

CHAPTER I

INTRODUCTION



1.1 OVERVIEWS OF THE STUDY

Since the first definitive description of sustainable development “*sustainable development must ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs...sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfill their aspiration for a better life*” (The World Commission on Environment and Development [WCED], 1987: 43) was first introduced during “The Brundtland Report” in 1987, there was the widespread recognition of the importance of sustainable development. Regarding the Brundtland Report, the United Nation Conference on Environment and Development (UNCED) declared the statement of Forest Principle and in the Chapter 11 “Combating Deforestation” of Agenda 21 in Rio de Janeiro 1992, the term “*sustainable forest management*” was proposed and demonstrating recognition (Prabhu et al., 1996; Brand, 1997; Pettersen, 2001).

Forest ecosystem management is a means of achieving the goal of sustainable forest management. The concept of forest ecosystem management means the integration of scientific knowledge of ecological relationships within a complex sociopolitical and value framework toward the general goal of protecting native ecosystem integrity over the long term (Grumbine, 1994; Slocombe, 1998; Pirot, Meynell, and Elder, 2000). In order to implement the UNCED principle, there is a need to measure progress toward sustainable forest management. In response to this, criteria and indicators (here after referred to as C&I) were developed as a tool for assessing forest conditions and management. A variety of Initiate/Processes and many of organizations have been active in developing C&I for sustainable forest management in different management level (e.g., the Montreal processes, the Pan-European forest processes, the International Tropical Timber Organization (ITTO), the Forest Stewardship Council (FSC) and the Center for International Forestry Research (CIFOR).

To date, the problem facing human and resources utilization especially forest resources, the competition, confliction, and depletion of forest resources are severe in the current period. Although we have become accustomed to using economic indicators, such as interest or unemployment rates to help assess the state of our economy, in contrast there are few systematically reported indicators to assist stakeholders in evaluating the state of environment. We need more and better environmental information that is easily understood, readily available and widely disseminated to use in making reasonable choices to manage our resources. Ecological indicators describe, analyze and present scientifically based information on environmental conditions and trends. Ecological indicators help to elucidate the effects of human activities and natural changes. They can also help to assess future implications of these factors for the integrity of ecosystems and their abilities to support ecosystem itself and human life. Indicators are representations of components or processes of ecosystems. The indicators typically refer to their inherent value which they have directly measured. Indicators generally simplify in order to make complex phenomena quantifiable so that communication about them is so meaning and understanding about ecological conditions can be made more transparent. And if regular data collection is undertaken, indicators can support consistent assessment over time of trends in environmental condition to help answer the question, are environmental conditions getting worse or better. Ecological indicators are only as good as the scientific data upon which they are based. Then indicators must be presented to decision-makers in the way that are relevant to them and can be readily understood. Ecological indicators can enable us to understand past ecological damage and provide early warning of potential environmental problems to enhance our ability to manage and resolve these problems. Once indicators have identified elements of the environment that are under stress, successful management of problems could be measured in relation to interim targets and long-term goals.

Ecological indicators are useful tools for a variety of environmental management purposes. The availability of environmental indicator systems at various temporal and spatial scales can increase the capacity of government, and organizations to manage the environment as reflected by these indicators.

Forest ecosystem degradation is often the result of massive perturbations associated with human activities such as replacement of natural ecosystems by agriculture and human settlements. In the past, resources management paradigms were focused on a particular resource (e.g., timber, cropland). The whole ecosystem has never taken before

into consideration. In forestry, sustainable forest management has been initiated to solve this problem.

Sustainable forest management may be described as *“the process of managing forests to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment”* (Canadian Council of Forest Minister [CCFM], 1996). C&I, logically, reflect a series of holding value to the environmental, economic and social functions of a forest and it must be recognized that C&I constitute appropriate tools for defining, assessing and monitoring progress towards sustainable forest management (Brand, 1997; Prabhu, Colfer, and Dudley, 1999).

Currently, several countries that trade in natural products especially forest products were motivated to focus on their “green products”. Much international trading is reliant on these products. Among the forest product traders, the focusing on environmentally friendly, sustainable forest management is inevitable. According to sustainable forest management, it is almost impossible to address any one issue to guarantee “green products”. Sustainable forest management requires balancing the multiplicity of values represented by ecological, economic and social issues. Many sectors found it helpful to have a clear definition of the scope, key elements and measurable features of sustainable forest management. Nowadays, there are several general supports for C&I from many international and national processes that appropriate for different management level (e.g. global, national and forest management unit level). Most processes have been transparent and have allowed the participation of many stakeholders.

