THESIS

LOCAL STRATEGY FORMULATION FOR FOREST RESOURCE MANAGEMENT IN NAMSAN WATERSHED, LOEI PROVINCE

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GRADUATE SCHOOL, KASETSART UNIVERSITY
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THESIS

LOCAL STRATEGY FORMULATION FOR FOREST RESOURCE MANAGEMENT IN NAMSAN WATERSHED, LOEI PROVINCE

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A Thesis Submitted in Partial Fulfillment of
the Requirements for the Degree of
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The combination of qualitative and quantitative techniques by applying Participatory Action Research (PAR) were applied to study local strategy formulation for forest resources management in Namsan watershed, Loei Province. The objectives were (1) to survey and study the status, potential, need of local community, and readiness of Local Administration Organization (LAO) in the study area; (2) to formulate local strategy for the forest resource management and the cooperation process between local administration, community, and related agencies and (3) to propose and suggest the policy in forest resource management by the Local Administration Organization that can lead to action implementation. The research methodologies composed of study from secondary data, on site survey, 192 interviews with target group, arrangement of focus group, appointment of task force, formulating local strategy, arrangement of workshop and conduct pilot implementation project.

The finding of the research indicated that Namsan watershed had potential as forest resource and tourist attraction. However, the result of interviews noticed that the deteriorated forest takes up to 51% and local community still lack of participation in planning and strategy formulation process. Furthermore, the community required more promotion in income distribution by encouraging plantation of flower, garden tree, and mushroom. According to the survey, 85.9% wanted to establish an organization to manage natural resources and environment in Namsan watershed. The working group, which consists of representatives from all stakeholders, had formulated 5 local strategies, 9 plans, and 31 projects in Namsan watershed. The researcher played the role as facilitator who provided support in research, information and coordination in the area.

As a result of this research, a recommendation was forward the implementation of this new formation to apply the natural resources and environmental management, Tambol Administration Organization (TAO) together with local people and researcher. Thus, the best practice should come from an establishment of an incorporative mechanic/organization to manage the natural resources and environment in Namsan watershed effectively. This included the concept of technical/education/ training supply to strengthen the local community in extensive way, included the economics, social and environmental dimensions. Hence, this guideline should also be able to apply in the other watershed area.

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LIST OF ABBREVIATIONS

AAR	=	After Action Report
AIC	=	Appreciation Influence Control
CBNRM	=	Community-based Natural Resource Management
CPT	=	Core Planning Team
FAO	=	Food Agricultural Organization
GIS	=	Geographical Information System
GPS	=	Geographical Point System
JOMPA	=	Joint Management of Protected Area
NESDB	=	National Economics and Social Development Board
NESDP	=	National Economics and Social Development Plan
ONREPP	=	Office of Natural Resource and Environment Policy and Planning
PACT	=	Pre-Action Consultation
PAR	=	Participatory Action Research
PI	=	Project Implementation
PRA	=	Participatory Rural Appraisal
SPSS	=	Statistical Package for the Social Science
SWOT	=	Analysis of strength,weakness,opportunity,threat
TAO	=	Tambol Administration Organization
TERMS	=	Technology Economic Resources Man/Mental Social

LOCAL STRATEGY FORMULATION FOR FOREST RESOURCE MANAGEMENT IN NAMSAN WATERSHED, LOEI PROVINCE

INTRODUCTION

The development of the country in the past 40 years has extremely deteriorated the environment, which was mainly due to excessive consumption of natural resources and improper management. The National Economics and Social Development Board (NESDB) concluded before the implementation of the 9th National Economics and Social Development Plan that the past development of the country was fundamentally imbalanced, which leaded to poverty, inequality of wealth distribution, and deterioration of natural resource and environment. The plan also indicated that the imbalanced development would continue and worsen the problems. (NESDB, 2002) There will be the scarcity of natural resource, which will ultimately lead to social conflict. This circumstance coincides with many statistics. For example, the forest area had decreased from 55.33% of the total area (171.02 million rai) in 1961 to 25.28% of the total area (81.07 million rai) in 1998. In 2004, the situation was slightly improved as statistically indicated that the forest area increased to 32.64% of the total area (104.7 million rai). (National Park, Wildlife, Plant Conservation Department, 2004) At the same time, the lands were used without conservation or restoration. Out of the total land used, 134 million rai was brutally eroded (NESDB, 1997). The most important resource, which is water, faced the severe problems of scarcity, distribution, and quality. These problems were caused by the rapid growth of population and economic activities in the upstream, midstream, and downstream of the watershed.

The vital problem and cause in resource management is the lack of watershed system management. The management should integrate the ecological and environmental system with socio-economic system both in within each watershed and integrated with other watersheds in all dimension. In the past, the desired integration was conducted mainly by the government through the national policy and implementation. From 1972 to 2002, the government had planted only 5 million rai, which was not enough to balance the ecology system. Furthermore, the government still requires more specific policy and action plan in term of resource management in watershed area. Inefficient coordination between central government and local authorities, which directly recites with the residents, also the factor that creates more problems especially in the area that lacks of local participation in the management of local resource and environment. These factors are the major causes that make the management in the watershed area not successful as planed. Therefore, the central government should encourage the local authorities and neighborhood to take continuing and balanced action in conserving the ecology and environment system especially within the watershed area. The concept of delegation to local government is corresponding with the latest Constitution Law. According to the Constitution of Kingdom of Thailand, 2008 Edition designates the preservation, conservation, rehabilitation, and utilization from natural resources by government sector, community sector, public sector, private sector, and private development sector in the following Article. In Article 66, the constitution requires the participation from local community or native inhabitants to manage, preserve, and utilize from natural resources and variety of biological species in sustainable and

balanced way. In Article 67, it states that it is the personal right to participate with government and community to conserve, rehabilitate, and utilize natural resources. In Article 87, the government must act according to the public participation policy by promoting public participation in formulating policy, and Social and Economics Development Plan both in national and local level. (Office of the Council of State, 2007) The constitution law also suggests that the local shall have the appropriated strategy and shall formulate its own plan and measures to conserve the resource in watershed area, which can be realistically implemented. (Phiromchai, 2000)

Namsan watershed is one of the important watershed in the northeastern of Thailand. It is the source of water that approximately covers the area of 906.58 sq.km. The watershed covers two districts, namely Phuruea and Dansai. The majority of the area is forest protected area that consisted of Phuruea National Park, Phuluang Wildlife Sanctuary, and also Phuruea, Phupuey, Phukitao, and Kokphulek national forest area. These areas, along with adjacent areas used to be in plentiful condition that sources good water and biodiversity. Unfortunately, the majority of Namsan watershed area nowadays is demolished by the residents and the community especially around the Phuruea National Park due to expansion that leads to the transformation of the forest area to agriculture usage. It can be analyzed from the Geographical Information System (GIS) database that agriculture is an inappropriate land-use because this area is an efficient source of water and conservation of biodiversity. Not only the database that needs to be considered, but it should also regard the socio-economic, politic, and the trend of the region and province development. Loei province currently emphasizes on the growth of economic and tourism, which inevitably put some impacts on natural beauty of the forest conservation area.

There is another problem other than the aforementioned in the Namsan watershed area, which is the high frequency of instant flooding that usually, causes fatalities and damages to life, property, agriculture area, and natural resource such as landslide. According to the Meteorologyl Department of, in the past 20 years (1970-1989), 34 floods had occurred in the northeastern; the damages were estimated to be 8,396 million baht. The intangible damages such as lost of life and fatalities were excluded from this figure. (Meteorology Department, 1995) In the future, if there were no significant improvement in the management of forest along with the management of land-use, and water, the disasters would persist. Therefore, it is urgent to properly manage the forest resource in the source of water area in order to prevent the demolition of forest. The erosion, instant flooding, and poverty, must be taken cared of by initiating the integral management approach in every dimensions such as, socio-economic, ecology system, and environment. The approach would ultimately aim for the sustainable forest resource management in the watershed area by mean of local management of natural resource. The localization would enable the local administration and residents to extensively participate in the planning for the management of forest resource in the watershed area.

The researcher chose the Tambol Administration Organization (TAO) of Nongbua, Plaba, and Ladkang, Phuruea District, and Tambol Administration Organization of Phonsung, Dansai District, Loei province as the study area. These Tambol Administrations Organizations have significant figure of population and locates within Namsan watershed and adjacent to Phuluang Wildlife Sanctuary and Phuruea National Park. The researcher will study the process that will encourage local potential for the management of forest resource in Namsan watershed by the local

administrations, the form of cooperation among local administration, community, related agencies, and local academia to recognize local ability and strength to initiate the formulation of local strategy. The local strategy should also harmonize with provincial and nation strategy/plan. The local cooperation should also be able to jointly identify the problems, jointly plan, jointly create the strategy, and jointly hold the responsibility in order to propose the local policy for the management of forest resource. The idea of the strong local participation can be an example for other local administrations in the watershed area, and also at the national and international level for efficiency and sustainability in the future.

OBJECTIVES

1. To survey and study the status, potential, problems, need of local community and readiness of the local administration in the study area for the forest resource management.

2. To formulate the local strategy for the forest resource management and the form of cooperation process among local administration, community, and related agencies.

3. To propose and suggest the policy in forest resource management by the local administration that can lead to actual implementation.

Scope of the research

1. This research was a Participatory Action Research (PAR) therefore, instead of setting the hypothesis and variables, the study would be concentrate on the management of the Namsan watershed area by the local administration Organization around the watershed. The study area would be selected using specific selection technique in upstream, midstream and downstream watershed. The 4 Tambol Administration Organizations in the study area were Plaba, Nongbua**,** Phonsung, and Ladkang Tambol Administration Organization respectively. The research used the concept of the forest management by community that could be further developed to the management by local administration level.

2. The 4 pilot areas were Plaba, Nongbua, Ladkang Tambol Administration Organization, Phuruea district, and Phonsung Tambol Administration Organization, Dansai district. The research will search for potential in the area.

3. The population boundary is the target people within the study area composes of local administration, community leader, direct and indirect related agencies, private sector, private development organization sector, and academia.

Expected Benefit

1. Realize the status, potential, problems, need of local community and readiness of the local administration Organization in forest resource management.

2. New local strategy and form of local participation for forest management by local administration organization.

3. Suggestions in policy of forest resource management by local administration organizations that can be leaded to implementation and can be expanded and applied to other areas in adjacent area and in national wide level.

4. Local forest resource in Namsan watershed strategy formulation handbook.

LITERATURE REVIEWS

The researcher reviews the literatures to obtain the concept, procedures, and methodology, which can be divided to 4 major categories as follows:

1. The Community-based natural/forest / watershed resource management.

1.1 Community-based natural resource management (CBNRM) concept.

Community-based natural resource management (CBNRM) concept has developed over the past 20 years. Presently, this concept receives incredibly interests from many administrations both at local and international level due to the fact that the concept can be used as the third choice for natural resource management. In the past, the concepts of natural resource utilization were strictly in the form of (1) control and command, and (2) Marketing based. (Ostrom, 1998) In the current situation, CBNRM is considered to be suitable for the natural resource management especially for the resource that can be substituted, where CBNRM consists of objective, process, procedure, form, activity, and tool.

This research uses the concept framework of the natural resource management by the community because it can harmonize the human being and environmental system in both conservation and protection. In order to obtain realistic CBNRM that can lead to actual implementation, one must use the strategy as a tool and integrate with social, economy, and local culture. The required procedures are as follows:

1.1.1 The natural resource management by the local administration.

a. Create principle under the concept of learning by doing.

b. Emphasize on local needs and abilities.

c. Identify the stakeholders such as, local, community, private sector, non-government organization, and central/local government agencies.

d. Understanding of natural resource management system.

1.1.2 Natural resource management by letting the local administration manages the natural resource especially for the substitutable such as local forest resource management.

Thailand has adopted the CBNRM concept in The Joint Management of Protected Area – JOMPA project. (National Park, Wildlife and Plant Conservation Department, 2005) JOMPA aims to promote the management of protected area in Thailand under the approach of involving stakeholders' participation from various sectors to achieve the conservation of various species along with uplift of local quality of life.

1.2 Forest Resource Management Concept

Forest is an important resource of the country. It is a source of wood-based products that can be utilized and is a source that supports environment and other resources for sustainability. Forest management means the way to manage people and social to utilize the usage from forest efficiently and fairly. (Intachan, 1984) Forest resource management can be managed for many purposes such as for community, for source of water development, for people profession promotion, for industrial development, for food, etc.

The forest management concept adopted the development pattern from the 9th National Economics and Social Development plan, the national forest policy year 1985, the policy from National Park, Wildlife and Plant Conservation Department, and Royal Forest Department. These plans emphasized to conserve, protect, rehabilitate, develop, and conduct proper usage from the forest in order to sustain ecology system, and biodiversity. These plans also assign 5 approaches and strategies to conserve and develop the forest as follows:

1.2.1 Protect and preserve the natural forest and suppress the offender of Forestry Law.

1.2.2 Rehabilitate the forest condition and encourage the cultivation of forest. The local administration and resident will be encouraged to participate in term of protection, rehabilitation, management, and sustainable resources utilization.

1.2.3 Demarcation and assignment of the approach for proper utilization as follows:

a. Protected forest area, shall assign the management in 3 categories, which are the protection of demolition in plentiful forest area, the rehabilitation and restoration of the deteriorated forest area, and the multipurpose management in the economically valuable forest area.

b. Economic forest area shall have the management that considers mainly on the usage of wood, and emphasizes on providing sustainable forest products.

c. The deteriorated forest district shall have the management for rehabilitation by letting the plants in the forest breed naturally, cultivation of forest plantation, and the implementation of land reform.

1.2.4 The conservation concept.

The conservation concept is the implementation that applied from the conservation approach by selecting the appropriated method for usage, conservation, protection, rehabilitation, development, conservation, and demarcation.

1.2.5 The promotion of efficiency and potential in management and research.

1.3 The watershed management concept

The watershed area is the area that collects and distributes surface water through the watershed that can let all water though the stream intersection (Dingman, 1994), and watershed is the specific area that related to water management. The definition of watershed must be thoroughly considered as FAO stated that the first concept of watershed management is defining the physical boundary of studied watershed that depend on the operation capacity, manpower, financial resource, time, and the landscape of watershed.

Watershed management is the integrated natural resources management and landuse planning in watershed area in accordance with its potential. The integral survey and analysis on the physical condition, and socio-economic, are essential especially in the hydrology of watershed that should be improved and developed for the better efficiency in water production. It should also summarize the researches and plan the development for the upstream watershed, where it is the source of water and stream. Moreover, the plan for the approach and procedure of the management of source of water in midstream and downstream watershed should also be planned together with the upstream to achieve the integrated watershed management. The concept is melodious with many researchers, who stated that the watershed management could be divided into 3 principles. The first principle is the land use planning, the second principle is to assign efficient resource utilization in the watershed area, and the last principle is to control pollution. All three principles must regard watershed as ecology system, thus, each action to a part of watershed inevitably yields impacts to others in watershed.

Watershed management, therefore, must focus on system-wise approach that specifically highlights public participation, which is the actual owner of the resource. The community should participate in planning, operating, monitoring and evaluation from the beginning till the end of the project. The objective of the project is to express the importance the interests of the midstream and downstream that correspond with the management of upstream land users.

The top-down approach to conserve in the past is no longer appropriated for the current circumstance due to the growth of population and consumption of resource. The government, which used to be the instructor in the past, must change its role to consultant, and budget provider. For immediate and future approach, the government must persuade local resident to set their own goal, give more attention, and conscious to conserve natural resource, and sustainable land use management. The planning to implementation phase should select the small scale watershed area and should concentrate at the management of watershed area program. The program should encourage the participation from local, community in the area, related agencies, and concerned parties, and it should correspond with the national watershed management master plan.

The area based watershed and environment management concept is very popular nowadays, and can be applied to this research to seek for appropriated area-based management for the forest resource in watershed area (Watershed Approach) that emphasizes on interdisciplinary knowledge composes of ecology, social including local, community, culture, and local economic. (Niyom and Rattana, 2005) In addition, multi-stakeholders partnership between the government agencies responsible for policy, and local administration, who is the representative of the resident, needs to be formed to coordinate in management in order to effectively transform the plan to implementation.

1.4 Participation Process

Participation is a procedural process that the government agencies should not provide a direct control and force the participation, rather, government agencies should encourage learning process by the community. The participation process can be divided to 4 procedures as follows; (Niyom *et al.*, 2007)

1.4.1 Planning : The people must participate in analyzing problems, prioritizing problems, setting goal, formulating the method for monitor and evaluation, and setting decision making.

1.4.2 Implementation: The people must participate in implementing the plan in targeted area.

1.4.3 Obtaining Benefit: The people must obtain benefits from their direct activities on the basis of fairness and equality in the society.

1.4.4 Monitoring and Evaluation: The people must participate continuously in directing monitoring and evaluating. In addition, if necessary, the community can review and revise implementation such that it will truly be for the community needs.

All in all, participation is one of an important tool to manage watershed due to the fact that it reduce the government's burden in solving problems. The participation also increase the value of decision making, and create consensus building in many agreements that can be leaded to implementation.

2. Related natural resource and environment management strategy concept.

2.1 National Development Strategy Concept

Strategy means the tool that helps dictating the decision-making process at any levels of organization. (Kaothien, 2002) The strategy is formulated from brainstorming from participated stakeholders bases on principle analysis on status, environment, and market condition to suggest the goal. The strategies will be prioritized and implementation of plan and supporting projects that leads to valuable outcome, effectiveness, and correspond to public needs. This process should be conducted under good management, which consequently, yield success and becomes a drive force for country development.

In the last two decades after the end of the Cold War, the world has moved to globalization era that recognizes the importance of the advancement in science, technology, and information, which creates coordination and connectivity as global village. Moreover, there is a Democracy trend that increasingly recognizes the importance of participation, human right, and natural resource and environment conservation. Thailand has adopted the sustainable development concept for country's development for more than 20 years. In the Seventh National Economic and Social Development Plan (1992-1996), Thailand issued the law and exclusively formulated the natural resource and environment strategy. Later in the Eighth National Economic and Social Development Plan 1997-2001 (NESDB,1997) recognized the importance of principle and concept to improve human resource as a center for development, and use economy as a tool to improve the quality of life for Thai people. Later in the 9th NESDP (2002-2006) and in the tenth Plan (2007-2011) has adopted his Majesty King Bhumipol's philosophy and speech of "Sufficiency Economy" as a core of the plan under the Middle Path concept for the development, which ultimately will lead to balanced development and integrative development in all dimensions such as economic, social, culture, natural resource, and environment under the principle of Sufficiency Economy, which is sufficient, reasonable, and immunity system that strong enough to protect from external and internal impacts. The important aspects to achieve under the philosophy is the tool, which includes, planning, strategy, development and management of the country. The action plan should be formulated in all levels in synchronize fashion, which will lead to balance and sustainable development. The natural resource management strategy in the 9th and 10th NESDP can be concluded as follows;

2.2 Natural resource and environment management strategy in the 9th National Economic and Social Development Plan 2002-2006 is the strategic plan that indicates the direction of the development of the country in mid term basis. The plan suggests the balanced development in term of human, socio-economic, and environment, as the concept and natural resource and environment management strategy. The development should underline the transformation of mechanism and procedure of natural resource management for the optimum effectiveness as follow (National Economic and Social Development Board, 2001):

2.2.1 Improvement of efficiency for natural resource and environment management that can effectively aids the utilization, conservation, rehabilitation, and fundamental economic development. The management mechanism must be changed by emphasizing of the integrated management, and encouraging participation from all parties especially from local.

2.2.2 Conservation and rehabilitation of the natural resource that can improve the condition of the resource by assigning reserved area. The goal of the area is to keep the balance of ecology system and guide the utilization that synchronizes with its capacity.

2.2.3 Conservation and rehabilitation of community condition, culture, and tourist attractions that can support the quality of life of the community. The environment, natural tourist attractions, and local heritage, should become the fundamental of community economic development.

2.2.4 Effective pollution management for the better living quality in the community must be done by promoting the reduction and disposal of waste and hazardous material that are acknowledged by the community.

2.3 The 10th National Economic and Social Development Plan 2007-2011 has adopted his Majesty King Bhumipol's philosophy of "Sufficiency Economy" as a core of integrated development. The philosophy emphasizes on integrating all sectors to participate in every process of planning, and creates the driving force for implementation of strategy especially in natural resource and environment. The increase in population causes the deterioration in natural resource and environment worldwide. This is related to the natural resource management in the 10th plan, which is the development based on biodiversity, and resource and environment security strategy, that compose of 3 approaches. The approaches are the protection of resource base and balanced ecology system to maintain the balance between utilization and conservation, the creation of high quality environment to elevate quality of life and sustainable development, and the development of biodiversity and local knowledge. The fundamental should be set for the development bases on long term biodiversity, and emphasized to encourage all sectors to recognize the importance and value of resource base and must be taken care of forever. This must be integrated with the strengthening in economic cost, social cost, and natural resource and environment cost, to be able to lead to sustainable and prosper society.

2.4 Local Natural Resource and Environment Management Strategy.

Natural Resource and Environmental Local Strategy is a way that creates the form corresponding to the natural resource and environment management to the ultimate goal of national sustainability. In order to obtain the effective local strategy; form, organization, mechanism, and decision-making process must be integrative and holistic. These factors are the backbone of the new strategy and policy. The local must store its own local natural resource and environment data as its database for decision-making and monitoring for the management. The local must underline the mechanism that encourages its resident to participate in the local natural resource and environment management (Greg, 1999); including the important mechanism that enhances local development capability and potential. The mechanism should enable the community to continuously develop its potential under learning community concept as an essential tool. The coordination between direct and indirect responsible agencies is also crucial, and must be transparent. It is also vital that the coordination must be transparent enough that it can be monitored and evaluated.

All in all, natural resource and environment management strategy is the guideline for actual operation to manage natural resource and environment at national, local, and community level. It needs the strategy as a tool for proper management form of holistic and integrative in all dimensions such as socio-economic, natural resource, and environment together as good governance. It must decentralize its jurisdiction to local administration, which has closely associated with resident, creates its own local strategy and prioritizes, set vision, objective, goal, and mission. It should also have database with reputable sources and seamless coordination between directly and indirectly related agencies. The essential factor that cannot be omitted is

the participation from local community in thinking, implementing, decision-making and responsibility process in conservation and rehabilitation, for the sustainable consumption of natural resource under the transparent management that can be monitored.

2.5 Concept and Theory of Local Administration

2.5.1 Many people have defined local administration (Holloway, 1951; Robson, 1953; Wit, 1967 and Utai, 1980), and can be concluded as follow; local administration must contain autonomy, legal right, and necessary organization. Moreover, it must allow local participation and empower them in administration either all or partial in order to become the local government of the people, for the people, and by the people.

2.5.2 The concept of Local Administration are as follows;

a. The importance of local administration is decentralization by encouraging participation in suggesting needs, electing representative, operating for public, and controlling the responsibility of representative Therefore, the administration would correspond to majority's needs and would allow the participation from the community with the government.

b. The need to decentralize in administration usually has 3 characteristics. First of all, centralization is the form that all decisions and operations are from central government. Secondly, partial decentralization is the form that central government delegates part of the power to local government. Thirdly, decentralization is the form that most of the powers are delegated to local government. In the case of Thailand, the service and result should be decentralized, where local can operate partially. In the meantime, the central government must delegate responsibility and administration to the local.

3. Participatory Action Research: PAR

Participatory Action Research is the research approach that is different from traditional natural science research or social science research. The expected outcome of this approach is to gain the acceptance from community. This particular typed of research, the researcher must ensure continuous relationship analysis between researcher and community, and must review the objective of the research occasionally so the research will embrace the participation from community. These processes would ensure actual and effective participation and would effectively change the community. This is harmonized with Whyte (1991) who said, "The decision making must be the consensus from participation among community, local organization by using strategy for implementation."

3.1 The definition of Participatory Action Research (PAR).

Participatory Action Research is the concept that was applied from local community development strategy by delegating the authority to community or selected commoners as a center of development and operation, where many researchers had

agreed to the concept. They declared that this type of research is the way to stipulate the community unity, and community learning by encouraging strong participation from all stakeholders. The research encourages community to identify problems and possible solutions, analyze alternative for the solution, implementation of desired solution, monitor and evaluate. It will ultimately lead to the participation in decision-making process by the people for each development project. The research aims to educate the people to effectively analyze problem and set its own local researcher team.

3.2 The concept of Participatory Action Research.

The importance of Participatory Action Research can be elaborated, as it is the approach to search for the solution for community by underlining problem, and local resources analysis. It is the process that needs participation from the community in decision-making process for desired development activities. It must be agreed in detail so that it is able to answer following questions: who will participate? How to participate? When to participate? All the operation will emphasize on the teamwork spirit, and the PAR research needs local people or community to acknowledge and participate in every process of the research, which are (1) Community understanding and problem identifying in the research topic. (2) Generating alternatives for possible solution. (3) Problem analysis and problem solving approach. (4) Arrangement of post research activities. The research process would ensure the exchange of thought between researcher and local people (Kungsirikul, 2004) to achieve procedural outcome. Local people are expected to slowly, yet continuously; gain the knowledge and potential in term of community problem solving skill. They will finally earn self-learning skill, and natural resources ownership conscience, which ultimately would lead to better quality of life. The researcher is only a facilitator, and coordinator. While the researcher stipulates learning skill for the community, at the same time, the researcher also learns extensively by the activity. Therefore, this type of research is a seamless mixture of theoretical knowledge, research protocol, objective and goal of developer, local and community needs and knowledge.

3.3 Procedure to conduct Participatory Action Research

The procedure of Participatory Action Research is flexible and natural, that should be adjusted to local way of life, social, and culture. It should not have official protocol and specific form. (Sitthinut, 2002) The procedures can be defined as follow:

3.3.1 The relationship should be developed between researcher, developer and community leader. Each party should identify explicit role and especially goal, objective, expected result so local could manage its problems effectively.

3.3.2 The problems should be jointly analyzed by the aforementioned partnership. The system that can trigger the joint thinking, joint action, joint problem solving should be established.

3.3.3 The action plan should be jointly developed during researching process. The result from problem analysis and possible solution will be summarized and analyzed further for potential, constraint, restriction, and resource. Furthermore, the analysis should consider the activities that can be solely done by the partnership, or the activities that can be spontaneously implemented, or the coordination plan with other related agencies both government and private sector. These aspects would add more drive to the problem solving and would correspond with actual causes that can be realistically implemented.

3.3.4 There should be action and activity that summarizes the lesson learns from the Participatory Action Research to develop the knowledge process and implementation plan.

3.4 The researcher adopted PAR research and Participatory Rural Appraisal (PRA) as one of the tool to study. These techniques are used to collect data in Namsan watershed such as group talking, Depth interview, SWOT analysis, mind map, local network and organization building. These techniques also emphasize on the participation from community to participate in activities, thinking process, analysis, planning through data collection both from researcher and from community information. These information will be used to formulate local strategy. Moreover, the researcher also becomes acquainted with local people and observe and take picture from the site.

3.5 SWOT analysis

SWOT analysis is the analysis for formulating the strategy for the organization by assigning the duration of the operation that emphasizes on its potential, readiness, opportunity, and treats. These factors will be analyzed and evaluated for the designing of duration for the operation, and formulating the strategy for the success of the organization.

SWOT is the abbreviation from the following alphabets:

S is strength, where the strength of the organization typically includes personnel, skill, dedication, equipment, technology, financial resource, and management.

W is weakness of the organization in various aspects such as weak management, inexperienced personnel, weak teamwork, etc.

O is opportunity, which usually means the external opportunity such as government support and promotion in forest plantation, profession, local income, etc.

