



CHAPTER II

LITERATURE REVIEWS

2.1 Sustainable Development and Ecotourism

Sustainable development is a concept that has been at the forefront of international development. In the early 1970s, the Club of Rome had presented for the first time how limited resources could set limits to growth in “our common future”. The underlying principles that make up sustainable development have been around for centuries but it was not until 1987 that official use of the term “sustainable development” received international recognition in the Bruntland Commission. Basic definition of sustainable development was “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development [WCED], 1987).

Since the first definition of sustainable development by the Bruntland Commission, the concept has continued to gain popularity and has evolved to represent much more than it’s original definition (Buchsbaum, 2004). Environmental protection topic became a major issue in the 1990s after the concept of sustainable development has been introduced. The 2002 World Summit on Sustainable Development expanded this definition identifying the three over arching objectives of sustainable development to be eradicating poverty, protecting natural resources, and changing unsustainable production and consumption patterns.

A number of such sustainability concepts have been developed for different purposes, targeted at different stakeholders but each eventually leading to a sustainable future. Such concept is often associated with the sustainable agriculture, sustainable forestry, sustainable community developments, and sustainable tourism (Tsaor *et al.*, 2006). Sustainable development is vital for continued survival and viability of the tourism industry and for protection and nurturing of the natural and cultural environment on which tourism depends. A more appropriate and conscientious approach would be to use tourism as a means to protect the environment and turn sustain biodiversity (Page and Dowling, 2002).

Nature-based tourism (which include sustainable and ecotourism), is rapidly growing sector of the tourism industry. So it has often proved to be powerful incentive for conservation in many parts of the world. But in the same time, uncontrolled mass tourism has and continues to contribute to the degradation of many areas of natural and cultural significance, entailing the loss of biological and cultural diversity, as well as of important sources of income. Clearly, what is needed is an environmental responsible approach to tourism, or “sustainable tourism” (Ceballos-Lascurain, 1996).

In 1995, the World Trade Organization (WTO) stated the meaning of sustainable tourism in Agenda 21 for the Travel and Tourism industry “Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems”.

Many groups have proposed sets of guidelines or principles for sustainable tourism and ecotourism. Tourism Concern and the World Wildlife Fund for Nature developed a well known list of principles and guidelines in 1991 which are presented in Table 2-1.

In the 4th International Borneo Tourism Conference 2007, Hector Ceballos-Lascurain (2007) noted that sustainable tourism is an umbrella concept embracing all types of tourism which maintain the environmental, social and economical integrity and well being of natural and cultural resources in perpetuity. Quite often, ecotourism is also confused with sustainable tourism. In comparison to ecotourism, sustainable tourism is much more comprehensive and covers all forms of tourism. Ecotourism is a sub-component of sustainable tourism as shown in Figure 2-1.

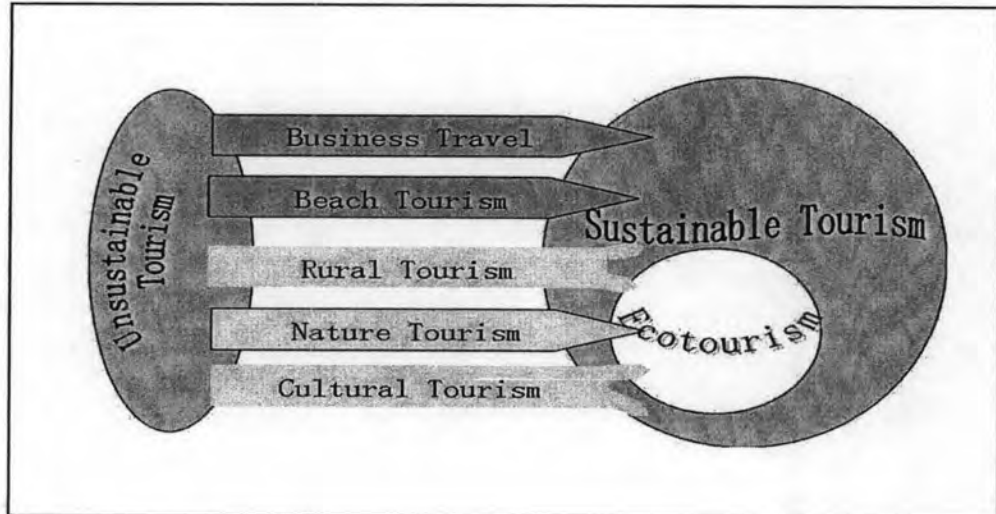


Figure 2-1 Sustainable tourism and ecotourism (UNEP, 2002)

Table 2-1 Principles for Sustainable Tourism (Blamey, 2001)

Principles	Components
1. Using resources with sustainable ways	The conservation and sustainable use of resources (natural, social, cultural) is crucial and makes long-term business sense
2. Reducing over consumption and waste	Reduction of over-consumption and waste. Avoid the costs of restoring long-term environmental damage and contribute to the quality of tourism
3. Maintaining Biodiversity	Maintaining and promoting natural, social, and cultural diversity is essential for long-term sustainable tourism, and creates a resilient base for the industry
4. Integrating tourism into planning	Tourism development is integrated into a national and local strategic plan which undertakes environmental impact assessments and increase the long-term viability of tourism
5. Supporting local economies	Tourism that supports a wide range of local economic activities avoids environmental damage
6. Involving local communities	The full involvement of local communities in the tourism sector not only benefits them and the environment but also improves the quality of the tourism project

Table 2-1(Cont.)

Principles	Components
7. Consulting stakeholders and the public	Consultation between the tourism industry and local communities organizations and institutions is essential if they are to work alongside each other and resolve potential conflicts of interest
8. Training Staff	Staff training which integrates sustainable tourism into work practices, along with recruitment of personnel at all level and improves the quality of the tourism product
9. Marketing tourism responsibly	Marketing that provides tourists with full and responsible information, increases respect for the natural, social and cultural environments of destination areas and enhances customer satisfaction
10. Undertaking research	Ongoing research and monitoring using effective data collection and analysis is essential to help solve problems and bring benefits to destinations, the industry and consumers

Ecotourism has been growing rapidly over the last decades and defined as a form of sustainable tourism which was expected to serve as a tool for both conservation and development (Ceballos-Lascurain, 1998). Ecotourism has also often perceived as an excellent tool for promoting sustainable development in developing countries. While ecotourism has the potential to create positive environmental and social impacts, it can unfortunately be as damaging as mass tourism if it is not done properly (UNEP, 2002). United Nation designated the year 2002 as the International Year of Ecotourism. Commission on Sustainable Development has requested

international agencies, government and the private sector to undertake supportive activities.

Many definitions of “Ecotourism” have emerged since the originally term was coined in 1983 by Hector Ceballos-Lascurain who is a Mexican architect and environmentalist. Ceballos-Lascurain noted that there was the presence of an ever-growing number of tourists, especially North Americans who were interested mainly in bird watching. He believed such people could play an important role in boosting the local rural economy, creating new jobs and preserving the ecology of the area, and began using the word “ecotourism” to describe this phenomenon (Ceballos-Lascurain, 1996; Page and Dowling, 2002).

