifically Decision 95/Q -CP regarding development of new economic zones and Decision 254/Q -CP encouraging households in jointly investing with the government to reclaim “abandoned or waste” lands, encouraged people to resettle and reclaim “uncultivated” areas throughout Viet Nam. Until recently, wetlands had been viewed as wastelands. Duong Van Ni *et al* (1999) reported that during this period about 1,569 households or 7,797 people, and an additional 3,416 labourers from other surrounding areas came to resettle in Tram Chim. As a consequence, the establishment of new agricultural areas quickly replaced the natural wetlands in the Plain of Reeds, changing the landscape and ecological functions of the area.

During the last 40 years agriculture expansion has been made possible in the Plain of Reeds by the construction of a dense network of canals and roads in the area. Huge effort was made to drain flood waters, to flush the acidity out of soils and water in order to intensify rice growing. All of these developments have profoundly changed the hydrological regime of the Plain of Reeds. Flood patterns have become more unpredictable and irregular than ever before. While there is little research into the changing patterns of flooding in the Mekong Delta in general, anecdotal evidence suggests that the rate of flooding has changed in some areas with floods rising faster and deeper. In other areas, the reverse experience of late and smaller floods has occurred.

The general realisation that continuing dyke developments was having such unpredictable results has led the government to reevaluate its flood management strategy with the support of agencies such as the UNDP (Lempert *et al* 2004). Developing out of such initiatives, a shift from the previous strategy of ‘preventing, suppressing and fighting floods’ which formed the predominant development approach within the now out-of-date Cuu Long Master Plan is evolving and being experimented with. This new government strategy in the Mekong Delta and in particular, the Long Xuyen Triangle and the Plain of Reeds, is usually described as a “living with the floods” or a non-structural approach. This guides government response towards strategies that look at mitigation and response rather than flood prevention as well as placing a value on the ecological functions of floods (Oxfam GB 2003).

While not a new approach, indeed it seeks to support local communities’ traditional ways of coping (or living) with and adapting to floods, the government is now experimenting with development interventions based on this non-structural approach to flood management. Contrary to many media reports and government rhetoric, local communities often view floods in positive terms such as the benefits that it brings in the form of sediments and the seasonal expansion of fisheries resources (Miller, 2003). Present government policy towards flood management seems to be a combination of structural approaches (involving large scale dyke building) in high value agricultural areas and non-structural approaches in low value areas (SIWRP, 2004). A number of NGO managed community based flood management projects have been proposed recently including one in Dong Thap and Tien Giang Province



(Oxfam GB 2003). These projects offer the provincial government and relevant government departments including DARD, DoNRE, and DPI the opportunity to gain exposure to and build capacity in non-structural approaches which gives greater recognition to the ecological value of floods. Since 2000, the Plain of Reeds has also received large government investments in welfare development to assist people to live with floods, including construction of residential clusters on raised soil beds, housing, classrooms, medical facilities road and water supply facilities, and poverty reduction and livelihood improvement programs (T.T.K. Dinh 2004).

## 7.2. Regulatory framework for forests and wetlands

The present regulatory framework as applied to the demonstration sites are not generally supportive of the objectives of wetland conservation. The regulations that apply to wetland-special-use forests such as Decree 109/CP on the conservation and development of wetlands stipulate that the ultimate objectives and most important mandates of these sites are to conserve the wetland ecosystem, forest resource, and biodiversity. However, wetland national parks and nature reserves such as TCNP come under the regulatory framework of special-use forests and are thus regulated by the Law on Forest Protection and Development, as well as by other legal documents related to forest management. The consequence is that forest protection is the foremost mandate of forest owners or those assigned to manage special-use forests. At Tram Chim, this is manifested in the way park management's overall concern and a large amount of resources are put towards the suppression of forest fires which has undermined the park's wetland ecosystem functions such as Sarus Crane feeding grounds.