T is treats, which usually means the external treats or foreseeable risks such as flooding, landslide, water scarcity etc.

3.6 Appreciation Influence Control (AIC)

Appreciation Influence Control (AIC) is the technique that allows public participation in the thinking process, problem identification process, planning process, and implementing process in the aspects that related to the community. In conclusion, it is the process that encourages people centered approach. The community and stakeholders will have a chance to participate in the thinking and implementing process. The typical AIC participation process consists of 3 steps as follows:

3.6.1 Appreciation or A: Educate the community and encourage the information exchange environment by encouraging the participation. The participation is by mean to search for community's potential and assigning the future, direction, and goal of the community's future aims. The community also considers problems, difficulties, opportunities, and resources of the community on the basis of realism by formulating community vision.

3.6.2 Influence or I: By bringing the thinking and creativity in each individual to formulating important procedure to jointly analyze that there are appropriated projects or activities. The selecting process is based on the priority of the projects that are acceptable by majority in order to achieve the desired goal and objective.

3.6.3 Control or C: The execution of important method or action plan that is acceptable by majority to actual implementation. What are need to consider are principle, reason, designation, methodology, responsibility, financial source, and benefit to community. These factors are the joint agreement that the actors and related people, who represent various groups in community, can control the action that leads to concrete implementation.

3.7 Mind map

Mind map is a technique of short-noting that was developed from human brain and memory knowledge. In other word, it is the technique that utilizes the brain theory, and the procedure to write mind map is as follows;

3.7.1 Prepare paper without lines and oriented horizontally.

3.7.2 Draw color picture or write words that communicates or show the topic of the map.

3.7.3 Think of important things, and problems to draw mind map. Write only short meaningful word from the center, the total branches should not exceed 8.

3.7.4 Elaborate each idea to many branches and supporting idea as supporting branches. This process can be continued infinitively depend on the ideas.

3.7.5 Word writing should be written with important or major word, or meaningful phrase.

3.7.6 Word, phrase, symbol or picture that need to be highlighted, highlight with draw circumferential.

3.7.7 Decorate the map as wish for attractiveness.

4. Result from the Related Researches.

The related studies and researches in the past regarding the formulation of Local Strategy for Forest Resource in Watershed area are unfortunately not too many due to the fact that the idea is fairly new. The majority of past researches are more pure science than social science. However, the researcher had conducted an extensive research in many aspects especially the form of public participation that is, and will be the trend in implementing the project in the future and can be concluded as follows;

NESDB (2004) conducts the Form of Public Participation in Natural Resource Management Study, and it indicates that:

1. Public participation is usually initiated when there is a crisis that causes by deterioration of natural resource and environment. When the development yields significant impacts to quality of life, it would create unity within the community and the members tend to unify and jointly identifies problems and corresponding solutions.

2. The evolution of participation usually developed from group of people such as local club, community, network who shares the same situation or problems and tends to share the same thinking process. There are many examples of such networks namely, Profession Development Network, Forest Conservation Network, and Seawater and Coastal Conservation Network, etc.

3. Successful participation in different areas usually is the result from different factors and influences in many aspects; geographic, condition of ecology system, culture, ethnic group, and living condition. Potential and development policy are also usually different. These different factors yield different outcomes in usage pattern, unification strength/characteristic, and for of participation activities resulting in different problem characteristic and severity.

The past research, "The Alternative of Conflict Management: Natural Resource and Environment Sustainable Management in Minor Basin of Hua Mae Tia, Jomthong District, Chiang Mai Province Pilot Project," emphasized on the participation from stakeholders in problem solving mechanism. The participation group appointed the task force as a focal point for every activity, along with the participation from community and usage of Geographical information technology. (Sudsawat, *et al,* 2004) The main objective of the pilot project is to generate significant participation from stakeholders in thinking, and decision-making process and ultimately to ensure natural resource and environment sustainable management plan in minor basin Hua Mae Tia is established.

The methodology of the study uses 3 strategies, Core Planning Team Strategy (CPT), Public Participation Strategy, and Geographical Information Technology for Planning. The study concluded that (1) CPT working process that leads to conflict solving is acceptable and using local capability and potential along with environment as a fundamental factor for the development that correspond with local needs. (2) Natural resource and environment sustainable management plan framework consists of vision, goal, objective, establishment of management strategy, and demarcation and assignment.

The result from implementing aforementioned project can be applied for the demarcation and assignment for the management of natural resource and environment in watershed area as (1) Reserved forest area, (2) Usage area, (3) Rehabilitation area, and (4) Land-Use area. Each area will have its own approach framework, and appropriated usage measurement, which can be considered as the participatory development process that relies on local community's need.

Watershed management must state the objective for planning including the preparation in natural resource and environment, economic, quality, quantity of water. The composition of stakeholders must be thoroughly considered. The partnership of the development must set the objective and achievement. The success of related watershed group has 3 approaches as follows:

1. Data collection and analysis, status, readiness, apparent opportunity with documentary support for the decision-making.

2. Planning and development by setting objective, selecting area, searching planning strategy, and procedure that leads to measurement.

3. Implementation, monitoring and evaluation according to the plan.

Nevertheless, there is research related with forest conservation, "Public Participation from Community in Forestry Resource Conservation: Pakchong District, Nakorn Ratchasima Province Case Study." The study found that the majority of population (more than 80%) has never participated in any forest resource conservation activities as aforementioned. Moreover, the minority who participate did it as seldom directed by government. It is not regarded as activity that community volunteers to jointly think and manage. The following are the activities that community participates in descending order from highly participated, forest cultivation activity, planting in public activity, community forest development, and forest fire protection line.

More related researches have been reviewed and found that economic and social factors are essential factors to local participation for the management of natural resource and environment.

Seesomonn (2000) had studied "the potential of local community in watershed management: Case Study of Huai Thap salo watershed, Changwat Uthaithani and Changwat Nakorn Sawan." He exclusively studied the relationship between local potential and conservation action, and found that economic status, duration of

residency; knowledge, attitude, and unification have statistically significant influence to the conservation action. These variables are the important indicators for the researcher to collect and analyze. They would concur with Socio-economic, Land-use, and Wood Consumption of Resident to the Area Management of Erawan National Park Impact Study, which found that the majority of population own small piece of land without proper legal title deed. These lands possess low soil quality due to lack of knowledge from owners, which undoubtedly yield low productivity. The resident then solves productivity problem by invading more of national park area and transforms to agricultural use. The community also consumes wood as combustible material that is mostly chopped from the conserved forest area and Erawan National Park. Therefore, government should encourage the cultivation of dispensable forest to accommodate wood consumption and as a measure to prevent invasion to National Park. This situation is connected to the research to analyze the form and factor to build successful learning network to conserve forest resource in the studied area of Hak Moung Narn Group, Maewang Watershed Conservation Learning Network, Mae chan-Maeslong Community Organization Learning Network, and Ban Ba Nod Community Organization Learning Network. (Chuchart, 1997) The result of these researches found that the principle factors of learning network are human, knowledge, and resources. The potential was depended on whether the leader can connect the old and new knowledge in forest and persuade the community to acknowledge the importance of forest conservation. The members were jointly learned by exchanging knowledge. The factors of building learning network is the leader who is accepted from the community and sincere to solve problems, the strength building of community organization, the integration of local knowledge and modern technology. The form of the network building process for knowledge will develop network at human-human level to human-group and to group-group. The starting point is building the leader, expansion and coordination, emphasize on grouping for establishing strong community organization, and sustainability by encouraging members to consistently participate in activities and learning.

Gorder (2001) studies the Wisconsin's new watershed approach realizes that forming partnership with stakeholders is central to decision- making and implementation and those solutions need to be geographically based and reflect the external and internal factors that affect the area (Martin *et al*, 2000). The Wisconsin Department of Natural Resources (WDRN) considers watershed groups as important members of these partnership and are supports them greatly. The examples, the state has provided funding for projects, educational and technical support. They facilitated the formation of partnerships with the group,other agencies,and universities. The WDNR also utilizes these group in gathering data on the watershed, and includes them in the decision-making process.

Niyom *et al.* (2007) had concluded the lesson learn of the project, "Lesson from Participatory Management of Upstream Area: Forest Love Water and land Project" that the traditional management of watershed aimed to manage natural resource base as primary objective especially the effort to protect, and rehabilitate forest resource, which is a fundamental resource that will maintain the balance of natural ecology system. Meanwhile, the government had issued policies and approaches

to sustain natural resources. However, the outcome was not as good as expected. The unfortunate outcomes were from many related factors that caused ineffective working in the area especially in the upstream and highland area of the country. In these areas, the community was established largely in the scatter fashion. At that time, the policy was to relocate community out of sensitive area, which would interfere with the ecology system. The policy inevitably leaded to the conflict between government and people. The Forest Love Water and Land Project to celebrate Her Majesty Queen Sirikit aimed to increase the effectiveness of protect and conserve forest using measures such as watch program, control forest area, conserve and rehabilitate, adjust ecology system at critical upstream area by encouraging local participation. The targeted areas are Namyom watershed and Narn watershed that cover the area of 11.11 million rai.The project also conserved and rehabilitated the critical forest in the Namyom watershed and Narn watershed of 1.83 million rai at the same time.

Thailand Institute of Scientific and Technological Research (1993) studied the form of economic self contain in the rural area using PAR in 5 rural communities, which are Tungyao village, Lumpoon province, Nongsang, Mahasarakam province, Tako village, Nakornratchasima province, Posricharoen village, Nakornratchasima province. The study found important knowledge to create community self contain and was permanently developed as follow; In order for the community to become self contain, it requires 5 aspects (TERMS) as follows;

1. Technology : T : Technology should be appropriated for rural area condition, which is include local tool and equipment, and modern technology that rural people can control.

2. Economic : E: Economic should be in the form that can create balance between the need and ability to obtain the need. It is the economic system that must be continuously developed and must be competitive. It should also have saving and investment ability and cooperation for producing and marketing with planning ability for the future.

3. Resources : R: Should be plentiful or can be utilized in a way that maintain the balance in ecology system and renewable.

4. Man/Mental : M: People in community should have conscious of self contain, learning, developing. Ultimately, people in community should have sufficient knowledge and ability to apply. The people should also have quality, work hard, and avoid the way of destruction.

5. Social and Culture : S: Community has good leadership, active participation, social unity, strong social organization, knowledge, and share the same information national and international.

The 5 aspects of self contain system must have the process to create self contain and community development in 3 process (BAN), which are creation of balance in self contain (Balance: B), Ability building in management (Ability: A), and creation of working networking. (Net-Working) These concepts coincides with the study," People Participation Process for Continuous Learning Process." The continuous learning will

occur under factors and environment. (Local Development Institute ,2000) These factors and environment are the possession of community fundamental data in all aspects, knowledge and ability to obtain knowledge that lead to public society, technique and procedure for participation, and universal communication system. It is synchronized with the operation in community and local strength (Vijan, 2001) which states that in order for local community to become strong, it needs coordination between 2 trends, base trend which operate in local community, and system trend which operate in national level to develop system and regulations that encourage local community operation. Both trends must support each other so that the strength can be obtained.

All in all, the researcher will apply the concepts from related researches for the development of forest resource management in Namsan Watershed strategy. The aforementioned researches show that the form in management of forest resource in watershed area by local and community is essential to area development in economic, social, culture, natural resource and environment. This situation reflects decentralization so that local can manage, solve, and develop according to local role. Natural resource management especially requires participation and coordination process from variety of stakeholders and societies. The human management must received extensive attention along with natural resource and environment management. PAR technique will be used as a tool for the study, and strategy formulation is the tool for integrative-Good Governance management by decentralizing the resource management in watershed to local, who resides in the area. Local Administration then can formulate it own strategy, prioritize, formulate vision, objective, mission, goal, and plan. The database and data source should also be incorporated. The coordination among responsible agencies and network connecting all dimension such as economic, social, and natural resource and environment to encourage and develop potential of local administration organization and local communication. One of the ways is to initiate the training in participation for the community. The researcher will use variety of target group especially in the area that will be studied by local administration. Furthermore, the researcher believes that the related government agencies should suggest or advise the management of natural resource in watershed for the development of people in study area.

Conceptual Framework

In this research, research review, theory, and other research reported from various sources were analyzed as a fundamental development of this research of local potential for the assignment of Namsan watershed forest management strategy by Phuruea Tambol Administration Organization, Loei province. The following Figure1 shows the framework of the research.

1. Critical Issue Problems

Watershed management is the essential all natural resource management in both at the present and in the future. Therefore, the research to analyze the local forest management in watershed area is critical and the following aspects must be thoroughly considered locally; status, potential, critical aspect problems, needs, and readiness. These aspects are the database for effective local planning in the future.

The traditional concept of top down planning solely by the government was reviewed along with uncertain policy and implementation. There are inappropriate management and lack of participation and coordination among government, local, and community especially the role of local participation is still limited. It shows that there is lack of public participation and coordination between related agencies at national-local-community level. The role of local administration is very limited. Therefore, the future development should stipulate local administration to adopt the major role in local natural resource management and should be the medium to coordinate between the government, local community and the citizen.

2. Local Natural Resource Management Approach

Local natural resource management conceptual framework will be used as an outline for the researcher to stipulate local administration to manage local development and problem solving. The concept will be underlined participation from stakeholders that emphasize various aspects of natural resource and area management. (under the management principle of forest, watershed, soil, and environment) with the following framework:

2.1 Analyzing local status, critical aspect problems, needs, and potential.

2.2 Designating usage/development/conservation.

2.3 Establishment of organization/mechanism/local participation.

2.4 Benefit distribution to local.

The goal is to enable local to be able to effectively analyze its own problem that correspond to the needs and potentials. Local, citizen, and government agencies must participate in planning and strategy building to achieve realistic strategy and plan that can really be implemented.

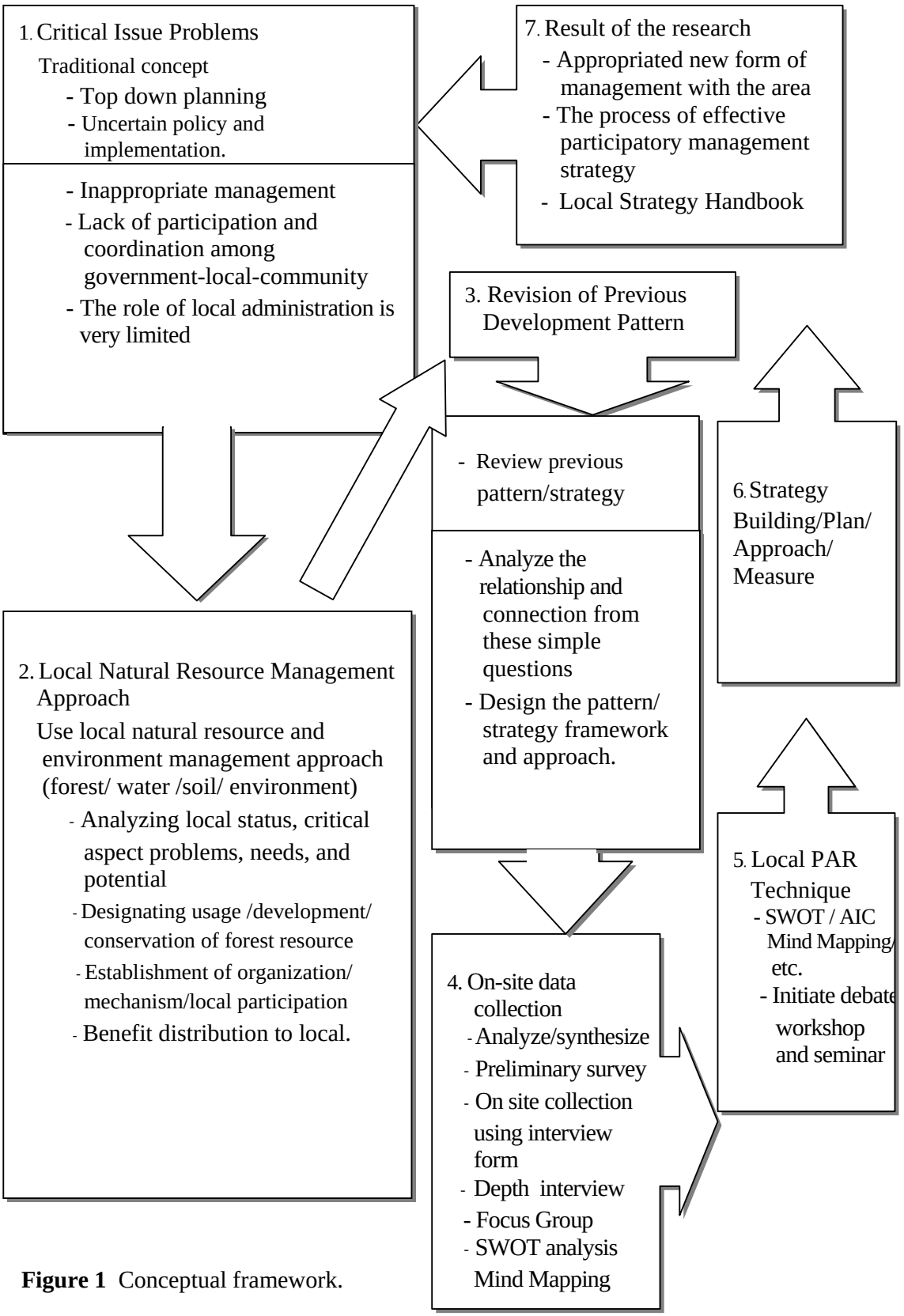

Figure 1 Conceptual framework.

3. Revision of Previous Development Pattern

After designing the conceptual framework and approach for the research, it is necessary to review previous pattern/strategy in participation, coordination, and management. The revision will be conducted by thoroughly review the related documents to gather the necessary information that can answer the background question such as who, what, when, where, how. The researcher will analyze the relationship and connection from these simple questions to enable the researcher to design the pattern/strategy framework and approach. The designing of framework is only the starting point, yet depend on the local people, who represent the sample of the research.

4. On-site Data Collection

4.1 Analyze/Synthesize from document and secondary data.

4.2 Preliminary survey for status, problems, needs, and potential.

4.3 On site collection using interview form, in-depth interview, focus group

5. Local Participatory Action Research Technique

The research will apply the concept of Participatory Action Research (PAR) as primary tool. The research emphasizes on the Local Participation using PAR technique in conjunction with SWOT, AIC approach, and Mind Mapping, etc. These processes underline participation from every sector to gain effective local participation. The process starts from the study of status, problem, potential in every aspect. Such aspects include socio-economic, culture, and especially local forest management in Namsan watershed to jointly think, analyze, plan, and design local strategy. Local debate will be initiated due to it would truly express the local needs. The researcher will have to intimately work and live in the study area and collaborate with local such as local administration, community leader, developer, local researcher to obtain the ability to locally manage forest resource. The collaboration would also enable the designing of joint pattern and approach including organization/mechanism that can ultimately lead to the achievement of the local strategy planning for sustainable forest management.

6. Strategy Building/Plan/Approach/Measure

Digest all information from the public participation and thoroughly summarize/ grouping for designating strategies/approaches/measures for implementation.

7. Result of the research

The primary result of the research is the new form of management that will be appropriated with area condition and effective integrated natural resource management. The major outcome of this research is the process of effective participatory management strategy that can be applied to other areas.

Experimental Site

The Experimental Site is Namsan watershed area as shown in Figure 2, which is one of the important watersheds in the northeastern of Thailand. The area will be selected from Tambol Administration Organization around Namsan watershed in upstream, midstream, and downstream of Phuruea and Dansai District, Loei province using selected sampling technique. The selected study area is as follows;

1. Upstream Watershed area is Plaba Tambol Administration Organization

2. Midstream Watershed area is Nongbua and Phonsung Tambol Administration Organization

3. Downstream Watershed area is Ladkang Tambol Administrative Organization

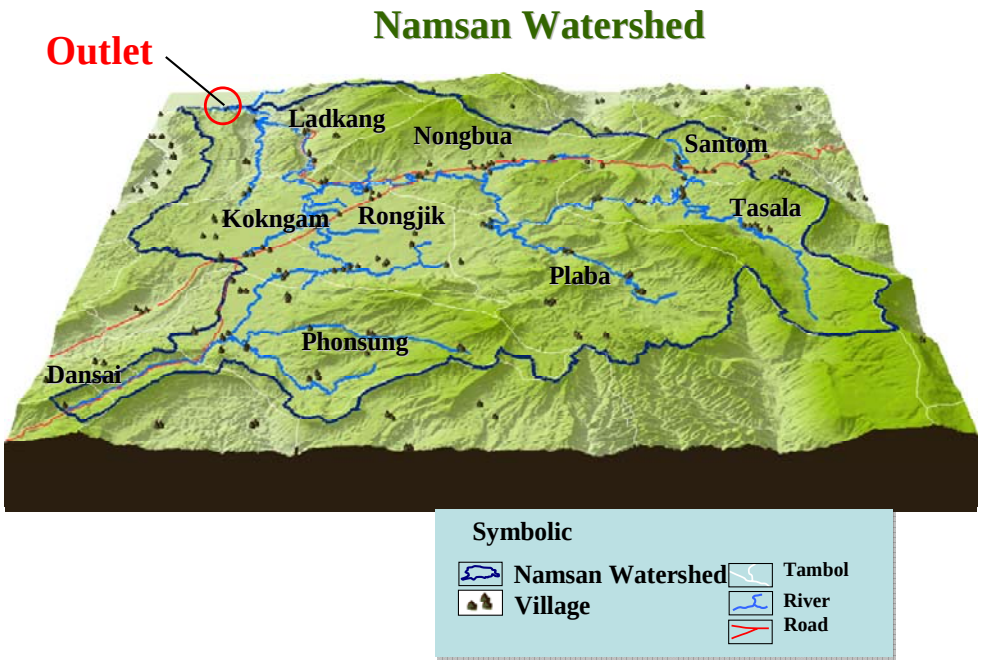

Figure 2 Boundary of Namsan watershed area.

Source: ONREPP (2005)

Study Area Characteristic

Topography

Namsan watershed is part of mountainous area of Loei province with dendritic characteristic. Its geographic can be described as mountainous with constant ravines. The watershed covers the area of approximately 906.58 square kilometer in the area of Phuruea and Dansai district, Loei province as shown in Figure 3. The upstream locates in Phuluang mountainous, which is the source of Namsam watershed, which has Namsan Yai and Namsan Noi as a major stream, which flows to Manhung River, Laos PDR, which is the estuary and locates 490 kilometers from Bangkok.

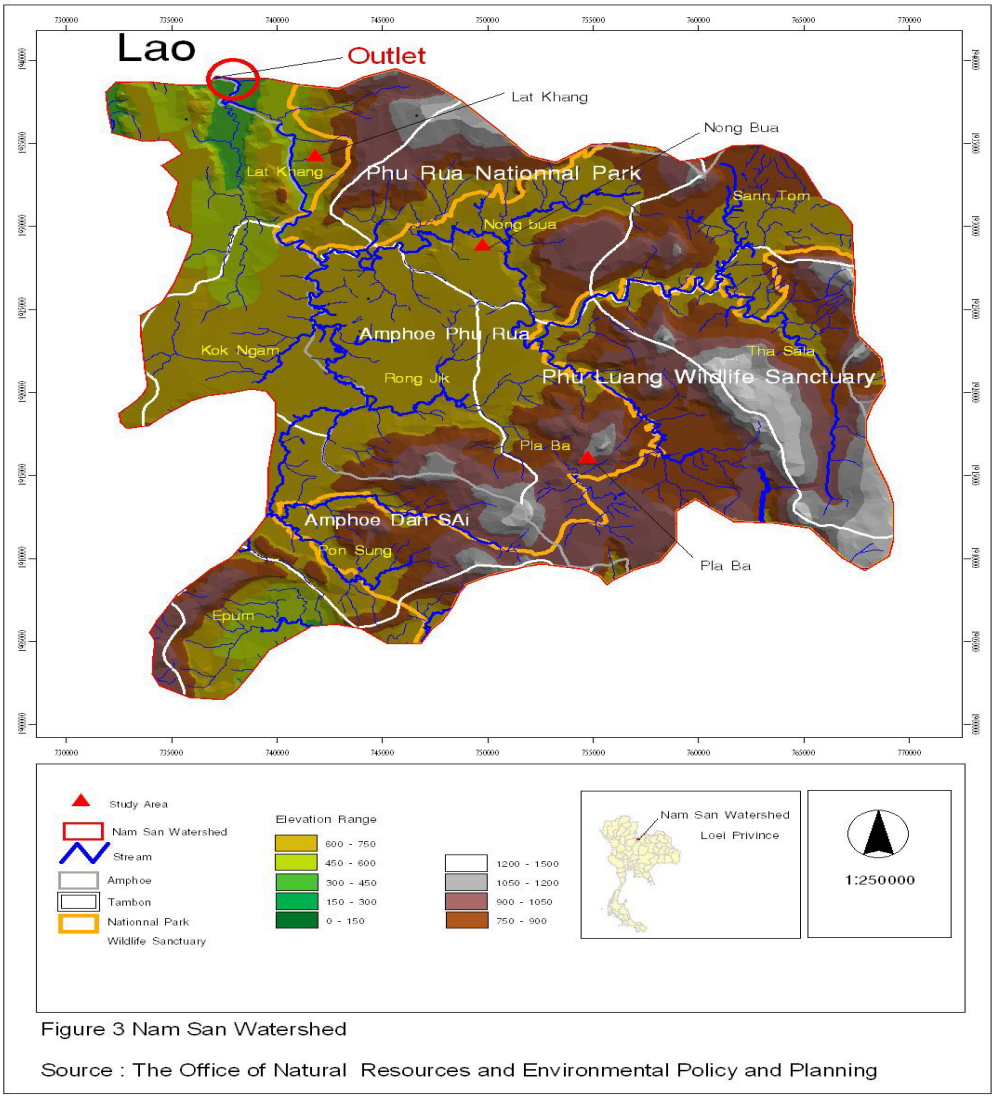

Figure 3 Nam San Watershed

Source : The Office of Natural Resources and Environmental Policy and Planning

Figure 3 Elevation range of Namsan watershed area.

Source: ONREPP (2005)

Climate

Loei province's climate can be defined as high temperature with humidity, where sometimes is very dry. The climate is extremely hot in summer, and severely cold in winter. There is frequent rain, and when there is no rain, the weather is dry. The average temperature is 25.5 °C, and the average annual relative humidity is 73%. The average annual rainfall is approximately 1,237.5 mm., where the average evaporation is approximately 1,512.8 mm. The climate data in year 2004 of Namsan watershed can be summarized as shown in Table 1.

1. Temperature: The annual average temperature is approximately 25.5°C, where the highest temperature is averaged at 28.3°C in April, and the lowest temperature is averaged at 20.8°C in December.

2. Rainfall Amount: Annual average rainfall is approximately 1,237.5 mm.. Annual raining day is averaged approximately 126.2 days per year. The highest rainfall is averaged 219.9 mm. in September (rainy), and the lowest rainfall is averaged 5.5 mm. in December.

3. Evaporation: The measurement from tray, total averaged approximately 1,512.8 mm. The highest averaged evaporation in April approximately 168 mm., and the lowest averaged evaporation in November approximately 102.6 mm..

Table 1 Climate characteristic of Namsan watershed in year 2004.