Therefore, Ceballos-Lascurain started that “ecotourism is the tourism that involves traveling to relatively undisturbed natural areas with the specific objective of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects (both past and present) found in these areas.” He added that the term also implies a scientific, aesthetic or philosophical approach although the ecotourist is not required to be a professional scientist, artist or philosopher.

In 1993, the earlier ecotourism definition was revised and modified to “Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features-both past and present) that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations”. This definition was officially adopted by IUCN during its First World Conservation Congress held in Montreal, 1996 (Page and Dowling, 2002).

Since then, the concept of ecotourism has taken on a more scientific character, focusing on environmental management concerns and development of sustainable tourism methods. Currently, there is no specific consensus on the definition of ecotourism. There are many well recognized definitions that have formed a clear picture of its core principles, which are shown in Table 2-2.

Ecotourism is usually considered to be not only nature-based tourism, but also responsible travel to natural areas that conserves the environment and improves the well-being of local people. Scace *et. al* (1991, cited in Ceballos-Lascurain, 1996) have identified 35 terms that may link to ecotourism. Among the best known of these are: nature tourism, nature-based or nature-oriented tourism, wilderness tourism, adventure tourism, green tourism, alternative tourism, sustainable tourism, appropriate tourism, nature vacations, study tourism, scientific tourism, cultural tourism, low-impact tourism, agro tourism, rural tourism ,and soft tourism. In addition, ecotourism appears to have much in common with the concept of “alternative tourism” or “appropriate tourism” which has been discussed within the tourism industry for over a decade. For example, it provides its greatest benefits through pursuit of a widespread but controlled “small is beautiful” philosophy.



Table 2-2 Definitions of Ecotourism

Sources	Definitions
Hector Ceballos-Lascurain (1996)	Ecotourism is tourism that involved traveling to relatively undisturbed natural areas with the specific object of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects (both past and present) founded in this area.
Conservation International (Ziffer, 1989)	Ecotourism is a form of tourism inspired primarily by the natural history of an area, including its indigenous cultures. The ecotourist visits relatively undeveloped areas in the spirit of appreciation, participation and sensitivity. The ecotourist practices a non-consumptive use of wildlife and natural resources and contributes to the visited areas through labor or financial means aimed at directly benefiting the conservation of the site and the economic well-being of the local residents.
World Conservation Union [IUCN] (Ceballos-Lascurain, 1996)	Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations.

Table 2-2 (Cont.)

Sources	Definitions
Martha Honey (Honey, 1999)	Ecotourism is a travel to fragile, pristine, and usually protected areas that strive to be low impact and (usually) small scale. It helps educate the traveler; provides funds for conservation; directly benefits the economic development and political empowerment of local communities; and fosters respect for different cultures and for human rights.
International Ecotourism Society	Ecotourism is a responsible travel to natural areas that conserves the environment and sustains the well-being of local people
Tourism Authority of Thailand (TAT, 1997)	Ecotourism is responsible travel in identified natural areas, including any cultural and historical component related to the ecosystem, which is intended to raise ecological and environmental awareness by means of a learning process and community participation in ways that are sustainable and involve environmental management

Honey (1999) identified the true form of ecotourism characteristics that should involves travel to natural destinations, minimize impact, build environmental awareness, provide direct financial benefits for conservation, provide financial benefits and empowerment for local people, respect local culture, and support human rights and democratic movements.

UNEP (2002) defined the principles of ecotourism in Ecotourism principles, practices, and policy for sustainability. Principles of ecotourism compose of mainly components as follow;

1. Minimize the negative impacts on nature and culture that can damage a destination.
2. Educate the traveler on the importance of conservation.
3. Stress the importance of responsible business which works cooperatively with local authorities and people to meet local needs and deliver conservation benefits.
4. Direct revenues to conservation and management of natural and protected areas.
5. Emphasize the need for regional tourism zoning and for visitor management plan designed for either regions or natural areas that are slated to become eco-destinations.
6. Emphasize use of environmental and social-base line studies, as well as long term monitoring program, to assess and minimize impacts.
7. Strive to maximize economic benefit for the host country, local business and communities, particularly people living in and adjacent to natural and protected areas.
8. Seek to ensure that tourism development does not exceed the social and environmental limits of acceptable change as determined by researchers in cooperation with local residents.

9. Rely on infrastructure that has been developed in harmony with the environment, minimizing the use of fossil fuel, conserving local plants and wildlife, and blending with the natural and cultural environment.

Furthermore, the International Ecotourism Society (2007) determined an outline for the principles of ecotourism in Oslo Statement of Ecotourism 2007. The principles of ecotourism includes minimizing environmental impact, building an environmental and cultural awareness and respect, providing positive experiences for both visitors and hosts, providing direct benefits for conservation, providing financial benefits and empowerment for local people, and raising sensitivity to host countries political, environmental, and social climate.

It was found that the idea and the theme of ecotourism has spread rapidly worldwide because of the impact of tourism occurred in many countries on many aspects such as social, economic, and environment (Nelson, 1994). The definition of ecotourism has been developed to satisfy some practitioners, depending on nature sites, geography of the sites and management objectives.

Based on variety of ideas of ecotourism from different people and organizations, Thailand Institute of Scientific and Technological Research [TISTR] and Tourism Authority of Thailand [TAT], 1997 have determined the definition and key elements of ecotourism. The following ideas are:

“Ecotourism is responsible travel in identified natural areas, including any cultural and historical component related to the ecosystem, which is intended to raise ecological and environmental awareness by means of a learning process and community participation in ways that are sustainable and involve environmental management”

There are 4 basic key elements that can be considered in terms of ecotourism area, tourism activities and processes, management system, and participation as follows:

Tourism area: Ecotourism takes place in natural tourism areas, which have endemic characteristics, including cultural and historical resources that are closely connected to the ecosystem of an area. This component can be called “nature-based tourism”.

Activities and Processes: Ecotourism provides and opportunity for learning about the conditions of the environment and the function of the ecosystem in a tourism resources area. The result will increase knowledge, experience, appreciation and deeper awareness on the part of tourists, local people and entrepreneurs about the need to promote conservation values. This can be considered as “environmentally education-based tourism”.

Management System: Ecotourism involves responsible travel that has no or low impact on the environment and society. The management system is comprehensive and addresses issues of resource conservation, environmental management, pollution control, pollution disposal and the control of tourism development. This can be referred to as “sustainable tourism management”.

Participation: Ecotourism emphasizes the involvement of local communities and local government in organizing and managing tourism programs to give direct benefits. Benefits include income generation, enhancing people’s quality of life and providing economic returns that can be used to maintain and manage tourism resources. The local community would participate by supervising tourism development

to ensure that it is appropriate. This can be referred to as “community participation-based tourism”.