There is growing consensus within the scientific community in Viet Nam that the regulatory framework needs overhaul. Recent recommendations that came out of a national workshop on "Water and Forest Fire Management in the Mekong Delta of Viet Nam", in September 2005, Ho Chi Minh City are put forward here:

- Need to formulate appropriate policies for wetland special-use forest management which better fit ecological principles and socio-economic characteristics of wetland areas. There should be specific regulation for upland forest, coastal mangrove, and inland wetland forest. At present, these different ecosystems are managed under one general regulation.
- A master plan on the conservation and sustainable development of important wetland sites which are located on several provinces (such as the Mekong and Red River Deltas) is required as a foundation for working out management solutions for wetland special-use forest.
- Need a training plan to build up human resources with knowledge and managerial skills in wetlands in general, and in wetland special-use forests in particular, so as to assure the rational use of wetland resources while conserving and maintaining the functions and values of wetland ecosystems.
- Today, very small areas of *Melaleuca* forests in Viet Nam remain, mostly in the Mekong Delta. There is a need to study forest fire prevention and control alternatives to the present approach of intensive canal construction which causes adverse impacts to the ecosystem.

- Investment in the development of buffer zones in wetland special-use forests is very important to realise Government Decree 109/2003/ND-CP on the conservation and sustainable development of wetlands.

## 8. Politics and institutions

### 8.1. Governance: How different institutions work together – power and influence

The changes in governance in Viet Nam are currently taking place in the areas of accountability, decentralisation (of natural resources management and development), financial management and public administration. An example of decentralisation has been the designation of direct management for some newly established national parks including TCNP to respective provincial PCs, and the establishment of LSWR has been at the initiative of the Long An Provincial government.

The MWBP demonstration sites are taking on an ambitious multi-stakeholder approach including communities which can be unfamiliar to governments in Viet Nam. There are a number of challenges in terms of implementing such an approach. TCNP and LSWR are managed by a management board established for the purpose of day-to-day management activities of the protected area, with a primary focus on conservation. However, the buffer zone areas at TCNP and areas within LSWR are managed by the commune level people's committees whose main focus is on community development. Despite the fact that the commune people's committee, which in theory represents the local community and their interests, is much closer to the communities in terms of understanding their needs, this level of government is not a formal part of the management structure of TCNP and LSWR. Present regulations based on the Forest Protection and Development Law (passed 1991 and revised 2004) and other relevant legal documents (VANEP 2002) require the TCNP management board to work with the Tam Nong District PC while control over the TCNP management board is overseen by the Provincial PC. Twice yearly meetings with Tam Nong District PC are held to review and discuss collaboration relating park protection, buffer zone socio-economic development and public conservation education. The commune level PCs are only consulted, usually on a monthly basis, when the Forest Protection Unit of the Park has the need to deal with violations of the park's regulations and arrests. Presently there are no direct consultations with the communities themselves, the assumption being that the commune PCs adequately represents their views. However, this may not be the case if the park management's primary institutional relationship with the government is at the provincial and district level, in which case, the commune level PCs may defer their interests to those of the provincial and district level government which may be more inclined to put conservation interests ahead of livelihood concerns.

Another key issue in relation to institutional influence in the buffer zone area of TCNP will be the ability of the commune and district PCs or the park management to influence local householder activities in the buffer zones. This is questionable since most of these households have legal land use rights to their land and as such they are generally free to use their land as they wish within the general guidelines of their land use certificates (i.e. for agriculture).

### 8.2. Management capacity

A key issue in relation to the administration of TCNP and LSWR is the narrow professional base on which its management and staff draws from. All of the staff and management are

qualified in the two predominant fields of forestry and land management. This may also partly explain why the management of the demonstration sites is predominantly oriented towards protected forests rather than protected wetlands which have a greater emphasis on issues dealing with ecology. For example, there are no professional ecologists on staff or management. Perhaps even more seriously, professional capacity and qualifications to deal with the critical social issues of concern to MWBP such as sustainable livelihoods, conflict management, sharing of benefits, and so on do not exist within the staff or management of TCNP and LSWR. In our experience in Viet Nam, it is also safe to generalise this situation to the various levels of government and departmental agencies. This lack of capacity to deal with social issues largely explains why community conflict issues have not been addressed to date and problems which are predominantly social problems, for example the fires lit by arsonists, are dealt with through technical solutions.

### 8.3. Public participation

TNCP has occasionally organised events to celebrate special days like the World Wetland Day (2 February), World Environmental Day (5 June) and Viet Nam Forestry Day (28 November) with participation of hundreds of local people to raise public awareness of the need to conserve the wetland environment. Some have been involved in the park's activities such as reforestation, fire management and alien invasive species control (i.e. Mimosa and Golden Apple Snail). Since 2000, 300 residents from within the buffer zone area have become members of the Tram Chim National Park Sub-Association - VNPPA (VANEP 2002).