Climate Charateristic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	Total
Rainfall Amount (mm)	5.6	16.8	41.9	93.5	202.7	174.7	167.4	175.3	219.9	115.5	18.4	5.5	-	1237.5
Rainy day (day)	1.3	2.7	5.5	10.6	17.1	17.1	17.9	19.2	19.0	12.0	3.0	0.8	-	126.2
Avg Temp	21.5	23.9	26.8	28.3	27.7	27.7	27.4	27.2	26.3	25.4	23.3	20.8	25.5	-
Relative Humidity (%)	68.0	63.0	60.0	66.0	76.0	78.0	78.0	80.0	83.0	81.0	75.0	71.0	73.2	-
Evaporation (mm.)	113.3	124.9	159.0	168.0	149.3	134.7	128.0	115.9	104.9	108.3	102.6	103.9	-	1,512.8

Source: Meteorology Department (2005)

Forest Resource Condition

Namsan watershed covers the total area of approximately 906.58 square kilometer (ONREPP,2005), in the area of Phuruea and Dansai district, Loei province. The majority of the area is forest area of 482.1 square kilometer. Some of them are

protected area that consisted of Phuruea National Park, Phuluang Wildlife Sanctuary, Phuruea forest, National Forest Reserves, Phuboue and Phukitao forest, and Kokphulek National Forest Reserves, Phudongkhunkham National Forest Reserves, Phuphanjam forest, and Ladkang forest. Total area forest is 53.18%. However, there is still an area beside aforementioned forest, that is important and still plentiful that provided good water sources and remain biodiversity. Unfortunately, the majority of Namsan watershed area nowadays is demolished by the residents and the community especially around the Phuruea National Park due to expansion that leads to the transformation of the forest area to agriculture usage, which inevitably put some impacts on natural beauty of the protected area.

1. Resource Utilization Classification in Forest Area

In the study area of Namsan Watershed, the majority of the area remains in plentiful forest condition. According to the decoration of national forest reserves area, found that there is approximately total national forest reserves area of 482.10 square kilometer (ONREPP,2005). There is a classification for forest utilization in accordance with Cabinet Resolution on 10 and 17 March, 1992 as economic and conservation forest as shown in Table 2.

Table 2 Resource utilization classification in forest area**.**

National Forest Reserves Name	Type	Area(sq.km.)	Percentage
1. Kokphulek forest	Economic Forest	25.92	5.38
2. Kokphulek forest	Conservation Forest	130.76	27.12
3. Dongkhunkham forest. Kokyai forest. Phuphanjam forest. Ladkang forest.	Economic Forest	0.14	0.03
4. Dongkhunkham forest. Kokyai forest. Phuphanjam forest. Ladkang forest.	Conservation Forest	11.82	2.45
5. Phuruea forest. Phubuea forest Phukhitao forest.	Economic Forest	54.60	11.33
6. Phuruea forest. Phupuey forest Phukitao forest.	Conservation Forest	258.42	53.60
7. Phuluang forest. Phuhor forest	Conservation Forest	0.44	0.09
Total		**482.10**	**100.00**

2. Conservation Forest Area

2.1 Phuruea National Park

Phuruea National Park area covers tambol Ladkang, Nongbua, and Rongjik, Phuruea district, and Tambol Thali, Thali district, Loei province.The total are is 120.84 square kilometer. The area was designated as 16th national park of the country in December, 1978. Phuruea locates 1,365meter above see level. Apart from the Phuruea pinnacle, there are also Phuson pinnacle at 1,035 meter above sea level, Phuku pinnacle at 1,000 meter above sea level (ONREPP,2005). There are many important streams flow through the national park such as Huapai, Huasaikao, Huahinratch, Huibong, and Huathiengna. These streams have water flows through all year long, and will flow to Namsan, and eventually to Houng river, which is the boarder of Thailand and Laos PDR at Bantua and Banlad village.

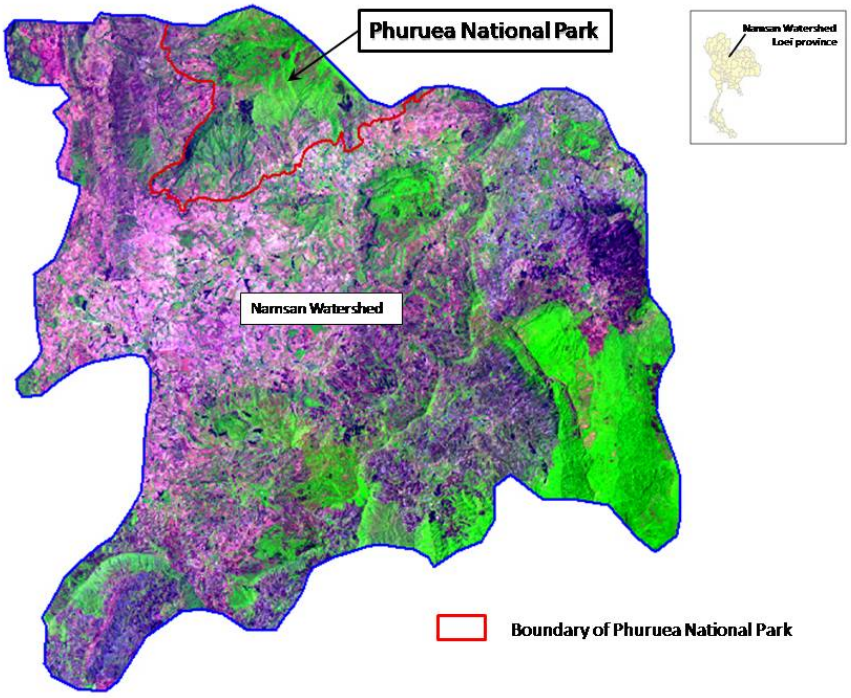

Figure 4 Phuruea National Park.

Source: ONREPP (2005)

The Phuruea National Park composes of high mountainous area, thus, the climate is relatively cold all year long especially during winter that the winter is very cold such that the dew on the glass turns to ice. The local call that icing dew, "Maekaning". The area is the mixture of many kinds of forest, deciduous forest, rain forest, pine forest. The pinnacle of Phuruea is especially composes of pine forest along with bush, natural stone forest, and savannah glass field as shown in Figure 4. The typical bushes are forest rose, moss, fern, and rare jungle orchid such as

Oung kum, Oung mjuen, Mawing, Samboi, and Iyares (ONREPP,2005). The orchids usually grow on trees, and blossom in alternate fashion. Moreover, Phuruea forest also a home to many wildlife such as bear, dear, boar, coyote, monkey, bantam, jungle rabbit, various kinds of turtle, and various birds. Many birds migrate from China.

2.2 Phuluang Wildlife Sanctuary

Phuluang Wildlife Sanctuary was announce Wildlife Sanctuary in Government Gazetteo on 18 December, 1974 covers the area of 896.94 square kilometer. It is locates in Wangsapung district, Phuruea district, Dansai district, and Phuluang subdistrict, Loei province. The topography is mountainous with steep ravine with the highest pinnacle at 1,571 meter from sea level. The mountain on the eastern side is high and steep ravine declining to western side, and consequently, is the source of Loei and Pasak river (ONREPP,2005). Loei river will flow from the middle of the area from north to south and redirect to Wangsapung district to Maekong river in Chiang Kan district. Pasak river is formed from many streams in the western side of Phuluang Wildlife Sanctuary that form the river to flow through Petchaboon province and to the land in central region and eventually merges with Lopburii river at Nakornloung district, Pranakornsri ayudhaya province before it flow to Chaopraya river and finally to Gulf of Thailand. The climate in Phuluang Wildlife Sanctuary is under influence of monsoon, but the weather is somehow like hot area due to the far distant from sea coastal. However, due to its height, the weather is colder than other area in Northeastern region. (Figure 5)

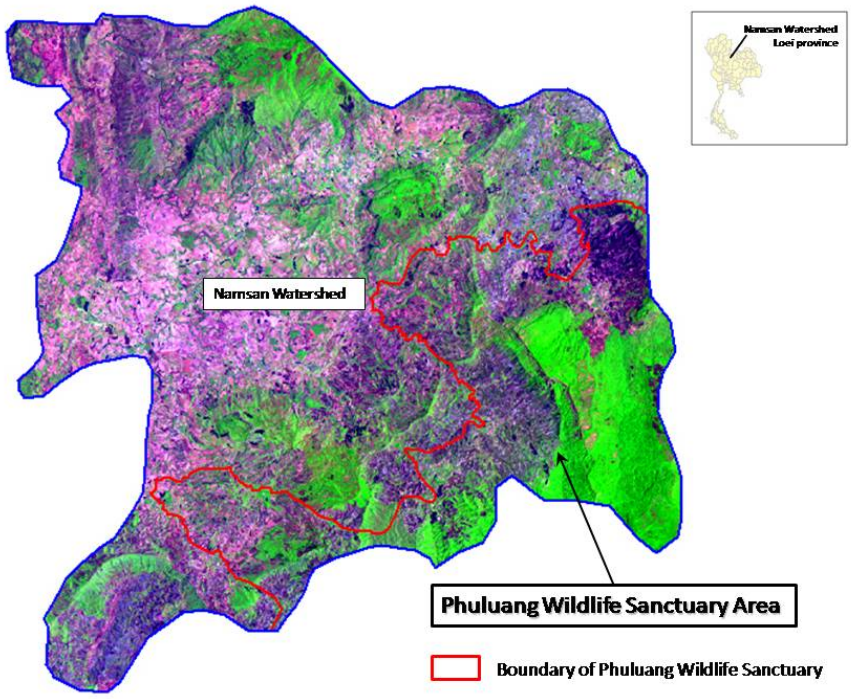

Figure 5 Phuluang Wildlife Sanctuary.

Source: ONREPP (2005)

3. Watershed Classification Area

The cabinet resolved on February 21, 1995 regarding the designation of watershed classification in the western and central part of the country including Pasak watershed, and the designation of watershed classification level in the northern and northeastern part of, where the classification as shown in Figure 6 and Table 3.

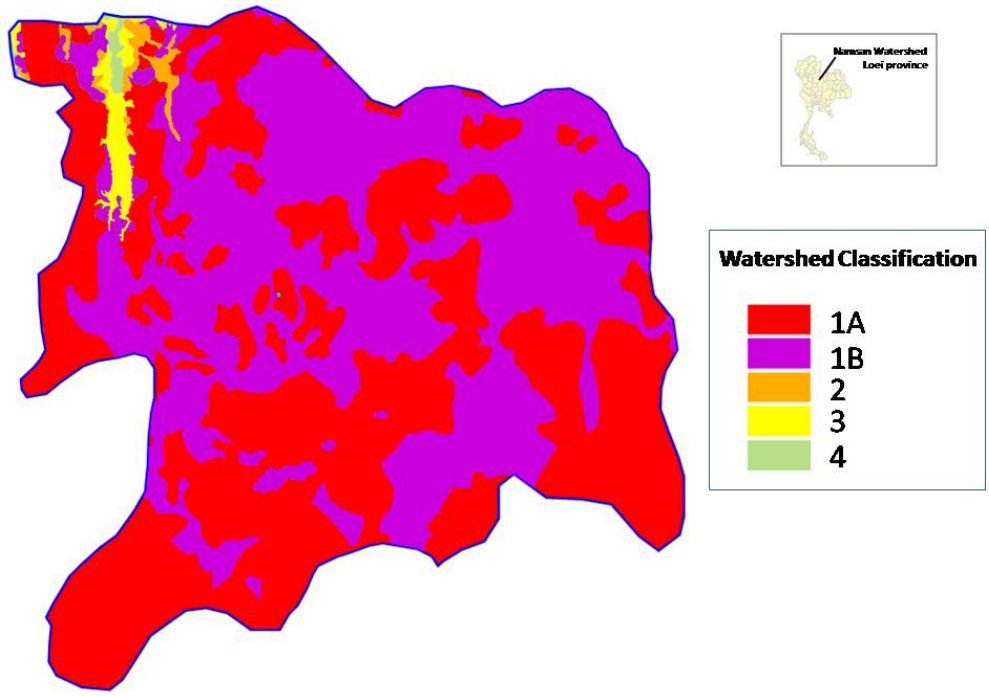

Figure 6 Watershed classification level 1A, 1B in Namsan watershed.

Source: ONREPP (2005)

Table 3 Namsan Watershed Classification Area.

Watershed Classification	Area (sq.km.)	Percentage
1A	472.52	52.12
1B	409.64	45.19
2	8.48	0.94
3	12.82	1.41
4	3.01	0.33
5	0.11	0.01
Total	**906.58**	**100.00**

Land-use Characteristics

The area around Namsan watershed is mostly mountain range with some highland. Plants and ancestry are in a very good condition, and covers with thick and sparse forest. On the east side is Phuruea National Park, and on the northwest side is Phuruea Wildlife Sanctuary. The whole area has the great potential to become tourist attraction. However, when the community starts to grow, people start to reside in the lower area where the government can provide necessary infrastructure. The residents use the big piece of land in Phuruea district for agriculture such as rice, corn, red bean, mango, tamarind and other plants. Therefore, the majority of forest areas were demolished even in the highland, where it is equal to 14% of watershed area (ONREPP,2005). Land use pattern in watershed area, therefore, is both appropriate and inappropriate. There are fundamental natural problem in agriculture such as shallow soil, and extreme slope as shown in Figure 7.

The office of Agricultural Economics reported the statistic that in planting year 2004/2005, there is the total land occupied for agriculture of 3,636.19 square kilometer, which can be seen in Table 4.

Table 4 Area occupied for agriculture in Loei province.

Area Occupied for Agriculture	Area (sq.km.)	Percentage
1. Residence	74.85	2.06
2. Rice Field	704.33	19.37
3. Farm Crop	1,707.31	46.96
4. Plantation, Orchard	748.65	20.58
5. Garden and Flower Farm	26.41	0.73
6. Animal Farm	58.41	1.60
7. Abandoned	315.41	8.68
8. Others	0.82	0.02
Total	**3,636.19**	**100.00**

Source: ONREPP (2005)

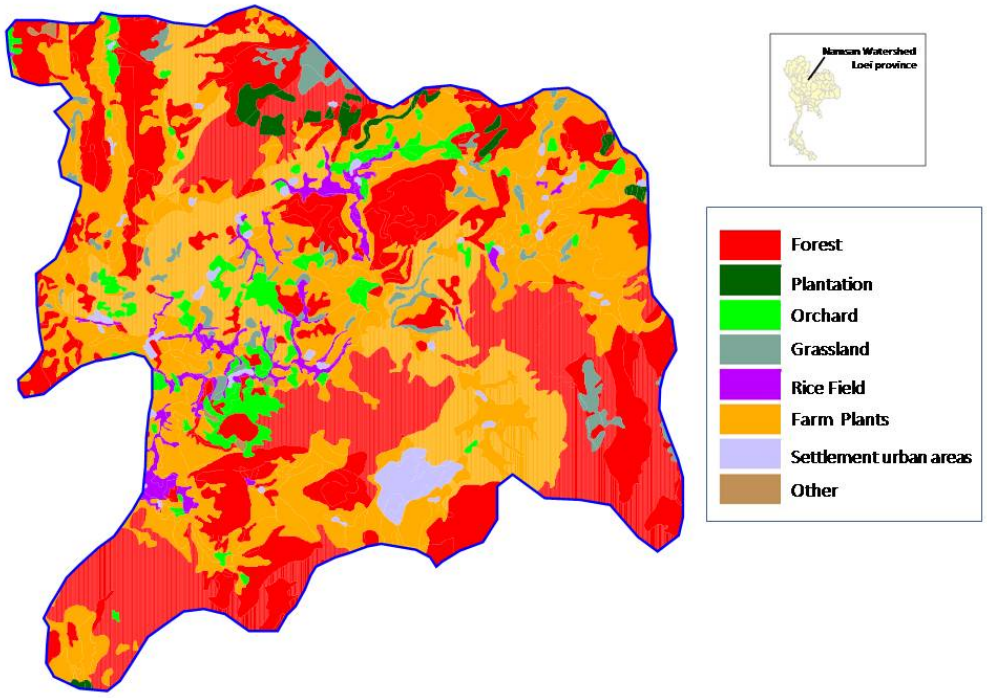

Figure 7 Land-used in Namsan watershed Area.

Source: ONREPP (2005)

Population and Area

Namsan watershed covers the area of 612.32 square kilometers in Phuruea district and 294.6 square kilometers in Dansai district, Loei province. The partial area that is occupied by Namsan watershed in Phuruea district consists of 6 Tambols, which are Tasala, Plaba, Rongjik, Ladkang, Santom, and Nongbua. In addition, the area that is partially occupied in Dansai district consists of 3 Tambols, which are Tambol Pakmarn, Kokngam, and Phonsung. The area of Phuruea National Park covers 3 Tambols, which are Tambol Ladkang, Nongbua, and Rongjik (ONREPP, 2005).

The statistic data from Department of Provincial Administration in 2004 shows that total population in Namsan watershed and branches is 33,842 people and 9,012 households, or an average of 4 people/households. The population in Dansai district is 12,618 people and 3,252 households, and in Phuruea district is 21,224 people and 5,762 households. The detailed can be sumarrized as shown in Table 5 and 6

Table 5 Population in each Tambol of Phuruea District**.**

Tambol	2002		2003		2004	
	Population	household	Population	household	Population	household
Tasala	2,688	617	2,670	620	2,701	656
Plaba	3,027	766	3,064	783	3,089	804
Rongjik	4,629	1,213	4,689	1,233	4,689	1,292
Ladkang	1,921	463	1,964	467	1,984	485
Santom	2,621	672	2,621	690	2,598	734
Nongbua	3,081	643	3,122	675	3,257	770
Phuruea Municipal	2,936	976	2,938	995	2,906	1,021
Total	20,903	5,350	21,068	5,463	21,224	5,762

Source: Department of Provincial Administration (2005)

Table 6 Population in each Tambol of Dansai District**.**

Tambol	2002		2003		2004	
	Population	household	Population	household	Population	household
Pakmarn	3,089	746	3,101	752	3,100	754
Koknjam	4,455	1,206	4,501	1,258	4,564	1,291
Phonsung	4,927	1,188	4,974	1,194	4,954	1,207
Total	12,471	3,140	12,576	3,304	12,618	3,252

Source: Department of Provincial Administration (2005)

Economics

1. Occupation: The majority engage in agriculture profession. The next popular profession is farming in fruits, garden plant, mushroom, etc. The annual average income is relatively low, it is approximately 27,802 Bath, which is ranked in the 10th of the province.

2. Agriculture: Occupy the area of 4.28 % of the total provincial agriculture area, which is 141.11 square kilometers. Rice field occupies 30.54 square kilometers. The important economic plant are corn, with the planting area of 83.01 square kilometers, fruit 19.56 square kilometers, annual rice 12.09 square kilometers, ginger 10.09 square kilometers, rubber 2.26 square kilometers. Flower, garden tree, and herbs occupy 69.79% of agriculture area in the district. Important domestic animal are cow, buffalo, broilers, fighting hen, and duck (ONREPP,2005).

3. Industrial: There is only 1 winery, and 1 resort.

4. Banking and Finance: There are Siam Commercial Bank and Bank for Agriculture and Agricultural Cooperatives.

Social

1. Education: There are 30 institutes, 263 classrooms, 166 instructors, 3,333 students, the teacher to student ratio is 1:20, and the classroom to student ratio is 1:13. 25 is primary school, 5 is secondary. None of them are undergraduate or professional school. There are 47 newspaper reading places.

2. Public Health: There is only 1 public hospital in the size of 30 beds. There are 6 Public health center, and 4 clinics. The personnel are as follow; 2 doctors, 1 dentist, 2 pharmacists, 23 nurses, and 20 public health officers. The top 3 cause of death are (1) cancer (2) heart muscle failure (3) kidney failure. Up to November 2005, there are 84 HIV infected. (ONREPP, 2005).

3. Quality of life (Village Profile, and Family Profile.: In accordance with village profile, The developing level of the village in Phuruea district by 2005, there is none 1st place rapid development village, and only 2 2nd place rapid development village, while 42 villages are ranked as 3rd place rapid development. 3,533 household earns more than 20,000 Baht per person per year, which is accounted for 97.22% of the total 3,634 household

4. The registration of having social problem and poverty 9,760 persons had registered, which is ranked 12th in the northeastern region. The most critical problem is debt, where 4,751 persons had registered, and 3,974 persons had registered as no agricultural land.

MATERIALS AND METHODS

Materials

1. Document, Data from related agencies. 1:50,000 Map that shows geographical characteristic, land-use pattern and watershed classificiation.

2. Geographical Information System (GIS) map and Remote Sensing picture from the Office of Natural Resource and Environment Policy and Planning (ONREPP).

3. Interview form that was developed from concept, theory, principle, and from previous interview forms by other researchers in the subject. 30 samples were randomly selected from Tambol Rongjik which outside the study area , and were analyzed for validity. The alpha coefficient was equal to 0.8054, and was improved for suitability with this research's objective. The form consists of questions regarding fundamental data in term of economics, social, population, attitude, and local participation in Namsan watershed area in Management of forest resource. The form will be used in the interview.

4 . In-dept interview.

5. Participatory observation form

6. Survey equipment consists of camera, camcorder, tape recorder, GPS, rope, paint, paint brush, and diameter tape.

7. Paper, stationary, and flipchart for participation.

8. Computer and printer.

Methods

This research is a qualitative research that emphasizes on the process, which is Participatory Action Research (PAR). The research uses various techniques such as interview form, in-depth interview, and participatory observation. These techniques are basically under Community-based natural resource management (CBNRM) concept. The target group must be stakeholders and should participate in searching for identification of problems, analysis, potential, readiness, planning, and formulating of strategy. The goal is implementation, which is to implement the tambol plan to provincial plan that synchronize with National Economic and Social Development Plan and Government Management plan. The details can be summarized as follow;

1. Document revision by researching in the related research to formulate conceptual framework and scope of the study to cover related topics of strategy, policy, plan, participation, decentralization in Namsan watershed management.

2. Collect fundamental data and related information in watershed management and Namsan watershed both in macro and area level including natural resources and environment.

3. Select targeted group and unit analysis (Interview, In-depth interview)

3.1 Target group in this research is the people who live in Namsan watershed area and vicinity, where it is the source of water in upstream, midstream, and downstream watershed. The selection of governing body for study area, selected sampling technique was conducted, and the result is

3.1.1 Upstream watershed area is Plaba Tambol Administration Organization

3.1.2 Midstream watershed area is Nongbua and Phonsung Tambol Administration Organization

3.1.3 Downstream watershed area is Ladkang Tambol Administration Organization

3.2 In this research, Household is the unit for analysis, where the fundamental data in economic, social, natural resource and environment will be collected from the interview with the household leader or representative using the interview form.

3.3 The focus group to formulate local strategy will be selected during the public participation process, where the participants will come from every sector, people sector, Tambol Administration Organizations, related agencies, private development organization sector, private sector, academia, local leaders, and networks.

3.4 Methodology as shown in Figure 8 consists of following procedures as follows;

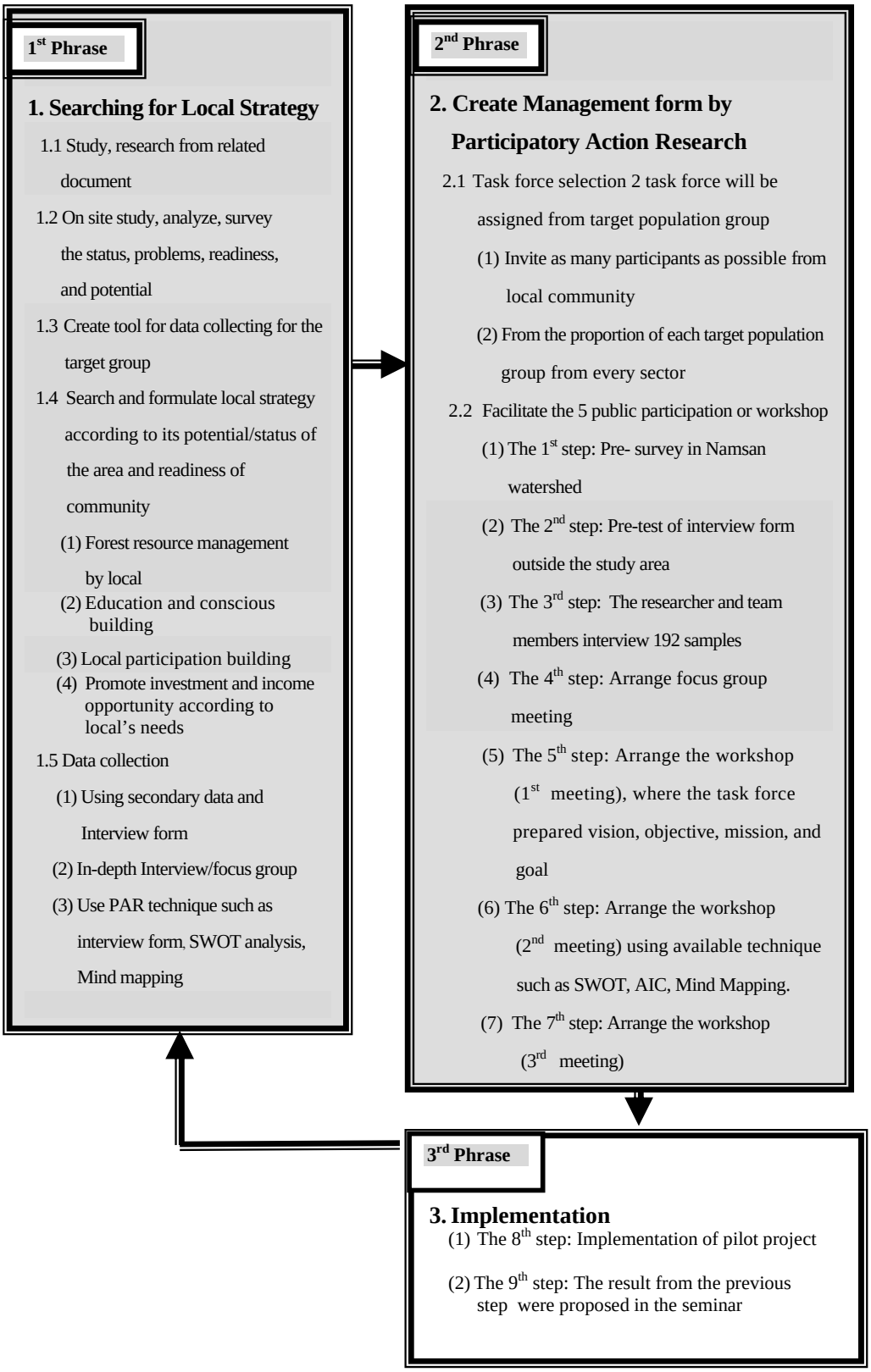

Figure 8 Research Methodology.

First Phrase: Searching for Local Strategy

3.4.1 Study, research from related document.

3.4.2 On site study, and analyze, survey the status, problems, readiness, and potential on every dimension. The dimension shall include at least socio-economic, and culture. It should emphasize on forest management in the watershed area by the local. The participation is vital for effective local plan and strategy.

3.4.3 Create tool for data collecting for the target group such as educate and transfer knowledge. The training should enable community to accurately collect necessary data related to the management of forest resource in the watershed area in term of socio-economic, culture, natural resource and environment.