These four elements play an important role together to create the unique character of ecotourism (Figure 2-2). This form will be incomplete and cannot be called ecotourism, if any element is missing.

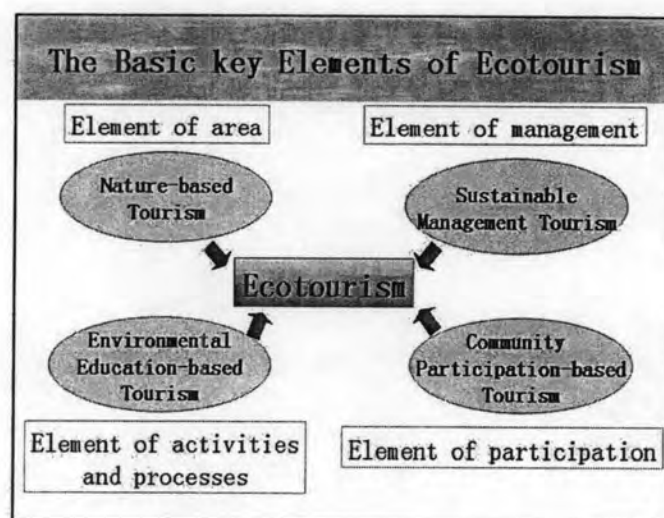


Figure 2-2 Basic key elements of ecotourism (TISTR and TAT, 1997)

Ecotourism becomes an alternative approach to the traditional tourism under the assumption that it minimizes negative impacts but maximizes benefits for the local people and their environment. As a result, many researches and sustainable techniques have been conducted on tourism topic in order to reduce its negative impacts and promote sustainable tourism development

Therefore, ecotourism is expected to provide incentives for conservation of natural areas. It will also provide resources, both financial and physical, for natural conservation, maintenance against environmental degradation, improvement in

biodiversity through breeding programs or gene bank, etc. Ecotourism will help to promote environmental awareness and ethics to the visitors.

However, ecotourism may cause the negative impact on the environment such as plant damage, forest clearance, disturbing animal habitats, creating soil compaction, and marine resource destruction. Overcrowding or unmanaged ecotourism can also increase pollution in the form of garbage, air pollution, and water pollution. It is also possible that ecotourism can introduce new species to an ecosystem; and it can increase the frequency of fire. Briefly, it is necessary to recognize that the negative impacts can be the result from inadequate planning and mismanagement of ecotourism. These impacts can be reduced with well-designed ecotourism activities, a control of the volume or frequency of visits, proper pricing techniques and careful environmental assessments by using indicators. These management strategies will be discussed in the next topic.

2.2 Tourist Site Assessment

Rapid growth and development in gateway communities for protected areas, such as national park and wilderness areas, threaten the sustainability of protected area ecosystem. (Howe *et al.*, 1997; Baron *et al.*, 2000; Parks and Harcourt, 2002 cited in Prato, 2007).

One way to determine the extent to which growth and development adversely affect protected area ecosystems is to assess their sustainability. If the assessment indicates the ecosystem is sustainable, then there is no need to change management practices and policies. On the other hand, if the assessment indicates the ecosystem is not sustainable, then we can rank management alternatives and select a preferred

management plan for achieving sustainability (Prato, 2007). An evaluation and rating system may help tourist to select sites, enhance their satisfaction, and encourage them to act responsibly (Deng, King, and Bauer, 2002). Therefore, the need for evaluating the sustainability of ecotourism is important not only to measure its effectiveness as a development strategy but also as a way to identify and reward companies which practice responsible ecotourism rather than those that are merely green washing (Macaulay Institute, 2007).

A number of tourism attraction rating systems or models used elsewhere were examined, including those used or proposed by academics, practitioners, and state tourism authorities in Australia, Canada and the USA. Tarmen *et al.* (2007) provided a basis for assessment and comparison tourism attractions in Kuching, Sarawak based on 10 categories. These include uniqueness, access, quality, parking/staging area, public supporting infrastructure, commercial supporting facilities, seasonality, information and interpretation, on-site activities, and accommodation.

Teh and Cabanban (2007) presented an *a priori* evaluation of the potential for developing sustainable within the biophysical context of Pulau Banggi, and undeveloped island off the northern Sabah, Malaysia. A set of biophysical criteria which include marine biodiversity, seasonality and oceanographic conditions, water resources and distribution, and waste management was applied as the criteria for assessment. The biggest constraint in this island is the lack of inadequate water and sanitation infrastructure. Blast fishing, although occurring less than once per hour, can potentially destroy the major attraction for tourist.

Ecotourism is usually considered to be more than just nature-based tourism and seen as a tool for conservation and sustainable development. So, how to maintain

sustainable development for an ecotourism site has become a critical issue. The use of indicators and standards is increasingly common among managers who monitor social and biophysical changes in natural resources settings. This may be the first time such an approach has been used to evaluate ecotourism operations. It should be noted that indicators are intended to be site specific and, in an ideal evaluation or monitoring procedure, should be selected and Delphi tested by people who know the area and setting being evaluated, and who understand the principles (Wallace and Pierce, 1996; Lin *et al.*, 2006). Moreover, it should be remembered that indicators are not comprehensive but can yield an evaluation that is indicative of overall conditions, if carefully selected. It is possible to develop standards for each indicator that enable a much higher degree of precision in measuring the indicators that are associated with ecotourism principles.

Farrell and Marion (2001) identified and assessed ecotourism visitor impacts at eight protected areas in Costa Rica and Belize. The impact assessment procedures included qualitative condition class systems, rating system, and measurement-based system applied to trails and recreation sites. Standardized assessment procedures were developed and applied to record trail recreation site impacts. Impacts affecting the study areas included trail proliferation, erosion and widening, muddiness on trails, vegetation cover loss, soil and root exposure, and tree damage on recreation sites.

Emphadhu and Ruschano (2007) studied the assessment of nature-based tourism site potential at Chiang Mai province. Indicators and evaluative standards for site potential assessment were determined. The indicators divided into 4 groups which are tourism resources, facilities and service, environmental and social impact management and local community participation in tourism and also identified into

twenty-two parameters. The results revealed that 121 nature tourism site in Chiang Mai are currently managed for nature appreciation tourism, 56 sites for adventure tourism and only 6 for ecotourism.

Bhattacharya and Kumari (2004) determined the criteria and indicator for sustainable ecotourism in Sikkim, India. Several criteria were proposed with the group of indicators which are composed of maintenance of healthy ecosystem, conservation of cultural heritage, enabling environment for ecotourism promotion, livelihood generation and poverty alleviation, tourist satisfaction, carrying capacity and people participation and awareness generation.