To date, many countries/regions have been able to develop appropriate C&I that use to assess their forest conditions and their management progress toward sustainable forest management (Brand, 1997). Generally, international and national C&I are used to clarify or hamper ongoing debates on certification of products from sustainable managed forest. Not only for certification or guarantee of “green products”, from the conservation point of view, C&I could also provided effective tools to monitor the status of forest and effects of management practices over time. Ultimately, these tools will be useful to promote improved management practices and to promote development of healthier forest. Now forest management has a clear “target” to be evaluated and monitored.

Prabhu et al. (1996) suggested that the task of evaluating the sustainability of forest management would be to assess the two conditions that the first one is *“ecosystem*

integrity is maintained or enhanced” and the second one is “people well-being is maintained or enhanced”.

Ecological integrity is highly complex and a single indicator or operational definition is insufficient to capture its multifaceted aspects (De Leo and Levin, 1997). In order to implement management activities toward sustainable management goals, an appropriate ecological procedures and/or tools are necessary to guide decision-makers in monitoring and evaluating the overall status of forest ecosystems for addressing the problems of selection the suitable management options. The C&I approach should be the appropriate channel to achieve successful of sustainable forest management.

From the definition of sustainable forest management mentioned above “...to maintain the continuous flow of products and services of forest...” it can be recognized that the maintenance of forest ecosystem integrity should be regarded as the essential goal to be fulfilled in the first step of sustainable forest management.

Under the same concept of C&I for assessing toward sustainable forest management, developing C&I for assessing ecological integrity must harmonize to its theoretical aspects.

Nowadays, managing community forests toward sustainable forest management is the hot issues in Thailand. Community forest means “*forest area which can be classified by local community and managed by local community for sustainability of resources utility especially for subsistence use under common rule and involve in cultural and traditional aspect of local community*” (Chammarig, et al., 1993). Cultural forests are also considered and named as the community forest of local community in the Northeastern Thailand. These forests and forest products constitute of an integral part of daily life of local people such as natural market, incentive income from selling forest products, recreation, and the place for ceremonial purposes. These are non-timber forest products include foods, medicinal plants, firewood, fiber, tools, building materials, and livestock foraging. Almost of these forests are patchy and scatter distributed along the local village in Northeastern. Because these are national reserves forest and public land properties, these forests are easily to approach and utilize by local people nearby. Therefore, they are highly risk to degrade in their integrity and consequently lost of forest area.

In this study, the developed ecologically-based C&I providing the tools to facilitate conservation management practices will be developed and tested at the forest management unit (cultural forest). They will be a key instrument for assessing and

monitoring the overall state and trend of the forest according to human activities such as harvesting of forest products and/or management activities.

1.2 OBJECTIVES OF THE STUDY

As the facts that ecosystems play a very important role in providing the materials and functional basis for all living processes and also form the foundations for all activities of human enterprise, to achieve sustainable forest management, management goals have to rest upon the ecological capacities of the ecosystem. The purpose of this study is to develop the set of C&I for assessing forest ecosystem integrity, as the part of sustainable forest management, at forest management unit (cultural forest) to facilitate the nature-oriented management of forest in implementing the management practices from the forest conservation point of view.

Thus, the objectives of this study will be concentrated on the following elements:

- To develop the appropriate set of ecological C&I along with the participation of local organization in assessing and monitoring their forest ecosystem.
- To apply and to test the developed set of ecological C&I at the local forest management unit level.
- To provide the ecological information on state and trend of the forest under the set of developed C&I to strengthen conservation policy and decision-maker to further improve management practices.

1.3 HYPOTHESIS OF THE STUDY

To achieve the goals of sustainable forest management, utilization of resources management should be conducted with respect to ecosystem integrity aspect. Components of ecosystem integrity for forest management should be taken into consideration. Policy planning and management systems of the cultural forest must be based on knowledge of the relevant ecology. Management regime demands the integration of large volumes of data, and requires a comprehensive understanding of ecosystem structure and functions in which human activities are an integral part of the ecosystem.

