

Survey and Development Planning for the New Tourist Destination: Mor Hin Khao, Thailand

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Abstract

In 2007, the Research Center for Mekong Region Tourism (ReCMerT), Khon Kaen University carried out a survey to examine the sustainable tourism potential of "Mor Hin Khao" (in Thai "white stones in a high land"), a number of large rock outcrops standing over 20 meters high in the area of Chaiyaphum Province in the northeastern part of Thailand. The project was commissioned by the city governor. It involved an expert group appointment: geomorphological survey, topography mapping, flora classification and taxonomization. Locals were advised on health and hygiene matters, villagers were interviewed to identify their ideas and needs for tourism development whilst an architect laid out the land to be used for sustainable tourism. The research team also required support from the government sector. Crucially, sustainability should be maintained by integrating local participation in the tourism planning and organization of tourism groups to manage homestay and tourist services more effectively.

Keywords: geological tourism, sustainable tourism, community-based tourism

I. Introduction

Tourism is an important industry in Thailand and raises a large amount of revenue for the country. The Thai government has had a policy to support the tourism industry but decentralization of government policy means that every province has to strengthen their own planning to improve the quality of life of the people in their province. Tourism is an important means to increase income at the provincial level, thus the majority of tourist destinations are competitive, and therefore, the provinces have to improve quality of service and maintenance for these destinations. New tourism areas, referred to as "Unseen" destinations, are becoming more valuable. Chaiyaphum is one of the poorest provinces in Thailand. Situated near the central mountain range, it has only one well known tourist destination where plants of the Zingiberaceae family, flowering during May to June, are attractive to tourists.

In 2007, the Governor of Chaiyaphum Province,

Thailand was informed by the local people that a number of large rock outcrops had been found in a place called "Mor Hin Khao" (in Thai Mor=hill, Hin Khao=white stone). There are six large rock outcrops of more than 20 meters high, standing among numerous other rock formations. The governor commissioned the Research Center for Mekong Regional Tourism, Khon Kaen University, and planned to develop the area as a tourist destination with sustainable management. The result of this study is reported in this paper.

II. Study Method

A group of researchers from the Research Center for Mekong Regional Tourism (ReCMerT) carried out a survey in the area and found Mor Hin Khao lies at the top of a hill, 800 meters above sea level (mASL). The hill slopes are approximately 10°–15°. About 20% of the area is covered with forest and the rest consists of eucalyptus plantation and grassland containing three groups of rock outcrops of differ-

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ent size and shape. These types of rock outcrops had never previously been found in Thailand, so it is possible for the area to be categorically described as an "Unseen" tourist destination. The eastern side of the area is covered with plants of the Family Orchidaceae and the Family Zingiberaceae. Nearby is a village of fifty seven households where the villagers plant cash crops such as cassava, sugar cane, jute, along with some fruit trees. During discussions between the researchers and the villagers, it was realized that Mor Hin Khao could be developed to become a new tourist destination. An expert geographer and geologist surveyed, identified geomorphological features and mapped the topographical landscape; a botanist classified forest formations and taxonomized flora; paramedics advised on health and hygiene for the local people; a social scientist together with a tourism expert interviewed villagers to identify their ideas and views on how the area would be developed as a tourist spot; an architect sketched the lay-out of the land that would be included in the tourism plan; a tourism expert would train the villagers on how to run a service business. The researchers also discussed how the concept of this study for Mor Hin Khao should be based upon the eco-tourism concept with respect to the numbers of visitors within a community-based