2.3 Sustainable Tourism Indicators

Sustainable development has become the most popular catchwords on the world's policy agenda. Nearly all governments have committed themselves to sustainable development by integrating economic welfare, environmental quality and social coherence. Monitoring progress towards sustainable development requires in first place the identification of operational indicators that provide manageable units of information on economic, environmental, and social conditions (Bohringer and Joechem, 2007) and how these relationships change over time.

The Global Development Research Center (GDRC) defined the term of indicator as "An indicator is defined as parameter, or a value derived from parameters, which points to provide information about the state of a phenomenon/environment/ area. It is a means to reduce large quantity of data down to the simplest form" (GDRC, 2007). Indicators of sustainability for ecotourism are different than traditional development indicators because they take into consideration the web of complex interrelationships

and interdependencies of resources and stakeholders involved (Sirakaya *et al.*, 2001). Indicators have been proposed to date to meet the criteria of policy relevance, analytical soundness and measurability (Briassoulis, 2001).

In the mid 1980s, ecological indicators were proposed, which were quantitative, descriptive measures of either human pressures on the environment or of environmental conditions (Briassoulis, 2001). An environmental indicator can be broadly defined as a parameter, or value derived from parameter, which provides information about a phenomenon (OECD, 1993 cited in ADB, 2002). McCool (1996) noted that indicators should be easy to measure quantitatively. Lacking warning indicators, retrieval attempts are made mostly after the environment has been seriously impacted upon and fragile ecosystems are lost (Li, 2004)

Broadly, park agencies use environmental indicators in order to determine what impact tourists and other visitors are having on the park's natural environments; compare them with impacts from other sources; and undertake and evaluate management responses. To Monitor visitor impacts needs ecological baseline data that incorporate seasonal cycles, long-term trends, extreme events, and internal patterns, it needs indicators that reflect the priority conservation values of the protected areas concerned, and the types of use not merely management process. It also needs specific indicators that are discriminating, quantifiable, actionable, sensitive, ecologically significant, integrated, and feasible in practice. And it needs experimental design that distinguishes tourist impacts from other sources of variation (Buckley, 2003).

Since the early 1990s, more environmental indicators have been developed (Briassoulis, 2001 and WTO, 2004). The compendium of sustainable development

indicator initiatives mentions more than 500 sustainable indicator efforts (Parris and Kates, 2003 cited in Bohringer and Joechem, 2007). The World Tourism Organization (WTO) has pioneered the development and application of sustainability indicators to tourism and to destinations. Since the Rio conference, planners and academics in many nations and specific destinations have been working to develop indicators suitable for their management needs. These indicators have focused both on issues of impact and sustainability for tourism, and more traditional management indicators that respond to particular needs at many scales (WTO, 2004).

The many generic guidelines, checklists, indicators and accreditation schemes for sustainability in tourism overall, therefore are of little use of tourism and recreation in the park. A very different set of indicators is needed, focusing on local scale green rather than global scale brown impacts. Many potential indicators have been identified but rarely have they been implemented in practice (Buckley, 2003); but rarely have they been implement in practices.

Besides, Manoliadis (2002) noted that there is no universal set of indicators that is equally applicable in all cases. However, the following criteria are appropriate to most indicator selections. The indicator selection must be closely linked to project objectives and the environmental problems being addressed; part of a small set aiming to an effective approach; defined clearly in order to avoid confusion in their development or interpretation; practical and realistic, and their cost of collection and development therefore needs to be considered; high quality and reliability; appropriate spatial and temporal scale.

There are various international initiatives that provide the rationale for indicators of sustainable development and also suggest particular measure which may be of use at many scales. These include:

- The Agenda 21, defined at the Rio Earth Summit, in chapter 40 defines the need for appropriate information that supports decision-making, and suggests the elaboration of indicators of sustainable development;
- The agenda 21 for Tourism (WTO, WTTC, EC, 1995), presents indicators as one of the priority action areas, and a principal tool for monitoring;
- The UN Commission on Sustainable Development has developed a Theme Indicator Framework, which address overall sustainability issues, with specific subsets that may be directly applicable to tourism destination or to key assets. It also defined guidelines for developing a national indicator programs;
- The Global Reporting Initiative (GRI) attempts to set world standards on environmental reporting for public and private organization;
- Base on GRI, the Tour Operation Initiative has elaborated guidelines for sustainability reporting through performance indicators for tour operators.

There are different types of indicators, each with different utility to decision-makers. While the most directly useful maybe those that help to predict problems, several other genres exist (WTO, 2004):

- early warning indicators
- indicators of stresses on the system

- measures of the current state of industry
- measures of the impact of tourism development on the biophysical and socio-economic environment
- measures of management effort
- measures of management effect, results or performance

While all categories of indicators can be valuable in supporting sustainable tourism, the early warning indicators are frequently most useful to tourism managers and may provide the ability to anticipate serious negative effects on the destinations, or on the overall tourist experience.

Ideally, indicators can enable actions to be taken well before serious threats to sustainability occur. It should also be noted that the same indicator can frequently serve different purposes and its use can change over the time. Sirikaya *et al.* (2001) also renowned that “to evaluate the past, guide the action of the present, and plan for the future, we need to know what to monitor, what data to collect and what to measure. In other words, to track changes in social, natural, cultural, economic, and political arenas of ecotourism destinations, we need several sets of sustainability-centered ecotourism indicators based on their policy relevance, analytical soundness and measurability”.

Good indicators provide decision makers with information that enables them to identify, evaluate and make timely decisions on critical changes being caused by ecotourism to the natural environment, communities and other resources. In theory, all forms of ecotourism can be differentiated as either sustainable or unsustainable but there is still a great deal of uncertainty regarding indicators for measuring and

monitoring sustainability. Furthermore, ecotourism, which appears to be sustainable in the short-term, may prove otherwise in the long run (Weaver, 1999).

WTO (2004) recommended that too many indicators can overwhelm users with too much information and can also overextend resources to support them. Most practitioners agree that it is essential to prioritize issues and the indicators that correspond to them to help create a shorter list without important gaps. The number of indicators will depend on the size of the destination, the number of critical issues, the interests of the user group, the information and the resources available to track and report on the indicators. The number of indicators for different projects is showing the Table 2-3.

Table 2-3 Numbers of Indicators

Organization	Purpose	Number of Indicator
Department of Culture, Media sport, UK	Measure the smallest set of sustainable tourism	21
The British Resorts Association	Measure tourism's impacts and good management practice amongst local authorities	12
Samoa	Monitor destination	20
Kangaroo Island, Australia	Monitor and manage tourism	17

In short, most practitioners agree 12-14 indicators are optimal and a central challenge in the indicators development process is to end up with consensus on a short list without important gaps. However, number of indicators are required “enough” to respond to the established priority issues. WTO (2004) also purposed baseline indicators for sustainable tourism in Table 2-4.