3.4.4 Search and formulate local strategy according to its potential/status of the area, value of ecology of the watershed, and readiness of community. The following are approaches to study the sub-strategy:

a. Forest resource management by local.

b. Education and conscious building.

c. Local participation building.

d. Promote investment and income opportunity according to local's needs

3.4.5 Data collection; the researcher will conduct the study by collecting the following data:

a. Collecting the preliminary data by using secondary data, interview form, and interviewing with the focus group and recording the geographic of the watershed and surrounding area such as physical appearance, natural resource and environment, forest resource/watershed management by local administration, socio-economic, participation process and quality of life, area and local potential. The secondary data that will be collected are strategy for watershed and forest management plan by local administration. The form, role, duty, and coordination pattern of local administration, community, and citizen in the area will be explicitly reviewed.

b. Data collection by In-depth interview with senior administrators both at policy and implementation level. Such administrators include Chairman of Tambol Municipal, Chairman and Secretary-General of Tambol Administration, community leader, and other representatives from both national/local government agencies and private sector who have responsibility in the management of watershed management.

c. Use Participatory Action Research (PAR) technique in conjunction with others such as interview, task force, participatory observation, SWOT analysis, AIC, mind mapping, and participation meeting.

Second Phrase: Create management form by Participatory Action Research (PAR)

3.4.6 Task force selection 2 task force will be assigned from target population group and local resident as much as possible by providing information and stipulate community to participate under PAR concept. The concept suggests that (1) Invite as many participants as possible from local community where a portion of participant should understand the importance and participate voluntarily. (2) From the proportion of each target population group from every sector.

3.4.7 Facilitate the 5 public participation or workshop after data collection, analysis, and summarization process that will be used for the preparation of seminars. The topics of the public participation or workshop consist of (1) Form and approach for forest resource management by local administration and (2) Strategy/forest resource management plan by local administration. There should be participants who represent community and stakeholders from every sector such as Tambol Administration Organization, local community, private sector, education institution, related agencies, etc. It should be directed under PAR technique in conjunction with SWOT, and AIC Approach, Mind Mapping, etc. These are the process that emphasizes on the participation from local, and create development drive, and underlining future, achievable vision, objective, mission, and duty that will play an integral part in future formulation of local strategy. The researcher will act as organizer and facilitator. The procedure consists of the following;

a. The 1st step: Pre-survey in Namsan watershed from upstream to downstream using car, and walking to chat with community leader, and people in the area as a selecting tool and designing interview form.

b. The 2nd step: Pre-test of interview form outside the study area for 30 samples. The result was analyzed and validated for the use of this research with the recommendation and was approved from the committee to be used for the actual interview form.

c. The 3rd step: The researcher and team members interview 192 samples using the approved form with the target group in the selected Tampol Administration Organization.

d. The 4th step: Arrange focus group meeting at Phuruea National Park by the researcher, staffs, and responsible personnel in the area, who are Chairman of the 4 Tambol Administration Organization, The chief of Phuruea National Park, Chief of Wildlife Sanctuary, and representative from Phuruea district. The purpose is to inform the group the following; status/ problem,/potential, needs, and the form of past operation. The meeting included In-depth interview with Phuruea Sheriff, Village leaders, private development organization sector, etc.

e. The 5th step: Arrange the workshop (1st meeting), where the task force prepared vision, objective, mission, and goal. The researcher, who is the secretariat, informed the background and proposed the objective in the meeting. Moreover, the researcher proposed the result from the analysis from secondary data such as condition of study area, primary data, which is 192 interview forms, depth interview, results from task force meeting. These primary data was analyzed and synthesized for status, problem, potential, needs as the information for consideration of the taskforce to draft the approach framework in formulating local forest resource strategy in Namsan watershed. The workshop was arranged at Phurueawittayakhom school, Phuruea district, Loei province.

f. The 6th step: Arrange the workshop (2nd meeting) using available technique such as SWOT, AIC, My Mapping. These selected techniques will help analyze strength, weakness, opportunity, and threat. The outcome of the analysis was used to develop strategy, approach framework for the local to manage forest resource. This meeting was held at Phuruea district office, Phuruea district, Loei province.

g. The 7th step: Arrange the workshop (3rd meeting). The outcome of the meeting is the summary of opinion to achieve local strategy in forest resource management, and form of operation. The pilot project was also proposed in the meeting. This meeting was held at Phuruea district office, Phuruea district, Loei province

Third Phrase: Implementation

3.4.8 The pilot project and local strategy were proposed in the seminar in order to lead to policy formulation in vicinity and national level as follow;

a. The 8th step: Implementation of pilot project by composing the academic team composed of Sheriff of Phuruea district, district developer, Chief of Phuruea national park, tambol chief of Plaba, Nongbua, village chief, and researcher. The meeting was arranged according to the action plan, and consensus at Phuruea district office, Phuruea district, Loei province. The team, community volunteer, and researcher visited the study area to implement pilot project in the form of local community forest management in Namsan watershed, Loei province at Phuruea forest, Phupuey forest, Phukitao forest, which are the national forest reserves. The operating area is Ban Plaba, Tambol Plaba, Phuruea district, Loei province. The researcher facilitate data, and technical knowledge in laying plan and procedure for the construction of community forest.

b. The 9th step: The result from the previous step, which are strategy/approach form, pilot project and others were proposed in the seminar as shown in Figure 9. The seminar, where the participant included local community, and responsible and related agencies to participate and propose idea, suggestion, which was analyzed and became additional suggestions. The meeting was held at Phuruea resort.

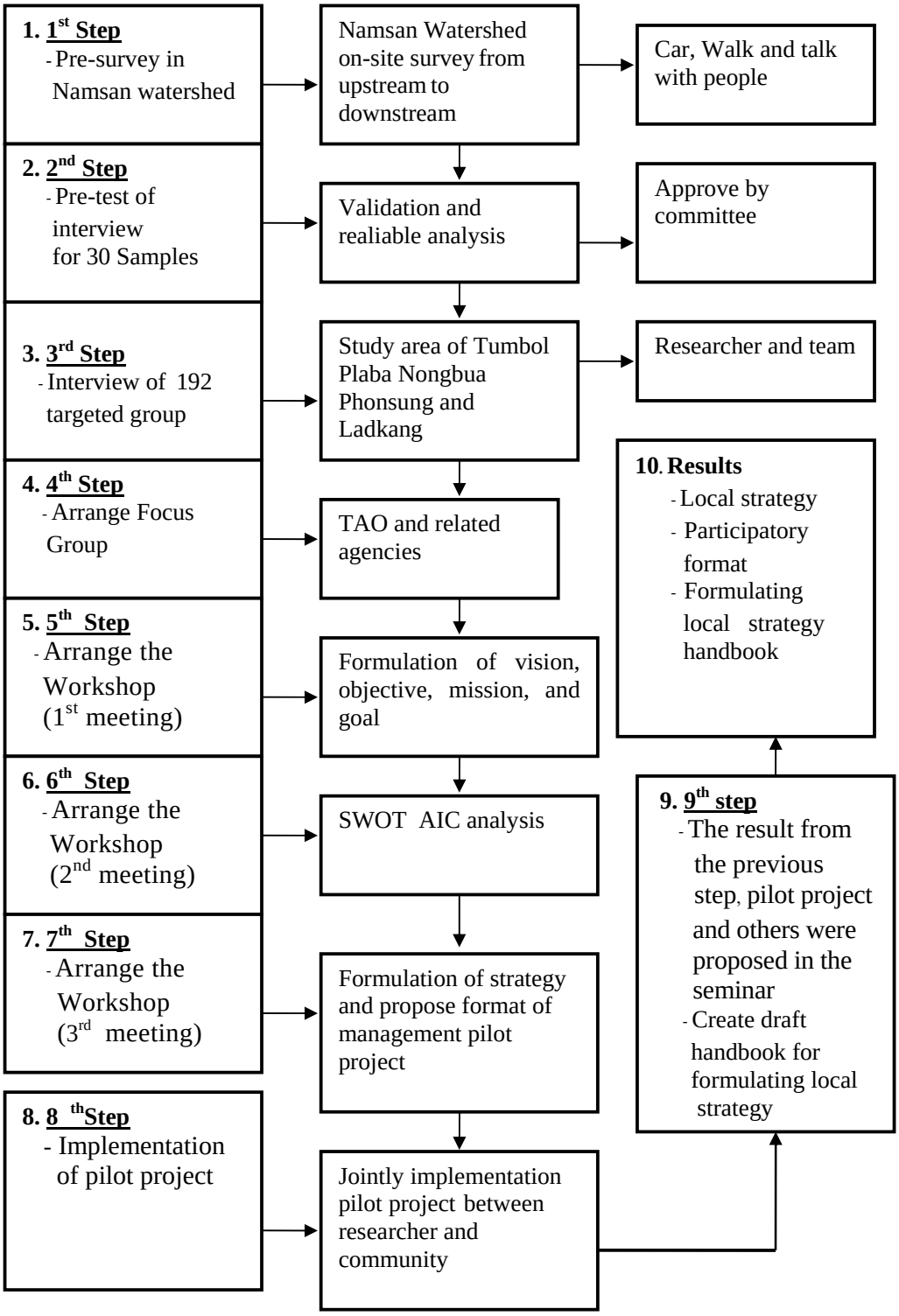

Figure 9 Designing the step of research procedure.

3.4.9 Proposed the local strategy that composed of plan/projects that can be implemented in the area to Tambol Administration Organizations. Ultimately, it will be included in Tambol Administration Organization plan, and to be proposed to district development plan that can be synchronized with provincial and national plan, and Government Management Plan.

3.4.10 Monitored and evaluated the plan/project after the project was implemented

3.5 Validity can be concluded as follows;

3.5.1 The researcher proposed the interview form to the thesis committee for inspection and content validity.

3.5.2 Validity by using indicator in PAR process, which can be concluded as follows;

a. Process indicator, by considering from (1) Procedure of designing research process. (2) Content of the participation whether it appropriated. (3) Duration is corresponded to content or not.

b. Outcome indicator, by considering from (1) It is the working process that can truly solve problems. (2) It can be applied in other watersheds area and synchronized with policy, development plan, and strategy, at departmental, ministerial, provincial, and national level.

c. Critique indication, by considering from (1) Posibility for implementation in Namsan watershed. (2) Whether it can be applied to other watersheds area by assigning at least 3 critics and must be from the area and from central government. The critics must have the expertise in natural resource management, participation, and management.

d. Record the action by observing frequency of the participation, length of activity, fondness, and inspiration.

e. The quality of participation, that can be detected from the result and impact from first time participation such as responsibility, decision making, and open-minded.

3.6 The creating of handbook in this topic to be used as a framework for natural resource and environment management in Namsan watershed, and other watershed, and to be available for interested people and related agencies.

3.7 The suggestion in policy in forest resources management in Namsan watershed by emphasizing in strengthening local administrations, participation development process, monitor system building, and protection and conservation network for the forest that is the source of water.

3.8 Send the research report to responsible agencies to encourage its use as the policy in forest resource management in watershed area.

4. Research Plan

The researcher has conducted the research from the beginning of drafting of proposal to arrange the seminar and conclude the result for the writing of this thesis, and can be summarized in Table 7.

5. Research Project Team

5.1 The researcher and team (Table 8)

5.2 Committee to the candidate and expert.

Table 7 Work plan.

Work/Activity	Duration 24 months (Jun 2005-May 2007)											
	Jun Jul	Aug Sep	Oct Nov	Dec Jan	Feb Mar	Apr May	Jun Jul	Aug Sep	Oct Nov	Dec Jan	Feb Mar	Apr May
1. Preliminary data collection from secondary source and drafting proposal	⟹											
2. Survey, study, analyze, and collect secondary data along with site survey	⟹	⟹										
3. Design interview form, interview, and data collection on site				⟹	⟹							
4. Focus group and in- depth interview				⟹	⟹	⟹	⟹	⟹	⟹			
5. Establish Task Force and arrange 5 workshops						⟹	⟹	⟹	⟹			
6. Pilot Project									⟹	⟹		
7. Arrange seminar and summarize conclusion and suggestion										⟹	⟹	
8. Write thesis	⟹	⟹	⟹	⟹	⟹	⟹	⟹	⟹	⟹	⟹	⟹	⟹

Table 8 Composition of the research project team.

Researcher and Team	Committee to the candidate and expert
1. Mr. Darakorn Jiamvijak	1. Associate Professor Dr. Wicha Niyom
2. Instructor Dr. Kitichai Rattana	2. Instructor Dr. Kasemsun Chinnavaso
3. Instructor Mr. Kittipoj Permpul	3. Associate Professor Dr. Sittichai Tantanasarit
4. Seven students from Rajabhat Thonburi University	

Data Collection

1. Data collection from secondary source

1.1 Watershed Potential

1.1.1 The topography and climate are a strong point, and compose of the beauty scenery and mountain. The weather is coldest in Thailand especially at Ban Hinso, Tambol Plaba such that the dew on the glass turns to ice in the winter. The local call that icing dew, “Maekaning”, which is one of the tourist attractions in winter both for Thai and foreigner.

1.1.2 There are many potential attractions that can be developed to become popular due to its standout and uniqueness. However, there should be some adjustment so that there will be tourist in every season. The example of important attractions are Phuruea National Park, Phuluang Wildlife Sanctuary, Plaba waterfall, Songkorn waterfall, Phuruea highland agriculture, and other potential attractions that can be developed such as Ladprabam, Ban Hua Tiew, Ladkang Tambol, Garden tree and flower market, Bannongbua, Tambol Nongbua.

1.1.3 Due to its cold climate, there is a potential to develop high value agriculture such as winter garden tree, flower, and vegetable that are desirable for domestic and international market.

1.2 Watershed Problem

1.2.1 Invasion and demolition of natural resource and environment in Namsan watersheds are the major problems due to the fact that majority of the population have profession in agriculture where the majority of the land is forest. Therefore, people need the land for their agricultural usage, and have to demolish the forest. Phuruea National Park, and Phuluang Wildlife Sanctuary share the same problem. Moreover, there is another problem, people usually burn weed flora and forest in dry season for agricultural usage. The popular plant is ginger especially in Tambol Ladkang, where the area is adjacent to Phupuey, Phukital, and Phuruea National Forest Reserves. There is an uncertainty in boundary of land ownership, and the local citizens usually claim that they have lived and used for agricultural purpose before the declaration of National Forest Reserves.

1.2.2 There is a problem in the title of ownership. The majority of land in Phuruea district is the national park, wildlife sanctuary, permanent forest area, and national forest reserves. The title of ownership cannot be issued due to the fact that people' agriculture land is government property. However, there are titles of ownership in Namsan watershed area in Phuruea district can be categorized as 5,842 title deed, with the area of 66.03 square kilometers, Certificate of ownership class I 2,297, with the area of 48.69 square kilometers, Certificate of ownership 1.35 square kilometers , with the area of 10.27 square kilometers, no title of ownership but applicable to issue 0.80 square kilometers, with the area of 9.35 square kilometers. There are also the occupied land with no title of ownership and cannot be issued in the whole area of Tambol Ladkang, Tambol Santom, Tambol Tasala, and the partial area of Tambol Plaba, Tambol Nongbua, and Tambol Rongjik. (Department of Land, Phuruea Branch, 2005)

1.2.3 There is a lack in water for agriculture. Phuruea only has 1 irrigation locates at Phuruea Highland Agriculture Demonstration Station, Ban Hinso, Tambol Plaba. There are 2 natural water sources, which are Namsan stream and Kaomun stream. These streams are only adequate in raining season, while in summer, water is not enough for agriculture due to the fact that there are no dam or water holding sources. If the future, the problem will persist and become more critical if there are no irrigation plan that can accommodate the expansion in agriculture and tourism.

1.2.4 The chemical usage for agriculture in upstream area and plain area near water shore, and waste quantity are also problem because there are no effective and appropriate waste management

1.2.5 The decrease in fish population and local aquatic animal is also problem due to improper fishery and spoil water.

1.2.6 The invasion of land around river bank by developing illegally in the river.

2. Primary Data Collection

2.1 Population and Sample Group

Unit of Analysis in this research is household leader who live in Tambol Administration Organization of the study area as follows;

2.1.1 Upstream watershed area is Plaba Tambol Administration Organization

2.1.2 Midstream watershed area is Nongbua and Phonsung Tambol Administration Organization

2.1.3 Downstream watershed area is Ladkang Tambol Administration Organization

2.2 Sampling

Sampling of household leader will use selected sampling technique to collect data in the study area.

The sample size was designed from the total number of households in the area, which are 3,066 households and using Yamane's technique. The result from the technique was the percentage and eventually yield the sample size of 97 to interview and detail of Yamane formula is below.

$$n = \frac{N}{1 + Ne^2} = 97$$

N = The total number of households
n = Number of households sample for study
e = Error of sampling is 0.10

Anyway, Researcher team get data collection with the target group who live in Namsan watershed area by the sample size is 192 interview

Tambol	**Households**	**Sample**
Plaba	804	64
Nongbua.	770	36
Ladkang	485	30
Phonsung	1,207	62
Total	**3,066**	**192**

The selection of working group for formulating local strategy must be selected during the local participation from every sector, private sector, Tambol Administration Organizations, related agencies, private development organization, academia, local leader, and other network.

2.3 Tool for Data Collection.

The tools that were used in data collection are interview form with both open-end and close-end questions, and was divided into 5 portions, which are;

1st Section: Fundamental data of household leader.

2nd Section: The opinion related to the management of forest resource and environment in Namsan watershed.

3rd Section: Opinion regarding the management and outcome of the Tambol Administration Organization (TAO) in the management of natural resources and environment in Phuruea and Dansai district, Loei Province.

4th Section : The participation, grouping, and activities in the local community to manage Namsan watershed

5th Section: Fundamental data on potential, problem, need, and participation in natural resource management in the area.

2.4 Validity and Reliability of the Interview

2.4.1 Validity: The researcher created the interview form that were consulted and confirmed for content validity with the experts. This process was to confirm that the interview would correspond with the desired objectives and contents. After that, the form was edited and improved, and was Pre- tested with the similar population with the study area. The form was improved further after the test, therefore, it can be sure that the form would be suitable for data collection of this study.

2.4.2 Reliability: The validated interview form was pre-tested again with the 30 household leaders/representatives in the area, who are not the target group. This process is to further improve the form by using the data from this pre-test to analyze for reliability .

2.5 Method of Data Collection.

The final form was used to interview the target household leader by 3 Ph.D. (Forestry) candidates in Watershed and Environment Management, and 7 students from Ratchapath Thonburi University. The team informed the interviewees with the following; the objective of the research, procedure and research process until the interviewees understood. Each day, after finished interviewing, the researcher and the team should be summarized and inspected the outcomes immediately by manual editing. The edited outcomes were then processed to coding, and evaluating using computer program.

2.6 Data Analysis

The researcher analyzed many types of data as follows:

2.6.1 Analysis of primary data.

2.6.2 Analysis using research techniques such as arranging focus group, depth interview, SWOT analysis, AIC Approach, and mind mapping

2.6.3 Analysis of primary data using computer program, where the used statistics are;

Percentage, mean and standard deviation : To analyze fundamental characteristics of the household leader, fundamental data about potential, problems, needs, participation in natural resource management in the area to present the data in each category. The total sample is 192 household leaders. The data can be categorized into 5 sections, the first section is fundamental data and common opinion, the second section is problems, and needs of the target group, who is the population in 4 study areas.

RESULTS AND DISCUSSION

The researcher proposed to divide the result of this research to 2 categories, which are quantitative and qualitative research. The quantitative results are obtained from interview with family leader from target group of 192 households, while the qualitative results are obtained from Participatory Action Research(PAR) along with other techniques such as Depth Interview, Focus Group, Task Force, Action Seminar, SWOT, AIC analysis, Mind Mapping, implementation of pilot project, working group, and seminar that can be concluded as follows;

1. To survey the potential, problem, and need of the local community, and to assess the readiness of local administration organization in the study area for forest resource management.

1.1 Section I: Fundamental Data of Household Leader.

The analysis from the data collection and interview found that the majority of the household leaders are adult and senior as statistically shown thereafter; (40-49 years 26%, 30-39 years 20.3%, between 50-59 years, 20.3% 60 through above years 20.3%, 20-29 years 11.5%, and below 20 1.6 %.) While there are more female in the area.. (53.1% female and 46.9% male.) The majority of the population was educated only at primary level. (primary 68.2%, secondary 17.2, professional and equivalent 3.6%, undergraduate 6.3, uneducated 4.7%. Most of the population is in agriculture profession that account to 64.1%. They plant rice, ginger, corn, garden tree and flower. Mushroom planting accounts to 18.8 %. Other profession are government service, general employment, fishery, farming, and business are 8.3%, 4.2%, 2.6%, and 1.0 % respectively. Up to 51.6% have lived in the area for more than 40 years, while only 4.7% have lived less than 4 years (30-39 years 19.3%, 20-29 years 18.2%, 10-19 years 4.2%, 5-9 years 2.1%. The majority of the population, which is 85.9%, has no position or role in the society. (Table 9)

Table 9 Section I: Fundamental data of selected household leader.

Fundamental Data	Number of Household leader		Percentage
Gender			
Female	102		53.1
Male	90		46.9
Age Range (years)			
≤20	3		1.6
20-29	22		11.5
30-39	39		20.3
40-49	50		26.0
50-59	39		20.3
≥60	39		20.3
(minimum = 18	maximum = 83	mean = 46.53	S.D = 15.06)

Table 9 (Continued)

Fundamental Data	Number of Household leader		Percentage
Education			
Uneducated	9		4.7
Primary School (grade1-6)	131		68.2
High School (grade 7-12)	33		17.2
Profession School or equivalent	7		3.6
Undergraduate of equivalent	12		6.3
Occupation			
Cash Crop	123		64.1
Fishery	5		2.6
Government Services	16		8.3
Business	2		1.0
Farming	2		1.0
Employment	8		4.2
Others	36		18.8
Length of Residency (years)			
≤4	9		4.7
5-9 year	4		2.1
10-19 year	8		4.2
20-29 year	35		18.2
30-39 year	37		19.3
≥40 year	99		51.6
(minimum = 0	maximum = 83	mean = 40.47	S.D = 18.49)
Position or Role in the Society			
Yes	27		14.1
No	165		85.9
Total	**192**		**100.0**

1.2 Section II : The opinion related to the management of forest resource and environment in Namsan watershed.

The majority of the samples (51%) believe that the forest condition in Namsan watershed is highly deteriorated. 22.4% believes that the forest is still plentiful, while 17.2% sees that the forest is lowly deteriorated, and 9.4% believes that it is deteriorated. 62 % has never participated in natural resource and environment conservation, and 85.9% sees the need the establishment of organization to manage natural resource and environment in Namsan watershed. (Table 10)

Table 10 Section II : Opinion related to forest resource management in Namsan watershed.

Forest Condition	Household leader (person)	Percentage
Percentage		
Highly Deteriorated	98	51.0
Deteriorated	18	9.4
Lowly Deteriorated	33	17.2
Plentiful	43	22.4
Participation		
Yes	73	38.0
Never	119	62.0
Need to Establish Organization /Mechanism		
Need	165	85.9
Don't need	27	14.1
Total	**192**	**100.0**

1.3 Section III: Opinion regarding the management and outcome of the Tambol Administration Organization (TAO) in the management of natural resources and environment in Phuruea and Dansai Districts, Loei Province.

According to the survey, the majority of the household leaders perceived that the TAO, 59.4% does not have a policy to formulate plans/projects according to its development plan, while the 40.6% of the household leaders perceived otherwise. 63% of them considered that the plans/projects of the administration are not synchronize with actual situation and 37% are not correspond to the needs of local community. The majority of them 83.8% considered the synchronization between the plans/projects and local needs are not obvious, 16.2% of them considered that the plans/projects are not in the same direction with the national development plan. The majority of the household leaders do not know that the local administration Organization has actions to protect and maintain national resources and environment, according to considered otherwise of them believed that the outcomes from the actions of the administration have a lot of benefits to the community and inhabitant too. While 30.3% thought that there are not. considered the administration has a monitoring process, while 41.5 % thought that dont know and 28.2 % thought that done by committee of the TAO. (Table 11)

Table 11 Opinion regarding the management and outcome of the Tambol Administration Organization in the management of natural resources and environment in Phuruea and Dansai Districts, Loei Province.

Opinion	Household leader (person)	Percentage
The administration has a policy to formulate Plans/projects		
Have	78	40.6
Never	114	59.4
Plan and projects correspond with needs		
Yes	71	37.0
No	121	63.0
Synchronize with National Development Plan		
Yes	160	83.8
No	32	16.2
The administration has monitoring system		
Never	58	30.3
Dont know	80	41.5
Yes(done by committee of the TAO.)	54	28.2

According to the survey, the household leaders perceived the actions for Tambol administration as follow (Table 12); the majority of them thought that the administration provides 1) Market (2.1%) 2) Protect and preserve assesses that considered as national treasure (19.8%) 3) Provide and maintain electricity (19.8%) 4) Provide water for drinking, consumption, and irrigation. (7.8%) 5) Commercialize some services (0.5%) 6) Provide and support group of agriculturists and cooperative (0%) 7) Provide and maintain sewage system (0%) 8) Promote and maintain the occupation of the inhabitants (0.5%) 9) Promote the family industry (0%) 10) Income generation for the benefit of the administration (0%) 11) Provide and maintain convention centre, sport facilities, recreational facility, and public Park (0%) 12) Others, please specify (17.2%) 13) Don't know (31.8%) .

Table 12 The Perception for activities of Tambol Administration Organization**.**

The administration	Household leader (person)	Percentage
The administration has actions in Percentage		
1. Market	4	2.1
2. Protect and preserve assesses that considered as national treasure	38	19.8
3. Provide and maintain electricity	38	19.8
4. Provide water for drinking, consumption, and irrigation.	15	7.8
5. Commercialize some services	1	0.5
6. Provide and support group of agriculturists and cooperative	-	0.0
7. Provide and maintain sewage system	-	0.0
8. Promote and maintain the occupation of the inhabitants	1	0.5
9. Promote the family industry	-	0.0
10. Income generation for the benefit of the administration	-	0.0
11. Provide and maintain convention centre, sport facilities, recreational facility, and public Park	-	0.0
12. Others, please specify	33	17.2
13. Don't know	61	31.8

1.4 Section IV : The participation, grouping, and activities in the local community to manage Namsan watershed

Moreover, the survey also suggested how the majority of the household leaders perceived in participating in community activities. The majority of them 40.6% had participated in the meeting in the utilization of forest resource in Tambol/Village. 24.5% had attended the self training in utilization of wood and forest goods. 4.7% had hunted animal for commercial purpose. In term of fire protection, 56.8% had developed the fire protection line for forest fire. There are also who cared for the environment, as 79.7% had planted in the public area. There are 62% who had Collected/sold forest goods such as plant and mushrooms for a living. 43.8% had involved in establishment of group or organization for village development. In term of the relationship with the government, 9.4% had some conflicts with government official on duty. 6.8% of them had explored forest area. 2.6% had dug/sold land surface, while 21.4.% had excavated lake or stream. 77.6%

had helped the community by collecting garbage in public area such as temple and street. In term of community awareness, 72.9% had provided aids to officer on duty without any payment. Moreover, 95.3% even had expelled illegal hunter or wood cutter out of area. 49.5% had utilized the use of death wood in the forest.31.3 of them had breeding of plant for village plantation. 16.1 had fishery in reservoir, stream for sell . 39.6% had developed own source of water. 29.2% had protected of landslide and 47.9% had issued community code of conduct to preserve environment. The statistic of this part of the survey are shown below in table 13.

Table 13 Local people activities in Namsan watershed.