However, overall participation from the surrounding communities in biodiversity conservation is still low at the demonstration sites, particularly in TCNP. Local people call TCNP 'Rừng Cấm', which means a "Forbidden Forest" in English. This name suggests that local communities do not consider themselves to be a stakeholder in park conservation. Based on the results of interviews with 90 households in four buffer zone communes of TCNP, Vu Thi Nhung (2004) reported that about 90% households did not understand the purpose of the protected area, 94% said the park did not bring any benefit to their lives, and 42% want to convert the park into paddy fields since the protected wetlands are just a waste of land, whereas they do not have enough land for agriculture for themselves. Most people think that in the protected area only the Eastern Sarus Crane should be protected, but other resources and wildlife such as fish, *Melaleuca*, lotus and so on should be harvestable. These negative sentiments pose a challenge in terms of achieving greater participation from the communities.

There are presently no formal forums or institutional developments such as a management committee for TCNP and LSWR with community representation on it. Commune level governments also do not have a management role in either TCNP or LSWR. Such institutional structures are essential for any effective communication strategies to work and for all stakeholders to be committed to the same conservation objectives and to resolve differences. While there are positive signs with talk of co-management and the implementation of grassroots democracy, such ideas will need considerable effort to progress (see 6.2.1 for discussion). An overall approach that seeks to break down management conceptions that non-violent community conflict is something to be avoided or downplayed to one where it is accepted as a norm and a driver of positive change should be considered. This is a difficult issue to deal with within the Vietnamese bureaucratic and cultural context where managers' performance and promotions are judged by the apparent

absence of conflict or tension within their communities. This incentive system sometimes leads to managers avoiding or downplaying and ignoring tension and conflict for fear that dealing with it directly may bring the tensions out into public view in potentially embarrassing ways.

## 8.4. Key stakeholders

### 8.4.1. Government

#### **People's Councils and People's Committees**

Provinces are divided administratively into districts, communes and hamlets. Each administrative level has a People's Council and a People's Committee.

The People's Councils represent the local authority of the state and are the top supervisory bodies at each level. They do not govern directly but instead elect and oversee People's Committees that act as executive bodies and carry out local administrative duties. Council members are popularly elected, although candidates are screened by the party, and are responsible for ensuring strict local observance of the Constitution and laws and for ruling on local plans and budgets.

Within each People's Committee are the various departmental arms of the Ministries, for example, Department of Agriculture and Rural Development, Department of Natural Resources and Environment, Department of Investment and Planning, and so on. These government agencies are the administrative arms of government within their respective sectors.

#### **Protected Area Management Boards**

Both TCNP and LSWR are autonomous bodies responsible for their own budgets which are allocated by their respective Provincial Governments. However, while TCNP management board reports to the DARD within the Dong Thap Provincial People's Committee, LSWR management board reports directly to the Long An Provincial People's Committee.

### 8.4.2. Local mass organisations

Local mass organisations help to build community cohesion; facilitate production knowledge, information exchange and dissemination; and implement community welfare programs. In particular, the Women's Union has administered a range of different credit and savings programs, handicraft training programs and family planning programs at the demonstration sites.

Among the mass organisations, the three most active and effective ones in Tram Chim are (Duong Van Ni *et al* 1999):

- Women's Union
- Agriculture Extension Club
- Farmer's Union

It should be noted that the TCNP Sub-Association that belongs to the Viet Nam National Parks and Protected Areas Association (VNPPA), currently comprises a small number of local volunteers for park protection. The TCNP Sub-Association also collaborates with concerned agencies to provide local communities with regular extension training, environment education, fire control and so on (VANEP 2002).

#### 8.4.3. Universities and research institutes

**Can Tho University:** Can Tho University (CTU) has been supporting biodiversity conservation and community development activities at these project demonstration sites in many ways, from technical to financial supports and capacity building. The university has conducted surveys, situation analysis, trainings, workshops, extension programs, farming technique transfer, credit and savings programs in collaboration with international organisations and local partners. The Mekong Delta Farming Systems Research and Development Institute of CTU have been active in helping improve the livelihoods of local farmers living in the buffer zone of TCNP.