Among the different resolution indicators, many organizations and researchers have been determined various kinds of sustainable indicators. Green Globe 21 International Ecotourism Standard (2004) provided information to the operators to understand ecological sustainability by categorizing the principles of ecotourism into 11 topics as follows: ecotourism policy, performance and framework, natural area focus, interpretation and education, ecologically compatible infrastructure, ecological sustainable practice, contribution to conservation, benefiting local community, cultural respect and sensitivity, customer satisfaction, responsible marketing, and minimal impact codes of conduct.

Abidin (1999) identified sustainability criteria and indicators for evaluating sustainable ecotourism development in Taman Negara National Park, Malaysia. He used Delphi method and public survey to solicit opinions from interdisciplinary panel. The methodology involved the identification selection, evaluation of measurable criteria and indicators for ecotourism sustainability.

Table 2-4 Baseline indicators of sustainable tourism

Baseline Issue	Baseline Indicators
Local satisfaction with tourism	Local satisfaction level with tourism (Questionnaire)
Effects of tourism on communities	Ratio of tourist to local (average and peak period/days) % who believes that tourism has helped bring new services or infrastructure (questionnaire-based) Number and capacity of social services available to the community (% which are attributable to tourism)
Sustainable tourist satisfaction	Level of satisfaction by visitor (questionnaire-based) Perception of value for money (questionnaire-based) Percentage of return visitors
Tourism seasonality	Tourist arrivals by month (distribution throughout the year) Occupancy rates for licensed accommodation by month % of business establishment open all year Number and % of tourist industry jobs which are permanent
Economic benefits of tourism	Number of local people employed in tourism Revenues generated by tourism as % of total revenues generated in the community
Energy management	Per capita consumption of energy from all resources Percentage of businesses participating in energy conservation programs or applying energy saving policy and techniques % of energy consumption from renewable resources
Water availability and conservation	Water used (total volume consumed and liters per tourist per day) Water saving (% reduced, recaptured or recycled)

Table 2-4 (cont.)

Baseline Issue	Baseline Indicators
Drinking water quality	Percentage of tourism establishments with water treated to international potable standards
	Frequency of water-borne diseases: number/percentage of visitors reporting water-borne illness during their stay
Sewage treatment	Percentage of sewage from site receiving treatment (to primary, secondary, tertiary levels)
	Percentage of tourism establishments (or accommodation) on treatment system (s)
Solid waste management	Waste volume produced by the destination (tones/month)
	Volume of waste recycled (m ³)/ total volume of waste (m ³)(specify by different types)
	Quantity of waste strewn in public areas (garbage counts)
Development control	Existence of land use or development planning process, including tourism
	% of area subject to control (density, design, etc.)
Controlling use intensity	Total number of tourist arrivals (mean, monthly, peak periods)
	Number of tourist per square meter of the site (e.g., at beaches, attractions), per square kilometer of the destination, mean number/peak period average

Source: WTO (2004)

The office of national tourism Australia (2005) also described that environmental indicators are physical, chemical, biological or socio-economic measures that can be used to assess natural resources and environmental quality. They defined the core indicators of sustainable tourism and specific measure as follows:

- Site protection: category of site protection according to IUCN index
- Stress: tourist numbers per visiting site (per annum/peak month)
- Use intensity: intensity of use in peak period (persons/hectare)
- Social impact: ratio of tourists to locals (peak period and over time)
- Development control: existence of environmental review procedure or formal controls over development of site and use
- Waste management: percentage of sewage from site receiving treatment
- Planning process: existence of organized regional plan for tourist destination region
- Critical ecosystems: number of rare/ endangered species
- Consumer satisfaction: level of satisfaction by consumers (questionnaire based)
- Local satisfaction: level of satisfaction by locals (questionnaire based)
- Tourism contribution to local economy: proportion of total economic activity generated by tourism only

Lim and McAleer (2004) studied ecologically sustainable tourism management and proposed five types of environmental indicators for the detailed checklist; including of indicators for fragility of ecosystem and biodiversity, waste disposal, water consumption, intensity of land use and physical impact, and protection of the atmosphere. Li (2004) also proposed environmental management indicators for ecotourism in China's nature reserves. For ecotourism management, a set of warning indicators is important to indicate environmental change at tourism sites.

Georgesce and Nilson (2004) identified key issues and indicators for North Cape Breton in 4 groups including:

- a control of environmental impact (perception of level of cleanliness of areas frequented by tourist, clean image of the region, water quality in beach/rivers/stream areas, environmental practices and attitudes of tourists);
- economic benefits to the region (employment statistics, amount spent per day per tourist);
- marketing the region (opinion for quality/value, price of accommodation, repeat visit to same accommodation);
- community impacts (local attitudes and perception on tourism benefits or non-benefits);
- infrastructure (road condition, percentage of pull-offs per km of highway, Length of maintained trail system)

Ecotourism maybe more environmentally benign option than other extractive resource uses. However, without sufficient planning and management, ecotourism may also result in significant environmental impacts (Leung and Farrell, 2002). Therefore, an environmental management system will be considered in next topic as the sustainable management tool to integrate environmental, management, and ecotourism together.

2.4 Environmental Management System

An Environmental Management System (EMS) is a voluntary management tool that provides a framework for an organization to pro-actively manage its potential and actual environmental risks and opportunities (Global Development Research Center [GDRC], 2007). Whilst content and coverage of an EMS varies depending on scope and organization type, each EMS does have common elements. The Urban Environmental Management EMS Training Resource Kit notes that each EMS should:

Both the International Standards Organisation (ISO 14000) and the European Union (EU) Eco-Management and Audit Scheme (EMAS) have developed standards for the production of an EMS. Certification to either scheme is voluntary and is dependent upon assessment of an accredited third party body.

The benefits of an EMS include: reduced environmental impacts and risks; reduced operating costs; market advantages; enhanced reputation; increased efficiency of operations; improved relationships with regulators (improved compliance) and other stakeholders; cheaper insurance; the creation of an environmental early warning system; and the tracking of trends and the ability to make predications.

Obstacles to implementing and EMS include lack of time, human or financial resources; lack of senior management support; and lack of understanding of the EMS process.

The key stakeholders of an EMS are employees and persons/organizations directly affected by the EMS such as suppliers, temporary staff, contractors and distributors. Other stakeholders include government; environmental groups; the local community; regulators; non-government organizations; and industry groups. EMS can be applied to any government or non-government organization, site or activity.

In addition, the concept of environmental management system (EMS) was applied to encourage environmental friendly activities not only in industrial sector but also in natural resource management and tourism. The EMS method has been widely used, particularly in large hotels or hotel chains, to help conduct baseline studies, train staffs, and set up an achievement and monitoring system for the selected environmental targets such as reduction of pollution, and usage of water and electricity (Honey, 2004). Consequently, EMS concept, when integrated with various environmental aspects, is absolutely applicable for developing ecotourism in the national parks. There're various types of research and projects relevant with EMS.