Activities that had engaged	**Percentage (Person)**			
	Had		**Never**	
1. Meeting in the utilization of forest resource in Tambol/Village	40.6	(78)	59.5	(114)
2. Self training in utilization of wood and forest goods	24.5	(47)	75.5	(145)
3. Hunting of animal for commercial	4.7	(9)	95.3	(183)
4. Developing of fire protection line for forest fire	56.8	(109)	43.2	(83)
5. Planting the public area	79.7	(153)	20.3	(139)
6. Collecting/selling of forest good such as plant and mushroom	62	(119)	37.5	(72)
7. Establishment of group or organization for village development	43.8	(84)	55.7	(107)
8. Conflict with government official on duty	9.4	(18)	90.6	(174)
9. Exploration of forest area	6.8	(13)	93.2	(179)
10. Digging/selling of land surface	2.6	(5)	97.4	(187)
11. Excavation of lake or stream	21.4	(41)	78.6	(151)
12. Garbage collection in public area such as temple, street	77.6	(149)	22.4	(43)
13. Provide aids to officer on duty without pay	72.9	(140)	27.1	(52)
14. Expel the illegal hunter, wood cutter out of area	95.3	(183)	4.7	(9)
15. Utilize the use of death wood in the forest	49.5	(95)	50.5	(97)
16. Breeding of plant for village plantation	31.3	(60)	68.7	(132)
17. Fishery in reservoir, stream for sell	16.1	(31)	83.9	(161)
18. Develop own source of water	39.6	(76)	60.4	(116)
19. Protection of landslide	29.2	(56)	70.8	(136)
20. Issue community code of conduct to preserve environment	47.9	(92)	52.1	(100)

The detailed result of the survey with the household leaders in term of participation and collaboration with government official are shown in table 14. From the survey, the majority of them 49% had participated in protection of forest with official. 39.6% had attended in soil, water, forest conservation training. 42.2% had collaborated with official to protect forest fire, while 38.5% had collaborated with the administration. 35.4% had involved in establishing an organization to develop village with the administration 40.6% had helped the administration to protect and preserve natural resources, and 22.4% had helped to excavate canal, and stream. 2.4% had helped deciding water allocation with other communities 85.9% had attended village monthly meeting 70.3% had involved in forest plantation with official.

Table 14 Participation and collaboration with official.

Activities that had engaged	**Percentage(Person)**			
	Had		**Never**	
1. Protection of forest with official	49.0	(94)	51.0	(98)
2. Training in soil, water, forest conservation	39.6	(76)	60.4	(116)
3. Protection of forest fire with the official	42.2	(81)	57.8	(111)
4. Protection of forest fire with the administration	38.5	(74)	61.5	(118)
5. Establishment of organization to develop village with the administration	35.4	(68)	64.6	(124)
6. Protect and preserve natural resources with the administration	40.6	(78)	59.4	(114)
7. Excavation of canal, stream with the administration	22.4	(43)	77.6	(149)
8. Planning of water allocation with other communities	24.0	(46)	76.0	(146)
9. Attend village monthly meeting	85.9	(165)	14.1	(27)
10. Forest plantation with official	70.3	(135)	29.7	(57)

1.5 Section V: Fundamental data on potential, problem, need, and participation in natural resource management in the area are concluded in Table 15 and Table 16.

Table 15 Problematic Point of Tambol Plaba, Nongbua, Ladkang, and Phonsoung.

Tambol	Plaba	Nongbua	Ladkang	Phonsung
Problematic Point	1. Lack of conservation for the Forestry.	1. Lack of care for the Forestry caused a area in decline.	1. Local people mainly have no certificate of land use.	1. A decayed in forestry; there is an increasing in cutting the timber and woods in a wrong way.
	2. Local People mainly has no certificate of land use and has an insufficient workplace .	2. Local people mainly have no certificate of land use.	2. Lack of water supply for agriculture during the summer period.	2. Water supply is inadequate, in some village there is no tap water and has to use the
	3. The road mainly remind non-asphalt road.	3. Lack of promotion to get a local involvement in the management of forestry natural resources.	3. Lack of bridge to cross River San to further carry out the agriculture.	3. Production price of farm product is low with increasing surplus and economics slow down.
	4. Chemical from Agriculture and garbage spread through	4. Lack of market and budget for distribution of the	4. The road mainly remind non-asphalt road and is very inconvenient.	4. Chemical from Agriculture and garbage spread through River san and become a cause of pollution.
	5. Lack of Market to supply the product to, creates a surplus in productions.	5. Lack of water supply and concreted road to the village.		
	6. Main income is not sufficient per family.			
	7. Some village still has no tap water.			
	8. School is far away from home.			

Table 16 Requirement of Tambol Plaba, Nongbua, Ladkang, and Phonsoung.

Tambol	Plaba	Nongbua	Ladkang	Phonsung
Problematic Point	1. Local people mainly need to conservation for the Forestry.	1. Local people mainly need to conservation for the Forestry caused a area in decline.	1. Local people mainly have to certificate of land use.	1. Local people mainly need to conservation for the Forestry
	2. Local People mainly need to certificate of land use and has an insufficient workplace .	2. Local people mainly need to certificate of land use.	2. Local people mainly have to water supply for agriculture during the summer period.	2. Local people mainly have to certificate of land use.
	3. Local People mainly need to promotion to travel.	3. Local People mainly need to promotion to travel.	3. Local people mainly have to bridge to cross river of Nam San to further carry out the agriculture	3. Local people mainly have to production price of farm product is high with increasing surplus and provide budget
	4. Some village need to tap water concreted road and electric.	4. Local People mainly need to market and budget for distribution of the flowering/ plant/product.	4. The road mainly remind asphalt road and is very convenient..	4. Local People mainly need to promotion to travel.
	5. Local People mainly need to teacher.	5. Local People mainly need to water supply and concreted road to the village.		5. Local People mainly need to concreted road and teacher.

1.4 Sector 2: The analysis and assessment in readiness of local administration organization in strategies and plans in Namsan watershed.

1.4.1 Upper Northeastern Provinces Cluster Group 1 Development Strategy, and Loei Provincial Strategy have important approach framework as the following;

a. The rehabilitation of ecology system to protect the natural balance and tourism.

b. Create value and elevate the production standard in safe agricultural product that synchronizes with market.

c. Increase potential in commerce, investment, tourism with neighboring countries.

d. Strengthening social, quality of life, and boarder security.

The researcher believe that the aforementioned approach framework requires organization/mechanism who have direct responsibility such as province, Tambol Administration Organization around Namsan watershed area. It is also required the participation from related agencies, stakeholders such as community, private sector, private sector organization to conserve Namsan watershed for sustainable utilization.

1.4.2 The Development Strategy Plan of the 4 Tambols, which are the study area, has identical natural resource and environment, tourism, economic, and social strategy. However, there are only a written strategy with approach framework and projects, without actual implementation. Part of the reason that the situation occurs is that Tambol Administration Organization emphasized the budget allocation in infrastructure, rather than the economic, natural resource and environment management. Moreover, the allocated budget is not enough for their desired missions.

1.5 Sector 2: Focus group: The focus group is form from the representative of related agencies on 25 November, 2005. The researcher invited major related agencies to discuss the appointment of focus group forth formulation of forest resource management in Namsan watershed, Loei province. The agencies include Phuruea National Park, Phuluang Wildlife Sanctuary, Tambol Administration Organization of Plaba, Nongbua, Ladkang, Phuruea district, and Phonsung, Dansai district, Loei province. The forming of focus group is shown in table 13.

The Formulation of Focus Group in Namsan Watershed

1. The researcher invited major related agencies to discuss the appointment of focus group for the formulation of forest resource management in Namsan watershed, Loei province. The agencies include Phuruea National Park, Phuluang Wildlife Sanctuary, Tambol Administration Organization of Plaba, Nongbua, Ladkang in Phuruea district, and Phonsung in Dansai district, Loei province

2. The researcher raised the following issues for the discussion;

2.1 Proposed the objective of the formulation of strategy, and benefit to the local.

2.2 Local problems and needs.

2.3 Subsequent working framework.

3. The resolution of the focus group meeting are

3.1 The boundary of conservation forest adjacent to the Tambol Administration Organization in the study area is ambiguous, therefore, it needs the government to clarify the boundary.

3.2 Lack of participation in natural resource management by local.

3.3 Lack of profession and income promotion including facilities. Therefore, it requires the help from the agencies that responsible for profession and income promotion, and facilities to the local citizen.

2. To formulate local strategy of forest resource management in Namsan watershed and the form of integrated working among local administration organization, community, and related agencies.

2.1 Procedure and process in formulating local strategy.

First Step: Local strategy formulation process.

Local Strategy Formulation Process is initiated by the need of the local, and must be done by the local and the result should also be for the local. The strategy must consider the area potential, problems, and the synergy with national, ministerial and provincial strategy. It is essential to have organization or mechanism, tool, strategy, plan, and local participation process in order to obtain sustainable area management. The suggested composition of local strategy process is shown in Figure 10 and Figure 11.

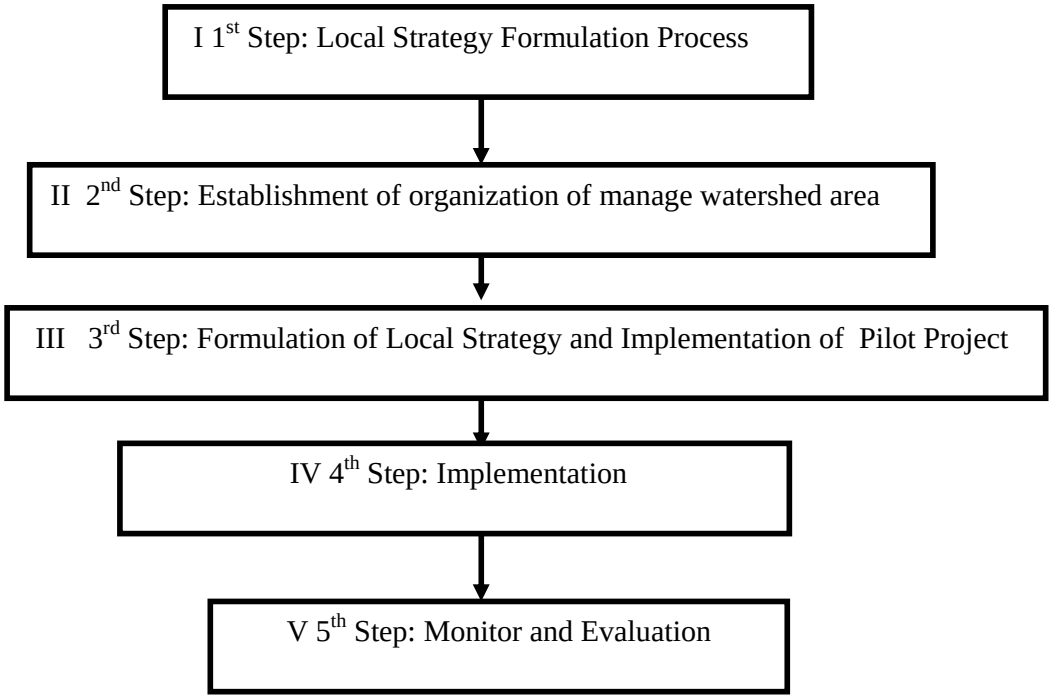

Figure 10 Composition/procedure/process of the formulation of local strategy.

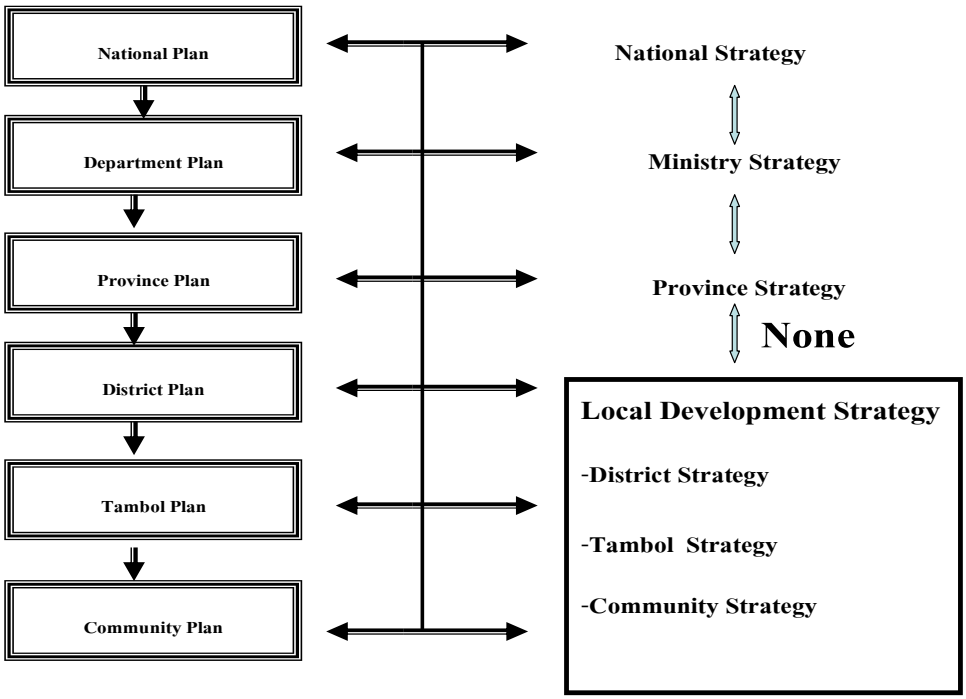

Figure 11 The linkage between plan and strategy in each level.

Second Step: Establishment of Area-base Watershed Management Organization

1. The form of organization establishment and working procedure of area-based watershed management. The approach framework is shown in Figure 12

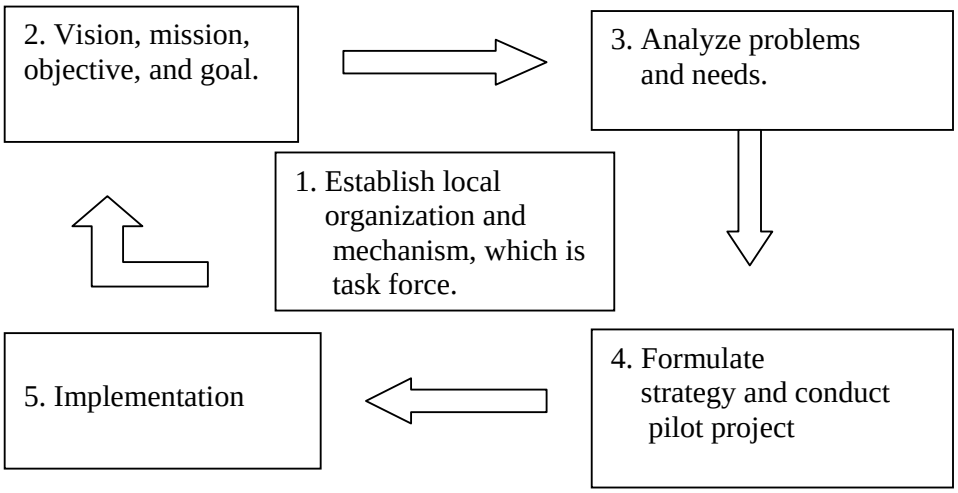

Figure 12 Establishment of area-base watershed management organization.

Source: Adapted from Strategic Planning (Kaothien, 2002)

2. The composition of organization to manage the area-base watershed/team member/ stakeholders shall consist of;

2.1 Government agencies, which are local administration organization, major related agencies both in policy and implementation level due to these agencies have duty in strategy and plan formulation and also budget and investment plan formulation, including implementation.

2.2 Private sector and private development organization

2.3 People sector/community, and related networks in each watershed such as farmer group, utilization group, and natural resource and environment conservation group.

2.4 Academia and/or researcher both inside and outside the area.

3. In order to conduct the area-base management, it must have organization/ mechanism to manage. It might be by establishing area-base watershed management organization or subcommittee, or task force, which depends on suitability. The governing body shall composed from stakeholders both from inside and outside the area, which are public sector, people sector, community, local administration organization, private development organization sector, private sector, academia, and related agencies. The duty of the governing body must also be specified as shown in Figure 13.

The Sheriff signed the appointment of task force to formulate local forest resource management strategy in Namsan watershed on 12 January, 2006, where the task force was chaired by Phuruea district sheriff, and the researcher, Mr. Darakorn Jiamvijak is the secretariat. The task force composes of 40 persons, 3 advisors, and the mission is to formulate local strategy in aforementioned subject. This is the form of coordination among developer, community and researcher. (The detail is shown in Appendix A.)

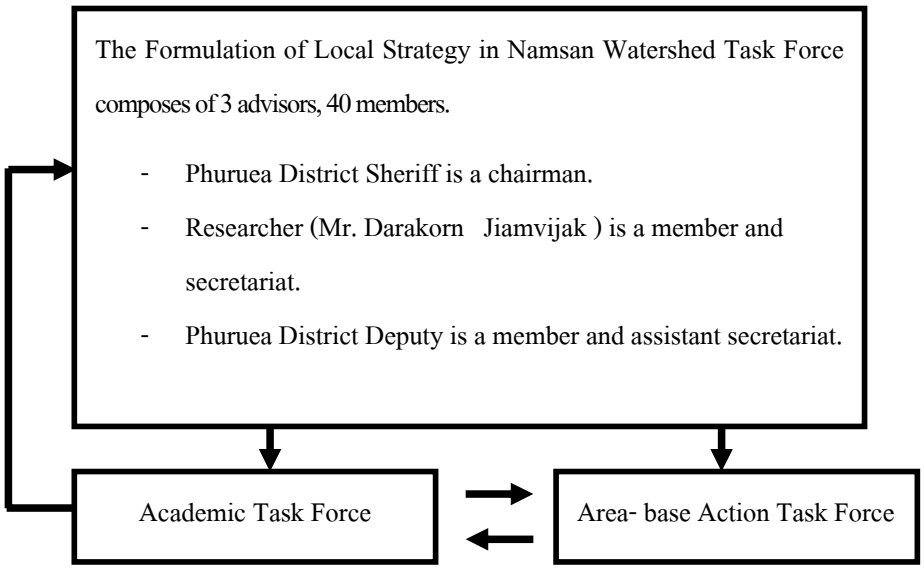

Figure 13 The Formulation of local strategy in Namsan watershed task force.

4. Participatory Action Research (PAR)

Participatory Action Research (PAR) is the research technique that different from traditional natural science or social science research in term of it requires acceptance or consensus from community. What essential in using PAR is that assessment of relationship among researcher and community must be assessed continuously, and objective must be reviewed periodically, so that it will be synchronized with community's opinion, which will truly lead to proper participation, and cause community to change. PAR consists of 2 procedures;

4.1 Must compose of stakeholders who relate to watershed activities.

4.2 The stakeholders must participate in formulation of strategy/planning/ and implementation of strategy and plan.

5. Participatory Rural Appraisal (PRA)

The researcher developed PRA process as one of a tool for this study. It is a form of data collection process in Namsan Watershed such as focus group, Mind Mapping, creation of local network and organization, by underlining the community to do activities together, and share thought, analysis on the summary of data that were gathered by researcher and community. The result were then, used as a supporting information in formulating local strategy in this topic. Moreover, the researcher also had a chance to get acquainted with local people and had a chance to observe and took picture at the site.

Third Step: Local Strategy Formulation using PAR process

The formulation of local strategy should contain 7 major compositions as follow:

1. The importance of problems that will lead to management planning.
2. Vision, Mission, Objective, and Goal for Watershed Area Management.
3. The analysis of potential, problems, and needs.
4. Formulation of local strategy.
5. Formulation of investment strategy.
6. Implementation of pilot project.
8. Monitor and evaluation.

1. The importance of Problem

The formulation of strategy shall prioritize the problems in order to formulate local strategy in area-base watershed due to the fact that there is no strategy and plan that can successfully solve area-base problems in all aspects. Therefore, the importance of problem must be prioritized by considering the factors of resource to be applied in formulating the sustainable local development strategy. In formulating strategy, the PAR and PRA must be applied, which is to design the interview form in the area, focus group, observation, in- depth interview, workshop, and the usage of tool in resource assessment. This will make the formulation of local area-base development strategy can connect with problems, needs, and local potential as shown in Figure 14.

Figure 14 Interview with target group, focus group, and in-depth interview.

2. Formulation of Vision, Mission, Objective, and Goal

The new way of formulating country development strategy process especially in formulating local strategy, it must formulate vision, mission, objective, and goal in order to obtain vision. The multi-stakeholder had formulated vision, mission, objective, and goal for the formulation of local forest resource in Namsan Watershed, Loei province strategy.

2.1 The researcher coordinated with the Chairman of the Task Force to invite members to the workshop for formulating local strategy in this topic on 18 January, 2006 at Phuruea Wittaya School. In the workshop, the task force searched for vision, mission, and goal. The meeting also jointly formulated the working direction, where the researcher was facilitator and presented data, and informed the meeting the objective of the research along with expected benefit for the community. The procedure can be concluded as;

2.1.1 Opening speech by the Chairman

2.1.2 The researcher informed objective, background, and joint working framework including rule and regulation.

2.1.3 The task force formulated vision, objective, and goal. The meeting was divided into 3 groups, where each group elected chairman and secretariat, and the researcher is the facilitator. The meeting was held for 2 hours, and then the chairman from each group summarized to the plenary session. The researcher summarized the result from each group as follow;

The formulation of Vision in the Formulation of Local Strategy to manage Forest Resource in Namsan watershed. The task force had formulated vision, mission, objective, and goal as follow;

1. Vision: Natural resource in Namsan watershed is plentiful of ecology system. It will be a fundamental in developing sufficient economic, and in developing conservation/ agriculture tourist attraction with the planning by all sectors for the balance and sustainable development, and for the prosper quality of life.

2. Mission

2.1 Maintain the balance of ecology system

2.2 Develop eco-tourism

2.3 Create the participation from local community in watershed management

3. Objective

3.1 To identify problem, potential, assessment of readiness of all sectors to drive to problem solving process of natural resource management with participation.

3.2 To formulate local strategy in natural resource (forest, soil, land, water, ecology system) in Namsan watershed by underlining sustainable conservation and utilization.

3.3 To encourage community to participate in the management of natural resource especially to make Namsan watershed becomes natural resource conservation area, and becomes sustainable conservation/agriculture tourist attraction.

3.4 To make local administration organization becomes the main agencies that adopt the strategy to the policy and implementation.

4. Goal

4.1 Conserve, rehabilitate, maintain ecology system in Namsan watershed in conjunction with other ecology system.

4.2 Create the strengthening conscience process for community including leader, people, and youth to love and maintain natural resource.

4.3 Expedite the issue process of title of land ownership to solve poverty.

4.4 Assign utilization area, and develop appropriated profession, and truly distribute income to local by constructing market mechanism.

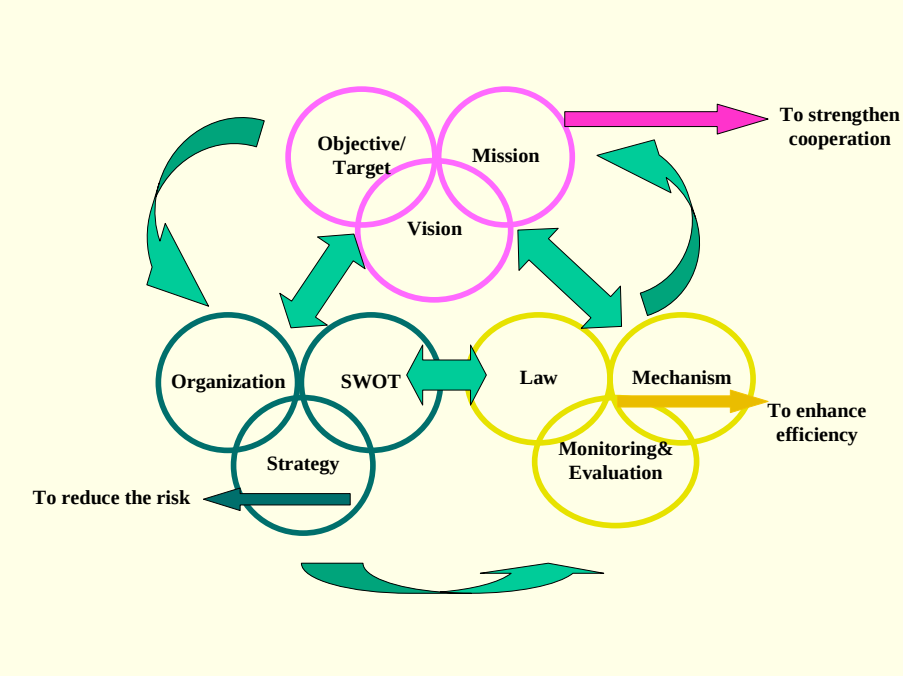

Figure 15 Show the relationship of main component of strategy**.**
Source: Adapted from Strategic Planning (Kaothien, 2006).

3. The Analysis of Problem, Potential, and Need

After the establishment of area-base management organization, it formulated vision, objection, mission, and goal. The next step is to analyze problem, potential, opportunity, constraint, and need at the area level using SWOT or AIC or Mind Mapping or the combination of all in order to recognize physical and biological status, value of utilization, and socio-economic. It is necessary to know what is composition of ecology system in the area, what is the problem, what is the potential, and what is the local needs. The important thing to know is the fundamental data of the watershed. All these are used to formulate strategy and approach framework in developing local. The SWOT analysis has the follow framework as shown in Figure 15.

3.1 SWOT analysis

SWOT analysis is the analysis to formulate strategy for organization by assigning the duration of the analysis and emphasizes on potential and readiness, opportunity, external difficulty. These factors will be analyzed and assess, assign working duration, and formulate strategy of the organization for the success. The analysis of potential, problem, weakness, strength, opportunity, and constraint (Figure 16 and 17), the researcher or developer must know the fundamental data such as;

3.1.1 Fundamental Data

a. Site condition, Watershed boundary

b. Physical characteristic such as topography, climate, soil, land, land utilization

c. Biological characteristic such as forest, wildlife, biodiversity

d. Economic and social data.

e. Surface and underground water quality

f. Land utilization map

g. Area potential, problem, and need

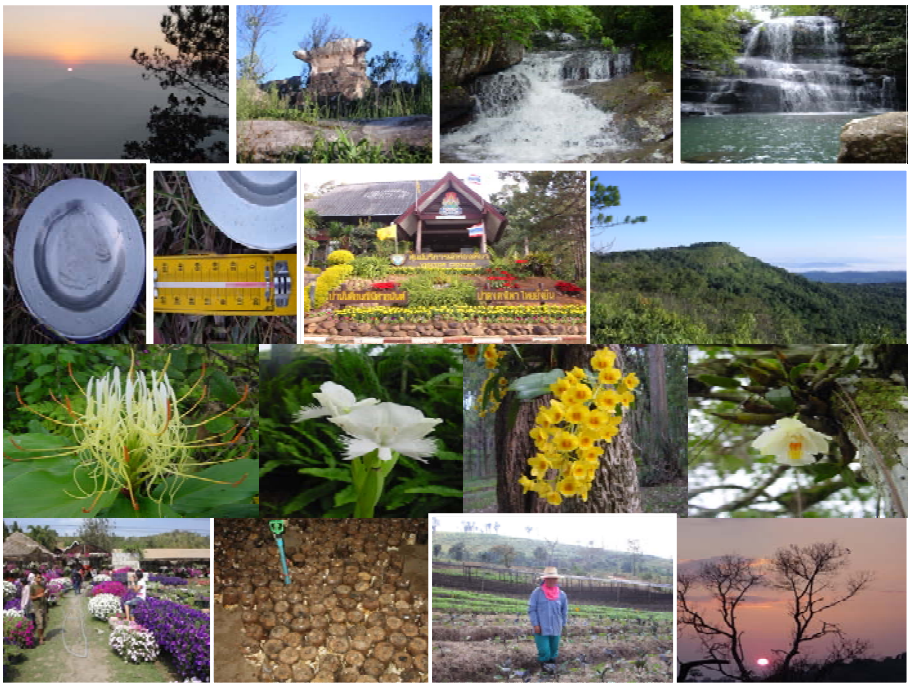

Figure 16 Potential and opportunity of tourism attraction in Namsan watershed area.