**Sub-Institute for Forest Inventory and Planning (Sub-FIPI):** Sub-FIPI is primarily responsible for developing investment plans for new protected area establishment.

#### **Other National Universities and Institutes with previous involvement in the Plain of Reeds:**

- Ho Chi Minh City University for Natural Sciences
- SIERES (Sub-Institute for Ecology, Resources and Environment Studies) - Institute of Tropical Biology
- Research Institute for Aquaculture No. 2
- Ha Noi University for Natural Sciences

#### 8.4.4. International non-government organisations (INGO)

International non-government organisations (INGOs) have provided support to the Government of Viet Nam at all levels in terms of financing and jointly implementing research, conservation and development projects; providing advice and expertise; and sharing experience, lobbying and informing decision making processes. They have also played a key role in supporting Eastern Sarus Crane conservation work (Archibald *et al*, 2003). In particular, in Tram Chim and Lang Sen, INGOs have collaborated with universities, research institutions, local authorities, mass organisations and relevant agencies to implement programs and projects. Some examples of INGO-government collaborations and initiatives are as follows:

- Birdlife International conducted biodiversity inventory of TCNP and LSWR including an assessment of the conservation priority of these wetlands.
- In 1989, Brehm Fund for International Bird Conservation (Germany) funded the construction of a two-storey building in Tram Chim used for environment education activities (Vu Thi Nhung 2004) and ornithological studies in the area (Pacovsky 2001).
- ICF has provided technical and financial support for the conservation of the Eastern Sarus Cranes, assisting with research, education, and habitat management programs at TCNP. There have also been initiatives to restore the park's wetlands (Archibald *et al*, 2003) – two sluice gates were built at zones A4 and A5 in Tram Chim in 1995, and

---

provided 50 boats in 2001 to poor households in the buffer zone of Tram Chim (VANEP 2002).

- ICF and IUCN in collaboration with the National Centre for Tropical Wetland Research, Australia, and the National University for Natural Sciences in Ho Chi Minh City have provided assistance in weed management in TCNP.
- Oxfam has funded programs for small-scale credit and savings and agriculture extension jointly implemented by Can Tho University and the Women's Union of Tam Nong District in three buffer zone communes of Tan Cong Sinh, Phu Duc and Phu Tho. The programs have found some alternative livelihoods for the poor.
- In 2000, Oxfam America financed the rehabilitation of *Melaleuca* forests in Phu Duc and Phu Hiep communes (VANEP 2002).
- In 2002, the Association for Overseas Vietnamese provided capacity building support to Tan Cong Sinh commune for environmental protection (VANEP 2002).

#### 8.4.5. Private sector

The authors have not been able to discover documentation on the level and character of private sector activities beyond the household enterprise level around the demonstration sites.

## 9. Key Findings

The situation at TCNP is presently not on a sustainable footing. The park faces a number of critical challenges over the short to medium term. Its management requires assistance in developing new approaches towards various aspects of the park's management. One of the major challenges at TCNP is to find an appropriate way in which local communities can share in the benefits that the park has to offer while not compromising its sustainability. Here the major obstacle has been the policy of excluding local communities from the use of the park's resources.

The situation at LSWR is less critical, nevertheless it faces a number of longer term challenges to its sustainability. At LSWR, limited livelihood opportunities for local communities which have legal tenure within the reserve may lead to increasing pressure on natural resources and biodiversity within the reserve, though there is no clear evidence for this at present.

The following sections summarises the key findings of the situation analysis for TCNP and LSWR. Where the findings refer to just one of the demonstration sites, this is indicated.

### 9.1. Baseline information and knowledge gaps

There is still a considerable amount of baseline information that is required to inform and monitor many of demonstration sites' management strategies and decisions. Some key areas where baseline information is required include:

- Comprehensive biodiversity assessments and inventories particularly that for fisheries and other fauna excluding birds.
- Assessment and inventory of NTFP products and potential utilisation.
- Community pressure on biodiversity - which species and how much?
- Potential economic use values of natural resources and biodiversity (NTFPs, fisheries, etc.).
- Socio-economic and livelihood profiles of different groups residing in and around the demonstration sites (including seasonal migrants) and who are exploiting resources at the demonstration sites.