For example, Commonwealth Department of Tourism, Australia (1995) developed best practice of ecotourism related energy and waste minimization initiatives in Australia and overseas. The twenty five activities were identified including land transport, water transport, energy supply, energy-efficient buildings, heating and cooling buildings, heating water, recovering heat, lighting, toilets, cooking, clothes washing and drying, dishwashing, hand washing, showering and bathing, refrigeration, office equipment, office paper, solid materials, building materials, newspaper and cardboard, glass, plastics, metal containers, food and garden materials, pumping water, and marketing energy and waste minimization.

Wood and Halpenny (2001 cited in UNEP, 2002), explained the key to achieve ecotourism management. They suggested that the significant sustainable index should come from researches, which have been developed from the best practices. Al-Sayed and Al-langawi (2003) studied biological resources conservation through ecotourism development in Kuwait. This research noted that ecotourism is one way to ensure the process of conservation and suggested the successful techniques to conserve the biological resources and biodiversity in the arid environment. These techniques include ecosystem identification, wildlife resource

identification, geological aspects of land use, and environmental feasibility of conservation and rehabilitation.

In Thailand, Environmental Research Institute of Chulalongkorn University (ERIC) and Bumi Kita Foundation (2007) conducted the research throughout Thailand in order to publish the natural guide of Thailand. The study was integrated principles based on the general framework of sustainable development.

For each principle detail criteria were further elaborated based on existing certification system and international guideline for sustainable tourism (for example the UNWTO, WWF, UNEP, Green Globe 21, IHEI, the European Eco-labels for tourism). The eco-rating principles used in this guidebook, which are:

- Traveler-friendly: is the criteria based on the perception of tourists, the hotel or activity provides and enjoyable experience for travelers who appreciate nature and local cultures. Important criteria are pristine and aesthetic environment; safe, clean and comfortable surroundings and facilities; friendly and efficient staff; and discovery of local nature and culture.

- Nature-friendly: the operation is designed and managed in a way that reduces negative environmental impact and enhances environmental conservation. Environmental management for small-scale tourism enterprises can be divided into four aspects: environmental planning; water and energy conservation, reduction of chemicals use; solid waste and waste water treatment; environmental education and conservation.

- Community-friendly: the operation contributes to the welfare of local people and enhances the local culture and focus on relationships with employees; relationships with communities; participation and economic opportunities for communities; and support of local culture.

2.5 Nan Province and Sri Nan National Park

2.5.1 Nan History

Nan, the land of eastern Lanna Kingdom has become city state more than 7 centuries (Charoensiri, 2007), is as old as the Sukhothai Kingdom and had 64 kings in total. Formerly, known as “Nantaburi” or “Woranakhon”. The city was built by King Phu kha around the 12th century A.D. on the plains know today as Pua District.

In 1359, King Kanmueang obtained the Buddha relic from Sukhothai Kingdom and had it enshrined on a hill called “Doi Phu Phiang Chae Haeng”. The city was then moved to the foot of this hill. Later in 1368, then Nan River changed direction, urging King Phakong, the son of King Kanmueang, to relocated the city to Ban Huai Khai on the west of Nan River, where the city has remained till today (TAT, 2005).

2.5.2 Geography

Nan Province is located in northern Thailand, covering an area of approximately 11,427 square kilometers (N 18° 00'45” - 19°37'53” and E 100°20'34” - 100°06'29”). The province is presently divided into 14 districts of which the northern and eastern parts are next to Laos’s border whereas the southern and the western parts connect to Uttaradit, Phrae, and Payao Provinces, respectively. Most areas of Nan Province are predominantly mountainous with the slope of more than 30 degrees, covered by forests. About 44% of the areas are classified as 1A-watershed zones, which are headwaters for many important rivers such as Nan River, Sa River, Pua River, and Long River, etc.

Nan’s geographical position has resulted in many terrestrial and aquatic ecosystems. Most of these varying ecosystems or natural resources are in pristine condition and result in the province being one of potential tourist sites. National parks in Nan Province have several spectacular natural environments, covering of

many types of tropical forests, streams, waterfalls, hot springs, caves, fossil of 200 hundred year-old marine mollusks, living fossil of a palm species, and varieties of wild flora and fauna. A rare species of plant which has a very beautiful flower, “Chompoo Phuka” *Bretschneidera sinensis* Hemsl., discovered only at Doi Phu Ka National Park and some rare species of wild animals such as the Serow *Naemorhedus sumatraensis*, the Banteng *Bos javanicus*, the Gaur *B. gaurus* and the Big-headed Turtle *Platysternon megacephalum* are attractive for tourists. The advantage of having these natural resources has brought more than 37 major tourism destinations in 7 national parks. In addition, Nan also has more than 27 major cultural tourist sites. Both natural and cultural sites have caused the increasing number of tourists annually (DNP, 2004).

The appreciation of beauty and fascination of its natural environment is currently the prime interest among tourists. As with this aspect of interest, increasing numbers of tourists seem to realize the importance of nature conservation, and ecotourism has become more and more popular recently.

GISTHAI of Chulalongkorn University (2006) was developed the 3D map showing geography of Nan (Fig 2-3) and Land Use in Nan (Fig 2-4).