Figure 17 Deterioration problem of forest resources in the Namsan watershed.

3.2 SWOT Analysis Framework to Formulate Strategy Measurement

The research team, as the facilitator, proposed SWOT analysis framework in various technique such as SWOT analysis, AIC, and Mind Mapping. The task force in this project can then conduct SWOT analysis to know the potential, weakness, strength, and threat of their own area, and can be concluded as follows; (Figure 18)

3.2.1 Strength + Opportunity	=	Aggressive measurement
3.2.2 Strength + Threat	=	Management
3.3.3 Weakness + Threat	=	Law and Regulation Structure
3.3.4 Weakness + Opportunity	=	Use Problem Solving

This is to be used for local strategy formulation as in Figure 19 and 20. After the SWOT analysis, the Task Force had formulated the local strategy for the forest resource management of Namsan watershed, Loei province, and arranged the second workshop to conduct SWOT analysis with AIC and Mind Mapping.

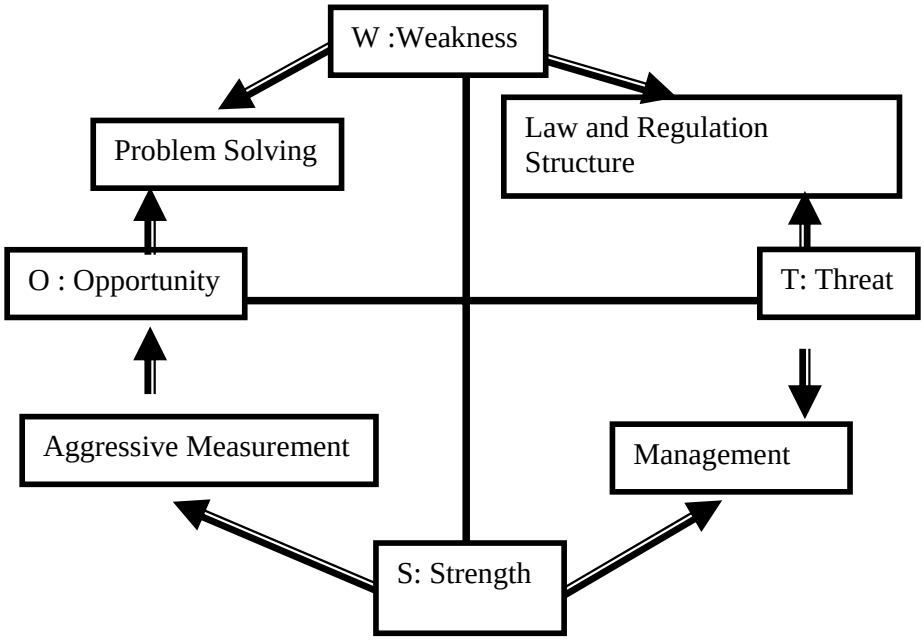

Figure 18 Framework for SWOT analysis.

Source: Kaothien (2002)

Figure 19 The research team proposed SWOT analysis framework**.**

Figure 20 The workshop of task force to conduct SWOT**.**

The SWOT analysis that was conducted by the task force and researcher, who was the facilitator, were for the task force to search for Strength, Weakness, Opportunity, and Threat in Namsan watershed area, Loei province, as in Table 17;

Table 17 SWOT analysis in Namsan watershed, Loei province**.**

SWOT Analysis in Namsan Watershed, Loei Province			
S: Strength	**W: Weakness**	**O: Opportunity**	**T :Threats**
1. Beautiful landscape 2. Appropriated climate 3. Potential in conservation tourism 4. Potential in Cross boarder trade. 5. Contain major rivers	1. Deterioration of soil water and forest resources. 2. Lack of land and title of ownership. 3. Lack of promotion in participation from community in management. 4. Lack of promotion in appropriated profession and income distribution. 5. Lack/outdated database. 6. Lack of potential in integrated management. 7. Infrastructure is priority for local Administrative Organization.	1. Leader/community are interested and acknowledge of the management of environment and natural resources. 2. National and provincial strategy see the importance of Watershed management and Ecotourism.	1. Community growth damages the balance of ecology system. 2. Poverty 3. Imbalance effect of natural such as flooding, and erosion. 4. Population growth, while profession remains the same. 5. Lack of proper infrastructure. 6. Need Tambol Administrative Organization to acknowledge problems and solve with community's participation.

3.3 Mind Mapping analysis that was conducted by the task force and researcher, were for the task force to search for Strength, Weakness, Threat and Other problems in Namsan watershed area, Loei province as in Figure 21;

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3.3.1 Strength

a. There are plentiful natural resources such as watershed, source of water, forest, and wildlife.

b. There are beautiful tourism attractions such as Phuruea National Park, Phuluang Wildlife Sanctuary, Songkorn Waterfall, Beautiful sites of flowers and garden trees.

c. There are strong institutions/Group such as Tambol Administration in Namsan watershed area, Natural Resources Conservation Group, Biological Agriculture Group, Sustainable Food Group, and various profession group such as, Flower and Garden Tree Group, Salted Eggs and Black Galingale Group, Grass Broom Group, Livestock Farming Group, Fruit Growing Group, etc.

d. Individual/Knowledge such as local innovation like small airplane, small tractor. In addition, there is attractive local way of life such as Brahman, and Professional Herb farmer. Occupation is strength as there are biological fertilizer, flower and garden tree, etc.

Figure 21 The workshop of task force to conduct mind mapping.

3.3.2 Weakness

a. Deteriorated forest

b. Inadequate water supply

c. The deterioration of Namsan watershed as it becomes shallow due to precipitation from water intrusion and government projects. The most severe is the quality of the water as there are chemical, muddy, waste water from community and direct disposal to the water.

d. Soil deterioration from drought, repeated bunching, improper agriculture such as open or wash away of surface soil.

e. Forest deterioration from hunting, firing, wood cutting, severe forest fire, livestock farming.

f. Over tourism beyond the capacity especially in winter, which lead to over-booking of lodging, inadequate water, and waste. All of them have an impact to the management in the area.

3.3.3 Threats are market mechanism brings the price of black galingale and ginger down. Tourists come to the area only in high season. Lack of awareness in natural resources conservation. Lack of agriculture support from government sector. Government projects such as roads that pass through the forest, road that block the waterway, construction of dam and reservoir, affect the environment. The most critical is that there is lack of integration among government agencies.

3.3.4 Other problems are improper agriculture; way of living is environmental unfriendly, lack of direction in self development, economics depend on activities outside the area, and lack of grouping/negotiation power.

3.5 Designation of Management Measure

The next step after SWOT analysis and mind mapping, are to use the result from the analysis to design measure and formulate strategy, plan, and project as the task force designed management measure as an example shown in Table 18;

Table 18 Management measure.

Measures		
1. Balance of ecology system	**2. Eco-tourism**	**3. Participation process building**
1. Conservation and rehabilitation of water quality in Namsan Watershed area.	1. Eco-Tourism promotion by the community in Phuruea National Park	1. Participation in Land utilization designation
2. Rehabilitate soil quality that appropriated with potential	2. Agriculture tourism promotion.	2. Research with community in the form to manage community forest.
3. Water quality measurement	3. Initiated natural learning place	
4. Survey for biodiversity		

3.6 In-depth Interview

3.6.1 In-depth Interview in the personal interview with the related personnel who related with strategy formulation both in the national and local level, and also with the people who work directly in the study area. The purpose of the interviews is to gain the details regarding approach framework in the management of natural resources in Namsan watershed. The following are the name list of the interviewes;

a. Dr. Kasemsun Chinnavaso, Secretary-General, Office Natural Resources and Environmental Policy and Planning.

b. Associate Professor Dr. Wicha Niyom, Head of Department of Conservation, Faculty of Forestry, Kasetsart University.

c. Mr. Chudchawan Sutthisrisilapa, Director of Planning and Information Office. National Park, Wildlife, and Plant Conservation Department.

d. Mr. Thanapol Chantaranimi, Phuruea District Chief

e. Head of Tambol Plaba, Phuruea District

3.6.2 Result of In-dept Interview

a. Dr. Kasemsun Chinnavaso, Secretary-General, Office Natural Resources and Environmental Policy and Planning stated that he spent 2 years continuously to push for concrete policy in managing natural resources and environment. During that time, he had arranged 62 meetings, and finally the office came up with the management plan for natural resources and environment that was approved by the cabinet. He brought Namsan watershed area as a case study and

stated that in order for the local strategy to be effectively implemented, the government must promote the participation/hearing from local stakeholders. The result of the hearing/participation then will be analyzed and concluded to be part of the suggestion in implementing in government mechanism.

b. Associate Professor Dr. Wicha Niyom, Head of Department of Conservation, Faculty of Forestry, Kasetsart University, stated that the academic sector shall closely facilitate and support the implementation of local authority especially in watershed management. The academic sector should actually survey on site around the watershed area to obtain in-dept information that represents status of actual location, problems, and needs of the local community in the area. He also indicated that the result of the research paper, "Local Strategy Formulation for Forest Resources Management in Namsan Watershed " is a good pilot project to inspire the implementation of participatory of the local community to manage forest resources in Namsan watershed. This form of management is actually be done by local for the local. Moreover, local community also gains knowledge, understanding in academic implementation due to the fact that the research team used the Participatory Action Research technique. All in all, the team uses the result from the workshop to arrange the seminar that provides the venue for local community to participate and give suggestions, which will be concluded and propose to local administration to be part of the local development plan in Namsan watershed area. Moreover, the researcher also publish local strategy manual in managing natural resources and environment in Namsan watershed, which will be very beneficial to the local community in Namsan watershed area, and also to the surrounding area.

c. Mr. Chudchawan Sutthisrisilapa, Director of Planning and Information Office. National Park, Wildlife, and Plant Conservation Department stated that the result of the research, "Local Strategy Formulation for Forest Resources Management in Namsan Watershed" is synchronized with the national development strategy regarding decentralization. He is confident that the result will actually lead to implementation. He also adds that the research should also emphasize in the collaboration between local community, government official, and private development agencies. Furthermore, he proposes the approach that can lead to local acceptance as follow;

1) Awareness : To implement the research on site to communicate the objective and benefit to the local from the related agencies, which responsible in the area.

2) Attention: The next step is more communication of the related information.

3) Consideration : It is the step that community consider whether to participate in the project.

4) Demonstration : Arrange the demonstration area or field or pilot project with the participation of local community.

5) Acceptance : Gaining local acceptance by arranging public hearing or seminar.

d. Mr. Thanapol Chantaranimi, Phuruea District Chief Stated that Namsan watershed is an important lifeline for inhabitants in Phuruea and Dansai District . In the past, the management of the watershed in inconsistent and non-uniform. Each agency manages by its own mission without integration among government and local agencies. The non-uniform management affects the inhabitants who utilize from the watershed. This particular research will benefit inhabitants in the area, related government agencies, private sector, and private development agencies. He believed that the local administration, who is the closet to the inhabitants should use the research as a stating point and a baseline for implementation.

e. Head of Tambol Plaba, Phuruea district informed that 30 years ago, the condition of the area in Namsan watershed was plentiful in term of forest resources and wildlife. Then, more people had moved in the area and started to invade the forest for agriculture use. Nowadays, the forest resources condition can be described as deteriorated. In his personal view, he wants to keep and preserve the forest; therefore, he needs the pilot project regarding the promotion of establishing community forest by the communities in Namsan watershed, Loei province in order to keep the forest under his responsibility as conserved community forest.

4. Local Strategy Formulation

The formulation of local strategy must incorporate the idea of national development plan that formulate national strategy to provincial strategy. The provincial strategy then was projected to local level. Local authority will then formulate local strategy by participation from stakeholder process or from related cooperation network (Figure 22). After SWOT analysis, potential, problems, and needs were known, and therefore, can be used to formulate local strategy.

Figure 22 The participation from stakeholder to formulate local strategy.

The Formulation of local strategy process as shown in Figure 23

1. Program/Project for area-base watershed management

2. Establishment of organization/mechanism such as committee/task force and supported from public.

3. Search, categorize, formulate problems, needs, and potential.

4. Formulate vision, mission, objective, and goal.

5. Formulate strategy/Plan/Project

6. Implementation

7. Monitor and evaluation

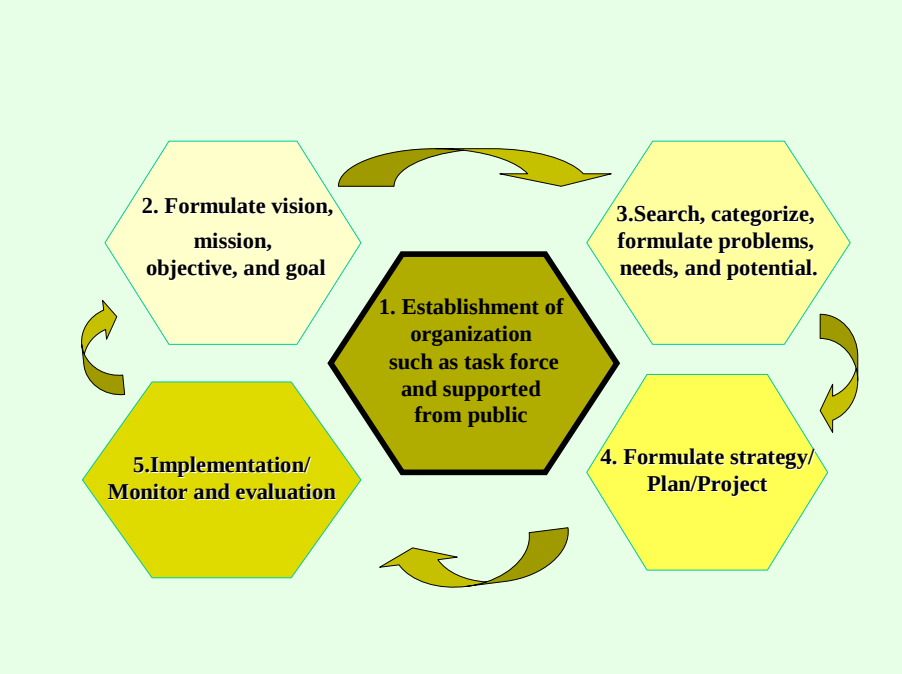

Figure 23 The Formulation of Local Strategy Process.

The Formulation of local strategy

The Formulation of local strategy shall proceed under the following framework:

Who	: Categorize problem and a focal point to implement
What	: The description of what to be done.
Where	: Describe the study area.
When	: Design the action plan and duration.
How	: Design the procedure
How much	: Estimate the budget for investment/expense

The task force in conjunction with the researcher drafted the local strategy to manage Namsan Watershed, Loei province. The task force held 4 meeting, and the researcher is both the facilitator and secretariat shown in Figure 24. The task force had formulated the development framework plan, and eventual evolved to become draft local strategy, with 5 supporting strategies ,9 plan and 31 projects. The details are shown in Table 19.

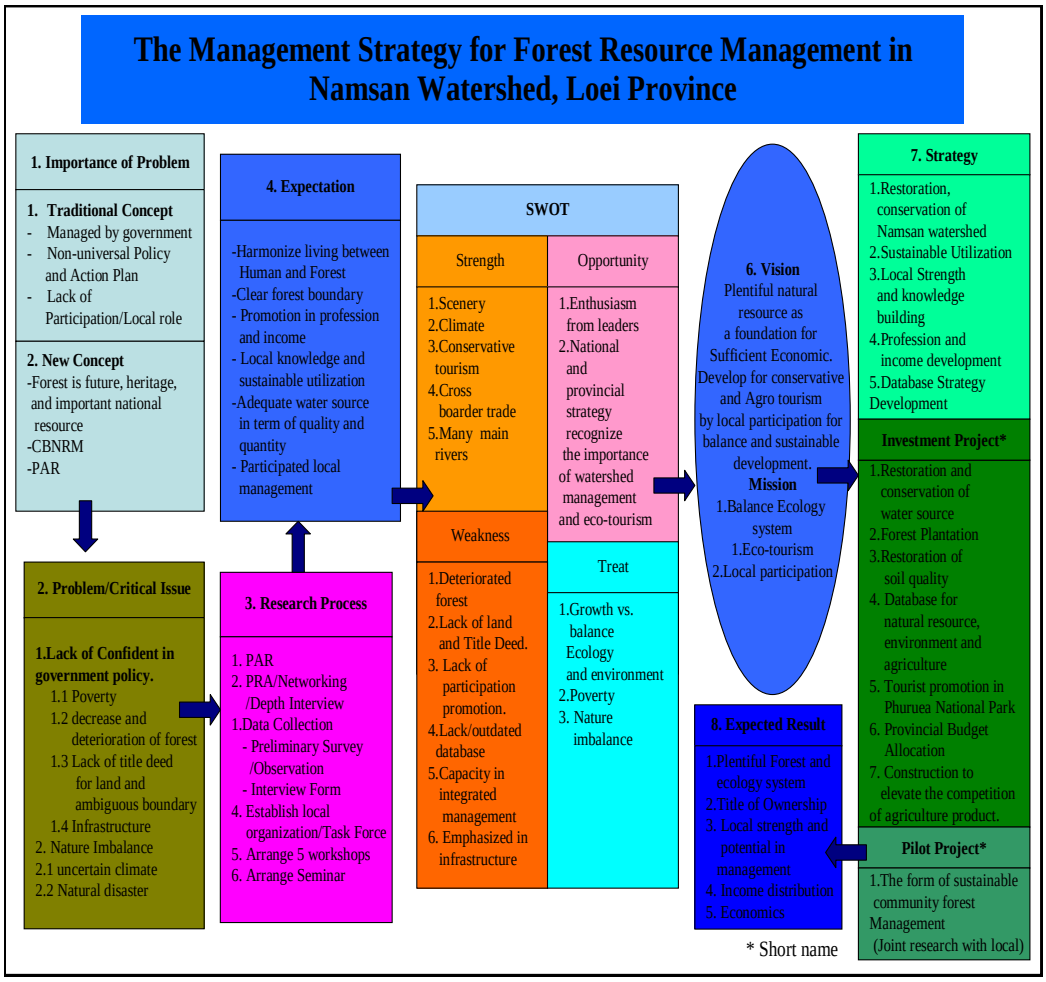

Figure 24 Forest resource management strategy for Namsan watershed, Loei province.

Table 19 Draft of local strategy, plan, and project in Namsan watershed area.

Strategy	Plan/Project
1. First Strategy: Rehabilitate and preserve ecology system in Namsan watershed	**1.1 Rehabilitation forest, soil, and water in Namsan Watershed area plan** - Conservation and rehabilitation of water stream in Namsan watershed area project. - Forest cultivation in upstream, midstream, downstreamproject. - Soil rehabilitation in Namsan watershed area. - Participation promotion in planning project. - Management plan for surrounding protected area.
	1.2 Environment quality management plan - Training project for local community in Water Quality Measurement - Waste water management around Namsan watershed area.
2. Second Strategy: The usage for sustainable development of Namsan watershed	**2.1 Sustainable Tourism Development Plan.** - Eco-tourism management by community in Phuruea National Park. - Survey project for eco-tourist attraction development in Namsan Watershed area (Ladkang, Phuruea, Phubak) - Phadang art work conservation project. - Agriculture tourism project - Rare jungle orchid (Aeungpung. planting project - Rare animal feeding project. (Mountain frog,crab, and prawn)
	2.2 Designation of sustainable natural resource utilization area. - The expedited the issuing process for land title of ownership to poor people project. - Designation of land usage area in Namsan watershed area participation project - Survey project on biodiversity in the surrounding area of Namsan watershed area. - Integrated budget allocation for natural resource management project.

Table 19 (Continued)

Strategy	Plan/Project
	2.3 The agriculture development plan - Knowledge transfer in bio agriculture by community knowledge project - The promotion of chemical reduction in agriculture project. - The making of bio fertilizer at community level project
3. Third Strategy: Local strength and knowledge building development strategy	**3.1 Local strength building plan** - Training project in local strategy/project/plan - The project to support local in field trip, study in eco/agriculture and tourism management - The fire protection around the conservation area with community project
	3.2 Local knowledge building plan - Joint project with local community in form of community forest management in Namsan watershed - Local Community curriculum formulation in conservation of Namsan watershed - Natural learing place in Namsan Watershed area study project
4. Fourth Strategy: Profession and income distribution promotion and development strategy	**4.1 Profession and income distribution plan.** - The development of market mechanism for garden tree and flower in community to international market project - The development and enhancement of mush room planting in community project. - The creation to elevate competitiveness of agriculture product and income for quality of life of farmer project.
5. Fifth Strategy: Database and network development strategy	**5.1 Database and network development strategy** - The database development in information on natural resource, environment, and agriculture in Namsan watershed area. - The community library project to share information in the community - The youth protect natural resource and environment in Namsan watershed area

5. Local Investment Strategy

Local shall designate its own investment framework by emphasizing on the important topic from the aforementioned strategy, and prioritize immediate plan, mid term plan, and long term plan. The Local shall also consider the expected benefit and output from the investment as shown in Figure 25.

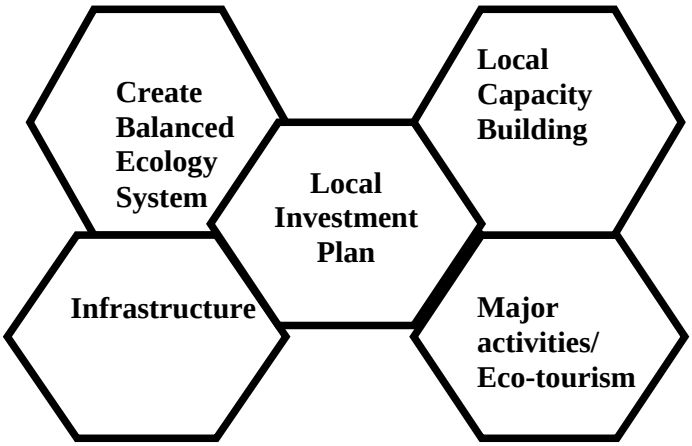

Figure 25 Strategy framework for local investment according to local capacity in natural resource.

After the local strategy formulation for Namsan watershed, there should be the investment strategy as a local developing frame. The significant issues include the creation of balance within the ecological system of Namsan watershed, the strengthening of the locality, the income distribution to the locality for directional development, and the budget spending within the solvable framework and sustainable spatial development. Additionally, the task force proposed the Pilot Project organization, which was the research project in collaboration with the local community for the management form of the community's forest by the locality of Namsan watershed, Loei province.

After the formulation of the local strategy draft, the task force needed the guiding frame for the transformation of plan into actual implementation. Consequently, there was a consultation with the researcher, and the result was the organization of one Pilot Project to be employed as a model for the locality. There was a consensus to proceed the Pilot Project jointly with the local community regarding the management form of the community's forest by the locality of Namsan watershed, Loei province; the details of the transformation of plan into actual implementation including the Pilot Project operation and the follow up and evaluation will be presented in the appendix B.

6. Seminar

6.1 On Monday 12th of March 2007, the research team consisting of Chairman of Student Committee, researchers, and Ph.D. students held a seminar on local strategy formulation regarding the management of forest resource in Namsan watershed, Loei province. The seminar location was at Phuruea Resort in Phuruea district, Loei province, and it was composed of 59 participants from Multi-Stakeholder.

6.2 The objectives of the seminar

6.2.1 To present the results of the research from beginning to the end, specifically focusing on forms of participation in local resource management, local strategy formulation, the Pilot Project, handbook acquisition, transformation of plan into actual implementation, and lecture on related issues by qualifiers.

6.2.2 To present a handbook, a local strategy, and Pilot Project of mentioned issues to seminar conference.

6.2.3 To criticize and discuss on local strategies for the management of forest resource in Namsan watershed, Loei province, with representatives from develop planning party of government organs including Deputy District Officer as representative of district level, representative of Nongbua Tambol Administration Organization, Director of Phuruea National Park and representative of People Sector, Decha Boonyaprang.

6.2.4 To listen to viewpoints and suggestions of seminar participants for future improvement and benefits.

6.3 The summary of the seminar

6.3.1 Researcher, Darakorn Jiamvijak, demonstrated research process starting from the operation on spot until the end. The process was composed of on site survey, Focus Group, interview on 192 samples, establishment of task force in the area, workshops for local strategies from the 1st to the 4th, Pilot Project establishment in cooperation with the local community concerning forms of community forest management by locality in Namsan watershed, Loei province under the surveillance of research team (to recommend, coordinate, and inform, for instance, about the techniques of plot laying and seed samples harvest, tool usage for border marking, advices on community forest conduct, handbook acquisition, seminar organization, and transformation of plan into actual implementation as shown in Figure 26

Figure 26 The Seminar on Strategic Formulation for the Management of Forest Resource in Namsan Watershed.

6.3.2 Lecture by expert from Kasetsart University which can be summarized as following:

a. Spatial Management of watershed resource illustrated by Associate Professor Dr.Wicha Niyom, Head of Conservation Department Faculty of Forestry, Kasetsart University who gave a keynote address for this seminar as shown in Figure 27.

Figure 27 Keynote speaker address and lectured on spatial management of watershed resource.

‘At present and in the future the management of watershed resource is necessary, especially the spatial management which must pay attention to the local people who reside in watershed area. Also, the organization/machinery, and authorities in charge must support; the significant one is academic institution on which Kasetsart University always places special emphasis. The spatial management of watershed resource can be successful with the integration of ecological system whose soil, water, and forest are well-maintained, the local people of watershed area, and the management for the local people’s suitable employment through equal income distribution for improved quality of life, and more importantly, for the long-term efficient management of watershed’s quality and quantity.’

The case study is taken from Darakorn Jiamvijak, Ph.D. candidate of major field in Watershed and Environmental Management, Kasetsart University, who did a research on Namsan watershed area with you all until coming to a research conclusion for the presentation. I, as Chairman of Student , joined to supervise, advise, and support to offer the University guidelines in the form of academic cooperation with local community resulting in increased potential of the local community itself.

b. The strengthening of the community in Namsan watershed area, Loei province, by Dr. Kitichai Ratana , Conservation Department, Faculty of Forestry, Kasetsart University (Figure 28), who believes that the strengthening of the community is essential. In the beginning, it is important to study problems, needs, potential, and threats within the area around Namsan watershed. Next, a variety of tools is needed, for example, Participatory Action Research (PAR), and SWOT analysis. Then, employ the process to enhance potential and strength by the assistance of academics who act as the facilitator; consequently, the local community takes action. Furthermore, the authorities in charge should help support the budget.

Figure 28 Keynote speaker lectured on strengthening of local community in Namsan watershed, Loei province.

3.3.3 The proposition of the strategic formulation handbook for local development regarding natural resources and environment of the watershed, in which the researchers mentioned during the seminar that it is a consequence of participatory process within the task force whose members come from multi-stakeholder; the group shared ideas, action, planning, and responsibilities, and it is considered strategic effort that places high emphasis on locality regarding resource management in the area level through the use of Namsan watershed area, Loei, as the pilot project. The handbook was published for public promotion, and for related people. The 3 objectives of the handbook are as following:

a. To be used as a handbook of strategic formulation for local development in the area of watershed, natural resources, and local environmental management.

b. To strengthen and enhance the capacity of the locality regarding the management of the watershed, natural resources, and environment.

c. To transform planning to actual implementation, and to set budget for annual expenses, which must be in coherence with not only the national strategies, but also the local ones.

Phuruea District Officer and seminar participants viewed that the aforementioned handbook was beneficial because it could be used as a model for spatial management of natural resources, and could be applied for other purposes.