Knowledge gaps exist in relation to the following issues:

- Conservation priorities.
- The impact of maintaining unseasonably high water levels at TCNP for fire suppression on flora and fauna biodiversity - there has been considerable attention given to the impact on the Eastern Sarus Crane at the expense of our understanding of impacts on other species.
- The impact of current prescribed-burn fire management regime at TCNP on the ecology and biodiversity.
- The impact of a much expanded tourism operation at both the demonstration sites.
- Definition of the buffer zones and its purpose which recognises the local context of human settlement and livelihoods.
- Numbers of seasonal migrants moving in and out of the demonstration sites.



## 9.2. Key Threats

- Biodiversity and environmental:
  - Invasion of exotic species, in particular *Mimosa Pigra*, is at a critical level particularly at TCNP.
  - Impacts of pollution from adjacent agricultural developments reliant on dyke building and the intensive use of fertilizers and pesticides.
  - Exposure of ASS from agricultural activities resulting in poor water quality in the waterways of the demonstration sites and surrounding region.
  - Fragmentation and loss of floodplains and fish breeding areas to continuing investments in dyke building.
  - Pollution from the dumping of household and agricultural waste into canals.
- People and livelihoods:
  - Marginal livelihoods of certain groups - particularly the landless, land poor and migrants. At TCNP this has resulted in pressure on natural resources and biodiversity.
  - Generally poor access to social infrastructure such as schooling and health facilities.
  - Lack of access to financial credit for the poor limits opportunities to diversify livelihoods or to adopt sustainable income generating activities.

## 9.3. Unsustainable management practices

- The inappropriate fire suppression and hydrological regime at TCNP is resulting in negative impacts on the flora and fauna and in particular the Eastern Sarus Crane. Experiments are being undertaken presently to find a more appropriate modified approach.
- Exclusionary policies towards the use of TCNP's resources have resulted in the lack of benefits for and support from local communities. This is unsustainable because it has lead to the build up of negative community attitudes towards the park. Arson is now the largest source of fires in the park.
- There is an inadequate regulatory framework governing wetlands management and overlapping regulatory and institutional responsibilities in relation to the management of protected forests and wetlands.
- Inappropriate forestry policies derived from enterprise forestry policy and practice are being applied to wetlands management which compromises the sustainability of said wetlands.
- The lack of direct community participation in the management of the demonstration sites results in poor support for conservation objectives. At TCNP, this has also led to a build up of community tensions.

## 9.4. Opportunities

- Commitment to participatory management approaches and the sharing of benefits, coupled to new government policies such as the Decree on Grassroots Democracy, present an opportunity to build new formal institutions where communities are participating meaningfully in management of the demonstration sites.
- Ongoing research and development has the opportunity to educate the public and media about more appropriate management approaches, for example with regards to the impacts of fires and their management.
- Coupled to growing scientific consensus on the present inadequate and inappropriate nature of policies and regulations governing wetland management in Viet Nam, there is opportunity to influence national policy through demonstration of more appropriate approaches.
- The high level of commitment towards the development of an eco-tourism operation presents an additional opportunity by which communities are able to share in the benefits from the park.