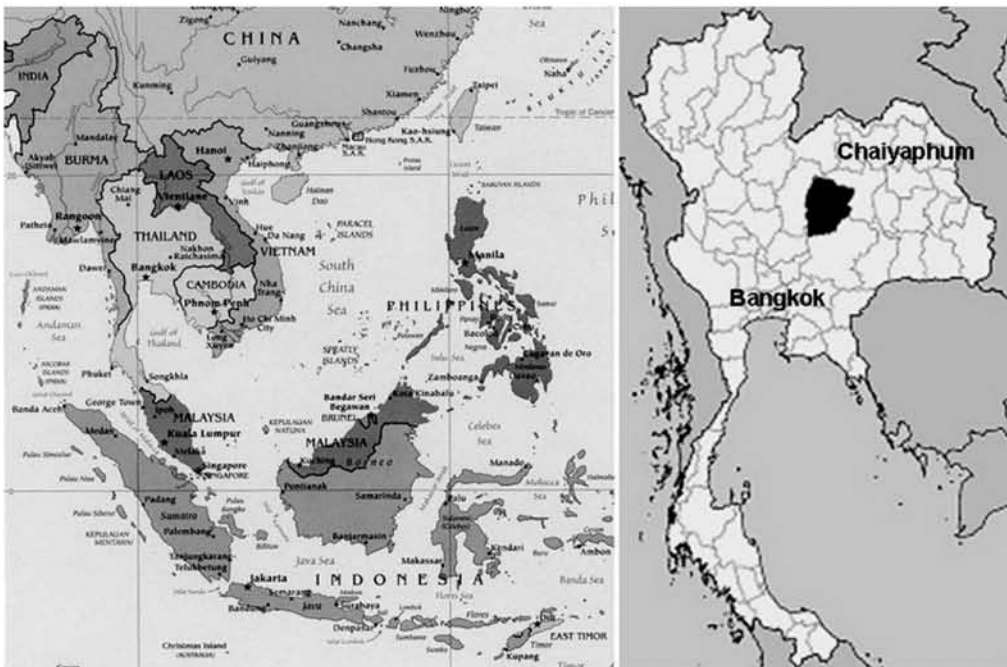
tourism project. The local people would participate in all aspects of the surveying, planning, designing and the hosting of visitors.

III. Results of Study

1. General situation

Mor Hin Khao lies on the western corner of the Phulandka National Forest Reservation, Northeast Thailand. The area is situated in Chaiyaphum Province, about 300 km northeast of Bangkok as shown in Figure 1. The area lies between grid UTM zone 48 of 1778660 to 1778700 N and of 815860 to 817670 E of the Royal Thai Surveying topographic map scale 1:50,000 series L7018 sheet 5341II. It covers about 300 ha including three main groups of rock exposures. Mor Hin Khao in Thai means "white stones in a high land". The name of the area has been long established among local residents because the sandstone reflects the moonlight at full moon, revealing a fascinating natural phenomenon of white light glimmering in the dark. During the day time, the variety of shapes in the geological landscape and panoramic views from the high land area also make this a remarkable destination for all visitors.

Mor Hin Khao was a dense Tropical Rain Forest. The villagers came to this area to gather non-timber



Source: <http://www.learnnc.org> and <http://www.wikipedia.com>

Fig. 1. Geographical map of Thailand and location of Chaiyaphum Province

products; mushrooms, honey, bamboo-shoots and to hunt wild pigs (Chaiyaphum Provincial Office, 2007). In 1978, a timber company got a concession to cut trees and subsequently, constructed an earth (dirt) road for carrying timber from the high land. Using this road, the villagers went to Mor Hin Khao and expanded their agriculture crops to plant jute and corn. Increasingly, people came to plant cash crops in the area until in 1981 when some farmers started to build homes by cutting down trees around the area planted with cassava. The steep angle of the slope caused soil erosion to become a factor, especially in the rainy season. After a while the soil quality was degraded to a great extent and this led to the productivity of the land being decreased and the soil consequently became infertile. On the high slopes, the farmland changed to become grassland. Nowadays, there is 20% of dipterocarp forest and approximately 10% of scrub forest of the Family Orchidaceae and Family Zingiberaceae.

2. Landforms

The denudated mountainous landforms contain fragments on their structural surfaces, gently sloping to slightly undulating terrain, flat topped hills and pediments. The area lies on the edge of the Khorat Plateau. The elevations of these areas range from 800 to 840 meters above mean sea level (mAMSL). The area consists of both mountainous and low lying land. The low lying area has a gentle slope (2–3°) and is located at the bottom of the catchment. The slopes gradually increase until they reach hill ridges. Hill slopes are approximately 10°–15°.