3.3.4 The proposition of local strategic draft to the seminar

a. The researchers proposed the local strategic draft, which was the result of the cooperation between the task force and the researchers who established the developing framework for local strategies composing of 5 back up strategies, 8 plans, and 31 projects, to the seminar conference.

b. The conference approved the proposed strategic draft and presented additional viewpoints and suggestions that can be summarized as following:

1) Since the geographical features and area condition of Phuruea district and most of the left handed districts are covered with forests and mountains which have potential to become beautiful natural areas of ideal weather for tourism (now brought in main income apart from agriculture section), the importance of the development of ecological tourism and biological variety should be added to the second strategy for a more long-term effective improvement of Namsan watershed.

2) In the past, agricultural yields such as ginger and corn had unsuitable pricing. Thus, there ought to be some research projects that attach great importance to organic agriculture.

3) There should be more projects focusing on Thai local wisdom as Phuruea district has a number of scholars and people with high local wisdom.

c. The researchers amended the strategic draft by following the points of view and suggestions of the seminar as illustrated in Table 20.

d. The proposition of the pilot project in cooperation with the local community regarding the management of the community forest by locality of Namsan watershed, Loei province, in Phuruea forest, Phubuea, and Phu Kee Tao.

The researchers collected the result of the Pilot Project run by themselves and the community; the researchers took positions of advisors who suggested and encouraged by giving the information and academic knowledge including plot laying techniques, GPS tool usage, and giving the information on approach to community forest establishment to the village chief of Tambon Plaba, Phuruea district, Loei province, of which the result will be demonstrated in the appendix.

e. The discussion on local strategies for the management of Namsan watershed resources which can be summarized as following:

There were 4 discussants and 1 host; each attached importance to strategies of aforementioned issues that can be transformed into actual implementation. The representative of Nongbua Tambol Administration Organization specially focused on the importance of the formulated local strategies, and insisted that the Tambol Administration Organization must be a chief host in the push for future addition of the strategy to the Tambol Administration Organization strategies. For the Head of Phuruea National Park, he valued participation in forest resource management, and pointed out that the conducted process was justified because it derived from the needs of the local community, especially in the part of the acquisition of the mentioned local strategies starting from the formulation of visions, objectives, missions, goals, the SWOT analysis, to the derivation of the strategies that not only involved the ecological management of forest resource in Namsan watershed, but also integrated natural resources and environmental, economic, and social management. For the area of natural resources and environment, there exist the strategy for the restoration and conservation of Namsan watershed ecological system and the strategy for sustainable development of Namsan watershed. For the economic region, there is the strategy for the encouragement and improvement of employment and income distribution. Lastly, for social area, the strategy for strengthening the locality by giving knowledge base, improving the database system, and expanding the network is indeed in line with discussant Decha Boonyaprang from the People Sector, who viewed the local community as the important force for the mentioned strategies. Since the formulated strategies occurred out of the needs to eliminate problematic issues in the locality, the cooperation from the government section is vital, for instance, by allocating the budget to the area, especially for community forest management, or conservational tourism under local community management.

f. The researcher expressed his gratitude to the task force, the participants, and other related people. After this, he will coordinate and participate in transforming planning into actual implementation.

Table 20 Approved local strategies, plans, and projects for Namsan watershed area.

Strategies	Plans/Projects
1. First Strategy - The restoration and conservation for the ecological system of Namsan watershed	**1.1 Plan for restoring forest, soil, and water of Namsan watershed area** - Project for conserving and restoring the stream sources in Namsan watershed area - Afforestation Project in the upstream, midstream, and downstream parts of Namsan watershed - Project for restoring the quality of soil in Namsan watershed area - Project for encouraging local participation in the planning for the management of areas around protected area
	1.2 Plan for the management of environmental quality - Training Project for inspecting water quality by local community - Project for the management of deteriorated water in Namsan watershed area
2. Second Strategy - The utilization for sustainable development of Namsan watershed	**2.1 Plan for the sustainable development of tourism** - Project for the management of ecological tourism in the Phuruea National Park by the community - Survey Project for the development of ecological tourism in Namsan watershed area (Ladkang, Phukrung, Phuruea, Phupak) - Capacity assessment on tourist attraction in Namsan watershed area, where there are high biodiversity project. - The initiation of education and leisure for wildlife and residency according to area capacity and participation from people project. - Project for the conservation of art objects in Padang - Project for agricultural tourism - Project for nursery of rare wild orchids (Aeung Pung) - Project for nursery of rare animals (mountain shrimps, mountains crabs, mountain frogs)

Table 20 (Continued)

Strategies	Plans/Projects
	2.2 Plan of limiting for the sustainable utilization of natural resources - Project for the acceleration of right document issue to those of poor record - Project for the boundary of participatory land use in Namsan watershed area -Survey Project on bio diversity in the area around Namsan watershed - Project for the allocation of integrated provincial budget regarding the natural resources management - Survey study project for preserve, conserver and protect area for the community food source.
	2.3 Plan for agricultural development - Project for the instruction of organic agriculture through local wisdom - Project for the encouragement of non-chemical agriculture - Project for the formulation of organic fertilizer at the community level - Project for the learning of the adjustment of agricultural approaches. - The agriculture promotion under the philosophy of sufficient economic according to His Majesty's speech, and create diversity in plant for agriculture area project.
3. Third Strategy – The strengthening of and the knowledge - based building to the locality	**3.1 Plan for strengthening the locality** - Training project for local strategies/ projects/ plans formulation - Project for the encouragement of the locality by surveying, visiting, and making study tours of the management of eco- tourism/agricultural - Project for the construction of firebreak around the conserved forest in cooperation with the locality/community
	3.2 Plan for knowledge - based building to the locality - Research Project with the local community for the management of community forest in Namsan watershed by the locality - Project for the formulation of local curriculum for the conservation of Namsan watershed - Project for the study of natural sources in Namsan watershed area

Table 20 (Continued)

Strategies		Plans/Projects
4. Fourth Strategy – The Development and encouragement of employment and income distribution	**4.1**	**Plan for the development and encouragement of employment and income distribution** - Project for the upgrade of the marketing mechanism of flowering trees and decorative plants in the local community to the international level - Project for the increased efficiency of Shitake mushroom nursery in the community - Construction Project for upgrading the competition of agricultural products and the income for farmers'improved quality of life
5. Fifth Strategy – The Development of the database system and the expansion of network	**5.1**	**Plan for the development of the database system and the expansion of network** - Project for the database formulation of the information technology on natural resources, environment, and agriculture in Namsan watershed area - Local Libraries Project for community's knowledge - Project of youth's protection for the natural resources and environment in Namsan watershed area - Knowledge building and research in forest and wildlife to create understanding between public and private sector project.

3. To formulate the proposition in the form of policy for the management of forest resource by the Tambol Administration Organization Agency for actual implementation

The researcher was doing the research from June 2005 to September 2007. After entering the area and writing the summary report, the proposition in the form of policy was achieved for the responsible units to directly employ it in the management of Namsan watershed area since the proposition was derived from local residents. The proposition can be summarized as follows:

3.1 The transformation of local strategies into actual implementation needs the force of multi levels, from the nation to the local. Especially for the local level, the Tambol Administration Organization Agency, who possesses power, duty, role, and budget, should put some pressure, while be under the surveillance and support of the government section. Furthermore, for the ultimate development, there should be supporting network, clear spatial goal, and success indicator of the strategies/ plans/ projects.

3.2 For the budget allocation, the Tambon Administration Organization of Namsan watershed should be a principal authority to place the strategy, which is composed of strategies, projects, goals, and indicators, within the frame of the annual budget allocation. This will help transform the plan/project into actual implementation that is in harmony with the national strategies and the ministry/department strategies of the province. More importantly, there should be a separate budget to support other subjects including the technical, educational, and training areas which will strengthen the locality.

3.3 The local investment strategies must be formulated and arranged in the order of importance and the budget be proposed. Also, there must be the plan/ investment strategies for Namsan watershed locality.

3.4 The Tambol Administration Organization Agency, principal authorities, and related authorities should reinforce the knowledge - based and the learning process to people of the local community as the back up power for the locality to exercise in the transformation of the local strategies into actual implementation.

3.5 The Tambol Administration Organization Agencies, principal authorities, and related authorities emphasize the participatory process of the Develop Planning members in order to drive the National Economic and Social Development Plan into local strategies with a number of processes such as public stage organization, meeting, seminar, supporting network for the management of Namsan watershed, and other activities in line with the area potential.

3.6 Government authorities should support the development of the database at every level, and link the database network of the policy-level authorities to the locality and the area. As a result, the information can be used for decision making at the local level.

3.7 The government section should encourage the Tambol Administration Organization Agency and the community to carry on the study and research under the academic surveillance of the local educational institution.

4. Indicators and Evaluations

The research paper, "Local Strategy Formulation for Forest Resources Management in Namsan Watershed, in Loei province" is the qualitative research. The researcher used 2 sets of indicators to evaluate the result as follow;

4.1 Process Validity Indicators. 3 indexes were used as follow;

4.1.1 Research Designing Process: There was clear design for implementation from the start till the end. The process consisted of 9 steps as shown in Figure 9.

4.1.2 Harmonization between the plan and actual research: The researcher had spent at least 2 years from July 2005 to September 2007.

4.1.3 The appropriateness of the content of meeting: In the research, the contents of the workshop were chosen in sequent base on appropriateness.

4.2. Action Validity Indicators. 4 indexes were used as follows;

4.2.1 Representative from all development parties: There were the evaluations from all parties, who attend meeting and contributed to the discussion.

4.2.2 The use of local strategy as a tool for development: There were evaluations by TAO, and were used as approach framework for development in the action plan.

4.2.3 The quantity of natural resources and environment management: The increase number of networks, and increase number of members in conservation, rehabilitation, and management in natural resources.

4.2.4 The quantity of projects in natural resources and environment management: The increase number of projects regarding natural resources and environment management.

4.3. Success of Projects

4.3.1 Output

1) Local strategy/approach framework/plans/projects in natural resources management in Namsan watershed, Loei province.

2) Form of participation among government sector, local administration sector, private sector, private development sector, local community, and researcher.

3) Natural resources and environment in watershed manual

4.3.2 Outcome

1) Local Organization/mechanism

2) Strategy that can realistically be implemented

3) Driving force that leads to actual implementation

4.3.3 Impact

1) Local strategy that harmonizes with national strategy

2) Strong local community and good quality of life

3) Namsan watershed becomes plentiful and gains more community forest area of 0.52 square kilometer

CONCLUSION

The researcher had spent approximately 2 years from June 2005 to September 2007 for the research, "Local Strategy Formulation for Forest Resources Management in Namsan Watershed, in Loei Province." The research emphasizes on natural resources and environment management in the area by local communities and inhabitants around Namsan watershed from upstream to downstream. The Participatory Action Research (PAR) technique were applied along with qualitative and quantitative, and could be concluded as follows;

1. The result of the research in term of identifying of problems, local community needs, and readiness evaluation of local administration in the study area are as follow. In term of gender of inhabitant in the area (upstream, midstream, and downstream), there were more female. The majority of population ages between 40 and 49. Farming was the most popular occupation in the area, people grow rice, ginger, corn, grows flower, garden tree, and mushroom. The majority of the population think that the condition of the forest was deteriorated and needed to participate in planning and suggesting for the local community forest resources management research.

The majority of the population thanks that TAO had no policy in formulating plans/projects according to TAO development plan. Moreover, the plans of TAO were not corresponding to the communities' need and area condition.

2. The result of the research in local strategy in forest resources management in Namsan watershed and form of collaboration among local administrations, communities, and related agencies were as follows;

2.1 The driving organization to drive the formulating local strategy in management of forest resources in Namsan watershed is, "The Working Group to Formulate Local Strategy in Management of Forest Resources in Namsan Watershed." The working group was assigned and chaired by the Phuruea District Chief, secretariat by Mr. Darakorn Jiamvijak and co-secretariat by Phuruea District Secretary. The working group had arranged 3 workshops, and implemented a pilot project. The researcher was the master of the ceremony and secretary in the meeting, and provided technical support, information for decision making. The working group had designated development approach framework to draft local strategy in the management of forest resources in Namsan watershed, Loei province, which consisted of 5 strategies, 9 plans, and 40 projects.

2.2 Form of participation among government sector, local administration sector, private sector, private development sector, local community, and researcher.

3. The results include the participatory working method, the handbook for the management of the natural resources and environment of Namsan watershed, Loei province, and the model of community's forest management project, which would be managed by the community itself so that it would created possession and awareness within the local people for an effective preservation of nearly 320-rai forest.

RECOMMENDATIONS

Before doing the research, the study found that the local community still lacked various factors such as the participatory process for the management of plan and strategy, and the policy and local strategies. After the research study, there was a new form of participatory process among the government sector, the Tambol Administration Organization Agency, the people, and the researcher who managed the forest resource of Namsan watershed by setting up the task force in order to eliminate the problems within the area of Namsan watershed.

1. Local Administration Organization Committee shall expedite the process of managing forest resources in Namsan watershed in term of conservation, utilization, development to become plentiful and be the base for production of community

2. In the future, the study should emphasize on the establishment of organizations/ mechanisms for managing Namsan watershed's natural resources and environment, which will lead to the efficient management of Namsan watershed's resources.

3. There should be the local strategy formulation and the formulated strategy should be arranged in the order of priority before the budget proposal. Also, the local investment plan/strategy for the management of Namsan watershed should exist.

4. The budget should be set for supporting a number of areas including the technical, education, and training in order to strengthen the locality.

5. There should be the expansion of the formulation of other local strategies so that they cover the economic, social, natural resources and environment, and the mentioned formulation handbook should be publicized in other watersheds.

6. There should be a follow up and evaluation of the local strategy implementation based on the set up plan and the handbook. Thus, the Namsan watershed becomes the watershed of happiness as mentioned in the vision, and the system is improved.

7. There should be a follow up, evaluation, and success indicator for the development at every level.

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APPENDIXES

APPENDIX A

Executive Order of Appointment

(Unofficial Translation)
Phuruea District Executive Order of Appointment
No 162 /2006
Committee to Conduct a Strategic Plan for Natural Resource Management in Namsan Watershed area, Loei Province

.....

Referring to the fact that Mr. Darakorn Jiamvijak, candidate for Ph.D. in watershed and environmental management, faculty of forestry, Kasetsart University, has conducted a research study on strategy for local natural resource management in Namsan Watershed area, Loei Province with an objective to study the capability, problem, and need to plan a strategic for local management system for natural resource in that area, including the involvement of the local authority and community to participate. This study has also aimed to include the recommendation for policy making in order to comply with national agenda and government interests.

With a view to enhancing appropriateness and effectiveness, it deemed appropriated to appoint a monitoring and managing committee to oversee the strategic plan for local natural resource management in Namsan Watershed area, Loei Province. It is hereby ordered as follows:

Advisory Committee to the Task Force

1. Associate Professor Dr.Wicha Niyom Chairman of the Advisory Committee
2. Instructor Dr.Kasemsun Chinnavaso Vice Chairman Advisor Committee
3 Instructor Dr.Kitichai Rattana Advisor Committee

Task Force

1. Sheriff of Phuruea District Chairman of the Task Force Committee
2. Sheriff of Dansai District Co-Chairman
3. Head of Tambol Phuruea Office Vice Chairman
4. Head of Plaba Tambol, Administration Organization Vice Chairman
5. Head of Nongbua Tambol Administration Organization, Vice Chairman
6. Head of Ladkang Tambol Administration Organization Vice Chairman
7. Head of Phonsoung Tambol Administration Organization Vice Chairman
8. Director of Phuruea National Park Committee
9. Director Phuluang Wildlife Sanctuary Department Committee
10. Development Officer of Phuruea District Committee
11. Public Health Officer of Phuruea District Committee
12. Land Officer of Phuruea District Committee
13. Highland Agriculture Officer of Phuruea District Committee

14. Representative from Thailand Tourism Authority	Committee
15. Representative from Academic Institute	Committee
16. School Headmaster	Committee
17. Tambol Head	Committee
18. Tambol Head	Committee
19. Village Head	Committee
20. Village Head	Committee
21. Village Head	Committee
22. Village Head	Committee
23. Village Head	Committee
23. Village Head	Committee
24. Owner of Hotel & Resort	Committee
25. Mr. Somkiat Wiwatanakerin	Committee
26. Mrs. Pudtida Bualeang	Committee
27. Mr. Decha Boonyaprang	Committee
28. Mr. Saard Netibut	Committee
29. Miss Darunee Inpet	Committee
30. Mr. Kumpoun Suthongsa	Committee
31. Mr. Komin Pontecha	Committee
32. Monk at Chainam Temple	Committee
33. Agriculturist Representative (Rice)	Committee
34. Agriculturist Representative (Farm Plant)	Committee
35. Agriculturist Representative (Animal Husbaudry)	Committee
36. Agriculturist Representative (Mushroom)	Committee
37. Agriculturist Representative (Flowering/Ornamental Plant)	Committee
38. Local Coordinator	Committee
39. Mr. Darakorn Jiamvijak	Committee and Secretariat
40. Mr. Narongrid Jantapanid	Committee and Assistant Secretary

The committee established under this order for the purpose of creating the strategic plan for local management of natural resource in Namsan watershed area, Loei Province, shall have a role and responsibility as follows:

1. Conduct a strategy for local management of natural resource in Namsan watershed area, Loei Province

2. Advice and give support to the establishment of the pilot project that emphasized on the local participation

3. Cooperation with the local authority, community and related alliance for an exchange of basic information that shall lead to analyzing problem/obstacle/ and guideline to develop the natural resource management of Namsan watershed area.

4. Appointed supporting stuffs to assist on this project management in Namsan watershed, Loei Province area for creating effectiveness.

5. Act accordingly to the instruction of Phuruea Distict-Chief Officer for the benefit of Namsan watershed , Loei Province Project.

Effective from now and onwards,

Annouced on June 12, 2006

Signature _____

(Mr. Mongkul Thammakittikul)
Sheriff of Phuruea District

APPENDIX B

Preparatory Case Study for Implementation

Preparatory Case Study for Implementation

1. Preparatory Case Study for Implementation

As a result of the strategic plan, the committee/Team has suggested to create a filed pilot project to be a sample case study and has requested the researcher to advice and direct this project by drawing together all outcome of the previous seminars, to help modify this model plan into practice as follows:

1.1 An installation of the pilot project

Firstly, the field pilot project should be the project that the local community feels important and sets as its priority. Thus, the pilot project could be able to perform without any budget allocation or with a very modest amount. In consequence, the researcher shall apply a sample of the pilot project from the management team of River San (as the co-research project between the researcher and the local community to manage the sustainable forestry within the Namsan Watershed area) details include: -

1.1.1 The Filed Pilot Project with the local community on the topic of how to arrange the local forestry by the local society within the Namsan Watershed area (Loei province)

a. Description

For the past 40 years of country development, there was over-utilization of natural resources and with the inadequate management; this created a disaster in term of natural resource shortage and spur a conflict within the society. In this case, the direction and trend to solve such a problem of degrade natural resource and environmental management from state to local authority must involve the local community to take care of its ecology system, especially to manage a balance of the natural forestry around the river area.

Community Forest is the forest, where can be controlled by the local community to balance between the ecology system and the human activities. To do so, one shall set a clear frontier and activities for the community forest so local people could be granted an authorization to care and take responsible of such a forest for the sustainable utilization. Hence, this kind of control and management will effect positively to the local development and create opportunities for several disintegrated local communes in that area to be able to make use of the pure balance ecology system as a source of woods, water, animal farming. On the other hand, the state can also decentralize the authority to the local authority to protect abundance of forest that generally can't be done by centre.

Researcher has selected the study area as the community forest of Phuruea, Phupuey and Phukitao Moo 1 and 5 Tambol Plaba, as the said areas are consisting of a large quantity of people population who have been taken advantage of local forest in many ways without a solid care system. The research shall emphasize

on the local participation with the government sector in set up the forest boundary. The state shall act as a consultant and the local authority shall act as a mentor and the local community shall act as a practitioner to sort out for the proper local forest management.

b. Objective

1) To survey the problem, capability and need of community forest

2) To direct an arrangement of forestry boundary for development, utilization, and reservation including to set a rule and regulation on how to make use of the local forest

3) To guide on the creation of co-operated local management plan

c. Project deliverable

To attain one co-operative local forest management system

d. Location to conduct this research

Location to conduct this research is the selected local forest in the area of River San, Loei Province 1 as a local forest.

e. Plan for Pilot Project

The local forest management plan by local people from River San, Loei Province, is the co-study by the researcher and local community. The researcher will provide information and technical support on how to handle the local forest. In practice, on the other hand, the protocol like setting up the forest boundary, utilize, and protect the local forest including the implementation of the rule and regulation shall be conducted by the local community. The said establishment shall be done under the natural resource management by the community framework which will involve the target group that is the stakeholders to participate in fact-finding and analyze problem/ capability/ readiness and make a plan to set a co-operation action framework. In short, the action plan shall be as follows:

1) Set up a working tem to plan a local forest management with the researcher team.

2) Select the Study area by selecting one local forest within the area

3) Conduct a Management Plan

3.1) Collect basic information and use the technique of plant planning for randomly collect information of type, quantity, quality, and biodiversity of plants and animals within the forest area.

3.2) Situate the development, utilization, and reservation border

3.3) Position rules and regulation for development, utilization and reservation

3.4) Design a local forest by local community

4) Make Public about the good of utilization of this community forest to local community though a better understanding of rules and regulations as well as standardize of effective usage of this local forest.

5) Follow up and evaluation of the result of local forest set up every 1 year

f. Responsible Organization and related agencies

Local community Organization, Village, Community, School, and Representative from Royal Forest Department

g. Budget

h. Research Duration

This research duration estimates for 3 months, start from January to March 2007

i. Projected Outcome

1) To learn the cause of problem, obstacle, and capability and need to manage the local forest in the selected study area

2) To have a local forest plan, made by local community

3) To have a strategic and locally- input recommendation in term of the natural resource management that can extend to other area around the river Namsan region.

1.1.2 Forest area at Phuruea, Phubuea, and Phukitao

a. Phuruea, Phupuey, and Phukitao Forest are all the national forest reserves located cover Plaba, Rongjik, and Tambal Nongbua , Phuruea District, Loei Province.

b. Type of Forest, plants, forest product and other natural resources look like deciduous forest, dry evergreen forest., etc. Hence, most of the forest contains beehive, beeswax, bamboo shoot, and charcoal.

c. Geographical condition mostly consisted of mountains and hills with highland such as forest area of Mountain Phupuey.

1.1.3 The installation of the field pilot project with the local community input on local forest management format within the Namsan watershed area, Loei Province, divided into 3 steps include:

a. Preparatory Process or PRE-Action Consultation (PACT) Firstly, the researcher will conduct a meeting, chaired by district-chief officer, and included academic committee members such as the Chairman of the Province authority organization, District Developer, Head of the National Park, village chief and village headman from the area of local forest. Secondly, the researcher will announce the background information, objective, and method for preparation process to create a local forest for local community by local society and distribute the project publication (as in table 2: Annex B)

b. Project Implementation (PI), Researcher shall arrange accordingly to the following:

1) Arrange a meeting with all related agencies such as the volunteer from the village, people who habituated near the proposed area for local forest. Then Local society discuss and agree upon the concept of installation of local forest project at Phuruea, Phupuey, Phukitao National Forest Reserves (Figure 26). The district headperson shall then publicize and PR inviting people and volunteers to join the meeting at village chief in the morning at approximately 9.00 hrs in order to address the objective, method, process and framework for installation of this local forest, including setting up the table for volunteer registration.

2) Volunteer and local people together set a boundary line for local forest according to the researcher team supervision, technical guidance and usage of GPS tool to make a land plot. This will also involve the participation of the people habituated around the proposed local forest area to support this activity.

3) After the local forest was plotted, the researcher has offered a technical advice on plotting the local forest area by using the technique of plotting of 40x40 meter for 2 plot and 10x10 for 3 plot to investigate the biodiversity and prosperity of plants and animals within the model plan.

c. Conclusion on the preparation process or After Action Report (AAR)

1) Researcher invited volunteers and local people for a meeting and discussion on problem and solution. Hence, all parties shall prepare the installation process for local forest together.

2) Researcher makes a recommendation on process of local forest set up by presenting the application form for local forest project together with a guide to local forest management, which is consisting of detailed information such as the process of application form, the land investigation process, the project

presentation, monitoring process, etc. to the district chief for further consideration.

3) Researcher suggests the local community to explore on the capability of the proposed local forest in term of prosperity, biodiversity, the boundary plot, rules and regulations for mutual benefit, the forest planting and further revitalization and the groundwork for fire protection line etc.

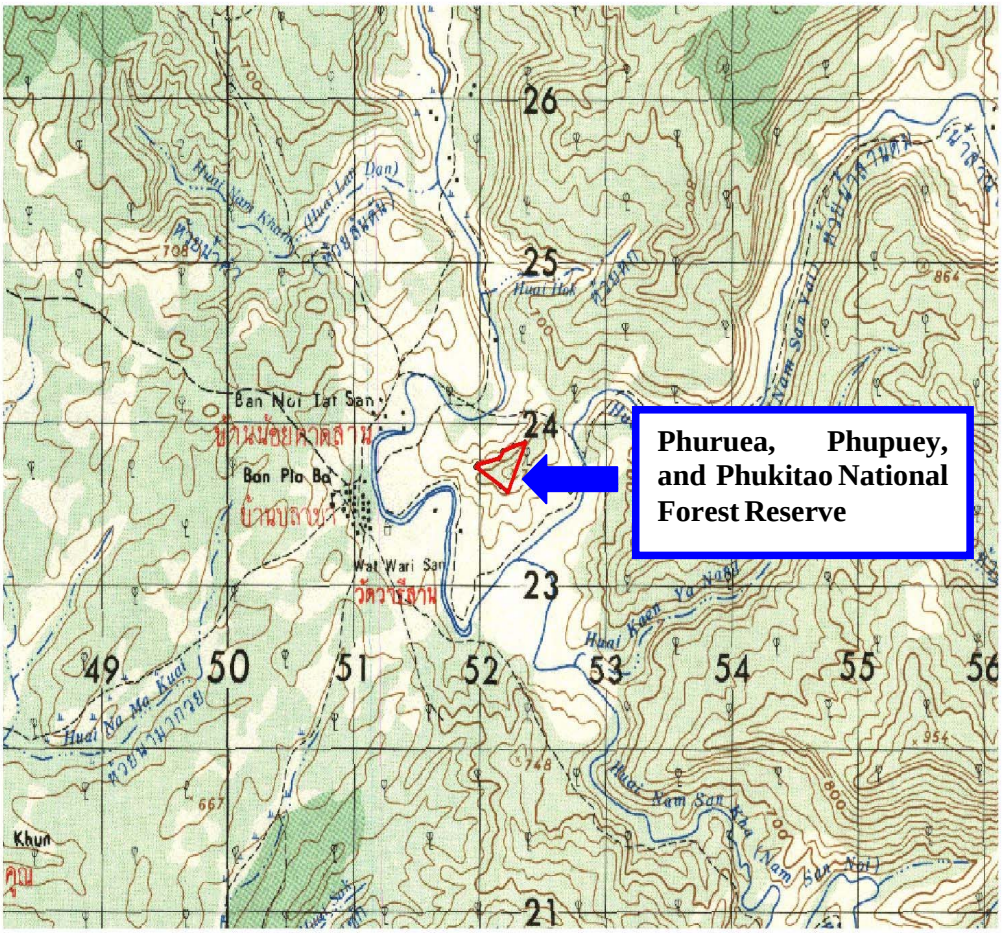
4) Researcher concludes on the preparation process and conducts a certificate ceremony for local people and volunteer to honor and promote the co-operation and to carry forward the said project.