## 10. References

- ActionAid (2002). PPA report for IUCN (draft version).
- Anon. (1994). Investment plan for Dong Thap Muoi Nature Reserve, Lang Sen, Vinh Hung district, Long An province. Tan An: Long An Provincial Department of Agriculture and Rural Development and Ho Chi Minh City Sub-FIPI. In Vietnamese.
- Archibald G.W., K.S.G. Sundar and J. Barzen (2003). A review of three species of Sarus Crane *Grus antigone*. J. of Ecological Soc. 16:5-15. Johnsgard PA. 1983. Cranes of the world. Bloomington: Indiana University Press. Meine CD, Archibald GW. 1996. Website: <http://www.npwrc.usgs.gov/resource/distr/birds/cranes/grusanti.htm>. Accessed April 30, 2005.
- Australian Mekong Resource Centre (AMRC) (2005). National Interests and transboundary water governance in the Mekong. Inception Report. University of Sydney in collaboration with Danish International Development Assistance.
- BirdLife International (2000). *Tram Chim National Park under threat*. World Birdwatch 22(1). Website: <http://www.birdlife.net/news/news/2000/03/49.html>. Accessed Nov 28, 2004.
- BirdLife International and the Forest Inventory and Planning Institute (2004). Sourcebook of existing and proposed protected areas in Viet Nam (Second edition). Hanoi, Viet Nam: BirdLife International Viet Nam Programme and the Forest Inventory and Planning Institute. Website: [http://www.birdlifeindochina.org/source\\_book/](http://www.birdlifeindochina.org/source_book/). Accessed 20 Dec 2004.
- Buckton, S. T., Nguyen Cu, Ha Quy Quynh and Nguyen Duc Tu (1999). The conservation of key wetland sites in the Mekong Delta. Hanoi: BirdLife International Viet Nam Programme.
- Central Institute for Economic Management (CIEM) (2005). Empowering the Poor by Strengthening Formal Rural Land Titles. Markets and Development Bulletin. May 2005.
- Center for Tropical Wetlands Management (2000). Website (Accessed Jan 02, 2005): <http://www.cdu.edu.au/ctwm/courses/course5/course5.html#3>.
- Duong Van Ni, Nguyen Trung Cang and Vo Tong Xuan (1999?). Identify socio-economic factors of the buffer zone community to provide information for sustainable development of Tram Chim National Park in Tam Nong, Dong Thap. In Vietnamese.
- Duong Van Ni, Edward Maltby, Roger Stafford, To-Phuc Tuong and Vo-Tong Xuan (2003). Status of the Mekong Delta: Agricultural Development, Environment Pollution and Farmer Differentiation. In Torell, M., A.M. Salamanca and B.D. Ratner (Eds.) Wetlands Management in Viet Nam: Issues and Perspectives, WorldFish Center, 89 p.

- DWC<sup>8</sup> (2003). A summary of regulation on the exercise of democracy in communes (attached to the Decree No. 79/2003/NĐ-CP dated July 7, 2003 of the GoV). 28p. In Vietnamese.
- FAO (2005). Background Document for Special event on "Impact of Climate Change, Pests and Diseases on Food Security and Poverty Reduction". 31th Session of the Committee on World Food Security: May 23-26, 2005.
- Friederich, Hans (unknown year). The biodiversity of the wetlands in the Lower Mekong Basin. The World Commission on Dams, Serial No. ENV148. Website: <http://www.dams.org/kbase/submissions/showsub.php?rec=ENV148>. Accessed Jan 01, 2005.
- GoV (2002). The comprehensive poverty reduction and growth strategy (CPRGS).
- Root, K. B. (2003). North Vam Nao Water Control Project II, 14 March 2003, Report on Environmental Impact Assessment. Report prepared for AusAID.
- Kuznik, Frank (1994). Healing on the Plain of Reeds. *International Wildlife*. 24: 14-17.
- Lang Sen Wetland Reserve (LSWR) (2005). Lang Sen 5 year work plan 2005 – 2009.
- Le Cong Kiet (1993). Dong Thap Muoi: Restoring the mystery forest of the Plain of Reeds. *Restoration and Management Notes* 11, 102-105.
- Le Dien Duc (1989). Inventory of wetlands in Viet Nam. Hanoi: CRES. In Vietnamese.
- Le Dien Duc and Derek A. Scott (1989). Dong Thap Muoi. In Scott D.A. (ed.) *A directory of Asian Wetlands*. IUCN 1989. Website (Accessed January 1, 2005): [http://www.arcbc.org.ph/arcbcweb/wetlands/Viet Nam/vnm\\_donthamuo.htm](http://www.arcbc.org.ph/arcbcweb/wetlands/Viet%20Nam/vnm_donthamuo.htm).
- Mai Van Nam, Nguyen Viet Thao, Quang Minh Nhut and Pham Le Thong (2002). Melaleuca Forest Fire in 2002 in the Mekong Delta, Viet Nam. Website (Accessed 13 March 2006): [http://www.idrc.ca/en/ev-60714-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-60714-201-1-DO_TOPIC.html)
- Miller, Fiona (2003). *Society-Water Relations in the Mekong Delta: A Political Ecology of Risk*. PhD Thesis. School of Geosciences. Sydney, University of Sydney.
- MWBP (2005). Interim Water and Fire Management Strategy, April 2005 to June 2006, Tram Chim National Park. 22 March 2005.
- Nguyen Duc Tu (2002) Report on a visit to Long An province, 26 to 29 March 2002. Unpublished report to the BirdLife International Viet Nam Programme.