It is known that land clearing affects the hydrological balance. Without vegetation intercepting the precipitation, the result is less transpiration and high surface runoff, and water can easily infiltrate to subsurface storage. The excess water will rapidly flow down slopes. These factors bring about severe soil surface erosion and encourage the water table to rise. The high evaporation resulting from the bared surface causes soluble salts in groundwater to accumulate on the surface ground.

The area is covered by the sedimentary rocks of the Khorat group. The major rocks are sandstone, siltstone and shale (Geological Department, 2001). The sandstone ridge has an elevation at the top of hill ridges of about 800 mAMSL. Outcrops occur mainly on top of hill ridges and slope areas which are about 6% of the total area.

3. Meteorology

The climate of the study area is classified as tropical savanna and thus has influence from the

northeast and southwest monsoons. The northeast monsoon brings cool and dry weather from continental China during November to February. In contrast, the southwest monsoon from the Indian Ocean brings warm and moist weather during May to September. During the wet season, there are also depressions from the Pacific and the South China Sea. About 80% of total rainfall occurs during May to September. Pacific tropical cyclones also contribute erratically to the rainfall. Furthermore, dry spells and delays in the start of wet season usually occur during May to June. The changing of wind patterns in the pre-monsoon season from March to April brings dry weather with high temperatures. Rainfall data was taken from several stations located at altitudes of 160–200 mAMSL. in Chaiyaphum City. The average annual rainfall was about 1,100 mm. The average maximum temperature is 33°C in April. The average minimum temperature is 20°C in January. The average temperature throughout the year is 26.5°C. The annual potential evaporation ranges between 1,557 and 1,776 mm. with an average of 1,653 mm. The highest potential evaporation period is from February to June with the rate of 850 mm, whereas during the rainy months of July–October an average potential evaporation rate of 120 mm./month was recorded (Chaiyaphum Provincial Office, 2007).

4. Geology

The geological survey followed the contour lines with contour intervals of 2.5 meters using a Topography Map 1:50,000 and Aerial Photographs 1:25,000 from the Royal Thai Survey Department, Ministry of Defense as a basis for the research. A field survey was performed to locate and classify the rock exposures. The exposed rock is mainly sandstone of the Phra Wihan formation. The sand grains are composed mainly of white quartz sandstone, thin laminated red siltstone, some feldspars and iron oxide cement material. The Phra Wihan Formation was deposited in braided streams in the Lower Cretaceous period (Geological Department, 2001). Rock exposures can be found throughout the area. The formations in the ridge-forming terrain consist mainly of massive layers of light colored, resistant, thick, coarse-grained sandstone intercalated with pebbly sandstone, conglomerate and siltstone. The thickness calculated from the outcrop pattern is 142 m. Cross bedding and associated internal structures indicating paleocurrents in the south or southwest direction are well observed. The sandstone beds are oriented north-south dipping 15°–20° eastwards. The uppermost sandstone portion shows



Fig. 2. Rock outcroppings and rock forms at Mor Hin Khao

a very irregular top surface with polygonal and shallow incised erosional cracks as well as pot holes of various diameters. The weathered sandstone is also a source of colluvial deposits of milky quartz gravels along the dipping footslope portion.

There are several features of exposed rock resulting from the geological processes *i.e.* weathering and erosion processes. Weathering is the term used to describe changes in the composition and texture of rocks and minerals as a result of exposure at the Earth's surface. Weathering processes affect the exposed outermost parts of rock masses. The changes occur in a place within the range of temperature and chemical conditions found near the Earth's surface. The work of lichens, algae and fungi are capable of carrying out both biophysical and biochemical weathering. The products of rock weathering are often removed from the points where they are produced by the process of erosion. Once soils were removed and transported by water or wind, then rock columns were exposed and formed geological features (Fig. 2).

5. Flora

A botanist researcher joined with a local herbalist in this region for the field survey. They found that there are 5 forest types: The most common forest-cover is a dipterocarp forest with *Dipterocarpus obtusifolius* Teysm. ex Miq., a dominant plant and *Gluta laccifera* Ding Hou, *Phyllanthus emblica* L., *Lithocarpus harmandii* A.Camus, *Cratoxylum formosum* Dyer subsp. *formosum*, *Polyalthia dubia* Kurz, *Amorphophallus* spp., *Vietnamosasa pusilla* Nguyen, *Leea indica* Merr. The villagers often gather their leaves, flowers and seeds as food.