Appendix Table B1 Local forest installation framework.

Installation Outline	Participation/Person	Role & Responsibility
1. PRE-Action Consultation: PACT		
1.1 Academic Committee Meeting 1.2 Re searcher addresses the background, objective, method and process of work	- District-Chief officer and academic committee - Researcher - 12 person	- District-Chief Officer acts as chairman of the meeting - Researcher acts as the secretary and co-organizer
2. Project Implementation : PI		
2.1 Researcher organize a meeting for related agency within the area, with the led of village chief to invite local people and volunteer to install the local forest project 2.2 Researcher give the tool and information support such as GPS Map, robe, color, stationary for noting the type of plants. All of this activities, researcher shall supervise the volunteer to conduct the finding	- Village Chief - Local People that acquire a land around the forest area - Volunteer to install the local forest project - 40 person	- Together all explore the forest boundary and frontier - Researcher advice on the installation of the sample plot while volunteers explore the biodiversity of plants and animals

Appendix Table B1 (Continued)

Installation Outline	Participation/Person	Role & Responsibility
3. After Action Report :AAR		
- Researcher make a conclusion and recommendation on the installation of the local forest	- Village Chief, Volunteer, Researcher - 35 persons	- Discussion on the problem and make a recommendation to enhance the process of local forest installation



Appendix Figure B1 Map of location for Community forest in Phuruea, Phupuey, and Phukitao National Forest Reserve.

1.1.4 The exploration for the condition of Phuruea, Phupuey, Phukitao national forest reserve.

The Forest in the area of Phuruea, Phupuey and Phukitao have been explored by team of researchers with the use of GPS tool and by help of local people and volunteer. The results include:

a. The area proposed for local forest has covered approximately of 370 rai (see Appendix Figure A1)

b. The forest condition is mixed deciduous forest, dry evergreen forest.

c. Team of Researcher designed a land area of 40x40 meter (2 plots), 5x5 meter (2 plots) and 2x2 meter (2 plots) to study the plants by its biodiversity and level of prosperity within each plot. For example, the plots No 1 and No 2 have a conclusion as follows appendix table A2 and table A3

Appendix Table B2 Type of tree,sapling and seedling found in sample plot 1.

No	Local Name	Botanical Name	No.of tree (Rai)	Approx. hight (Meter)	GBH (Centimeter)
Tree Plot area 40 x 40 Meter					
1.	Mahat	*Artocarpus lacucha*	1	12.0	92
2.	Tin nok	*Vitex pinnata*	1	10.0	79
3.	San yai	*Dillenia obovata*	1	7.0	104
4.	Khai nao	*Vitex glabrata*	2	6.0	52
5.	Som pho	*Streblus asper*	1	6.0	93
6.	Kra phi khao khwai (Smitinand,2001)	*Dalbergia cultrata*	4	5.3	115
7.	Ko kang dang	*Lithocarpus garrettianus*	3	4.6	72
8.	Ko hin	*Lithocarpus trachycarpus*	4	4.5	82
9.	Ko paen	*Castanopsis diversiforia*	1	4.0	40
10.	Mueat	*Symplocos racemosa*	1	3.0	57
	Total		**19**	**6.24**	**78.6**
	Average			**6.24**	**78.6**
Sapling Plot area 5 x5 Meter					
1.	Lane	*Archidendron clypearia*	64	6	19
2.	Ko hin	*Lithocarpus trachycarpus*	64	5	28
	Total		**128**	**5.5**	**23.5**
	Average			**5.5**	**23.5**
Seedling Plot area 2x2 Meter					
1.	Ko hin	*Lithocarpus trachycarpus*	2,000		
2.	Salot	*Styrax apricus*	800		
3.	Pradu laeng	*Dalbergia foliacea*	800		
4.	Wa	*Syzygium cumini*	400		
	Total		**4,000**		

Appendix Table B3 Type of tree,sapling and seedling found in sample plot 2.

No	Local Name	Botanical Name	No. of tree (rai)	Approx. hight (Meter)	GBH (Centimeter)
Tree Plot area 40 x 40 Meter					
1	Haen	*Termiali bellirica*	1	12.0	74
2	Makok	*Spondias pinnata*	1	10.0	104
3	Ta baek	*Lagerstroemia calyculata*	1	8.0	97
4	Haen daeng	*Termialia calamansanai*	3	7.5	50
5	Lane	*Cryptolepis buchanani*	2	7.5	69
6	Tin nok	*Vitex Pinnata*	1	6.5	80
7	Kra phi khao khwai	*Dalbergia cultrata*	1	5.5	105
8	Tio kliang	*Cratoxylum cochinchinense*	2	5.0	60
9	Tio daeng	*Cratoxylum pruniflorum*	1	4.5	71
10	Pao lueat	*Stenotaphrum venosa*	4	2.37	37
	Total		**17**	**7.64**	**72.45**

Sapling Plot area 5x5 Meter

- No Sapling found, as mainly found is 25 cluster of bamboo trees

Seedling Plot area 2 x2 Meter

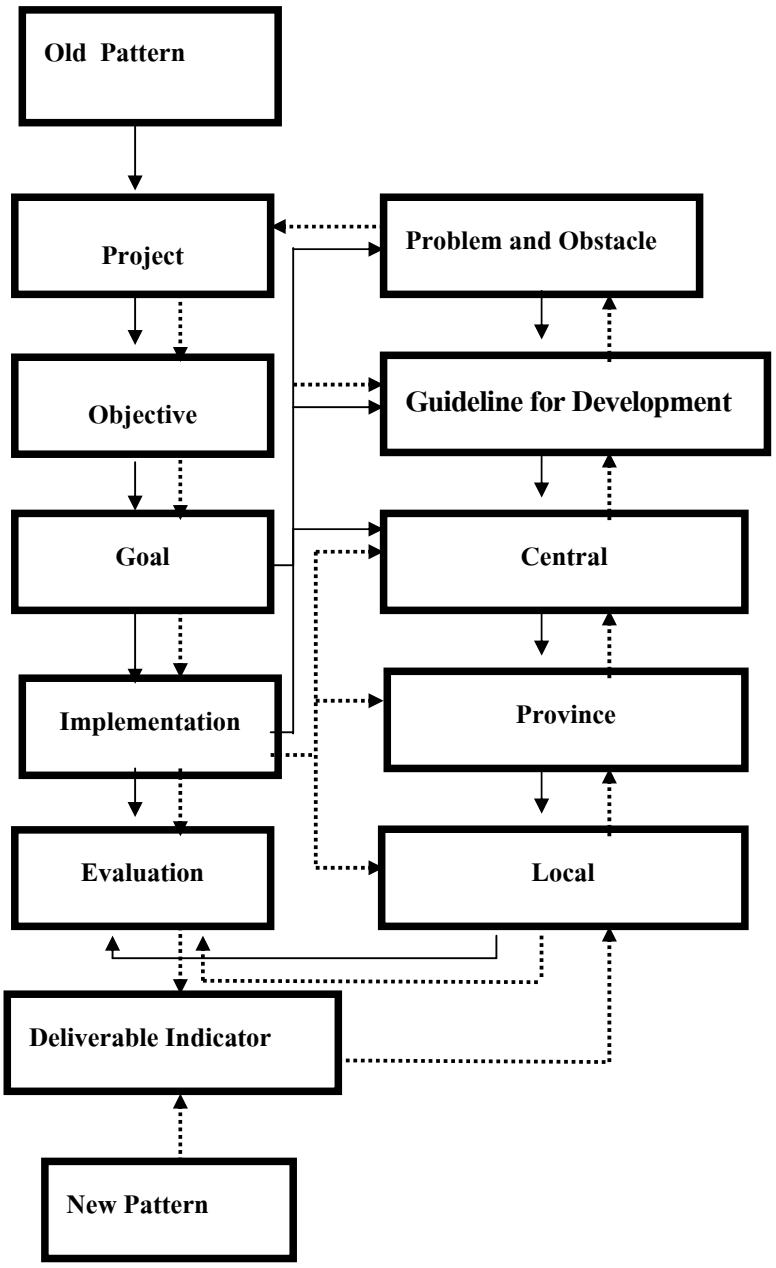
1.	Pao lueat	*Stenotaphrum venosa*	20

Appendix Table B4 IVI Analysis of type of trees.

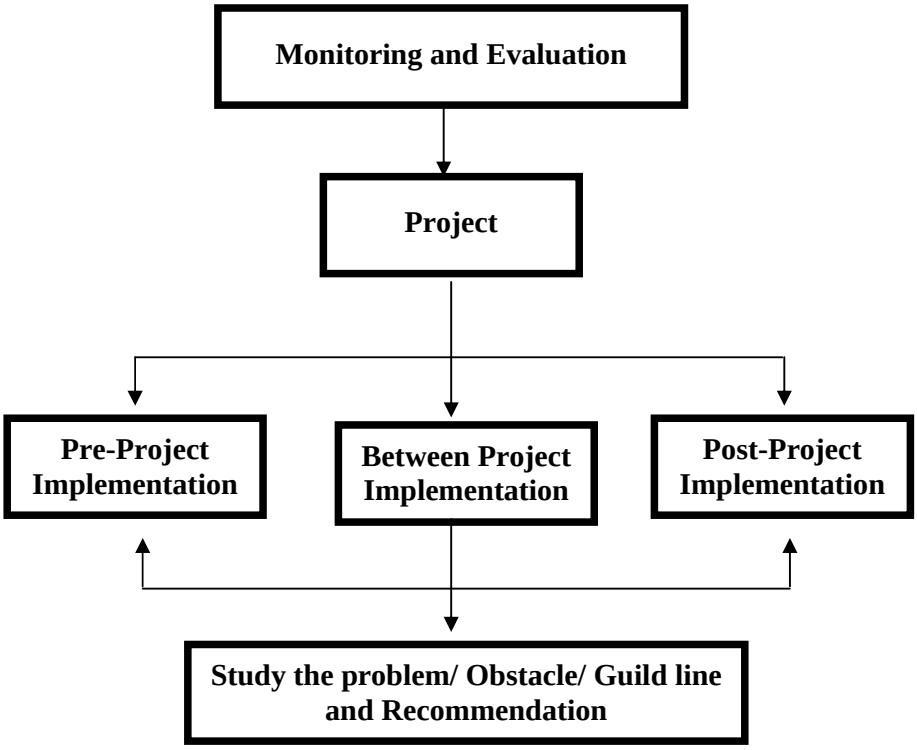
Species	Botanical Name	RD	RF	RDo	IVI	Rank
1. Mahat	*Artocarpus lacucha*	2.77	2	8.41	16.18	10
2. Tin nok	*Vitex pinnata*	5.55	20	6.27	21.82	3
3. San yai	*Dillenia obovata*	2.77	5	10.74	18.51	4
4. Khai nao	*Vitex glabrata*	5.55	5	2.68	13.23	14
5. Som pho	*Streblus asper*	2.77	5	8.59	16.36	9
6. Kra phi khao khwai	*Dalbergia cultrata*	13.88	20	12.02	35.90	1
7. Ko kang dang	*Lithocarpus garrettianus*	8.33	5	5.15	18.48	6
8. Ko hin	*Lithocarpus trachycarpus*	11.11	5	6.68	22.79	2
9. Ko paen	*Castanopsis diversiforia*	2.77	5	1.58	9.35	18
10. Mueat	*Symplocos racemosa*	2.77	5	3.22	10.99	17
11. Haen	*Termiali bellirica*	2.77	5	5.44	13.21	15
12. Makok	*Spondias pinnata*	2.77	5	20.74	18.51	4
13. Ta baek	*Lagerstroemia calyculata*	2.77	5	9.34	17.11	8
14.Haendaeng	*Termialia calamansanai*	8.44	5	2.48	15.81	11
15. Lane	*Cryptolepis buchanani*	5.55	5	4.73	15.28	12
16. Tio kliang	*Cratoxylum cochinchinense*	5.55	5	3.57	14.12	13
17. Tio daeng	*Cratoxylum pruniflorum*	2.77	5	5.01	12.78	16
18. Pao lueat	*Stenotaphrum venosa*	11.11	5	1.35	17.46	7
Total		100.00	100	100.00	300.00	18

1.2 Monitoring and Evaluation Process

After receiving a budget allocation for installation plan/project, the implementation of the pilot project should be monitoring closely and evaluate the result according to the strategy/ project plan/ project result to measure the deliverable and effectiveness of that project in line with its objective and goal. Hence, this process will also help identify the problem or obstacle with a guideline for solution. The framework for monitoring and evaluation shall be as follows (Appendix Figure A2 and A 3)



Appendix Figure B2 Evaluation framework or follow up framework.



Appendix Figure B3 Pattern of monitoring and evaluation framework.

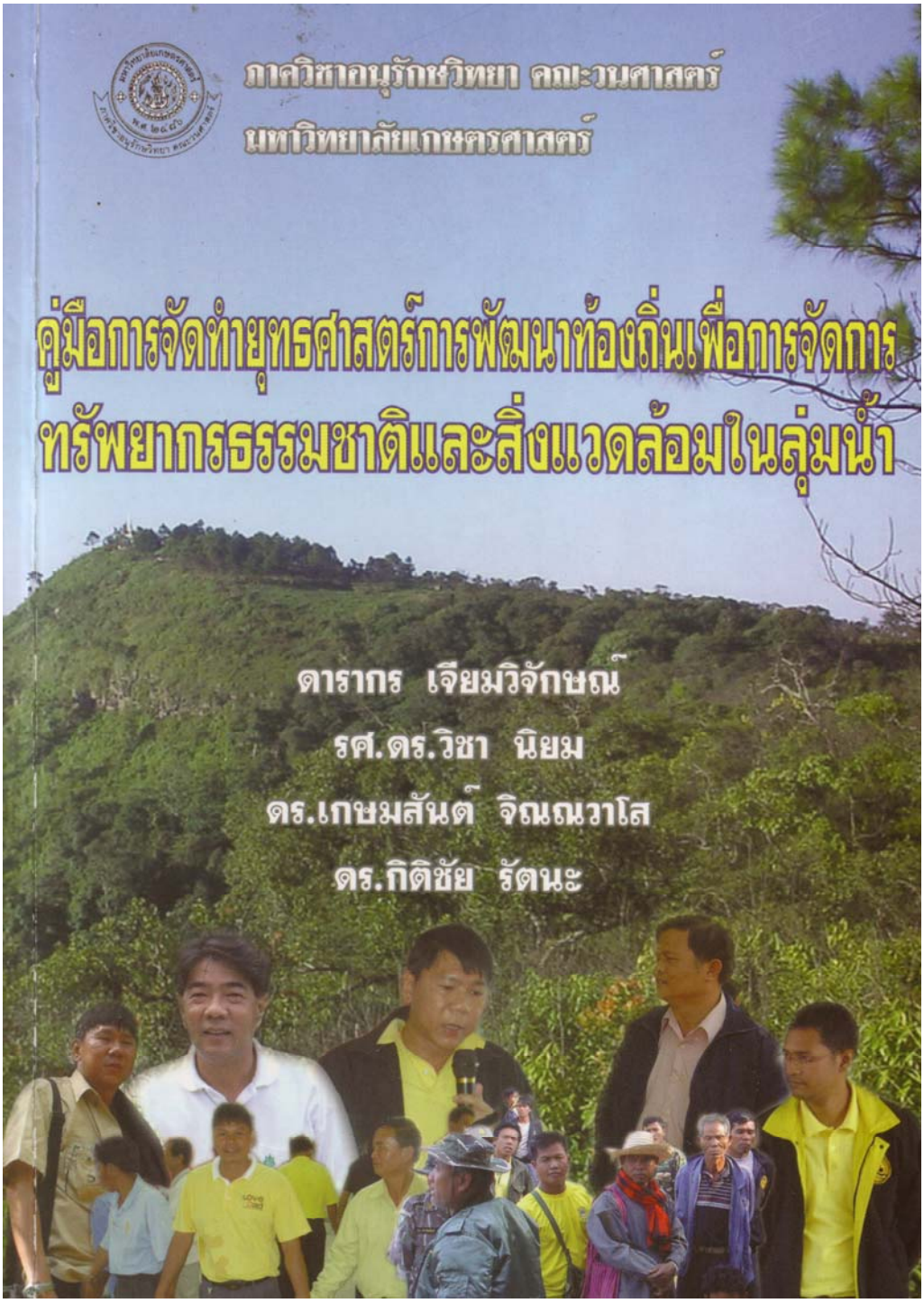
1.2.1 The process of monitoring and evaluation can be conducted from the start-up of the pilot project, between the installation, and even when project has been finalized. The main issue to consider is the problem/ obstacle and the solution guideline / and further recommendation.

1.2.2 The method of monitoring and evaluation process shall continuously keep an involvement of local communities. Thus from the process of making its strategic plan, identifying the problems, installation of the sample model plan and follow up, there shall be a constant participation from the local communities for example, the local community can help examine the follow up on the change in ecosystem within the area and can help taking care and protecting the nature fire and set up an alarm prior to the flooding disaster.

1.2.3 After the follow up and evaluation process, the problem should be present to the responsible agency in order to find a right solution and better management scheme.

APPENDIX C

A Handbook to Strategic Planning for local development in natural resource and environmental management in watershed area (Thai version)


ภาควิชาอนุรักษวิทยา คณะวนศาสตร์
มหาวิทยาลัยเกษตรศาสตร์
คู่มือการจัดทำยุทธศาสตร์การพัฒนาท้องถิ่นเพื่อการจัดการ
ทรัพยากรธรรมชาติและสิ่งแวดล้อมในลุ่มน้ำ
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ข้อมูลทางบรรณานุกรมของหอสมุดแห่งชาติ

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APPENDIX D
Questionnaires

Questionnaire
Local Strategy Formulation for Forest Resource Management in Namsan Watershed, Loei Province

Date ……
Address No. ……..……Moo……Village……
Tambol…….……Distict…….Province……
Status of the interviewee
(1)Community Leader (2) Household Leader (3) Spouse(4) Tambol Administration

---

Section I: Demographic Data (Please mark ✕ in ☐ for the most accurate information)

1. Gender ☐ Male ☐ Female

2. Age……..Years

3. Nationality ☐ Thai ☐ Other (Please specify……)

4. Education (Years in education)……Years
   - ☐ Uneducated
   - ☐ Primary
   - ☐ Secondary
   - ☐ Professional Certificate
   - ☐ Higher than Bachelor degree
   - ☐ Other (Please specify.....)

5. Occupation
   - ☐ Plantation ☐ Livestock Farming
   - ☐ Fishery ☐ Government Employee
   - ☐ Government Official ☐ Common Employment
   - ☐ Business/Commercial ☐ Other (Please specify……)

Supplemental Occupation (.....)

6. Annual Major Household Income (Baht/Year)

☐ < 2,000 ☐ 20,00-4,000

☐ >4,000-6,000 ☐ > 6,000-8,000

☐ >8,001-10,000 ☐ >10,000-30,000

☐ Other (please specify…….)

Income from supplemental occupation (.....)

7. Current Habitat

☐ Native

☐ Move from Tambol……..… Distict ….. Province……

8. Time at current address..…… Years (Fraction more than 6 months count to 1 year)

9. Social Position or Role

☐ None ☐ Yes, Please specify

1)…….

2)……

3)……

10. Participation in the Management of Natural Resources or Environmental or others.

☐ Never ☐ Yes, Please specify

1)……

2)…….

3)……

Section II: Opinion regarding Forest Resource in Namsan Watershed Area

11. How do you perceive the current condition of forest resources in your community?

☐ Extremely deteriorated ☐ Deteriorated

☐ Less than plentiful ☐ Plentiful

12. Do you agree with the idea of the demolition of forest and environment resource affects the way of life of inhabitants in the surrounding area?

☐ Agree ☐ Not Agree ☐ No Comment

13. Are you aware of the current problem of the forest resources in your community?

☐ Yes, and the problem are ……

☐ No, because ……

14. Have you ever consume/utilize the forest resources in your community?

☐ Never ☐ Yes, by……. ☐ Recreation

☐ Collection of forest goods, mushrooms, and plant.

☐ Wood cutting for firewood/charcoal

☐ Others……..

15. Would you agree if the government invites representative from the community to participate in the decision making of the utilization of local forest resources?

☐ Agree ☐ No comment ☐ Not agree

16. If you are able to dictate, what would you direct your development/utilization of forest resources in your community?

☐ To be the forest for the living of Plants, animals, and organic variety.

☐ To be community forest for firewood/charcoal

☐ To be community forest for ecological tourism.

17. If there is a training in local forest resources management, would you participate?

☐ Definitely participate ☐ No

☐ Not sure ☐ Depend on the topics

18. What topics of the training would interest you? (You can choose more than 1)

- ☐ Conservation of Forest Resources.
- ☐ Protection, Prevention, Rehabilitation of Forest Resources.
- ☐ Forest Plantation
- ☐ Sustainable Utilization of Forest Resources.
- ☐ Leadership in Forest Resources Management.
- ☐ Others ……

19. Do you agree that there should be a form of management in forest resources for the fair utilization of the forest resources in the community?

☐ No comment ☐ Not agree ☐ Agree

20. How much you currently get benefits from forest resources in the community?

☐ Not at all ☐ A little
☐ A lot ☐ Other, please specify .....

21. What is the form of benefits you get from the forest resources?

- ☐ Wood, firewood, charcoal, and forest goods
- ☐ Community and public forest
- ☐ Medicinal plant, herbs
- ☐ Income from tourism
- ☐ Other, please specify .....

22. Would you participate in planning/hearing in “Forest Resources Management in the Community” research project?

☐ Yes ☐ No

23. Do you want the organization/mechanism/committee to be responsible for the management of forest resource and environment in Namsan watershed?

☐ I do ☐ I do not

Section III: Opinion regarding the management and outcome of the Tambol Administration in the management of natural resources and environment in Amphur Phurue and Dansai, Loei Province.

24. Does the administration has a policy to formulate plans/projects according to Tambol Development Plan? If yes, in what capacity?

☐ None ☐ Yes, in
1)…….
2)……

25. Does plans/projects in local strategy that were formulated synchronize with actual situation and correspond to local community needs?

☐ No ☐ Yes, in term of
1)…….
2)……

26. Does the local plans and projects synchronize with the National Development Plan, National Administration Plan, and Provincial Plan?

☐ No ☐ Yes, in
1)…….
2)……

27. How do you think that the local administration has actions to protect and maintain ational resources and environment?

……

…… **……**

28. How do you think that the outcome from the action of the administration benefit he community and inhabitant?

……

…… ……

29. How the administration facilitate the participation from the community in making decision or solving problems?

……

……**……**

30. Do the administration prioritize the development projects according to the needs and monitor the outcome?
    1) None
    2) Don't know
    3) Yes, the monitor were done by (Can choose more than 1 answer)
        1) The committee of the administration
        2) Government official
        3) Others (Please specify)…….

31. The administration at your Tambol facilitate the following activities (Can choose more than 1 answer)
    1) Market
    2) Protect and preserve assesses that considered as national treasure
    3) Provide and maintain electricity
    4) Provide water for drinking, consumption, and irrigation.
    5) Commercialize some services
    6) Provide and support group of agriculturists and cooperative
    7) Provide and maintain sewage system
    8) Promote and maintain the occupation of the inhabitants
    9) Promote the family industry
    10) Income generation for the benefit of the administration
    11) Provide and maintain convention centre, sport facilities, recreational facility, and public Park
    12) Others (Please specify)…….
    13) Don't know

Section IV: The participation, grouping, and activities in the local community to manage Namsan watershed

4.1 Local Activities in Namsan Watershed

Local Activities in Namsan Watershed	Have	Never
1. Meeting in the utilization of forest resource in Tambol/Village		
2. Self training in utilization of wood and forest goods		
3. Hunting of animal for commercial		
4. Developing of fire protection line for forest fire		
5. Planting the public area		
6. Collecting/selling of forest good such as plant and mushroom		
7. Establishment of group or organization for village development		
8. Conflict with government official on duty		
9. Exploration of forest area		
10. Digging/selling of land surface		
11. Excavation of lake or stream		
12. Garbage collection in public area such as temple, street		
13. Provide aids to officer on duty without pay		
14. Expel the illegal hunter, wood cutter out of area		
15. Utilize the use of death wood in the forest		
16. Breeding of plant for village plantation		
17. Fishery in reservoir, stream for sell		
18. Develop own source of water		
19. Protection of landslide		
20. Issue community code of conduct to preserve environment		

4.2 Participation and grouping

Participation and grouping	Have	Never
1. Protection of forest with official 2. Training in soil, water, forest conservation 3. Protection of forest fire with the official 4. Protection of forest fire with the administration 5. Establishment of organization to develop village with the administration 6. Protect and preserve natural resources with the administration 7. Excavation of canal, stream with the administration 8. Planning of water allocation with other communities 9. Attend village monthly meeting 10. Forest plantation with official		

Section V: Fundamental data on potential, problem, need, and participation in natural resource management in the area.

1. How the local/community require the management of forest resources in Namsan watershed?

.....

.....

2. What does the local/community think of the problems or barriers in Namsan watershed?

.....

.....

3. What does the local/community think of the potentials in Namsan watershed?

.....

.....

4. How the local/community would direct the utilization, rule, regulation, and conservation of forest resources?

.....

.....

5. What are the area that local/community think the government should provide funding?

.....

.....

6. How does the local/community think of the way to synchronize the local participation process in thinking, working, and planning with government policy and inhabitants' need?

.....

.....

7. How the local/community think of the way to formulate the strategy to manage forest resources?

.....

.....

8. What the community need?

.....

.....

9. What projects and budget that the community think should be implemented to support the community?

.....

.....

10. Have you ever received the suggestion/recommendation from related agencies, such as government agency or foundation, regarding forest management? If yes, how?

.....

.....

11. In what direction do you want to see your local develop in the future?

.....

.....

APPENDIX E

Item Correlation Analysis and Reliability Test Output

Item Correlation Analysis

EXECUTE .
CORRELATIONS

Correlations between item activities and total score

Activities that had engaged	Total Score
1. Meeting in the utilization of forest resource in Tambol/Village	.810
2. Self training in utilization of wood and forest goods	.695
3. Hunting of animal for commercial	.670
4. Developing of fire protection line for forest fire	.806
5. Planting the public area	.610
6. Collecting/selling of forest good such as plant and mushroom	.729
7. Establishment of group or organization for village development	.781
8. Conflict with government official on duty	.562
9. Exploration of forest area	.835
10. Digging/selling of land surface	.000
11. Excavation of lake or stream	.791
12. Garbage collection in public area such as temple, street	.783
13. Provide aids to officer on duty without pay	.901
14. Expel the illegal hunter, wood cutter out of area	.000
15. Utilize the use of death wood in the forest	.754
16. Breeding of plant for village plantation	.817
17. Fishery in reservoir, stream for sell	.692
18. Develop own source of water	.839
19. Protection of landslide	.864
20. Issue community code of conduct to preserve environment	.755

Reliability

```
RELIABILITY
 /VARIABLES=b411 b412 b413 b414 b415 b416 b417 b418 b419 b4110 b4111 b4112
  b4113 b4114 b4115 b4116 b4117 b4118 b4119 b4120
 /SCALE('ALL VARIABLES')  ALL/MODEL=ALPHA
 /ICC=MODEL(MIXED) TYPE(CONSISTENCY) CIN=95 TESTVAL=0 .
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Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded(a)	0	0.0
	Total	30	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.8054	20

CURRICULUM VITAE

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BIRTH PLACE : Chiangmai
EDUCATION :

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POSITION : Policy and Plan Analysis
WORK PLACE : Office of the National Economic and Social Development Board