For cultural forest, current managements are lack of the ecological tools for assessing and monitoring status of the forest ecosystem and processes for improving management practices. An appropriate set of ecological C&I guideline for cultural forest management in Northeastern Thailand for long-term adaptive management strategy is necessary. Thus, the hypothesis of this study was:

“The developed set of ecological C&I could be the effective tools for assessing the ecological integrity of cultural forest and could be identified ranges of variation and thresholds for those C&I, and provide an ongoing feedback mechanism to adjust management practices.”

1.4 SCOPE OF THE STUDY

Based on the ecological integrity concept, the case study is concentrate on developing indicators under the three main criteria which are the components of ecological integrity; structure, function and disturbance of forest ecosystems manage by local community (cultural forest) in the Maha Sarakham Province, Northeastern of Thailand (Figure 1.1). Local organization is inherently affiliated to the forest with strengthen in management practices. According to the similarity of management regime and utilization of cultural forest in Northeastern region, in this study, Nong Meg-Nong Hee cultural forest was selected as a representative cultural forest of Maha Sarakham Province since it is managed by rigorous local organization (Figure 1.2). This local forest organization was one of the northeast local communities that awarded the highest honor with conservation flag from Her Majesty Queen Sirikit at the Phu Pan Royal Palace. According to the site specification and conservation perspective of the local forest organization, some modification to the approach will be applied.

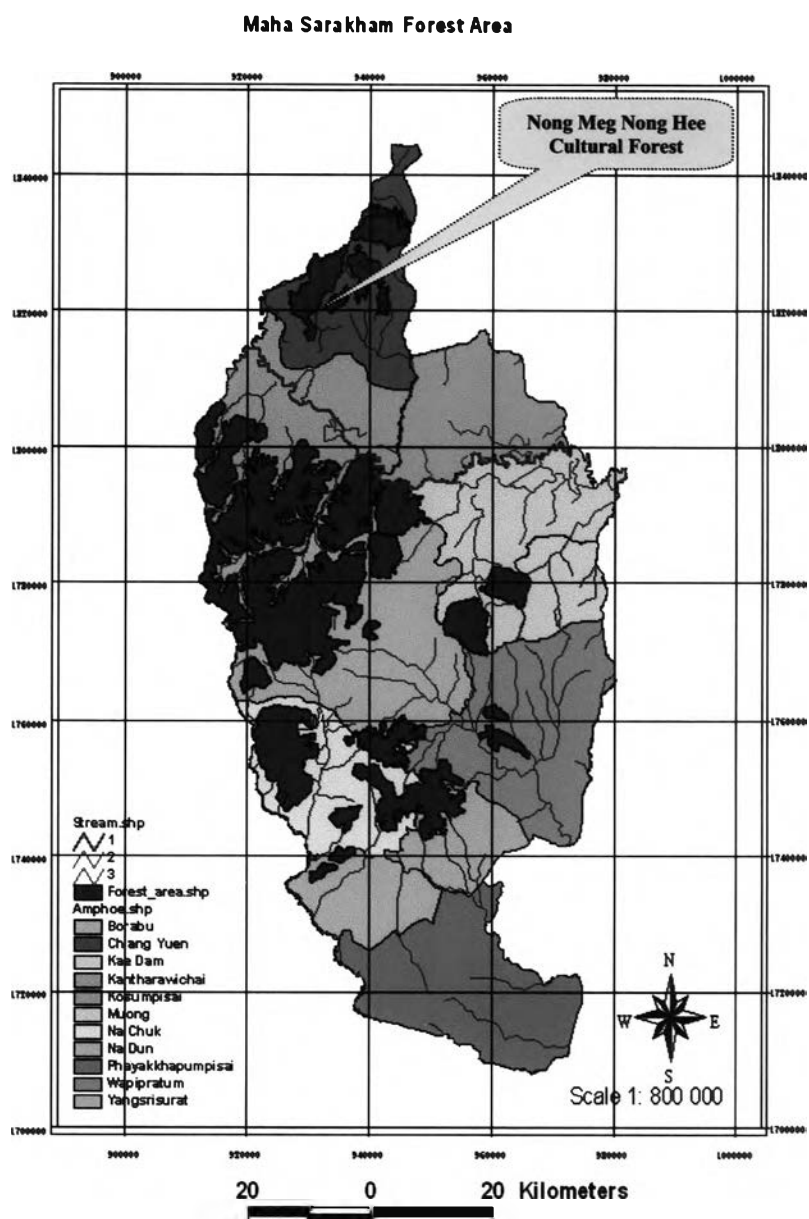


Figure 1.2 Location of Nong Meg Nong Hee cultural forest

1.5 CONCEPTUAL FRAMEWORK OF THE STUDY

The conceptual framework of this study was mainly divided into 2 phases. Phase I was involved in selection and revised the initial set of C&I (literature reviews and field survey) and Phase II was involved in C&I filter and testing/assessing of C&I. The overall framework was illustrated the step by step as showed in Figure 3.1.