The second is deciduous Forest consisting of *Gluta laccifera* Ding Hou, *Holarrhena pubescens* Wall. ex G.Don, *Bombax anceps* Pierre, *Hopea odorata* Roxb., *Irvingia malayana* Oliv. ex A.W.Benn., *Azizelia xylocarpa* Craib, *Senna siamea* Irwin & Barneby, *Pterocarpus macrocarpus* Kurz, *Polyalthia dubia* Kurz, *Decaschistia* sp., orchid and fern. The third type is dry tropical rain forest with *Spondias pinnata* Kurz, *Baccaurea ramiflora* Lour, *Ficus* sp., *Nephellium hypoleucum* Kurz, *Rauvofia cambodiana* Pierre ex Pit., *Fagraea ceilanica* Thunb., *Hedyotis corymbiformis* Geddes, *Musaenda*



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|------------------------------------|----------------------------------|
| 1. <i>Garcinia fusca</i> | 2. <i>Clerodendrum kaempferi</i> |
| 3. <i>Clerodendrum paniculatum</i> | 4. <i>Clerodendrum schmidtii</i> |
| 5. <i>Uraria acaulis</i> | 6. <i>Chassalia curviflora</i> |
| 7. <i>Centranthera siamensis</i> | 8. <i>Torenia fourmieri</i> |

Fig. 3. Some indigenous plants commonly found in Mor Hin Khao

sanderiana Roxb., *Boesenbergia* spp. At the river-site the species found were *Melastoma malabaricum* L., *Alpinia malaccensis* Roscoe, *Lasia spinosa* (L.) Thwaites and on the bare rock there was *Fagraea ceilanica* Thunb., *Sonerila griffithii* C.B. Clarke, *Syzygium gratum* S.N. Mitra.

The survey found that there are more than 129 species of 54 families including 14 species of *Leguminosae*, respective 7 species of *Euphorbiaceae* and *Rubiaceae*, respective 6 species of *Orchidaceae* and *Zingiberaceae*, 5 species of *Moraceae*, and respective 4 species of *Anacardiaceae*, *Apocynaceae*, *Guttiferae*, *Labiatae* and *Myrtaceae*. Particularly in the northern part of the Mor Hin Khao area, there

are bare rocks covered with *Zingiberaceae*. These plants flower in the rainy season and *Orchidaceae* flower during the winter season. These plants will attract tourists to visit Mor Hin Khao which is rich in plant diversity. Some common plants found in this area are shown in Fig. 3.

6. Development plan

The architect gathered all related information from geological field research, the landscape and visual quality survey, and site topography, and the botanist surveyed indigenous plants and land use as well as community development guidelines (Ashworth, 1991). The Tourism Development Plan