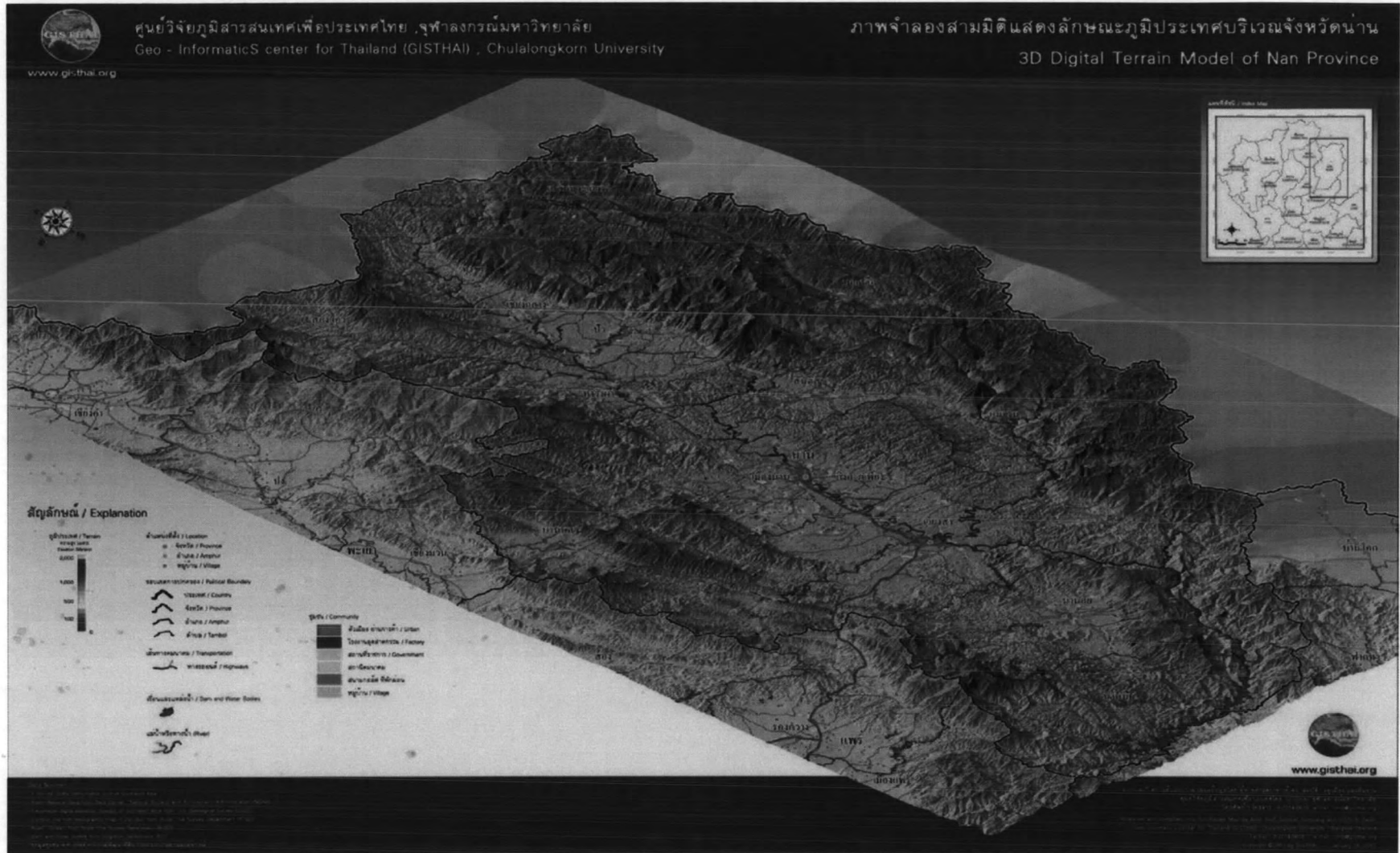


Figure 2-3 Geography of Nan

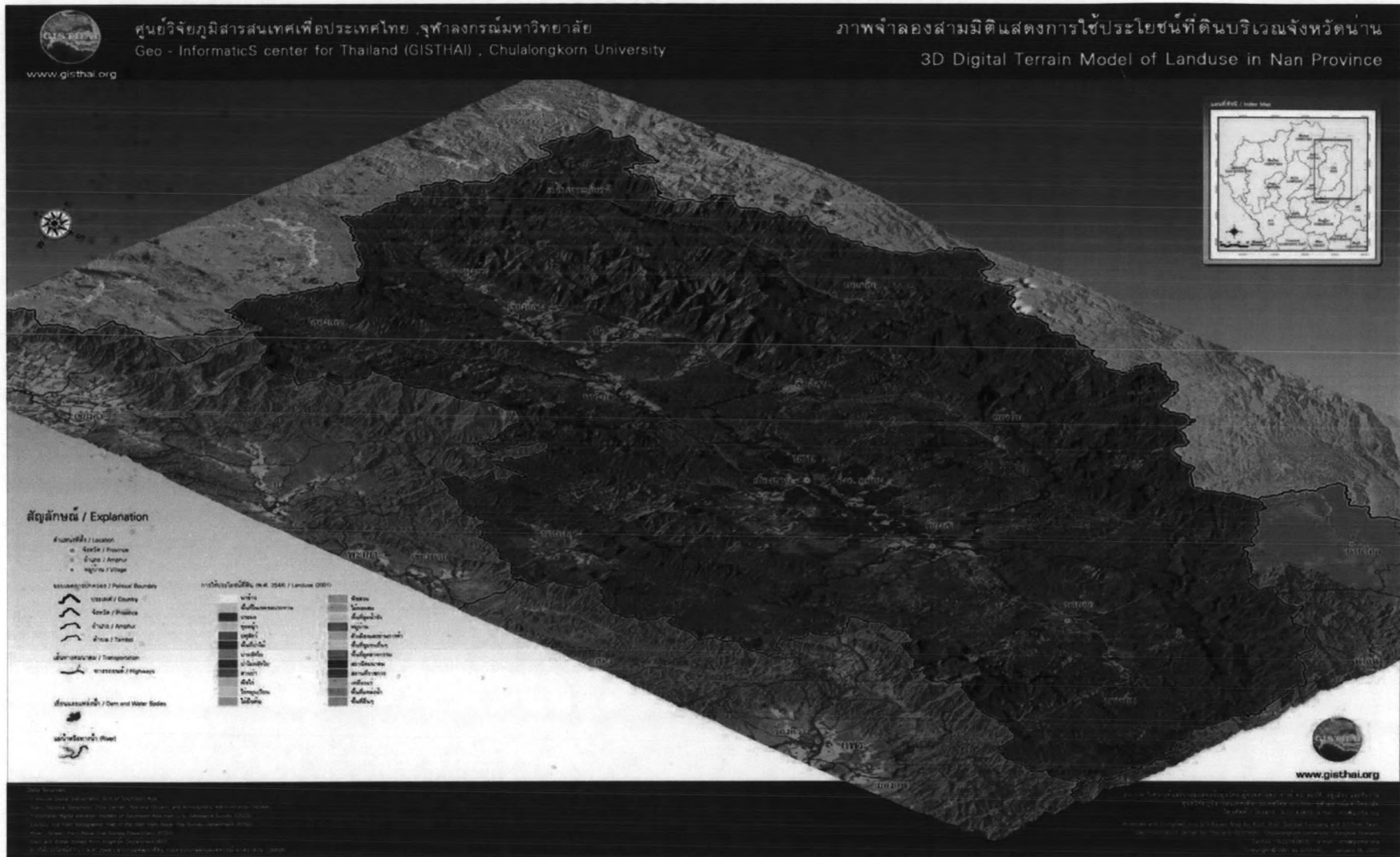


Figure 2-4 Land Use in Nan Province

2.5.3 Climate

Figure 2-5 shows the average temperature in Nan during year 2000-2006. During November - February, the average temperature was lower than 25 degree celcius.