---

<sup>8</sup> Development for Women and Children - A local NGO.

- Nguyen Huu Thien (1997). Winning support for conservation from local communities around Tram Chim. In Safford, R.J. *et al* (eds.) (1997): *Towards sustainable management of Tram Chim National Reserve, Viet Nam*. Proceedings of a Workshop on balancing economic development with environmental conservation. London: RHIER pp 17-46.
- Nguyen Phong (2002). Poverty reduction strategies, MDGs and demand for statistical data in Viet Nam. Case study presented in Regional Seminar for Asian Managers on Monitoring and Evaluation of Poverty Reduction Programmes. WB/UNESCAP/ADB/NSO, Bangkok: 9-11 October 2002.
- Nguyen Thanh Tin and Anders Wilander (1995). Chemical conditions in acidic water in the Plain of Reeds, Viet Nam. *Water Research*, Vol. 29, Issue 5: 1401-1408.
- Nguyen Van Lap, Ta Thi Kim Oanh and Masaaki Tateishi (2000). *Late Holocene depositional environments and coastal evolution of the Mekong River Delta, Southern Viet Nam*. *Journal of Asian Earth Sciences*: Volume 18, Issue 4, August 2000, pp 427-439.
- Pacovsky, Jill (2001). Restoration of wetlands in the Tram Chim Nature Reserve. *Restoration and Reclamation Review* (Student On-Line Journal, Hort 5015/5071, University of Minnesota). Vol. 7- Fall 2001: Lessons Learned From Long-Term Restoration. Website: <http://horticulture.coafes.umn.edu/vd/h5015/rrr.htm>. Assessed May 20, 2005.
- Pham Trong Thinh (1998). Investment plan for upgrading Tram Chim Nature Reserve to national park status. Ho Chi Minh City: Ho Chi Minh City Sub-FIPI. In Vietnamese.
- ODI<sup>9</sup> (1999). Sustainable livelihoods in practice: Early applications of concepts in rural areas. *Natural Resources Perspectives*: No. 42 June 1999. Website (Assessed April 1, 2005): <http://www.odi.org.uk/nrp/42.html>.
- Rothuis, A. (1998). Rice-fish culture in the Mekong Delta, Viet Nam: Constraints analysis and adaptive research. Dissertation, Katholieke Universiteit Leuven, Belgium.
- Safford, R.J., D.V. Ni, E. Maltby, and V.-T. Xuan (eds.) (1997). *Towards sustainable management of Tram Chim National Reserve, Viet Nam*. Proceedings of a workshop on balancing economic development with environmental conservation. London: Royal Holloway Institute for Environmental Research.
- Sanchez, Diana and Katherine Cash (2003). Reducing poverty or repeating mistakes? A civil society critique of Poverty Reduction Strategy Papers. Published by: Church of Sweden Aid, Diakonia, Save the Children Sweden and The Swedish Jubilee Network. Website (Accessed Mar 15, 2005): <http://www.eurodad.org/uploadstore/cms/docs/SwedishPRSPRapporteng.pdf>
- Shulman, Deanne (2002). Fire management assessment Tram Chim National Park, Dong Thap Province. IFFN No. 26 - January 2002, pp. 106-113.

---

<sup>9</sup> Overseas Development Institute - UK

Sida (2002). Perspectives on Poverty. 59p.

Stakeholder workshop (2005). Minute of Situation Analysis Stakeholder Workshop held in TCNP on November 30, 2005.

State of Queensland (2005). Acid sulphate soils. Website <http://www.nrm.qld.gov.au/land/ass/>. Accessed 20 May 2005.

Storrs, M.J. (2000). Towards the strategic weed management of Tram Chim National Park and U Minh Thuong Reserve: a report on a workshop held in Viet Nam, May 2000. National Centre for Tropical Wetlands Research, Darwin, Australia.

Sub-Institute for Water Resources and Planning (SIWRP) 2004. Water Resources Development Strategy for the Mekong Delta, Ho Chi Minh City.

TCNP (2005). Tram Chim National Park annual report in 2005. In Vietnamese.