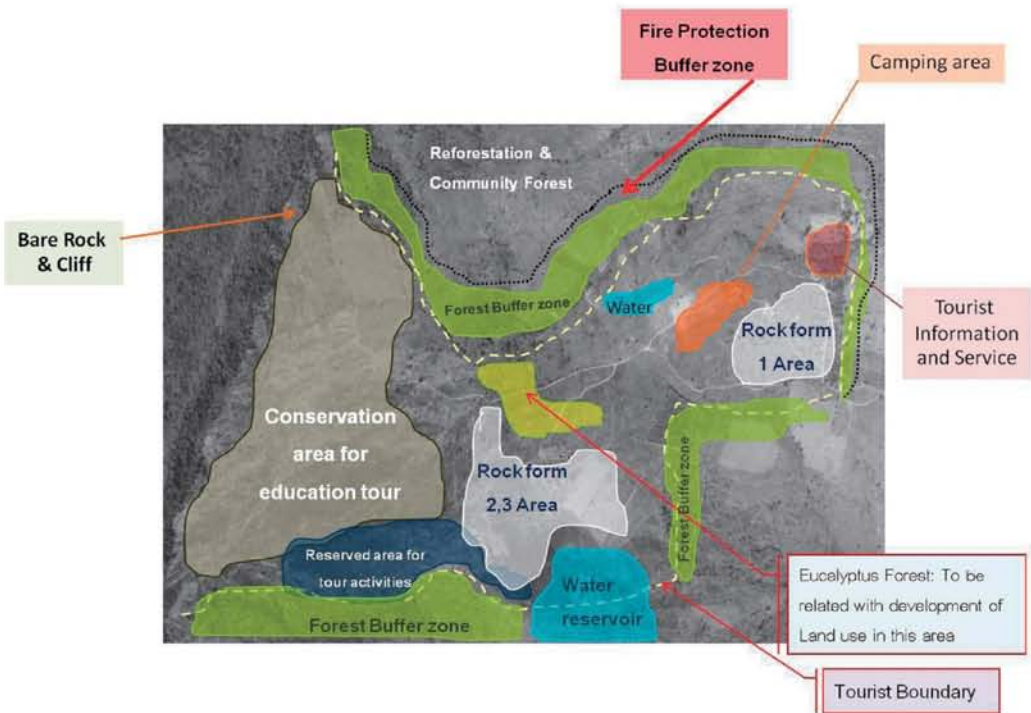


Fig. 4. Proposed development plan

mainly uses natural topography; valley, waterline, trees and land use to define the boundary of the tourist area. The Development Plan (Fig. 4) has proposed five zones of different degrees for development including (1) natural conservation area, (2) tourist attractions area, (3) tourist camping and facilities area, (4) reserved area for future expansion and extended tourism routes, (5) buffer zone for fire protection and community reserved forest.

7. Community participation

Wang Kum Kaen village lies 3 km. away from Mor Hin Khao, with 238 inhabitants and 57 households. The village has a kindergarten and primary school. There is a health station and high school at the district level (Chaiyaphum Province, 2004). Villagers generally had no experience with tourism activities but they are willing to offer a very warm welcome to all potential tourists who would visit to experience Mor Hin Khao. The researchers tried to encourage the villagers to participate with tourism activities using the concept of community-based tourism. They conducted interviews in relation to the development of settlement, land use and traditional culture. The tourism expert provided a tourism concept based upon management and service. Villagers

had a 'brain storming' session concerning the potential for a responsible tourism business conducted by themselves with *SWOT* analysis to analyze their Strength, Weakness, Opportunity, and Threat. The villagers also discussed the change from village life in the past which focused on village settlement, land use and the environment to the present day in terms of aspects of society, economy and culture with the influence of globalization. The future plan will emphasize how they want their community to be developed as a tourist destination, analyzing the potential of Mor Hin Khao and related stakeholders in the village, understanding and discussing the steps and processes of how to prepare for and manage a tourism service within the concept of community-based tourism. The community experts and local authorities participated with the researchers in the geological survey, identified plants and shared ideas on the location of the local tourist attractions site.

The villagers concluded that they could organize a village committee to be responsible for community-based management and set up social groups to provide services for tourists as follows: Women's group to take care of food preparation, Home-stay group for those who wish to provide accommodation, Culture group who are identified as being able

to provide a window to local culture and lifestyle by performing folk music, arranging cultural events and agricultural activities (Homestay Central, 2006). Pupils would be trained as youth guides who would take care of tourists and explain about the geological layout, plant formation, village development, way of life, and village culture. Community group members organized two study tours to the most successful community-based destinations in Thailand to learn how to become 'good hosts'. They had the chance to learn, share ideas and discuss the route to success in this field of tourism.

IV. Conclusion

At the beginning of 2009, the village committee participated with the Governor at the district level to find out how to protect the environment and to manage the waste water and garbage created by the visiting tourists. The village committee had also made a request to the Governor at the provincial level to support and facilitate infrastructure at Mor Hin Khao such as electricity supply, upgraded road development (from earth road to asphalt), and water supply. Unfortunately, by mid-2009, the Tourism Authority of Thailand had already promoted Mor Hin Khao as an incredible tourist destination on television and in many other media. It is a very important factor to bear in mind that as a result of this promotion, huge numbers of tourists have been accessing this area, especially during last winter. In

reality, community participation is just at the beginning stage as they try to organize themselves to follow the concept of community-based tourism. This poses a substantial challenge for all parties involved to determine if it is possible for the community to regulate all the tourist services.

Acknowledgment

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