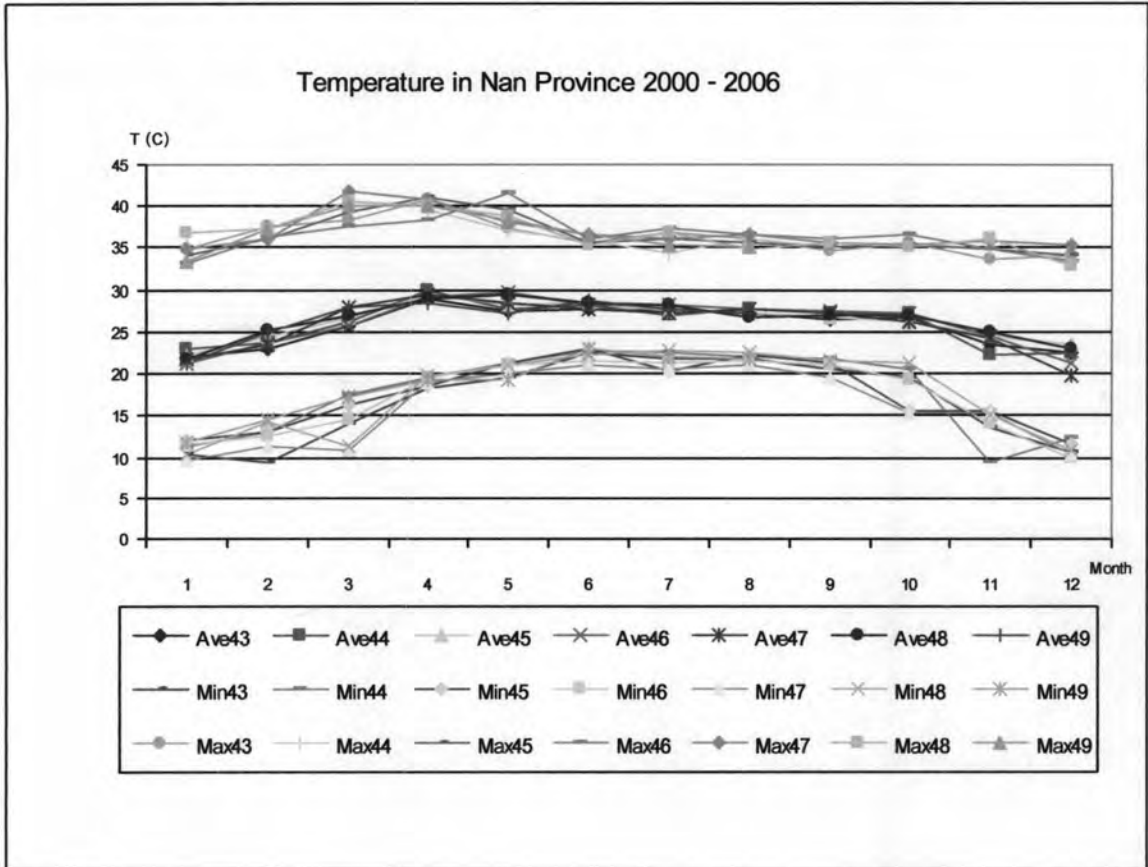


Figure 2-5 Average temperature in Nan Province

Source: The Meteorology Nan, Northern Meteorology Station (2007)

2.5.4 Tourist Statistic in Nan

Department of National Park Wildlife and Plant (2006) recorded the tourist statistics visiting national parks in Nan during 2005-2006 as shown in Table 2-5. Sri Nan National Park has maximum number of tourists, follow by Mae Cha Rim, Doi Phu Ka, Nantaburi, Khun Sa Than, Tam Sa Koen, and Khun Nan National Park, respectively.

Table 2-5 Numbers of tourists visiting national parks in Nan during October 2005 - September 2006.

National Park	Numbers of tourists												Total
	Oct 05	Nov 05	Dec 05	Jan 06	Feb 06	Mar 06	Apr 06	May 06	Jun 06	Jul 06	Aug 06	Sep 06	
Doi PhuKa	968	682	6,052	4,073	2,000	639	1,837	472	254	446	574	325	18,322
Mae Charim	2,939	3,952	6,944	4,377	4,380	3,560	5,679	2,738	2,289	2,143	1,288	2,529	42,818
Sri Nan	2,310	2,042	13,348	9,782	2,637	1,386	2,434	595	541	1,313	1,173	8,376	45,937
Nantaburi	255	430	2,012	2,019	2,021	629	543	540	542	350	353	354	10,048
Tam Sa Koen	171	156	180	220	129	92	125	195	165	110	90	85	1,718
Khun Nan	56	94	217	287	153	58	67	542	43	46	50	-	1,613
Khun Sa Tan	380	1,171	2,406	1,099	946	324	600	347	323	456	588	664	9,304

2.5.5 Sri Nan National Park

In 2004, 445,988 tourists visited Nan and 94.53% were Thai (TAT, 2005). Among all tourists who visited Nan, 61,308 or 13.75% visited SNNP which was the highest number of tourists compared to other national parks (DNP, 2005). The area of Sri Nan, covering 1024 square kilometers, made up with massive mountains and hill ranges with several spectacular natural environments. Many types of forests and tremendous species of flora and faunas exist within the park. The popular destinations in Sri Nan are Doi Sa Mer Dao Mountain, Pha Chu Cliff, Sao Din and Kok Sua Landform, Kang Luang Rapid, and Pak Nai Fishery Village Reservoir.

At Sao Din, Bunma (2004) studied diversity and utilization of plants and found 134 plant species were identified into 113 general and 57 families. The interesting plant was *Gardenia Turgida* Roxb. There were 17 useful plant species, among this 9 species used as food, 5 species for medicine, and 3 species used in another purposed.

Graduate students from Chiang Mai University conducted research related with tourism in Nan Province as follows:

Waritt (2001) investigated the community potentials in ecotourism promotion of Lam Nam Wa community. The results show that physical and environmental resources in this study had high level of potential, whereas the community potential for natural resource conservation was at a middle level, as same as the community potential for community participation-based tourism, the community potential for tourism service, and the community potential for income generation from tourism. The recommendation from this study is to establish a community committee to dialogue together with outsiders that arrange the tourist activities, the government and NGOs to find the way for community's potential income from ecotourism.

Jitrawongnun (2002) studied tourism changes in the Folk Ways along the Numwa River Bank, Nan Province. The key finding of the study noted that community had tourist site with diversity of natural resources such as forest, cataracts, and fish nurturing area. The folkways involved with these natural resources, in return, they have been preserved with trees, plants, wild animals and aquatic animals. The important pull factors were such as nature and soft adventure tourism sources, which caused tourism into the community.

Chankham (2003) conducted research in the potential of Tai Lue community in resource management for ecotourism at Don Mun village, Tha Wang Pha District. The results of this research showed that Tai Lue Community of Don Mun Village had long historical backgrounds. Many tourists always visited, the community ecosystem, and studied the culture, creating the community's pride and awareness of the village's resource conservation along with their tradition, culture and life style.

From the literature reviews, only a few of ecotourism researches have been conducted in Nan, especially in national park. Nevertheless, currently, Nan is still being one of the virgin popular destinations for tourists to admiring natural, cultural, and historical which are very sensitive areas. The mass tourism or even ecotourism may disturbed the pristine environment if lack of suitable management plan. Ecotourist impacts could have more serious ecological consequences as most visitor activities occur in environmentally sensitive or ecologically significant communities (Leung and Farrell, 2002). Consequently, this research is aimed to investigate tourist site potential and applied environmental management system for ecotourism development in Sri Nan National Park.