Thai Van Vinh (1997). Socio-economic background to the Tram Chim Wetlands, and the past, present and future of Tram Chim Nature Reserve. In Safford, R.J. *et al* (eds.) (1997): *Towards sustainable management of Tram Chim National Reserve, Viet Nam*. Proceedings of a Workshop on balancing economic development with environmental conservation. London: RHIER pp 9-15.

Tiempo Issue 26 (1997). Typhoon Linda hits Viet Nam. December 1997.

Tran Thi Kim Dinh (2004). Economic activities of farmer households during flood season in the Plain of Reeds of Long An Province. A report presented in Scientific Workshop on Development of Scientific Base for Socio-Economic Development and Environment Protection under the direction of Living Together with Floods in Mekong Delta. Ho Chi Minh City: August 6-7, 2004. In Vietnamese.

Tran Triet, Nguyen Lan Thi, Michael J. Storrs and Le Cong Kiet (2001). The value of awareness and early intervention in the management of alien invasive species: A case study on the eradication of *Mimosa pigra* at Tram Chim National Park and U Minh Thuong Nature Reserve, Viet Nam. pp. 37-39. In Secretariat of the Convention on Biological Diversity (2001): Assessment and management of alien species that threaten ecosystems, habitats and species - Abstracts of keynote addresses and posters presented at the sixth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, held in Montreal, Canada, from 12-16 March 2001. Montreal, SCBD, 123p. (CBD Technical Paper no.1).

Tordoff, A. W. ed. (2002) Directory of important bird areas in Viet Nam: Key sites for conservation. Hanoi: BirdLife International in Indochina and the Institute of Ecology and Biological Resources.

Torell, M. and Albert Salamanca (2003). Wetlands Management in Viet Nam's Mekong Delta: An Overview of the Pressures and Responses. In Torell, M., A.M. Salamanca and B.D. Ratner (Eds.) Wetlands Management in Viet Nam: Issues and Perspectives, WorldFish Center, 89p.

VANEP (2002). Proceedings of Scientific workshop on Environmental Protection and Sustainable Development for the Mekong Delta. Camau: November 29, 2002. In Vietnamese.

Vu Thi Nhung (2004). Tram Chim National Park: Management status and sound measures for sustainable development. A thesis report to complete a master degree at the Faculty of Geography, University of Social Sciences and Humanity. In Vietnamese.

World Bank Press Release, Nov 2004. Viet Nam Development Report 2005: Governance.



## Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme

The Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP) is a joint programme of the four riparian governments of the Lower Mekong Basin – Cambodia, Lao PDR, Thailand and Viet Nam – managed by the United Nations Development Programme (UNDP), the World Conservation Union (IUCN) and the Mekong River Commission (MRC), in collaboration with other key stakeholders. With funding from the Global Environment Facility (GEF), UNDP, the Royal Netherlands Government, MRCS, the Water and Nature Initiative (WANI) and other donors, the programme addresses the most critical issues for the conservation and sustainable use of natural resources in the Mekong wetlands. MWBP aims to strengthen the capacity of organisations and people to develop sustainable livelihoods and manage wetland biodiversity resources wisely. It is a five-year (2004-2009) intervention at three levels – regional, national and local – with demonstration wetland areas in each of the four countries: in the Songkhram river basin, Thailand; in Attapeu province in southern Lao PDR; in Stung Treng, Cambodia; and in the Plain of Reeds in the Mekong Delta, Viet Nam. The programme aims to:

- Improve coordination for wetland planning from regional to local levels
- Strengthen policy and economic environments for wetland conservation
- Generate and share information
- Train and build capacity for the wise use of wetlands
- Create alternative options for sustainable natural resource use and improve livelihoods

MWBP is a partnership between governments, aid agencies and NGOs, and provides a framework for complementary work for wetland conservation and sustainable livelihoods in the Lower Mekong Basin.

PROGRAMME MANAGEMENT UNIT  
PO Box 4340, 082/02 Fa Ngum Road, Vientiane, Lao PDR  
Phone: + 856 (0)21 240 904 Fax: + 856 (0)21 216 127  
Email: [info@mekongwetlands.org](mailto:info@mekongwetlands.org)  
Web: [www.mekongwetlands.org](http://www.mekongwetlands.org)

A JOINT UNDP - IUCN - MRC GEF-FUNDED PROGRAMME



CAMBODIA



LAO PDR



THAILAND



VIET NAM