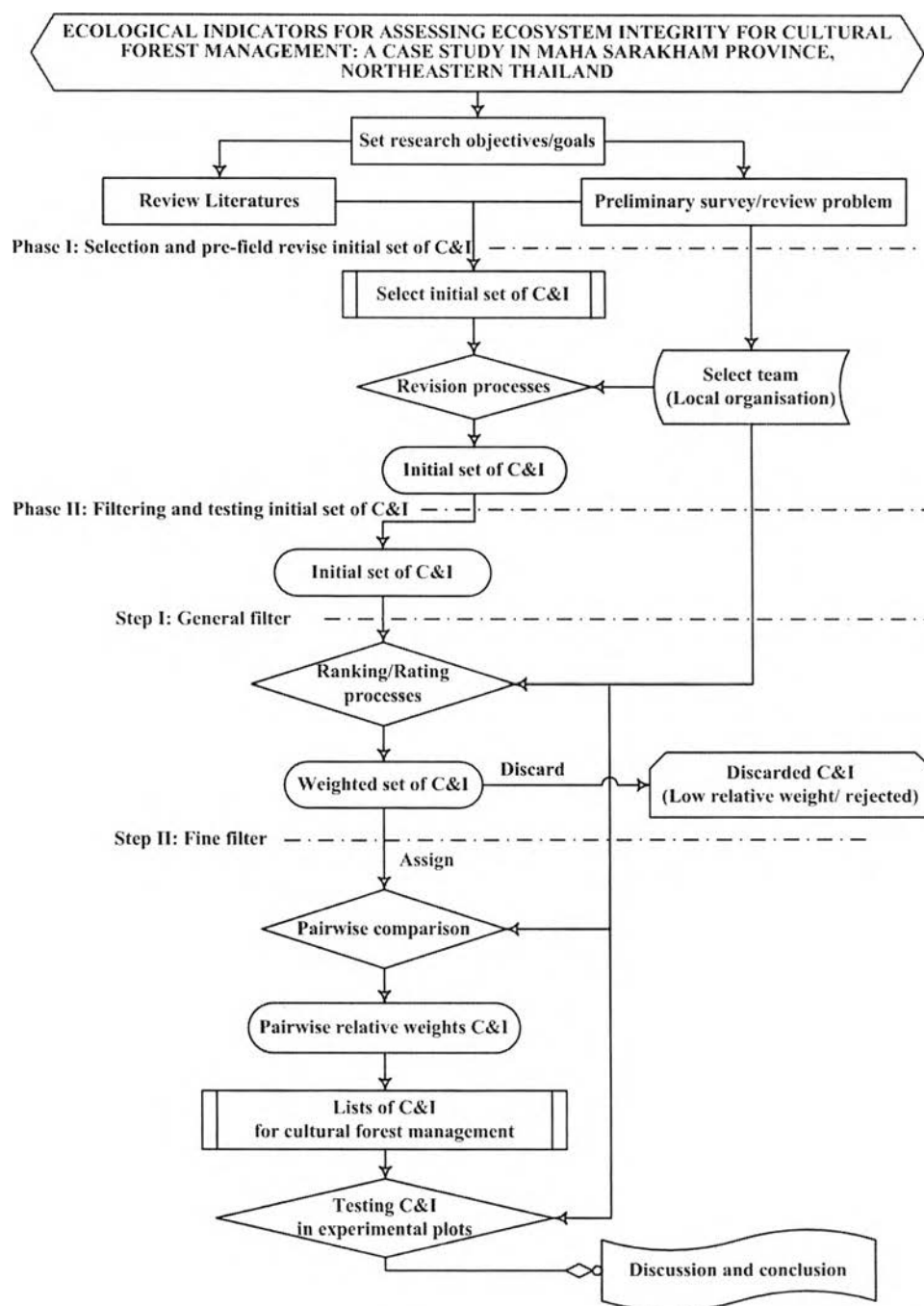


Figure 1.3 Conceptual framework of the study